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P001

Component Separation and Ventral Hernia Repair - A Review of the Literature

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Introduction: Component separation (CS) and myofascial advancement flaps have grown in popularity for the management of large and complex ventral hernias. This technique involves releasing either the external oblique muscle (anterior component separation or ACS) or the transversus abdominus muscle (posterior component separation or TAR). There are different approaches to CS, but all have the goal of restoring the linea alba to its normal anatomical position. Both imaging and functional studies demonstrate that when these are performed well, the abdominal wall function is preserved with a low risk of bulging and semilunar hernias. We completed a systematic review to compare the outcomes of the various component separation techniques with a focus on morbidity (surgical site occurrences) and recurrence rates to better guide future decision-making.
Methods: A comprehensive search of PubMed and Embase included systematic reviews, meta-analyses, RCTs, and guideline papers related to VHR, yielding 388 papers initially. After excluding duplicates, conference abstracts, and irrelevant articles, 193 studies remained. ?10 articles specifically addressing component separation with the focus largely on morbidity and recurrence.
Results: We identified 10 studies to include in our review. These largely consisted of meta-analyses on the approaches of one or more of the techniques. With regard to TAR, we found that rTAR is less morbid than oTAR with oTAR reaching similar morbidity as open ACS (around 10% for rTAR and 20% for oTAR and open ACS). We also found that TAR had a lower recurrence rate when compared to open ACS or primary fascial closure – TAR 5% and ACS 12%. When looking at ACS, there are two main approaches: endoscopic anterior component separation (ECS) and minimally invasive perforator sparing (MiCS). Our review found that ECS and MiCS have similar morbidity (10–20.3% for ECS and 9.5–16% for MiCS) and recurrence rates (7–11.3% for ECS and 6.5–10% for MiCS).
Conclusion: Ultimately, there was no consensus on which technique is the most superior, although our review suggests that there is a trend towards perforator sparing anterior component separation being the least morbid and transversus abdominus release (robotic or open) having the lowest recurrence particularly when reinforced with mesh. While we continue to expand and perfect these methods, it will be important to continue reviewing the literature to make recommendations to guide care

P003

eTEP vs. TAPP in the Management of Primary Midline Ventral Hernias: A Prospective Comparative Study of Short-Term Clinical Outcomes

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Introduction: Abdominal wall hernia surgeries are most commonly performed procedures globally. The paradigm shift from open techniques to minimally invasive procedures has improved the overall patient outcomes. Though Intraperitoneal Onlay Mesh repair (IPOM) has shown promising results early on, the long term complications associated with it has led to utilising different anatomical planes for hernia surgery and mesh placement. Transabdominal pre-peritoneal (TAPP) and Enhanced view Totally extraperitoneal (eTEP) techniques have gained popularity. This study compares TAPP and eTEP in managing primary midline ventral hernias with defect size less than 5cms. With main focus on feasibility and short term outcomes such as operating times, postoperative pain, return to normal work and quality of life.
Methods and Procedures: This is a prospective cohort study of 40 patients with primary midline ventral hernias. The patients were divided into TAPP and eTEP groups using batched sequential propensity matching based on age, sex, comorbidities, hernia type and defect size. The patient demographics, hernia characteristics were described and short term outcomes such as operative time, pain scores on post operative days 2 and 14, length of hospital stay, time to return to normal work, complications and quality of life after six months were measured. The data was analysed using tools such as standard deviations, T-tests, Wilcoxon rank sum tests as applicable for comparisons
Results: A total of 40 patients participated, with a mean age of 48.3 years (± 8.2). The average operating time was 2 h and 16 min for the

eTEP group and 2 h and 2 min for the TAPP group ($P = 0.011$). Postoperative pain scores on day 2 were 25.6 (SD 3.2) for eTEP and 23.8 (SD 6.2) for TAPP ($P = 0.342$). The time to return to work averaged 5.83 days (SD 2.32) for eTEP and 5.17 days (SD 2.04) for TAPP. Quality of life scores at six months were 87.2 (SD 4.08) for eTEP and 90 (SD 2.83) for TAPP.
Conclusion: This study compared the TAPP and eTEP techniques in managing primary midline ventral hernias, both the techniques are feasible and demonstrated comparable outcomes. Thus supporting flexibility in decision making based on surgeon expertise and individual patient factors.

P004

Comparative Evaluation of TAPP, e-TEP, and TEP Techniques for Inguinal Hernia Repair: A Focus on Surgical Outcomes

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Introduction: Inguinal hernia is one of the most common surgical conditions worldwide, and minimally invasive techniques have revolutionized its management. 1 Three commonly employed laparoscopic approaches for inguinal hernia repair include Transabdominal Preperitoneal (TAPP), Extended Totally Extraperitoneal (ETEP), and Totally Extraperitoneal (TEP) repairs. 2 Each technique offers distinct advantages. This presentation aims to provide comparative evaluation of three procedures with surgical outcomes.
Method: Retrospectively data was collected since January 2023 from electronically maintained database of patient of a prospective study. Data was collected including demographic profile, clinical examination, type of inguinal hernia and laterality. All included patient went under any of three procedure mentioned TAPP, e-TEP and TEP procedure. Post operative data was collected, analyzed and early outcomes assessed.
Result: A total 172 patients of inguinal hernia were diagnosed and operated since January 2023 in a single unit at our institute. Among 172 patients, 168 were male and 8 were female. Mean age was 55 years. A total of 72 cases were right inguinal hernia, 54 were left inguinal hernia and 46 were bilateral inguinal hernia. 90 cases underwent TAPP repair, 42 cases operated by e-TEP technique and rest of 40 cases underwent TEP repair. Mean duration of procedure was 120 min. The average operative time was significantly shorter in the TEP group (mean 35 $\pm$ 5 min) compared to TAPP (40 $\pm$ 10 min) and ETEP (55 $\pm$ 14 min). Intraoperatively 3 patients who were started with e-TEP procedure were converted to TAPP repair due to breach in peritoneum. Seroma rates were lowest in the TEP group 2 (5%) compared to TAPP 7(7.78%) and ETEP 5 (12%). Recurrence rates were comparable across all three groups, with a recurrence rate of 2 (5%) in TEP, 4(4.4%) in TAPP, and 2(4.7%) in e-TEP.
Conclusion: While TEP offers the shortest operative time and the lowest seroma rates, e-TEP provides better ease of dissection. All three techniques demonstrated comparable recurrence rates; making each a viable option based on surgeon's expertise and patient factors. E-TEP, however, may be advantageous in complex cases due to improved anatomical visualization. Further studies with longer follow-up are required to assess long-term outcomes.
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P005

The Follow-Up Dynamics: Distinct Patterns in Ventral Hernia Repair Across Time in a Single-Center Cohort Study

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Background: Ventral hernia repair (VHR) is a common surgical procedure, but the postoperative follow-up remains a critical concern. While many surgeons often consider short-term follow-up sufficient, the literature suggests that longer follow-up is necessary after VHR. However, following up with patients can present various challenges, ranging from baseline characteristics such as socioeconomic factors and comorbidities to the specific features of the hernia and postoperative complications. We aimed to analyze the differences in patient and hernia profiles between those with different postoperative follow-up periods.
Methods: This retrospective single-center study examined patients with VHR, divided into four groups based on postoperative follow-up: no follow-up, less than 6 months, between 6 months and 1 year, and more than 1 year. Patients who had surgery within the past year were excluded. We analyzed baseline characteristics such as race, age, BMI, comorbidities, hernia details, surgical factors, and postoperative complications. Continuous outcomes were assessed for normality and comparative tests were performed accordingly. Categorical outcomes were evaluated with the Chi-square test or Fisher's exact test depending on expected counting. Statistical analyses were conducted using R software.
Results: After applying the eligibility criteria, 391 patients were included in the analysis, comprising 42 patients (10.7%) who had no follow-up (FU), 284 (72.6%) had FU of less than 6 months, 31 (7.9%) had FU between 6 months and 1 year, and 34 (8.7%) had FU of more than 1 year postoperatively. Our analysis revealed that white patients tended to have longer FU periods compared to other races ($p = 0.02$). Additionally, cirrhosis or liver disease was more prevalent in the no FU group ($p = 0.02$). Umbilical hernias were more common in the no FU group compared to longer FU groups ($p = 0.04$), whereas epigastric hernias were more frequent in the long FU group ($p = 0.03$). Patients with preoperative hernia symptoms and recurrent hernias also tended to be more prevalent in the longer FU groups ($p = 0.04$). Furthermore, longer operative times ($p = 0.02$) and lengths of hospital stay ($p < 0.001$) were associated with longer FU, along with increased use of drains ($p = 0.004$). Both the presence of pain ($p = 0.03$) and higher visual analog scale ($p = 0.04$) scores were noted in longer FU groups. Postoperative clinical complications were also more frequent among patients with longer FU periods ($p = 0.008$).
Conclusion: Our findings indicate that patients with multiple comorbidities, and more complex and symptomatic hernias tend to have longer follow-up periods. Additionally, non-white patients are followed up less frequently than white patients.

P007

Biologic Versus Hybrid Mesh Hernia Recurrence Rate in Elective Ventral Hernia Repair: A Retrospective Cohort

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Objective: This study aims to compare the rates of hernia recurrence between biologic mesh and reinforced tissue matrix (RTM) during elective ventral hernia repair.
Methods & Procedures: A retrospective cohort study was performed to examine hernia recurrence between individuals who underwent ventral hernia repair with biological mesh versus reinforced tissue matrix from 2015 to 2023. Patients 18 and older were included in the study. Primary outcome was short (< 30 days) and long term (> 30 days) outcomes of hernia recurrence after elective ventral hernia repair. Demographic statistics were completed, and the Mann–Whitney U test and Fisher 'sexact tests were used to compare outcomes between mesh types. Time to recurrence was characterized using Kaplan–Meier methods.
Results: 156 patients underwent elective ventral hernia repair and provided follow-up data. 99 patients underwent repairs with RTM and 57 patients underwent repairs with biologic mesh. None of the patients who underwent hernia repairs with RTM or biologic mesh developed a hernia recurrence within 30 days of surgery. 15% of patients who underwent elective ventral hernia repairs with RTM developed a hernia recurrence after 30 days. In comparison, to 42% of the patients who received biologic mesh, although this group had significantly longer follow-up than RTM. Patients who received RTM have a 91% [95% CI: 82–100%] probability to be recurrence free at 12 months and 78% [95% CI: 61–100%] will be recurrence free at 24 months.
Conclusion: Use of reinforced tissue matrix in elective ventral hernia repairs results in a lower long term hernia recurrence rate compared to use of biologic mesh. Using Kaplan–Meier analysis, patients who received reinforced tissue matrix have a low chance of having a recurrence at 12 months and 24 months.

P008

Time Matters: Analyzing Follow-Up Practices and Long-Term Recurrence in Inguinal Hernia Repair Studies

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Background: Recent guidelines on inguinal hernia repair (IHR) emphasize the importance of a minimum follow-up period of 1 year, with a particular focus on long-term follow-up (> 5 years) to adequately assess recurrence rates. Despite these recommendations, the consistency and methodology of follow-up reporting in the literature remain variable. This study aims to evaluate follow-up practices in comparative studies of inguinal hernia repair.
Methods: A comprehensive search of studies published from 2018 onwards in top-cited surgery journals was conducted by two authors. We included studies that compared surgical techniques or materials for IHR and reported recurrence outcomes. We specifically looked for studies that defined one or more specific time points for assessing recurrence. We categorized the studies based on whether they used a minimum follow-up period of 1 year, as recommended, and identified those that provided long-term recurrence analysis (> 5 years). We also analyzed the proportion of studies that presented a follow-up of less than 1 year postoperatively but suggested superiority among the intervention or control groups for recurrence analysis.
Results: The initial search yielded 134 studies, of which 76 (56.7%) analyzed recurrence. Among these, 51 studies compared surgical techniques or materials, and 34 (66.7%) established a minimum cutoff for recurrence analysis and were included in final analyses, comprising 20 observational studies (58.8%) and 14 RCTs (41.2%). Among the selected studies, 7 (13.7%) selected cutoffs of less than one year postoperatively, 22 (64.7%) had a minimum follow-up period ranging from one to five years, while only 5 (9.8%) chose a minimum follow-up period greater than five years. Interestingly, there was a trend to indicate superiority in one of the groups analyzed in studies with shorter follow-up periods, with 71.4% of studies with follow-up of less than one year, 31.8% of studies with follow-up between one and five years, and 20% of studies with follow-up longer than five years reporting significant differences in recurrence between the analyzed groups. Also, this trend was lower in RCTs compared to observational studies, 7.1% vs. 50%.
Conclusion: Our analysis identified that studies with shorter follow-up periods often conclude differences in recurrence between groups. This highlights the need to establish standardized follow-up durations to accurately evaluate recurrence rates.

P009

Surgical Care for Rectus Diastasis in U.S. Ambulatory Surgery Centers, 2019-2020

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Introduction: While abdominal rectus diastasis (ARD) can impact a patient's health, there is not a standard surgical approach to treatment leading to inconsistent insurance coverage. Therefore, we conducted this study to describe the current surgical treatment of ARD in the U.S. and to identify factors associated with insurance coverage.
Methods: Utilizing the 2019–2020 Nationwide Ambulatory Surgical Sample, we identified discharges for adult patients with a diagnosis of ARD who underwent an abdominal wall surgical procedure. Patients were sub-grouped by presence or absence of a concurrent hernia and/or pannus. The primary outcomes were the surgical procedures performed and primary payer coverage. Multivariable logistic regression modeling was used to identify factors associated with insurance coverage.
Results: The final sample included 24,288 patients with most having diagnoses of diastasis with hernia (67.5%), followed by diastasis alone (18.7%), with pannus (10.5%), or with both conditions (3.3%). For the isolated ARD sub-group, most underwent abdominoplasty and panniculectomy (72.2%), however, 8.4% did not require a skin tailoring procedure and 6.0% had mesh placement. Among patients with concurrent hernia, laparoscopic (57.3%) and open (39.6%) hernia repair, as well as component separation (5.9%). Age (AOR = 1.02 [1.01–1.02]), obesity (AOR = 1.57 [1.33–1.84]), history of bariatric surgery (AOR = 3.12 [2.44–3.98]), hernia (AOR = 25.96 [21.02–32.07]), and diastasis with hernia and abdominal pannus (AOR = 6.53 [4.94–8.64]) were more likely to be associated with insurance coverage.
Conclusions: The surgical treatment of ARD follows a consistent pattern based on concurrent diagnoses at the abdominal wall, while insurance coverage is associated with specific clinical factors. This study may serve to inform future efforts to develop standardized care pathways and inform healthcare payer policy.

P010

Randomized Controlled Trial on Preoperative Cessation vs No Preoperative Cessation of Aspirin in Laparoscopic Inguinal Hernia Repair

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Introduction and Background: The incidence of inguinal hernia is increasing in view of the ageing population worldwide. Cardiovascular and cerebrovascular co-morbidities are the commonest indications for use of anti-thrombotic agents (including aspirin) in this age group. Thus, fundamentally, we need to better understand the risk of adverse thromboembolic events like acute myocardial infarction and strokes (when ceasing aspirin) versus the risk of bleeding (when not ceasing aspirin) in patients undergoing laparoscopic inguinal hernia mesh repair.
Methods: We designed a prospective randomized controlled trial to recruit 100 patients with either unilateral or bilateral reducible inguinal hernia undergoing laparoscopic inguinal hernia mesh repair. This was conducted in a tertiary hospital and a restructured hospital in Singapore. Patients who were unfit for general anaesthesia, had obstructed or strangulated hernias or if they underwent open surgery were excluded from this study. The primary outcome was post-operative bleeds while the secondary outcomes included post-operative thromboembolic events, surgical site infections, and length of hospital stay.
Results: Of the 92 patients recruited since 2015 for our randomised controlled trial, 42 have been randomised to continue aspirin preoperatively (45.6%) while 50 have been randomised to stop aspirin 5 days preoperatively (54.3%). In both groups, most patients were male, had similar mean BMI (23.8 vs 24.4), similar American Society of Anesthesiologists (ASA) grading, had primary bilateral hernias and comparable mean defect size. Mean postoperative stay in hospital in days was similar (0.70 vs 0.96). Mean follow up duration was similar for both groups (88.8 vs 93.4) days. There was no statistically significant difference in all post-operative complications (bruising, haematoma, wound infections, recurrence and chronic pain) in both groups. Additionally, nil adverse thromboembolic events and nil mesh infections were noted in either group.
Discussion: Aspirin cessation vs no aspirin cessation preoperatively did not have any statistically significant difference between post-operative bleeding or thromboembolic events.
Conclusion: This study challenges the practice that aspirin needs to be withheld before an elective laparoscopic inguinal hernia mesh repair.

P012

Epigastric Hernia Containing Incarcerated Gallbladder

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Introduction: Epigastric hernias represent 1.6–3.6% of all abdominal hernias, and usually contain preperitoneal fat and occasionally omentum or small bowel. Rarely, epigastric hernias may contain portions of other organs, such as colon or stomach. We report an unusual case of a patient whose incarcerated epigastric hernia contained her stone-filled gallbladder.

Case Presentation: An 81-year-old female presented to the outpatient clinic with intermittent epigastric pain and an abdominal bulge. CT demonstrated a small (1.5 cm) epigastric hernia containing a large portion of the gallbladder with numerous stones (Fig. 1). The hernia was not reducible with gentle pressure. She underwent elective robotic-assisted cholecystectomy and open primary suture repair of the epigastric hernia. The large hernia sac was removed robotically (Fig. 2), and the small defect was repaired primarily in an open fashion. Pathology revealed cholelithiasis.
Discussion: Gallbladder herniations are rare, with only a small number of published cases. Most commonly, a gallbladder-containing hernia occurs at a prior incision site, usually in the right upper quadrant, but may occur in other locations such as parastomal, internally through the foramen of Winslow, or ventral/epigastric. Associated risk factors include female sex, older age, prior abdominal surgery/hernias, and gallbladder carcinoma. Aggressive attempts at reduction of gallbladder-containing hernias should be avoided due to risk of rupture, and mesh should be used cautiously in a potentially contaminated field.

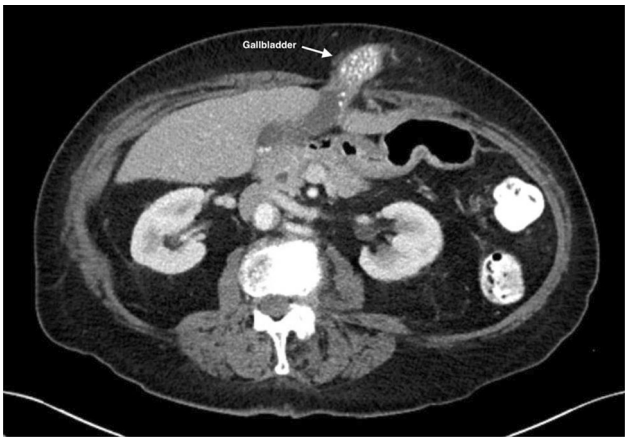


Fig. 1 Preoperative CT Scan

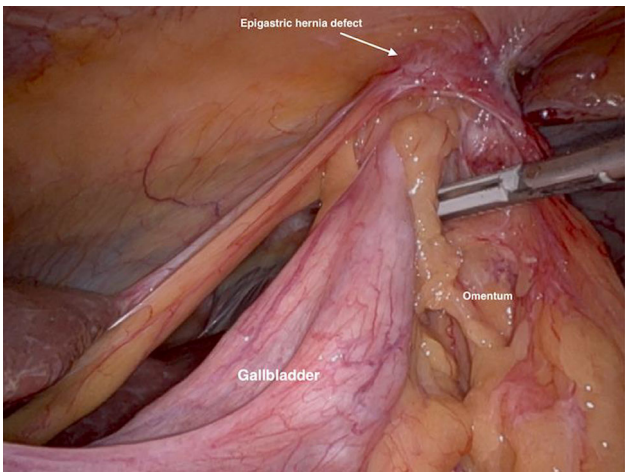
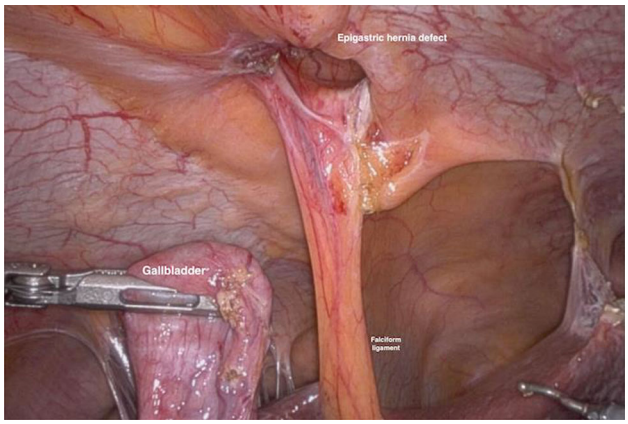


Fig. 2 Intraoperative Images, Pre- (left) and Post- (right) Gallbladder Reduction



P013

Correlation Between Obesity and Pneumoperitoneum in Initial Trocar Access for Laparoscopic eTEP

Nitin Baste; Vishakha Patil; Vinod Patil; SMBT IMSRC

Background: There are different techniques available to take initial trocar acess for eTEP RS. The commonly followed method is visi port access. But it's very difficult to use disposable visiport instruments in general and charitable hospitals. In tribal and rural India, open access with steel trocar and cannula is still the preferred method.
Methods: Prospective study of all eTEP procedures done in single institute has been conducted to see if patient has developed pneumoperitoneum just after initial trocar access for eTEP.
Results: Total 102 eTEP procedures done in our institute between March 2023 to April 2023.
Male patients were-75
Female patients were-27
Average BMI-23
Patients with BMI more than 30–25
Total number of patients in which pneumoperitoneum occurred-22
Total number of patients with BMI more than 30 in which pneumoperitoneum occurred-15
Total number of patients with BMI less than 30 in which pneumoperitoneum occurred-7
Conclusion: We have found that pneumoperitoneum occurred more in obese patients as there is thin posterior rectus sheath and peritoneum. BMI is good predictive indicator of pneumoperitoneum for eTEP surgery.

P014

Consulting Dr. Google: Popular Trends for Repair of Inguinal Hernias

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Introduction: Google Trends (GT) is an online tool that assesses the relative popularity of, and consequently interest in, search terms over time. Inguinal hernia repair (IHR) remains a common procedure, with over a million performed in the US, and over 20 million worldwide annually. We aim to study and compare interest trends in the US and the World for IHR techniques (open, laparoscopic, robotic) using GT.
Methods: The following search topics were analyzed from January 2010 to August 2024 in "US" and "World" subcategories: "open inguinal hernia repair," "laparoscopic inguinal hernia repair," "robotic inguinal hernia repair." We quantified and compared interest using relative search volume (RSV). Average annual RSV by technique each year was compared by region using one-way ANOVA. Average annual percentage change (APC) in RSV was compared by technique for each region (i.e., US vs. World robotic IHR) with graphical representation of overall trends.
Results: In the US, there was an increase in RSV for the IHR techniques ($p < 0.0001$), with average RSV APC of + 25.92% for open and + 23.50% for laparoscopic IHR from 2010–2024, and + 53.19% for robotic IHR (2015–2024) (Fig. 1). Similarly increased RSV for IHR techniques was observed worldwide ($p < 0.0001$), with average RSV APC of + 9.5% for open and + 3.06% for laparoscopic IHR from 2010–2024, and + 67.07% for robotic IHR (2015–2024) (Fig. 2). There was insufficient data for robotic IHR from 2010–2014, denoted by RSV = 0. Trends increased by region when differentiated by technique, with more apparent differences noted in robotic surgery over time (Fig. 3).
Conclusions: Our findings demonstrate an increasing number of Google searches for IHR since 2010. There was a trend toward increased interest in robotic IHR in the US compared to the World, consistent with greater robotics usage within the US. Interestingly, US average annual RSVs were approaching equal distribution between the approaches. As more patients turn to Dr. Google for information about inguinal hernia repairs, the resources that result from these searches should reflect the increasing interest in minimally invasive approaches. Further research to elicit patients' specific interests around inguinal hernia repairs, whether related to pre-operative preparation, intraoperative technique, or post-operative recovery would facilitate the development of accurate and helpful online resources and prepare patients for an effective discussion with their surgeon.

Figure 1. US Google Trends Average Annual RSV by IHR Technique (Jan 2010-Aug 2024) (p<0.0001)

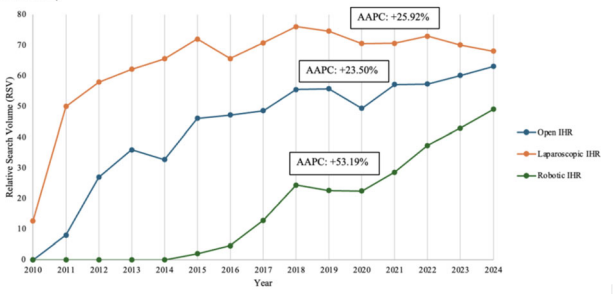


Figure 2. World Google Trends Average Annual RSV by IHR Technique (Jan 2010-Aug 2024) (p<0.0001)

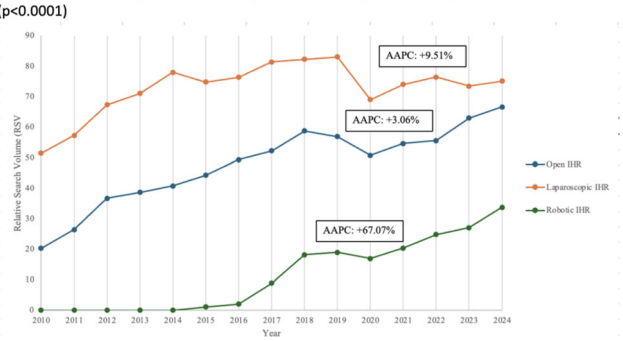
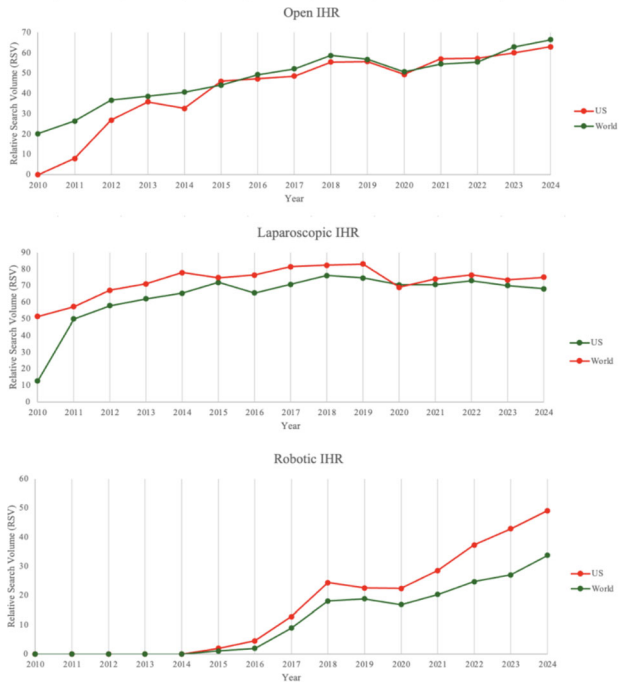


Figure 3. US vs. World Google Trends RSV Comparison by Operative Technique (Jan 2010-Aug 2024)



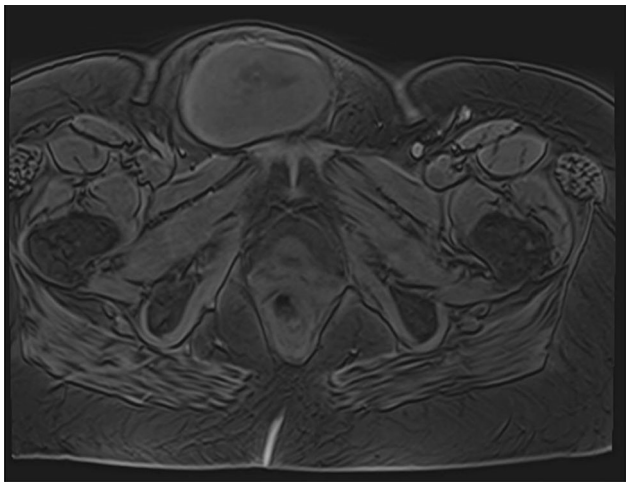
P016

A Rare Case of a Right Inguinal Hernia Containing a Round Ligament Leiomyoma

Kelly Fening, DO; Chinh Pham, MD; UPMC Central PA

Leiomyomas, or uterine fibroids, are the most common benign tumors in women of reproductive age and the leading indication for hysterectomy in the United States. Round ligament leiomyomas, on the other hand, are rare. This case details a patient who presented with symptomatic uterine fibroids as well as a large, irreducible right groin mass that appeared to be a round ligament leiomyoma on preoperative imaging.

52-year-old female with a history of symptomatic uterine fibroids as well as a large right groin round ligament leiomyoma presented for elective surgical intervention. She underwent a robotic assisted hysterectomy at which time she was noted to have an almost 18-week size multilobular fibroid uterus. Following the hysterectomy, general surgery excised a 12 × 8 cm right round ligament inguinal mass fibroid that was found to extend through the inguinal floor. After removal of the mass, an extra large mesh plug perfix was used to bridge the defect. This was secured to the muscle medially, inferiorly to the shelving edge of the inguinal ligament, and superiorly to the external oblique muscle. The external oblique aponeurosis, scarpa's fascia, and the subcutaneous tissues were sequentially approximated. She was discharged home on post operative day 1. Final pathology revealed multiple leiomyomas.



P017

Operative Techniques in Ventral/Incisional Hernia Repair

Nathan Haywood, MD; Kaela Blake, MD; University of Tennessee Medical Center Knoxville

The ideal operative technique in ventral/incisional hernia repair with mesh is debated. We performed a systematic review of the numerous minimally invasive and open techniques. A comprehensive search of PubMed and Embase was performed that included systematic reviews, meta-analyses, randomized controlled trials, and guideline papers related to ventral hernia repair, yielding 388 papers initially. After excluding duplicates, conference abstracts, and irrelevant articles, 193 studies addressing ventral hernia repair remained. Seven articles specifically addressed operative technique and were evaluated. The retro-muscular and underlay mesh position was associated with the lowest rate of hernia recurrence. When stratified by open or laparoscopic approach, a higher rate of recurrence was associated with the open approach. Open approaches have also been found to have a higher rate of wound complication when compared to the minimally invasive approach. Common minimally invasive techniques to perform hernia repair with mesh placement in the retro muscular and underlay position include intraperitoneal on lay mesh (IPOM) approach, extended totally extra peritoneal (eTEP) approach, and trans abdominal pre peritoneal (TAPP) approach. Studies comparing the efficacy and safety of eTEP and IPOM in ventral and incisional hernia repair have demonstrated longer operative time in eTEP compared to IPOM. However, there was less postoperative pain and shorter hospital length of stay in eTEP group compared to IPOM. There was no difference in intraoperative or postoperative complications and there was no difference in hernia recurrence over 6-28 months. Additional studies have compared the outcomes of TAPP ventral hernia repair to IPOM and eTEP. Compared to IPOM, TAPP was associated with less post operative pain, reduced average cost, and lower rates of surgical site infection. Compared to eTEP, TAPP ventral hernia repair consumed less operative time and had shorter hospital length of stay. A minimally invasive approach to ventral/incisional hernia repair with mesh placement in the retro muscular or underlay position has demonstrated benefit. However, the ideal minimally invasive technique remains unclear as there are multiple safe and efficacious options with unique strengths and weaknesses.

P018

A Prospective Study of the Effect of Hiatal Hernia Repair on Pulmonary Function Using a Standardized Questionnaire

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Introduction: Hiatal hernias are common in individuals older than 50 in the United States with a prevalence of 60%. Previous studies have demonstrated worse objective and subjective pulmonary function in patients with hiatal hernias. Whether hiatal hernia repair results in improved subjective dyspnea is an area of disagreement and mixed results. Our study sought to determine whether repair of large hiatal hernia relates to improvement in clinical symptoms at 6- and 12-months post-op using the St. George's Respiratory Questionnaire (SGRQ).

Methods and Procedures: We conducted a single-center, prospective review of patients with type 3 or 4 hiatal hernias who were being assessed for hiatal hernia repair. Informed consent was obtained, and patients completed the initial SGRQ prior to surgery. Follow-up questionnaires were completed at 6- and 12-months in clinic or over the phone. SGRQ scoring use item specific weighting to place the total score and three sub-scores (Symptoms, Activity, Impacts) on a 100-point scale; lower scores indicate better health. Repeated measures ANOVA with post-hoc tests were performed for the total score and all sub-scores. Analyses were conducted using SAS v. 9.4, with $p < 0.05$ indicating statistical significance.

Results: Fifty-four patients were included, of whom the average age was 70 years (SD: 8.9, range: 41–91), 89% were female, 91% were white, and 28% had a type 4 hiatal hernia. Twelve-month retention was 72%. Changes from the preoperative period to both the 6-month and 12-month postoperative follow-ups demonstrated statistically significant decreases in score ($p < 0.05$; Table 1). None of the changes from the 6-month postoperative period to 12-month postoperative evaluation were statistically significant (Table 1).

Conclusion: Hiatal hernia repair resulted in significantly decreased pulmonary health impairment and improved self-reported pulmonary health at the 6-month and 12-month postoperative periods. Subjective health measures remained constant between 6- and-12-months postoperatively, suggesting that hiatal hernia repair provides sustained quality-of-life improvement.

Table 1. Results of Hiatal Hernia Repair on St. George's Research Questionnaire

	Pre Mean (sd)	6-Mo Mean (sd)	12-Mo Mean (sd)	Pre vs 6-Mo (n = 45)	Pre vs 12-Mo (n=39)	6-Mo vs 12-Mo (n=39)
Total Score	36.6 (12.3)	22.2 (11.3)	21.1(10.3)	<.001	<.001	.662
Symptoms	40.9 (19.4)	12.9 (14.1)	10.2 (13.5)	<.001	<.001	.211
Activity	56.4 (20.7)	45.7 (20.9)	46.1 (20.1)	.003	.016	.426
Impacts	24.0 (12.3)	11.7 (9.4)	10.2 (6.7)	<.001	<.001	.059

*Note 1 = Very Good, 2 = Good, 3 = Fair, 4 = Poor, 5 = Very Poor.

P019

Delayed Testicular Compartment Syndrome After Robotic Inguinal Hernia Repair

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Introduction: Testicular complications including ischemic orchitis and testicular compartment syndrome are extremely rare after minimally invasive hernia repair.

Case Description: We report a case of a healthy 22-year-old man who underwent an uncomplicated robotic left inguinal hernia repair who required an urgent scrotal exploration on postoperative day 50 for testicular compartment syndrome. His presented to clinic 2 weeks after surgery with mild painless scrotal swelling that was resolving with each postoperative day. On postoperative day 39, he underwent a scrotal ultrasound due to painless elevation of the left testicle showing good testicular blood flow bilaterally, mild left scrotal thickening, no fluid collection or edema, and a nonspecific hyperechoic circumferential thickening of the left spermatic cord consistent with evolving post-operative changes. However, he presented to the emergency room on post-operative day 50 with left flank pain and emesis after exercising and was found to have decreased left testicular blood flow with a left hydrocele on ultrasound (see attached image). Intraoperatively, he had decreased left testicular flow due to a hydrocele and small hematoma underneath a thick rind of tunica vaginalis. There was no torsion present. The Urology team opened the thickened tunica vaginalis which restored normal blood flow, released the hydrocele, and saved the viable testicle underneath. The patient had an uneventful recovery.

Conclusion: Delayed testicular compartment syndrome after minimally invasive hernia repair is incredibly rare, and heightened clinical awareness of this complication should prompt earlier workup of painless postoperative scrotal and/or inguinal swelling to assist in earlier diagnosis of this complication.

P020

Outcomes of Robotic eTEP vs. TARM approaches for Midline Ventral Hernia Repair: Insights from a Large ACHQC Cohort

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Introduction: The evolution of midline ventral hernia repair has advanced from traditional open techniques to minimally invasive robotic approaches, notably the trans-abdominal retromuscular (TARM) and enhanced-view totally extraperitoneal (eTEP) methods. In a prior study, we compared these two techniques based on a single surgeon's experience, demonstrating how eTEP was associated with a larger area of implanted mesh, reduced hospital length of stay and postoperative pain compared to TARM. This current study aims to expand on these findings by utilizing a larger dataset from the Abdominal Core Health Quality Collaborative (ACHQC) database, allowing for a more robust comparative analysis.

Methods: A retrospective analysis was conducted on adult patients who underwent robotic retromuscular midline ventral hernia repair recorded in the ACHQC database between 2019 and 2023. After inclusion criteria, 479 patients were identified: 27 underwent TARM approach and 452 the eTEP approach. The primary outcomes were mesh area, hospital length of stay, operative time and postoperative pain scores. Secondarily, the type of hernia repaired, 30-day readmission, and surgical site occurrence (SSO) were also studied.

Results: The eTEP group demonstrated a significantly shorter median hospital length of stay compared to the TARM group (0.5 vs. 1.2 days; $p = 0.002$). Postoperative pain was also better in the former (median pain score: 2.1 vs. 3.4; $p = 0.01$). Additionally, the eTEP approach also allowed for a larger average area of mesh implanted (700 cm^2 vs. 330 cm^2; $p < 0.001$). While not statistically significant, the analysis also revealed a lower incidence of SSO at 30-days in the eTEP group (17%) compared to TARM (19%). Although the operative time trailed in that direction, it did not reach significance ($p = 0.08$). Both 30-day readmissions and type of hernia repaired were comparable between the groups; however, notably, the TARM group had more incisional and spigelian hernias, while the eTEP group had more primary ventral hernia repairs, including epigastric and umbilical, with only spigelian showing a significant difference (4% vs. 0%; $p < 0.001$).
Conclusion: The eTEP approach is associated with a shorter hospital length of stay, reduced postoperative pain, and a larger area of mesh implantation. These findings, now reinforced by a larger cohort from the ACHQC database, corroborate our previous single-surgeon study. The statistically significant advantages of the eTEP technique suggest it may offer superior outcomes for midline ventral hernia repairs. Further research is recommended to evaluate long-term impacts and refine patient selection criteria for each approach.

P021

Clinical vs. Statistical Relevance in Ventral Hernia Repair Literature: A Call for Clearer Distinctions

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Background: In ventral hernia repair (VHR) research, statistically significant findings are often emphasized without proper consideration of clinical relevance. This can lead to misinterpretation of data and affect clinical decision-making. Our study aimed to assess the frequency with which clinical relevance is reported and distinguished from statistical significance in comparative studies of VHR.
Methods: A comprehensive search was conducted across seven Surgery Journals with impact factor higher than 2, for articles comparing techniques in VHR. Studies published since 2018 were included, and non-clinical outcomes, such as cost-effectiveness, were excluded. Two independent reviewers screened the articles, identifying whether a clinical relevance cutoff was defined, if clinical relevance was addressed, and whether conclusions were based solely on statistical significance.
Results: Out of an initial 52 articles, 43 met the inclusion criteria, comprising 6 randomized controlled trials (RCTs) and 37 cohort studies. Only 2 studies (4.7%), both RCTs, defined a clinical relevance cutoff for their outcomes. Six studies (14%) addressed the concept of clinical relevance, with 5 noting that their findings might not hold clinical importance. One of these was an RCT. Additionally, 1 study highlighted the importance of weighing risk-benefit factors in clinical practice when considering statistically significant outcomes. On the other hand, 3 cohort studies concluded the superiority of a surgical technique despite lacking statistical and clinical relevance. Interestingly, 7 studies, including 2 RCTs, did not make conclusions of superiority despite presenting statistically significant results.
Conclusion: The findings reveal a critical gap in the reporting of clinical relevance in VHR studies. Even in RCTs the distinction between statistical significance and clinical importance is often neglected. There is a pressing need for future studies to define clinical relevance thresholds and to better contextualize their findings in relation to patient-centered outcomes.

P022

Single-Institution Evaluation of Outcomes in Patients Undergoing Surgical Intervention for Enterocutaneous Fistula or Mesh Infection

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Background: Mesh infections and enterocutaneous fistulas (ECF) are technically challenging problems to manage. This study sought to evaluate postoperative outcomes in patients undergoing surgical management of mesh infections and ECF. Additionally, we performed sub-analyses focusing on repair techniques (single vs two-stage) and mesh types.
Methods: A retrospective review of a prospectively maintained database was used to identify patients with mesh infection undergoing surgical intervention at our institution between January 2014 and March 2024. Primary outcomes included surgical site infections (SSI), fistula recurrence, and hernia recurrence.
Results: In total, 29 patients were included in the study, nineteen (65.5%) presented with an ECF, X with mesh infection. Five (17.9%) patients experienced a surgical site infection (SSI) within 30 days postoperative, and 5 (17.9%) more had SSIs at greater than 30 days postoperative. Four (14.3%) had a recurrent mesh infection with 2 (7.1%) developing a recurrent fistula and 3 (10.7%) patients had hernia recurrence.
Single-stage repair ($n = 14$) was associated with a higher SSI rate compared to two-stage repair (21.4% vs. 14.3%, $p = 1.00$) and fistula recurrence (14.3% vs. 0%, $p = 0.48$). Hernia recurrence, however, was lower in the single-stage group (7.1% vs. 14.3%, $p = 1.00$), though they experienced a higher rate of mesh infections (28.6% vs. 0.0%, $p = 0.10$). The mesh infection rate was significantly higher in single-stage repairs using synthetic mesh compared to bioresorbable and biologic mesh (100% vs. 10% vs. 50%, $p = 0.04$).
Conclusion: Single-stage repairs were associated with higher rates of surgical site infections, fistula recurrence, and mesh infections, particularly when synthetic mesh was used. These findings suggest that synthetic mesh in single-stage repairs may increase the risk of postoperative complications.

P023

Practice Patterns and Outcomes in Mesh Selection for Elective Ventral and Incisional Hernia Repair

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Introduction: There are many mesh products available for ventral/incisional hernia repair, however the quality of data evaluating long term recurrence rates, and the comparison of various mesh products is lacking. The following study examines one common differentiator of mesh products (absorbable vs nonabsorbable) and the association with long term patient reported recurrence in statewide data registry.
Methods: We included all elective ventral/incisional hernia repair cases captured in the Michigan Surgical Quality Collaborative Core Optimization Hernia Registry (MSQC-COHR) between January 1, 2020 and March 31, 2023. This registry collects nuanced information about intraoperative details plus, long term outcomes like self-perceived recurrence via the validated ventral hernia recurrence inventory. Patients with complete one-year follow-up and mesh implant data were the included in the study and as the outcome of interest. Clinically abstracted product identification number or full brand name of implanted mesh product was used to determine mesh type. Mesh products including any nonabsorbable component were considered nonabsorbable. We performed a logistic regression predicting likelihood of patient-reported recurrence while controlling; patient, operative, and hernia characteristics known to be associated. Postestimation with the adjrr (adjusted-risk-ratio) Stata Package were used to compare the adjusted relative risk of experiencing recurrence one-year after receiving absorbable vs nonabsorbable mesh.
Results: 1734 repairs were included in the study, with 83 receiving absorbable mesh and 1651 receiving nonabsorbable mesh. The median(IQR) age was 58(48.0–66.0) years and 814(47%) were female. The absorbable mesh cohort included more women than the nonabsorbable cohort (49(59%) vs 765(46%), $p = .024$) and had a larger median(IQR) hernia size (5 cm(3–7) vs 3 cm(2–4), $p < 0.0001$). Myofascial release was more commonly performed in repairs involving absorbable mesh than in those with nonabsorbable mesh (20(24%) vs 121(8%), $p = 0.010$). A smaller proportion of cases in the absorbable cohort included a clean wound classification (74(89%) vs 1599(97%), $P < 0.001$). The adjusted probability of patient reported recurrence for the absorbable mesh cohort was 0.25[95% CI(0.16, 0.33)] and 0.19[95% CI(0.17, 0.21)] for the nonabsorbable mesh cohort. However, the adjusted relative risk of experiencing recurrence among patients who received absorbable vs nonabsorbable mesh was not significant (aRRR = 1.28[95% CI(0.89, 1.85) $P = 0.231$]) nor was the adjusted risk difference (ARD = 0.0542[95% CI(− 0.0345, 0.1428) $P = 0.231$]).
Conclusions: There was no difference in likelihood of patient reported ventral/incisional hernia recurrence one-year after repair with absorbable vs nonabsorbable mesh. These findings should be interpreted with a measure of caution as the trends identified in this study may be underpowered to demonstrate statistically significant differences.

P024

Incarcerated Incisional Hernia with Abdominal Wall Abscess as a Sequelae of Peptic Ulcer Perforation Closure: A Case Report

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Incisional hernias occur in approximately 10% to 20% following laparotomy. Classical complications include incarceration, obstruction and strangulation. Abscess formation following complicated incisional hernia has been rarely reported.

We present a case of a 63-year-old male with a medical history of hypertension who presented with a protruding mass from his abdomen for three days. He was previously treated with peptic ulcer perforation surgery 9 months prior, in which a simple closure repair with omental patch procedure was performed. On examination, an irreducible, painful mass with erythema at epigastrium was found over the midline scar. His vitals were within normal limits and the blood test revealed leukocytosis with a left shift. Abdominal computed tomography (CT) showed a small ventral hernia at upper abdomen with multiloculated rim-enhancing lesions at the anterior abdominal wall extending to the adjacent intraabdominal fat anterior to the gastric antrum with perilesional fat strandings. Incarcerated incisional hernia with abdominal wall abscess was suspected and the patient underwent emergency surgery. Laparotomy revealed a segment of omentum which herniated through a 2-cm defect at upper portion of previous incision into the anterior abdominal wall, forming the abscess that involved subcutaneous tissue, rectus sheath, and muscles. After dissected free from the surrounding tissue, the hernia was revealed to be a continuation of the inflamed omental patch which adhered tightly to the stomach. Whitish pus and suture materials were found inside the abscess and sent for culture study. Omentectomy was performed removing all infected omental tissue along with omental patch. The gastric wall of the previous perforation site was exposed therefore the reinforcement sutures were placed. After debridement of infected abdominal wall tissue, the rectus sheath was carefully reapproximated. Postoperative administration of broad-spectrum antibiotics were given. The patient was discharged in stable condition 7 days after admission and suture materials were removed after 2 weeks. Pus culture identified moderate growth of Streptococcus constellatus which was susceptible to the treatment. Pathological report revealed acute suppurative and chronic inflammation of omentum with reactive hyperplasia of lymph node while no malignancy was seen. At one month and one year follow-up, he was in good health and no recurrence was observed.

We report an uncommon complication of incisional hernia in the presence of abdominal wall abscess caused by incarcerated omental patch. Our case demonstrated the usefulness of CT for the diagnosis and successful surgical management with debridement and abdominal wall repair.

P025

Six Year Outcome from a Complex Lateral Wall Hernia Repair with Mesh Strips

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Introduction: Hernia recurrence can be a very pervasive issue for patients and recent reports show rates of 40% and 70% with and without mesh. Mesh suture was approved by the FDA in 2021, designed as a mid-weight polypropylene network of suture. This case report demonstrates the mesh strips technique with no recurrence seen at six years.
Case Report: Patient is a 69-year-old male who presented with a recurrent ventral hernia and loss of domain along with Pseudomonas infected mesh (Fig. 1). He was taken to the operating room for repair with mesh excision from previous retrorectus, onlay, bridging and underlay mesh. The midline was unable to be closed, therefore a left external oblique myofascial flap release was performed to gain 9 cm of advancement. An absorbable mesh was placed in an underlay fashion and a midline wound vac was placed. On post-operative day 3, the patient was found to have a fascial dehiscence, not at the midline, but at the external oblique release site where all three layers

of the abdominal wall had split, measuring 10 × 13 cm (Fig. 2). A wound vac was replaced and Botox was done as it was not able to be closed from undue tension. He was then taken back to the OR, and a Whitman patch was placed to slowly close the defect while the Botox took affect. On post-operative day 21, the defect measured 30 cm long by 12 cm wide. This was closed using 24 "early mesh propylene strips" spaced at 1 cm intervals and reinforced with an absorbable mesh in an underlay fashion with transfascial sutures (Fig. 3). Six years later, he obtained a CT scan to assess inguinal hernias, and there was no recurrence at the midline or external oblique release site (Fig. 4).

Conclusion: This case demonstrates the robust repair of a complex lateral abdominal wall dehiscence using the "early mesh suture" technique with no recurrence at six years.

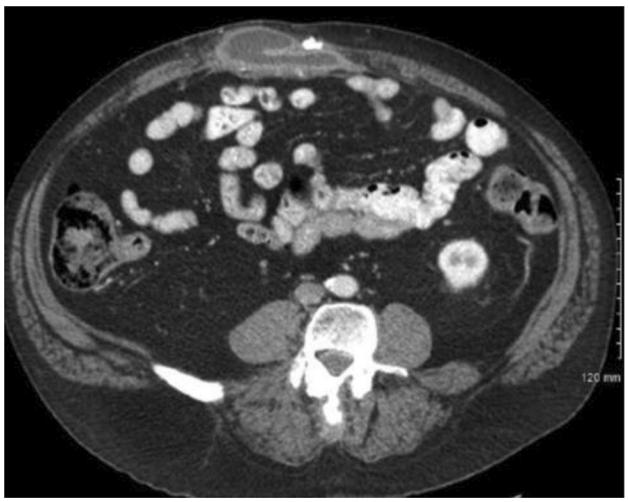

Fig. 1 CT showing infected mesh and recurrent hernia

Fig. 2 Dehiscence and evisceration at previous oblique release site

Fig. 3a Fascial defect with underlay absorbable mesh fixated with transfascial sutures

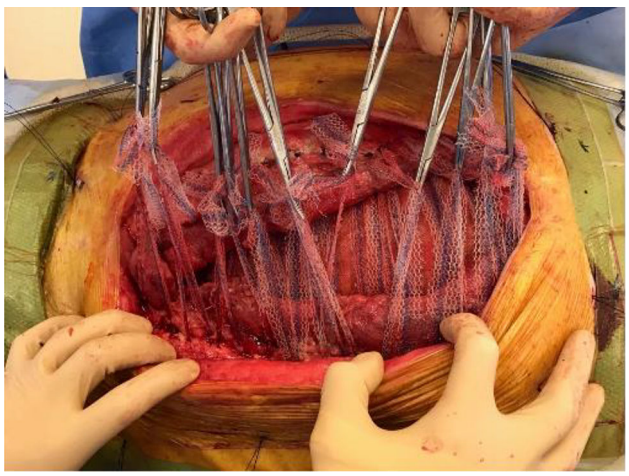

Fig. 3b Fascial closure of defect using mesh strips cut from a piece of soft polypropylene mesh

Fig. 4 CT scan 6 years post-operatively showing no recurrence

P026

Traumatic Abdominal Wall Hernia: A Case Report and Review of Literature

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Background: Traumatic abdominal wall hernia (TAWH) is an uncommon but serious condition associated with blunt trauma to the abdomen. The diagnosis is often discovered by imaging or during surgical exploration. We report a case of TAWH and review of the current literature.

Methods: Our case patient is a 36-year-old motorcyclist who presented after a high-speed road traffic accident (RTA), where he was hit from the back and flung off the motorbike. Significant physical examination findings include a large degloving injury over the left anterior chest wall exposing the underlying pectoralis major, and a diffusely tender distended abdomen. There was a soft ill-defined swelling present over epigastrium and left upper quadrant. Computed tomography (CT) scan revealed a large left anterior abdominal wall hernia through the rectus abdominis and external oblique.

Results: He underwent an exploratory laparotomy through a supraumbilical midline incision. Intraoperatively, the hernia was found to contain part of the mid transverse colon and omentum through the ruptured left rectus abdominis external and internal oblique muscles. This traumatic hernia is in direct communication with the open degloving injury over the left chest wall. In view of the large chest wall degloving injury and communication between both wounds with higher risks of cross contamination, temporary abdominal closure was performed. The patient was kept intubated and transferred to the intensive care unit.

The patient underwent a relook laparotomy, open suture of the left upper abdomen traumatic hernia and advancement flap closure of the left chest wound within the next 48 h.

He had an uneventful recovery and was discharged five days later. At the outpatient review three weeks later, all wounds were healed with no infection or hernia recurrence.

Discussion: TAWHs are rare injuries that are associated with blunt abdominal trauma, with most occurring secondary to RTAs. Incidence and specifics on how the impact during the blunt abdominal trauma affects the formation of TAWH is not well known.

Conclusion: Imaging is needed to confirm the location and extent of the hernia to facilitate management. Most cases require surgical repair of the hernia with the decision of early versus delayed and mesh versus mesh-free to be tailored case-by-case.

P027

Insurance Type Does Not Significantly Affect Patient Treatment Options and Outcomes in Ventral Hernia Repair

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Introduction: While multiple studies, such as in oncology and trauma, have exposed disparities in care based on insurance type, it is unclear if such disparities exist for ventral hernia repair (VHR). This study examines the impact of insurance type on VHR.

Methods: Data from the Abdominal Core Health Quality Collaborative (ACHQC) for VHR (2013–present) were analyzed. Variables included insurance type (Private, Medicare, Medicaid, Workers Compensation [WC], VA/TriCare [VA/TriC], Self-pay [SP]), demographics, operative details, and outcomes.

Results: Of 52,304 patients, Private insurance covered 54.95%, followed by Medicare (31.61%), Medicaid (8.95%), SP (2.14%), VA/TriC (1.36%), and WC (0.96%). Medicaid had the most females (61%, $p < 0.001$) and VA/TriC had most males (60%, $p < 0.001$). Open repair was performed on average in 63%, with WC having the highest rate (73%, $p < 0.001$). The difference in laparoscopic surgery use (range 6.2–12%) vs robotic surgery (21–27%) was deemed of small relevant effect size (Cramér's $V = 0.02$). Larger hernias ($\geq$ 9 cm) were more common in Medicare (27%) and VA/TriC (25%); WC had the largest proportion of smaller hernias (0–1.5?cm) (36%, $p < 0.001$). On average, 17.6% of VHR were repaired without mesh. Among the others, permanent synthetic mesh was the most used (92–94%). Use of synthetic absorbable mesh ranged 2.92–5.87%. Biological mesh usage was even lower: lowest in WC (0.8%) and highest in Medicare (3.8%, $p < 0.001$). Operative time showed 76% of VHRs were repaired within 180 min. VA/TriC had the highest operative times with 33% > 180 min and 17% > 240 min. Hospital stay ranged 0–3 days. At 1 year, recurrence rates were similar, averaging 11.8%, with SP incurring the highest rate (16.4%, $p = 0.07$). Patients were mostly repaired at academic centers (63–72%), except WC, which were mostly treated at private institutions (59%, $p < 0.001$). Quality of life change from VHR, as measured by HerQLes score, was similar across insurance types; notably, 40% reported a reduced HerQLes score within 30 days postoperatively.

Conclusions: Findings from the ACHQC database demonstrate that insurance type does not significantly affect treatment decisions nor outcomes in VHR. This is an assuring finding, as hernia repair is the most common operation performed electively by general surgeons and affects all ages and demographics. Notable exceptions warrant further investigation to help optimize outcomes in specific subgroups.

P028

Strangulated Femoral Hernia Containing Fallopian Tube Requiring Open Repair and Salpingectomy: A Rare Case Report

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Background: Groin hernias are infrequently found to contain atypical visceral contents such as the bladder, appendix, or adnexa.[1] While there are rare case reports of femoral hernias containing a fallopian tube, there have been no documented cases of femoral hernias with strangulated fallopian tubes requiring salpingectomy in adults.[1–3]

Case Report: A 65-year-old female with a history of chronic obstructive pulmonary disease (COPD) and congestive heart failure presented to the emergency department with 5 h of abdominal pain, a new left lower quadrant bulge, and associated symptoms of nausea, vomiting, and obstipation. A computed tomography (CT) scan revealed a left femoral hernia containing what appeared to be a short segment of bowel, causing small bowel obstruction at the transition point in the left groin. During operative exploration, a hemorrhagic and ischemic left fallopian tube was identified within the hernia sac. The fallopian tube was resected using bipolar electrocautery. A diagnostic laparoscopy revealed dilated loops of small bowel and scant ascites. The left ovary was found intact and well-perfused within the peritoneal cavity. The hernia sac was ligated, reduced, and the defect repaired with nonabsorbable mesh. Postoperatively, the patient experienced hypercarbia due to her pre-existing COPD, requiring brief admission to the surgical intensive care unit. She recovered well following respiratory stabilization and was discharged home on postoperative day 4. At follow-up, she remained in good health. Final pathology confirmed hemorrhage and degenerative changes in the resected fallopian tube.

Conclusion: Femoral hernias containing a fallopian tube are exceptionally rare. In cases where the fallopian tube is strangulated and

ischemic, an open femoral hernia repair with salpingectomy followed by diagnostic laparoscopy is a viable and effective surgical approach.

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Fig. 1 CT abdomen pelvis (axial) demonstrating femoral hernia

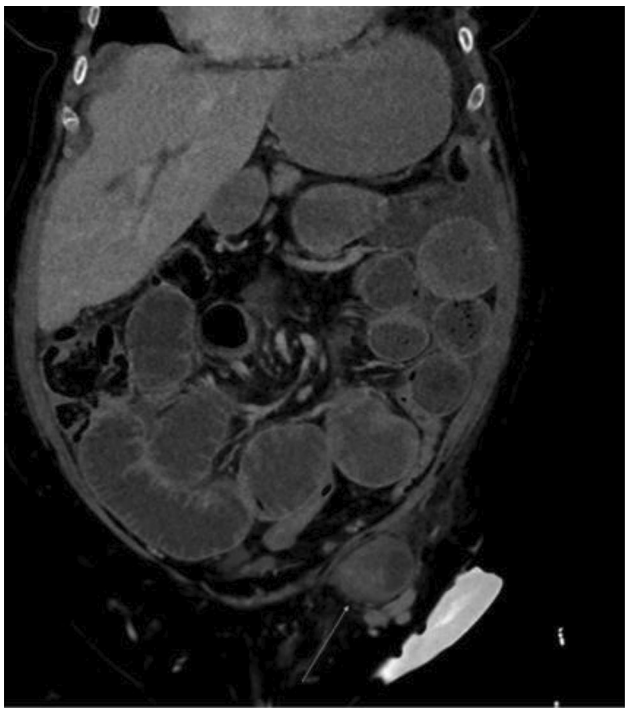

Fig. 2 CT abdomen pelvis (coronal) demonstrating femoral hernia

Fig. 3 CT abdomen pelvis (sagittal) demonstrating femoral hernia

P029

Mesh Location in Ventral Hernia Repair: A Systematic Review and Network Meta-analysis of Open, Laparoscopic and Robotic Techniques

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Introduction: Ventral hernia repair with mesh reduces the risk of recurrence. Common planes for mesh placement include onlay, inlay (interposition), sublay-retromuscular, sublay-preperitoneal, and intraperitoneal underlay mesh (IPUM). A previous systematic review and meta-analysis from 2018 suggested that the retromuscular plane has a lower recurrence rate. With advances in technology, particularly in minimally invasive surgery (MIS), mesh placement may influence outcomes differently. This systematic review and network meta-analysis compares the outcomes of different mesh planes in open, laparoscopic, and robotic ventral hernia repairs, focusing on hernia recurrence, surgical site infection (SSI), seroma formation, and hematoma occurrence.

Methods and Procedures: Relevant articles published before August 2024 were identified through searches in PubMed, EMBASE, Cochrane, and Ovid. Studies reporting recurrence, SSI, seroma, and hematoma following open, laparoscopic, or robotic ventral hernia repairs with mesh were included. A Bayesian network meta-analysis was conducted using R, and the MetaInsight tool was employed for statistical analysis, comparing outcomes of different mesh planes.

Results: Eighty-seven studies (31,070 patients) were included. Overall, 41.53% (12,903 patients) underwent intraperitoneal underlay placement, 41.49% (12,892 patients) underwent sublay-retromuscular placement, 8.95% (2781 patients) underwent onlay placement, 7.89% (2450 patients) underwent sublay-preperitoneal placement, and 0.14% (44 patients) underwent inlay placement. The mean follow-up period for recurrence was 27.1 months. The sublay-retromuscular group had significantly lower recurrence rates compared to the intraperitoneal underlay group (RR 0.501, 95% CI: 0.316–0.789), while the onlay group had a higher recurrence rate (RR 2.24, 95% CI: 1.31–4.16). The onlay group also demonstrated higher rates of SSI (RR 2.36, 95% CI: 1.65–3.45) and seroma formation (RR 2.28, 95% CI: 1.54–3.51). Hematoma occurrence did not significantly differ between groups (Fig. 1). Additionally, comparing open and MIS procedures, the recurrence rate was significantly lower in the MIS sublay-retromuscular group (RR 0.190, 95% CI: 0.0463–0.788) compared to the open intraperitoneal underlay group, while open onlay placement showed a higher recurrence risk (RR 2.61, 95% CI: 1.13–6.97) (Fig. 2).
Conclusion: Mesh placement significantly affects outcomes. The sublay-retromuscular plane may be superior for hernia recurrence compared to the intraperitoneal underlay plane. The onlay plane appears to carry a higher risk of recurrence, SSI, and seroma formation. Additionally, the MIS sublay-retromuscular group had a lower recurrence risk compared to the open intraperitoneal underlay group, while the open onlay placement group showed a higher risk. Further research is needed to confirm these associations and guide optimal mesh placement strategies.

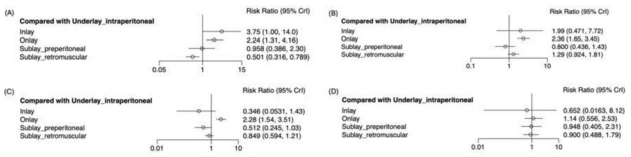

Figure 1. Forest plot representing the random-effects network meta-analysis of the included outcomes: A: Hernia recurrence, B: Surgical site infection, C: Seroma formation, D: Hematoma occurrence.

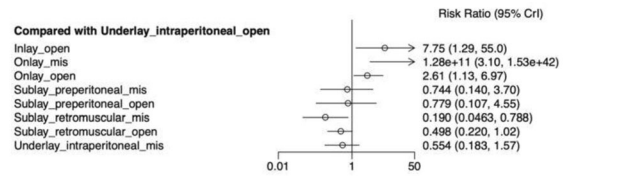

Figure 2. Forest plot representing the random-effects network meta-analysis of hernia recurrence comparing open and minimally invasive surgery procedures across each surgical approach.

P030

Amyand's Hernia and Garengeot's Hernia: A Series of Cases

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Introduction: The Amyand hernia is an inguinal hernia that contains the normal cecal appendix or in a state of acute appendicitis. Likewise, the Garengeot hernia is a femoral hernia where the appendix is ??located inside said hernia and is almost always incarcerated, the first described by Claudius Amyand in 1735 and Rene Jacques Croissant de Garengeot who first described the De Garengeot hernia in 1731. The other important entity in these two pathologies is the association with acute appendicitis due to intraluminal obstruction generated by increased pressure in the hernial neck that limits blood flow, thus forming inflammation and bacterial proliferation.
Methods and Procedures: An observational, retrospective and descriptive study is carried out on patients with Amyand's hernia and Garengeot's hernia who were managed in two tertiary institutions in the city of Bogotá, Colombia. Evaluating the following variables: sex, age, clinical symptoms, type of hernia, surgical approach, type of mesh, hospital stay, intraoperative complications, reintervention, mortality.
Results: During the time of the study, 8 patients who presented Amyand hernia and Garengeot hernia were operated on, 6 of them presented Amyand hernia and 2 of them Garengeot hernia, 80% were female and 20% were male, all patients underwent surgery. open surgical approach, 5 perforated appendix, 5 with macropore polypropylene mesh, hospital stay was 1.4 days, no patients presented intraoperative complications, no surgical reinterventions, zero mortality.
Conclusions: Both pathologies are rare in presentation and should be known by general practitioners, general surgery residents and general surgeons, taking them into account as a differential diagnosis and knowing which is the best optimal surgical technique for repair and whether or not the use of mesh to reduce recurrence.

P031

The Hidden Hernia: Why You Should Trust Your Preoperative Exam and Imaging When Repairing a Ventral Hernia

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Introduction: The falciform ligament is comprised of two thin folds of peritoneum fused together, attaching the diaphragm and anterior surface of the liver to the anterior abdominal wall (Garbar). Falciform ligament hernias have been explained in the literature as either internal herniation through a defect in the falciform itself, or incisional or epigastric hernias containing part of the falciform (Egle, Griffin, Takada and Koussayer). One possibility supported by a prior case report of epigastric hernia containing the falciform is the theory of Moschowitz, wherein a blood vessel perforating the linea alba served as weak spot for herniation (Liang). We present a case of ventral hernia adjacent to the falciform that emphasizes the importance of preoperative exam and imaging prior to operating.
Case Presentation: We present a case of 57-year-old female with complaints of a bulge in her mid-abdomen associated with abdominal discomfort for 6 months. Her surgical history was only notable for tubal ligation. She had a reducible ventral hernia in epigastrium on physical exam. CT abdomen pelvis revealed a ventral hernia with a small amount of inflammatory soft tissue within the hernia and a very narrow aperture [Fig. 1]. She was scheduled for elective robotic-assisted laparoscopic repair of her ventral hernia. Intraoperatively, her anterior abdominal wall was inspected, with no obvious hernia defect found. The falciform ligament was ligated, and a ventral hernia directly adjacent to its attachment was discovered, with a moderate amount of preperitoneal fat incarcerated through the defect [Figs. 2 and 3]. The hernia contents were subsequently reduced, and the hernia was repaired in a standard preperitoneal approach. She was discharged the same day from the post-operative recovery unit.
Discussion: We describe this hernia as "hidden," as the defect was masked by the falciform's attachment to the abdominal wall. The falciform ligament itself was not herniated through the defect, differentiating this from similar hernias reported in the literature. This case also emphasizes the importance of correlation between physical exams, reviewing of imaging results and careful intra-operative implementation of that knowledge.

P032

Complications of Infected Ventral Hernia Mesh

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Introduction: Hernia repair using mesh is commonly associated with lower recurrence rates of hernias, but significant complications, such as infection, can occur. This case involves a 51-year-old female who developed an infected mesh after ventral hernia repair. The infection subsequently led to a small bowel fistula, necessitating surgical intervention and bowel resection.

Methods and Procedure: The patient presented for elective removal of infected ventral mesh six years after her original hernia repair. Her extensive surgical history included a Cesarean section, laparoscopic appendectomy, umbilical hernia repair with mesh, hysterectomy complicated by periumbilical trocar site hernia repair, and extracorporeal shockwave lithotripsy for ureteral and renal calculi. The patient reported chronic drainage from a wound below the umbilicus, which developed shortly after her lithotripsy.

CT imaging revealed a heterogeneous phlegmonous collection containing air along the prior ventral hernia repair site, extending to the skin surface. The collection measured approximately 5.3 × 3 cm, with mild surrounding inflammation.

During diagnostic laparoscopy, dense adhesions between the small and large bowel and the umbilical area were observed. Extensive lysis of adhesions freed the colon and loops of small bowel. Continued dissection exposed a large pus pocket and a portion of the polypropylene mesh. Further lysis revealed mucosa of the small bowel, indicating a fistula between the bowel and mesh. The bowel was resected in three locations, followed by primary side-to-side anastomosis. The anterior abdominal wall was debrided, the fistula tract removed, and a wound VAC placed. Two days later, she was taken back for diagnostic laparoscopy for fever and tachycardia. It confirmed no leaks at the anastomosis site and a JP drain was placed as there was over 500 ml of purulent peritoneal fluid. The patient was discharged on postoperative day four with complete return of bowel function and with oral antibiotics.

Results: Ten days later, the patient returned with left-sided abdominal pain She was discharged on day two with oral antibiotics. At follow-up, the patient was doing well and symptom-free.

Conclusion: This case highlights the severe complications that can arise from mesh-related hernia repairs, such as infections and fistula formation. Despite the complexity of the case, timely surgical intervention and diligent follow-up care led to the patient's successful recovery. The case underscores the need for vigilant postoperative monitoring and patient compliance to mitigate the risk of further complications associated with mesh use.

A. Arrow to heterogeneous phlegmonous air containing collection along the site of prior ventral hernia repair extending to the skin surface with mild surrounding inflammation roughly measuring 5.3 x 3 cm in the axial plane and extends along the tract to the skin surface spanning about 9 cm

B. Arrow to interval development of abdominal wall 2.5 x 1.7 x 3 cm rim-enhancing fluid collection compatible with abscess s/p explantation of infected mesh.

P034

Unraveling the Role of Cognitive Function in Frailty: Insights Across Multiple Frailty Screening Tools in the Ventral Hernia Population

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Introduction: In elective surgeries, like ventral hernia repair (VHR), assessing a patient's ability to withstand surgical stress is essential for preoperative decision-making, and multiple frailty screening tools are validated to facilitate this process. Frailty, a state of increased vulnerability to stressors, is linked to adverse postoperative outcomes, yet the key determinants remain incompletely defined, and the significance of cognition in this state is unclear. Our study aims to explore the relationship between cognitive function and frailty and characterize how validated frailty screening tools capture cognitive dysfunction.

Methods: Patients ≥ 18 years old being evaluated for elective VHR at a single institution specialty clinic were prospectively enrolled from January 2023 to June 2023. Patients completed the Fried Frailty Index (FFI), FRAIL Scale, and SARC-F questionnaires, as well as the Patient-Reported Outcomes Measurement Information System (PROMIS) questionnaires, from which cognitive function (PROMIS-C) scores were derived (with higher scores indicating better subjective cognitive function). The Modified Frailty Index (mFI-11) and Charlson Comorbidity Index (CCI) were calculated. Logistic regression models were generated to assess the role of cognition across frailty screening tools.

Results: Our study enrolled 62 patients (mean age: 60.5 years, mean PROMIS-C: 48.3). Thirty-six patients (56.5%) had a CCI ≥ 3 and 26 patients (42.6%) were on > 10 medications preoperatively. Overall, 24 patients (38.7%) had at least one positive frailty screen. The PROMIS-C scores were significantly lower for patients screening positive on FFI (44.6 vs. 49.8), mFI-11 (45.1 vs. 49.1), and FRAIL Scale (44.0 vs. 49.7). Higher PROMIS-C scores lowered the odds of screening positive for frailty on FFI (OR: 0.91, $p = 0.035$) and FRAIL Scale (OR: 0.90, $p = 0.028$) in univariate analysis but was not a predictive factor in multivariate regression. Low PROMIS-C scores significantly correlated with physical deficits including weak grip strength ($r = -0.34$), ambulation difficulty (OR: 0.87), difficulty rising from chair (OR: 0.92), and falls (OR: 0.91).

Conclusion: A decline in subjective cognitive function is more prevalent in patients screening positive for frailty but is not an independent predictor in VHR patients. Cognitive dysfunction may be a separate but related entity from physical frailty and may be better captured by FFI and FRAIL Scale due to correlation with component metrics. Further investigation is needed to elucidate how cognitive dysfunction impacts overall functional status in ventral hernia patients, and whether it acts independently of, or synergistically with, physical frailty as a predictor of adverse outcomes.

P035

Managing the Inability to Close Fascia: Technique and Outcomes of Sublay/Inlay Hernia Repair

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Background: Despite the use of component separation techniques and preoperative adjuncts to increase abdominal wall compliance, there are patients with massive ventral hernias in whom anterior fascial closure cannot be achieved. Failure to close the anterior fascia in transversus abdominus release (TAR) hernia repair has been associated with higher rates of recurrent hernias. Some groups advocate suturing the sublay mesh to the edges of the un-reapproximated fascia. Here, we describe our experience managing this circumstance with a sublay retromuscular mesh and a bridging inlay mesh to span the fascial gap.
Methods: We retrospectively reviewed prospectively collected data from a single-center, institution-approved hernia registry for patients who underwent open TAR repair with a sublay retromuscular mesh and anterior bridging inlay mesh for inability to primarily close the fascia. Patient demographics, hernia characteristics, operative details, and primary outcomes of recurrence and SSO were collected.
Results: Six patients meeting the inclusion criteria were identified, with 6 incisional hernias and 1 parastomal hernia. Patients had an average BMI of 37.7 kg/m^2 and no patients were actively smoking. Two patients underwent preoperative botulinum toxin administration. The average hernia defect size was 875.5 cm^2 (SD = 454.4 cm^2) and 66.6% of patients had recurrent hernias. Most cases were clean (n = 4, 66.7%) or clean-contaminated (n = 1, 16.7%). All patients underwent an open bilateral TAR, placement of a reduced weight macroporous mesh in a retromuscular position, followed by placement of a second reduced weight macroporous mesh sutured to the edges of the anterior fascia as an inlay bridge (Fig. 1). The average size of the sublay mesh was 1910.1 cm^2 (SD = 774.6 cm^2) and the average inlay mesh area was 357.3 cm^2 (SD = 201.6 cm^2). Average operative time was 529.8 min (SD = 88.1 min). At a mean follow-up time of 1.3 years (0–2.7), there have been no recurrences. Surgical site occurrences requiring procedural intervention include seroma (16.7%, n = 1) and superficial surgical site infection rate of 33.3% (n = 2).
Conclusions: Combining a TAR, sublay retromuscular mesh, and anterior bridging inlay mesh is a feasible technique with favourable early outcomes. This technique had the theoretical advantage of reloading the anterior musculofascial complex and preventing stresses on the sublay mesh in areas unsupported by native fascia. Further study into abdominal function, quality of life, and long-term outcomes is required.

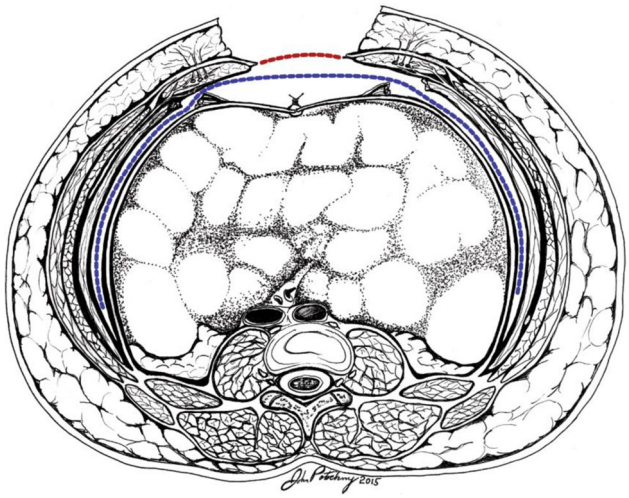

Fig. 1 GSchematic of the Sublay/Inlay Repair Technique. Red – anterior inlay mesh. Blue – sublay retromuscular mesh

P036

Use of Zynrelef (Bupivacaine and Meloxicam) to Eliminate the Need for Opioids in Laparoscopic Pre-peritoneal Inguinal Hernia Repairs (TEP)

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Introduction: Inguinal hernia repairs are a common procedure, occurring in 800,000 patients across the United States and 20 million patients worldwide annually (1, 2, 3). Currently the most common form of pain management used by providers has been opioids despite unwanted side effects and dependence risk. Studies show up to 71% of patients undergoing TEP are prescribed opioids for pain management (4). The growing national misuse of opioids stresses the importance for alternative pain management options. Zynrelef has proven efficacy for managing post-op pain up to 72 h following several other surgeries but has not been effectively tested in TEP(s) (5, 6, 7). This study observed opioid usage in patients following the use of Zynrelef during TEP procedures to determine if Zynrelef proved to be an effective alternative to opioid usage.
Methods: 43 subjects (42 male and 1 female) between ages 32-79 years old, scheduled to undergo TEP were enrolled in the study and received between 7 and 14 mL's of Zynrelef prior to wound closure in the pre-peritoneal space via the most inferior 5mm trocar. Subjects were instructed to take multimodal agents (Acetaminophen 1000 mg Q6 and Ibuprofen 800 mg Q6) and given a prescription for opioids if their NRS pain score was greater than 6/10 in recovery. Subjects were then followed for 10 days after surgery to observe and record all medication usage and pain levels.
Results: 39 subjects completed the study period (2 subjects excluded due to multiple hernias found during surgery and 2 lost to follow up). 6 (15.4%) subjects received an opioid prescription, 33 (84.6%) did not. Mean pain immediately following surgery was 3.51(SD $\pm$ 1.94), 2.63(SD $\pm$ 1.73) on POD1, 2.51(SD $\pm$ 1.57) on POD3, 2.00(SD $\pm$ 1.34) on POD5, and 1.11(SD $\pm$ 0.98) on POD10. Mean discontinuation of acetaminophen and ibuprofen was 6.23 and 5.63 days post-op, respectively. Of the six subjects that received opioids post-op the mean time to opioid discontinuation was 5 days.

Conclusion: Results of this study display adequate pain management following TEP procedures with the use of Zynrelef and a reduction in the use of opioids compared to patients undergoing TEP without Zynrelef. The findings from this study are in alignment with findings from other studies such as the HOPE trial in which Zynrelef was used in patients with open inguinal hernias and displayed an opioid-free rate of 91%.

P037

Incarcerated Appendix Within a De Garengeot Hernia

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The De Garengeot hernia is a rare presentation of a femoral hernia that contains the appendix. This case identifies how appendicitis can arise from an original, isolated pathology within a De Garengeot hernia.

We present the case of a 72 year old female with a history of recurrent incarcerated left inguinal hernia admitted after 3 days of intermittent left groin pain. She had abdominal tenderness and firm, non-reducible left inguinal hernia sac with mild suprapubic erythema. CT imaging showed left inguinal hernia containing bowel with surrounding inflammation and interloop ascites surrounding the herniated segment. There was circumferential bowel wall thickening and hyperenhancement of the bowel wall near the hernia neck suggested ischemia. Patient was taken emergently to the operating room for left inguinal hernia repair and possible exploratory laparotomy.

An open inguinal hernia approach with an incision over the left inguinal ligament. The external oblique fascia was incised down to the external inguinal ring to expose the inguinal canal and floor. The hernia sac was below the inguinal ligament and the ligament was transected for reduction. The bowel didn't appear ischemic and was reduced into the abdomen. The inguinal ligament was reapproximated using a 2-0 PDS. An additional 2-0 PDS was used to close the floor, and in Cooper's ligament to the pectineal ligament, with a transitional stitch on the floor. The external oblique was reapproximated using a 2-0 Vicryl. A 15 Fr drain was placed into the hernia sac and brought through the lateral aspect of the incision. A 5 mm incision was made below the umbilicus and a 5 mm Optiview trocar was placed into the abdomen. Two 5 mm ports were placed in the suprapubic position and in the right lower quadrant to inspect the bowel. The appendix had been in the hernia sac, with the cecum pulled over to the left side of the abdomen. The appendix was transected at the base and placed in an Endo-Catch bag.

The patient had a stable recovery and was discharged on the second postoperative day. She remained stable after 3 months of follow-up.

The case presented is a rare case of an incarcerated appendix within a left femoral hernia. Given the paucity of cases with this type of presentation in adults, it should be distinguished from other types of de Garengeot hernias. Laparoscopic appendectomy is performed to relieve symptoms and to obtain histopathological findings for an accurate diagnosis.

P038

Laparoscopic Ventral Hernia Repair with Only Two Trocars

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Background: Ventral hernias may be repaired in an open or minimally invasive fashion. Whereas robotic repair has recently gained interest still the majority of surgeons use the laparoscopic approach. Traditionally this is done using one 12 mm and two 5 mm ports, however, it would be desirable to reduce the surgical trauma by using less and smaller ports in order to decrease pain, achieve faster recovery and produce better cosmetic results.
Patients and Methods: The database of a single surgeon with MIS fellowship training was searched for ventral hernia repairs. All cases from three institutions during an eight year period in which only two ports were inserted were included in this study.
Results: Sixty patients (38 m/22 f) with a median age of 51.1 (range 22.8–86.3) years met inclusion criteria. In 3 cases a 10–12 mm and a 5 mm trocar were used in 13 cases an 8 and a 5 mm trocar and in 44 cases two 5 mm ports. For midline and right sided hernias the two ports were placed in the right upper and lower quadrant and for left sided hernias, the two ports were placed in the right upper and lower quadrant. After lysis of adhesions, the hernia contents were reduced and the hernia sack was resected if of large size and technically feasible and the falciform ligament was partially dissected off *umbilical/epigastric hernias). The fascia was closed using interrupted 0 Vicryl on a suture passer. Concomitant rectus diastasis was approximated in the same fashion. For smaller hernias, a round 8–12 cm coated non-absorbable mesh was used (8 cm bioabsorbale mesh in 4 recent cases), for larger hernias and to cover a rectus diastasis, larger meshes providing appropriate overlap were inserted. Two Spigelian and two ostomy site hernias were repaired using a TAPP like technique with placement of a subperitoneal Progrip mesh with a needle grasper replacing a 3rd port. The minigrasper was used in 9 cases and in 21 cases a suture passer was used for retraction, dissection and/or suturing. No recurrent hernias developed.
Discussion: In most cases small (< 5 cm) ventral hernias are amendable to laparoscopic repair with only 2 trocars. High patient satisfaction can be achieved and this is an excellent alternative to the robotic approach.

P039

Omental Patch Reconstruction for Pyloric Perforation in a Patient with Chronic Ventral Hernia and Loss of Domain

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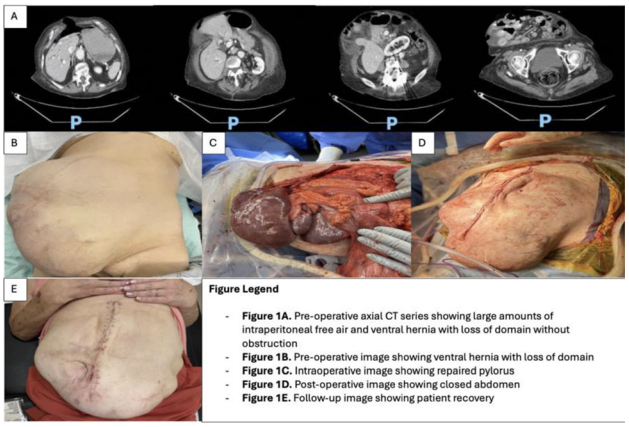
Introduction: Nearly 3-20% of abdominal wall surgeries are complicated by ventral wall hernias. While most fascial defects may remain stable, a subset of patients may develop gradually enlarging ventral hernias that progress to loss of domain (LOD) characterized by protrusion of visceral contents into the hernia sac. The management of patients with LOD is challenging as extensive abdominal content herniation may complicate surgical management of both the hernia itself and any concomitant intra-abdominal pathology. We describe our management of an elderly patient with chronic ventral hernia and LOD who presented with signs of peritonitis necessitating surgical exploration.

Methods & Procedures: A 71-year-old female with multiple surgical history including failed previous hernia surgery presented to a nearby hospital complaining of acute worsening of three weeks of abdominal pain. She was hemodynamically stable, and imaging showed large volume of intraperitoneal air. Her hernia contained a portion of non-obstructed left liver, stomach as well as large and small bowel with moderate ascites.
Results: The patient was emergently transferred to our Operating room at the tertiary referral center for exploratory laparotomy. Upon exposing the abdomen, several thin adhesion bands were lysed, and extensive fibro-purulent pelvic fluid was evacuated from the upper abdomen and right paracolic gutter. Initially no obvious gastric or duodenal perforation was found. The bowel was run and examined from the Ligament of Treitz to the rectum, with no evidence of pathology. On reexamining, a small (< 1 cm) partially healed perforation was identified just proximal to the pylorus. Omental patch repair was performed, and a drain was left at the level of the repair. The patient underwent a complex abdominal wall closure with fascia approximated for a small portion, with dermal closure for the majority. Internal absorbable retention sutures were placed in the dermis as well. An Incisional Negative-Pressure-Wound-Therapy Dressing was placed over it.
Conclusion: An upper gastrointestinal series was obtained on POD-4 which showed no extravasation, her drain was removed, and she was discharged home next day. She has subsequently completely recovered and is being worked up for planed hernia surgery. Our report highlights successful management of otherwise hostile abdomen in patient with loss of domain with concomitant abdominal catastrophe like acute gastric perforation. We propose using multimodal management of these complex cases and using all resources in the community.



P040

A Single-Center Comparison of Outcomes in Robotic Ventral and Flank Hernia Repairs

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Introduction: The purpose of this study is to compare the length of stay (LOS) and 30-day recurrence among patients who underwent a robotic flank hernia repair to a robotic ventral hernia repair (VHR) at our tertiary care institution. Flank hernias are uncommon abdominal wall hernias with about 17% incidence rate. Robotic VHR is prevalent in the literature, but reports of robotic repairs on flank hernias is limited.
Methods: This was a retrospective review of flank hernia repairs from 2019 to 2024. Patients who underwent flank hernia repairs were matched to ventral hernia controls by hernia defect width. Patient data was collected from the medical record regarding demographics (sex, age, admit/discharge date, follow-up date). Differences in LOS and 3-month recurrence rates by ventral and flank repairs were examined using *t*-test (continuous variables) and Fisher's exact test (categorical variables) with statistical significance at $p < 0.2$.
Results: A total of 18 patients (9 in each arm) were included in the comparative sample (mean age: 45.5; 12% female). There were no statistically significant differences in comorbidities across the two groups ($p > 0.2$). The mean flank hernia defect of 5.8 cm (SD 2.91) was similar to the ventral hernia defect width of 6.4 cm (SD 4.79; $p = 0.75$). The median mesh size for flank and ventral hernias was 180 cm^2 and 225 cm^2, respectively. The mean LOS was not significantly different between the flank and ventral groups (1.56 vs 1.22 days, $p = 0.33$). There were no 30-day recurrences noted in either group.
Conclusion: Although limited by sample size, we demonstrated that LOS and recurrence of robotic repairs of flank hernias are comparable to robotic ventral repairs in our matched cohort. Future investigation with long-term follow-up among a larger, representative sample is needed to assess the durability of robotic flank and ventral repairs.

Sample characteristics (mean (SD), Median [Min, Max])

	Overall sample	Ventral	Flank
Hernia width (cm)	6.1 (3.86)	6.4 (4.79)	5.8 (2.91)
Defect size (cm^2)	23.0 [5.0, 144]	16.0 [5.0, 119]	30.0 [9.0, 144]
Length of stay (days)	1.39 [0.70]	1.22 [0.67]	1.56 [0.73]
Follow-up (days)	50.6 (94.1)	15.7 (6.84)	85.4 (127)
30-day recurrence	0	0	0

P041

From Pancreatitis to Periumbilical: A Case Exploring Saponified Fat in an Umbilical Hernia Repair

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Introduction: Umbilical hernias are common ventral hernias located at or near the umbilicus. This condition is common, representing up to 6% of all adult abdominal wall hernias with an overall prevalence of 2% in the adult population. Some risk factors in the adult population include ascites, liver disease, diabetes, and obesity. Umbilical hernias are most commonly benign and asymptomatic but may become acutely symptomatic, incarcerated, or obstructed and need emergency intervention. While umbilical hernia repair may be perceived as simple, there is a recurrence rate between 2.7 and 27% in mesh and non-mesh repair, respectively.

Saponification is a chemical process that converts lipids into a soap and alcohol by the action of heat in the presence of aqueous alkali. In the human body, saponification can occur during the metabolism of fat and is vital to the digestion, absorption, and transport of lipids in the body. This can also occur in pathological conditions post pancreatitis?

Case: We present the case of a 55-year-old male with a past medical history of hypertension, diabetes, stroke, and life-threatening necrotizing pancreatitis 8 years ago who came to our clinic for an umbilical hernia repair. Review of previous imaging revealed a periumbilical fat containing hernia with a tubular soft tissue density that slowly progressed to calcification of fat. Upon physical examination, the 3 cm × 5 cm hernia defect was hard in consistency, confirming the diagnosis of an umbilical hernia with calcified fat necrosis. The patient was managed using open hernia repair with mesh?

Conclusion: In pancreatitis, the damaged pancreatic tissue can release fat-digesting enzymes such as lipase and phospholipase A2 that can cause the autodigestion of the organ, damaging the parenchyma and surrounding fat. This can activate many mediators of inflammation such as macrophages that greatly exaggerate the inflammatory response to lyse fat cells. Cell lysis releases fatty acids that can precipitate with calcium and undergo saponification, depositing in other tissues to cause potentially fatal complications such as organ failure.

Figure 1: Axial saponified hernia

Figure 2a: Pinching of hernia contents

Figure 2b: Gross Hernia Depiction

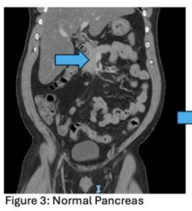

Figure 3: Normal Pancreas

Figure 4: Sagittal saponified hernia

P042

Role of Robotic-Assisted Surgery in Incisional Ventral Hernia Repair (IVHR) over Ten Years: A Review of the Real World Data from the ACHQC Database

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Introduction: Robotic surgery has gained popularity in the past few years in managing hernias. Management of incisional ventral hernia repairs (IVHR) has evolved with a deeper understanding of the anatomy, and novel techniques have been developed; the last decade has seen increased usage of robotic platforms in those procedures. This study evaluates the trends and short-term outcomes of Robotic IVHR techniques in the United States over ten years.

Material & Methods: A retrospective review of Robotic IVHR from the Abdominal Core Health Quality Collaborative (ACHQC) database was conducted from January 2013 to December 2023. Adult patients who underwent Robotic IVHR and with 30-day follow-ups were included. Univariate and multivariate analyses were performed comparing different timeframes.

Results: 5558 patients were included in 4 different groups (2013-2015 $n = 259$, 2016–2018 $n = 1396$, 2019–2021 $n = 2278$, 2022–2023 $n = 1625$) after applying inclusion and exclusion criteria. There was an increase in median hernia length and width over time ($p < 0.001$). Median Mesh width increased over time from 15 (IQR 12–20) to 17 (IQR 12–25) ($p < 0.001$), along with median mesh length from 19 cm (IQR 15–25) to 25 cm (IQR 15–30) ($p < 0.001$). Regarding mesh positioning, retromuscular repair increased from 36 to 59%, preperitoneal decreased from 25 to 20%, and intraperitoneal decreased from 39 to 26% ($p < 0.001$). Myofascial release increased from 39% (2013–2015) to 56% (2022–2023) ($p < 0.001$). Fascial closure increased from 94 to 98% over the years ($p = 0.002$) and readmissions decreased over time. Same day discharged increased over time (Fig. 1) SSI (Surgical Site Infection) and reoperation were similar across groups. Logistic regression showed more recent cases (2022–2023) with decreased odds of readmission (OR 0.4, 95% CI 0.2–0.7, $p = 0.004$), SSO (OR 0.5, 95% CI 0.34–0.7, $p \leq 0.001$), seroma (OR 0.5 95% CI 0.4–0.8; $p = 0.002$) and LOS (effect − 0.99 (95% CI − 1.3 to − 0.7; $p < 0.001$) when compared with old cases (2013–2015)

Conclusion: There is an increasing trend of using robotic platforms for IVHR cases. Robotic-assisted surgery in IVHR has proven safe in managing complex hernia repairs, as evidenced by increased use in larger hernia repairs and more retromusclular repairs and myofascial releases in the last decade. Recent cases showed decreased odds of readmission, SSO, seroma, and LOS, which can be translated into increased experience with the robotic platform.

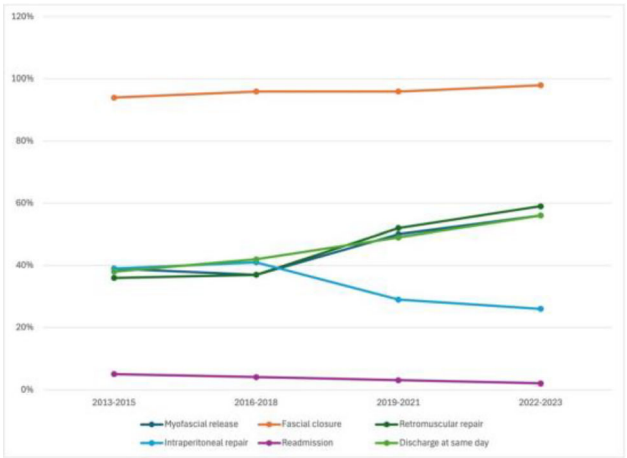

Fig. 1 Trends in robotic VHR over 10 years

P043

Demographic and Clinical Factors Associated with Same-Day Discharge Following Elective Ventral Hernia Repair: A NSQIP Analysis

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Background: There is limited data on predictive factors influencing same-day discharge (SDD) following ventral hernia repair (VHR). The objective of this study was to evaluate patient demographic and clinical factors associated with SDD among adult patients who underwent elective VHR (primary and incisional). The secondary objective was to evaluate 30-day clinical outcomes between patients who received same-day discharge (length of stay = 0 days) vs. multiple-day discharge (MDD), defined as length of stay greater than 0 days.
Methods: A retrospective cohort study using the National Surgery Quality Improvement Program (NSQIP) database from 2011 to 2021 was conducted. ICD9/10 and CPT codes were used to determine the study population, consisting of those who underwent elective ventral hernia repair. Emergency cases were excluded. We collected data on patient factors such as demographic information, race and comorbidities. Outcomes included 30-day post-operative complications, readmission, reoperation and mortality rates. Statistical analyses were performed using SAS software. Multivariate logistic regression analysis was used to adjust for clinically relevant confounding variables. *P*-values < 0.05 were considered statistically significant.
Results: A total of 305,731 and 175,646 patients were in the SDD and MDD groups, respectively. SDD was significantly higher among males ($p < 0.001$). SDD was significantly lower in patients with BMI ≥ 30, smokers, non-independent functional status, and ASA class ≥ 3 ($p < 0.001$). Patients were less likely to be discharged on the same day as VHR in the presence of comorbidities such as congestive heart failure, hypertension, steroid use, chronic obstructive pulmonary disease, bleeding disorder, disseminated cancer, and ascites ($p < 0.001$). SDD was associated with significantly lower rates of 30-day complications, reoperation, readmission, and mortality after elective VHR ($p < 0.001$). After adjustment, MDD was associated with significantly higher odds of 30-day complications (OR 1.27, $p < 0.001$, 95% CI 1.23–1.31), reoperation (OR 1.26, $p < 0.001$, 95% CI 1.20–1.32) and readmission (OR 2.42, $p < 0.001$, 95% CI 2.35–2.50). However, there was no significant difference with respect to 30-day mortality.
Conclusion: Same-day discharge following elective VHR in select patients is associated with significantly lower rates of 30-day post-operative complications, reoperation, and readmission. Obesity, smoking and severe medical comorbidities are associated with MDD. There was some variation in SDD based on race. SDD following elective VHR appears to be safe in select patients.

P044

Minimally Invasive Approach for De Garengeot Hernia: A Case Report

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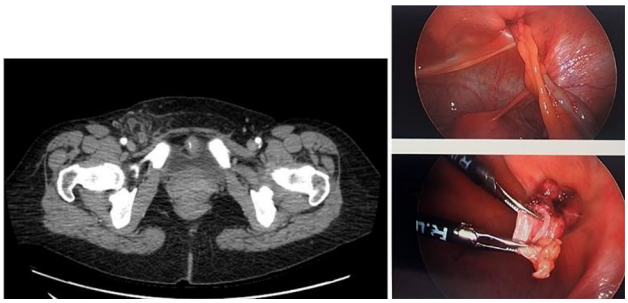
Introduction: De Garengeot hernias are defined by the presence of the appendix within a femoral hernia, first described by Dr De Garengeot in 1731 (1). There have been < 450 cases since the first description (4). These hernias are more common in women, often present with groin pain and a bulge, and can be difficult to diagnose preoperatively. Surgical management typically involves appendectomy and hernia repair.
This is a case report of a 45-year-old female with tip appendicitis caused by strangulation in a right femoral hernia.
Case: Healthy 45-year-old female presented with 4 days of right groin pain with associated tender, nonreducible bulge. CT demonstrated a right femoral hernia containing fluid-filled, distended appendiceal tip with periappendiceal fat stranding. She was urgently taken for a diagnostic laparoscopy. Appendix was seen entering a small femoral defect. The femoral space was opened to reveal the strangulated, gangrenous appendiceal tip. Appendectomy was performed in the usual fashion. She was discharged with a course of Augmentin.

She returned on POD13 for a robotic assisted TAPP. The femoral defect contained incarcerated preperitoneal fat. A mesh was placed to cover the direct, indirect, and femoral spaces. She discharged the same day and has followed up without any complications.
Discussion: De Garengeot hernias are more common in women (81.1%) (3). Signs and symptoms include groin bulge (82.4%) and tenderness (79.4%), or bulge erythema (33.3–56%) (2,3). Preoperative diagnosis has been reported to be 31.5%; imaging diagnosis rate of 20% with US and 44% with CT (2). Most surgical management has been by combination of appendectomy as appendix inflamed in 44.1% (3) and open femoral hernia repair; 81% of patients underwent primary herniorrhaphy and 19% had a mesh repair (2).
This is a noteworthy case that was managed in a two-step laparoscopic fashion, a less common approach. By removing the appendix and treating the infection before repairing the small defect, it allowed for the use of synthetic mesh without being in a contaminated field.
Conclusion: Small number of fully laparoscopic approaches have been described for de Garengeot hernias (4). With advancements of robotics, along with surgeon expertise it seems safe and a feasible approach. When pursuing treatment for symptomatic de Garengeot hernias, one should consider a minimally invasive approach and for those with signs of contaminated field, consider a staged 2-step approach to minimize risk of mesh infection.



P045

Barbed Sutures in Ventral Hernia Repair: A Propensity-Matched Analysis of the ACHQC

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Introduction: Barbed sutures (BS) are widely used across several specialties, but little is known about their impact on open, laparoscopic, or robotic ventral hernia repair (VHR). The aim of this study was to document the outcomes of BS in VHR.
Methods and Materials: Patients who underwent VHR with fascial closure from 2020 to 2022 from the Abdominal Core Health Quality Collaborative (ACHQC) were included. Propensity score matching (PSM) 1:1 with covariates of age, ASA class, recurrent, wound status, incisional procedure, hernia width, mesh used and type, mesh

location, BMI capped at 15–60, and concomitant procedures was performed by operative approach. The primary outcome of interest was operative time, and secondary outcomes were LOS, and SSI, SSO, SSOPI at 30 day follow up.

Results: OR time > 2 h was less likely for patients with BS compared to NBS for robotic procedures (47% vs 58%; $p = 0.006$) and was not statistically significant for open (57% vs 60%; $p = 0.2$) or laparoscopic (21% vs 15%; $p = 0.2$). LOS was shorter for patients with BS compared to NBS for open procedures (3 vs 4; $p = 0.003$) and was not statistically significant for laparoscopic (0.6 vs 0.5; $p = 0.3$) or robotic (0.9 vs 0.9; $p = 0.06$). Reoperation was more likely for patients with BS compared to NBS for open procedures (3% vs 1%; $p = 0.03$) and was not statistically significant for laparoscopic (1% vs 1%; $p = 0.3$) or robotic (1% vs 1%; $p = 1$). Other outcomes including SSI, SSO, SSOPI, readmission, and ER Visit had no statistically significant difference for BS or NBS patients across all modalities.

Conclusion(s): The usage of BS may reduce OR time for robotic procedures but has little effect on open or laparoscopic procedures.

	Open BS (n=717)	Open NBS (n=717)	p	Lap BS (n=126)	Lap NBS (n=126)	p	Robotic BS (n=272)	Robotic NBS (n=272)	p
Hernia Width, median (IQR)	8 (5-12)	8 (3-14)	0.2	2 (2-4)	2 (2-4)	0.6	4 (2-7)	4 (2-7)	1
Myofascial release, % (*n*)	49 (351)	59 (421)	<0.001	10 (13)	2 (2)	<0.003	36 (98)	31 (85)	0.2
Permanent Mesh used, % (*n*)	80 (575)	81 (584)	0.3	89 (112)	85 (107)	0.6	91 (248)	93 (252)	0.6
OR Time > 2 hours, % (*n*)	57 (409)	60 (423)	0.2	21 (26)	15 (19)	0.2	47 (127)	58 (159)	0.006
LOS, mean days ±SD	3±4	4±4	0.003	0.6±1.2	0.5±1.3	0.3	0.9±2.8	0.9±1.5	0.06
SSI, % (*n*)	5 (35)	7 (51)	0.07	5 (35)	7 (51)	0.07	0 (2)	1 (7)	0.09
SSO, % (*n*)	13 (93)	13 (94)	0.9	4 (5)	5 (6)	0.8	8 (22)	10 (28)	0.4
SSOPI, % (*n*)	8 (55)	8 (56)	0.9	1 (1)	0 (0)	0.3	1 (3)	2 (6)	0.3
Reoperation, % (*n*)	3 (22)	1 (10)	0.03	1 (1)	1 (1)	0.3	1 (2)	1 (2)	1
Readmission, % (*n*)	5 (38)	5 (38)	1	3 (4)	4 (5)	0.8	3 (7)	1 (4)	0.4
ER Visit, % (*n*)	8 (56)	6 (44)	0.2	3 (4)	6 (7)	0.4	5 (13)	4 (12)	0.8

BS: barbed suture, NBS: non barbed suture, IQR: interquartile range, OR: operating room, LOS: length of stay, SSI: surgical site infection, SSO: surgical site occurrence, SSOPI: surgical site occurrence with procedural intervention, ER: emergency room

Table 1 PSM Outcomes for BS and NBS in VHR by surgical approach

P046

Iatrogenic Diaphragm Injury Repaired with Mesh Suture

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Introduction: Mesh suture is a newer innovation has been used in many contexts. It was approved by the FDA in 2022, designed as a mid-weight polypropylene network of suture. This case demonstrates the use of mesh suture for diaphragm defect closure.

Case Report: This is a 63-year-old female with a past medical history of polysubstance abuse, hepatitis C, COPD who presented with xanthogranulomatous pyelonephritis secondary to a large left staghorn calculus (Fig. 1). This was causing a retroperitoneal abscess and was adherent to the diaphragm as well. She was taken to the operating room for a combination case with urology, colorectal surgery, and general surgery. The left colon at the splenic flexure was found adherent to Gerota's fascia. The abscess was also causing adherence to the left psoas muscle as well as the diaphragm. The left colon was mobilized off the kidney and did not require any resection. The general surgery team then was called into the operating room, and the kidney was removed from its superior attachments close to the diaphragm. There was a 10 cm defect in the diaphragm after this resection and the left lung was visualized. This was closed in a running fashion with a #2 mesh suture with minimal tension. The midline fascia was then also closed with a #2 mesh suture. She progressed well post-operatively with diaphragm repair remaining intact (Fig. 2) and was discharged on post-operative day 14 to rehab on prolonged IV antibiotics.

Conclusion: Mesh suture has been used on the diaphragm in various contexts such as for hiatal hernia repairs and diaphragm defects as shown here.

Fig. 1 CT scan showing staghorn calculus, atrophic kidney, and abscess

Fig. 2 Post-operative CT scan after resection showing intact diaphragm

P047

Amyand Appendicitis Anomaly

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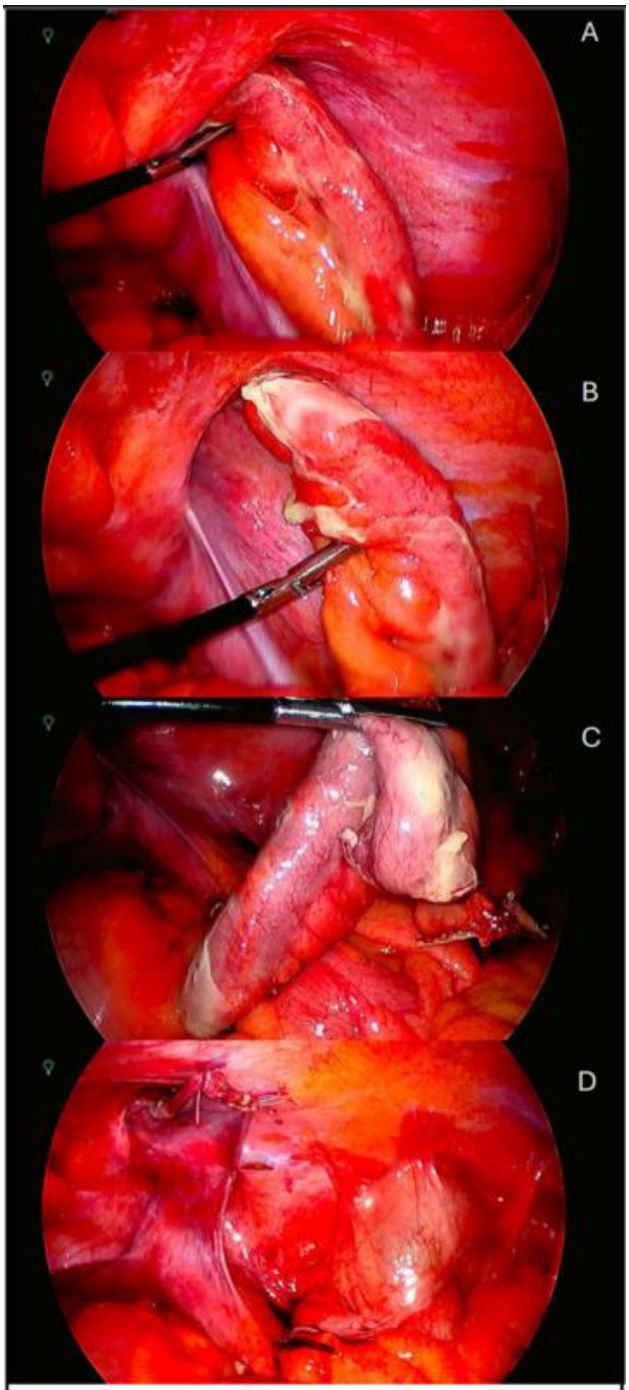
Introduction: Inguinal hernias are among the most prevalent surgical diagnoses in the United States, with an estimated lifetime risk of 27% in men and 3% in women. While most cases are reducible and managed electively, 1–3% present as strangulated or incarcerated, necessitating urgent surgical intervention. An Amyand hernia, characterized by the presence of the appendix within an inguinal hernia sac, represents a rare anatomical anomaly. The occurrence of acute appendicitis within an Amyand hernia is even rarer, estimated to occur in approximately 0.1% of all appendicitis cases. This condition presents unique diagnostic and therapeutic challenges due to its rarity and the complexities involved in managing both the hernia and the inflamed appendix simultaneously.

Presentation: We report the case of a male in his sixth decade who presented with acute right lower quadrant abdominal pain and a tender, irreducible right groin hernia. Imaging revealed an Amyand hernia with acute appendicitis. The patient was promptly administered antibiotics and underwent laparoscopic appendectomy and temporary pexy of the hernia sac without mesh. Definitive hernia repair was planned and successfully performed several weeks later, once the risk of infection had subsided.

Discussion: Managing an Amyand hernia complicated by acute appendicitis involves balancing the immediate need for appendectomy with the risks associated with hernia repair in a potentially contaminated surgical field. Laparoscopic appendectomy is favored due to its minimally invasive nature, which is associated with reduced morbidity and quicker recovery. However, the placement of mesh during hernia repair in the presence of contamination poses a significant risk of infection. In this case, a staged surgical approach was adopted: the hernia sac was initially pexied without mesh to reduce immediate infection risk, with elective hernia repair deferred until a safer time. This approach underscores the necessity of individualized treatment strategies in complex surgical cases.

Conclusion: This case illustrates the challenges and considerations in managing an Amyand hernia with concurrent appendicitis. The successful outcome in this patient highlights the efficacy of a staged surgical approach in reducing postoperative complications and achieving long-term hernia repair success. It highlights the importance of tailoring surgical management to the specifics of the pathology and patient condition. The inclusion of intraoperative images of the inflamed appendix within the hernia sac will further elucidate the complexity of this case for conference attendees.



A. Amyand Appendicitis
B. Appendix removed from right inguinal hernia
C. Appendectomy
D. Hernia pexy at time of laparoscopic appendectomy

P048

A Comparison of Outcomes Between Patients with Class I and Class II Obesity Undergoing Umbilical Hernia Repair: A Multicenter Study Using the ACHQC Database

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Introduction: Umbilical hernia repair (UHR) is one of the most commonly performed hernia operations. However, there is concern amongst surgeons on performing an UHR on obese patients due to increased risk for recurrence or wound complications. For some surgeons a body mass index (BMI) of 35–40 kg/m^2 may even be prohibitive to umbilical hernia repair. Thus, this study aims to compare outcomes for all primary UHR for defects < 2 cm between patients with class I and class II obesity

Methods: A retrospective review of prospectively collected data from the ACHQC was performed to include adult patients with a BMI of 30.0–39.9 kg/m^2 who underwent elective UHR for a hernia defect of < 2 cm. The cohort was divided into two groups, class I obesity (BMI 30.0–34.9 kg/m^2) and class II obesity (BMI 35.0–39.9 kg/m^2) and a propensity match scoring analysis was performed. The patients were matched based on diabetes mellitus, hypertension, chronic obstructive pulmonary disorder, and smoking status. A Wilcoxon rank sum and chi-squared test was used to compare surgical site infection (SSI) subtypes, surgical site occurrence (SSO) subtypes, 30-day reoperation, recurrence, and readmissions between the groups.

Results: A total of 1896 patients underwent UHR in this cohort. Patients with class II obesity more often underwent minimally invasive repair compared to class I (11% vs 6.2% laparoscopic; 21% vs 16% robotic; $p < 0.001$). Patients with class II obesity more often underwent mesh-based repair ($p = 0.019$). The only significant difference in 30-day outcomes was a higher incidence of SSI/SSO in the class II obesity group (5.6% vs 3.5%, $p = 0.027$). A subgroup of both SSI and SSO was also performed. In the SSI subtype analysis, there was no difference in any subtype including: superficial infection, deep space infection, infection requiring antibiotics, infection requiring debridement, or mesh explantation. In the SSO subtype analysis, there were was a higher rate of wounds with serous drainage in the class II obesity group (0.8% vs 0.1%, $p = 0.039$) but no difference in procedural interventions. There were no other differences between groups in the SSO subtype analysis including: cellulitis, purulent drainage, seroma, hematoma, or wounds requiring debridement or mesh explantation. No differences were noted in 30-day re-admission, re-operation, or hernia recurrence.

Conclusion: There are overall low rates of adverse short-term outcomes for patients in the group, despite a slightly elevated infection rate. Thus, concern for adverse short-term outcomes for a BMI of 35.0–39.9 kg/m^2 should not deter repair of umbilical hernias < 2 cm.

P049

Appendix Incognito: Decoding the Enigma of De Garengeot Hernia

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Introduction: De Garengeot hernia is an exceedingly rare condition where the appendix is found within a femoral hernia sac. This unusual presentation poses significant diagnostic and therapeutic challenges for clinicians. The incidence is estimated to be 0.5–5% of femoral hernias, making it a rare occurrence. Our aim is to highlight the importance of recognizing this rare entity and discuss its clinical implications.

Case Report: A 90-year-old woman presented with a one-day history of right groin pain and swelling. Medical history was significant for endometrial cancer, severe aortic stenosis, and chronic atrial fibrillation. Physical examination revealed a tender, non-reducible 6 cm diameter bulge below the right inguinal ligament. Laboratory findings showed leukocytosis WBC 16×10^3 μL. With these initial findings, a diagnosis of strangulated femoral hernia was made, and emergency surgery was performed.

Intraoperatively, an incarcerated femoral hernia was identified. Upon opening the hernial sac, a gangrenous appendix was discovered. The surgeon performed an appendectomy and reduced the cecum back into the peritoneal cavity. The hernia was repaired using Mac Vay's herniorrhaphy technique.

Discussion: There are many challenges associated with diagnosing and managing De Garengeot hernias. The rarity of this condition often leads to its discovery only during surgical exploration, as preoperative diagnosis is extremely difficult. The simultaneous occurrence of acute appendicitis within a femoral hernia complicates the clinical picture and surgical approach.

It is crucial to note that attempting manual reduction in the emergency department can potentially worsen the acute appendicitis. The surgical management remains up for debate. Some surgeons advocate for a combined inguinal and low midline approach, others prefer a single incision technique. In this case, a single inguinal incision proved sufficient for both appendectomy and hernia repair. Surgery carries risks including wound infection, mesh-related complications, appendiceal stump leakage, bowel injury, and femoral vein thrombosis. Clinically, patients may present with atypical pain patterns or sepsis in severe cases. The confined nature of inflammation can sometimes mask systemic symptoms, further complicating diagnosis.

Conclusion: De Garengeot hernia represents a rare but clinically significant entity that requires prompt recognition and appropriate treatment. Further research is needed to establish standardized guidelines for the surgical approach and management techniques of these hernias. The possibility of coexisting pathologies and rare recurrences emphasizes the need for thorough evaluation and follow-up. Given these complexities, a high index of suspicion and comprehensive understanding of this condition are crucial for optimal patient outcomes when suspected.

P050

Comparative Study Between Bottoms Up Versus Top Down Transverse Abdominis Release in Ventral Hernia Surgery

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Background: Component separation technique becomes one of the main armamentarium of any laparoscopic surgeon when he thinks of doing large and complicated ventral hernias, be it open or laparoscopic. If done in a right way TAR is helpful to approximate peritoneum in large defects. There are two types of TAR, top down approach and bottoms up approach. Each procedure has its own advantages and disadvantages.

Methods: A comparative study of early outcomes after TAR was conducted for ventral hernia patients who required TAR for defect ranging between 4 and 12 cm between Feb 2023 to January 2024.

Results: Till March 2024 23 TAR procedures has been done

7 patients underwent open surgery

16 patients underwent laparoscopic eTEP RS with TAR

Unilateral TAR was done in 12 patients

Bilateral TAR was done in 11 patients

Top down TAR - 14

Bottoms up TAR- 20

Out of 14 top down TAR peritoneal button hole occurred in 10 patients and bleeding occurred in 1 patient

Out of 20 bottoms up TAR peritoneal button hole occurred in 4 TAR and bleeding (oozy bloody field) occurred in 3 patients

Not a single TAR was associated with bowel injury.

Seroma occurred in one patient of bottoms up TAR.

Conclusion: Its very difficult to say on initial results about which method of TAR is better over other method. But to avoid peritoneal button holing, bottoms up TAR is more helpful.

P051

Oral Flora as a Cause of Prosthesis Infection During Hernia Surgery

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Figure 1: Axial view depicting abscess with air collection

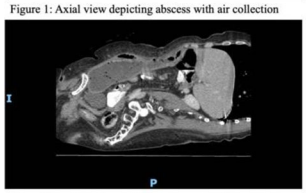

Figure 2: Sagittal view depicting abscess with air collection

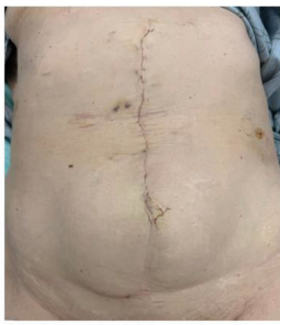

Figure 3: Coronal view depicting gross image of abscess

Introduction: Meshes in abdominal wall hernia repair has significantly reduced recurrence, but incidence of mesh-related infection is 1–8%, which is influenced by underlying co-morbidities, the type of mesh and the surgical technique. This case report portrays a female who presents with an Actinomyces and Prevotella infection of the surgical mesh after elective surgical repair of an incisional hernia.

Case Report: A a 67-year-old female with a surgical history of appendectomy, hernia repair, colon resection but no significant medical history of diabetes, smoking, or any active infection, presented for an elective repair of incisional hernia. She underwent a repair with placement of a 36 cm × 12 cm macroporous polypropylene mesh in the retrorectus plane. On post-operative day 20 she returned to the hospital with nausea, weakness, and abdominal pain for 5 days. Her exam was largely normal with healed incisions without any cellulitis. The CT scan demonstrated a 25 cm abdominal wall collection. There was no intraperitoneal or subcutaneous collection. These suggested an abdominal wall abscess without any Gastrointestinal injury and or cutaneous infection. Her BP was 150/80 mmHg, heart rate was 104bpm and temperature was 97.6°F. Laboratory values were largely normal with WBC 12 K/μL, Na 136 mEq/L, and Creatinine 0.8 mg/dL.

She was taken urgently to the operating room where 1.2 L of purulent fluid was removed along with the mesh from the from the retro-rectus space, as it was freely floating in the collection with a biofilm formation. The culture of the fluid yielded Prevotella and Actinomyces. She underwent multiple washouts and gradual closure of abdominal wall, aided by Negative Pressure Wound Therapy. A week later she noticed a broken tooth and recalled that she did have a mild tooth infection for a while. The Dentist did not find any active infection. Lacking any other obvious source of infection and Prevotella and Actinomyces are common in Orogential Flora, we hypothesize that the smoldering tooth infection was causing bacteremia that infected the seroma. The patient was placed on an empirical course of Cefpodoxime and Metronidazole and transitioned to a 1-month course of Doxycycline.

Conclusion: The mesh infection has been one of the most fearsome complications after Hernioplasty. Multiple steps have been taken to reduce infections from the skin and the GI tract but controlling infection from Oro-genital Flora is not commonly done. This rare cause of Mesh infection from an asymptomatic tooth infection warrants future studies and change in clinical protocol.

P052

Racial Disparities in Post-operative Outcomes Following Ventral Hernia Repair

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Introduction: Racial disparities in surgical outcomes have been well documented. Several studies have demonstrated differences in initial pre-operative screening and referral patterns for ventral hernia (VH) issues, as well as rates of emergent VH repair between different racial groups. Few studies have closely assessed disparities in overall VH post-operative outcomes.

Methods: The Abdominal Core Health Quality Collaborative (ACHQC) database was queried for patients who underwent elective VH repair. Exclusion criteria included parastomal hernia and incomplete data. The primary outcomes measured were 30-day Surgical Site Occurrences (SSO), Surgical Site Infections (SSI), SSO requiring Procedural Interventions (SSOPI), and Hernia-Related Quality-of-Life (HerQLes) Survey. Secondary outcomes include 30-day readmission, 30-day and long-term recurrence, significant postoperative outcomes, and major intraoperative complications. Descriptive statistics were performed using Kruskal-Wallis and Pearson tests. Logistic regression modeling was applied to 30-day SSI and SSO.

Results: Our cohort consisted of 32,192 patients (White = 26,962, Black = 3008, Hispanic = 1605, Other = 617) with a median age of 57. The most common type of hernia was incisional (57%), followed by primary umbilical (36%) and recurrent VH (23%). Racial differences in patient characteristics were statistically significant, with Black patients having higher BMI, as well as higher rates of active smoker status, heart failure, and end-stage renal disease ($p < 0.001$). Compared to White patients, Black, Hispanic, and Other races had higher ASA classification, rates of diabetes mellitus, and Distress Community Index (DCI) scores ($p < 0.001$). Black patients also had higher Ventral Hernia Working Group (VHWG) classification with the highest proportion of grade 2 and 3 hernias ($p < 0.001$). When evaluating outcomes, the Black cohort had higher rates of SSO (10% vs 8% White vs 7% Hispanic) and lower HerQLes scores at baseline, 30-day and at 2 to 4 years. There were no significant differences in secondary outcomes in all racial cohorts. After adjusting for selected covariates, logistic regression modeling demonstrated that Black patients were less likely to have SSI compared to White patients (OR

0.63, 95% CI 0.40–0.90, $p = 0.01$). There was no statistical difference between Non-White and White patients for SSO.
Conclusions: Non-White patients undergoing elective VH repair had more co-morbidities when compared to White patients. Although overall postoperative outcomes were similar, there still exists slight differences in SSO and, more importantly, quality of life scores, with Black patients reporting lower quality of life even after surgical intervention. Future studies could shift focus to improving disparities in patient-centered outcomes.

P053

Techniques to Eliminate Complications of Laparoscopic Inguinal Hernia Repair (TEP)

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Introduction: TEP is an excellent method for repairing hernias outside the abdominal cavity without exposing the sutures in the abdominal cavity. However, we present some ideas to reduce complications further and make the procedure less invasive.
Method: Addition of a 3mm intraperitoneal port above the umbilicus: Intraperitoneal observation allows for the identification of the type of hernia, distribution of fat deposits, and small blood vessels. It can also be used to plan the dissection of the preperitoneal cavity, degas the abdominal cavity during surgery, and confirm and correct the mesh position. In cases of sliding hernia, adding one more port allows for traction of the prolapsed portion.
Dissection based on fascial anatomy: Under monitor observation, enter the anterior surface of the rectus abdominis posterior sheath (RS) and expose the RS toward the pubic bone, then recognize it as being divided into the tendon, attenuated tendon and membranous portions (MP). The MP is incised on the medial side of the inferior epigastric vessels (IEV) to enter the preperitoneal space, and the peritoneum is further pushed down toward the dorsal side, cutting up toward the semilunar line to find the peritoneal edge on the lateral side. During this process, a part of the MP is left to cover and protect the IEV. From the outside, dissection of the fatty tissue attached to the hernia sac is started, and parietalization is continued. From the inside, dissection is performed between the sling of the preperitoneal fascia and the hernia sac, the VAS is identified, and dissection is performed up to the umbilical artery, and the vesicohypogastric fascia is cut so as not to interfere with the mesh prosthesis.

Dissection and hemostasis with bipolar forceps: Small blood vessels are individually hemostated using LAP BiSect to prevent postoperative bleeding. This is particularly useful for hemostasis during parietalization while considering chronic postoperative pain.

Lymphangiography using ICG: Identifying and protecting the lymphatic vessels prevents scrotal edema and helps preserve the spermatic cord components during complex dissection of scrotal and sliding hernias.

Inguinal canal closure by ligation and resection at the internal inguinal ring of the hernia sac. This eliminates unnecessary dissection within the inguinal canal, prevents mesh displacement during a period when early fixation is unstable, and further simplifies difficult cases of scrotal hernia.
Conclusion: By using the above techniques, TEP can be performed without complications.

P054

Split Underlay Complex Abdominal Wall Closure for Concomitant Midline and Parastomal Hernias

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Introduction: Parastomal hernias present a unique challenge, particularly when combined with midline hernias, due to the complexity of abdominal wall reconstruction. The Sugarbaker technique has been effective in managing parastomal hernias, known for its safety and low recurrence rate. However, its use in patients with both parastomal and midline hernias, especially after prior surgeries, can reveal technical limitations. Here, we describe a modified Sugarbaker technique used to successfully repair parastomal hernias in two patients with concomitant ventral hernias and the absence of the posterior rectus sheath due to prior surgeries.
Case Descriptions:
Patient 1: A woman in her 70s with a history of sigmoid resection for diverticulitis developed a ventral incisional hernia, which recurred after repair. Subsequent surgical complications, including an intra-abdominal abscess, required multiple interventions, leaving her with a parastomal hernia, ventral hernia, and loss of the posterior rectus sheath. The patient presented with debilitating pain and functional limitations. During surgery, her bowels were found densely adhered to the abdominal wall, and the posterior rectus sheath was absent. A modified Sugarbaker repair using ST-coated mesh was performed on the right side with the assistance of a laparoscopic absorbable tacker to secure the lateral aspect of both meshes, and the left hemi-abdomen was reinforced with the same mesh. The two meshes were reapproximated at the midline, creating a neofascia to replace the lost posterior rectus sheath. The procedure was successful, and both hernias were reinforced and remain intact.
Patient 2: A 55-year-old woman with a history of pelvic exenteration for cervical cancer and radiation therapy presented with a large parastomal and midline hernia. She had two prior failed hernia repairs. On exploration, her bowels were similarly adhered to the abdominal wall, and the posterior rectus sheath was missing around the stoma due to mesh explanation. Using the modified Sugarbaker technique, a right-sided repair with ST-coated mesh was performed, carefully avoiding injury to her ileal conduit again securing the mesh with the laparoscopic absorbable tacker. The left side was also secured with mesh, and the two sides were reapproximated at the midline to create a neofascia. The procedure was successful, and both hernias were reinforced and remain intact.
Discussion: This modified Sugarbaker approach, using a split ST-coated mesh with reapproximation at the midline, may offer a viable solution for patients with concurrent parastomal and midline hernias, particularly when the posterior rectus sheath is absent due to previous surgeries.

P055

Short-Term Outcomes Following Open vs MIS Inguinal Hernia Repair

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Background: The Lichtenstein technique is the gold standard for open inguinal hernia repair. With recent advancements in surgical innovation, the utilization of minimally invasive surgery (MIS) has

increased dramatically in hernia surgery. The aim of this study is to compare outcomes of open vs. MIS inguinal hernia repairs at our institution.

Methods: We conducted a retrospective study at a high-volume hernia center using a prospectively maintained database from November 2022 to July 2024. Patients were divided into two groups based on the surgical approach: open versus MIS. Demographic and perioperative data were analyzed using univariate analysis. Primary outcome was recurrence rate. Secondary outcomes were rates of surgical site infection, hematoma, seroma, and inguinodynia.

Results: A total of 143 patients were included in the study. The majority of patients underwent MIS repair (79% vs. 21%). The MIS group was significantly younger than the open group (60.3 ± 15.2 vs. 71.7 ± 14.2 years, $p = 0.0003$). The MIS group was significantly healthier (mode ASA class 2 vs. 3, $p = 0.0017$) and less frail (modified frailty index score 0 vs. 1, $p < 0.0001$) than the open group. The groups were similar as it related other risk factors: BMI, immunosuppression use, nicotine use, prior pelvic operation, prior hernia repair. The mean operative time for MIS repairs was shorter (57.9 ± 29.5 vs. 82.6 ± 25.8 min, $p < 0.0001$). All patients were discharged on the day of surgery. Both groups were followed for similar mean length of time: MIS - 58.4 ± 58.4 days vs. open - 58.4 ± 58.4 days ($p = 0.77$). There was only one recurrence in the open group during this period (0% vs. 3.3%, $p = 0.0515$). There were no documented surgical site infections in either group. Perioperative outcomes including hematoma (0.88% vs. 3.3%, $p = 0.31$) and seroma (6.2% vs. 0%, $p = 0.16$) were comparable. A subgroup analysis of these patients showed no difference in inguinodynia rates (4% vs. 14%, $p = 0.32$).

Conclusion: Our results indicate that the short-term outcomes of MIS repair at our institution are comparable to those of open repair. However, long-term follow-up is necessary to evaluate the rates of recurrence and inguinodynia. The selection of a surgical approach should be guided by patient-specific factors, the surgeon's expertise, and the availability of hospital resources.

P056

Single-Institution Evaluation of Outcomes in Transplant Patients Undergoing Ventral Hernia Repair

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Background: Transplant patients undergoing abdominal wall reconstruction (AWR) are classified as Ventral Hernia Working Group 2 (VHWG2), indicating higher risk for adverse outcomes. This study assessed perioperative outcomes in transplant patients undergoing ventral hernia repair (VHR). We also performed sub-analyses to explore the influence of mesh selection and immunosuppression on outcomes in the transplant group.

Methods: A retrospective review was conducted using a prospectively maintained database of patients who underwent VHR between January 2014 and March 2024. Inclusion criteria included patients with prior liver, kidney, heart, lung, islet cell, or pancreas transplants. Primary outcomes included 30-day complications and hernia recurrence. Sub-analyses in the transplant group evaluated the impact of mesh type, hernia location, and immunosuppressive therapy.

Results: In total, 44 transplant patients were included (30 liver, 9 kidney, 3 heart, and 2 islet cell). The average BMI was 30, average age was 60.3, 65.9% were male, and 34.1% were female. Rates of surgical site occurrences (SSO) were 4.5% (2/44) and surgical site infections (SSI) were 2.3% (1/44). The rate of hernia recurrence was 9.1% (4/44).

Hernia recurrence was significantly higher in patients receiving non-synthetic mesh compared to synthetic mesh (27.3% vs. 3.0%, $p = 0.04$), in lateral versus midline hernias (30.0% vs. 0.0%, $p = 0.01$), and in patients on sirolimus or cyclosporine versus tacrolimus (40.0% vs. 50% vs. 0.0%, $p \leq 0.01$). Patients on tacrolimus did not demonstrate any 30-day SSOs or SSIs (0/27), and 1 SSO and SSI each occurred in patients on sirolimus (1/5) (0.0% vs. 20.0%, $p = 0.16$).

Conclusion: Mesh type, hernia location, and immunosuppressive therapy significantly influence outcomes in transplant patients undergoing VHR. These findings underscore the need for further studies in larger patient cohorts to confirm the role of these factors in optimizing surgical outcomes.

P057

Abdominal Operations After Bilateral Transversus Abdominis Release Herniorrhaphy: Analysis of Incidence and Outcomes

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Introduction: The implantation of large retromuscular permanent prosthetic meshes during bilateral transversus abdominis release (bTAR) herniorrhaphy makes subsequent operations within the peritoneal cavity more difficult. Violating the mesh increases the risk of subsequent hernia formation; however, little is reported about this risk in the literature. Additionally, no reports list the incidence and types of abdominal surgery that violate retromuscular mesh following bTAR. This study aims to determine the incidence of abdominal surgery that violates the retromuscular prosthetic mesh following bTAR herniorrhaphy and the rate of subsequent hernia formation.

Methods: We retrospectively reviewed prospectively collected data from a single-center, institution-approved hernia registry for patients undergoing re-operation following hernia repair with bTAR and permanent mesh implant with at least three years follow-up. Patient demographics, comorbidities, and operative and postoperative data were collected, including the method of abdominal closure. Parastomal hernia repairs, retrorectus repairs without TAR, and unilateral TAR patients were excluded. Outcomes of interest include the incidence and types of abdominal operations after bTAR and subsequent rates of hernia occurrence.

Results: We identified 197 patients who underwent open bTAR with retromuscular mesh placement between August 2012 and August 2021. One hundred and fifty-six patients were identified with long-term follow-up (3–11.4 years, mean 6.1 years). Spontaneous hernia recurrence was found in four (2.6%) patients.

Twenty (12.8%) patients required 23 additional surgeries that violated their mesh, including recurrent hernias repaired laparoscopically (Table 1). The mean time to the first subsequent operation was 3.1 ± 2 years. Ten (50%) patients underwent a total of 12 laparotomies. Within the twelve operations that were performed through a laparotomy, two incisional hernias occurred after mesh reconstruction with absorbable sutures. In contrast, no incisional hernias occurred following mesh reconstruction with permanent sutures. There have been no incisional hernias following minimally invasive surgery, regardless of port site closure technique.

Conclusion: Our data suggest that 12.8% of patients will require future abdominal operations following bTAR herniorrhaphy. Development of subsequent hernias is highest in patients who undergo

laparotomy without proper reapproximation of the divided mesh with permanent sutures.

Total number of operations (n=23)	N (%)
Open	12 (52.2%)
Exploration	6 (26.1%)
Small bowel resection	2 (8.7%)
Colon resection	2 (8.7%)
Gynecologic procedure	2 (8.7%)
Laparoscopic/Robotic	10 (43.4%)
Cholecystectomy	2 (8.7%)
Gynecologic procedure	1 (4.3%)
Sleeve gastrectomy	2 (8.7%)
Ventral hernia repair	3 (13.0%)
Paraesophageal hernia repair	2 (8.7%)
Percutaneous	1 (4.3%)
Cholecystostomy tube	1 (4.3%)

Table 1: Operations performed following bTAR herniorrhaphy

P058

Minimally Invasive Repair of a Pediatric Traumatic Spigelian Hernia

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Introduction: Traumatic spigelian hernias occur along the anterior portion of the wall along the semilunar line and are rare, approximately 1% of all abdominal hernias. The literature for management of traumatic spigelian hernias especially in the pediatric population is limited to case reports and controversial use of mesh overall in the pediatric population. The options range from open operative repair to non-operative watchful waiting, although there is a noted 20% risk of small bowel strangulation. This case involves a pediatric patient with a traumatic spigelian hernia which was successfully managed with a robotic assisted TAPP repair using biosynthetic absorbable mesh.
Case Report: This is a 13-year-old active and healthy male with no significant past medical history who presented one week following a traumatic abdominal hernia that occurred after falling on the handlebar of his bicycle. Due to persistent lower abdominal pain and noted bulging in the right lower abdomen that worsened with Valsalva maneuver, he presented for further evaluation. He denied any obstructive symptoms. CT with valsalva maneuver was notable for the bulging of a small loop of bowel into the posterior surface of the anterior abdominal wall lateral to the right rectus muscle along the linea alba above the umbilicus, with no change during valsalva consistent with a spigelian hernia. Given his persistent symptoms and after discussion with his family, the decision was made to proceed with a robotic assisted repair of the ventral hernia with biosynthetic absorbable mesh (P4HB).
Discussion: Pediatric surgeons most commonly encounter inguinal hernias for which high ligation of the sac is performed without the use of mesh. For direct inguinal hernias, there has been more consideration in placing mesh in late adolescent pelvic floors, as the physiology at that point has transitioned to being more similar to that of an adult. In this case report, for a traumatic spigelian hernia in the right lower quadrant in proximity to the myopectineal orifice, a robotic TAPP approach was used with primary closure of the defect followed by preperitoneal placement of biosynthetic absorbable mesh for reinforcement. Using a biosynthetic absorbable mesh, may be a viable option to consider in growing adolescent patients.
Conclusion: A minimally invasive repair may be considered in an adolescent with use of the robotic platform for both assessment of the bowel, appropriate dissection of the myopectineal orifice and flap creation and enhanced precise mesh suturing to reinforce the integrity of the repair.

P059

Right Inguinal Hernia Repair Reveals Canal of Nuck Cyst: A Rare Case in a 37-Year-Old Female

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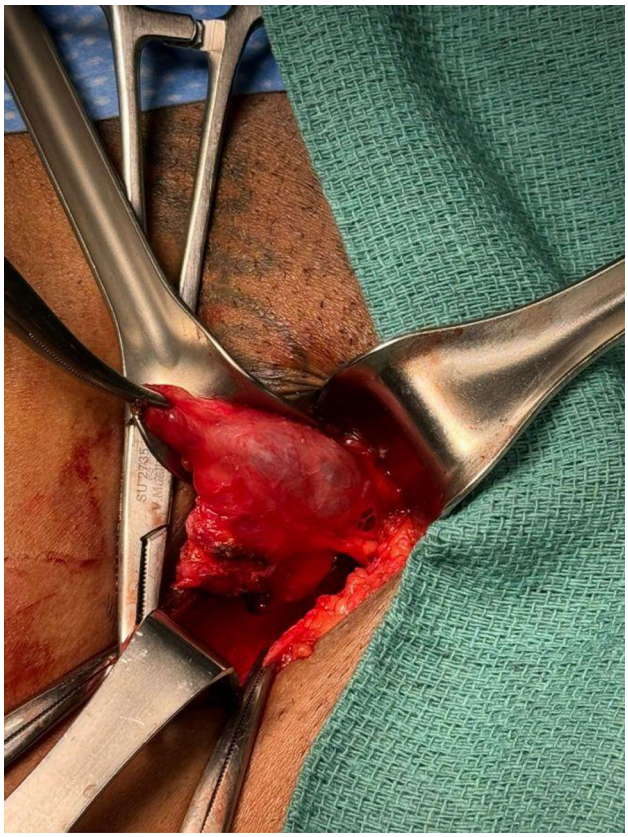
Background: The Canal of Nuck is an embryological extension of the parietal peritoneum in females that typically obliterates early in development. If it fails to do so, it can present itself as either a cyst or hydrocele, although very seldom in the adult female. Because of similar clinical findings, groin swelling, misdiagnosis as inguinal hernia is not infrequent and thus makes the diagnosis quite elusive.
Case Presentation: We report a 37-year-old female referred to the general surgery clinic for assessment of a right-sided groin bulge. The bulge had been present since 2016 and, although reducible, had recently increased in size. A preoperative CT suggested an ovoid mass in the right Canal of Nuck that raised suspicion for a femoral hernia. An ultrasound further characterized the mass as a complex cystic structure that measured 3.7 × 1.5 × 3.1 cm. Physical examination did not demonstrate any tenderness or skin changes. The patient underwent a right inguinal hernia repair, where a lipoma was identified along with a small Canal of Nuck cyst and excised. The inguinal defect was repaired with mesh. Pathological examination confirmed the cyst to be benign. On immunohistochemical staining, it showed positivity for CK7, CK5/6, Calretinin, WT-1, and low proliferation index (Ki-67: 1%).
Discussion: Persistence of the Canal of Nuck in adults is rare, usually presenting clinically with features similar to that of an inguinal hernia. Ultrasound and MRI are the modalities of choice for accurate delineation of the cystic structure. Simple excision is sufficient if the communication with the peritoneal cavity is absent and in cases involving hernias, encouragement of mesh reinforcement is recommended to evade recurrence. As in the case described, the case turned out well; this was a case of successful use of mesh after excision of the Canal of Nuck cyst and lipoma, with no postoperative complications.
Conclusion: The Canal of Nuck cysts is a rare cause of swelling in the groin of a female adult and is most often mistaken for an inguinal hernia. Diagnosis, typically aided with imaging, requires surgical intervention for optimal outcomes. This case reminds us not to forget to include the differential diagnosis of a Canal of Nuck cyst in a female presenting with inguinal swelling.



P060

Complex Abdominal Wall Reconstruction. Our Experience with Botox for Hernias with Loss of Abdominal Domain in Component Separation Technique

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Introduction: Loss of domain usually refers to the clinical scenario where more of the viscera is outside of the abdominal cavity than the inside. Difference in abdominal cavity pressure, when sudden reparation can lead to great intra-abdominal pressure with fatal pathophysiological implications. Without the proper preparation of the abdominal wall the surgical treatment is challenging leading to intra-abdominal hypertension after the herniated content is returned to the cavity. For the repair of these hernias we have different approaches and techniques, in the case of Botulinum toxin A (BTA), muscles decreases the thickness and increases its length. BTA is a neurotoxin derived from the bacteria clostridium botulinum, when injected into muscle tissue, it causes a temporary flaccid muscle paralysis; this effect peaks around 2–4 weeks after injection and decreases in the months after.

Case Presentation: We present a case of a 61-year-old male involved in a gunshot attack with multiple injuries to the thorax, abdomen and bowel perforation in 2018. He was managed with exploratory laparotomy and stayed with a Bogota Bag while the wounds closed and abdominal pressure ceased, with closure 3 months later suffering a ventral hernia with loss of domain. We reconstructed 4 years later with an adequate protocol of Botox using 250 Disport UI per side, administered in 5 different abdominal points in each side (50U each point) also in the intraoperative management we use bioabsorbable mesh (3D max large) and components separation technique. Postoperative physical therapy was applied to. The patient did not experience any recurrence after his abdominal wall reconstruction and remains alive at the time this case was written.

Discussion: The reconstruction of abdominal wall hernias with loss of domain is still an unclear field in which different approaches could be used in order to obtain the best possible results for the patient. The preoperative planning is one of the most crucial steps in obtaining the best results with the less amount of complications. In this case we use BTA and wait 6 weeks in order for the toxin to be at their best performance.

Conclusion: There are multiple alternatives to reconstruct midline defects. The component separation technique with Botox repairs extensive defects returning functionality to the abdominal wall. It is a procedure that is not free of complications, however, in our experience it is stable over time without evidence of recurrence during follow-up. An adequate evaluation and selection of each case is recommended.

P061

Diagnostic and Operative Challenges of Primary Femoroceles: An Interesting Case and Review of Literature

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Introduction and Background: Femoral hernia is a protrusion of abdominopelvic content through the femoral ring into the femoral canal. Femoral hydrocele is a rare subtype, also known as femorocele whereby fluid collection is found within the femoral hernia sac. This is an uncommon differential for irreducible groin lumps – clinical examination along with cross-sectional imaging can assist physicians in clinching the diagnosis.

Methods: Our case patient is a 71-year-old female patient with a body mass index (BMI) of 21.2 kg/m^2 who initially presented to a General Practitioner with a two-week history of painless left groin lump after sustaining a fall three months prior. Examination reveals a 4 × 3 cm left groin lump along the medial aspect of the inguinal ligament—it is soft, irreducible, non-tender, non-pulsatile and cough impulse was negative. Given the possibility of a groin hernia, patient was referred and seen in a General Surgery outpatient clinic. An ultrasonography (US) was performed in view of the clinical

suspicion—it demonstrated a cystic lesion with a possible neck extending towards the left hip joint. Patient then proceeded with a magnetic resonance imaging (MRI) which showed a well-defined thin-walled cystic lesion in the subcutaneous left groin measuring 4.6 cm associated with a fat containing left femoral hernia, overall suggestive of a femorocele. Patient was counselled and agreeable to proceed with surgical repair.

Results: The hernia specialist opted for a femoral hernia repair via the laparoscopic totally extraperitoneal (TEP) approach. Intraoperatively, the myopectineal orifices were carefully dissected—it was noted that there was a left incarcerated femoral hernia containing large amount of preperitoneal fat and omentum. The hernia sac was identified and its content was reduced. A preperitoneal ropivacaine nerve block was administered. BD 3DMaxTM 16 cm × 10.8 cm anatomical polypropylene mesh was inset and anchored around the hernia defect with GEM Glutack®, a synthetic biodegradable cyanoacrylate adhesive for non-traumatic mesh fixation. Postoperative recovery was unremarkable.

Discussion: A comprehensive literature review was performed on this rare pathology—till date, there are total of 14 other cases reported in English literature. All documented cases of femoroceles were in females in their fourth to sixth decade, majority being unilateral right-sided pathology. Most reported cases are diagnosed either intra or postoperatively and were all treated with an open (low) approach except one that was robotic-assisted. Our presented case will be the first to be treated laparoscopically.

P062

Optimal Timing for Elective Ventral Hernia Repair to Prevent Bowel Obstruction Utilizing a Population-Level Model

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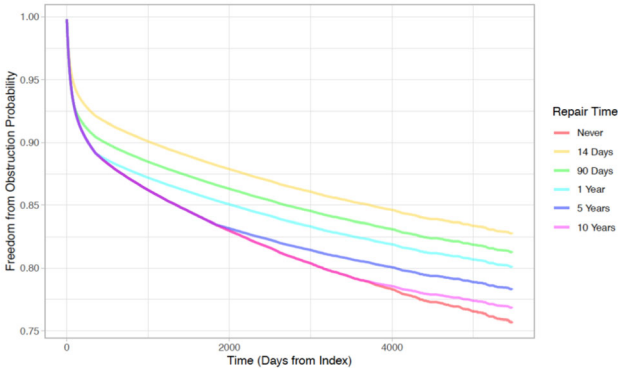
Introduction: Ventral hernia repairs (VHR) are among the most commonly performed surgical procedures worldwide, however optimal timing of repair remains a topic of significant debate. The presence of ventral hernia is a risk factor for intestinal obstruction, along with the possibility of serious complications. Recent evidence has advocated for delaying repair of some ventral hernias to optimize a patient's modifiable risk factors, such as weight, smoking status, diabetes, and cardiopulmonary diseases. Our study aims to utilize population-level data to model ideal timing of ventral hernia repair after diagnosis in order to minimize the occurrence of bowel obstruction in those patients awaiting repair.

Methods: This retrospective study utilized the TriNetX Research Network, a large global health research network that provides access to aggregated electronic medical records from multiple healthcare organizations. Using ICD-9, ICD-10, ICD-PCS, and CPT codes, we identified our patient cohort, relevant demographics and health history covariates. Using ventral hernia diagnosis as the index event, we built a Cox proportional hazards regression model, with surgery status as a time-varying binary covariate, to assess the impact of surgery on the incidence of obstruction. To demonstrate our findings, we examined a representative standard case, a 50-year-old white male, reflective of the average patient in the cohort, and assessed their predicted likelihood of freedom from bowel obstruction over time. Using our Cox model, we simulated this patient undergoing surgery within 14 days, 90 days, 1 year, 5 years, 10 years, and never.

Results: We identified 587,384 patients with ventral hernia diagnosis. These patients had a median age of 50 years; 51% were men; 64.3% were white. We simulated an average patient undergoing surgery at several time points (Figure). Our model estimates that early repair within 14 days of diagnosis is beneficial for freedom from bowel obstruction. Earlier intervention provides even greater advantages by minimizing the risk of obstruction over time.

Conclusion: Our study demonstrates that an average patient diagnosed with ventral hernia will benefit from the earliest possible surgical intervention to maximally reduce the risk of bowel obstruction over time. While delaying repair may allow for the optimization of patient comorbidities, it also increases the risk of complications such as bowel obstruction. Therefore, a balanced approach between optimization and a timely repair should be strongly considered. Next steps involve analyzing additional hernia specific outcomes to refine timing recommendations and ensure optimal decision-making.

Figure. Estimated Freedom from Obstruction, Representative Average Patients, 15 Years Out



P064

Unmasking Spin in Comparative Studies of Groin Hernia Repair: An In-Depth Analysis of Statistical Relevance and Abstract Bias

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Background: Since the publication of the latest guidelines on groin hernia repair in 2018, numerous comparative studies have examined various surgical techniques, materials, and anesthesia approaches. This review aims to assess the prevalence of spin in the abstracts of these studies, particularly focusing on those that did not demonstrate statistical significance.

Methods: We conducted a comprehensive search of comparative studies published in JAMA Surgery, Hernia, Surgery, Surgical Endoscopy, Annals of Surgery, Journal of the American College of Surgeons, and JAWS from 2018 onwards analyzing inguinal hernia repair. We included randomized controlled trials (RCTs), observational studies, and meta-analyses. We included studies comparing surgical techniques, materials or anesthetic methods. Two independent reviewers assessed the abstracts for the presence of spin, which involved assessing whether the abstracts exaggerated or misrepresented the significance of the results. To measure the agreement between the two reviewers, we used Cohen's Kappa statistic, which quantifies inter-rater reliability by comparing the observed agreement to the agreement expected by chance.

Results: From the 146 identified comparative studies, we selected 103 (70.5%) that did not show statistical significance, comprising 33 RCTs, 28 meta-analyses, and 42 observational studies. Overall, the frequency of spin ranged from 45.6 to 53.4% among the evaluators ($p < 0.001$). The Cohen's Kappa statistics showed moderate

agreement among the raters (Kappa = 0.46). Furthermore, the presence of spin varied significantly among study types. For meta-analyses, spin frequency ranged from 35.7 to 46.4%. In RCTs, the incidence of spin ranged from 39.4 to 45.5%, while in observational studies showed the highest prevalence, with spin observed in 57.1 to 64.3% of the abstracts. Inter-rater reliability test showed moderate

Conclusion: This review reveals a significant presence of spin in the abstracts of comparative studies analyzing inguinal hernia repair, despite the lack of statistical significance in the studies themselves. The observed spin may influence the interpretation of research results, highlighting the importance of critically evaluating reported conclusions against the actual data.

P065

Outcomes After Minimally Invasive Ventral Hernia is Converted to Open Approach: A Propensity Score Match Analysis of the ACHQC

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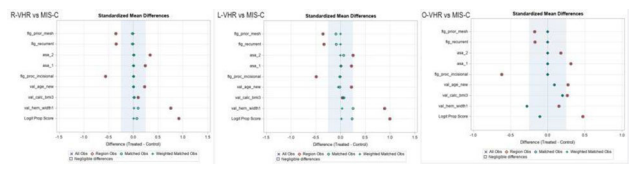
Introduction: Minimally invasive ventral (MIS) hernia repair (VHR) has been quickly adopted with evidenced benefit on wound morbidity. Scarce literature on the impact of a conversion from an MIS approach to open VHR exists. This study compared outcomes of converted MIS (MIS-C) VHR to those performed robotically (R-VHR), laparoscopic (L-VHR), or open (O-VHR).

Methods and materials: Adult patients who underwent VHR from 2016 to 2023 were queried from the Abdominal Core Health Quality Collaborative (ACHQC) database. Three propensity score matched analyses (1:3) compared MIS-C VHR to: 1) R-VHR 2) L-VHR 3) O-VHR; balanced covariates included age, BMI, hernia width, ASA score, prior mesh, recurrent hernia, and incisional hernia (Fig. 1). Clinical outcomes at 30 days of follow up were compared.



Results: A total of 484 patients with MIS-C were included and matched with 1401 R-VHR, 1192 L-VHR, and 1473 O-VHR patients (Table 1). Patients that underwent MIS-C were more likely than O-VHR to have a longer length of stay ($p < 0.001$), more surgical site occurrence requiring procedural intervention (9.0% vs 6.0%; $p = 0.022$), surgical site infection (6.9% vs 4.2%; $p = 0.016$), reoperation (3.7% vs 1.6%; $p = 0.005$), and hematomas (2.2% vs 1.0%; $p = 0.040$). Stronger associations were observed when comparing MIS-C to R-VHR or L-VHR (Table 2).

Baseline / Operative Characteristics	MIS-C n=484	R-VHR n=1401	p	MIS-C n=461	L-VHR n=1192	p	MIS-C n=484	O-VHR n=1473	p
Female Sex, % (n)	61.6 (298)	53.8 (754)	0.003	62.5 (288)	54.2 (646)	0.0023	60.9 (299)	49.5 (729)	<0.001
Age, median (IQR)	61.0 (52.0, 68.0)	61.0 (50.0, 70.0)	0.556	61.0 (52.0, 69.0)	61.0 (51.5, 69.5)	0.687	61.0 (52.0, 68.0)	60.0 (50.0, 68.0)	0.160
ASA III, % (n)	65.7 (318)	65.2 (913)	0.976	65.7 (303)	62.4 (744)	0.627	65.2 (320)	65.1 (959)	1
Incisional Hernia, % (n)	87.0 (421)	85.9 (1203)	0.540	86.3 (398)	85.0 (1013)	0.486	87.0 (427)	87.8 (1293)	0.636
Hernia Width	6 (4, 10)	6 (4, 10)	0.7563	6 (4, 10)	5 (4, 8)	0.001	6 (4, 10)	8 (4, 15)	<.0001
Myofascial release, % (n)	65.7 (318)	65.2 (913)	0.4618	65.7 (303)	62.4 (744)	<0.001	65.2 (320)	65.1 (959)	0.032

LOS: length of stay, SSI: surgical site infection, SSOIPI: surgical site occurrence or infection requiring procedural intervention, MIS-C: minimally invasive surgery conversion, R-VHR: robotic ventral hernia repair, O-VHR: open ventral hernia repair.

Table 1 Baseline and operative characteristics of PSM cohorts

30-day Outcomes	MIS-C n=484	R-VHR n=1401	p	MIS-C n=461	L-VHR n=1192	p	MIS-C n=484	O-VHR n=1473	p
LOS, median (IQR)	3 (1, 5)	1 (0, 2)	<0.001	3 (1, 5)	1 (0, 3)	<0.001	3 (1, 5)	3 (1, 5)	<0.001
SSOIPI, % (n)	8.7 (42)	2.4 (33)	<0.001	8.5 (39)	2.0 (24)	<0.001	9.0 (44)	6.0 (88)	0.022
Readmission, % (n)	8.3 (40)	3.7 (52)	<0.001	8.2 (38)	4.4 (53)	0.002	8.6 (42)	6.0 (89)	0.053
SSI, % (n)	6.8 (33)	1.6 (22)	<0.001	6.5 (30)	1.6 (19)	<0.001	6.9 (34)	4.2 (62)	0.016
Reoperation, % (n)	3.5 (17)	1.5 (21)	0.007	3.5 (16)	1.7 (20)	0.025	3.7 (18)	1.6 (23)	0.005
Hematoma, % (n)	2.3 (11)	1.1 (15)	0.051	2.2 (10)	0.8 (9)	0.016	2.2 (11)	1.0 (15)	0.040

LOS: length of stay, SSI: surgical site infection, SSOIPI: surgical site occurrence or infection requiring procedural intervention, MIS-C: minimally invasive surgery conversion, R-VHR: robotic ventral hernia repair, O-VHR: open ventral hernia repair.

Table 2 30-Day outcomes by PSM operative approach

Conclusion: In this study, deciding to convert a MIS VHR was associated to worse clinical outcomes than performing an open, laparoscopic, or robotic VHR.

P066

Outcomes of Combined Complex Hernia Repair and Panniculectomy in Abdominal Wall Reconstruction: A Single-Center Retrospective Review

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Background: The increasing incidence and complexity of abdominal wall hernias present unique challenges, leading to significant variations in its surgical management. These include differences in the selection of mesh material, plane placement, and the choice between open or minimally invasive techniques. Additionally, many patients require both functional and cosmetic corrections, necessitating a multidisciplinary approach among plastic and general surgeons. While numerous studies have evaluated outcomes related to the repair of ventral hernias, there is a paucity of published literature related to hernia repairs when combined with panniculectomy to achieve abdominal wall reconstruction.

Objective: To evaluate outcomes in patients undergoing abdominal wall reconstruction with single stage open hernia repair with panniculectomy.

Methods: This single-center retrospective cohort study included patients > 18 years old who underwent elective ventral hernia repair with concomitant panniculectomy at an academic tertiary level care referral center from January 2014 to 2024. Parastomal hernia repairs were excluded. Outcomes included hernia recurrence, incidence of surgical site complications, and 30-day adverse events. Descriptive summary statistics were performed using Wilcoxon rank sum and Fischer's exact test for comparative analysis. All statistical tests used p-value < 0.05 for statistical significance.

Results: Of the 57 patients identified, 52 (91.2%) required mesh-based hernia repairs. Among these, 27 (50.9%) had undergone at least

one previous hernia repair. Hernia recurrence was observed in only 2 patients (3.5%), both of whom had repairs with biologic mesh and had associated surgical site infections. Fascial closure was successfully achieved in all but one patient. The most common surgical site complications were infection (21.1%), seroma (21.1%), skin or soft tissue ischemia (7.0%), stitch abscess (5.3%), chronic pain defined as lasting > 6 months (5.3%), and mesh infection (3.5%). 30-day adverse events included acute kidney injury (10.5%), ileus (3.5%), and prolonged ventilation > 48 h (3.5%). Comparative analysis between underlay and onlay mesh repair revealed no statistically significant difference in the incidence of surgical site complications or 30-day adverse events. The median length of hospital stay was 4.5 days (IQR 3–7) for underlay mesh repair and 5.5 days (IQR 3–7) for onlay mesh repair.

Conclusion: In conclusion, the combination of open hernia repair with panniculectomy in abdominal wall reconstruction demonstrated low rates of hernia recurrence but high rates surgical site complications. The study found no significant difference in surgical site complications or 30-day adverse events between underlay and onlay mesh placements, supporting the feasibility of either approach in this complex patient population.

P068

Exploring the Effect of Community Distress on Complications and Quality of Life After Elective Ventral Hernia Repair

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Introduction: Patients from lower socioeconomic backgrounds are at higher risk of morbidity and mortality across multiple disease processes. Specifically in surgery, lower socioeconomic background is associated with presenting with more severe disease process and higher risk of post-operative complications. Arguably one of the more important outcome measures in ventral hernia repair is quality of life. To date, the relationship between socioeconomic status and improvement in quality of life has not been explored in ventral hernia patients. Using the Distressed Communities Index (DCI), we aim to explore if socioeconomic distress is associated with post-operative quality of life in the ventral hernia population.

Methods: Retrospective analysis was performed using data from the Abdominal Core Health Collaborative (ACHQC). Patients included were adult patients (> 18 years old) who underwent elective ventral hernia repair from 2013 to 2023 with race, sex, operative approach, DCI score and follow-up data available. Participants were divided into quintiles based on DCI score, including distressed (0–20), at-risk (21–40), mid-tier (41–60), comfortable (61–80), and prosperous (81–100). Primary outcomes were any postoperative complication and Hernia-Related Quality-of-Life Survey (HerQLes). Kruskal–Wallis test was used for continuous variables, Pearson test was used for categorical variables.

Results: Of 38,211 patients, 5319 (14%) lived in distressed, 5707 (15%) in at risk, 6820 (18%) in mid-tier, 8526 (22%) in comfortable, and 11,839 (31%) in prosperous communities. Patients from more distressed communities were more likely to be younger, identify as a female or racial minority, and have a higher ASA class and BMI ($p < 0.001$). They were also more likely to present with larger hernia length and width and undergo open repair ($p < 0.001$). Living in a distressed community was associated with higher rates of 30-day surgical site infection (SSI), surgical site occurrence (SSO), readmission, and reoperation. There was no difference in one year hernia recurrence or mortality rate across quintiles. Patients from more distressed communities had a larger increase in HerQLes score from baseline at 30 days and one year.

Conclusion: Patients from more distressed communities were more likely to present in worse clinical status and more complicated disease process, which was associated with higher 30-day complication rates and recurrence in these communities. Despite higher complication rates, patients from more distressed communities had significantly greater improvements in HerQLes scores from baseline at 30-days and one year compared to their more prosperous counterparts. These results emphasize how impactful access to quality surgical care can be in these communities.

P069

Why Do I See Everyone Else's Recurrent Hernias? Patterns of Care for Persons With Recurrent Ventral Hernia

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Introduction: Anecdotally, surgeons see more recurrences from other surgeons than they do of their own. However, these same surgeons may be unaware of their own recurrences if those patients seek care with another surgeon. Within this context, we sought to evaluate the extent to which patients with recurrent hernia seek care with the surgeon who repaired their original hernia, or whether they choose to seek care with a new surgeon.

Methods: We conducted a retrospective study using 100% fee-for-service Medicare claims data. Patients included all adults (18+) who had both an inpatient primary abdominal wall hernia repair and a recurrent abdominal wall hernia repair between 2011 and 2021. We used a multivariable logistic regression controlling for demographics, comorbidities, and surgical factors to determine the association between patient factors and likelihood of seeing the same surgeon for their recurrent hernia.

Results: Of the 262,400 patients who underwent hernia repair, 26,639 (10.2%) experienced an operative recurrence within 10 years. About half (n = 13,905; 52.2%) of those who experienced an operative recurrence were treated by a different surgeon than at primary repair. On average, time to recurrent repair was longer for those who were treated by a different surgeon compared with those treated by the same surgeon (mean (SD): 28.3 (23.6) vs. 18.1 (17.0); $p < 0.001$). Controlling for demographics, comorbidities and surgical factors, patients who were older [aOR (per year increase) (95%CI): 1.01 (1.00–1.01), $p < 0.001$], White [1.11 (1.03–1.20); $p < 0.01$] and had component separation [1.44 (1.31–1.59); $p < 0.001$] at primary repair were more likely to be treated by the same surgeon for their recurrent repair. Conversely, patients who had 30-day complications [0.90 (0.85–0.95); $p < 0.001$] after primary repair were less likely to be treated by the same surgeon for their recurrent repair ($p < 0.001$).

Conclusion: About half of patients seek care with another surgeon when they experience recurrent hernia requiring reoperation. These findings reveal a potential blind spot in surgeons' ability to assess long term care and outcomes of their patients. Reasons for this are multifactorial but are likely related to issues around access as well as whether a person experienced a postoperative complication.

P071

Laparoscopic Inguinal Hernia Repair on Screen: A Qualitative Analysis Assessing YouTube's Educational Value

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Background: With the advent of distance education, there has been exponential growth in the dissemination of surgical videos for various purposes. In the field of hernia and abdominal wall surgery, numerous videos are available on YouTube. However, no studies have yet analyzed the accuracy of these videos. We aimed to perform an analysis of YouTube video quality on laparoscopic inguinal hernia repair.
Methods: A systematic search was performed on YouTube using the keywords "laparoscopic inguinal hernia". The top 100 results were compiled into a dataset. We gathered descriptive characteristics such as the number of views, likes, dislikes, and video duration. The videos were categorized into four groups: Physician (created by individual physicians), Academic (produced by universities or medical schools), Commercial (produced by surgical companies), and Society (produced by professional surgical societies). All videos were independently evaluated by two general surgery residents using a validated assessment tool, the LAParoscopic surgery Video Educational GuidelineS (LAP-VEGaS) assessment tool (0 to 18 points). Inter-rater reliability test was performed using the SPSS software version 29.
Results: A total of 50 videos were found that fit the objective of the analysis. Among those, 24 were in the physician group, 13 were classified as society video, 12 were in the academic group, and only 1 fit the commercial group. The mean LAP-VEGaS score for all the videos was 10.74 ± 3.64 (inter-rater reliability = 0.87; 95% CI 0.76–0.92; $p < 0.001$). Academic videos presented a mean LAP-VEGaS score of 10.54 ± 4.01 (inter-rater reliability = 1; $p < 0.001$). For the physician (inter-rater reliability = 0.68; 95% CI 0.26–0.86; $p = 0.004$) and society (inter-rater reliability = 0.91; 95% CI 0.72–0.97; $p < 0.001$) domains, the mean LAP-VEGaS score were 10.77 ± 2.33 and 10.69 ± 5.16 respectively. Most of the academic videos did not provide adequate formal case presentation (75%), or additional graphic aids (66%), and did not show operative time and other relevant outcomes (66%). Among the physician videos, the most common mistakes were the absence of an adequate formal case presentation (83%), or additional graphic aids (87%), and did not showing operative time and other relevant outcomes (83%).
Conclusions: Our findings indicate that the videos across all four categories exhibited similar overall LAP-VEGaS scores. This suggests that current YouTube videos on inguinal hernia repair require significant improvement and standardization to serve as more effective and high-quality teaching tools.

P072

Gender Disparities in Laparoscopic ETEP RS with TAR- is TAR Procedure is Less Common in Females?

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Background: Though ventral hernias are more common in females as compared to males. Nearly more than 60% of ventral hernia surgeries are performed in males in our institute. Females have more chances of developing incisional hernia as compared to males. Also females develop more complications in ventral hernia surgery as compared to males. This is due to higher BMI and different fat distribution in females as compared to males.
Methods: Comparative study between males and females undergoing eTEP RS with TAR done in tertiary healthcare centre from March 2023 to March 2024.
Results: From March 2023 to March 2024, we performed 56 ventral hernia surgeries.
Males undergoing ventral hernia surgeries is 35.
Females undergoing ventral hernia surgery is 21.
We did laparoscopic eTEP RS in 49 cases and open surgery in 7 cases.
In 56 patients, we did 34 TAR procedures.
Laparoscopic eTEP RS with TAR-16 (12 patients), 4 underwent bilateral TAR.
Open TAR- 7, all underwent bilateral TAR.
Out of which unilateral TAR were 12 and bilateral TAR were 11.
Out of all unilateral TAR- Males were 9 and females were 3.
Out of all bilateral TAR- males were 8 and females were 3
Out of 35 male patients, 17 required TAR.
Out of 21 female patients, 6 required TAR.
Conclusion: In our studies, male ventral hernia surgery is associated with more TAR procedures than female ventral hernia surgeries. This may be due to lax peritoneum, more fat and low muscle tone in females which is helpful to approximate peritoneum in midline requiring less TAR. In contrast with females, males have more fibrotic, less fatty layer near peritoneum in vicinity of defect.

P073

Mesh Type Does Not Improve Short-Term Outcomes After Ventral Hernia Repair in Risk-Stratified Patients

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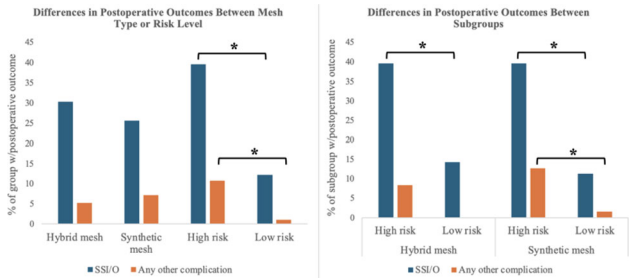
Background: Options for mesh reinforcement in ventral hernia repair (VHR) include synthetic, absorbable, and hybrid mesh. Synthetic mesh provides permanent strength and is the most cost-effective, but it has a higher potential to induce a foreign body response and mesh fractures have been reported. Absorbable mesh promotes tissue ingrowth, decreases foreign body response, and is more resistant to infection, but it is more expensive. Hybrid mesh combines the attributes of long-term durability and tissue ingrowth. We investigated the

association between early postoperative outcomes and mesh type as well as with complication risk status. We tested the hypothesis that hybrid mesh would give the greatest benefit to the highest risk patients.

Methods: A retrospective review was conducted of patients who underwent laparoscopic and robotic ventral hernia repair with intraperitoneal onlay placement of hybrid (GORE Synecor) (n = 76) and synthetic (Symbotex Composite) (n = 125) meshes. The ACS NSQIP Surgical Risk Calculator was used to stratify patients into low and high-risk groups. Short-term complications included 30-day surgical site infection (SSI), surgical site infection or occurrence (SSI/O), any other complication, readmission, and 1-year hernia recurrence.

Results:



* denotes statistical significance ($p < .05$)

Using logistic regression, the ACS NSQIP calculated risk was the only predictor of SSI/O and any other complication. All of the SSOs were seromas, consistent with bridging mesh. When the fascia was closed robotically, the SSOs were significantly less.

Conclusions: Mesh type was not associated with improvement in any short-term postoperative outcome, regardless of whether or not a patient's risk profile was considered. Additionally, the NSQIP Surgical Risk Calculator accurately predicted SSI/O and any other complications in this population. The complication of seroma (SSO) was significant, but did not affect long-term outcome in any of the patients and therefore had little morbidity. SSOs resolved with robotic fascial closure.

P074

Long-Term Clinical and Radiological Evaluation of Patients Undergoing Ventral Hernia Repair with Plication of Diastasis of the Rectus Abdominus Muscles

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Background: The management of ventral hernias (VH) with associated diastasis of the rectus abdominus muscles (DR) remains a topic of debate. There is an association with higher recurrence rates after ventral hernia repairs in the presence of a rectus diastasis; therefore, mesh-based repair of both the diastasis and ventral hernia is recommended by most experts and international societies. Despite this, the value of concomitant VHR+DR is not well understood. Here, we present a long-term radiological and clinical follow-up for patients undergoing repair of VH+DR.

Methods: A single-institutional retrospective review of patients who underwent repair of a VH+DR with postoperative clinical and/or postoperative Computer tomography (CT) imaging on follow-up was performed. Preoperative hernia characteristics, intraoperative data, including technique and mesh selection, postoperative outcomes, and postoperative clinical and radiologic outcomes were analyzed. Descriptive statistics were utilized to report our results.

Results: 35 patients were analyzed after meeting inclusion and exclusion criteria. The mean age was 47.71, and the patients were predominantly female. Mean BMI was 30.13. The mean HbA1C in Diabetic patients was 5.64. Patients were predominantly ASA class 2 and 3. 85.7% of patients had preoperative CT imaging, and 60% of patients had postoperative imaging, with a median number of days between surgery and postoperative CT of 614 days, with a mean clinical follow-up of 783 for the cohort. The mean hernia width was 2.4 cm, with a mean width and length of the diastasis of 4 and 9.8 cm, respectively. The techniques implemented included ETEP (51.4%), SCOLA (17.1%), LIRA (5.7%), TARUP (5.7%), TAPP (2.9%), IPUM+ (11.4%), Stapled Aponeuroplasty (2.9%) and Open repair (2.9%). A polypropylene macroporous midweight mesh was used in 48.6% of cases, followed by self-gripping mesh in 20.0%. The complication rate was 5.7%, including seromas (2.9%) and posterior rectus sheath dehiscence with intestinal obstruction (2.9%) with a (2.9%) clinical and radiological recurrence. Radiological Diastasis recurrence was observed in (17.1%) of cases.

Conclusions: VHR+DR along a different array of surgical techniques is safe. Rectus diastasis recurrence was significantly higher than hernia recurrences despite mesh reinforcement. Further studies, also considering patient-reported outcomes, to evaluate the impact of diastasis repair in hernia recurrences are necessary to support causality vs. association regarding hernia recurrence in the setting of a concomitant diastasis.

P075

Symptomatic Pneumomediastinum: A Rare Complication During Progressive Pneumoperitoneum in the Management of Recurrent Complex Incisional Hernia

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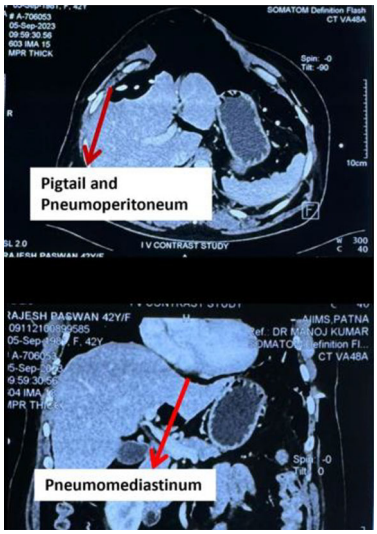

Introduction: This report presents a rare case of symptomatic pneumomediastinum, an unusual complication arising during progressive pneumoperitoneum (PPP) for the treatment of recurrent complex incisional hernia. The patient, who underwent Transversus Abdominis Release with Posterior Component Separation in 2022 for recurrent incisional hernia following a 2002 road traffic accident, experienced a subsequent recurrence. To prepare for a redo surgical intervention, the patient underwent PPP, encountering unexpected respiratory difficulties during the preoperative phase.
Case Report: Comprehensive evaluation, including contrast-enhanced computed tomography (CECT) of the thorax and abdomen, revealed symptomatic pneumomediastinum as an uncommon complication of PPP. To address the symptoms, the pigtail catheter used for progressive pneumoperitoneum was intentionally left open. The patient then underwent a successful surgical intervention for the recurrent complex incisional hernia.
Discussion: This case underscores the infrequent yet critical occurrence of symptomatic pneumomediastinum during progressive pneumoperitoneum, necessitating vigilant monitoring and prompt management. Insights from this report contribute to the understanding of potential complications associated with PPP, emphasizing the need for optimized patient care in the intricate surgical treatment of recurrent incisional hernias.
Conclusion: Awareness of rare complications, such as symptomatic pneumomediastinum, during progressive pneumoperitoneum is crucial for clinicians. This report aims to enhance understanding and improve patient care strategies by emphasizing the significance of close monitoring and timely intervention in complex hernia surgeries.

P077

Port Site Incisional Hernia Incidence in a Private Practice Bariatric Population: A Comparative Analysis of Blade vs. Bladeless Trocars

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Introduction: Obesity rates have dramatically increased over the past three decades, leading to the development of various laparoscopic techniques for its management. Port site incisional hernias (PIHs) are a common complication associated with laparoscopic surgery. While the current standard of care includes fascia closure and mesh repair for PIHs, there is limited evidence supporting the necessity of these interventions. This retrospective cohort investigates the incidence of PIHs in a bariatric population, comparing the use of blade and bladeless trocars, as well as the impact of BMI on incidence of PIHs.
Methods: Between 2019 and 2024, 293 patients underwent bariatric surgery at a single private practice center. Data were collected and analyzed retrospectively, considering surgical technique, trocar sizes, and the absence of routine fascia closure.
Results: No port site hernias were observed in this cohort of 293 patients. Three to five trocars, ranging from 10 mm or larger, were used. Only the umbilical port was closed with polypropylene suture. Patient BMI ranged from 32 to 60. The most common procedures were laparoscopic sleeve gastrectomy (LSG) (59% of patients) and Roux-en-Y gastric bypass (RYGBP) (37% of patients). Four patients underwent reoperations at the same port sites: one for early gastric bypass stenosis, two for bypass leaks, and one for late sleeve stenosis. The mean follow-up period was 18 $\pm$ 35 months.
Conclusions: This retrospective cohort suggests that BMI is not a risk factor for PIHs in a bariatric population. Additionally, avoiding fascia closure for flank port sites, regardless of trocar diameter, appears to be safe when bladeless trocars are used. However, further studies are needed to establish definitive guidelines for port site management in laparoscopic bariatric surgery.

P078

Robotic Inguinal Hernia Repair Reduces the Need for Subsequent Contralateral Inguinal Hernia Surgery

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Introduction: Inguinal hernias are a common surgical problem. Typically, patients present for a unilateral inguinal hernia; however, contralateral hernias are discovered 12% intraoperatively and 10% of the time at 10-year follow-up. There are three main approaches to hernia repair: open, laparoscopic and robotic. Open and laparoscopic preperitoneal approaches do not routinely assess contralateral side for concomitant hernia while the most common robotic approach routinely does. The primary aim was to evaluate the incidence of contralateral inguinal hernia after a prior repair comparing surgical approaches. Secondary endpoints included defining the incidence of finding a contralateral inguinal hernia during robotic repair of a unilateral inguinal hernia and to determine difference in complications with surgical approach. We hypothesize that asymptomatic contralateral inguinal hernia found and repaired at the time of primary robotic repair reduce the number of subsequent surgeries while not increasing overall risk.
Methods: IRB approved, retrospective cohort study at a single institution of patients who underwent primary inguinal hernia repair from January 1, 2017 to December 31, 2023. All surgical approaches were included. Patients with history of previous inguinal hernia repair, less than 18 years old at time of surgery or urgent/emergent surgery upon admission were excluded.
Results: A total of 1456 patients were included. 91% (n = 1321) were male and 88% (n = 1266) were overweight or obese. 51% underwent open, 13% laparoscopic and 36% robotic repair, respectively. The rate of undergoing subsequent contralateral surgery when the primary surgery was a unilateral inguinal hernia repair was 2.8% across all

surgical approaches (3.5% open, 3.16% laparoscopic, 0.74% robotic). Of those undergoing planned robotic inguinal hernia repair, 36% (151/414) had a contralateral inguinal hernia identified at the time of surgery which was also repaired. There was no difference in length of stay ($p = 0.12$), post operative allodynia ($p > 0.9$) or number of follow up appointments ($p = 0.3$) when a contralateral hernia was found at index surgery and repaired.

Conclusion: The incidence of contralateral inguinal hernia after primary unilateral repair was 2.8% with those undergoing open repair having the highest rate. Although the incidence of contralateral hernia was not significant amongst approach, those undergoing robotic repair had the lowest rate of subsequent contralateral hernia over the study period. In patients undergoing robotic inguinal hernia repair, 36% had a contralateral hernia repair that was not known or only suspected preoperatively. Performing robotic bilateral repair at the index operation did not increase risk to the patient.

P079

Weight Specific Prehabilitation in Elective Complex Abdominal Wall Hernia Repair

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Introduction: Complex abdominal wall hernias have become increasingly more prevalent. Obesity is one of the most significant risk factors for recurrence of abdominal wall hernias following surgical repair. In collaboration with the Complex Hernia and Abdominal Reconstruction Group of Edmonton (CHARGE), this study examined the effectiveness of the Alberta Obesity Center (AOC) weight specific prehabilitation program on patients undergoing abdominal wall hernia repair. This was a multidisciplinary program involving nutritional support and very low-calorie diets (Optifast), behavioral therapy, exercise therapy and pharmacotherapy.

Methods and Procedures: Abdominal wall hernia patients enrolled in the prehabilitation program between 2021 and 2023 with at least 6 months follow up at the AOC were included. Prior bariatric surgery patients were excluded. The primary outcome was clinically significant weight loss, defined as > 5% reduction in total body weight at six months and one year.

Results: A total of 57 patients were screened, with forty patients meeting inclusion criteria, of which 26 patients were followed for over 1 year. Overall mean age and BMI were 56 years old and 41.0 kg/m^2 respectively. At 6 months ($n = 40$) weight loss of > 5%, 10%, 15% was seen in 43%, 25% and 15% respectively. At 1 year ($n = 26$), weight loss of > 5%, 10%, 15% was seen in 69%, 42% and 13% respectively. In patients who have completed surgery ($n = 14$) weight loss at 6 months of > 5%, 10%, 15% was seen in 71%, 42% and 28% respectively. At 1 year ($n = 7$) weight loss of > 5%, 10%, 15% was seen in 100%, 100% and 57% respectively.

Conclusions: Obesity represents one of the most significant risk factors for the recurrence of abdominal wall hernia following surgical repair. - This AOC program facilitates weight specific prehabilitation in patients undergoing elective hernia repair. Clinically significant weight loss (> 5% reduction in body weight over 6 to 12 months) was demonstrated in 43% and 69% of patients respectively. Reduction in body weight from six months to one year highlights a sustained safe and gradual weight reduction program. Furthermore, patients who completed their surgery had greater reduction in body weight. Further studies should be conducted exploring the benefits of weight specific prehabilitation on postoperative outcomes including hernia recurrence and quality of life.

P080

Comparison of Laparoscopic Totally Extraperitoneal (TEP) Inguinal Hernia Repair vs. Robotic Inguinal Hernia Repair: A Retrospective Study

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Introduction: Although the laparoscopic TEP remains a part of the hernia surgeon's repertoire, it has declined in popularity in recent years due to the rise of other preperitoneal and intra-abdominal approaches. This study presents a comparison of laparoscopic TEP with robotic inguinal hernia repair.

Methods: This retrospective study evaluated all adult patients at a single institution from January 2019 to September 2024 who underwent primary inguinal hernia repair, either via laparoscopic TEP or robotically (including eTEP, TAPP, and other robotic approaches). Primary outcomes included total operative time, readmission rates, complication rates, risk scores for admission or emergency department visits, and length of postoperative hospital stay. Continuous variables were compared using the two-sample *t*-test, and categorical data were analyzed using the Chi-Square test. In addition, we describe the specific approach for laparoscopic TEP used in this study.

Results: A total of 184 patients underwent laparoscopic TEP hernia repair, while 724 patients received robotic inguinal hernia repair. The laparoscopic TEP group was statistically older ($P < 0.01$) and had a higher proportion of male patients ($P = 0.021$) than the robotic group. The laparoscopic TEP group also had a significantly lower risk score for admission or emergency department visits. Operative time ($P < 0.01$) and postoperative hospital stay ($P = 0.028$) were significantly shorter in the laparoscopic TEP group compared to the robotic group. However, no significant differences were found between the groups in terms of complication rates or readmission rates.

Conclusions: Our findings suggest that laparoscopic TEP, compared to robotic inguinal hernia repair, remains an effective and time-efficient approach for inguinal hernia surgery. Future studies may benefit from employing propensity score matching and accounting for surgeon experience to refine these comparisons further.

	Laparoscopic TEP ($n = 184$)	Robotic Inguinal ($n = 724$)	Statistic	*P*-value
Age (years)	63.41 ± 14.19	58.18 ± 15.58	t=-4.371	<0.001*
Gender: Male/Female	173/11	635/89	X^2=5.342	0.021*
Operative time (min)	36.06 ± 13.34	110.76 ± 48.89	t = 32.902	<0.001*
Risk of Admission or ED visit (%)	11.389 ± 14.81	16.563 ± 20.60	t=3.388	<0.001*
Complications overall	3	23	X^2<0.767	0.381
Readmission	1	21	X^2=2.523	0.112
Postoperative hospital stay (days)	2.000 ± 2.10	3.450 ± 3.60	t=2.316	0.028*

Figure 1. Ideal port placement for laparoscopic TEP hernia repair.

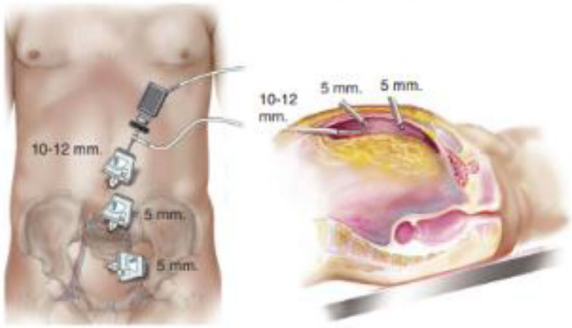


Figure 2. Balloon-less finger dissection technique for the preperitoneal space.

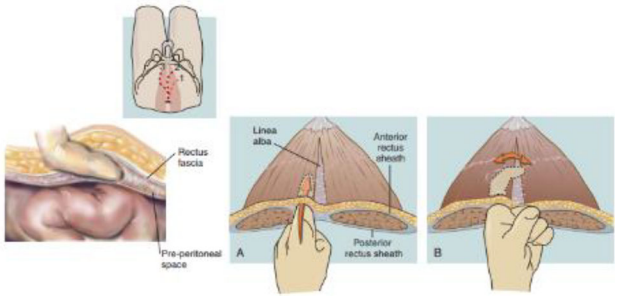
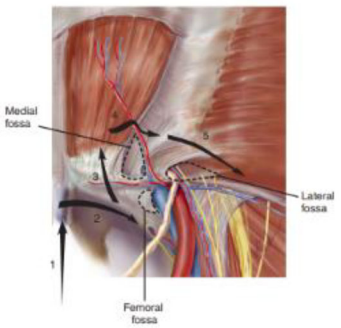


Figure 3. Steps of TEP: 1) Identify pubic symphysis, 2) bluntly sweep Cooper ligament bilaterally to open the space of Retzius, 3) identify the Hesselbach triangle, 4) elevate the epigastric vessels, 5) bluntly develop the space of Bogros to the level fo the ASIS, 6) dissect cord structures, 7) placement of mesh without tacking



P081

The Impact of Surgeon's Experience in Abdominal Wall Hernia Repair: A Systematic Review

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Background: Surgeon's experience is a fundamental factor for improving postoperative outcomes, however, evidence regarding its impact for hernia repair is limited. We aimed to perform a systematic review assessing surgeon's experience and hernia repair.

Methods: PubMed, Cochrane, EMBASE, Lilacs, and SciELO databases were searched from inception to January 2024. We included patients ^{3} 18 years old, undergoing ventral hernia repairs (VHR) and inguinal hernia repairs (IHR), with reports on surgeon's experience with annual volume or total volume, and outcomes such as reoperation, recurrence, and complications.

Results: 15,879 studies were screened, 1243 reviewed, and 8 selected, comprising 205,127 patients. 96.1% assessed IHR and 3.9% VHR patients. 81.7% of cases were open and 18.5% were laparoscopic. Recurrence for laparoscopic approaches ranged between 1 to 4.3% for annual volume < 25 and reduced to 0.7 to 1.2% for > 25. Among surgeons with total volume > 500 procedures, recurrence ranged between 0.6 to 3%, compared to 2 to 2.2% for < 500. Reoperation for IHR ranged between 2 to 2.6% for annual volume < 25 and between 1.2 to 2.6% for > 25. Reoperation rates were 2.9% for VHR with annual volume < 9 and reduced to 2% for > 30. Surgeons with annual volume < 25 presented more intraoperative complications (1.3 to 5.6%), compared to > 25 (0.9 to 1.2%). Postoperative complications were higher among annual surgeon volume < 25 (2.2 to 35.9%) compared to > 25 (4.9 to 13.3%).

Conclusions: Higher surgeon's experience, with annual volume > 25 and total volume > 500 procedures, might be related to lower recurrence, reoperation, and intraoperative and postoperative complications.

P082

Laparoscopic Abdominal Wall Reconstruction: A Single Institution Case Series

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Introduction: Large abdominal wall hernias pose a significant challenge for repair. Abdominal wall reconstruction is a well-established practice. While a robotic approach, has technical and ergonomic benefits these are costlier than the laparoscopic approach. Many hospitals do not have access to robotics. Our centre has performed laparoscopic abdominal wall reconstruction over the last five years.

This project aims to evaluate the outcomes of laparoscopic abdominal wall reconstruction performed by a single surgeon at a busy single institution.

Methods and Procedures: Local ethics were obtained for a case series evaluation. Data on patient demographics, co-morbidities, defect size, operative details, complications and postoperative length-of-stay were extracted. Patients were followed up to collect quality-of-life data using the "36-Item Short Form Survey" (SF36). Data was collected and analysed in Microsoft Excel.

Results: Ten cases were performed between 04/07/2019 and 08/08/2023. Male: Female (4:6), median age 54 (range 38–67), median body mass index 37 (range 23–50), median Charlson Co-Morbidity score was 0 (range 0–2). 9 patients were non-smokers and 1 was an ex-smoker. The average area of the defect was 42.6 cm^3 (Range: 16.8–70 cm^3). Mean operation time 265 min (38–420 min). Mesh used included 4 – Ultrapro^{TM} Mesh, 2 – Phasix^{TM} Mesh, 2 – Swing mesh^{TM}, 1 - polypropylene mesh and 1-THT BioScience Mesh. Estimated blood loss was < 30 ml in all cases. 30% (3/10) patients had a grade 2 CTCAE (1, chest infection, 1 infected haematoma, 1 wound infection) 7 patients had no complication. Median length of stay was 4 days (Range 1–6 days). No patients were re-admitted to hospital. No patients had a recurrence.

Median follow-up questionnaires were performed with a median of 39 months post-procedure (range: 12–60 months).

Quality of life (SF36)	Mean score
Physical functioning	59
Role limitations due to physical health	50
Role limitations due to emotional problems	67
Energy/fatigue	54
Emotional well-being	69
Social functioning	73
Pain	69
General health	54

Conclusions: This case series shows a laparoscopic approach to abdominal wall reconstruction is safe with low risk of recurrence and also positive quality of life experience months following the procedure. In the absence of robotic accessibility a laparoscopic approach in experienced hands could be beneficial to patients.

P083

Case Report: Find an Occult Hernia? Repair It

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Occult hernias, or hidden hernias, can be a source of persistent pain for patients without physical exam findings consistent with a hernia. The highest incidence of occult hernias is incidentally discovered inguinal hernias. In this case report, we present a 78 year old female who underwent an elective robot assisted right Spigelian hernia repair and was incidentally found to have a right inguinal hernia. No additional trocars were required to repair both the Spigelian hernia and the right inguinal hernia.

Case Presentation: The patient was taken to the operating room for an elective Spigelian hernia repair. Three 8 mm trocars were inserted to address the Spigelian hernia. Upon inspection, the patient was incidentally found to have a right inguinal hernia. The operative plan was adjusted for the creation of the peritoneal dissection flap for the right inguinal hernia above the Spigelian fascial defect. The flap was extended caudally to Cooper's ligament and the right indirect hernia was repaired in usual fashion. Attention was then directed to the Spigelian hernia which was closed in two layers. Progrip mesh was then placed under the hernia defect. The dissection flap was closed with v-lock suture.

Discussion: The incidence of occult hernias in patients undergoing hernia repair is approximately 8%. It is important to fully inspect the entire abdomen in every hernia repair for these occult defects as they can lead to harmful and poor outcomes for the patient if not addressed, particularly in the elderly population. Repairing "hidden" hernias at this time provides significant benefit to the patient, as it can avoid additional operative procedures as well as future pain and potential incarceration.

Conclusion: Addressing occult hernias during index operations can spare patients from presenting with incarceration and strangulation, without adding significant operative time and not prolonging hospital length stay.

P084

Management of Large Eroding Umbilical Hernia: A Case Report

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Background: Patients with large, eroding umbilical hernias are at increased risk for complications such as surgical site infections, dehiscence, and recurrence. This case highlights a large eroding umbilical hernia and outlines key surgical principles for successful repair.

Case Description: A 78-year-old female presented with a chronic umbilical hernia that had progressively enlarged over seven years. In the months preceding her clinic visit, she experienced worsening erythema and skin necrosis within the umbilical folds, unresponsive to antibiotics. On physical examination, a large, non-reducible umbilical ventral hernia with skin necrosis, ulceration, cellulitis, and erythema in the umbilical folds was observed. Her lab results were normal. CT imaging revealed a large umbilical hernia containing fat and non-obstructed transverse colon, with a trace of fluid at the margins. The hernia sac measured 6.5 × 10.2 × 11.4 cm. Due to persistent pain, the patient underwent surgical repair, including excision of the umbilicus, partial omentectomy, panniculectomy, flap creation, and primary abdominal wall reconstruction. No mesh was used due to the cellulitic and eroded nature of the site. A large elliptical incision was made to achieve tension-free closure.The resected specimen included a 21.5 × 9.0 × 3.5 cm portion of fatty tissue (panniculus) partially covered by 21.5 × 7.0 cm of pale skin. A protruding herniating mass measuring 6.0 × 5.0 × 3.5 cm, with a central ulcerating lesion, was identified. Pathology confirmed the findings, and the patient's postoperative course was uneventful. She remains asymptomatic at her six-month follow-up.

Conclusion: This case presents a rare instance of a large, eroding umbilical hernia. A large elliptical incision was key to achieving tension-free repair. We recommend against the use of mesh in cases involving cellulitic or eroded tissue, as seen in this patient.

Figure 1. CT scan demonstrating large umbilical hernia containing fat and colon.

Figure 2. Large umbilical hernia with skin erosion.

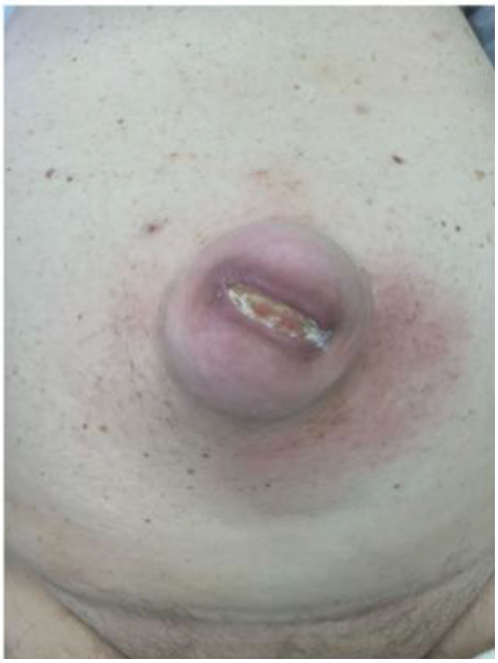

Figure 3. Surgical planning with wide elliptical incision.

Figure 4. Dissected hernia sac involving large omental fat

Figure 5. Resected umbilical hernia with overlying skin

Figure 6. Postoperative visit 3 months later.

P085

Comparison Between Surgical Outcomes of Laparoscopic eTEP, Open Rives Stoppa Repair and Lichenstein's Hernioplasty for Bilateral Inguinal Hernia

Nitin Baste; SMBT IMSRC

Background: Inguinal hernias are common surgical entity globally. Multiple methods are available to treat bilateral inguinal hernias like eTEP, TEP, TAPP, Rives Stoppa repair, Lichenstein repair, Desarda repair. For selecting optimal approach for bilateral inguinal hernia surgery, patient specific factors, surgeons expertise and hospital resources should be considered. The primary objective of this study is to compare surgical outcomes in three methods of bilateral inguinal hernia surgery, eTEP, Rives Stoppa repair and Bilateral Lichenstein's repair. Following factors are considered.

Type of anesthesia, operative time, intraoperative complications, postoperative pain, length of hospital stay, wound infection, mesh infection, post operative inguinodynia and recurrence.

Materials and Methods: We analysed the operative surgery data from single institute from April 2019 to March 2024.

Results: Total bilateral hernia surgeries-

Bilateral Lichenstein's hernioplasty- 243

Open Rives Stoppas -119

Laparoscopic eTep- 63

1-We used General anesthesia for Laparoscopy and spinal anesthesia for open surgeries.

2-Mean operative time for

Lichenstein- 67 min

Rives Stoppa- 53 min

eTEP- 77 min

3-Intraoperative complications

Rives Stoppa-Bleeding from vesical venous plexus in 1 patient

Peritoneal tears in 9 patients

Lichenstein- no intraoperative complications.

eTEP- Bleeding from inferior epigastric artery-1

Peritoneal tears- 11 patients

4-Post operative pain is more in bilateral lichenstein repair.

5-Average length of stay

Lichenstein-3

eTEP-2

Rives Stoppas- 3

6-Wound infections are more in Lichensteins repair.

7-No mesh infection in any group.

8-Post operative inguinodynia is more in Lichenstein repair.

9-eTEP- 1 Recurrence

Rives Stoppa- 1 recurrence

Lichenstein-2

Discussion: Among all three methods Open lichenstein repair procedure is having more complications, postoperative pain. Rives Stoppa and eTEP are comparatively good procedures for bilateral inguinal hernia. More randomised controlled trials required to prove which method is superior.

P086

Surgical Outcomes of Laparoscopic Totally Extraperitoneal Inguinal Hernia Repair Compared to Open Hernia Repair Performed by a Junior Surgeon: A Single-Center Cohort Study

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Background: Laparoscopic totally extraperitoneal (TEP) inguinal hernia repair is an effective minimally invasive method for treating hernias which has become popular worldwide. However, laparoscopic TEP repair has been shown to be relatively difficult, takes longer time to perform, and requires more advanced surgical techniques. Hence, many junior surgeons may choose to perform traditional open hernia repair. We aim to demonstrate the surgical outcome performed by a junior surgeon.

Methods: A retrospective cohort study was performed on 65 patients who underwent hernia repair by a junior surgeon in a single institution between January 2023 and June 2024. We included only unilateral inguinal hernia operation. Recurrent surgery and emergency surgery were excluded. The operative outcomes of patients undergoing laparoscopic TEP repair (group A, $n = 31$) were compared to those undergoing open hernia repair (group B, $n = 34$). Baseline patient demographic characteristics were compared between groups. Self-gripping polypropylene mesh was placed in laparoscopic TEP repair compared to light weight polypropylene in open hernia repair. Post-operative data included pain score at 24 h by numeric rating scale, length of hospital stay, surgical site complication, and recurrence were obtained in all patients

Results: Patients baseline characteristics were not different between groups except for age (51 ± 22 vs 64 ± 29, $p = 0.04$). The mean operative time for group A was significantly longer than group B (72 ± 33 min vs 55 ± 11 min; $P = 0.03$). A statistical difference between groups was observed in mean postoperative stay (1.1 ± 0.6 d vs 1.4 ± 1.1 d; $P = 0.05$) and pain score at 24 h (3.1 ± 2.4 vs 5.2 ± 2.1, $P = 0.03$). No recurrence was found in all patients after 3 months of follow up. One patient from group A suffered from pneumoscrotum which resolved spontaneously upon discharge. One patient from each group suffered from a mild case of hematoma.

Conclusions: Surgical outcomes of laparoscopic TEP repair performed by a junior surgeon was non-inferior to the open technique. We encourage junior surgeons to perform laparoscopic hernia repair as the minimally invasive approach also provided benefits in terms of faster recovery and shorter hospital stay.

P087

When Numbers Lie: The Disconnect Between Statistical Significance and Clinical Relevance in Inguinal Hernia Pain intensity Studies

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Background: Clinical studies often define their findings as statistically significant based solely on a *p*-value of less than 0.05. In hernia surgery, pain intensity is a key patient-reported outcome, commonly measured using the Visual Analogue Scale (VAS). However, recent research indicates that, despite achieving statistical significance, a difference of less than 1 point on the VAS lacks clinical relevance. Our aim is to assess the frequency with which clinical relevance is reported and distinguised from statistical significance in studies analyzing pain after Inguinal hernia repair (IHR).

Methods: We searched 6 Surgery Journals with impact factor higher than 2 for comparative articles analyzing IHR. Our search was performed according to the recent guidelines, comprising articles published since 2018. We included all the studies that used the VAS pain scale as a pain intensity analysis tool. Two authors independently screened the articles analyzing the presence of a clinical relevance cutoff definition for the VAS tool, of statistical significance, and if it suggested superiority of an intervention or control regarding the pain intensity based solely on the p-value, despite having a VAS difference of less than 1 point.

Results: The initial search resulted in 169 articles, of which 45 manuscripts were included. Among the studies, 21 (46.7%) were randomized controlled trials (RCTs), 15 (33.3%) were cohort studies, and 9 (20%) were meta-analyses. 15 (33.3%) studies compared surgical techniques, 19 (42.2%) studies analyzed surgical materials, while the other studies compared anesthetic methods, patient characteristics, and intraoperative aspects such as hernia sac and internal orifice management. Surprisingly, none of the studies defined a clinical relevance cutoff for the VAS pain scale. 25 (55.6%) studies presented a statistically significant difference between the groups analyzed. Among these studies, only 11 (44%) presented a VAS difference of 1 point in their analyses. However, among the 14 studies that presented no clinically relevant VAS difference, 12 (85.7%) supported a difference in pain intensity based solely on the *p*-value, while only 2 (14.3%) highlighted that their results may not be of clinical relevance, both being meta-analyses. Interestingly, these findings were more evident among the randomized studies, of which 9 (42.9%) RCTs presented statistical significance. However, only 2 (22.2%) among those statistically significant results presented a VAS difference of more than 1 point.

Conclusion: Our findings revealed that the widely recommended clinical relevance cutoff of a 1-point difference on the VAS tool is often overlooked in inguinal hernia clinical studies.

P088

Risk Factors Associated with Emergent Ventral Hernia Repair: A Retrospective Case-Control Study

Leigh Friedman, ME; Kevin Horton-Schleicher, MD; Karimatu Jalloh; Maria Altieri, MD; Leslie Okorji, MD; University of Pennsylvania

Introduction: Our study aims to evaluate hernia-specific risk factors associated with emergent ventral hernia repair (VHR) when compared with elective VHR.

Emergent VHR is associated with worse outcomes than elective repairs. Identifying hernia-specific risk factors can expedite elective repair which would lead to improved outcomes and reduced cost. Hernia-neck ratio has been shown to be higher in emergent VHR with suggested cutoff of 2.5. In addition, patients undergoing watchful waiting and preoperative optimization have a risk of undergoing emergent VHR of up to 8.3% and 16.7% respectively.

This study assesses whether hernia-neck ratio correlates with the need for emergent VHR and examines the impact of other hernia-specific risk factors such as watchful waiting and optimization on emergent VHR.

Methods: This single-center, retrospective case-control study included patients > 18 years old who underwent VHR over a 12-month period. Cases included all emergent VHR; controls included elective VHR performed by two surgeons. We excluded patients with lateral and flank hernias or other concurrent primary procedures. Univariate and multivariate analysis were performed using Mann–Whitney *U*-test for continuous data and Pearson's chi-square test or Fisher's exact test for categorical data.

Results: A total of 90 VHRs were included, with 38 emergent and 52 elective cases. There were no differences in age, sex, BMI, diabetes, COPD, active smoking and prior hernia repair between the two groups. ASA class and proportion of uninsured patients were higher in the emergent VHR group. Prior to emergent VHR, only 15.8% of patients had the hernia addressed by a PCP within 12 months. 21.1% saw a surgeon and 50% of them were either recommended optimization or not offered surgery. 2.6% of emergent cases were performed MIS compared to 69.2% of elective cases. Hernia width and hernia-neck ratio were similar in both groups with mean values of 3.1 vs 3.2 ($p = 0.73$), and 2.3 vs. 2.4 ($p = 0.40$), respectively. Bowel resection, drain placement, ICU admission, length of stay, 30-day readmission and reoperation, and surgical site occurrence were significantly greater in emergent cases.

Conclusion: There was no difference in hernia-neck ratio in patients undergoing emergent VHR when compared to elective VHR in our cohort. Emergent VHR was associated with inferior postoperative outcomes which may be exacerbated by the underutilization of MIS approaches. Lack of access to care, watchful waiting and preoperative optimization were contributors to need for emergent VHR. Future prospective studies examining hernia-specific risk factors in these patients are warranted.

P089

A Case Report of an Incarcerated Femoral Hernia Containing the Bloodless Fold of Treves, Handled with a Minimally Invasive Approach

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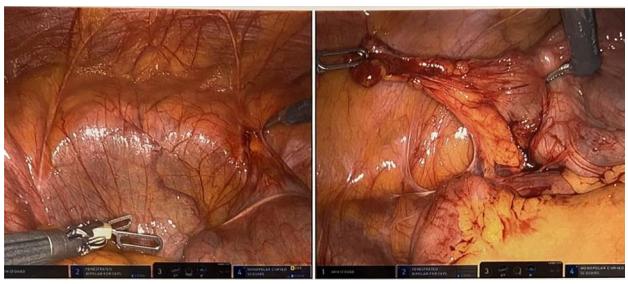
Introduction and Importance: Femoral hernias are a rare type of inguinal hernia, accounting for approximately 3% of all groin hernias. They occur most commonly in females, but have less frequently been observed in males.

Case Presentation: A 63-year-old male with a history of prior appendectomy presented for symptoms of pain, discomfort, and bulging in the right inguinal region. On physical examination, a solid nodule of tissue was palpable in the inguinal region, and was confirmed on ultrasound to be an inguinal hernia containing fatty tissue. After discussion of management options, it was decided to perform surgical repair. The patient was taken electively for robotic assisted repair of a right inguinal hernia via TAPP approach, during which a femoral hernia was identified. Further dissection showed the abdominal contents contained in the hernia were identified as fat originating from the bloodless fold of Treves (Ligament of Treves), on the anti-mesenteric side of the terminal ileum. The ligament of Treves was reduced and a successful pre-peritoneal repair with mesh was performed. Post-operatively patient had resolution of symptoms, and no palpable bulge or hernia on examination.

Clinical Discussion: This patient had a rare hernia defect containing an unexpected intra-abdominal organ. The defect in the right lower quadrant may have allowed nearby intra-abdominal contents to herniate and get incarcerated in it. One could suspect that without having had a prior appendectomy, this could have presented as an Amyand hernia, although it is possible scar tissue formation may have contributed as well by forming adhesion and incarceration at this site. If left untreated, the condition could have progressed, worsening to cause abdominal pain or even obstruction.

Conclusion: Femoral hernias are rare in male patients, and this case showed incarcerated ligament of Treves in the defect. This case may be the first of its kind in surgical literature.



P090

Impact of Community Distress on Long-Term Outcomes Following Ventral Hernia Repair

Dahlia M Kenawy, MD, MS; Jennifer M Underhill, MD; Theresa N Wang, MD, MS; Victor Heh, PhD; Savannah M Renshaw, MPH, MPA; Benjamin K Poulose, MD, MPH; The Ohio State University Wexner Medical Center

Introduction: The distressed communities index (DCI) is a measure of socioeconomic distress within a community based on zip codes. It has been correlated with inequity in postoperative outcomes following ventral hernia repair (VHR). We hypothesized that greater community distress would be correlated with worse long-term outcomes in patients undergoing VHR.

Methods: This was a retrospective cohort study of patients undergoing VHR at a single tertiary care institution between 2010 and 2016. Patient and operative factors including demographics, insurance status, comorbidities, hernia size and location, hernia type, recurrence status, and mesh placement were recorded. Long-term outcomes (> 30 days) were categorized as hernia recurrence reoperation (HRR), major complications requiring emergency surgery (MCES), and non-recurrence procedural interventions (NRPI). Using the DCI database, zip codes were used to correlate levels of community distress (distressed, at risk, mid-tier, comfortable, and prosperous) with rates of long-term outcomes following index VHR. Ten-year Kaplan Meier survival curves were obtained for each outcome.

Results: A total of 846 patients were included in the study (distressed $n = 160$, at risk $n = 226$, mid-tier $n = 93$, comfortable $n = 105$, prosperous $n = 265$). Significant differences were present in age distribution ($p = 0.047$), race ($p < 0.0001$), and insurance status ($p < 0.0001$) between groups. More prosperous communities had lower rates of diabetes ($p = 0.028$), COPD ($p = 0.0018$), and nicotine use ($p = 0.043$), but not BMI ($p = 0.10$) or steroid use ($p = 0.72$). At the time of index VHR, distressed communities were more likely to have recurrent hernias ($p = 0.0031$) that were incisional ($p = 0.0001$). More prosperous areas tended to have smaller hernia widths ($p = 0.0004$) and clean wound status ($p = 0.024$). Presence ($p = 0.15$), location ($p = 0.13$), and type ($p = 0.08$) of mesh were not correlated with levels of community distress.

No significant difference was found in HRR (logrank $p = 0.42$, Fig. 1), MCES (logrank $p = 0.32$), or NRPI (logrank $p = 0.16$) on Kaplan Meier survival curves. Only HRR showed a significant difference on univariate analysis in relation to community distress level when evaluating both overall rate ($n = 90$, 10.6%, $p = 0.04$) and months to recurrence (81.5[64.7,99.7], $p = 0.04$). HRR rates and months to recurrence were as follows: distressed 6.3% ($n = 10$), 84[66.9,100.9]; at risk 11.5% ($n = 26$), 81.3[65.5,102.2]; mid-tier 5.4% ($n = 5$), 86.7[66.9,101.9]; comfortable 16.2% ($n = 17$), 75.3[60,97.9]; and prosperous 12.1% ($n = 32$), 80.8[62.3,96.4].

Conclusions: Greater socioeconomic distress was correlated with higher rates of HRR, but not MCES or NRPI. Levels of community distress do not appear to be correlated with need for urgent or emergent procedural intervention following VHR. Further analysis is needed to identify factors that contribute to poor long-term outcomes following VHR.

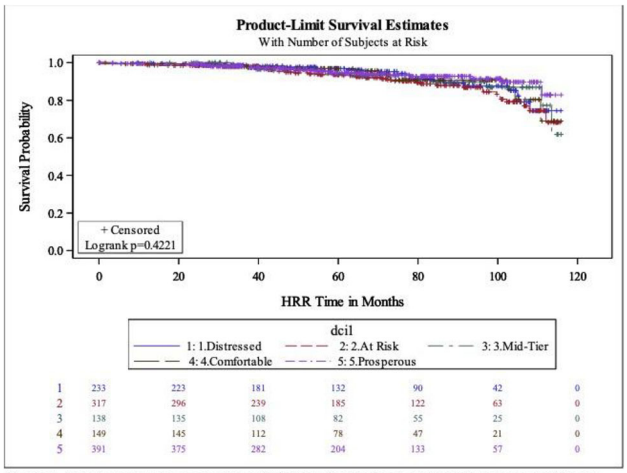


Figure 1. Hernia recurrence reoperation (HRR) by level of community distress over a 10-year follow-up period.

P091

Racial Disparities in Post-operative Outcomes Following Inguinal Hernia Repair

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Background: Racial disparities within health care have been established over time, including racial inequality within the field of surgery [1]. Surgical repair of inguinal hernias is one of the most common surgical procedures general surgeons perform [2]. As such, investigating racial disparities relating to inguinal hernia repair outcomes should give an accurate portrayal and insight into the racial disparities that exist throughout various surgical fields and surgical operations. While prior studies have investigated racial disparities related to the timing of surgical intervention for hernia repair, access to surgical services, and surgical approach, studies investigating racial disparities regarding surgical outcomes undergoing hernia repair are lacking [3–6]. Therefore, this study aims to evaluate if there is a difference in post-operative outcomes and quality of life in patients who underwent inguinal hernia repair based on patient race.
Methods: A retrospective analysis of prospectively collected data from 2017 to 2023 using the Abdominal Core Health Quality Collaborative (ACHQC) was performed using a multivariable regression model. Study participants included all adult patients who have undergone elective unilateral inguinal hernia repair with clean wound class and 30-day follow-up. The primary outcomes included 30-day surgical site occurrence (SSO), surgical site occurrence/infection (SSO/I), and 30-day post-operative complications. Secondary outcomes included 1-year hernia recurrence, 30-day and 1-year quality of life. Patients were categorized based on race: White, Black, Hispanic, Other. All outcomes compared each "non-white" race to the reference group ("white" race).
Results: A total of 19,699 patients were included (White = 16,929, Black = 1334, Hispanic = 832, Other = 604). There were statistically significant difference between race and BMI, ASA class, hypertension, diabetes, kidney disease, heart failure, chronic obstructive pulmonary disease, and smokers (all $p < 0.001$). Racial differences were associated with operative characteristics including hernia size, use of mesh, and operative time ($p < 0.001$). In the adjusted analysis, there was no statistical difference in 30-day SSO ($p = 0.07/0.18/0.68$), SSO/I ($p = 0.09/0.13/0.77$), 1-year hernia recurrence ($p = 0.97/0.81/0.75$), or 1-year quality of life ($p = 0.37/0.11/0.17$). There was a significant difference in 30-day quality of life ($p = 0.0001/0.02/0.01$) and post-operative complications when comparing "Hispanic" race to "White" race ($p = 0.03$).
Conclusion: The data shows significant differences in patient and operative characteristics, 30-day postoperative complications and 30-day quality of life based on patient race. To eliminate these disparities, further investigation into the cause and discussions into potential solutions is warranted.

P092

A Prospective Comparative Study to Evaluate the Restoration of Abdominal Wall Dynamics in Patients with Incisional Hernia Following Laparoscopic and Open Repair in a Tertiary Care Centre

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Introduction: Incisional hernia (IH) is a common complication following abdominal surgery, resulting in impaired abdominal wall function and reduced quality of life (QoL). This study was conducted at a tertiary care center to compare the restoration of abdominal wall dynamics in patients undergoing laparoscopic versus open IH repair, using surface electromyography (sEMG) to assess individual muscle activity pre-operatively and post-operatively at six months. Additionally, QoL and pain levels were measured to evaluate patient recovery.
Materials and Methods: A prospective study was conducted on 44 patients with IH at a tertiary care center. The patients were divided into Group A (17 patients undergoing open mesh repair) and Group B (27 patients undergoing laparoscopic repair). sEMG was performed pre-operatively and at six months post-operatively to measure muscle activity in the rectus abdominis, external oblique, and internal oblique muscles. QoL was assessed using the WHOQOL-BREF questionnaire, and the pain was measured using the Visual Analog Scale (VAS). Statistical analysis was performed using STATA 14.1, with a p-value < 0.05 considered significant.
Results: Postoperative sEMG analysis at six months revealed significant improvements in muscle strength in both groups. The laparoscopic group showed superior recovery in the rectus abdominis (pre-op MVC: 1.01 mV, post-op MVC at 6 months: 1.85 mV, $p = 0.002$), external oblique (pre-op MVC: 0.35 mV, post-op MVC at 6 months: 1.68 mV, $p < 0.01$), and internal oblique (pre-op MVC: 0.4 mV, post-op MVC at 6 months: 1.75 mV, $p < 0.01$). Both groups demonstrated significant improvements in QoL at six months, with the laparoscopic group showing higher gains (mean WHOQOL-BREF score: open repair 65.3 ± 7.1 vs laparoscopic repair 70.1 ± 6.5, $p < 0.01$). Pain levels also decreased significantly in both groups, with the laparoscopic group exhibiting greater reductions ($p < 0.01$).
Conclusions: Both laparoscopic and open hernia repairs effectively restore abdominal wall function, as measured by sEMG at six months, and lead to significant improvements in QoL and pain levels. However, laparoscopic repair results in superior recovery of individual muscles and greater enhancements in QoL.

P093

Successful Salvage of Infected Bioresorbable Mesh (Poly-4-hydroxybutyrate) Following Hernia Repair: A Case Series and Systematic Review

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Purpose: Bioabsorbable mesh is becoming increasingly common in complex cases. However, the outcomes of mesh salvage following complicated hernia repair with bioabsorbable mesh have not been well-characterized. We report a series of four cases involving the

salvage of poly-4-hydroxybutyrate bioabsorbable mesh following ventral hernia repair (VHR).

Methods: We included patients who presented with postoperative complications following VHR using poly-4-hydroxybutyrate mesh at Tampa General Hospital.

Results: Four reported cases of mesh infection with poly-4-hydroxybutyrate
were analyzed. The mean time to hospital presentation for postoperative complications was 35.3 days, with a median of 29.5 days. Complications included infection and dehiscence (4/4 cases), necrosis (2/4 cases), and exposed mesh (2/4 cases). Postoperative procedures included incision and drainage (3/4 cases) and debridement (2/4 cases). Mesh salvage was successful in all cases. Complete mesh removal was not required in any case. Negative pressure wound therapy (NPWT) was utilized in all cases after wound dehiscence and infection. One patient experienced chronic diarrhea and incomplete wound closure after 12 months. One patient had hernia recurrence after 19 months.

Conclusion: Mesh infection in a percentage of complex hernia repairs is inevitable. Salvage of poly-4-hydroxybutyrate mesh in complicated VHR was successful in all reported cases at our institution.

Pt	Age	Gender	BMI
1	49	M	27.37
2	70	F	28.25
3	66	F	22.86
4	55	F	43.76

Table 1 Patient demographic data at initial VHR

Pt	Mesh placement	Mesh size	Recurrent incisional hernia
1	Onlay	400cm^2	Yes
2	Onlay	500cm^2	Yes
3	Bridging	32cm^2	No; intra-op consult, abdominal closure by surgical oncology
4	Not reported	150cm^2	Yes

Table 2 Perioperative data

	Complications				Post-op procedure		NPWT Placement		Long-term outcome		
Pt	Necrosis	Dehiscence	Infection	Exposed Mesh	I&D	Debridement	Initial surgery	Postoperative procedure	Failed closure	Salvage of mesh?	POD to postop complications
1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	19
2	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	30
3	No	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	63
4	No	Yes	Yes	No	Yes	No	No	Yes	No	Yes	29

Table 3 Postpoerative data

Figure 1: Patient 1 POD 19

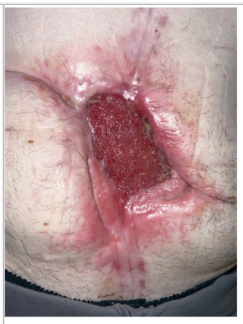

Figure 2: Patient 1 eight weeks post-salvage

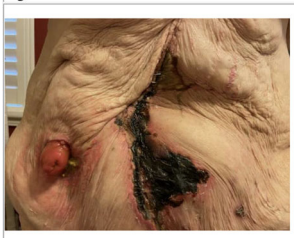

Figure 3: Patient 2 POD 30

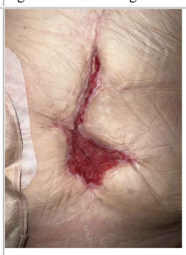

Figure 4: Patient 2 eight weeks post-salvage

Figure 5: Patient 3 POD 63

Figure 6: Patient 3 nine weeks post-salvage

Figure 7: Patient 4 POD 29

Figure 8: Patient 4 three weeks post-salvage

P094

Impact of Pre-operative Pain Catastrophizing Scores on Post-operative Opioid Consumption and Satisfaction

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Introduction: The Pain Catastrophizing Scale (PCS) is a critical tool for assessing patients' negative thoughts about pain, which has shown to influence post-operative outcomes in several fields. We aim to investigate the relationship between pre-operative PCS scores and post-operative outcomes, specifically opioid rescue pill use and patient satisfaction, in patients undergoing elective general surgery procedures.
Methods: A single center prospective review of patients undergoing surgery at a quaternary referral center was conducted from 2021 to 2024. The study population included adults aged 18 or older undergoing ambulatory surgery procedures. Participants who were currently using opioids, immunocompromised, or had an NSAID/acetaminophen allergy were excluded from participation. Pre-operative PCS scores were recorded and dichotomized into high and low categories based on the median. The primary outcome was patient-reported utilization of post-operative opioid rescue pills, and the secondary outcome was patient satisfaction with care. Logistic regression was used to assess the association between PCS scores and opioid use, adjusting for confounders including age, sex, race, type of surgery, and type of anesthesia. Similarly, a multiple linear regression was used to evaluate the relationship between PCS scores and patient satisfaction on a 1–10 scale.
Results: Unadjusted data showed that patients in the high PCS group were 1.8 times more likely to use post-operative opioid rescue pills compared to those in the low PCS group (OR = 1.80, 95% CI: 1.10–2.95, $p = 0.022$). After adjusting for potential confounders, including age, sex, race, type of procedure, and type of anesthesia, this association became even more pronounced (Adjusted OR = 2.03, $p = 0.0299$). Similarly, those in the high PCS group were also associated with significantly lower post-operative satisfaction scores (Unadjusted $\beta = -0.53$, $p = 0.004$). This negative association persisted and further strengthened after adjustment, with an adjusted β of -0.727 ($p = 0.003$).
Conclusions: This study found higher pre-operative PCS scores to be strongly associated with increased post-operative opioid use and decreased patient satisfaction, even after accounting for key demographic and clinical factors. These analyses underscore the importance of incorporating PCS into pre-operative evaluations to identify patients at risk for increased opioid utilization and tailor interventions accordingly.

P095

Comparison of Outcomes After Laparoscopic Intraperitoneal Onlay Mesh Plus Repair Versus Transabdominal Pre Peritoneal Mesh Plus Repair for Patients with Primary Ventral Hernia: A Randomized Controlled Trial (Interim Results)

Devender Singh; AIIMS, New Delhi

Introduction: The placement of mesh in the peritoneal cavity may sometimes lead to serious mesh-related complications including bowel obstruction, abscess or fistula despite of the use of composite mesh. The biggest limitations of composite meshes are their high cost and the need for a fixation device which too adds to the cost and may be a source of post-operative pain. This led the hernia surgeons to place the mesh extra-peritoneally or pre-peritoneally to avoid all the mesh-related complications. The objective of this randomised study is to compare the outcomes of laparoscopic intraperitoneal onlay mesh plus repair versus transabdominal pre-peritoneal mesh plus repair (extraperitoneal technique) for patients with primary ventral hernia.
Patients and Methods: This double-blinded study conducted at a tertiary care hospital, included 60 patients scheduled for laparoscopic primary ventral hernia repair and were divided into two groups: IPOM Plus and TAPP Plus. Pain scores, length of hospital stay, operative duration, hernia recurrence and surgical site infection (SSI) rates were compared between the two groups.
Results: Baseline demographic profiles were comparable in the two groups. TAPP plus group demonstrated significantly lower pain scores at 1, 3, 7 and 21 days post-operatively. TAPP plus group also had a markedly shorter hospital stay, reduced analgesic requirements, and an earlier return to normal activity. However, the operative duration was significantly higher in the TAPP plus group and in 52 percent of patients intended to undergo TAPP plus repair required conversion to either IPOM plus or transabdominal retro-muscular repair.
Conclusion: TAPP plus repair yielded significant benefits, including reduced pain, lower analgesic requirements, shorter hospital stays, and earlier resumption of routine activities compared to IPOM plus repair. However, the caveat is it may not be feasible in each case even with advanced laparoscopic skills. Future studies comparing robotic ventral TAPP repair with laparoscopic IPOM repair are needed.

P096

Multi-center Evaluation of Robotic Component Separation Techniques for Ventral Hernia Repair: The First Experience in Korea

Tae Kyung Ha, PhD[1]; Kyung Won Seo, PhD[2]; Sang Hyun Kim, PhD[3]; [1]College of Medicine Hanyang University; [2]Kosin University Gospel Hospital; [3]Soonchunhyang University Seoul Hospital

Objectives: This study aims to provide a comprehensive assessment of the first multi-center implementation of robotic component separation techniques for ventral hernia repair in Korea. The objective is to evaluate key surgical outcomes, including operation time (OP time), hospital stay, and complication rates, in order to assess the safety and efficacy of this procedure. With the growing adoption of robotic surgery worldwide, this study provides important insights into the feasibility of this technique within a multi-institutional setting in Korea.
Methods: A retrospective review was conducted across multiple hospitals in Korea, focusing on 60 patients who underwent robotic ventral hernia repair using component separation techniques. Data collected included patient demographics, such as age and body mass index (BMI), as well as detailed surgical metrics, including OP time, docking time, and console time. Postoperative outcomes such as hospital stay, complication rates, and hernia recurrence were also analyzed. Descriptive statistics were performed to summarize the data, and logistic regression analysis was used to identify factors associated with increased complication risks.
Results: The mean age of the patients was 53.4 years, ranging from 29 to 78 years, with an average BMI of 28.46. The average OP time was 274 min, with docking times averaging 10.7 min and console times averaging 242 min. Postoperatively, the average hospital stay was 3.7 days, with a range of 1 to 10 days. The average hernia width was 6.7 cm, ranging from 2 to 16 cm. Of the 60 patients, three experienced postoperative complications, leading to a complication rate of 5%. Logistic regression analysis indicated that age and console

time were modestly associated with an increased risk of complications, while shorter docking times were linked to fewer complications. Importantly, no hernia recurrences were observed during the follow-up period.
Conclusions: This multi-center study marks the first Korean experience with robotic component separation techniques for ventral hernia repair. The findings demonstrate that this procedure is both safe and effective, with a low complication rate and manageable hospital stays. The favorable surgical outcomes, including the absence of hernia recurrences, highlight the feasibility of robotic ventral hernia repair in a multi-institutional setting. While the results are promising, further research with larger patient cohorts is recommended to optimize surgical protocols and refine patient outcomes. The study underscores the potential for robotic surgery to become the standard of care in ventral hernia repair, especially in complex cases.

P097

Institutional Analysis of Elective Inguinal Hernia Repair in Alcoholic Cirrhosis with Ascites

Frank G Lee, MD; Jon D Skjaerlund, MD; Myung S Park, MD, MS; Daniel Stephens, MD; Mayo Clinic Rochester

Background: The decision to operate on elective inguinal hernias in patients with alcoholic cirrhosis and ascites is nuanced. Our aim is to assess the clinical characteristics and outcomes for those who underwent surgery.
Method: Retrospective review of adult patients with above diagnosis/procedure from 2018 to 2024 at a single institution was performed.
Results: Twenty-two transplant-naïve patients were identified. Median MELD was 11. All were abstinent from alcohol at time of surgery. Control of ascites prior to surgery was by diuretics (91%), transjugular intrahepatic portosystemic shunt (TIPS) (14%), and regular paracentesis (9%). Surgical technique was predominantly open (82%), followed by robotic-assisted and laparoscopic (9% each). Ligation of hernia sac was more common than reducing the sac. All cases used mesh. Use of surgical drains were uncommon (3/22). There was no mortality at 30 days. Complication rate was 23%, including seroma, hematoma, and decompensation. Operations were done predominantly by general surgeons (20/22) then transplant surgeons (2/22). Decision to operate by surgeon was dependent on symptom severity, history of incarceration, and approval by hepatology.
Conclusions: Elective inguinal hernia repair in cirrhotics with ascites is safe in carefully selected patients with stable and controlled disease. Ascites requiring perioperative paracentesis for control was associated with worse outcomes. Intraperitoneal drains were not commonly used nor a prerequisite for successful surgery. Ligation versus reduction of hernia sac had equivalent rates of seroma formation. MELD and Child–Pugh scores are useful but imperfect markers for predicting surgical complications.

Patients	$n = 22$
Male	21
Female	1
Median MELD 3.0 (range)	11 (7–21)
Median Child–Pugh score (range), grade	6 (5–9), A and B
Diuretic regimen	
Furosemide range	20–80 mg/day
Spironolactone range	25–400 mg/day
Management of hernia sac	
Ligation	15 (68%)
Reduction	7 (32%)
Approach	Total (by ligation/reduction)
Open	18 (14/4)
Laparoscopic	2 (0/2)
Robotic-assisted	2 (1/1)
Complications	
Seroma	3 (2/1)
Hematoma	2 (1/1)
Decompensation	1 (1/0)
Outpatient/overnight observation	17 (77%)
Inpatient	5 (23%)
LOS range	2–20 days

P098

Asymptomatic Mesh Migration Following Hernia Repair A Review of Current Literature & Case Report

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Introduction: Over 20 million hernia repairs are performed globally every year, and with the widespread adoption of mesh implantation, and the 2018 HerniSurge Guidelines, recurrence rates have significantly reduced. However, these guidelines emphasize a lack of definitive evidence for recommendations regarding mesh type, surgical approach, and fixation techniques, as well as commented on potential underreporting of adverse effects such as mesh erosion (partial displacement into an organ) and migration (complete

translocation of the mesh). This review aims to use an atypical case presentation of mesh migration as a framework to discuss a comprehensive review of literature from the past twenty years, summarizing instances of mesh migration and the details of these reports to better inform future recommendations.
Methods and Procedures: A search was conducted in PubMed and Google Scholar using the keywords "mesh migration", "hernia repair" and "mesh erosion" with a focus on studies published after 2004 to 2024. Inclusion criteria included case reports, case series, meta-analysis, and literature reviews addressing mesh migration or erosion written only in English. Data was extracted from 29 studies, summarizing mesh type, hernia type, migration location, presenting symptoms, and management.
Results: We present a case of a 59-year-old man who during a routine colonoscopy for malignancy screening was found to have mesh migration into his descending colon. This patient had a 5 × 5 cm umbilical hernia repaired one year prior with a composite mesh via robot-assisted trans-abdominal preperitoneal and to date denied any symptoms of pain nor changes in bowel consistency or constipation. In this literature review, polypropylene mesh (45%) was the most frequently reported mesh associated with mesh migration, closely followed by composite mesh (34%) and the remainder did not report the type of mesh. 62% of cases were reported within five years of the procedure and only one case reported asymptomatic presentation. The most common presentation was pain (41%), bowel obstruction (24%), enterocutaneous fistula (24%), and changes in bowel habits (21%). Of the cases reviewed, 21 (73%) required small bowel or colonic resection.
Conclusions: This case and literature review emphasizes the importance of increased surveillance postoperatively for post-hernia repair with mesh and suggests even asymptomatic presentations could be at risk for severe adverse outcomes. Future studies can increase the evidence available for guidelines on mesh selection, surgical approach, and post-operative monitoring to attenuate the incidence of this complication and improve long-term outcomes for patients.

P099

Results of Laparoscopic Intraperitoneal Onlay Mesh Repair (IPOM) with Intraperitoneal Suturing of Hernia Sac by Barbed Sutures for Incisional Ventral Hernia

Viet Trung Lam; Ngoc Huan Nguyen, MD; Dung Tien Tran Phung, MD, PhD; Quoc Hau Ly Pham, MD; Hai Dang Pham, MD; Cho Ray Hospital, Ho Chi Minh City, Vietnam

Introduction: Laparoscopic intraperitoneal onlay mesh repair (IPOM) is currently the preferred technique for treatment of ventral hernia. It offers advantages such as reduced hospital stay, diminished pain, low recurrence rate and in addition to aesthetic benefits. One of the common complications after laparoscopic IPOM is seroma formation that bothersome to patients and might require drainage. Laparoscopic IPOM repair with intraperitoneal suturing of hernia sac by barbed sutures might help to reduce this complication and maintain optimal outcomes for the patients.
Methods: A retrospective analysis of laparoscopic IPOM repair with intraperitoneal suturing of hernia sac by 1.0 barbed sutures (Strastafix or V-loc sutures) for incisional ventral hernia was conducted at the Digestive Surgery Department of Cho Ray Hospital, Vietnam. All patients underwent surgery utilizing Parietex^{TM} Optimized Composite mesh, fixing with transfascial suturing and Protack.
Results: Over a 4-year period from June 2020 to June 2024, thirty five patients with incisional ventral hernia was included into study, comprising 25 females and 10 males. The mean age was 52 years (range 35–83), with 8 patients had comorbidities. Thirty two patients had one previous operation, one patient had 3 and two patients had 4. There were 24 cases with midline ventral hernia, 8 cases with iliac fossa hernia and 3 cases with flank hernia. The average hernia size was 5 cm (4–12 cm). Mean operating time was 100 min (60–130). No conversion to open surgery required. The median hospital stay were 3 days with mean VAS score of 3.6 at postoperative day 1. Postoperative seroma occurred in one case (2.8%) of right flank hernia that required no further drainage. Intestinal obstruction happened in one case (2.8%) of suprapubis midline hernia in postoperative day 7 that required reoperation. No recurrence was noted with the mean follow-up of 12 months (3–48 months).
Conclusion: Laparoscopic IPOM repair with intraperitoneal suturing of hernia sac by barbed sutures is a safe, feasible and effective technique for the treatment of incisional ventral hernia. It might help to reduce to rate of seroma formation. More randomized controlled trials might be needed to evaluate the role of this technique.

P101

Cost Analysis and Utilization of Robotic Approach in Emergent Minimally Invasive Cholecystectomy Among Privately Insured Patients: A Retrospective Cohort Study from 2016 to 2021

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Introduction: This study analyzed the utilization and costs of robotic-assisted cholecystectomy (RAC) and laparoscopic cholecystectomy (LC) in emergent settings from 2016 to 2021. The objective was to assess the trend in surgical preferences and evaluate differences in net payments between RAC and LC in the context of emergent minimally invasive cholecystectomy.
Methods and Procedures: A retrospective cohort analysis of patients who underwent emergent LC or RAC (2016–2021) was conducted using the IBM® MarketScan® database, a comprehensive private payer database that includes de-identified healthcare claims data from various employers and health plans in the United States. Statistical analysis used inverse probability of treatment weighting (IPTW) to adjust for potential confounders, including patient age, sex, Charlson Comorbidity Index (CCI), insurance type, and regional variation. The primary outcome was the mean difference in insurer net payment between the two surgical techniques after adjusting for inflation. The trends in the adoption of RAC and LC over the study period were also analyzed.
Results: Between 2016 and 2021, RAC utilization increased significantly from 2.2% to 8.2%. In contrast, LC slightly decreased over the same period. The unadjusted mean net payment per case for RAC was $46.89 higher than LC (95% CI: $5.92 to $87.87). After IPTW adjustment, the cost difference narrowed to $38.09 (95% CI: $38.08 to $38.11), with RAC consistently remaining more expensive than LC across all years analyzed. Additionally, with the increasing utilization of RAC from 2016 to 2021, the adjusted total net payment for RAC surged by 199.49%, while it decreased by 38.24% for LC over the same period.
Conclusions: The study demonstrates an increasing trend in the adoption of RAC for emergent cholecystectomy from 2016 to 2021, though LC remains the most frequent technique. Despite adjustment for clinical and demographic factors, RAC remains more costly than LC. The difference is small but highlights the economic implications of increasing RAC utilization. The payment differential may affect hospital and surgeon decisions to offer a robotic approach for emergent cholecystectomy.

P102

Large Bowel Obstruction Secondary to Cecal Volvulus with and Incidental Finding of Small Bowel Intussusception: Are Two Anastomoses Safe?

Matthew Passeggiata[1]; Patrick Plummer[1]; Allen Tsai[1]; David Thomas[1]; Geovanna Badaro[2]; [1]Western Reserve Health Education; [2]American University of Antigua

Performing synchronized bowel anastomosis without establishing a diverting ileostomy or colostomy can be deemed a complicated procedure. In many intraoperative cases, the longevity of multiple anastomosis is dependent upon certain variables that are present at the time of the operation. Incorporating certain sterile conditions such as clean versus contaminated operating fields, and laparoscopic versus open surgical approach can alter the practicality of a successful synchronized anastomosis. In patients with multiple small and large bowel pathologies requiring a dual resection with two anastomoses can increase morbidity and mortality rates. Certain complications such as anastomotic leaks, fistulas, and infections can arise due to a failed bowel anastomosis. Determining whether to perform a diverting colostomy, diverting loop, or primary anastomosis can be a difficult decision and making the wrong intraoperative decision can have potential for disastrous consequences. The patient's comorbidities and clinical status on presentation may be out of a surgeon's control, but the operative technique and decision making is within the surgeon's control. There are various options to create an anastomosis and no one technique has prevailed. In this case report, the patient is a 56-year-old female who presented with a large bowel obstruction secondary to cecal volvulus requiring ileocecectomy with primary anastomosis. An unexpected challenge arose when intraoperatively a small bowel intussusception was found that ultimately required a small bowel resection with primary anastomosis in the index case. The primary goal is to highlight the safest approach in an acute abdomen requiring two separate bowel resections with two separate primary anastomoses.

P103

Chylolymphatic Mesenteric Cyst as a Surgical Emergency

Alana Ravasio, MD; Jimmie Knight 3rd, MD; Scott W Schimpke, MD; Rush University Medical Center

Mesenteric cysts are a rare tumor that can be found anywhere from the duodenum to the rectum. They are even less common in adults than children, and a minority of case presentations are acute in nature. This case was one of a 28-year-old female presenting with three days of subjective fever, right-sided abdominal pain, nausea, vomiting, PO intolerance, and obstipation in the setting of one month of constipation and a palpable abdominal mass. Examination was significant for tenderness to palpation of a mid-right abdominal mass, labs for a leukocytosis to 10.47, and computed tomography with IV contrast for a heterogeneous, complex cystic structure with internal fat densities. There was communication with the central mesentery, with fat stranding, shifting of the third part of the duodenum and jejunum to the right, and thickened wall of the proximal jejunum, implicating concern for mesenteric cyst torsion. Due to concern for obstruction and small bowel ischemia, the patient was taken for urgent exploratory laparotomy. The large cyst was found to be emanating from the jejunum and its mesentery, 20 cm distal to the ligament of Treitz, and the associated loop of jejunum was congested but viable. Given the cyst's broad attachment, the involved segment of bowel and mesentery was resected in its entirety, and an anastomosis was created to leave the bowel in continuity. Pathologic diagnosis was a chylolymphatic cyst measuring 8.6 cm involving the muscular propria of the small intestinal wall and the adipose tissue from the adjacent mesentery, with inflammation and necrotic tissue in the adipose. To date, the literature suggests surgical removal in acute and symptomatic cases of mesenteric cysts, and an open rather than laparoscopic approach in cases of mesenteric cysts > 10 cm. In a review of 70 cases of symptomatic mesenteric cysts > 10 cm, 10% of patients presented with acute onset of abdominal pain due to mechanical compression and bowel obstruction, requiring urgent intervention. While acute symptomatic presentations are rare, this case highlights that there should be a low threshold for urgent surgical removal of a mesenteric cyst or other rare mass when a young patient with a virgin abdomen presents with a bowel obstruction and/or mesenteric ischemia.

P105

Laparoscopic Surgical Management of Retained Appendicolith from Perforated Appendicitis

Chunghun Ji; John Jeffries; Adventhealth Orlando

Appendicitis is a prevalent abdominal emergency with a global lifetime incidence of 7–8%, commonly treated by surgical resection. Postoperative complications such as retained appendicoliths, occurring in less than 1% of cases, pose significant management challenges. This case report details a 62-year-old female with a 13-year history of recurrent abdominal pain and abscesses due to a retained appendicolith after a laparoscopic appendectomy. Initially managed conservatively with antibiotics, her condition necessitated surgical intervention following recurrent retroperitoneal abscesses. A combination of diagnostic laparoscopy and interventional radiologic drain placement successfully removed the appendicolith, resolving the abscess. This case highlights the limitations of conservative management and underscores the effectiveness of surgical intervention, particularly laparoscopic removal with preoperative radiologic assistance, in addressing complications and preventing recurrence associated with retained appendicoliths.

P106

Equal Access for Acute Care Surgery

Courtney A Green, MAEd, MD; Simon Lavotshkin, MD; Yuma Regional Medical Center

The acute care surgery (ACS) population reflects a unique group of patients with remarkably increased surgical risk. However, despite enormous growth in robotic technology, integration into ACS lags considerably. Limited robotic access is a common challenge for ACS surgeons looking to utilize this technology. This study highlights our experiences with a structured ACS service before and after dedicated robot access was obtained.

Our hospital, a 406-bed, not-for-profit rural institution, recently experienced exponential growth leading to development of a structured ACS service in early 2023. Efforts to ensure equal access resulted in acquisition of a dedicated ACS robot in January 2024. Data from April-November 2023 (Pre RoACS: 8 months prior to dedicated robotic access) was compared to data from January-August 2024 (Post RoACS: 8 months following dedicated robotic access). Comparisons are illustrated in the table below.

Data pre and post dedicated robotic access reflect similar consulting patterns. Of the surgical consults, 51% required surgical

intervention, and the most commonly performed procedures remained cholecystectomy and appendectomy. Together these represented > 65% of surgical interventions before and after dedicated robotic access. Of the consults requiring surgical intervention, 39.9% were operated on using robotic technology before dedicated access was established compared to 58.4% of patients after access was obtained. The overall use of a minimally invasive approach increased from 69.7 to 77.4%.

Acute care surgeons treat some of the highest acuity patients with unpredictable timing. Limited access to robotic technology has restricted its use among this high-risk patient population. At our institution, acquiring dedicated robotic technology for the ACS team has expanded our ability to provide minimally invasive interventions. After obtaining the ACS technology, over 200 more robotic cases were performed on patients with acute surgical complaints. This patient population deserves a dedicated robotic option to ensure equal access to optimal treatment.

Outcomes		
Measure	Pre RoACS	Post RoACS
Consults	1244	1585
Surgery required (%)	641 (51.5%)	810 (51.1%)
MIS procedures (%)	447 (69.7%)	627 (77.4%)
Robotic procedures (%)	256 (39.9%)	473 (58.4%)
Appendectomies	94 (14.7%)	157 (19.4%)
Cholecystectomies	360 (56.2%)	366 (45.2%)

P107

Spontaneous Superior Mesenteric Vein Tear

Alexandra McMillan, DO; Dustin Williamson, DO; Stefan Iverson, General Surgery Resident; Burt Katubig, MD; Sky Ridge Medical Center

Background: Non-traumatic injury of the superior mesenteric vein (SMV) is an extremely rare but fatal injury. Hemoperitoneum from blunt abdominal trauma has been well documented in the literature; however, hemorrhage from a ruptured superior mesenteric vein has been rarely reported. A few cases describing non-traumatic rupture of the superior mesenteric vein are secondary to patient's with underlying conditions such as portal hypertension and hepatic cirrhosis or acute pancreatitis. However, our patient did not express any of these findings.

Case Presentation: We present a case of spontaneous superior mesenteric vein tear in a patient who presented with a one-day history of abdominal pain and no underlying comorbidities or history of trauma. The patient had a CT abdomen and pelvis on initial presentation that did not show any acute abnormality. However, she experienced worsening abdominal pain with multiple episodes of emesis and re-presented eight hours later lethargic with peritonitis. Repeat imaging then showed a large volume hemoperitoneum (Fig. 1). She was hypotensive, MTP was initiated and she was emergently taken to the operating room. Exploratory laparotomy found a large hematoma in the mesentery of the small and large bowel in the right upper quadrant with active hemorrhage. The mesentery of the transverse colon was found to be nonviable and this section of the colon was resected. Vascular surgery was consulted intraoperatively and identified a proximal superior mesenteric vein tear which was then primarily repaired. The patient was left in discontinuity. On reoperation, the mesenteric hematoma had almost fully resolved and there were no signs of intra-abdominal trauma. An ileocolic anastomosis was then performed and the abdomen was closed.

Discussion: Superior mesenteric vein rupture is rare and can be associated with cirrhosis, pancreatitis and trauma. This case is unique as there are no underlying risk factors present in this patient for a superior mesenteric vein rupture that have been currently identified in the literature. An intraoperative cause of an superior mesenteric vein tear could be due to retraction but this is unlikely in this case as there was already an identified hemorrhage stemming from the mesenteric root. Intractable emesis was the only differentiating variable between initial presentation and representation. Further research on risk factors for non-traumatic spontaneous superior mesenteric vein rupture might shed light on the etiology of this case.

P108

A Rare Form of Gastrointestinal Lymphoma Presenting with Acute Bowel Obstruction and Perforation: A Novel Use for Robotics in Emergency General Surgery

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Introduction: Monomorphic epitheliotropic intestinal T-cell lymphoma (MEITL), formerly known as enteropathy-associated T-cell lymphoma (EATL, type II), is a rare primary intestinal T-cell lymphoma. It accounts for 10–34% of all intestinal T-cell lymphomas, which themselves make up less than 5% of all peripheral T-cell lymphomas. MEITL is often diagnosed pathologically after surgery for bowel perforation or obstruction, with 40% having stage IV disease at time of diagnosis. This contributes to a poor prognosis, with an estimated mean overall survival time of 7 months. Approximately 50% of MEITL patients require emergency surgical intervention due to advanced-stage presentation of acute small bowel obstruction (SBO)/or perforation, often resulting in peritonitis, septic shock and multiple organ failure. Therefore, acute care surgeons ought to be familiar with this unusual pathology.

Case Report: We present the case of a 55-year-old-male without history of abdominal surgery who presented with pneumoperitoneum and peritonitis concerning for perforated viscus. Emergency robot assisted (RA) diagnostic laparoscopy revealed a small bowel perforation with uncontained abscess necessitating resection and primary anastomosis. Pathology demonstrated diffusely infiltrated atypical lymphocytes with abundant apoptotic and mitotic figures, and predominant CD3+T-cells and CD20+B-cells, consistent with MEITL.

Two months later, the patient returned with recurrent perforations, both adjacent to and distant from the prior anastomosis, raising concern for early recurrent disease and necessitating resection and diversion. Post-operatively he developed multisystem organ failure, in the setting of septic shock, and the family elected to withdraw care after two weeks.

Discussion: There are currently no established screening guidelines or standard treatments for MEITL. Research suggests optimal treatment involves a combination of chemotherapy and surgery, followed by stem cell transplantation. However, immediate chemotherapy is frequently contraindicated in the early postoperative setting of advanced disease requiring surgery. The most successful outcomes are achieved when patients are treated before complications requiring surgical intervention arise. Familiarizing surgeons with MEITL can lead to more accurate diagnoses, better perioperative management, and quicker transitions to definitive oncological treatments, highlighting the crucial role acute care surgeons play in the initial management of MEITL. The objective of our case is to acquaint acute care surgeons with this uncommon presentation of lymphoma, thereby facilitating the timely initiation of chemotherapy and prompt oncological referral following surgical intervention. Furthermore, initial surgical management of these patients using minimally invasive techniques can reduce the postoperative wound morbidity associated with conventional open surgery, allowing initiation of systemic chemotherapy earlier in this patient population.

P109

Gender and Age Impacting Outcomes in Trauma Patients with Delirium

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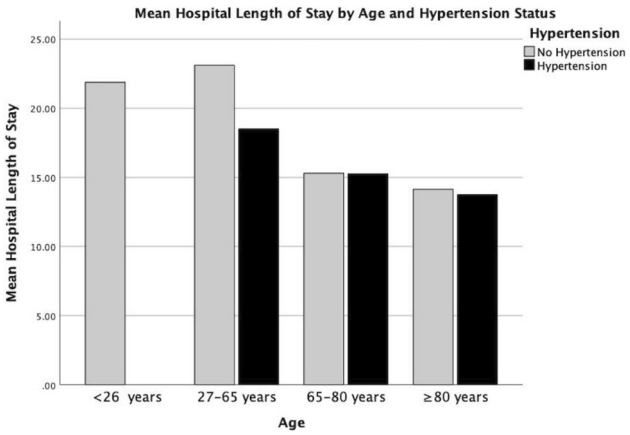
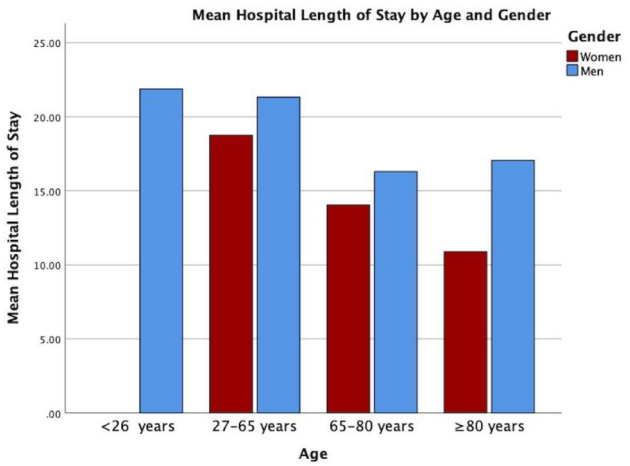
Introduction: This study aims to investigate how age, gender, and comorbidities relate to hospital length of stay (LOS) in patients diagnosed with delirium in the intensive care unit (ICU). Delirium is a serious complication in surgical ICU patients, linked to increased mortality, longer stays, and worse cognitive outcomes. While several risk factors for ICU delirium are known, the relationships between patient demographics, comorbidities, and outcomes require further investigation. Understanding delirium's impact on hospital length of stay is crucial, as prolonged stays raise patient morbidity and healthcare costs. This study aims to inform risk stratification, prevention strategies, and management approaches for ICU delirium.

Methods: A retrospective chart review of 157 patients diagnosed with ICU delirium from 2020 to 2023 at a county hospital with a Level I trauma center. Data on age, gender, comorbidities, and hospital length of stay were extracted from electronic records. The Confusion Assessment Method for the ICU (CAM-ICU) identified delirium cases. Non-parametric statistical tests were used due to non-normal data distribution. The Mann–Whitney U test compared mean hospital length of stay between groups. A p-value < 0.05 was considered significant. Outliers more than two standard deviations from the mean length of stay (20.57 days) were excluded.

Results: Significant associations emerged between patient characteristics and hospital LOS among ICU delirium patients. Men had substantially longer stays than women (mean LOS: 19.21 vs. 14.34 days; $p = 0.009$). Even after excluding patients with substance abuse, men still had significantly longer LOS than women. Hypertension was linked to shorter stays; patients with hypertension had a mean LOS of 15.74 days versus 20.02 days for those without hypertension ($p = 0.016$). Age was also significant; patients aged 80 and older had shorter stays than those aged 27–65 (mean LOS: 13.82 vs. 20.62 days; $p = 0.021$).

Conclusion: This study highlights the interplay of gender, comorbidities, and age on hospital length of stay in ICU delirium patients. Longer stays in men indicate a need for targeted interventions addressing gender-specific factors, possibly including alcohol withdrawal. The unexpected correlation between hypertension and shorter stays warrants further investigation into whether this is linked to medications like statins or antihypertensives. Shorter stays in older patients suggest potential differences in delirium presentation or recovery patterns. These insights can inform tailored approaches to improve outcomes in this vulnerable population while identifying areas for future research in ICU delirium management.





P110

Sucks the Life Out of You: Rare Complication of Multiple Enterotomies and Enteroatmospheric Fistulas from Abdominal Liposuction

Anne M Montal, MD; Savanna Duong, PA; Akilah Pratt, MD; Francis Baccay, MD; Montefiore Medical Center Albert Einstein College of Medicine

Here we report a case of multiple enterotomies after 360 abdominal liposuction at an outside hospital requiring multiple surgical interventions and a prolonged, ongoing, complicated hospital course, including the development of multiple enteroatmospheric fistulas (EAFs).

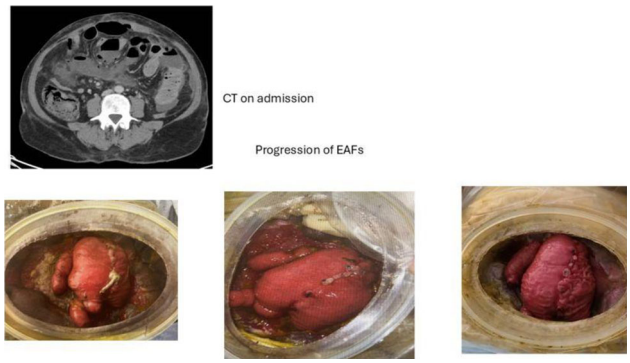
A 57F with a history of HIV presented ten days after undergoing abdominal liposuction with diffused abdominal pain, inability to tolerate PO, nausea, and vomiting. She was hemodynamically stable, with a leukocytosis of 33 and E coli bacteremia. Her abdomen was markedly distended and significantly tender. A CT scan demonstrated pneumoperitoneum and extensive complex ascites compatible with bowel perforation near the midline, where free air was contiguous with subcutaneous gas in the anterior abdominal wall. She was taken to the operating room (OR) emergently for an exploratory laparotomy, drainage of 1500 mL of succus, small bowel resection left in discontinuity, and abthera placement. She returned to the OR two days later for an additional small bowel resection, followed by a small bowel side-to-side anastomosis, component separation with Strattice graft, and drain placement three days later.

On POD11/9/6, brownish fluid was noted from the inferior aspect of her wound. A CT demonstrated a likely enterocutaneous fistula. Given clinical improvement, hemodynamic stability, normal WBC, previous three operations, and cocoon abdomen, the decision was made to attempt non-operative management with NPO, TPN, nasogastric tube, and octreotide. She returned to the OR on POD32/30/27 for an abdominal wound washout and skin excision.

Her hospital course was further complicated by multiple infections, including UTI, multiple episodes of bacteremia and fungemia requiring PICC line removal and replacement, +Stenotrophomonas respiratory cultures, multiloculated intraabdominal abscesses, abdominal wall hernias, superficial vein thrombosis, and EAFs with bowel adherent to granulating abdominal wall wound base diagnosed on POD60/58/55 requiring multiple take-backs to the operating room.

She's been admitted for close to 200 days for management of her high-output fistula and extensive wound care with the plan of returning to the operating room for EAF resections once her wound/EAFs mature and surrounding tissue becomes more pliable, making mobilization of small bowel and repair safer.

Abdominal liposuction is a commonly performed cosmetic procedure, and although complication rates are low, 0–10%, they can be deadly. The incidence of visceral perforation is $< 0.1\%$, but when it occurs, can have detrimental effects on the patient's physical and mental health. Awareness of these rare and morbid complications, in addition to a multidisciplinary approach, is imperative to implement appropriate intervention promptly and provide life-saving measures.



P111

A Case of Jejunal Diverticulitis with Pneumatosis Mimicking Perforation

Janet Lavrich, DO; Elizabeth Polsin, MD; Patrick Offner, MD; Sky Ridge Medical Center

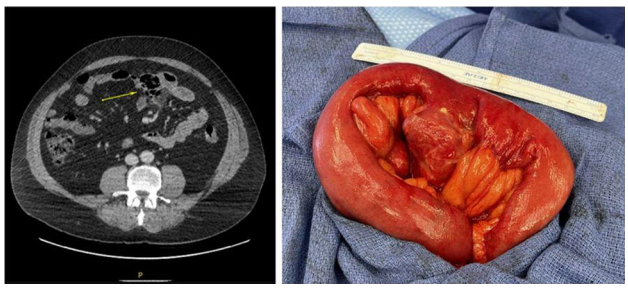
Introduction: Small bowel diverticulosis is a rare entity, with a prevalence of 0.1–2.3%. Although typically asymptomatic, complications such as diverticulitis, perforation, or hemorrhage occur in around 10% of cases (1). Due to its rarity, clinical presentation and management can vary significantly, making it a challenging condition to diagnose. The optimal treatment for jejunoileal diverticulitis is debated. Historically, surgical resection was standard, though conservative management has been described. This report presents a case of jejunal diverticulitis with suspected perforation, which was successfully managed surgically.

Case Presentation: A 54-year-old male with a history of anxiety presented with acute abdominal pain, fever, chills, and bloating. He was tachycardic while the remainder of his vital signs were normal. Laboratory workup was notable for WBC of $17.26 \times 10^3/\mu L$ and lactate of 3.2 mmol/L. Physical exam showed periumbilical tenderness without peritonitis. A contrast-enhanced CT scan revealed acute inflammation around a small bowel diverticulum with evidence of free air suggestive of perforation, prompting surgical exploration (Fig. 1).

The patient underwent an exploratory laparotomy. A 3 cm inflamed jejunal segment consistent with diverticulitis was identified without gross perforation. Surrounding pneumatosis was evident (Fig. 2). Approximately 8 cm of the affected small bowel was resected and a side-to-side, two-layer, hand-sewn anastomosis was performed.

The patient's postoperative course was uncomplicated, and he was discharged on day 7. Pathology confirmed jejunal diverticulitis with contained perforation within the mesentery and associated abscess formation.

Discussion: Small bowel diverticula, excluding Meckel's, are rare. Complications such as diverticulitis and perforation are even less common. While the exact etiology remains unclear, its presentation poses significant diagnostic challenges. Pneumatosis can mimic free air on CT imaging, which may lead to the mistaken assumption of perforation and unnecessary surgical intervention. Management of small bowel diverticulitis varies depending on the clinical presentation. Historically, surgical intervention was the standard treatment, but more recent reports suggest that non-operative management can be effective in select cases, especially when patients do not exhibit signs of generalized peritonitis or hemodynamic instability (2).
Conclusion: In this case, pneumatosis of the small bowel diverticulum and a contained perforation into the mesentery was mistaken for localized pneumoperitoneum on imaging. He did not have a frank perforation. Conservative management could have been considered. This case illustrates the necessity for careful imaging interpretation and individualized treatment strategies in managing small bowel diverticulitis.



P112

Growth of Robotics in Acute Care Surgery at an Academic Level 1 Center

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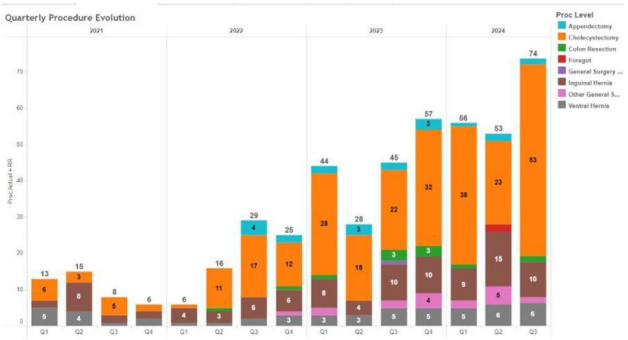
Introduction: Robotic surgery has been established to be safe and beneficial the elective setting, however little has been studied about robotic surgery in the acute setting. There are no established guidelines for the use or ideal patients in acute care surgery. A 24/7 robotic program gives surgeons and patients the opportunity to utilize robotic surgery in acute care surgery and is showing promise in a broader application.
Methods and Procedures: All Robotic surgery cases performed by an academic Acute Care Surgery Group was reviewed over a 30-month period from January 2022 to July 2024. The Types of surgeries completed were recorded.
Results: In this 30-month period there was a consistent increase in the utilization of robotic surgery in the emergent setting. A total of 359 cases were completed. The most frequently performed operation was robotic cholecystectomy ($n = 207$) followed by robotic inguinal hernia repair ($n = 75$).
Conclusions: Robotic surgery is a tool that should be used by acute care surgeons in the emergent setting. More work is needed to determine it's benefit in specific situations. As robotic utilization in acute care surgery continues to grow, outcomes data and experience should steer future guidelines and applications in this area.



P113

Campylobacter-Induced Intussusception in an Adult: A Rare Case Report

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Intussusception occurs when one segment of the bowel telescopes into an adjacent segment, resulting in complications such as bowel obstruction, bowel necrosis, and ischemia. It is more common in the pediatric population and uncommon in adults, but when present, it is likely due to a pathological lead point such as neoplasm and is rarely infectious, as seen in pediatrics. Herein, we add a rare case to the limited literature on infection-related enteritis and adult intussusception. A 40-year-old woman presented with three-day history of lower abdominal pain, mucoid diarrhea, and intractable emesis with only past medical and surgical history of remote laparoscopic cholecystectomy. Abdominal computerized tomography showed a 7 cm long segment of small bowel into small bowel telescoping suggestive of intussusception in the left mid abdomen with mild proximal dilation. On exam, she was tachycardic with mild leukocytosis and diffuse abdominal tenderness. Given high suspicion for enteric intussusception, the patient underwent a diagnostic laparoscopy which revealed an area of dilated small bowel that was the likely involved segment. A Meckel's diverticulum was incidentally noted that was not inflamed and quite distal to the involved small bowel. No other abnormalities were noted. No resection was performed as no compromised bowel or masses were noted. Stool studies performed during admission showed many white blood cells and stool culture later resulted as campylobacter jejuni. Post-operatively, ultimately left against medical advice on post-operative day 1 but she did return several months later with similar symptoms. Imaging showed thickened dilated small bowel loops in the left hemiabdomen and was later found to have Neisseria gonorrhoeae, which was treated appropriately. Adult intussusception is an infrequent and challenging condition, with extremely few reported cases of infection-related etiologies. Though no universal consensus exists on the approach to adult intussusception, surgical exploration is largely pursued and often necessary for definitive treatment. Although colonic intussusception often requires en bloc resection given the high rate of associated malignancy, enteric intussusception may be managed with a more selective approach, especially in younger patients and incidental, transient cases. Current controversy remains, however, on the extent of resection versus reduction of the intussusception but there is a paucity of data and reports on intussusception secondary to infectious etiologies in adults.

P114

Can Appendectomies Be Safely Delayed? An Updated Systematic Review and Meta-analysis Comparing Emergent vs Delayed Appendectomy in Adult and Pediatric Patients

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Background: Appendicitis has traditionally been managed with urgent surgery. Due to operative room and logistic constraints, surgery may be delayed. Evidence on the impact of this delay remains equivocal. The aim of this systematic review and meta-analysis is to assess postoperative outcomes of delayed appendectomy among both pediatric and adult populations.
Methods: A systematic review and meta-analysis was performed including all studies comparing cohorts of urgent vs delayed appendectomy, excluding those with interval appendectomy. Studies were included as long as one relevant postoperative complication was mentioned. A comprehensive search of Ovid MEDLINE, Ovid Embase, Scopus, Web of Science Core Collection, and Cochrane Library was performed on January 15, 2024. A meta-analysis with a random effects model and restricted maximum likelihood was used.
Results: Of 11,227 citations, five prospective adult studies and 19 pediatric studies were included. Definitions of early surgery cohorts were surgery < 4–12 h or overnight and delayed surgery > 4–12 h or next day. Adult studies were composed of two RCTs and three prospective cohorts, consisting of 4250 patients. The mean age was 36.81 ± 15.19. The results revealed no statistically significant difference in the incidence of intraoperative perforation between the delayed and emergent appendectomy groups (OR 1.57, 95% CI 0.93–2.61, $p = 0.09$), abscess (OR 1.54, 95% CI 0.58–4.10, **p** = 0.39), surgical site infection (SSI, OR 1.35, 95% CI 0.71–2.56, $p = 0.36$), or conversion to open (OR 0.81, 95% CI 0.64–1.03, $p = 0.09$) between the groups. The pediatric meta-analysis included 827,019 patients (mean age 11.85 ± 4.15). There was no increased risk of intraoperative perforation in delayed versus emergent cohorts (OR 1.16, 95% CI 0.78–1.72, $p = 0.44$). No significant changes were noted in the secondary outcomes of hospital LOS (mean diff. in days 1.24, 95% CI [− 0.33]–2.80, $p = 0.12$), abscess (OR 0.80, 95% CI 0.29–2.25, $p = 0.68$), SSI (OR 1.11, 95% CI 0.93–1.30, $p = 0.24$) or readmission (OR 0.82, 95% CI 0.55–1.21, $p = 0.32$).
Conclusions: There were no differences in postoperative outcomes in the urgent versus delayed appendectomy groups. These findings suggest that a modest delay in inpatient appendectomy is permissible in pediatric and adult patients presenting with acute appendicitis. While this does not replace surgeon clinical acumen, it may help guide decision making in resource-constrained settings.

P115

Rare Perforation of Jejunal Diverticulum: A Case Report and Surgical Management in an Octogenarian

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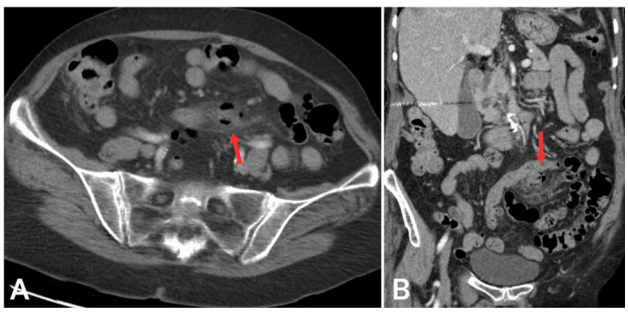
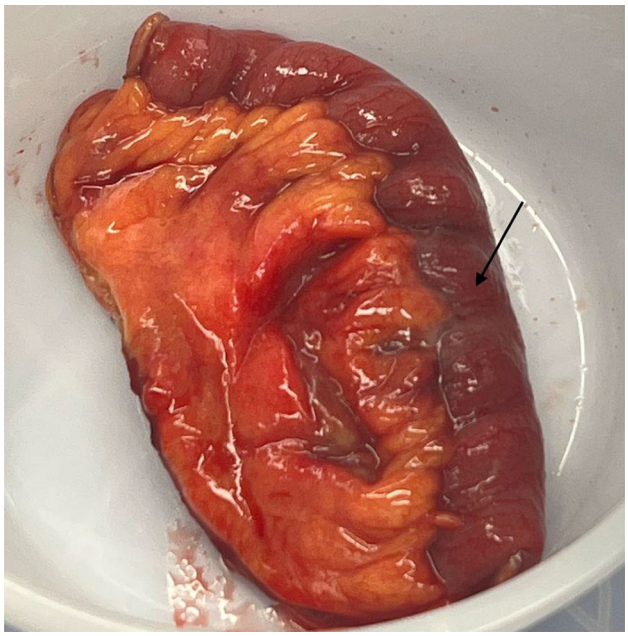
Introduction: Jejunal diverticulum is a rare pathology, representing the least commonly encountered type of diverticula involving the small bowel. Initially, the condition is clinically silent, although it may eventually cause nonspecific symptoms such as chronic abdominal pain and malabsorption. Acutely, it may present with hemorrhage, small bowel obstruction, or peritonitis. Implementing upper gastrointestinal contrast series with small bowel follow-through aids in diagnosis; however, laparotomy is necessary to confirm the diagnosis. The condition is rarely complicated by bowel perforation, occurring only in 2.3–6.4% of cases.
Methods and Procedures: An 84-year-old female with a history of diverticulitis presented with worsening left lower quadrant abdominal pain for two days, associated with nausea and decreased appetite. Initially, she was nontoxic, in no acute distress, and afebrile. Her abdomen was soft, with mild left lower quadrant tenderness, but no peritonitis. A CT scan with contrast revealed a thickened loop of small bowel with inflammatory changes and a focus of air in the adjacent mesentery suggesting focal perforation (Fig. 1). Overnight, her abdominal exam worsened, and she was taken for an exploratory laparotomy.

Figure 1



Results: The small bowel was inspected, revealing a perforated jejunal diverticulum 60 cm distal from the ligament of Treitz. We performed a 13 cm resection with a side-to-side isoperistaltic jejunum anastomosis imbricated with 3-0 Vicryl and a crotch suture. Pathology reported erythematous and congested bowel serosa. The perforated diverticulum, 4 cm from the staple line, led to inflamed, hemorrhagic adipose tissue with a small mesenteric abscess (Fig. 2). Despite persistent nausea, she recovered well, with bowel function returning on post-op day four and her diet appropriately advanced. Antibiotics were discontinued on post-op day five. The patient was discharged without complications and scheduled for a two-week follow-up.

Figure 2



Conclusions: Although jejunal diverticulum is a rare diagnosis it has the potential for life-threatening complications. The limited number of reported cases of jejunal diverticulum presenting with perforation highlights the need for increased awareness of this complication. Given its nonspecific presentation, diagnosis can be challenging and is often delayed, further increasing its morbidity and mortality. In patients presenting with an acute abdomen, perforated jejunum diverticulum should be included in the differential diagnosis particularly when colonic diverticulosis coexists. In cases requiring surgical intervention, resection of the involved bowel segments remains the preferred treatment.

P116

Propofol - Induced Anaphylaxis, A Rare Entity With a Misleading Presentation

Maryam Hassanesfahani, MD; Alexander Schaal; Jose Lopez; Martine A. Louis; Michelle Evans; Noman Khan; Flushing Hospital Medical Center

Introduction: In modern medicine, propofol is used extensively as one of the safest medications, with its ease of induction, and rapid recovery for both surgical interventions and outpatient procedures. Here we are reporting a rare case of anaphylactic reaction to propofol in a patient during a colonoscopy.
Case Presentation: A 66-year-old male with a past medical history of hypertension but not on any medication became desaturated during a screening colonoscopy. Oxygen support with an ambo-bag and face mask was initiated. He gradually became somnolent, with blood pressure (BP) of 80/55, heart rate (HR) of 130, with severe abdominal distention. The impression was colon perforation and given worsening respiratory distress, an endotracheal tube was placed. Two liters of normal saline and antibiotics were given. However, CXR showed no intraabdominal free air which subsequently was confirmed by abdominal CT scan. Meantime the chest CT revealed the tip of the endotracheal tube in the larynx. multiple attempts to reposition the tube were unsuccessful due to severe airway narrowing. At this time, the patient developed significant head and neck edema including lips, eyelids, and neck associated with cardiopulmonary collapse with BP: 70/40, HR:140, O2sat:70. Intramuscular epinephrine and Solu-Medrol were given. Bag mask ventilation was initiated and eventually, a surgical airway (cricothyroidotomy) was performed to secure the airway. After recovery, both intradermal and pin-prick tests showed positive response to propofol. He was discharged after decannulation of the tracheostomy without any issues.
Discussion: The new formulation of propofol is considered a safe medication with a very low risk of causing allergic reactions [1,2]. However, if there are any concerns certain serological tests such as serum tryptase, skin prick test, or intra-dermal injection should be considered to guide diagnosis [3,4].
Treatment is similar to any anaphylactic reaction in which epinephrine, intravascular bolus of fluid, and steroids should be given [5].

We believe the prolonged face mask ventilation led to the significant abdominal distention which misled our initial diagnosis toward colon perforation rather than anaphylaxis. The history of an enlarged thyroid gland with a 2.5 cm thyroid nodule along with ongoing severe angioedema made cricothyroidotomy even more challenging. Therefore, it is very important to be aware of the possibility of propofol-induced anaphylaxis to avoid these consequences.
Conclusion: Anaphylaxis secondary to propofol is very rare but still exists which means both anesthesiologists and surgeons should keep it as part of their differential diagnosis.

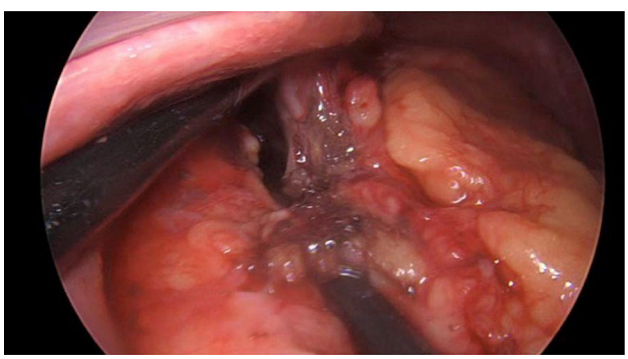
P117

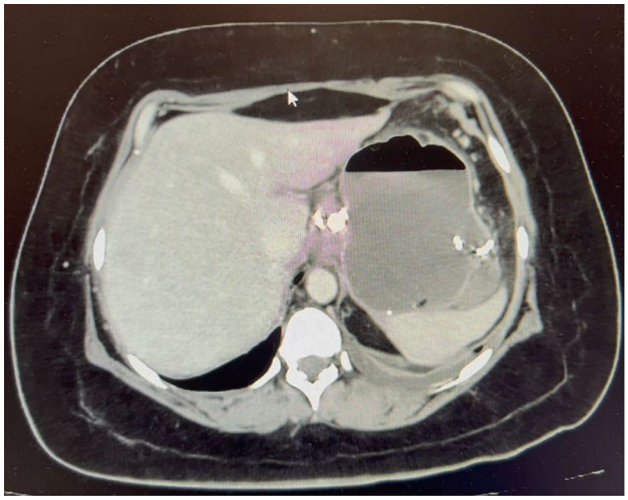
Saturday Night Fever: Management of Postoperative Peritonitis After Sleeve in a Highly Unstable Patient: A Life-Saving procedure using the Maestro System from Moon Surgical

Henry Mercoli, MD, MBA[1]; Marius Nedelcu, MD[2]; Benjamin Cadiere, MD[3]; [1]PFC - ELSAN; [2]Bouchard - ELSAN; [3]Arnault Tzanck Institute

Background: Emergency surgeries often involve significant challenges, especially when compounded by factors such as staff shortages, limited team experience, and critically unstable patients. Laparoscopic procedures in these settings require rapid decision-making, steady visualization, and effective organ exposure in a hostile abdominal cavity. This case report details the successful use of the Maestro robotic platform in a high-risk emergency surgery, demonstrating its effectiveness in enhancing surgical performance under suboptimal conditions.
Case Description: A 46-year-old female patient (BMI 42) underwent a primary laparoscopic sleeve gastrectomy in a day surgery setting. She was readmitted 8 days later with tachycardia and abdominal pain. A CT scan revealed a gastric leak with a 6 × 8 cm abscess along the staple line. Initial management with endoscopic placement of two pigtail drains was attempted; however, the patient's condition deteriorated rapidly within 36 h, leading to sepsis and tachypnea. A follow-up CT scan showed expansion of the abscess to 12 × 10 × 5 cm, necessitating urgent surgical intervention.
Upon transfer to the operating room, the patient's condition was critical, marked by severe respiratory distress, complete left atelectasis, and severe sepsis. The urgency of the situation was exacerbated by an inexperienced surgical team due to on-call staffing constraints. The Maestro robotic platform was employed to assist in the laparoscopic management, maintaining consistent visualization and exposure while allowing the surgical assistant to focus on high-priority tasks, such as suction and surgical instrumentation.

Results: The emergency laparoscopic procedure was successfully completed within 15 min, under 8 mmHg pneumoperitoneum maximum pressure, with no intraoperative complications. The Maestro Platform provided stable visualization and effective retraction, enabling the surgeon to drain this huge abscess and perform complex maneuvers swiftly and efficiently despite the challenging conditions. Postoperative recovery was long and marked by nutritional and respiratory issues, and she was discharged on postoperative day 23.
Conclusion: This case illustrates the critical role that the Maestro robotic platform can play in managing complex surgical emergencies. In an environment with limited staff expertise and high patient instability, the system's ability to ensure steady visualization and free up surgical personnel for essential tasks proved invaluable. The use of the Maestro Platform demonstrates its potential to enhance surgical performance and improve outcomes in emergency settings where time and resources are constrained. Further studies are warranted to validate these findings across broader emergency scenarios.





P118

Use of ICG DYE in NIR Imaging for Stump Appendicitis -A Novel Way of Treating Stump Appendicitis

Prashant Rahate, Dr; Nachiket Rahate, Dr; Seven Star Hospital, Nagpur, India

The incidence of stump appendicitis has increased after the advent of laparoscopy. Operating stump appendicitis can be challenging due to adhesions. All patients are subjected to CECT of the abdomen to confirm stump appendicitis. all patients' colonoscopic cannulation of the cecal meatus of the appendix is done after good bowel preparation. ICG dye is instilled in the stump lumen. Colonoscopy is done by CO2 insufflation, to save repeat OT visits of patients. Laparoscopy is done, Stump is illuminated in NIR imaging. identification of stump becomes very easy. Due to ease in the detection of the stump, operative time decreases, less tissue dissection and early discharge, and early recovery occurs. This simple manure helps a lot at multiple level

P119

Synchronous Acute Cholecystitis and Acute Appendicitis

Julianne E Pilla, MD; Devika R Soin, DO; Tanner J Wright, MD; Eric Y Luo, MD; George T Chapa, DO; Hussam Kudsi, MD; Nazareth Hospital

Synchronous cholecystitis and appendicitis is a rare entity. Laparoscopy is the main stay of the treatment of these disease processes separately but it is important to consider and prepare for an applicable laparoscopic approach that allows for both procedures should the patient require simultaneous cholecystectomy and appendectomy. This case describes a successful laparoscopic approach utilized in a case of synchronous acute cholecystitis and acute appendicitis.

P120

Fishing For Answers: An Uncommon Cause of a Gastric Perforation

Tara Ranjbar, MD[1]; Kiara Singer, DO[1]; Valentina Lara Erazo, MD[1]; Kyungseo Yoon, MD[1]; Calista Kee, BS[2]; Ricky Lovell, BS[2]; Rachel Tran, MD[1]; Matthew Baker, DO[1]; Indraneil Mukherjee, MD[1]; Parth Patel, MD[1]; [1]Northwell Health Staten Island University Hospital; [2]CUNY School of Medicine

Gastric perforation is a potentially life-threatening condition where a breach in the stomach wall allows its contents to leak into the abdominal cavity, leading to complications like peritonitis. While peptic ulcer disease is the most common cause, perforation can also result from trauma, malignancy, or the ingestion of foreign bodies. In rare cases, sharp objects such as fish bones can penetrate the gastrointestinal tract, causing perforation, particularly in regions with high fish consumption. Prompt diagnosis and surgical intervention are crucial to prevent severe outcomes.

A 24-year-old male with no prior medical history presented with progressively worsening epigastric pain following his last oral intake two days prior. The patient denied any recent ingestion of foreign bodies or fish (none for over a month). A CT scan revealed a 2.5 cm linear dense structure along the lesser curvature of the stomach, accompanied by fat stranding and inflammation, raising concerns for a foreign body and gastric perforation.

The patient underwent diagnostic laparoscopy, which revealed a 3 cm foreign body lodged within an abscess cavity in the left lobe of the liver, likely originating from the stomach. After the foreign body was removed and the abdomen was irrigated, endoscopy revealed no obvious perforations and a negative endoscopic leak test. It was concluded that the perforation had spontaneously sealed. Two Jackson-Pratt drains were placed: one beneath the stomach and the other between the stomach and liver.

The patient had an uneventful recovery and was discharged on postoperative day 3 after drain removal. He tolerated his diet and demonstrated return of bowel function. This case signifies the importance of early diagnosis and timely surgical management to prevent severe complications in cases of foreign body-induced gastric perforation.

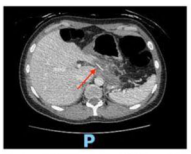


Figure 1: CT A/P identifying a 2.5 cm linear dense structure seen by red arrow along the lesser curvature of the stomach, accompanied by fat stranding and inflammation, raising concerns for a foreign body and gastric perforation

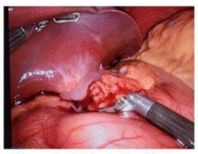


Figure 2: Fish bone identified intraoperative originating from the posterior stomach and lodged into the liver

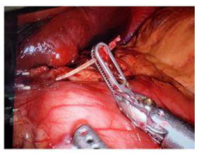


Figure 3: Fish bone after removing it from its lodged site

P121

Unmasking Acute Gastric Distension: A Rare Case of Complicated Stomach Enlargement in an Elderly Patient

Calista Kee, BS[1]; Tara Ranjbar, MD[2]; Katerina Jou, MD[2]; Yaathika Challapalli, BS[1]; Indraneil Mukherjee[2]; Jonathan Schor, MD[2]; [1]CUNY School of Medicine; [2]Staten Island University Hospital Northwell Health

Introduction: Acute gastric distension (AGD), while still lacking a clear clinical definition, generally describes a rare condition with an enlarged stomach spanning the entire of the abdomen filled with gas/fluid on abdominal imaging. The cause of obstruction is typically non-mechanical by factors such as strictures, volvulus, eating disorders, or gastroparesis. Mechanical obstruction, either luminal from gastric cancer or extra luminal from liver/pancreatic tumors, are slow in progression and rarely cause AGD. This condition tends to be overlooked by physicians due to a need for more awareness regarding both the condition itself and its severity. The stomach has a rich vascular supply boasting several different arteries derived from the celiac trunk, but in AGD, this vascular supply could become compromised from over distention leading to ischemia or perforation occurs.

Case: We present the case of an 88-year-old man with a PMH of CAD, PVD, carotid arteriosclerosis, prior CVA, and hospitalization a year ago for abdominal pain who came in complaining of acute gastric pain and distention. He was promptly treated with a Nasogastric tube. Work up showed an extremely distended stomach with no apparent cause. CT was otherwise normal. EGD was normal. Labs and vitals were normal. On detailed history, he had a similar episode 2 months ago at an outside facility. He has been gradually deteriorating in both mental and physical health with decrease in cognition and mobility.

As he improved, the NG tube was removed. He was able to tolerate food and has been doing well without any readmission for the same issue. He was treated with a low residue diet and Xifaxan trial with follow up as needed. After a month, his abdominal pain and diarrhea has become intermittent and improved since it was in the past and will be evaluated to if his symptoms improve at his next follow-up appointment.

Conclusion: Early diagnosis of AGD through plain abdominal radiographs or CT of the abdomen is key to treating this condition, as could reveal the acutely dilated stomach as well as any potential obstruction sites. This should be immediately followed with the use of a nasogastric tube to alleviate the compressed stomach. Patients should receive adjunct PPI therapy and continue with follow-up after this procedure, as late complications such as bleeding and perforation could occur. Surgical exploration should be employed, especially in patients presenting with ischemia and obstruction, but, the technique varies with the severity of cases.

Figure 1: Distended stomach

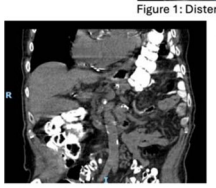


Figure 2: After decompression with NG tube

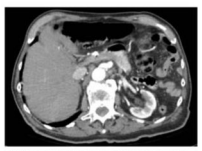


Figure 3: After 6-month follow up

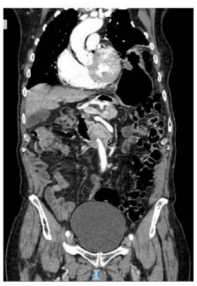


Figure 4: 18-month follow up

P122

Cholecystocolonic Fistula: Large Bowel Obstruction Secondary to Impacted Intraluminal Gallstone in Sigmoid Colon

Lauren Bishop, MD[1]; Judy Wong, MD[1]; Dmitriy Kim, DO, FACS[1]; Pedro Cordero, MD[2]; [1]St. John's Episcopal Hospital; [2]RWJ Barnabas Trinitas Regional Medical Center

Introduction: Gallstone ileus occurs in 0.3–0.5% of patients with cholecystitis and causes intestinal obstruction in less than 1% of patients. Most commonly this occurs secondary to cholecystitis with a large gallstone > 2 cm preceding formation of bilioenteric fistula to the duodenum, stomach, or colon. However, there are few published case reports describing symptomatic cholecystocolonic fistulas.
Case Presentation: In this case, an 88 year old female presented with worsening generalized abdominal pain for 5 days with constipation with decreased frequency of flatus. Patient was tachycardic and normotensive. Abdomen soft, diffuse abdominal tenderness, mild distention with high pitch bowel sounds on auscultation and tympanic to percussion. Leukocytosis 13.9, normal liver function enzymes. CT Abdomen/Pelvis demonstrated a moderate amount of intrahepatic and extrahepatic pneumobilia, gallbladder fossa with inflammatory stranding and outpouching of the proximal transverse colon consistent with fistulization of the gallbladder to the transverse colon. The small bowel and colon was diffusely distended, containing large amounts of stool and gas with collapse of distal sigmoid colon. At the junction of the descending colon and sigmoid colon with ischemic changes, there was a large intraluminal oval shaped filling defect within peripheral calcifications measuring up to 7 cm.
Due to patient's presentation, age, and distended loops of bowel, the patient was taken for exploratory laparotomy, resection of sigmoid colon containing the intraluminal obstruction, and end colostomy creation. Pathology resulted with sigmoid colon with gallstone measuring 9×5 cm gray brown black ovoid stone.
Conclusion: In this case, a large gallstone became impacted in the sigmoid colon after fistulization to the transverse colon. The site of obstruction secondary to the large size of the gallstone stone also showed necrosis of the bowel wall requiring resection of the affected segment. The direct cholecystocolonic fistula to the transverse colon was left alone.
Discussion: On literature search, case reports on cholecystocolonic fistulas were usually incidentally found during cholecystectomies. When symptomatic, patients presented with chronic diarrhea, pneumobilia, or obstruction. Therefore it is important to identify sources for large bowel obstruction including rare instances of gallstone eroding and lodging into the colon as a possible risk for bowel perforation and peritonitis.

P123

Unraveling the Complexity: Insights into Appendiceal Goblet Cell Carcinoid Management and Survival Outcomes

Abdul Waheed[1]; Abdul Q Yasinzai, MD[2]; Asad Ullah[3]; Najiha Farooqi, MD, FACS[4]; Richard Hodges, MD, FACS[1]; Kirandeep Bains, MD[5]; Feroze Sidhwa, MD, FACS[5]; Subhasis Misra, MD, FACS[1]; [1]Saint Joseph Hospital Tampa, Florida; [2]university of Florida Health Cancer Center Gainesville, Florida; [3]Texas Tech University Health Science Center, Texas; [4]Trauma and Critical Care, Stanford University Hospital, California; [5]San Joaquin General Hospital, French Camp, California

Background: Appendiceal goblet cell carcinoid (GCC) represents a rare and diagnostically challenging entity within the spectrum of appendiceal neoplasms. Combining features of both adenocarcinoma and carcinoid tumors, GCCs pose unique clinical dilemmas regarding their optimal management. Despite their infrequency, their clinical significance is underscored by their potential for aggressive behavior and propensity for metastasis. The intricate histopathological characteristics of GCCs, characterized by goblet cell morphology amidst neuroendocrine differentiation, further complicate their diagnosis and therapeutic approach. The current study examines the epidemiological, clinical, and survival factors of a large cohort of GCSs to understand this rare clinical entity better.
Methods: Surveillance, Epidemiology, and End Results (SEER) database was queried for patients with pathologically confirmed GCSs from 2011 to 2020. Cox proportional hazards regression analysis was performed to assess factors influencing overall survival.
Results: A total of 1752 cases were identified, with a gender distribution consisting of 51.3% males (899 patients) and 48.7% females (853 patients). Most patients were diagnosed after the 6th decade of life and belonged to Caucasian ethnicity (81.6%). When data regarding tumor staging was available, 41.6% (728 cases) were diagnosed at the localized stage, 25.0% (438 cases) at the regional stage, 13.2% (231 cases) at the distant stage, 20.2 (355) were unstaged. The majority of tumors were moderately differentiated (54.3%), followed by poorly differentiated (28.1%) and well-differentiated (17.6%). Surgical resection was the primary treatment modality, with 60% of patients undergoing appendectomy or more extensive surgical procedures for tumor removal. Chemotherapy was administered to 30% of patients, typically in combination with surgery for advanced or metastatic disease. Radiation therapy was utilized in 20% of cases, often as adjuvant therapy following surgery or for palliative purposes. The mean survival duration was 69.57 months, with a median survival of 54 months. Regional spread and distant stage are negative predictors of survival ($p < 0.01$), while surgery is a positive predictor ($p < 0.01$).
Conclusion: The study underscores the complexity of treating appendiceal goblet cell carcinoid, highlighting the central role of surgery and acknowledging the contributions of chemotherapy, radiation therapy, and combined treatments to patient outcomes. The findings advocate for a multidisciplinary approach tailored to individual patient characteristics, tumor biology, and disease stage. Future research should investigate optimizing treatment combinations and population's survival.

Tabel 1: Clinical Data of 1,752 patients with Appendiceal Goblet cell Carcinoid

Feature	Data
Total Cases	1,752
Demographics, (%; N)	
Gender Distribution	51.3% males (899 patients), 48.7% females (853 patients)
Mean age of Diagnosis	6th decade
Ethnicity	81.6% Caucasian
Tumor Stage, (%; N)	
Tumor Stage - Localized	41.6% (728 cases)
Tumor Stage - Regional	25.0% (438 cases)
Tumor Stage - Distant	13.2% (231 cases)
Tumor Stage - Unstaged	20.2% (355 cases)
Tumor Grade, (%)	
Differentiation - Moderately	54.3%
Differentiation - Poorly	28.1%
Differentiation - Well	17.6%
Treatment, **(%)**	
Treatment - Surgical Resection	60% underwent appendectomy or more
Treatment - Chemotherapy	Administered to 30% of patients
Treatment - Radiation Therapy	Utilized in 20% of cases
Survival Data	
Mean Survival Duration	69.57 months
Median Survival	54 months
Survival Predictors	Negative Predictor: Regional spread and distant stage Positive predictor: Surgery

Abbreviation: %= Percentage, N; Numbers

P124

Process Measures in the Emergency Surgical Service: Which Factors are Most Relevant to Improving Survival?

Chloe Wong; Brian Dobbins; Mohammed Eid; Sarah Abdelbar; Ahmed Boalot; Musab Mohammed; Arin K Saha; Soutrik Basu; Huddersfield Royal Infirmary

Background: In the United Kingdom, there is a mandatory registry for emergency laparotomies called the National Emergency Laparotomy Audit (NELA). Within this database (which has been running for almost a decade), all hospitals should enter data for all emergency laparotomies. Several data fields are included; some are related to the patient and others are related to service provision, such as case ascertainment, consultant involvement and post-operative transfer to intensive care.

Every year, the NELA Study Group produces a summary report which describes mortality for each hospital and how well they perform with regard to process measures. However, the study group has never described which of these process measures are important and whether any of them influence mortality.

Methods: The summary data sheet from the Eighth Year NELA Report (nela.org.uk/reports) was downloaded and analysed. Hospitals were grouped into 'low mortality' (lower than the national average) and 'high mortality'. The NELA study group categorises all processes measures using a RAG rating system; any measure where fewer than 55% of patients have achieved that standard are assessed as 'Red'. For this study, all process measures were grouped into Red (< 55%) or Amber/Green (> 55%).

Chi-squared tests were used to assess which process measures were associated with low mortality hospitals.

Results: There were 21,710 cases on the NELA database in the Eighth Year Report. The national adjusted mortality rate was 9.03% which varied from 2.5 to 18.4%. There was wide variability between hospitals in success in achieving various process measures; for example, the proportion of patients who had a CT reported before surgery ranged from 30 to 100% and the proportion of patients who went to ICU ranged from 36 to 100%.

There were no associations between any process measure and low mortality hospitals. The only recorded variables that had any association with low mortality hospitals were unplanned return to theatre (proportion of patients with an unplanned return to theatre of > 5%, 37% vs. 58%, $P = 0.009$) and unplanned transfer to critical care.

Conclusions: Despite almost a decade of data collection, the NELA study group have been unable to find any process measures which should be focussed on to reduce mortality after emergency laparotomy. The only variables that are associated with lower mortality are unplanned return to theatre and unplanned transfer to critical care, which suggests that high-quality surgery and initial post-operative management in ICU should be targeted by all hospitals to improve outcomes.

P125

Minimally Invasive Extraction of Migrating Biliary Stent: A Case Report

Elizabeth Polsin, MD[1]; Harry Kranichfeld, DO[1]; Janet Lavrich, DO[1]; Kasey Pickard, MD[1]; Hussein Al Ogaidi[2]; Naveed Ismail, MD[1]; [1]Sky Ridge Medical Center; [2]Rocky Vista University

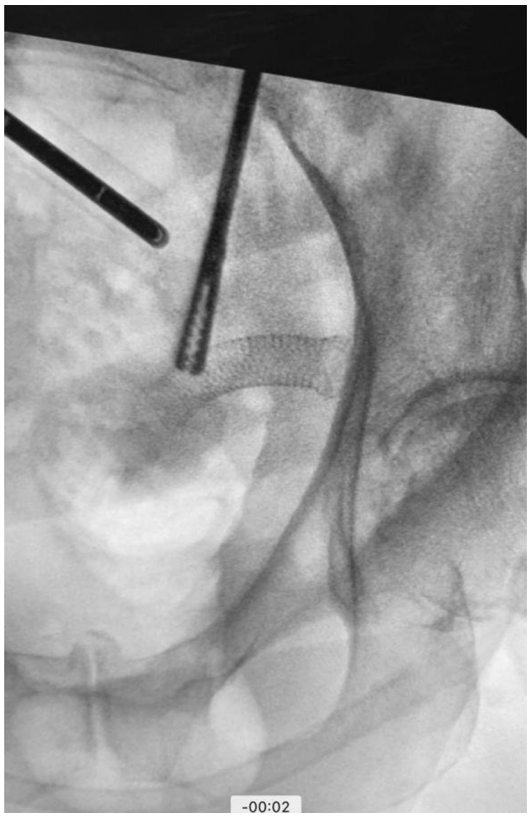
Endoscopic biliary stent placement is a widely utilized approach in the relief of biliary strictures caused by benign and malignant biliary tree pathologies. In patients with periampullary tumors, stenting can relieve symptoms of cholestasis, treat cholangitis, and allow for further optimization of medical status prior to or instead of chemoradiation and surgical therapies. Adverse events reported with ERCP-guided biliary stent placement are well-described in the literature and may be ERCP- or stent-related in nature. Sporadic cases of endo-biliary stent displacement have been reported, with some studies showing displacement and migration rates of up to 8.4% [1]. Here we present a case of an elderly female presenting with partial small bowel obstruction secondary to biliary stent migration.

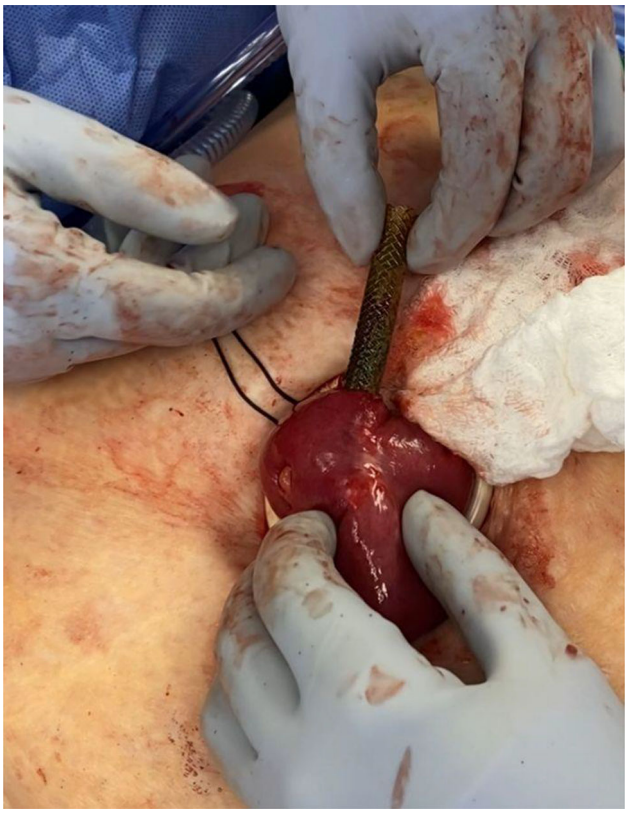
An 89 year old female with history of pulmonary fibrosis and atrial fibrillation, cholangitis, and periampullary duodenal adenoma with metal common bile duct stent exchanged three months prior presented to the emergency department with abdominal pain. She was found to have a partial small bowel obstruction secondary to a migrated biliary stent lodged in the mid small bowel (Fig. 1). After discussion with GI colleagues, we attempted non-operative management with the hopes the stent would pass spontaneously. However, after 4 days of no progression on serial KUB, we discussed surgical intervention.

She underwent a laparoscopic assisted stent removal. We used intraoperative fluoroscopy to confirm the location of the stent prior to exteriorizing a loop of small bowel. An enterotomy was made and the stent was removed intact (Figs. 2 and 3). The enterotomy was closed in two-layers and the bowel returned to the abdomen. Interestingly, the stent was lodged at a prior small bowel anastomosis which the patient was unaware she had. She developed a hematoma at the umbilical port site which required opening of the incision, but otherwise progressed well post-operatively. She will have a new metal biliary stent placed as an outpatient.

This case demonstrates a minimally invasive approach to removal of an iatrogenic foreign body causing bowel obstruction. Dislodged biliary stents may pass spontaneously, however our patient had a prior small bowel anastomosis and the stent was stuck at that location preventing stent passage. Surgical bowel resection and endoscopic retrieval of migrated biliary stents have been described [1, 2, 3] however fluoroscopic-laparoscopic localization and enterotomy is a novel approach. Our patient underwent laparoscopic surgical

intervention without bowel resection, preserving anatomic integrity in an otherwise chronically ill patient.





P126

Is Early Primary Anastomosis Feasible in Patients With an Open Abdomen?

Stephen Wonnacott, MSc[1]; David Seok, MD[2]; Grant Schroeder, BSc[1]; Issa Fakhouri, MSc[1]; Michael Jacobs, MD[2]; [1]American University of the Caribbean School of Medicine; [2]Ascension Providence Hospitals, Southfield Campus

Introduction: Damage control surgery for mesenteric ischemia and trauma usually requires small bowel resection with delayed abdominal fascial closure. This affords the surgeon to re-examine the small bowel and perform an anastomosis prior to closure. Small bowel anastomosis during the index procedure may be safe and lead to early abdominal closure in select patients. The study aims to compare abdominal closure times and the safety of patients undergoing primary anastomosis (PA) during index operation versus small bowel resection only (SBRO).
Methods: We present a retrospective analysis of patients who have undergone damage control surgery with small bowel resection during July 1, 2009 to Sept 1, 2024 at a community-based academic hospital by a single-surgeon. Surgical pathologies related to colonic diverticular disease were excluded from the study. Those who had PA during index operation were compared with the group with SBRO. The primary outcome measured was time to abdominal closure. Secondary outcomes measured were all complications (cardiovascular, pulmonary and renal morbidities) and mortality within 30 days.
Results: A total of 16 patients were identified, with 8 undergoing PA at the index operation and 7 with SBRO. PA was associated with faster closure of the abdomen (57 versus 110 h), though there was no statistically significant difference ($p = 0.281$). Additionally, there was

no statistical difference between groups for overall complications within 30 days ($p = 0.714$) and mortality within 30 days ($p = 0.268$). **Discussion:** Primary anastomosis during index operation for damage control when feasible may be technically easier, because there is less bowel edema related to aggressive resuscitation. As a retrospective study, selection bias for which patients undergoing PA could not be accounted for. Further analysis of patient characteristics will elucidate patients where PA may be appropriate even if they are on vasopressor therapy. Though performing a primary anastomosis during index operation for damage control with an open abdomen, may go against surgical dogma, it can lead to safe and early closure in select patients.

Table 1 Comparison of patients undergoing primary anastomosis (PA) and small bowel resection only (SBRO) during index procedure for damage control surgery

Characteristic	PA	SBRO
Gender		
Female(%)	2(13)	4(27)
Male(%)	6(40)	3(20)
Complications within 30 days		
No(%)		
Yes(%)		
Mortality within 30 days		
No(%)		

P127

Spotting of a Amebic Liver Abscess in the United States

Kirandeep K Bains, MD, MS; Bidisha Nag, MD; Danielle Berera, MD; San Joaquin General Hospital

Amebic liver abscess represents a common extraintestinal manifestation of Entamoeba histolytica infection, particularly prevalent in developing countries of South America and Asia and not commonly seen in the United States, where it makes up less than 10% of all liver abscess. After fecal-oral transmission, the protozoan colonizes the gastrointestinal (GI) tract and gains access to the liver via the superior mesenteric vein and subsequently the portal vein. Symptoms typically manifest approximately 4 weeks after exposure and encompass a spectrum of GI symptoms including mild to severe right upper quadrant pain, accompanied by constitutional symptoms such as fatigue, anorexia, weight loss, and fever. Diagnostic evaluation and management of amebic liver abscess a proper history and physical, imaging, serological testing, pharmacotherapy with agents such as metronidazole, and potentially drainage procedures. Herein, is a case of a 42-year-old man who presented with 4 months of worsening right upper quadrant pain with anorexia and 7–10 kg of unintentional weight loss. History was significant for alcohol consumption and recent migration from India to Argentina and now to the United States. Work-up showed mild leukocytosis of 12.6, isolated elevated alkaline phosphatase at 408 IU/L and imaging showing 12.6 × 16 cm hypodense lesion in the dome of the right hepatic lobe with cystic features surrounded by hypoattenuated hepatic parenchyma. Given his travel history, isolated elevated alkaline phosphatase, RUQ pain in a setting of a liver abscess, suspicion for an amoebic liver abscess rather than a pyogenic was high, therefore serologies were collected and patient was started on Metronidazole. Furthermore, since the abscess was larger than 5 cm and at the dome of the right lobe, there was increased risk of rupture, particularly into the right pleural space, therefore CT-guided drain was placed which removed thick, grey material resembling anchovy paste, further confirming the diagnosis. Once intial serology resulted it confirmed our diagnosis of amoebic liver abscess with it being positive for E. histolytica. Although an uncommon cause of liver abscesses in the United States, a degree of clinical suspicion should be employed when evaluating patients with vague GI symptoms in a setting of a liver abscess for amoebiasis, especially with increase in travel to and immigration from endemic areas in recent times.

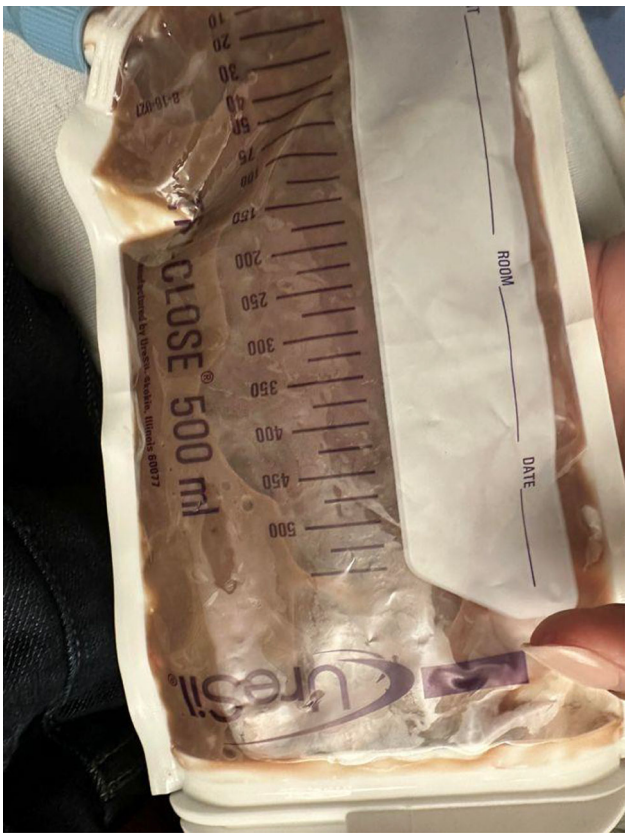


Fig. 1 GDrainage from liver abscess

P128

Isolated Blunt Traumatic Bladder Injury: Laparoscopic Repair and Literature Review

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Purpose/Background: Blunt traumatic bladder injuries are relatively uncommon, accounting for less than 2% of all trauma cases. They are typically associated with significant pelvic fractures, and isolated cases without concurrent injuries are rare. The most common type is intraperitoneal bladder rupture, typically occurring at the bladder dome due to its vulnerability to increased intravesical pressure during trauma. Surgical management usually involves open repair, with

laparoscopic approaches being less documented. We present a rare case of isolated intraperitoneal bladder rupture secondary to blunt abdominal trauma, successfully managed with laparoscopic two-layer repair. This abstract reviews the case and the existing literature to provide insight into the presentation, diagnosis, and management of this unique injury.

Methods/Interventions: A 36-year-old female was brought in by EMS as a level 1 trauma activation following a motor vehicle collision (MVC) with reported loss of consciousness and suspected intoxication. She presented with abdominal pain and a positive focused assessment with sonography in trauma (FAST) in the emergency department. Given stable vitals and free intraperitoneal fluid on imaging, the patient was taken to the operating room for exploration. Intraoperatively, a 3 × 1 cm bladder dome defect was identified, and urology was consulted for repair. A laparoscopic two-layer repair was performed using Endostitch 2-0 Vicryl sutures. Cystoscopic evaluation post-repair revealed diffuse bladder ecchymosis and no additional injuries. A Foley catheter was placed for bladder decompression, and the patient's postoperative course was uneventful.

Results/Outcomes: The patient tolerated the procedure well and was discharged in stable condition. Follow-up cystography showed no evidence of bladder leak, and the Foley catheter was successfully removed. A review of the literature indicates that laparoscopic repair of intraperitoneal bladder injuries, while feasible and effective, is underreported, with most cases managed via open surgery. The laparoscopic approach provides the benefits of minimally invasive surgery, including reduced postoperative pain, shorter hospital stay, and faster recovery.

Conclusion/Discussion: Isolated intraperitoneal bladder rupture from blunt trauma, especially without associated pelvic fractures, is rare. This case highlights the successful laparoscopic management of such injuries, suggesting it as a viable option for selected patients. Further studies are needed to compare outcomes between open and laparoscopic approaches and to establish standardized management protocols for these uncommon yet complex injuries.

P129

Incarcerated Acute Appendicitis Within a Ventral Hernia Defect

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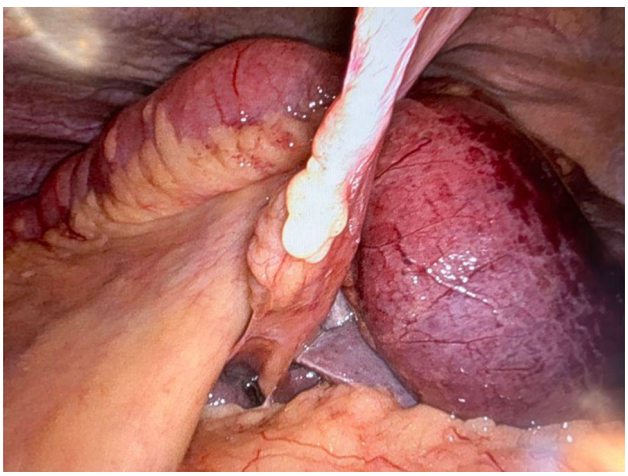
We present a case of a 70-year-old male with a history of A.fib on Eliquis, RCC s/p nephrectomy, inguinal hernia repair, HTN, HLD with complaints of acute onset right lower quadrant abdominal pain. Physical examination was notable for peri-umbilical tenderness, irreducible bulge, and a well-healed overlying incisional scar. Laboratory studies were significant for leukocytosis of 15 with a left shift. CT of the abdomen/pelvis was performed and was noted to show a ventral hernia with evidence of an inflamed incarcerated acute appendicitis through a small defect in the abdominal wall. The patient underwent diagnostic laparoscopy with appendectomy.

P130

Falciform Ligament Hernia: A Rare Cause of Small Bowel Obstruction

Rachel M Wright, MD[1]; Elliot Flint, BS[2]; Ibrahim B Cetindag, MD, FACS[1]; [1]HCA Houston Healthcare Kingwood; [2]University of Houston

Falciform ligament hernia remains a rare form of internal hernia and is difficult to diagnose pre-operatively. We report the case of a 78-year-old-male patient with no prior surgical history who presented for small bowel obstruction with high nasogastric tube output and pain out of proportion on exam. No clear transition point was identified on CT abdomen. Due to concerns of bowel ischemia and lack of prior surgical history, the decision was made to take the patient to surgery for diagnostic laparoscopy. Upon exploration of the abdomen, a falciform hernia with incarcerated small bowel was found and released. ICG confirmed bowel was viable with no evidence of necrosis. The patient recovered without any complications. His case highlights the difficulty in diagnosing falciform ligament hernia pre-operatively as well as the importance of early operative intervention to avoid the need for small bowel resection and associated morbidity.



P131

Gravity and Society: Geriatric Fall Recidivism and the Social Deprivation Index

Joseph C L'Huillier, MD, MSHPEd; Joseph D Boccardo, MA; Ajay A Myneni, MBBS, PhD, MPH; Katia Noyes, PhD; Jihnhee Yu, PhD; Weidun A Guo, MD, PhD, FACS; University at Buffalo

Introduction: Falls are the most common cause of geriatric trauma. Subsequent fall risk escalates after an initial incident. While an area's Social Deprivation Index (SDI) impacts trauma outcomes, its impact on seeking care following fall recidivism remains unknown.

Methods and Procedures: Analysis of the New York State hospital discharge database (SPARCS, 2005–2020) included patients aged ≥ 65 with an ED visit $\pm$ inpatient admission for a fall, excluding initial fall deaths. Patients were stratified into those who sought care for a single or multiple falls ("recidivism," ≥ 30 days apart) during the study period. Demographics and environmental factors including SDI of patients' home zip codes at time of first fall were compared between groups.

Results: Out of 1,579,595 patients, 1,169,936 (74.1%) sought care following a single fall, while 409,659 (25.9%) sought care for fall recidivism. On bivariate analysis, those seeking care for fall recidivism were more likely to be White (82.2% vs 74.8%, $p < 0.01$) and lived in zip codes with better/lower SDI (49th vs 53rd percentile, $p < 0.01$). A forest plot of the logistic regression model with odds ratios of > 1 indicating an increased likelihood of suffering fall recidivism is shown (Fig. 1). SDI components of "percent living in poverty" (OR 3.306) and "percent of single parent families" (OR 1.776) were associated with higher odds of seeking care for fall recidivism. SDI component of "percent living in crowed housing" (OR 0.203) and "Black race" (OR 0.608) were associated with a lower odds of seeking care for fall recidivism (all $p < 0.01$). Results were also stratified by patients living in the same zip code vs a different zip code as the treating hospital (Table 1).

Conclusion: A quarter of patients sought care for fall recidivism, which is associated with better/lower SDI zip codes and White race. Patients of color and those living in areas with worse/higher SDI may not be able to seek care for additional falls. Social factors including home SDI should be considered in the risk assessment for seeking care for fall recurrence upon index admission.

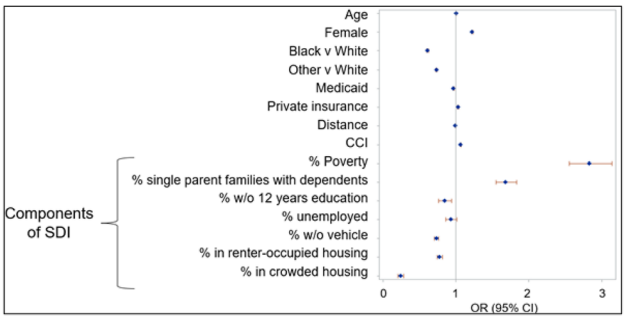


Table 1	Patient and hospital in same zip code			Patient and hospital in different zip codes		
	Single Falls N=230,358 (72.9)	Recidivism N=85,815 (27.1)	P-Value	Single Falls N=905,442 (74.2)	Recidivism N=315,591 (25.8)	P-Value
Age [Mean (SD)]	79.1 (8.9)	80.1 (8.5)	<.01	78.4 (8.8)	79.7 (8.4)	<.01
Gender, %						
Female	151,730 (65.9)	60,059 (70.0)		588,897 (65.0)	216,795 (68.9)	
Male	78,612 (34.1)	25,756 (30.0)	<.01	316,521 (35.0)	97,795 (31.1)	<.01
Race, %						
White	178,614 (77.5)	71,776 (83.6)		674,567 (74.5)	257,902 (82.0)	
Black	17,501 (7.6)	4,337 (5.1)		86,872 (9.6)	20,039 (6.4)	
Other	34,243 (14.9)	9,702 (11.3)	<.01	144,003 (15.9)	36,650 (11.6)	<.01
Insurance, %						
Medicare	155,163 (82.8)	74,373 (86.7)	<.01	636,856 (82.3)	271,342 (86.3)	<.01
Medicaid	36,768 (16.0)	14,364 (16.7)	<.01	132,560 (14.6)	44,843 (14.3)	<.01
Private	87,279 (37.9)	42,761 (49.8)	<.01	384,135 (42.4)	169,260 (53.8)	<.01
Other	4,815 (2.1)	2,020 (2.4)	0.01	20,555 (2.3)	6,651 (2.1)	<.01
Uninsured	32,657 (14.2)	11,680 (13.6)	0.01	148,049 (16.4)	51,915 (16.5)	>1
CCI Score [Mean (SD)]	3.79 (1.4)	4.10 (1.5)	<.01	3.75 (1.4)	4.10 (1.5)	<.01
SDI Percentile Score [0-100]	61.4 (28.0)	59.4 (28.0)	<.01	50.2 (31.7)	46.3 (31.0)	<.01

P132

Contemporary Trends and Outcomes of Laparoscopic and Robotic Repair for Perforated Peptic Ulcer Disease

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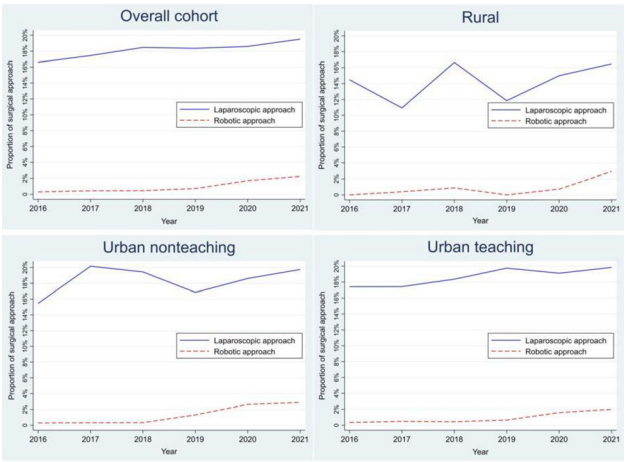
Background: While the advantages of laparoscopic repair for perforated peptic ulcer (PPU) disease have long been reported, recent changes including the adoption of robotic platforms and any associated outcome benefits remain unclear. We aimed to analyze contemporary trends in the use of laparoscopic and robotic approaches for PPU repair and compare their clinical outcomes to the open approach.

Methods: The National Inpatient Sample was queried for patients (age ≥ 18 years) who underwent nonelective surgical repair of PPU between 2016 and 2021. National trends in laparoscopic and robotic approaches were evaluated by calculating the annual percent change (APC) with 95% confidence intervals (CI) using a generalized linear model assuming a Poisson distribution, stratified by rurality and teaching status. Multivariable linear and logistic regressions were used to assess the independent associations between operative approach and outcomes, including mortality, complications, length of stay (LOS), and hospital charges.

Results: A total of 78,350 patients underwent surgical repair of PPU: 63,275 (80.8%) via open approach, 14,275 (18.2%) laparoscopic, and 800 (1.0%) robotic. The proportion of patients undergoing laparoscopic repair increased from 16.6 to 19.5% (APC = 2.8%; 95%CI, 1.8–3.8%). While the proportion of laparoscopic repairs was highest in urban teaching hospitals, the APC for the laparoscopic approach was highest in rural hospitals (APC = 4.0%). The APC for the robotic approach was highest in rural hospitals (APC = 91.1%; 95%CI, 57.4% to 137.5%), followed by urban non-teaching (APC = 70.9%) and urban teaching hospitals (APC = 50.1%). Multivariable analysis revealed that both laparoscopic and robotic approaches were significantly associated with lower mortality compared with open repair

(odds ratio [OR]: 0.60, 95% CI, 0.50–0.72 for laparoscopic and OR: 0.22, 95% CI, 0.08–0.64 for robotic). Laparoscopic repair was also associated with fewer pulmonary complications (OR: 0.59), surgical site infection (OR: 0.37), venous thromboembolism (OR: 0.69), and paralytic ileus (OR: 0.74). Both laparoscopic and robotic approaches were associated with shorter LOS (18.5% and 19.1% reductions, respectively, $p < .001$). Robotic repair was associated with a 13.3% increase in hospital charges ($p = 0.049$).

Conclusions: Despite its documented benefits, the adoption of laparoscopic repair for PPU has been slow, with open repair remaining the predominant surgical approach. Robotic repair, though still relatively rare, has increased rapidly, particularly in rural hospitals, and may offer improved outcomes compared to open surgery. The utility and cost/benefit ratio of robotic platforms should be re-evaluated in future studies.



P133

An Abnormal Presentation of a Delayed Necrotizing Soft Tissue Infection Secondary to Spinal Hardware Malfunction: A Surgical Case Report

Patrick Plummer; Landry Umbu; Penelope Mashburn; Ryan Debiec; Western Reserve Health Education/NEOMED

Necrotizing Soft Tissue Infections (NSTI) are characterized by "flesh-eating bacteria" that are rapidly progressive and requires immediate diagnosis and aggressive surgical debridement with broad-spectrum antibiotics. Common pathogens such as, Streptococcus Pyrogens, Staphylococcus Aureus, Enterococcus Coli, and Clostridium are the usual culprits of this disease. While NSTI have a relatively low incidence, they're associated with higher rates of morbidity and mortality. Due to the aggressive nature of the pathogen, NSTI can cause widespread necrosis of soft tissue and muscle leading to extensive surgical intervention and patient disfigurement. The patient population that is most susceptible to NSTI include the elderly, immunocompromised, and diabetics. In this case report, we will present an abnormal case of a delayed NSTI secondary to spinal hardware infection. The patient is a 54-year-old female with past medical history of type 2 diabetes mellitus, hepatitis C, an extensive spinal surgery with malfunctioning spinal hardware who developed an NSTI while in the Intensive Care Unit.

P134

Minimally Invasive Management of Cecal Bascule with Herniation Through the Foramen of Winslow

Autumn Pak, MD; Aneil Sood, MD; Rubayet Kamal, MD; Justin Allard, MD, FACS; Rathna Shenoy, MD, FACS; Summa Health

We describe a presentation of cecal bascule with internal herniation through the foramen of Winslow, a condition rarely documented in surgical literature. A 75-year-old female with a history of melanoma, diverticulitis, GERD, and hyperlipidemia, presented with sudden onset of colicky abdominal pain. Initial imaging reads suggested contained pneumoperitoneum leading to a differential diagnosis of perforation versus internal hernia. Diagnostic laparoscopy revealed the ascending colon and cecum had herniated through the foramen of Winslow, causing a closed-loop obstruction. The cecum was laparoscopically reduced and determined to be viable, so colopexy instead of resection was performed. The patient recovered well and was discharged after 48 h with return of normal bowel function. This case underscores the importance of considering internal hernias with presentations of acute abdominal pain and illustrates the benefits of minimally invasive laparoscopic management of these rare presentations.

P135

Severe Noroviral Gastroenteritis Leading to Small Bowel Ischemia in an Elderly Patient

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Introduction: Norovirus is a predominant cause of acute viral gastroenteritis worldwide, particularly affecting vulnerable populations such as children, the elderly, and immunocompromised individuals. The typical clinical course is self-limiting, with symptoms including nausea, vomiting, and diarrhea. However, in rare instances, norovirus can lead to severe complications, such as small bowel ischemia, which poses significant diagnostic and therapeutic challenges. This report details an uncommon case of norovirus-induced small bowel ischemia in an elderly male emphasizing the need for awareness of this potential complication and the critical role of timely surgical intervention.

Methods and Procedures: An 88-year-old male presented to the emergency department with a 3-day history of abdominal pain, nausea, vomiting, chills, and reported ten episodes of non-bloody diarrhea since the prior day. Notably, the patient had been in contact with his grandson, who experienced similar symptoms and was managed with supportive care for gastroenteritis. Stool polymerase chain reaction (PCR) testing confirmed the presence of norovirus. Conservative management was trialed with bowel rest and intravenous fluid resuscitation, with initial clinical improvement. However, on hospital day three, the patient reported worsening abdominal pain. His condition rapidly deteriorated, with new onset of bloody bowel movements and physical signs of peritonitis including diffuse abdominal tenderness, guarding, and rebound tenderness.

Results: A CT scan (Fig. 1) revealed extensive small bowel pneumatosis and portal venous gas, consistent with small bowel ischemia. An emergency exploratory laparotomy was performed, revealing necrotic, ischemic small bowel (Fig. 2) with extensive pneumatosis extending from 40 cm distal to the ligament of Treitz to 40 cm proximal to the ileocecal valve. In total, 220 cm of jejunum and

ileum were resected, leaving approximately 80 cm of viable small bowel. A second-look laparotomy was performed the following day, during which a side-to-side anastomosis was created. The patient tolerated the procedure well and was discharged to a skilled nursing facility on post-operative day 20.

Figure 1

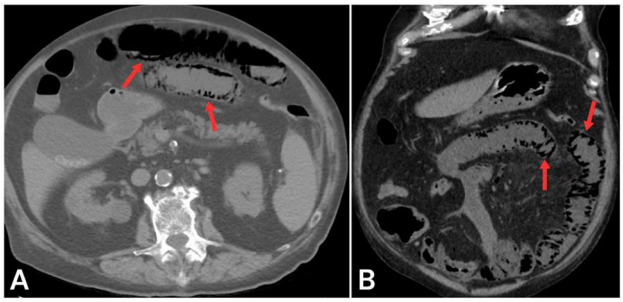
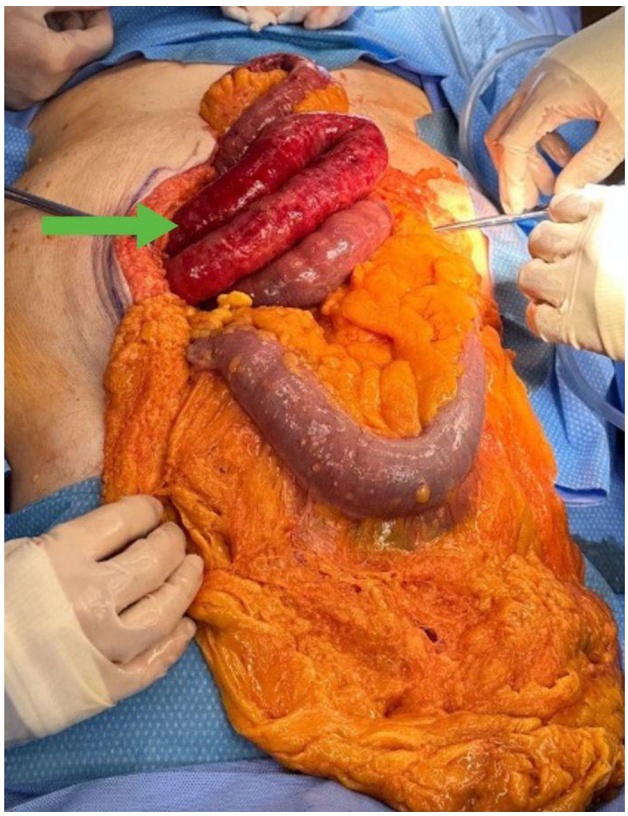


Figure 2



Conclusions: This case highlights a rare but serious complication of norovirus gastroenteritis—small bowel ischemia—in an elderly patient. The clinical course underscores the importance of considering norovirus as a potential etiological factor in cases of unexplained small bowel ischemia, particularly in at-risk populations. Early recognition, vigilant monitoring, and prompt surgical intervention are crucial in managing such cases and improving patient outcomes. Further research is necessary to elucidate the pathophysiological mechanisms behind this complication and to establish evidence-based guidelines for its management.

P136

Successful Implementation of the Robotic Platform in a Case of a Pediatric Patient with Penetrating Thoracoabdominal Trauma

Jacob Boersma, MD[1]; Charles Keane, MD[1]; Phillip Nahirniak, MD[2]; [1]Central Michigan University; [2]Covenant HealthCare

Background: Over the past two decades, emergency general surgery and acute care surgery have witnessed a paradigm shift from traditional open surgeries in favor of minimally invasive laparoscopic and robotic modalities. Fewer studies have demonstrated the utility of the robotic platform in the setting of emergency trauma surgery, particularly in cases of penetrating trauma to the thorax and abdomen. Once thought to be relatively contraindicated, the robotic platform does carry several possible advantages compared to the traditional trauma laparotomy when used in the appropriate setting. The theoretical benefits of smaller incisions, less postoperative pain, fewer postoperative wound complications, and decreased hospital length of stay must be balanced against the possible disadvantages of increased cost, staff familiarity with the robotic platform, and the possibility of a missed injury. Patient selection is paramount, and previous studies have demonstrated that the robotic platform can be safely used in hemodynamically stable patients with specific injury patterns. The following case demonstrates successful implementation of the robotic platform in a penetrating thoracoabdominal wound.
Case Report: The patient is a 13-year-old male who presented as a level 1 trauma for thoracoabdominal and right thigh gunshot wounds. Physical examination revealed stable hemodynamics, a left flank wound, a right thigh entry wound, no exit wounds, and no significant oozing. He had a left-sided pneumothorax, which resolved with placement of a chest tube. CT scan showed a left hemidiaphragm injury, grade 3 splenic laceration, and gastric injury. He remained hemodynamically stable, so we proceeded with robotic exploration. He underwent a robotic assisted splenectomy, primary repair of gastrotomy $\times 2$, primary diaphragm repair $\times 2$, and wedge resection of the liver. The spleen was morcellated and removed from 12 mm incision. JP drains were placed and then removed on postoperative day 9. His postoperative course was complicated by recurrent left pneumothorax which resolved with pigtail catheter placement. After discharge, the patient made a full recovery.
Conclusion: This case demonstrated the successful implementation of the robotic approach in a penetrating thoracoabdominal trauma in which many injuries were identified and repaired. Prior studies have shown that when used in the appropriate setting in trauma scenarios, the robotic platform offers advantages of lower risk of wound infections, pneumonia with no increase hospital length of stay, procedure time, or missed injuries. Future prospective comparison studies should be conducted to evaluate the differences in outcomes between open and robotic surgery in penetrating thoracoabdominal trauma.

P137

Robotic-Assisted Appendectomy: Is It Safe and Effective in Urgent Settings?

Diaa Soliman, MD; Christopher Mishreky; Nada Dakka; Abdulghafoor Alani; Mohammad Shaear, MD; Akram Alashari, MD; Central Michigan University, College of Medicine, Saginaw, Michigan

Introdution: Laparoscopic and open techniques are widely used for urgent general surgery procedures. However, the significance of robotic assistance in urgent operations is of a topic of interest. Comprehensive data on clinical outcomes, particularly in newly established robotic surgery programs, remains limited. This study aims to evaluate the safety and efficacy of robotic-assisted appendectomies focusing on acute appendicitis, such as perforated appendicitis or appendicitis with an abscess. The objective is to determine whether robotic appendectomies are safe and effective.
Methods: This is a retrospective review of data collected between August 2023 and September 2024 from a tertiary health care referral center. The series included 46 patients who had urgent robotic-assisted appendectomies for acute appendicitis. Data was collected from comprehensive surgical records and patient follow-up interviews. The outcomes were overall morbidity, serious morbidity, mortality, conversion to open, length of hospital stay, readmissions, and patient satisfaction.
Results: There were 55.2% females and 44.8% males. The mean BMI was 31.12 (± 7.3). The median age was 44 [IQR = 34.5–57]. There were 62.07% of the cases that were acute appendicitis, 28% of the cases were perforated appendicitis, and 10% of the cases were acute appendicitis complicated with an abscess. Four patients (8.7%) had a drain placed intraoperatively, all of them had perforated appendicitis. The overall morbidity was 6.5% (n = 3 patients). None had serious morbidity (Clavien-Dindo 3 or 4) that required interventions under general anesthesia. The three complications that were reported were intrabdominal fluid collections, two of them were treated with a drain that was placed by intervenional radiology and one of them with IV antibiotics. The median length of hospital stay was 1 day (IQR = 0–1.5). There was one case that was converted to open. Two patients (4.3%) had a readmission. There were no mortalities.
Conclusion: This retrospective analysis offers an initial evaluation of robotic-assisted platform in managing acute appendicitis along with its complications. Our data revealed that the use of robotic surgery in acute appendicitis is safe and effective in terms of morbidity, mortality, conversion to open, readmission, and length of hospital stay. Our review may contribute to the development of a framework for establishing the registry for urgent robotic interventions.

P138

Delayed Neuraxial Morphine-Induced Respiratory Depression; a Rare but Possible Adverse Event

Maryam Hassanesfahani[1]; Loryn Bucci[2]; Martine A Louis[1]; Michael Reich[1]; [1]Flushing Hospital Medical Center; [2]New York Institute of Technology College of Osteopathic Medicine

Introduction: Effective postoperative pain control is essential for rapid recovery and reduced hospital stay. Epidural analgesia is an established perioperative analgesic method, but intrathecal opioid administration can lead to complications, including respiratory depression. We present a case of a 70-year-old woman who experienced delayed postoperative respiratory depression following epidural morphine injection.
Case Presentation: A 70-year-old woman underwent a sigmoidectomy for recurrent diverticulitis under general anesthesia along with epidural catheter placement and administration of 100 mcg fentanyl, 2 mg midazolam, 100 mL propofol, and a total of 70 mg rocuronium via peripheral intravenous line and 4 mg of morphine via epidural catheter. Postoperatively, the patient initially appeared hemodynamically stable but became unresponsive eight hours later, exhibiting pinpoint pupils and a decreased respiration rate. The patient's weight, renal function, and urine output were within normal limits, ruling out other potential contributing factors. Continuous blood pressure and heart rate monitoring in the immediate postoperative period did not show any abnormalities until the sudden onset of respiratory depression. The rapid response to naloxone, a known opioid antagonist, confirmed the diagnosis of opioid-induced respiratory depression. The epidural was removed after the initial recovery. No further complications were observed, and she was discharged on postoperative day two.
Discussion: Opioids are effective for postoperative pain management but carry risks of severe adverse effects, such as respiratory depression. This case highlights the necessity of vigilant monitoring for delayed respiratory depression following epidural opioid administration, especially in elderly patients. Prompt recognition and treatment with naloxone are crucial for preventing life-threatening consequences. Improved communication between anesthesiology and surgical teams is essential to ensure patient safety. Additionally, there should be heightened awareness of the potential for delayed respiratory depression, even with low doses of epidural opioids, and protocols should be in place for immediate intervention. This report underscores the importance of comprehensive postoperative care, including thorough patient evaluation, careful dosing of epidural opioids, and continuous monitoring to detect and address complications promptly.
Conclusion: Opioids and injections of them via the epidural catheter have proven to be useful medications to control post-operative pain and ultimately promote quicker recovery. However, associated with some adverse effects such as delayed respiratory depression. This article highlights the importance of being cautious about all possible reasons for consciousness loss and changes in vital signs perioperatively and emphasizes the necessity of appropriate communication between anesthesiology and surgery teams during hand-off and transferring the patients to post-operative care.

P139

Laparostoma - Boon or Bane in Non-trauma Surgical Patients-An Observational Cohort Study

Uttam Kumar Thakur, MBBS, MS; Devender Singh; Piyush Ranjan, Dr; Sunil Chumber, Professor; AIIMS, New Delhi

Introduction: Open abdomen (OA) or Laparostoma refers to the intentional non-closure of fascial edges following laparotomy, a technique well-established in trauma patients undergoing damage control surgery. However, its role in non-trauma surgical patients remains unclear, with potential benefits counterbalanced by significant complications, including hernia formation, enterocutaneous fistula (ECF), and mortality. This study aims to evaluate the outcomes and complications of OA in non-trauma surgical patients.
Methodology: An observational cohort study was conducted over eight years (March 2015–March 2023), involving 54 non-trauma surgical patients managed with OA at a tertiary care centre. Indications for OA included a burst abdomen, inability to achieve tension-free closure, and other complications such as bowel ischemia and sepsis. Key parameters analyzed were the incidence of ventral hernia, ECF formation, temporary abdominal closure technique used, definitive fascial closure rate, and mortality rates. Statistical analysis was performed using repeated measures ANOVA and appropriate statistical tests.
Results: The cohort's mean age was 44.3 ± 17.8 years, with a male predominance (72.20%). Temporary abdominal closure was achieved

using Urobag/Bogota bag (59.26%) or mesh (40.74%), with vacuum-assisted closure (VAC) utilized in 59.25% of patients. The primary indication for OA was burst abdomen (72.22%), followed by failure to achieve tension-free closure due to bowel oedema (27.78%). The incidence of ECF was 5.56%, with a 30-day mortality rate of 29.63%. Among the 18 patients who developed ventral hernias, 5 had large ventral hernias with loss of domain (LOD). Definitive fascial closure during the index hospitalization was successfully achieved in 2 patients, neither of whom developed hernias.

Conclusion: OA remains a vital but high-risk intervention in non-trauma surgical patients, while it can prevent life-threatening conditions such as abdominal compartment syndrome (ACS). However, it is associated with significant risks, including ventral hernia, ECF, and increased mortality rates. The use of VAC therapy and early definitive fascial closure may improve outcomes. Future research should focus on optimizing patient selection, reducing complications, and considering the economic impact of OA in the management of non-trauma surgical patients.

P140

Exploratory Laparotomy for Small Bowel Obstruction in a One-Hundred-Year-Old Patient

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Introduction: Small bowel obstruction (SBO) is among the most common indications for emergency laparotomy. While immediate surgical intervention is a treatment option, SBO may be managed conservatively either initially or completely until resolution. This case report details the presentation and decision-making for conservative vs. surgical management for acute SBO in a one-hundred-year-old male, and highlights the challenges of weighing the risks and benefits of major abdominal surgery in geriatric patients..

Case Presentation: This patient was a 100 year old male with a history of prior open cholecystectomy, prostate cancer, hypertension, type two diabetes mellitus and hypothyroidism who presented with one week history of abdominal pain, and two days of nausea,vomiting and obstipation. After confirmation of SBO with CT imaging, patient was placed on nil per os (NPO) with nasogastric tube (NGT) placement for decompression. After three days without symptom improvement and worsening abdominal pain, the patient was treated with an exploratory laparotomy. Mid-jejunum adhesions were identified and lysed, resulting in improvement of symptoms. Our patient experienced post-operative pneumonia and a mild AKI, treated with antibiotics and fluids, respectively, and was successfully discharged to a rehabilitation facility on post-operative day 9.

Discussion: For patients with SBO, the treatment goal is to achieve resolution of the obstruction while minimizing morbidity and mortality. Nonoperative management is typically preferred for the older patient given associated increased risk of poor outcomes with emergency surgery. However, with no improvement with conservative management, it is imperative that surgical intervention be considered, regardless of age. In the preoperative evaluation of a patient undergoing emergency abdominal surgery, the American College of Surgeons-National Surgical Quality Improvement Project (ACS-NSQIP) has been used to assess operative morbidity and mortality risk. It has also been validated in the veteran population, making this the most accurate risk calculator for this patient.9-10 Alternatives to exploratory laparotomy, which include laparoscopic or robotic exploration, should also be considered in these patients, however these operations also carry risks in patients with distended bowel.

Results: This case highlights the challenges of managing a frail, elderly patient with a small bowel obstruction. It also shows with adequate pre and post operative care, these patients can recover well from these operations.

P141

Off Course: A Rare Ureteral Complication Following Laparoscopic Appendectomy

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Introduction: Appendectomy is the most common general surgical procedure performed worldwide, with iatrogenic ureteral injury being extremely rare. To date, only two cases of ureteral injury following open appendectomy have been reported in the literature. We present a unique case of distal right ureteral injury following laparoscopic appendectomy in a 26-year-old patient.

Case Presentation: A 26-year-old male with a history of ADHD presented to the emergency department with a one-week history of abdominal pain, nausea, and vomiting. Computed tomography (CT) of the abdomen and pelvis showed uncomplicated acute appendicitis with appendicolith. The patient underwent laparoscopic appendectomy. Intraoperatively, the cecum was mobilized using a bipolar energy device. The appendix, found to be retrocecal, dilated, and inflamed, was non-perforated with dense inflammatory adhesions. The mesoappendix was dissected using bipolar cautery, and the appendix was doubly ligated with looped PDS sutures. The patient was discharged on postoperative day (POD) 0.

He returned on POD 7 with right flank pain. Laboratory results revealed acute kidney injury (creatinine 1.13 mg/dL), leukocytosis (13.8×10^9/L), and hematuria on urinalysis. A follow-up CT showed a 3 cm fluid collection and contrast extravasation near the distal right ureter. Urological surgery was consulted, and a double J stent was placed, along with percutaneous drainage of the fluid collection. The patient was discharged on POD 11.

Discussion: The right ureter typically follows a retroperitoneal course along the psoas muscle, crossing the iliac vessels into the pelvic cavity. A review of the initial CT imaging revealed the ureter to be within 1 cm of the appendix base at the pelvic brim. Given this proximity and the delayed presentation (POD 7), it is likely that the injury resulted from thermal damage caused by the bipolar energy device.

Conclusion: Ureteral injury following appendectomy is exceedingly rare, with this being the first known case after laparoscopic appendectomy. Surgeons should carefully evaluate the ureter's proximity on preoperative imaging and exercise caution when using thermal devices to avoid this uncommon but severe complication.

P142

Unusually Delayed Wound Complication of a Remote APR: A Case Report

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Abdominoperineal resection (APR), an operation involving the resection of sigmoid colon, rectum, and anus with creation of an end colostomy, remains a mainstay of the surgical approach for treatment of low rectal and anal cancers. Despite major advancements in surgical techniques since it's advent in early 1900s, both intra-abdominal and perineal complications remain an ongoing struggle in the post-operative care of patients who have undergone APR. Perineal wound complications are a particular challenge in this population given its weight-bearing location and propensity for movement and tension. While most of these complications present in the immediate postoperative period, delayed wound healing may extend to protracted

management over several months with downstream effects on quality of life, healthcare costs, and need for re-operations.

Here we present a case of a notably delayed wound complication involving perineal dehiscence and subsequent small bowel evisceration following remote APR. A 73 year old man with a surgical history of APR for rectal cancer 20 years ago presented to the emergency department with a new bulge of the perineum. On examination, he was found to have dehiscence of his perineal wound and evisceration of small bowel with congested, ischemic bowel and frank perforation. He was hemodynamically stable and had a benign abdominal exam. He was taken urgently to the OR. The congestion of the bowel precluded reduction of the eviscerated contents, and a small bowel resection was performed via a perineal approach. Remaining contents were then reduced through the perineal wound and an ileocecectomy and ileocolic anastomosis were performed. Plastic surgery assisted intraoperatively with placement of pelvic mesh and gracilis muscle flap for closure of the perineal defect.

This case highlights the need for a high index of suspicion for surgical complications that can arise regardless of the time since an initial operation. Surgery, particularly extensive resection or reconstruction as exemplified in an APR, can have life-long implications for patients' health and their susceptibility to acute illness or varied pathology. The case also underscores the importance of considering the longevity of closure techniques at the time of APR, including recognizing the role of plastic surgery flap reconstruction vs primary closure of perineal defects, as well as the challenging postoperative care of perineal wounds.

P143

AI Powered Analytics-An Innovative Approach for Optimizing the Cost, Quality, and Outcomes of Surgical Procedures

Jimmy Y Chung, MD, MBA, FACS; Bon Secours Mercy Health

Most health systems in the US are operating within thin or negative margins and are under tremendous pressure to reduce costs. With the right strategy driven by data, cost reduction can be achieved while improving quality by reducing unnecessary variations and waste in surgical procedures. The Clinical Transformation team at Bon Secours Mercy Health developed a data analytics tool to gain insights into quality improvement and cost reduction opportunities, but the tool itself is complex and requires training and analyst support. We applied an Artificial Intelligence (AI) module to the tool to enable any user to rapidly access usable data by asking simple questions in natural language. This enabled operational and clinical stakeholders to identify opportunities for cost and quality improvement in real-time. This session will demonstrate the AI capabilities of the tool and results of use cases as well as potential future applications in optimizing surgical service lines.

P144

Achievements of the S-access Database Project: A 4-Year Review of Surgical Data Utilization

Akihiro Hirao; Surg Storage Co., Ltd

This presentation will highlight the achievements of the S-access database, a collaborative project between Surg storage and the National Cancer Center. Over the past four years, the database has compiled high-quality endoscopic surgical videos from various specialties. We will discuss the data collection process, the scale of the database, and its application in developing AI models for surgical and diagnostic support. Additionally, we will present its role in medical education and contributions to international standards (ISO/TC215). Future plans for expanding data collection, particularly in ASEAN, will also be addressed.

P145

Using Text Network Analysis to Assess if Chat GPT Generates Comparable Responses to Google Sources When Asked Questions Related to Gastrointestinal Pathologies

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Introduction: Over the last few decades, the role of the patient has evolved from a passive to active participant, engaging more in their own health care. ChatGPT has increasingly been used as an alternative to Google for online health searches, creating concern about its accuracy and reliability. Our purpose was to compare ChatGPT 4o mini to Google web sources. A secondary objective was to determine if ChatGPT's answer had a different source distribution amongst varying question difficulty.

Methods: We queried three gastrointestinal medical questions: "What causes appendicitis?," "What causes heartburn?," and "fecal microbiota transplant for IBS?" These were selected due to high, medium, and low consensus of medical evidence respectively. ChatGPT was asked each question 20 times to account for stochasticity. Next, a text network analysis was performed using cosine comparisons of term frequency inverse-document frequency (TF-IDF) to gauge similarity between ChatGPT and Google source responses. A statistical reference ($p = 0.001$) for interpretation of TF-IDF values was generated using random text samples with same length distribution as the Google searches. Another analysis compared similarity of ChatGPT responses to overall source type: academic, government, commercial, manuscript.

Results: ChatGPT responses were generally dominated by top Google search results. For example, the top result for heartburn cause was an academic website with mean TF-IDF score of 0.531 ± 0.037. A similar result occurred for the other questions. Reference TF-IDF score of randomly generated text was 0.284, 0.298, 0.240 for the first, second, and third questions. For source distribution, ChatGPT's response had higher similarity to more common source types of the Google search. In addition, the similarity distribution by source type varied depending on question difficulty. For the question with highest medical evidence, ChatGPT's response was most similar to commercial sources (TF-IDF 0.445 ± 0.096), in comparison to academic (TF-IDF 0.419 ± 0.133), government (TF-IDF 0.386 ± 0.079) and manuscript (TF-IDF 0.322 ± 0.030). For medium consensus, ChatGPT's response was most similar to academic sources (TF-IDF 0.516 ± 0.097) compared to commercial (TF-IDF 0.384 ± 0.172) and government (TF-IDF 0.379 ± 0.077). For low consensus, ChatGPT's response was most similar to academic sources (TF-IDF 0.430 ± 0.113) compared to manuscript (TF-IDF 0.356 ± 0.038) and commercial (TF-IDF 0.313 ± 0.073).

Conclusion: ChatGPT responses are similar to individual Google search results for gastrointestinal pathologies, but the distribution of source information can vary based on the topic's level of consensus. Thus, ChatGPT seems to have a role in patient online health information acquisition with the caveat that its utility may vary based on existing evidence of the topic.

P146

Development of an Artificial Intelligence System for Detecting Chronic Atrophic Gastritis Based on Endoscopic Images

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This is a 3 phase phase study to develop an artificial intelligence (AI) system for detecting chronic atrophic gastritis based on endoscopic images. In the first phase, we implemented a gastric segment recognition algorithm using a trained convolutional neural network model with high sensitivity and specificity results. Then (second phase) we trained deep learning models to classify segmented regions into absent/mild atrophy vs. moderate/severe atrophy, using histopathological diagnosis as the gold standard, achieving satisfactory overall sensitivity and specificity in detecting moderate to severe gastric atrophy. Finally, validation was performed on 47 new consecutive videotaped endoscopies from patients and compared the AI prediction to the histopathological diagnosis. AI system outperformed the endoscopist in the diagnosis of moderate to severe gastric atrophy with sensitivity and specificity of 92% and 91% *vs. 85% and 75%, respectively. Also, this AI approach showed a negative predictive value of 97% and may help to avoid up to 68% of unnecessary gastric biopsies.*

P147

Development and Validation of an AI-Based System for Classification, Detection and Tracking of Bleeding in Laparoscopic Surgery

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Introduction: The advancement of minimally invasive technologies has expanded the use of laparoscopic techniques in various surgical fields, significantly improving patient outcomes by reducing recovery times and minimizing trauma. Despite this, intraoperative bleeding remains a prevalent issue, accounting for 80% to 90% of all adverse events and complicating surgery. Excessive bleeding not only necessitates surgical conversions but also elevates the risk of postoperative complications, adversely affecting long-term outcomes for cancer patients. This study develops an AI-based algorithm to classify, detect, and track intraoperative bleeding, and preliminarily validates its clinical feasibility and efficacy.

Methods: In this study conducted from 2023 to 2024, 257 surgical videos including hepatobiliary, pancreatic, gastrointestinal, and gynecology surgery were collected from 25 hospitals. The data, categorized into three bleeding categories—none, mild oozing, and significantly vascular bleeding—were used to train,validation and test a deep learning model for bleeding classification, detection and tracking in surgeries. We developed a multi-task hierarchical deep learning framework that includes a 3D Patch Embedding module for structured data representation, progressive 'Hiera stage' modules for feature extraction, and specialized output heads for precise task performance (Fig. 1). The model's effectiveness is demonstrated through metrics such as precision, recall, F1-score for bleeding classification, and mean distance between predicted and ground truth for bleeding sites detection and tracking. Finally, we deployed the algorithm on the previously developed SurgSmart intelligent workstation, running it in real time during surgeries to verify its feasibility and effectiveness.

Results: As illustrated in Fig. 2, 9499/5662 clips and 12,436/162,421 frames of mild/significant vascular bleeding were annotated for the training, validation, and testing of the model. The model demonstrated robust performance across various tasks, achieving a precision of 0.830, a recall of 0.776, and an F1-score of 0.799 in bleeding classification, along with a mean distance error of 0.087 in bleeding point detection and tracking. When deployed on the SurgSmart workstation and used in the operating room (Fig. 3), over 80% of surgeons reported that the algorithm exceeded surgeons in both accuracy and speed, indicating its strong potential to improve hemostasis in future procedures.

Conclusion: This study developed an AI algorithm that effectively classifies, detects, and tracks bleeding in real-time across diverse procedures, demonstrating excellent accuracy and significant potential for clinical application.

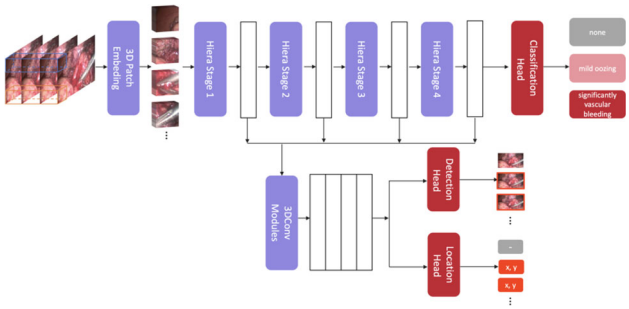

Fig. 1 AI model structure

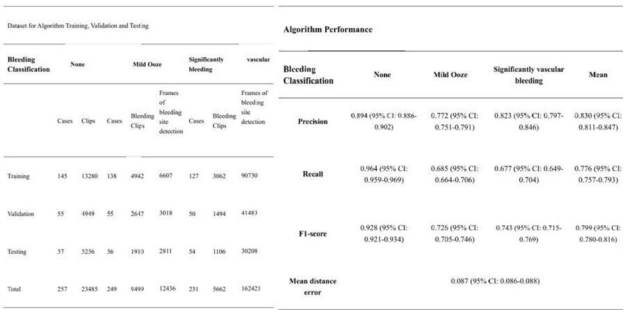

Fig. 2 Dataset for algorithm training, validation and testing and algorithm performance

Fig. 3 Clinical application of SurgSmart workstation in operating room

P150

Validation of a New Classification to Predict Mortality in Penetrating Cardiac Trauma Using Artificial Intelligence: The Bogota Classification

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Introduction: Penetrating chest trauma (PCT) represents 10% of worldwide mortality, with countries such as Colombia counting as some of the most affected by high mortality rates due to its high violence prevalence. This study aims to improve the assessment and treatments for PCT, and acknowledging its limitations, three distinct machine learning models were employed to analyze their performance in predicting outcomes in cases of precordial wounds between the Bogotá Classification and the Ivatury Scale.
Methods and Procedures: A retrospective cohort study was conducted, comprising 501 patients with precordial wounds collected from Hospital Cardiovascular del Niño de Cundinamarca institutions in Bogotá during 2018–2021. Three predictive machine learning (ML) models were then trained to identify predictor variables for hemodynamic instability. The developed models included logistic regression (LR), decision tree for regression CART, and random forest (RF). Finally, a concordance analysis was conducted using Cohen's Kappa index to compare the proprietary scale used in Bogotá with the validated Ivatury scale.
Results: The LR showed vital signs upon admission had the highest positive coefficient (0.251), while CPR performance exhibited the highest negative coefficient (− 1.215). CART highlighted Mean Arterial Pressure as the most influential feature (0.496), followed by vital signs upon admission (0.145) and CPR performance (0.082). RF identified Mean Arterial Pressure (0.336), CPR (0.101), and signs of cardiac tamponade (0.097) as primary features. Injury location displayed moderate importance in CART (0.046) and lesser importance in RF (0.026), with a coefficient of − 0.076 in LR. Associated injuries showed lesser importance in both CART (0.020) and Random Forest (0.017), with a coefficient of − 0.467 in Logistic Regression. The model with the best final sensitivity was CART with a performance of 98.67%, followed by RF with 95.33%, and LR with 92%, demonstrating that all three are generalizable models.
Conclusions: The incorporation of machine learning models enhances the analytical rigor of the performance of the novel classification and underscores its potential to yield insights that transcend geographical boundaries. As such, this research not only contributes to improving healthcare outcomes in Colombia but also holds promise for informing clinical practices and policy decisions in diverse settings worldwide.

P151

Deep Learning-Based Vessel and Nerve Recognition Model for Lateral Lymph Node Dissection

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Background: Lateral lymph node dissection (LLND) for rectal cancer presents technical challenges because the lateral pelvic area contains major blood vessels, which pose a risk for substantial intraoperative hemorrhage, and numerous nerves critical for postoperative genitourinary function and leg movements. A deep learning-based surgical support system holds promise for assisting in precisely identifying these critical anatomical structures during LLND. Therefore, we aimed to develop a semantic segmentation model to automatically recognize and visualize critical anatomical structures during laparoscopic LLND and evaluate the model's performance.
Methods: We used intraoperative video data from laparoscopic LLND for rectal cancer performed between 2018 and 2021. Specific scenes depicting the beginning to the end of the LLND procedure were extracted and divided into still images, which were annotated to delineate the boundaries of three key structures: the external iliac artery (EIA), external iliac vein (EIV), and obturator nerve (ON). Each pixel was assigned annotation labels to accurately identify the anatomical structures to train a deep learning-based semantic segmentation model. Evaluation metrics included precision, recall, and the Dice coefficient (DC). The model underwent five-fold cross-validation.
Results: In total, 992 images were extracted from 22 laparoscopic LLND videos. The DC value was 0.789 (± 0.009) for the ON, 0.736 (± 0.033) for the EIA, and 0.574 (± 0.082) for the EIV. The inference speed was 12.7 fps, equivalent to processing a single still image in 0.08 s.
Conclusions: We successfully developed a DL-based semantic segmentation model that automatically recognizes key structures in laparoscopic LLND, including the ON, EIV, and EIA. Quantitative evaluation using precision, recall, and the DC demonstrated relatively high recognition performance, indicating the feasibility of identifying the ON, EIV, and EIA in laparoscopic LLND. Our model holds potential as a foundational technology for constructing surgical navigation systems aimed at improving the safety and efficiency of LLND procedures.

P152

Utility of ChatGPT for Automated Creation of Patient Education Handouts: An Application in Bariatric Surgery

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Introduction: The complexities inherent in patient education for bariatric surgery create considerable challenges for clinicians, particularly due to time constraints and limited resources. The deployment of artificial intelligence (AI), specifically through the use of ChatGPT, represents a novel adjunct for generating patient handouts that are both comprehensive and accessible. This study aims to evaluate the feasibility of ChatGPT-generated educational materials for patients undergoing bariatric surgery.
Methods and Procedures: A manual literature search of the American Society for Metabolic and Bariatric Surgery (ASMBS) website was conducted to identify patient handouts addressing peri-operative care, intended for direct patient dissemination. Subsequently, ChatGPT-4o mini, a fine-tuned closed-source model based on the GPT architecture released in March 2024, was queried in separate chat sessions to produce two outputs (handouts) per prompt (condition) on August 25, 2024 to generate educational materials aligned with the identified topics from the ASMBS public forum. Rigorous prompt engineering was conducted utilizing established best practices

such as assigning the model a role and posing open-ended prompts to ensure precision and relevance in the generated content. Each handout, both from ASMBS and ChatGPT, underwent independent evaluation by three authors using the validated DISCERN tool, which assessed the quality, validity, and reliability of the information provided. Additionally, readability was measured using the SMOG test to quantify the linguistic complexity of the materials

Results: A total of eight patient education handouts were retrieved from ASMBS. Of these, five addressed specific bariatric procedures (gastric banding, biliopancreatic diversion with duodenal switch, Roux-en-Y gastric bypass, sleeve gastrectomy, and single anastomosis duodeno-ileal bypass with sleeve gastrectomy), while three focused on post-operative recovery topics (diarrhea, constipation, and dysphagia). The mean DISCERN scores significantly favored the ChatGPT-generated handouts compared to those from ASMBS [45.19 (SD 4.53) vs. 35.80 (SD 9.43), $p < 0.01$]. Both sets of handouts exhibited common limitations, including insufficient referencing, absence of additional resources for further inquiry, and lack of acknowledgment of uncertainty in recommendations. Additionally, ChatGPT-generated handouts required a higher reading level (Grade 11) compared to ASMBS (Grade 8).

Conclusions: The findings indicate that ChatGPT-generated handouts can provide comprehensive information. By addressing readability and accessibility concerns, AI-driven educational tools have the potential to significantly enhance patient comprehension and engagement throughout the bariatric surgery process. However, this study is limited to one patient handout resource, which underscores the necessity for further research to increase confidence in the comparative effectiveness of AI-generated patient handouts.

P153

The Evolving Role of ChatGPT (Chat-Generative Pre-Trained Transformer) in General Surgery: A Systematic Review

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Aim: Chat Generative Pre-Trained Transformer (ChatGPT) emerged in 2020 as one of the pioneering accessible artificial intelligence (AI) models online. Despite gaining worldwide recognition, initial medical literature on ChatGPT surfaced in 2022, exploring its capabilities in drug and disease generation. While recent systematic reviews have highlighted potential benefits in surgical specialties like neurosurgery and plastic surgery, they also underscored the need for cautious application. As no systematic review has examined ChatGPT's role in general surgery, we performed a systematic review to explore ChatGPT's potential in general surgery.

Materials & Methods: A thorough search of Cochrane Central, Scopus, SciELO, LILACS, and PubMed/MEDLINE, focusing on studies that explored ChatGPT possible applications in educational, research, and clinical practice was performed. We included both analytic data and descriptive studies. Conference abstracts and other AI platforms were excluded from our analysis.

Results: Among 550 screened studies, 23 met inclusion criteria. These studies showcased ChatGPT's diverse applications in surgical contexts: 6 demonstrated its capability in addressing common questions about surgical diseases, 7 highlighted its utility in clinical practice, 11 explored its educational potential, and 5 examined its research functions. Notably, ChatGPT exhibited proficiency in providing anatomical explanations and answering open-ended questions, achieving an accuracy of approximately 87% for colorectal queries but varied performance for appendicitis questions. Moreover, assessments of its performance in board exam-style questions yielded accuracy rates ranging from 48 to 66% for open-ended questions and 68 to 76.4% for multiple-choice questions. In addressing patient queries, ChatGPT's responses were generally rated positively, particularly in bariatric, transplant, and pancreatic surgery domains. Additionally, ChatGPT displayed enhanced clarity and comprehensiveness compared to traditional medical literature and demonstrated efficiency in generating reliable questions with minimal revisions. In clinical decision-making scenarios, ChatGPT's concordance with specialists' decisions varied widely across studies, with rates ranging from 0 to 86.7% in colorectal surgery studies and 30% in bariatric. Notably, ChatGPT proved effective in preparing consent documentation and producing comprehensive surgical notes. However, limitations were observed in its ability to provide accurate references and extract data from charts, though it showed promise in generating research ideas. Overall, while ChatGPT holds promise across education, clinical practice, and research, its reliance on human evaluation remains crucial.

Conclusions: ChatGPT shows significant potential to be explored in the realms of surgical education, clinical practice, and research. However, it is not yet an independent tool from human evaluation, as all its potential uses must be assessed by experienced surgeons.

P154

ChatGPT in Healthcare: Assessing Its Role in Educating Hernia Surgery Patients

Isabel Mayorga Perez, MD; Andres Torres Olivieri, MD; Luis Alamo Irizarry, MD; Ricardo Vargas Figueroa; Carlos Crespo Borges; Cesar Luque Fontanez, MD; University of Puerto Rico Medical Sciences Campus

Artificial intelligence has made headway in the medical field as of late, particularly with the implementation of the ChatGPT platform. Multiple studies have sought out to analyze ChatGPT's ability to provide reliable answers to medical based questions. While these inquiries have revealed that ChatGPT shows great potential as a patient information tool, none has been employed for one of the most common surgeries worldwide, inguinal hernia repair. A set of questions were queried to ChatGPT, and the accuracy of the answers were graded by a group of surgeons who perform inguinal hernia repairs frequently. Results showed that the platform provided comprehensive responses for the majority of questions. These outcomes further highlight the vast potential ChatGPT holds in serving as a trustworthy and reliable patient tool for the surgical field.

P155

Human VS AI: Comparison of Scientific Paper Drafting Capabilities

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Large language models (LLMs), a type of artificial intelligence (AI), are increasingly popular tools used for everyday and work-related activities and tasks. Their application in medicine is widely researched and have been used recently to help write scientific papers in various fields. LLMs can draft sections of manuscripts or whole

papers far more quickly than human writers. However, they need appropriate prompting to draft near-complete and worthwhile papers. In the current study we used two different LLM models—ChatGPT-4o and Claude 3.5 Sonnet—to test AI's scientific writing capabilities. We took an article written by one of the authors on the topic of fluorescent cholangiograms and ran it through the models to help build prompts for the article to be written by the AI. After that we loaded the data and bibliography used for the article in both AI tools and prompted them to write sections of the article (or a whole article if possible) on the same topic while allowing for independent choice of statistical analysis. The results of the human-written article and the AI generated ones were compared, evaluating the information used from the bibliography, the types of statistical analysis methods used, the conclusions drawn, and the time it took to complete. Afterwards the same prompts and data were used again to check if the LLMs would produce a different article with the same inputs.

P156

Revolutionizing Informed Consent: Integrating AI Avatar Technology to Enhance Clinical Communication

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Background: In-person informed consent (IC) is a critical component of clinical practice and research, yet it poses significant challenges, such as time constraints and considerable demands on healthcare professionals. Recent advancements in digital technologies, including artificial intelligence (AI) and large language models (LLMs), offer promising solutions to address these issues and improve the efficiency of IC procedures. In response, we developed an innovative digital avatar-based system utilizing generative AI technologies to streamline and enhance the IC process. This study describes the system's development and reports its preliminary impact on the efficiency and quality of IC.
Methods: Key challenges in traditional IC procedures, such as prolonged duration and the need for personalized communication, were identified. To address these issues, we developed a system that generates a realistic avatar of the attending physician, capable of delivering customized explanations via video. This system simulates a near face-to-face interaction, providing patients with an experience akin to direct communication with their healthcare provider. A pilot study was conducted to evaluate the system's impact on IC duration, patient satisfaction, and trust in the physician. Data were collected through patient surveys and objective measurements of IC duration before and after the system's implementation.
Results: The AI avatar-based video IC system was utilized by over 600 patients, resulting in a significant reduction in IC time by approximately 40% ($p < 0.05$). The use of avatar explanations did not compromise patient satisfaction or trust. Patients who interacted with the avatar system reported positive experiences, including improved understanding and a sense of familiarity with their physician prior to an in-person consultation. The survey indicated no significant concerns or negative feedback regarding the use of AI avatar videos.
Conclusion: The AI avatar-based IC system demonstrated substantial potential for enhancing the operational efficiency of IC procedures while maintaining high standards of communication quality, patient satisfaction, and trust. Continued integration of emerging digital technologies will be essential for further advancing and optimizing IC processes.

P157

Fairness of Machine Learning Readmission Predictions Following Open Ventral Hernia Repair

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Introduction: Few models have predicted readmission following open ventral hernia repair, and none have assessed fairness. Fairness ensures that algorithmic biases are not propagated in predictions. Surgical machine learning models seldom evaluate fairness. Therefore, we generated an interpretable machine learning model to predict readmissions following open ventral hernia repair while assessing fairness.
Methods: NSQIP (2018–2021) was queried for open ventral hernia repairs with or without mesh. An XGBoost model predicted unplanned readmissions within 30 days with fivefold cross-validation. Performance and fairness were assessed by attributes: sex (female vs male), ethnicity (Hispanic vs non-Hispanic), and race (non-White vs White). Utility was quantified with lift analysis. Influential features within attributes were determined with SHapley Additive exPlanations (SHAP).
Results: The cohort had 59,482 patients with a readmission rate of 5.5%. The model had an AUC of 0.72 and a Brier score of 0.16. Metrics at the F1-maximizing threshold were accuracy = 0.84, specificity = 0.87, recall = 0.34, precision = 0.14, and F1 score = 0.19. Lift analysis showed that the quartile of patients with the highest predicted probability of readmission were more than twice as likely to be readmitted as the overall population. Fairness metrics included statistical parity difference (difference in readmission prediction rates), equal opportunity difference (difference in recalls), average odds difference (average differences in true and false positive rates), and disparate impact (ratio of readmission prediction rates). Minimal disparities were noted (Table 1), with the most significant differences being equal opportunity difference and disparate impact of sex which favored females over males. SHAP revealed that the most influential variables were similar across attributes and included days from operation to discharge, morbidity probability, and operative time.
Conclusion: Interpretable machine learning improved readmission risk prediction over random prediction and could assist in follow-up decisions. Fairness metrics revealed marginal algorithmic bias indicating the fairness of our model. SHAP allowed the interpretation of predictions by attributes. Future surgical machine learning models should similarly assess bias through fairness metrics and interpretation.

Table 1 Fairness metrics

	SPD	EOD	AOD	DI
Sex	− 0.026	-0.084	− 0.031	1.209
Ethnicity	0.027	− 0.048	− 0.039	0.825
Race	− 0.003	0.009	0.006	1.018

SPD statistical parity difference, *EOD* equal opportunity difference, *AOD* average odds difference, *DI* disparate impact

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Critical View of Quality: A Novel Tool for AI-Based Assessment of Lymph Node Dissection Quality in Distal Gastrectomy

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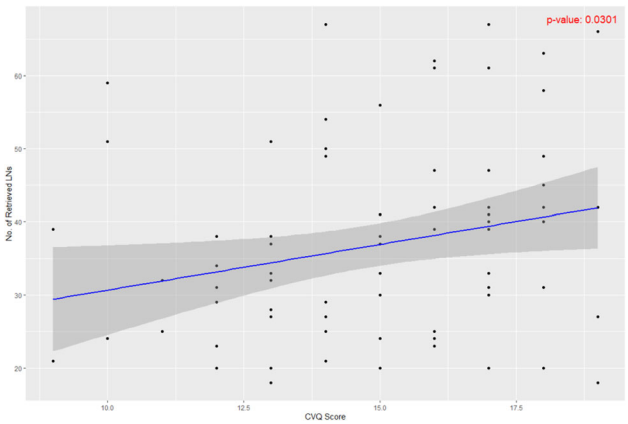

Introduction: Artificial intelligence (AI) models have demonstrated potential for improving surgical video analysis, yet an objective metric for quality assessment of safe and complete surgery remains lacking. This study introduces the Critical View of "Quality" (CVQ), a novel tool for measuring the quality of lymph node (LN) dissection in minimally-invasive distal gastrectomy (DG) using visual cues observable in surgical videos. The ultimate goal is to create a foundation for integrating this tool into an AI model capable of evaluating surgical performance.

Methods and Procedures: This retrospective video-based study included 80 patients who underwent DG for primary gastric cancer at a high-volume center between November 2020 and July 2023. We developed the CVQ scale to assess the quality of lymphadenectomy for five LN stations, LN#4sb, LN#6, LN#5/12a, suprapancreatic LN, and LN#1/3a. Clearly identifiable visual landmarks were scored from 0 to 2, with a total CVQ score ranging from 0 to 20. An expert surgeon assigned scores for each station, and the correlation between CVQ scores and number of retrieved LNs was evaluated. To assess the feasibility of basing an AI model on the CVQ system, we examined agreement among three independent raters for 33 videos. A surgical intelligence platform (Theator, Inc.) that segments DG videos was used for analysis.

Results: CVQ scores ranged from 9 to 19, with a mean total score of 14.78 ± 2.59. The highest CVQ scores were observed for key structures in the suprapancreatic LN and LN#6 stations, where perfect scores were achieved in 93.8% and 77.8% of cases, respectively. These stations had the most straightforward visual indicators for anatomical dissection, resulting in higher CVQ scores. A significant correlation was found between total CVQ scores and number of retrieved LNs ($r = 0.243$, $p = 0.030$). Inter-rater agreement was strongest for LN#4sb, with an agreement of 73% ($K = 0.70$, $p < 0.001$), indicating that this station had the most consistent and reliable visual cues for scoring.

Conclusion(s): The novel CVQ tool is a sensitive and objective measure of LN dissection quality in DG. The significant correlation between CVQ scores and number of retrieved LNs demonstrates that higher CVQ scores reflect more thorough and extensive lymphadenectomy, highlighting its potential clinical utility. High inter-rater agreement suggests that the chosen visual cues will enable accurate AI-based scoring. By forming a solid basis for integrating the CVQ system into an AI model, we aim to establish a reliable standard for assessing surgical quality.

P160

Development, Validation, and Application of an Artificial Intelligence (AI) Algorithm for Automated Recognition of Surgical Instruments and Evaluation of Surgical Skills in Laparoscopic Procedures: A Retrospective, Multicenter Study

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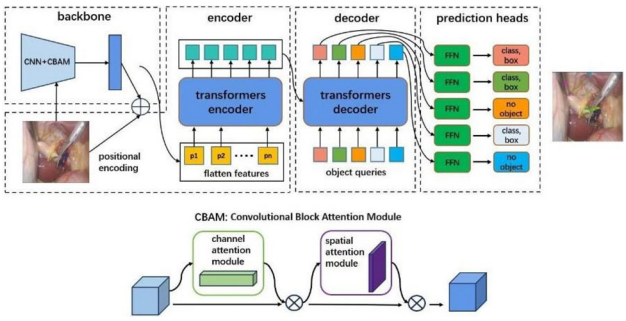
Objective: This study aims to develop and validate a universal AI algorithm for recognizing surgical instruments and deploy it on our previously developed SurgSmart platform to assess its utility in surgical skills evaluation during laparoscopic procedures.

Background: Laparoscopic surgery videos offer the sole comprehensive record of intraoperative activities, providing valuable insights into surgical performance and skill evaluation. Despite increasing emphasis on objective evaluation, current methods remain inconsistent and subjective. Surgical instruments are essential for laparoscopic procedures, and their usage patterns reflect the surgeon's technical proficiency. However, manual analysis of instrument usage is time-consuming and impractical. AI has emerged as a promising solution, enabling efficient and objective assessment of surgical skills based on instrument usage patterns.

Methods: A total of 1261 surgical videos from 21 medical centers across China were collected. Of these, 1210 videos covering five laparoscopic procedures were used to train and validate the AI algorithm which was then deployed on SurgSmart to generate visualizations of instrument usage data (Fig. 1 shows the algorithm architecture). The remaining 51 laparoscopic pancreaticoduodenectomy videos, scored using a customized mGOALS scale, were uploaded to SurgSmart for the analysis and evaluation of surgical skills. We then analyzed the relationship between four key instruments and the mGOALS scores.

Results: The AI algorithm achieved a mean average precision (mAP) of 80.31% across 21 types of surgical instruments (Fig. 2 shows the detailed performance of the algorithm). Leveraging this algorithm, the SurgSmart platform enables surgeons to efficiently review critical surgical maneuvers and automatically generate surgical reports and instruments heatmaps for surgical skills assessment (Fig. 3 illustrates the functional interface of the SurgSmart platform). No statistically significant differences were found in the usage duration of ultrasonic scalpel, linear stapler, or needle holder between the incompetency group (ICP) and competency group (CP) ($P > 0.05$). Clip applier usage showed a significant difference: the ICP averaged 5.00 (3.50, 7.00) minutes, while the CP averaged 3.00 (2.00, 4.00) minutes ($P < 0.001$, Table 4). A negative correlation was found between clip applier usage duration and surgical scores ($r = -0.545$, $P < 0.001$).

Conclusion: The developed AI algorithm exhibits robust generalization and accuracy. Its deployment on SurgSmart platform achieves the visualization of surgical instrument usage patterns and demonstrated significant application value in automated surgical skill assessment.



NO.	Surgical instrument	AP, %	Precision, %	Recall, %	F1 Score
SI-1	Clip	78.78	85.34	66.99	0.75
SI-2	Aspirator	90.68	87.93	85.14	0.87
SI-3	Atraumatic fixation forceps	85.29	82.93	81.75	0.82
SI-4	Atraumatic forceps	73.19	65.19	72.44	0.69
SI-5	Biclamp	76.90	93.24	71.02	0.81
SI-6	Bulldog clip	65.89	90.10	51.41	0.65
SI-7	Cautery hook	97.51	97.60	96.06	0.97
SI-8	Clip applier	91.94	90.02	88.38	0.89
SI-9	Coagulator	96.71	87.71	96.73	0.92
SI-10	Drainage tube	64.61	66.98	59.50	0.63
SI-11	Gauze	86.79	88.71	81.56	0.85
SI-12	Grasping forceps	61.06	78.38	41.16	0.54
SI-13	Linear stapler	94.03	91.10	89.06	0.90
SI-14	Maryland dissecting forceps	83.03	78.85	77.88	0.78
SI-15	Metal clip	80.50	88.24	73.88	0.80
SI-16	Needle	56.77	73.96	44.14	0.55
SI-17	Needle holder	85.95	88.63	78.52	0.83
SI-18	Scissor	85.79	96.40	69.48	0.81
SI-19	Specimen bag	73.51	77.48	65.76	0.71
SI-20	Straight dissecting forceps	60.23	78.65	45.27	0.57
SI-21	Ultrasonic scalpel	97.39	95.66	95.59	0.96
/	Mean	80.31	/	/	/

P161

Innovation in AI for the Surgical Patient: An Analysis of FDA Approved AI/ML Medical Devices

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Introduction: Artificial Intelligence (AI) and Machine Learning (ML) are poised to transform the landscape of medical care. However, skepticism prevails within the surgical community about practical integration of these technologies into clinical practice. We aim to explore all US Food and Drug Administration (FDA) approved AI/ML medical devices with surgical indications.

Methods and Procedures: We conducted an analysis of all published records of approved AI/ML devices by US FDA as of 8th of March 2024. Devices were included if they guided elective surgical planning, detected operative lesions/complications in real-time, or were involved as a device intra-operatively. Devices designed without explicit surgical indications were excluded. We categorized devices according to year of approval, primary FDA regulatory specialties, identified relevant secondary surgical subspecialties for device application, and by clinical testing parameters.

Results: Of the 692 AI/ML devices currently approved, we identified 535 that could be applied to the surgical care continuum. Only 35 met our inclusion of use during operative management of the patient. Of these devices, 13 (37%) saw approvals in 2023, doubling the number of approvals from previous years. Primary FDA regulatory specialities demonstrated that 15 (43%) were radiological tools. Delving into their subspeciality applications, oncologic (33%) and vascular (33%) surgery were notable areas of use. Of the remaining 22 devices, primary FDA specialities highlighted diverse involvement, including cardiothoracic (27%), gastrointestinal/urology (27%), general/plastic surgery (27%), and neurosurgery (9%). In terms of clinical evaluation, 13 devices (37%) were classified as high-risk. The majority of these underwent testing based on retrospective data from single centers, accounting for 54% of high-risk device assessments. Conversely, prospective multicenter randomized trials were conducted for just three devices (23%).

Conclusion: The landscape of AI/ML device development in surgery is accelerating. Majority of surgical AI/ML devices leverage extant software and hardware, highlighting opportunity for rapid surgical adoption. Reliance on single retrospective data is of concern as it limits AI applicability to general populations and fails to account for implementation concerns. Our study is limited by review of only approved FDA devices and device classes not subject to review. Partnership with medical colleagues and industry to steer the next wave of technological advancements will be vital to the future of surgery.

P162

Comparative Analysis of Robotic and Laparoscopic Hiatal Hernia Repair: Insights from a Surgical Artificial Intelligence (AI) Platform

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Introduction: Using an innovative surgical platform that provided Artificial Intelligence (AI) analysis of intraoperative insights, this study aimed to compare total procedure times and specific steps duration in robotic and laparoscopic revisional versus primary hiatal hernia repair (HHR), and to examine potential correlations between risk factors and postoperative outcomes.
Methods and Procedures: A retrospective study was conducted on patients who underwent minimally invasive HHR between September 2023 and August 2024. A surgical intelligence platform (Theator, Inc) provided total procedure times and durations of surgical steps and events, among them hiatal dissection, esophageal mobilization, hiatal repair, and wrap creation. Demographics, operative and postoperative variables including length of hospital stay, complications and reoperations within 30 days, 3 and 6 months were collected from patient records. Operative times between robotic and laparoscopic cases in the primary and revisional groups were compared and logistic regression was used to assess the relationship between surgical approaches and complications.
Results: Of 92 patients included, 70 (22 robotic vs 48 laparoscopic) underwent primary HHR and 22 (7 robotic vs 15 laparoscopic) were revisional cases. There were significant differences in the mean operative times when comparing robotic and laparoscopic times in both primary and revisional groups. Total operative time was shorter in robotic than in laparoscopic cases, in revisional (114 ± 23.3 min vs 145.4 ± 34.1 min, $p \leq 0.05$) and primary cases (101.1 ± 31.1 vs 135.7 ± 51.8; $p < 0.05$). Duration of hiatal dissection differed between the approaches only in the revisional group, with a mean time of 24.7 ± 12.1 min in robotic cases and 48.7 ± 20.1 min in laparoscopic cases (p: < 0.05). Wrap creation time differed significantly in both groups, with mean times of 17.5 ± 5.4 min for robotic and 21.6 ± 5.7 min for laparoscopic cases in the primary group ($p < 0.05$), and 15.4 ± 4.8 min for robotic and 21.2 ± 5.6 min for laparoscopic cases in the revisional group ($p < 0.05$). The correlation analysis between surgical approaches and overall complications revealed an odds ratio of 0.3 for robotic cases (CI: 0.08–1.13; p: 0.076).
Conclusions: Robotic-assisted operations were shorter in total operative time and in the duration of specific surgical steps in both revisional and primary cases, compared to laparoscopic cases. Duration of procedures related to clinical outcomes demonstrated no significant correlation. Nonetheless, when overall complications were correlated to surgical approaches, robotic-assisted surgeries showed trends towards fewer complications.

P163

Using Artificial Intelligence for Predicting Overall Survival in Colon Cancer Patients Using National Cancer Database (NCDB) Database

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Introduction: Cancer is the second leading cause of death worldwide, with colon cancer being one of the most prevalent types in the U.S. The overall lifetime risk of developing colon cancer is 1 in 23 for men and 1 in 25 for women. Artificial Intelligence (AI) applications have become integral to daily life, from smartphones to self-driving cars. In recent years, AI has made significant strides in medicine, assisting healthcare providers with diagnosis, classification, and outcome prediction. In this study, we aimed to develop an AI model to predict overall survival in patients with colon cancer using data from the National Cancer Database. This model also highlights the impact of various clinical metrics on overall survival through AI-driven analysis.
Methods: Two models were developed; one included all patients from 2005 to 2019 while the other model excluded patients diagnosed between 2016 and 2019, to assess 5-year survival. The dataset was randomly divided into training (70%), testing (15%), and validation (15%). After splitting the data, a gradient boosted decision tree was fitted using the XGBoost library. The model performance was evaluated based on accuracy, precision, recall, and the area under the receiver operating characteristic curve (ROC AUC). Metrics used for the development included patient demographics, staging, operation details, timing of the operation, in patient stays, and systemic therapy.
Results: We analyzed data from 860,463 patients diagnosed with colon cancer between 2005 and 2019 (first model). After removing patients who were diagnosed between 2016 and 2019, the remaining 601,495 patients were included in the second model. The first model achieved an accuracy of 77.5%, with a precision of 78.4% and a recall of 76.7%. The ROC AUC score was 0.86, indicating an acceptable predictive ability (Fig. 1). The features that contributed most to the first model's predictions were surgical margins, liver metastasis, and pathologic TNM staging. Conversely, regional lymph node dissection, microsatellite instability score, and intraoperative conversion were among the least impactful features. Our second model focusing on 5-year survival had an accuracy, precision, and recall of 76.7%, 79.5%, and 80.4%, respectively. The ROC AUC score was 0.84 (Fig. 2). The impact of features was similar for both models.
Conclusion: Predicting survival is feasible using AI and can be a helpful tool for clinicians in future. Models can be improved with more diverse clinical data and ones that are developed should be tested using other databases for validation.

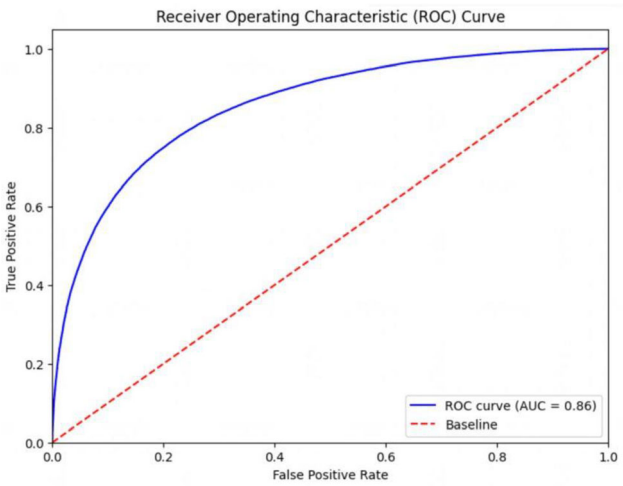

Fig. 1 ROC curve for the first model

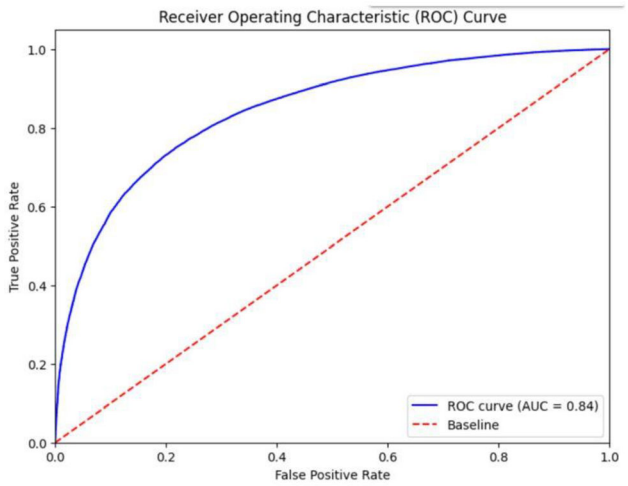

Fig. 2 ROC curve for the second model

P164

Comparative Analysis of Popular AI-Chat Bots in Generating Inguinal Hernia Surgery Recommendations

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Introduction: Artificial intelligence (AI), particularly large language models (LLMs), has garnered increasing interest for its potential clinical applications. LLMs have been shown to produce appropriate responses to questions in various medical fields. However, minimal data exists evaluating the use of LLMs within the field of inguinal hernia repair (IHR).
Objective: To compare the quality of LLM-generated responses to questions regarding inguinal hernia surgery.
Methods: Questions were generated based on pre-existing clinical guidelines regarding IHR. Each question was entered into 3 LLMs: Microsoft CoPilot, Google Gemini, and OpenAI ChatGPT-4. LLM-generated responses were recorded and blinded for review by 6 fellowship-trained minimally invasive surgeons. Each reviewer assessed the quality of the responses using a 5-point Likert scale. The readability of responses was determined using validated readability formulas.
Results: A total of 30 questions were compiled. The mean score for CoPilot responses was significantly lower than the mean scores for Gemini and GPT4 responses (CoPilot: 3.75 ± 0.99, Gemini: 4.35 ± 0.82, GPT4: 4.30 ± 0.89, $p < 0.001$). However, there was no significant difference in readability, with all 3 LLMs producing responses with college to college-graduate reading levels.
Conclusion: This study demonstrated variability in the performance of different AI-powered LLMs in generating appropriate responses to questions about IHR. Readability was consistently difficult across all models. Still, newer iterations of LLMs from various sources are rapidly delivering reliable and accurate medical information, increasingly suitable for both public and professional use.

P166

Evaluation of Machine Learning Models for Predicting Postoperative Adverse Events in Conversion and Revision Bariatric Surgery Using MBSAQIP Data

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Background: Accurate prediction of postoperative complications in metabolic and bariatric surgery (MBS) is integral to enhance patient safety and optimizing outcomes. Machine learning (ML) techniques offer potential improvements in pattern detection over traditional statistical methods. This study evaluates the performance of various advanced ML models in predicting postoperative complications following conversion or revision MBS. We hypothesize that addressing class imbalance and collinearity will reduce the sensitivity of these models and that significant differences in predictive performance will exist among them.
Methods: A retrospective analysis of MBSAQIP database from 2020 to 2022 was conducted, including demographic, clinical, and surgical variables. The ML models evaluated were Generalized Linear Models (GLM), Support Vector Machines (SVM), Extreme Gradient Boosting (XGBoost), and Deep Learning (DL) neural networks. Each model underwent hyperparameter optimization using grid search. Models were trained and tested under three conditions: unbalanced data, balanced data (using sampling techniques), and after applying anomaly detection to remove outliers. Performance metrics assessed included Area Under the Receiver Operating Characteristic Curve (AUC), accuracy, precision, recall, and F1-score.
Results: A total of 68,498 patients were included of which 11,411 (16.7%) patients developed adverse events. Balancing the data improved the AUC for predicting complications across all models. However, models trained on unbalanced data exhibited higher accuracy but significantly lower sensitivity. For instance, the DL model on unbalanced data achieved an accuracy of 83% but a recall of 0.2%, indicating poor detection of patients who experienced complications. In contrast, balancing the data increased the recall to 61% for the DL model but reduced accuracy to 59%. Anomaly detection did not markedly improve model performance. Feature importance plots from GLM and SVM models consistently identified a history of pulmonary embolism as a significant risk factor for postoperative adverse events. Conversely, patients with a history of adjustable gastric banding (AGB) procedures were less likely to develop complications compared to those with a history of Roux-en-Y gastric bypass (RYGB).
Conclusion: ML models demonstrated limited performance in predicting postoperative complications using the current MBSAQIP dataset, likely due to class imbalance and collinearity among variables. Additionally, the MBSAQIP dataset is not specifically structured for ML model applications, which further impedes their effectiveness. The high accuracy observed with unbalanced data was misleading due to low sensitivity, highlighting the necessity of addressing class imbalance. Future research should focus on enhancing data quality by incorporating additional explanatory variables, and rigorously testing for collinearity to improve ML model performance.

P167

Predictive Power in GI Surgery: Machine Learning Models and the AI-Driven Healthcare Revolution

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Background: The integration of Artificial Intelligence (AI) and Machine Learning (ML) into gastrointestinal (GI) surgery has garnered considerable attention, demonstrating notable promise in predicting postoperative complications. Anastomotic leaks, infections, and thromboembolic events remain key concerns in GI surgery, contributing to increased morbidity, mortality, and healthcare costs. This review evaluates current AI and ML technologies and their predictive capabilities, particularly focusing on their role in predicting adverse outcomes and improving patient care. The review also addresses current gaps in the application of AI, highlighting areas ripe for future research that could further revolutionize surgical care through earlier and more precise prediction of postoperative complications.

Methods: A comprehensive literature review was conducted by examining scientific databases (PubMed, Web of Science, OVID Embase, Google Scholar, and Cochrane library), using the following search terms: artificial intelligence/AI, machine learning/ML, gastrointestinal/GI surgery, postoperative complications, and outcomes. Studies involving the use of ML models for predicting postoperative outcomes in GI surgery were selected, with specific attention to performance metrics such as accuracy, sensitivity, and area under the receiver operating characteristic curve (AUC-ROC). The review also examined current limitations and proposed future directions to enhance the clinical applicability of these models.

Results: Current predictive models range in accuracy, with some of the best ranging between 83 and 89%, and AUC-ROC scores exceeding 0.90. Use of ML in the postoperative space was concluded to significantly outperform traditional clinical methods. By enabling early intervention, these technologies have the potential to reduce complication rates and shorten hospital stays, contributing to improved patient outcomes and optimized healthcare resource utilization. Beyond improving clinical results, AI and ML bring notable economic benefits by lowering costs associated with extended hospital stays and readmissions. New technologies continue to emerge, designed to push the boundaries of postoperative care, such as providing earlier prediction for a wide range of significant surgical complications, thus offering healthcare providers a proactive approach to managing patient care.

Conclusion: This study provides a comprehensive literature review of the current landscape of AI/ML in the postoperative gastrointestinal surgery space, revealing the compelling work that has been completed thus far, as well as future directions of the field, to further push the boundaries of exceptional care. These advancements signify a new era in surgery, where data-driven insights empower clinicians to deliver more efficient, targeted, and cost-effective healthcare.

P168

Critical Post-Surgical Challenges: An Evidence-Based Review of Complications in Gastrointestinal Procedures

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Background: Despite countless surgical advances, postoperative complications continue to be a reality within the world of gastrointestinal surgery. Application of Artificial Intelligence (AI) and Machine Learning (ML) in the surgical space has opened new doors for predicting postoperative complications earlier, more precisely, and less invasively, with great potential for improving patient outcomes. However, it is critical that the landscape of postoperative complications be fully understood to develop accurate ML models. This study fills a gap in this space, undertaking a comprehensive literature review aimed at describing the most pressing postoperative complications impacting colorectal and hepatobiliary (HPB) procedures.

Methods: A systematic review of over 200 peer-reviewed papers on postoperative complications in colorectal and HPB surgeries was conducted. This review also incorporated an analysis of current Standard of Care (SOC) practices and interventions, referencing several gold-standard medical texts to evaluate the impact of early prediction by assessing the potential for early intervention. Meta-analysis techniques were applied to compare complication patterns between colorectal and HPB procedures. A decision matrix was created to rank complications based on key factors: average cost, incidence, mortality rate, potential for early intervention, and the availability and performance of existing AI/ML models for predicting complications.

Results: For colorectal surgeries, the most significant complications identified included surgical site infections, anastomotic leaks, bleeding, and sepsis. These complications were associated with increased resource utilization and hospital stays, contributing significantly to postoperative mortality and incurring, on average, $14,643–$32,546 excess cost. In HPB surgeries, postoperative pancreatic fistulas (POPF), bleeding, and sepsis were the major complications, with incidence rates of 13.9%, 8.5%, and 4.62%, respectively. These outcomes contribute to prolonged hospital stays and economic burdens reaching greater than $100,000 in severe cases. Mortality rates in HPB surgeries were also noticeably high, with some complications (e.g. POPF) reaching 23.33%, on average. While various AI/ML models exist, their performance in predicting the full range of complications remains inconsistent, with AUC/ROC scores ranging from 0.31 to 0.98.

Conclusion: This review highlights the most significant postoperative complications in colorectal and HPB surgeries, emphasizing their impact on cost, incidence, and mortality. Its outcomes can be used to guide further research and the development of ML models to predict such complications in advance.

Table 1 - Highest Significance Postoperative Complications following Colorectal Surgery - Metrics

Consequence	Incidence (Average)	Mortality (Average)	Excess Cost (Average, USD)	Current ML Model AUC/ROC score range (Min-Max)
Surgical Site Infection	18.38%	9.63%	$14,643.56	0.65-0.93
Anastomotic Leak	7.5%	20.51%	$32,546.64	0.724-0.952
Bleeding	13.28%	11.13%	$23,967.86	0.773-0.85
Sepsis	10.70%	26.28%	$19,168.20	NA

Table 2 - Highest Significance Postoperative Complications following HPB Surgery - Metrics

Consequence	Incidence (Average)	Mortality (Average)	Excess Cost (Average, USD)	Current ML Model AUC/ROC score range (Min-Max)
Fistula Formation	13.9%	23.33%	$41,699.50	0.68-0.85
Bleeding	8.5%	4.13%	$32,834.33	0.31-0.4
Sepsis	4.62%	7.81%	$34565.00	0.83-0.84

P169

Feasibility of AI-Generated Organ Models for Laparoscopic Training: Validation through Expert and Resident Evaluation

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Introduction: Laparoscopic simulation training is essential for surgical trainees before performing laparoscopy in the operating room, where they usually start with laparoscopic cholecystectomy. Although high-fidelity digital simulators are widespread, most fail to implement the anatomical variability and pathologies found in the operating room. This may impede the transfer of skills to the operating room and delay the development of surgical competence.

To introduce real-world anatomical variations in realistic digital organ models for laparoscopic training, we created cholecystectomy-related anatomical models using artificial intelligence techniques in combination with procedural modeling. This study is the first to establish face validity of artificial intelligence-based digital models by soliciting senior resident and experienced surgeon opinion.

Methods and Procedures: Large organ models were generated using Latent Diffusion Models trained on liver and gallbladder images segmented from computed tomography scans. Fine structures, including small blood vessels, ductal structures, and organ surface, were enhanced and corrected through an overlaid procedural modeling system, guided by established anatomical variations.

Five different organ sets with varying features were independently evaluated by senior surgical residents and expert gastrointestinal surgeons at Radboudumc. They indicated their agreement scale with statements pertaining to the morphology, configuration, and relevance to surgical training of the models, on a 5-point Likert scale. Participants also provided suggestions for model improvements.

Results: Twenty-five participants (12 senior residents, 13 expert surgeons) completed the assessment. Among them, 21 participants (8 senior residents, 13 experts) had primary responsibility for over 100 laparoscopic procedures in their current professional role. Mean scores for all variables including shape, color, texture, and anatomical positioning were between 3 (neutral) and 4 (good), indicating general acceptance. The configuration of bile ducts and blood supply received the lowest ratings, with a mean score of 3.28. The similarity to the diversity of anatomical variants in the operating room was rated positively, with mean scores of 3.79. Suggestions included enhancing the depiction of disease-specific aspects, such as gallbladder hydrops in cholecystitis. Overall, the models were deemed suitable for integration into surgical skills training, with a mean score of 4.05.

Conclusion: The simulated organs were well-received by experienced senior residents and experts for all aspects of morphology, configuration, variability, and applicability to surgical skills training. Our novel, hybrid workflow of artificial intelligence and procedural modeling for anatomical model generation can improve laparoscopic simulation training by providing real-life variability and by reducing the predictability of traditional simulation.

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Assessment of AI for Colorectal Cancer Imaging Interpretation: A Comparative Analysis Between AI and Radiologist Interpretation

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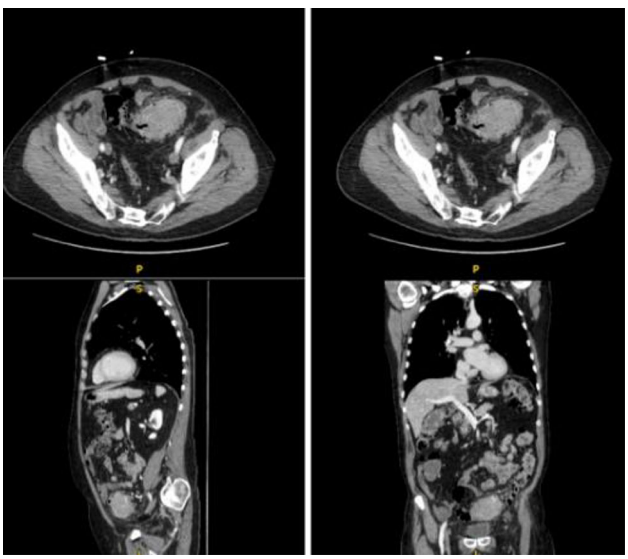
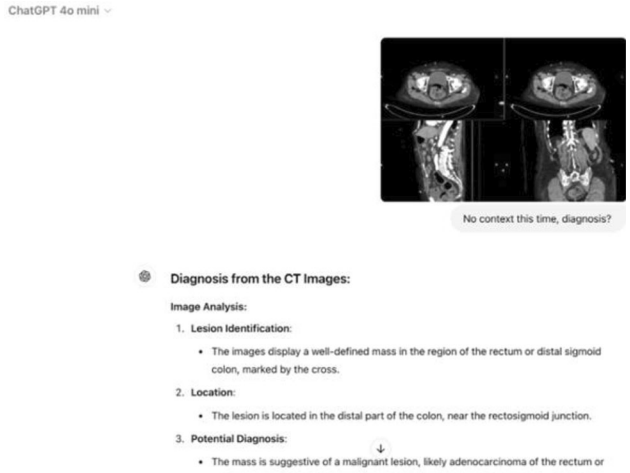
Objective of the Study: Artificial intelligence (AI) is revolutionizing medical diagnostics, with growing application in imaging interpretation. This study evaluates the correlation between AI and an experienced radiologist in interpreting CT scans of patients with colorectal cancer. The aim was to assess the accuracy of AI compared to trained human expertise, focusing on different sections of the colon.

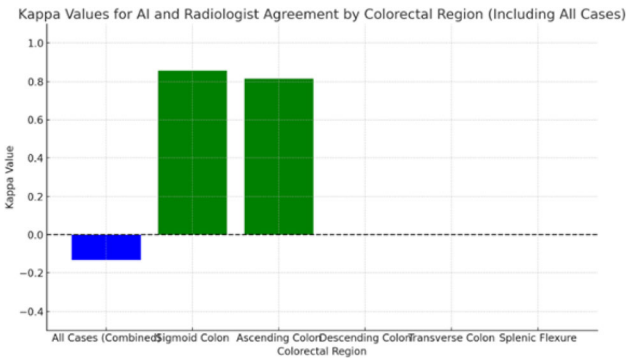
Methods and Procedures: A 5-months retrospective analysis was conducted on 18 colorectal cancer patients. After excluding three cases due to oral contrast use, 15 cases were included for analysis. Each CT scan was reviewed by an experienced radiologist, and the results were directly compared to those generated by the AI system ChatGPT 4o. A Kappa test was performed to evaluate the correlation between the AI's and the radiologist's interpretations, focusing on key areas of the colon: ascending, transverse, splenic flexure, descending and sigmoid colon.





Results: The level of agreement between AI and the radiologist varied depending on the location of the colorectal cancer. For the 6 cases of sigmoid colon cancer, the Kappa value was 0.857 ($p = 0.001$), indicating strong agreement. Similarly, for the 4 cases of ascending colon cancer, the Kappa value was 0.815 ($p = 0.001$), also showing strong agreement. However, for the 2 cases of descending colon cancer and 1 case of transverse colon cancer, there was no correlation between the AI's and the radiologist's interpretations. Additionally, the single case of splenic flexure cancer demonstrated no correlation as well. The combined analysis of all 15 cases yielded a Kappa of − 0.132 ($p = 0.333$), indicating no statistically significant agreement across all cases between AI and radiologist interpretations.

Region	Number of Cases: n	Kappa Value	Significance (p-value)	Interpretation
All Cases (Total)	15	Varies	0.333	Mixed Agreement
Sigmoid Colon	6	0.857	< 0.001	Strong Agreement
Ascending Colon	4	0.815	0.001	Strong Agreement
Descending Colon	2	Non	N/A	No Correlation
Transverse Colon	2	Non	N/A	No Correlation
Splenic flexure	1	Non	N/A	No Correlation



Conclusions: The AI showed perfect agreement with the radiologist for sigmoid and ascending colon cancer but failed to show consistent agreement in other regions of the colon. These findings suggest that while AI holds potential in imaging interpretation for specific cases, further refinement and research are necessary to ensure broader and reliable applicability across different regions of the colon.

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One Port, Two Procedures: Hiatal Plasty and Vertical Sleeve Gastrectomy in laparoscopic Surgery

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Vertical sleeve gastrectomy is one of the most frequently performed bariatric procedures in the world. Single-incision laparoscopic surgery is performed using just a single port for the whole surgery, compared to the usual technique that uses 5 ports. We present a 22-year-old female patient, with obesity refractory to hygienic-dietary measures (BMI of 34.2 kg/m^2), without symptoms of gastroesophageal reflux and reflux data in a gastroduodenal series. The patient underwent a gastric sleeve surgery through a single port, as an intraoperative finding a type I hiatal hernia was observed, so a hiatal plasty was performed, the patient maintained good postoperative evolution and was discharged on the 2nd postoperative day.

The procedure began with the patient in the French position, a 4 cm transumbilical incision was made, the space was digitally freed to begin the pneumoperitoneum with the Veres technique and subsequently a 10 mm trocar and two other 5 mm trocars were placed with a distance of 1.5 cm in triangular shape. Once the pressure of 15 mmHg was achieved, a 30° lens was introduced through a 5 mm port and conventional laparoscopic forceps were placed through the other two ports. A retractor was used to retract the liver and visualize the hiatus and the gastric chamber. A 40 Fr esophageal calibration probe was placed and dissection of the vasculature began 5 cm proximal to the pylorus. The vasculature was sectioned from that point to the angle of His using advanced bipolar energy sealing and cutting technology. Subsequently, a the plasty was performed, the pillars were closed with Ethibond-0 suture cross stitches, visualizing the orogastric tube passing easily through the esophagus. Stapling of the greater curvature was performed with a 60 mm cartridges stapler. An airtightness test was performed with methylene blue using an orogastric probe, which was negative. Subsequently, staple-line hemostasis was verified and laparoscopic instruments were removed by extracting the stomach segment through the transumbilical incision. The patient was discharged after 48 h of hospital stay without postoperative complications. He remained under monthly follow-up with adequate progress.

In addition to a better aesthetic result, the reduction of trauma to the abdominal wall results in less postoperative pain, less bleeding, faster recovery and lower risk of wound complications are great advantages of this technique. Gastric sleeve and hiatal plasty via single port has been shown to be feasible and offers the opportunity to maintain a single incision approach.

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Bariatric Surgery Conversion from Sleeve Gastrectomy in Patients 65 Years and Older: An Analysis of the 2020-2022 MBSAQIP Database

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Introduction: Bariatric surgery conversion has become increasingly common for patients with prior sleeve gastrectomy due to recurrent symptoms like weight regain. Primary bariatric surgery has been effective in patients $\geq$ 65 years, but conversion, such as to Roux-en-Y gastric bypass (RYGB), has not been well-researched. Our objective was to assess 30-day morbidity for elderly patients undergoing BSC from sleeve-gastrectomy (SG-BSC) and study procedure safety profiles with a nationwide database.

Methods: A retrospective analysis of the MBSAQIP database was performed from 2020 to 2022. We analyzed patients who underwent SG-BSC to either Roux-en-Y gastric bypass (RYGB), biliopancreatic diversion with duodenal switch (BPD/DS), single-anastomosis duodenal-ileal bypass sleeve (SADI-s), Roux-en-Y distal gastric bypass (RYGB-d), or one-anastomosis gastric bypass (OAGB). Descriptive analyses were utilized to evaluate morbidity by age ($\geq$ 65 years vs. $<$ 65 years).

Results: 31,493 SG-BSCs were identified, with 1523 in patients $\geq$ 65 years. SG-BSCs included 1304 RYGB (85.6%), 65 BPD/DS (4.3%), 55 RYGB-d (3.6%), 50 SADI-s (3.3%), and 14 OAGB (0.9%). SG-BSC trended upwards in this cohort, from 26.6% in 2020 to 42.4% in 2022 with a median age of 68 years [66,70]. The selected cohort had more females (85.1% vs. 14.9%), and were racially 80.8% White, 12.7% Black, 5.2% Unknown, 0.8% Some Other, 0.4% American Indian, 0.1% Asian, and 0.1% Native Hawaiian/Pacific Islander. Preoperative BMI was significantly lower in patients $\geq$ 65 years (37.3 ± 7.14 vs. 40.57 ± 8.14, $p < 0.0001$). Older age was significantly associated with increased intraoperative/postoperative occurrences (8.21% vs. 5.67%) and complications, including unplanned ICU admission (2.23% vs. 0.75%), transfusion (2.10% vs. 1.23%), bowel obstruction (1.64% vs. 1.41%), organ space SSI (1.51% vs. 0.88%), pneumonia (1.18% vs. 0.34%), sepsis (0.72% vs.0.26%), anastomotic leaks (0.98% vs. 0.51%), septic shock (0.66% vs. 0.13%), and ventilator use $>$ 48 h (0.46% vs. 0.15%) when compared to $<$ 65 years ($p < 0.05$). Contrarily, there were significantly decreased ED return visits (9.7% vs. 12.18%) ($p = 0.005$). No significant differences were observed for reoperation (3.41% vs. 2.82%, $p = 0.177$), readmission (7.16% vs. 7.10%, $p = 0.924$), or reintervention (2.56% vs. 2.21%, $p = 0.374$) (Fig. 1).

Conclusions: Our study found increases in BSC in elderly patients with lower preoperative BMI compared to those $<$ 65 years. Notably, ED return rates were lower in the $\geq$ 65 years group without significant differences in reoperations, reinterventions, or readmissions, but patients $\geq$ 65 years had significantly higher rates of postoperative occurrences and complications. Longer follow-up is needed to further validate the reliability of these findings and establish a confirmed safety profile of BSC in this population.

Figure 1. 30-Day Postoperative Complications Comparing Patients ≥65 years versus <65 years

30-Day Complications	Patients ≥65 years (N = 1,523)	Patients <65 (N = 29,970)	p-value
Intraoperative/postoperative occurrences	125 (8.21%)	1699 (5.67%)	<0.001*
Surgical Site Infections and Wound-Specific Complications			
Superficial SSI	16 (1.05%)	226 (0.75%)	0.386
Deep SSI	3 (0.20%)	52 (0.18%)	0.752
Organ space SSI	23 (1.51%)	265 (0.88%)	0.039*
Anastomotic leak	15 (0.98%)	153 (0.51%)	0.04*
Wound Disruption	2 (0.13%)	27 (0.09%)	0.803
Pulmonary Complications			
Pneumonia	18 (1.18%)	103 (0.34%)	<0.001*
Unplanned intubation	4 (0.26%)	49 (0.16%)	0.59
Pulmonary embolism	4 (0.26%)	51 (0.17%)	0.34
Ventilator use >48h	7 (0.46%)	45 (0.15%)	0.012*
Critical Illness Complications			
Sepsis	11 (0.72%)	77 (0.26%)	0.005
Septic shock	10 (0.66%)	40 (0.13%)	<0.001*
Unplanned ICU admission	34 (2.23%)	225 (0.75%)	<0.001*
Gastrointestinal Complications			
GI bleed	12 (0.79%)	216 (0.72%)	0.755
Bowel obstruction	25 (1.64%)	423 (1.41%)	0.012*
C. difficile colitis	1 (0.07%)	17 (0.06%)	0.59
Other Complications			
Transfusion needed	32 (2.10%)	368 (1.23%)	0.005*
Urinary tract infection	10 (0.66%)	146 (0.49%)	0.346
Reoperation	52 (3.41%)	846 (2.82%)	0.177
Readmission	109 (7.16%)	2127 (7.10%)	0.924
Reintervention	39 (2.56%)	661 (2.21%)	0.374
ED visit	149 (9.78%)	3651 (12.18%)	0.005*

*Statistical significance

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Independent Predictors of Complication and Potential Cost Savings in Patients Undergoing Sleeve Gastrectomy with Same-Day Discharge

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Introduction: The aim of this study is to (1) identify predictors of morbidity in patients undergoing sleeve gastrectomy with same-day discharge (SDDSG), (2) understand the relative uptake of SDDSG and (3) estimate the potential cost-savings to US healthcare that SDDSG could present.

Methods and Procedures: Cases of SDDSG were identified in the 2021–2022 MBSAQIP database. Univariable analyses comparing complication with predictor variables were conducted using chi-square (categorical) or Student's *t*-test (continuous). Variables with $p < 0.25$ were incorporated into a multivariable model, then stepwise logistic regression was performed to isolate independent predictors of complication.

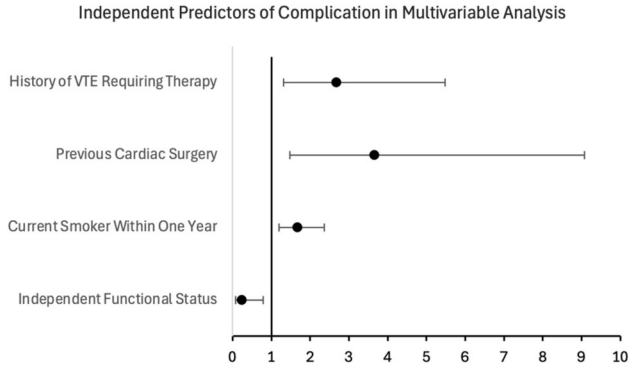
Results: There were 28,235 cases of SDDSG, of which 406 (1.4%) experienced a complication. Independent predictors of complication included independent functional status (OR = 0.24, $p = 0.02$), smoking status (OR = 1.68, $p = 0.003$), previous cardiac surgery (OR = 3.66, $p = 0.005$), and a history of venous thromboembolism requiring treatment (OR = 2.67, $p = 0.005$). 145,463 people underwent sleeve gastrectomy in 2022, of which 132,441 (91.7%) had none of these comorbidities. Recent studies have estimated SDDSG costs 6.8% less than sleeve gastrectomy with inpatient recovery; accordingly, the potential savings with increased utilization of SDDSG among the population at relatively lower risk could be as great as $51.8 million per year based on 2022 data.

Conclusions: SDDSG represents an exciting, accelerated pathway to minimize hospitalization and cost for patients seeking bariatric surgery, though uptake remains low. When planning sleeve gastrectomy, clinicians should exercise patient-centered judgement with available

information on predictors of complication versus potential cost savings of SDDSG.

Table 1 Select demographic, health, and procedural variables associated with complication

	Complication, n = 406 (n,%)	No Complication n = 27,829 (n,%)	p-value
Female	327 (80.5)	23,358 (83.9)	0.07
BMI	44.1 ± 6.9	43.6 ± 6.9	0.16
Preop hematocrit	41.6 ± 4.0	41.2 ± 3.7	0.09
Preop A1c	6.1 ± 1.0	6.0 ± 1.1	0.16
Independent functional status	403 (99.3)	27,786 (99.8)	0.004
Current smoker within one year	37 (9.1)	1,551 (5.6)	0.002
History of hypertension	168 (41.4)	10,247 (36.8)	0.06
History of venous thromboembolism requiring therapy	8 (2.0)	197 (0.7)	0.003
Prior foregut surgery	22 (5.4)	854 (3.1)	0.007
Prior cardiac surgery	5 (1.2)	92 (0.3)	0.002



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Is Surgical Technique Associated with Long-Term Outcomes for Sleeve Gastrectomy?

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Introduction: Sleeve gastrectomy (SG) technique varies by surgeon with no consensus to suggest which technical aspects result in better weight loss. This study aimed to examine how variations in technique affect long-term outcomes for SG.

Methods and Procedures: We identified patients who underwent a SG between 2015 and 2023 within a province-wide registry. We surveyed bariatric surgeons in that province to identify aspects of their SG technique and linked these to one- and three-year patient outcomes of percent total body weight loss (%TBWL).

Results: 32 out of 45 bariatric surgeons in Ontario responded to the survey, accounting for 3142 (70%) SGs performed during the study period. 76.9% of the patients were female with a mean age of 46 (± 11.5) and baseline BMI was 51.81 (± 10.29) kg/m^2. The %TBWL from baseline was 27.50 (± 10.26) % at one year, and 25.43 (± 12.22) % at three years ($p < 0.001$). Insufficient clinical response (less than 20% TBWL) was seen in 26.0%, and 39.3% patients at one and three years, respectively.

A 34Fr bougie resulted in the greatest %TBWL compared to gastroscope for sizing (GFS) (4.22% vs 36Fr: 3.07%, 40Fr: 2.34%, 46Fr: 0.93%; $p < 0.001$) at one year. At three years, all sizing devices had significantly higher %TBWL compared to GFS, with 40Fr or greater having the greatest %TBWL (40Fr: 18.16%, $P = 0.001$; 46Fr: 18.40%, $P = 0.005$). At one year, patients were 2.8 times more likely to achieve an optimal clinical response with a 34Fr bougie compared to GFS ($p < 0.001$). At three years, all sizing devices resulted in patients being 2–4 times more likely to achieve an optimal clinical response than GFS, with 40Fr and 46Fr having the best results (OR 4.3, $p = 0.003$, and 4.8, $p = 0.006$).

A staple line distance 5 or 6 cm from the pylorus versus 3 or 4 cm was associated with a significantly greater absolute difference of %TBWL at one (2.59%, $p = 0.002$) and three years (5.42%, $p = 0.004$). Patients were more likely to obtain an adequate clinical response if the pylorus distance was 5 or 6 cm versus 3 or 4 cm at one year (OR 1.9; $p = 0.019$), and three years (OR 2.2; $p = 0.037$).

Conclusions: Most of the study patients had an optimal clinical response to a SG at one and three-years. Overall, a 40Fr bougie and 5 or 6 cm staple line distance from the pylorus is the most reasonable technical approach long term; however, the association between surgical technique and patient outcomes appears to diminish over time.

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Comparison Between Robotic and Laparoscopic Approaches in Bariatric Surgery Conversions: An MBSAQIP Analysis

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Introduction: Comparisons of outcomes between robotic and laparoscopic approaches in bariatric surgery have been previously reported; however, consensus on the superiority of either technique remains limited. Despite this, utilization of robotic surgery has grown significantly, particularly in conversion bariatric procedures. In the current study, we evaluated utilization of robotics in bariatric conversions and compared outcomes between laparoscopic and robotic approaches.

Methods: A retrospective analysis of the 2021–2022 Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database was queried for all patients undergoing conversion of sleeve gastrectomy (SG) to roux-en-y gastric bypass (RYGB), biliopancreatic diversion with duodenal switch (BPD/DS), or single anastomosis duodenoileostomy (SADI) (n = 22,895). Perioperative and 30-day postoperative outcomes were analyzed and stratified by procedural approach. Categorical variables were assessed using Chi-square or Fisher's exact test and continuous variables were assessed using two-tailed unpaired Student's t test.

Results: From 2021 to 2022, the use of robotics for conversion bariatric surgery increased significantly from 27.3 to 36.6% ($p < 0.01$), although the majority of cases were still performed laparoscopically. Most conversions were from SG to RYGB (89.2%), followed by SG to BPD/DS (6.2%), and SG to SADI (4.6%). For SG to RYGB

conversions, rates of superficial surgical site infection (SSI) (0.4% vs. 1.0%), bleeding (0.4% vs. 0.9%), transfusion (1% vs. 1.4%), and unplanned ICU admission (0.6% vs. 0.9%) were significantly lower in the robotic group (all $p < 0.01$). Conversely, rates of bowel obstruction (1.9% vs. 1.3%) and 30-day readmission (7.9% vs. 6.3%) were higher in the robotic SG to RYGB group. For SG to BPD/DS conversions, rates of bowel obstruction (2.2% vs. 0.3%) and septic shock (0.7% vs. 0.0%) were significantly higher in the robotic group (all $p < 0.01$). No statistically significant differences in outcomes were observed for SG to SADI conversions.

Conclusion: Utilization of robotic approach for conversion bariatric surgery has increased in recent years and may be justified given an associated improvement in specific outcomes including SSI, bleeding, transfusion, and ICU admission rates. However, despite these benefits, further evaluation and improvement are necessary due to the increased rates of bowel obstruction and readmission in robotic conversions.

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Band to Sleeve or Band to Bypass? A Propensity Score Matching Analysis Using the 2020-2022 MBSAQIP Database

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Introduction: Laparoscopic adjustable gastric banding (LAGB) was previously a popular bariatric procedure; however, its poor long-term outcomes, such as insufficient weight loss and mechanical issues, often necessitate revisional surgery. Revisional procedures, particularly single-stage band removal with conversion to sleeve gastrectomy (SG) or Roux-en-Y gastric bypass (RYGB), are increasingly common, but data on complications from these conversions are limited. We compared 30-day outcomes of SG versus LAGB to SG conversion, RYGB versus LAGB to RYGB conversion, and LAGB to SG versus LAGB to RYGB.

Methods: This study included patients who underwent primary SG and RYGB. The variable PROCEDURE_TYPE: "conversion" was analyzed in the 2020–2022 MBSAQIP database. Using Propensity Score Matching analysis, the cohorts were matched for 23 preoperative characteristics. We then compared 30-day postoperative outcomes and bariatric-specific complications between SG versus LAGB to SG conversion (analysis 1), RYGB versus LAGB to RYGB conversion (analysis 2), and LAGB to SG versus LAGB to RYGB conversion (analysis 3).

Results: 215,817, 80,546, 6939, and 4097 patients were included for SG, RYGB, LAGB to SG, and LAGB to RYGB conversion, respectively. The matched cohorts in analysis 1 ($n = 6938$), analysis 2 ($n = 4097$), and analysis 3 ($n = 4097$) had similar pre-operative characteristics. Propensity-matched outcomes in analysis 1 showed that patients who underwent LAGB to SG conversion had higher rates of readmissions (2.7% vs. 2.1%, $p = 0.018$), reoperations (1.5% vs. 0.6%, $p < 0.001$), interventions (0.9% vs. 0.4%, $p < 0.001$), emergency visits (6.5% vs 5.1%, $p < 0.001$), and staple line leak (0.4% vs 0.1%, $p < 0.001$) compared to SG patients. In analysis 2, patients who underwent LAGB to RYGB conversion had higher rates of emergency visits (10.0% vs. 8.4%, $p = 0.014$), conversion to open (0.6% vs. 0.1%, $p < 0.001$), and staple/anastomotic leak (0.5% vs. 0.1%, $p = 0.006$) compared to RYGB group. In analysis 3, patients who underwent LAGB to RYGB conversion had higher rates of mortality (0.2% vs. 0.0%, $p = 0.035$), unplanned ICU admission (1.2% vs. 0.5%, $p < 0.001$), readmissions (4.8% vs. 2.8%, $p < 0.001$), reoperations (2.4% vs. 1.5%, $p < 0.001$), emergency visits (8.4% vs. 5.2%, $p < 0.001$), and conversion to open (0.6% vs. 0.2%, $p = 0.003$) compared to LAGB to SG conversion.

Conclusion: Conversion from LABG to SG or RYGB has a higher complication rate than its primary bariatric procedures. Furthermore, conversion from LABG to SG has fewer short-term complications and lower mortality than patients who underwent conversion from LABG to RYGB.

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See No Evil? Malignancy in the Excluded GI Tract After Gastric Bypass

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Introduction: Obesity is a major issue in the United States, which increases the risk of esophagogastric adenocarcinoma. Bariatric surgery has been suggested to decrease this risk, however, altered gastrointestinal anatomy can complicate the diagnosis of malignancy after gastric bypass.

Methods and Procedures: Several databases, including PubMed and Google Scholar, were consulted to identify cases of gastric, esophageal, and duodenal cancers after bariatric surgery. Non-human studies, previous malignancy, malignancy present at surgery, and procedures other than gastric bypass were excluded. References were reviewed for all papers to identify missed reports.

Results: 83 reports of malignancy after gastric bypass were ultimately included, 52 in the excluded GI tract and 31 in the esophagus/gastric pouch. Adenocarcinoma was the most common diagnosis in both groups (42/80.8% vs 30/96.8%). In the excluded GI tract, the most common reported symptoms were abdominal pain/distention (69.2%), iron-deficiency anemia/upper GI bleeding (38.5%), and anorexia/early satiety/recurrent weight loss (36.5%). In the esophagus/gastric pouch, the most common presenting symptoms included dysphagia (69.2%), and recurrent weight loss (46.2%). Malignancies in the excluded GI tract were diagnosed later (11.8 vs 7.1 years after surgery, $p = .013$), required more diagnostic modalities (3.83 vs 1.5, $p < .001$), were higher stage at the time of diagnosis (3.12 vs 2.04, $p < .001$), and more likely to be metastatic (51.6% vs 7.7%, $p < .001$). Overall, 40.5% of cancers in the excluded GI tract required surgical intervention for diagnosis. Before 2015, 84.6% of cases were diagnosed surgically, but with the increasing popularity of advanced endoscopic techniques, this has decreased to 16.7%. Described techniques include double-balloon enteroscopy, endoscopic ultrasound-guided biopsy, laparoscopic-assisted gastroscopy, IR-gastropexy with gastroscopy, and lumen-apposing-metal stents to create a gastrogastrostomy or gastrojejunostomy.

Conclusions: As approximately 60,000 gastric bypasses are performed in the United States annually, the incidence of excluded malignancies should be expected to rise. The remnant stomach and duodenum are inaccessible via traditional endoscopy, thus surgeons must have a high index of suspicion for pathology in the excluded GI tract. A more aggressive approach with advanced endoscopic techniques should be undertaken for patients with suspicious symptoms when the diagnosis cannot be made with traditional endoscopy alone.

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The Need for Treatment of Acute Cholecystitis Post Rygb: A Comparison of Incidence Between Perigastric Dissection and Pars Flaccida Transection Techniques for Creating Gastric Pouch in RYGB Patients

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Introduction: In Roux-en-Y gastric bypass surgery (RYGB), two methods exist for gastric pouch creation: directly transecting the perigastric neurovascular bundle containing branches of the vagus nerve (pars flaccida transection) and preservation of these structures by creating a tunnel adjacent to the lesser curve of the stomach (perigastric dissection). Previous studies comparing the methods have reported increased rates of dumping symptomology and intra-abdominal abscess in the pars flaccida transection but have not compared the need for subsequent cholecystectomy. We hypothesized that patients who underwent pars flaccida transection have a higher risk for cholecystectomy secondary to cholestasis, given the loss of parasympathetic innervation of the gallbladder from vagus nerve damage.
Methods and Procedures: A retrospective review of adult patients who underwent RYGB surgery at our institution from January 2020 to September 2023 was conducted. Patients with a cholecystectomy before or during bypass surgery and patients lost to follow-up before 1 year were excluded. Patients were grouped based on surgical technique. At one-year post-operation, patients who had a cholecystectomy or were placed on medication for cholelithiasis were identified. BMI was calculated pre- and post-operation. Welch's *T*-Tests and Chi square tests were conducted using Python Pandas Script Stats Package with alpha set at 0.05.
Results: Of the 267 patients that met inclusion criteria, 84 underwent pars flaccida transection and 183 underwent perigastric dissection. Between groups, there was no significant difference in the percentage of patients who had a cholecystectomy and/or were put on medications for cholelithiasis (Table 1). There was a significant difference between the groups in BMI 1-year post-op but not in baseline BMI or change in BMI (Table 2).
Conclusions: In these patients who underwent RYGB surgery at our institution, the pars flaccida transection did not result in increased rates of cholecystectomy or cholelithiasis when compared to perigastric dissection, making it an acceptable technique for creating the gastric pouch.

TABLES

Table 1: Association Between RYGB Method and Incidence of Cholelithiasis (n=267)

	Pars Flaccida (n=84)	**Perigastric Dissection (n=183)**	
	Percent of patients (%)	Percent of patients (%)	P-values
Cholecystectomy	8.33	7.40	1.000
Cholestasis medications	8.33	8.46	1.000
Both	16.67	15.87	1.000

Table 2: Association Between BMIs and RYGB Method of RYGB (n=267)

	Pars Flaccida (n=84)	**Perigastric Dissection (n=183)**	
	Average	Average	P-value
BMI (lbs/in^2)	46.72	45.50	0.290
1 year post op BMI (lbs/in^2)	32.73	30.61	**0.013**
Change in BMI ((lbs/in^2))	13.97	14.89	0.249

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Evaluating Post-operative Outcomes of Single-Fire vs Multiple-Fire Stapler Use in Minimally Invasive Sleeve Gastrectomy

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Introduction: The laparoscopic sleeve gastrectomy (LSG) is the most common surgical intervention for weight loss. New advances have led to the development of a single-fire (SF) stapler. The purported benefits of single-fire LSG are a more linear staple line which may avoid angulation and therefore is hypothesized to reduce post-operative nausea and vomiting as well as reduce operative times. The objective of this study is to determine if the SF technique has improved perioperative outcomes and shorter operative time compared to the multiple-fire (MF) LSG.
Methods: Retrospective chart review between 7/3/2023 and 6/12/2024 of 90-day perioperative outcomes in patients who received a LSG six months prior to and six months after switching to a single-fire stapler at a single academic bariatric center of excellence. Patient demographics, length of hospital stay, and duration of procedure were abstracted from the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program.
Results: 193 patients underwent LSG during the study period, 127 patients using MF and 66 patients using SF. The median age of patients undergoing MF was 40 (IQR 32–50) compared to 39 (IQR 33–48) for the SF group. Median highest BMI for the MF group was 47.7 (IQR 43.6–54.4) compared to 53.1 (IQR 44.2–57.9) in the SF group. There was no significant difference between the two groups for patients with diabetes, COPD, liver disease, renal insufficiency, or hyperlipidemia. The SF group had significantly more patients with hypertension (56% vs 41%, $p = 0.05$) and patients with heart failure (9% vs 2%, $p = 0.04$). There was no significant difference in median 90-day weight loss between the two groups, 47 kg in the MF group vs 43 kg in the SF group. Median operative times were 92 min and 85 min for the MF and SF groups respectively, however no statistical significance was observed. There was no significant difference in hospital length of stay, surgical site infection, staple line leaks, post-operative nausea or vomiting, requirements for intravenous fluid resuscitation post-operatively, ED visits or readmission rates between the two groups.
Conclusions: Throughout the first six months using the SF technique for LSG at this academic bariatric center of excellence, the SF method was not found to be inferior to the MF method. There is a trend toward shorter operative times with SF. While statistically insignificant in our current analysis, with greater exposure and familiarity with the device we anticipate the difference in operative times between the two groups may grow stronger.

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Severity of Obesity Does Not Impact Outcomes Following Paraesophageal Hernia Repair And Concurrent Bariatric Surgery

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Introduction: Paraesophageal hernias (PEH) are common in patients with obesity. It is reasonable to offer PEH repair and concurrent bariatric surgery to appropriate patients, but counseling should be provided to patients on safety and outcomes following combined surgery. The current study aims to evaluate if severity of obesity impacts postoperative outcomes following PEH repair and concurrent bariatric surgery.

Methods: A retrospective analysis of patients who underwent PEH repair at a single institution between 2010 and 2020 was utilized. Patients whose body mass index (BMI) was not recorded, surgery was urgent or emergent, PEH was previously repaired, or age was under 18 were excluded. Patients included had a Roux-en-Y or a gastric sleeve at the time of PEH repair, without additional procedures (cholecystectomy, ventral hernia repair, etc.). Patients were divided into groups based on BMI using the American Society for Metabolic and Bariatric Surgery classification: 30–34.9 (Class I), 35–39.9 (Class II) and 40 or more (Class III). Demographics and outcomes (recurrence, 30 day complications, reoperation, postoperative gastroesophageal reflux disease (GERD) or dysphagia) were compared across groups. Two multivariable logistic regression models predicting PEH recurrence and 30 day complications, respectively, were conducted. The models included bariatric surgery as an independent predictor and an interaction effect between obesity class and age to control for age.

Results: A total of 235 patients were included in the analysis, of which 11 (4.68%) had Class I obesity, 50 (21.28%) had Class II obesity and 174 (74.04%) had Class III obesity. Class I and II were collapsed into one group given the small number of Class I patients. Patients with Class III obesity were younger (median age 44 versus 51; $p < 0.001$). Groups did not differ in terms of smoking status, diabetes, cardiovascular or pulmonary disease, previous abdominal surgery, operative approach (laparoscopic, open, robotic) or bariatric surgery (Roux-en-Y vs. gastric sleeve). There was no difference in PEH recurrence, 30 day complications, reoperation or postoperative dysphagia across groups. Patients with Class III obesity trended towards lower rates of postoperative GERD (5.2% versus 14.8%, $p = 0.053$). On multivariable logistic regression, obesity class was not a predictor of recurrence or complications.

Conclusion: Obesity severity does not impact PEH recurrence, 30 day complications, reoperation or postoperative symptoms of dysphagia in patients undergoing concurrent bariatric surgery and PEH repair. Patients with Class III obesity can safely and effectively be offered concurrent bariatric surgery and PEH repair.

Comparing Postoperative Outcomes between patients with Class I or II obesity versus Class III obesity

		Class I&II Obesity Total=61 N (%)	Class III Obesity Total=174 N (%)	p-value
30 Day Complications	No	56 (91.8%)	158 (90.8%)	
	Yes	5 (8.2%)	16 (9.2%)	
	Not Recorded	0 (0.0%)	0 (0.0%)	0.81
PEH Recurrence	No	54 (88.5%)	159 (91.4%)	
	Yes	7 (11.5%)	12 (6.9%)	
	Not Recorded	0 (0.0%)	3 (1.7%)	0.32
Postoperative GERD	No	51 (83.6%)	162 (93.1%)	
	Yes	9 (14.8%)	9 (5.2%)	
	Not Recorded	1 (1.6%)	3 (1.7%)	0.053
Postoperative Dysphagia	No	58 (95.1%)	167 (96.0%)	
	Yes	3 (4.9%)	4 (2.3%)	
	Not Recorded	0 (0.0%)	3 (1.7%)	0.35
Reoperation	No	59 (96.7%)	164 (94.3%)	
	Yes	2 (3.3%)	7 (4.0%)	
	Not Recorded	0 (0.0%)	3 (1.7%)	0.56

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Surgical Outcomes in Banded vs. Non-Banded RYGB: A Systematic Review and Meta-analysis

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Introduction: Obesity is a chronic and recurrent disease, and weight regain or inadequate weight loss can occur even after bariatric surgery. To enhance dietary restriction in Roux-en-Y gastric bypass (RYGB) procedures, the use of a Silastic ring or "banding" has been proposed. This systematic review evaluates the efficacy and safety of incorporating this device into RYGB procedures, addressing the limited data available on its impact.

Material and Methods: PubMed, Cochrane Central, Web of science and EMBASE were searched for studies comparing banded vs. non-banded RYGB until May 2024. Studies lacking control groups or having overlapping populations were excluded. Our primary outcomes of interest included weight loss, postoperative complications and incidence of vomiting.

Results: From 1878 initial results, fourteen studies comparing banding or no-banding RYGB surgeries were included in our final analysis. Our sample comprised 18.474 patients, of which 3441 (18.6%) were submitted to the banded procedure. Mean BMI of the population ranged from 39.7 to 54.6 kg/m^2. Most papers reported two years post-op weight measures. Decrease in BMI as well as excess of weight loss were greater in the banded group (MD = 1.02; 95% CI − 0.3; 1.7; heterogeneity p-value < 0.01 and MD = 7.4; 95% CI − 10.7; 4.1; heterogeneity p-value < 0.01). However, the banded group experienced increased food intolerance and vomiting (odds ratio (OR) = 3.2; 95% CI 0.9–10.3; $p = 0.05$, heterogeneity $p < 0.01$). No significant differences were observed in postoperative complications (OR = 1.1; 95% CI 0.2–5.2; $p = 0.4$) or mortality rates (OR = 1.4; 95% CI 0.9–2.2; $p = 0.5$).

Conclusion: Incorporating banding into RYGB procedures may enhance weight loss outcomes, particularly in the first two years following surgery, but is associated with a higher incidence of postoperative vomiting.

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Preoperative Use of MBSAQIP Risk Calculator and Its Impact on Metabolic and Bariatric Surgical Outcomes

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Introduction: Metabolic and bariatric surgery (MBS) is the most effective treatment for obesity when conservative methods fail but is underutilized due to patient concerns about surgical risks. Thus, risk calculators such as the one created by the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) were developed to provide personalized, preoperative outcomes based on patient characteristics and comorbidities. This study utilized the MBSAQIP database to evaluate impact of pre-operative use of the calculator on 30-day adverse events and readmission rates. We hypotheses that the use of the risk calculator will impacts the post-operative adverse events

Methods: This was a retrospective analysis of patients from the MBSAQIP database who underwent bariatric procedures from 2021 to 2022. Patients evaluated and counseled using the calculator were compared to those who were not, analyzing differences in patient and clinical characteristics, as well as postoperative complications. Univariate and multivariate regression analyses examined independent factors associated with 30-day readmission after bariatric surgery. The primary outcomes of interest were 30-day adverse events and post-operative complications.

Results: Of the 324,642 total patients included, 61,153 (18.8%) were assessed via the calculator and 263,489 (81.2%) were not. The calculator cohort was significantly older (43 years vs 42 for controls, *p*?

Conclusion: Preoperative use of the MBSAQIP risk calculator was associated with a significant reduction in 30-day readmission rates but not with other adverse events. This suggests the calculator may help reduce readmissions, possibly through enhanced patient counseling and optimized perioperative planning. Its impact on other postoperative complications appears limited. Further research is needed to assess the effectiveness of the calculator across diverse populations. Addressing racial disparities in calculator use and outcomes could potentially improve patient care and identify areas for future investigation.

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Evaluating GERD Related Outcomes for Bariatric Patients

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Background: While the relationship between obesity and gastroesophageal reflux disease (GERD) is established, data surrounding proper procedure selection for patients with GERD is varied. This study aimed to identify pre-operative characteristics that influence GERD-related outcomes for patients undergoing either sleeve gastrectomy (SG) or Roux-en-Y gastric bypass (RYGB).

Methods: This was a retrospective, single-center study including adult patients undergoing SG or RYGB who had pre-operative pH testing (impedance, Bravo, or both) between 2017 and 2022. For each patient, demographic information, pre-operative BMI, and pre-operative pH testing results were collected. Patients were followed for the need for long-term PPI usage as well as need for subsequent interventions for GERD within a two year-follow up after surgery. Student's *t*-tests and logistic regression models were used for statistical analysis as appropriate.

Results: 195 patients were identified that met study inclusion criteria. 89 patients had 24-h pH impedance testing pre-operatively and 106 patients had Bravo pH testing. 79 patients ultimately underwent SG and 116 patients underwent RYGB. Mean DeMeester for SG and RYGB patients was 17.26 and 27.52, respectively ($p = 0.000074$). Logistic regression demonstrated that patients with positive DeMeester scores were more likely to receive RYGB. Patients were subsequently followed for 2 years post-operatively. At 1 year follow-up, 12 (33%) SG patients required PPI use vs. 16 (21.3%) RYGB patients ($p = 0.2588$). At 2 year follow up, 7 (38.9%) of SG patients required PPI use vs. 8 (18.6%) of RYGB patients ($p = 0.176$). 4 SG patients required conversion to Roux-en-Y gastric bypass.

Conclusion: Although the study is underpowered to provide definitive conclusions, with an aggressive pH diagnostic process before surgery, only 4/79 SG patients required a conversion to RYGB.

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Bariatric Surgery in Heart Failure Patients: A Feasibility Case Series Study

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Introduction: Bariatric surgery outcomes in high-risk patients remain poorly understood. Obesity is strongly linked to heart failure (HF), with each increase in unit of Body Mass Index (BMI) being associated with increased HF incidence by 5% and 7% for men and women, respectively. Patients with end-stage HF and obesity with BMI greater than 35 are precluded from cardiac transplantation. This study aims to explore the safety and outcomes of bariatric surgery in HF patients.

Methods: This is a retrospective case series review of bariatric surgery on patients with HF at a Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) accredited tertiary care centre between 2021 and 2024. Intraoperative complications, length of stay, 30-day and 1-year complications, change in BMI, change in HF medications and dosage, and candidacy for heart transplantation were assessed.

Results: Six patients (3 female, mean age 54.1 years, mean BMI 44.4 kg/m^2) underwent bariatric surgery (5 laparoscopic sleeve gastrectomy, 1 laparoscopic Roux-en-Y gastric bypass). Mean postoperative change in BMI was $-$ 8.7 kg/m^2, with percent excess weight loss of 48.2% at follow-up of 26.8 months. Patients' severity of HF was varied (3 HF with reduced ejection fraction including 2 end stage HF supported with a left ventricular assist device (LVAD), 3 HF with preserved ejection fraction). There were no intraoperative complications. Mean length of stay was 3.2 days. One patient, a 50-year-old male supported with an LVAD underwent successful cardiac transplantation two years post bariatric surgery. Two patients experienced postoperative complications, both secondary to hypovolemia after sleeve gastrectomy. One was a 57-year-old female supported with an LVAD, who presented with localized ascending colon microperforation due to hypovolemia on postoperative day 20 and managed conservatively with intravenous antibiotics. Her BMI remains a contraindication for heart transplantation. Another was a 61-year-old male with HF with reduced ejection fraction, who

presented with orthostatic presyncope due to overdiuresis eight months postoperatively, and was medically managed. All patients had decreased HF medication use post bariatric surgery.
Conclusion: To date, our institutional experience with bariatric surgery in patients with heart failure has been successful. In highly selected patients in centres with appropriate multidisciplinary expertise, bariatric surgery may be a useful tool in improving outcomes in patients with HF as well as a potentially effective bridging intervention for cardiac transplantation in patients supported with an LVAD.

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Intraoperative Leak Testing During VSG and RNYGB

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Introduction: Post operative leak account for significant morbidity and mortality after bariatric surgery. This analysis investigated patient and perioperative factors to determine those which increase the risk of post operative leak both with and without intraoperative leak testing.
Methods: The MBSAQIP individual datasets from 2015 to 2022 were combined and then filtered based on a set of exclusionary criteria. Patient demographics, comorbidities, perioperative factors, and 30-day complication outcomes were analyzed for Roux-en-Y gastric bypass (RYGB) and vertical sleeve gastrectomy (VSG) cohorts using unpaired *t*-tests or chi-squared tests. A multivariable logistic regression model was created to determine factors for postoperative leak (organ space SSI).
Results: The original combined dataset included 1,162,712 patients. Patients underwent RYGB or VSG, and Chi-squared and *t*-test analysis ($p < 0.001$) revealed patients in the leak test cohort on average had more incidences of co-morbities such as hypertension, hyperlipidemia, GERD, COPD, and diabetes (CI > 95%). The thirteen factors associated with increased risk of organ space SSI were hypertension (OR 1.10), hyperlipidemia, GERD (1.29), COPD, robotic, white, black, increased BMI, renal insufficiency, low albumin, diabetes, and immunosuppression therapy. The analysis reveals that variables such as COPD, GERD, and robotic surgery are significantly associated with an increased postoperative organ space infection. Patients with shorter operations, operations in later years, Asian, and underwent intraoperative leak testing had a lower associated risk of organ space SSI.
Conclusions: The analysis suggests that the patients with hypertension, hyperlipidemia, GERD, COPD, robotic surgeries, white, black, increased BMI, renal insufficiency, low albumin, diabetes, and immunosuppression therapy had higher associated risk for post operative organ space SSI. This would indicate a need for further study of these factors.
Questions that still remain: Surgeon technique, sore throat post intraoperative leak test

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Concurrent Ventral Hernia Repair During Conversional Sleeve Gastrectomy: Insights from 30,664 Patients in the MBSAQIP Registry

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Introduction: Ventral hernias (VH) affect up to 20–32% of obese patients undergoing metabolic and bariatric surgery (MBS). The combination of VH repair (VHR) with MBS remains controversial due to timing uncertainties, potential complications, recurrence risk, and safety concerns. Large-scale studies on outcomes of combined VHR and conversional sleeve gastrectomy (CSG) are lacking. This study aims to evaluate the 30-day rate of serious complications and prolonged hospital stay associated with concomitant VHR.
Methods and Procedures: We analyzed the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database (2020–2022) for patients undergoing CSG with or without concurrent VHR. Conversions included SG to RYGB (89.3%), BPD (6.3%), and SADI (4.4%). Primary outcomes were prolonged length of stay (LOS; > 2 standard deviations above mean) and 30-day serious complications. Secondary outcomes included specific surgical profiles and postoperative complications. Multivariable logistic regression identified independent predictors of these outcomes.
Results: Of 30,664 patients, 690 (2.3%) underwent concurrent VHR. VHR was associated with older age, higher BMI, higher ASA scores, and increased comorbidities (diabetes, hypertension, COPD, prior VTE; all $p < 0.0001$). VHR was more common in open SG conversion (2.6% vs 0.4%; $p < 0.0001$) with longer operation times (174.3 ± 71.8 vs 143.8 ± 66.5 min; $p < 0.0001$). At 30 days, VHR patients had higher rates of reoperation (5.1% vs 2.8%; $p < 0.0001$), reintervention (3.6% vs 2.2%; $p = 0.01$), readmission (9.0% vs 7.1%; $p = 0.05$), and serious complications (10.0% vs 6.6%; $p < 0.0001$). Multivariable analysis showed higher odds of serious complications with VTE (OR 1.6, 95%CI 1.1–2.5; $p = 0.022$). For prolonged LOS, higher odds were associated with African American race/ethnicity (OR 1.3, 95%CI 1.1–1.5; $p = 0.001$), VTE (OR 1.6, 95%CI 1.1–2.2; $p = 0.011$), COPD (OR 1.9, 95%CI 1.1–3.1; $p = 0.014$), hypertension (OR 1.3, 95%CI 1.1–1.5; $p = 0.002$), and therapeutic anticoagulation (OR 1.9, 95%CI 1.3–2.8; $p < 0.0001$). Lower BMI (OR 0.9, 95%CI 0.8–0.9; $p < 0.0001$) and SG to SADI procedure compared to SG to RYGB (OR 0.5, 95%CI 0.45–0.8; $p = 0.004$) showed lower odds of prolonged LOS.
Conclusion: Concurrent VHR during CSG significantly increases complication risks, with VTE history as a key predictor. Rigorous patient selection and tailored risk mitigation strategies are crucial for those considering this combined approach. Further investigation is needed to better characterize hernia types and their associated factors that may lead to increased complications, thereby enhancing our understanding and potentially improving patient outcomes.

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Conversion to Mini Gastric Bypass Post-single Anastomosis Sleeve Jejunal Bypass for Non-responders to Weight Loss

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Purpose: Single-anastomosis sleeve jejunal (SAS-J) bypass is reported as revisional surgery for weight regain after laparoscopic sleeve gastrectomy (LSG). However, technical faults in performing this procedure made it functionless. The aim is to evaluate the efficacy of the mini gastric bypass (MGB) procedure, which was opted to configure the previous SAS-J technique.
Methods: A 37-year-old woman performed LSG in 2017 (103 kg, BMI 40.7 kg/m^2). Her nadir weight was (65 kg, BMI 25.7). In 2023,

the SAS-J procedure was performed because of weight regain (100 kg, BMI 39.5 kg/m^2). The patient complained of periodic abdominal cramping, which was relieved with antispasmodic drugs. After 8 months, she lost only 5 kg despite the restriction of the diet with pharmacological regimen. A CT volumetry revealed a mild mid-body kinking at the sleeved stomach with a volume of 560–580 cc and a gastro-jejunal anastomosis of 11–12 mm in diameter. The MGB surgery was opted to configure the previous SAS-J bypass procedure.
Results: No postoperative complications occurred, abdominal cramping resolved, and the patient lost 11 kg in three months post-operatively (84 kg, BMI 33.2 kg/m^2).
Conclusion: Conversion from (SAS-J) bypass to MGB for non-responders to weight loss requires cautious consideration, thorough evaluation, and skilled surgical intervention. It aims to provide patients with a viable alternative to achieve their weight loss goals and improve their overall health and quality of life.
Keywords: One Anastomosis Gastric Bypass, redo, MGB, bariatric, conversion, SASJ.

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Veggie Trap: A Case of Phytobezoar in a Vegetarian Patient

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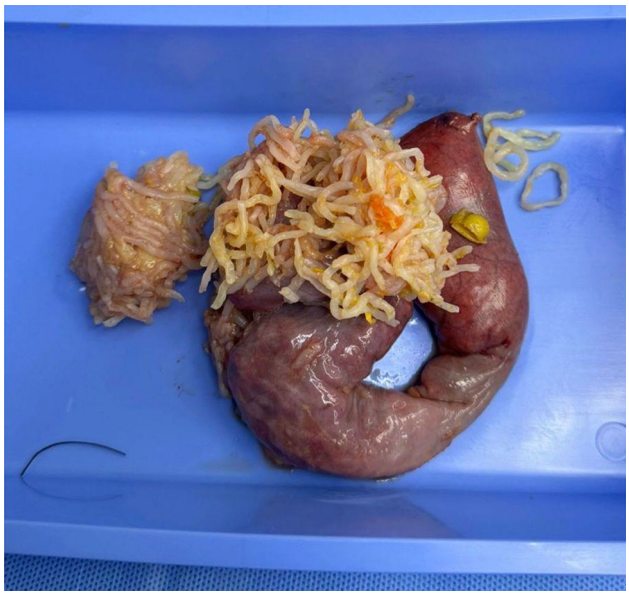
Phytobezoars are concretions of indigested fruit and vegetable fibers in the gastrointestinal tract. Gastric surgery is the most common risk factor of phytobezoar. We present the case of a 32-year-old male who was admitted to the emergency department with small bowel obstruction due to phytobezoar, he had past medical history of gastric Roux-en-Y gastric Bypass (RYGB) 6 years ago.

On clinical examination the patient presented abdominal pain, associated with vomiting and bloating. The procedure started under general balanced anesthesia, patient in modified lithotomy position a transumbilical incision was made and pneumoperitoneum was insufflated with a Veress needle, an 11 mm trocar was placed,under direct vision another two trocars of 5 mm were placed in the right and left paramedial zones, 5 mm trocar placed on the left flank and another 5 mm subxiphoid. Diagnostic laparoscopy is started, showing distended small intestine loops, with good coloration and no signs of necrosis. The gastric pouch was located and the gastrojejunum anastomosis is adequately visualized without alterations. The Peterson space is then searched for, which is observed adequately closed and with no signs of internal hernia. The alimentary loop is followed and an adequate jejunum–jejunum anastomosis is verified without alterations as well as the mesenteric gap with no signs of hernia or ischemia, then it is closed. Subsequently, the small intestine loops are followed until reaching the transition site, which is delimited by a portion of indurated small intestine, which is not mobile, and it is decided to resect a portion of the small intestine using a laparoscopic stapler using two white cartridges. The resected segment is then reconstructed by making an entero-entero anastomosis on a side-to-side basis with a white cartridge and closing the enterotomy with 3-0 Vicryl. The newly formed gap is closed with 2-0 Ethibond and the intestine segment is then extracted, which is explored extracorporeally, revealing an alimentary bezoar, which shows food with a hard consistency that completely obstructed the lumen of the small intestine segment. Finally, adequate hemostasis is verified and trocars are extracted under direct vision.

The patient was discharged after 48 h of hospital stay without complications. The patient was followed monthly, with good results and no abdominal pain. The patient changed his diet with low fiber, proper mastication and treatment of its vegetarian alimentary habits.



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Does Preoperative Response to GLP-1 Therapy Impact 6-Month Weight Loss After Roux-en-Y Gastric Bypass

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Intro: Novel long-acting glucagon-like peptide-1 receptor agonist (GLP-1RA) pharmacotherapies approved for diabetes and obesity represent a revolutionary change in obesity management due to demonstrated efficacy. While the long-term efficacy and durability of minimally invasive Roux-en-Y Gastric Bypass (RYGB) has been well established, little is known regarding optimal combination treatment strategies that combine GLP-1RA with surgery. RYGB is known to increase endogenous GLP-1 levels, however, understanding of how this mechanistic relationship could impact optimal utility of GLP-1RA in combination with bariatric surgery remains unknown. In particular, few have studied the use of novel long-acting GLP-1RA in the preoperative setting.
Methods: A pilot cohort was evaluated by selecting consecutive adult patients with obesity treated with combination preoperative GLP-1RA therapy followed by minimally invasive RYGB from a prospectively maintained single-center database. Patients treated with semaglutide or tirzepatide for a minimum duration of two months were included. Patients with missing data or less than 6-month postoperative follow-up were excluded. Patients were stratified by response to GLP-1RA therapy as responders if they lost $\geq$ 5% total body weight loss (TWL). The primary outcome of interest was 6-month post-operative %TWL. GLP-1RA responders (R), and non-responders (NR) were compared using bivariate analyses, and multivariable linear regression for 6-month post-surgical %TWL was performed adjusting for GLP-1RA response category (R or NR), sex, semaglutide vs tirzepatide, and pretreatment BMI.
Results: A total of 21 patients were identified who were treated with GLP-1RA prior to RYGB; 85.7% were female. Median pre-treatment BMI was 45.2 (IQR: 39.4–51.2). Semaglutide was administered to 19

(90.5%) of patients and 2 (9.5%) were treated with tirzepatide. GLP-1RA therapy was observed for a median of 5.3 months (IQR: 3.9–9.9). Median preoperative weight loss on GLP-1RA's was 4.54 kg, which corresponded to 4.1%TWL. 38.1% of patients treated with GLP-1RA's were classified as responders (R) with $\geq$ 5% TWL, while 61.9% were classified as non-responders (NR). Median %TWL at 6 months post-RYGB was 20.3%. Six-month postoperative %TWL was similar among groups: NR: 20.3% (IQR: 16.2–26.6), R: 21.1% (IQR: 16.4–23.7), $p = 0.69$ (Figure). On multivariable linear regression, preoperative GLP-1RA response did not correlate with altered 6-month postoperative weight loss (β – 0.01, 95%CI: [– 0.07 to 0.06], $p = 0.80$).

Conclusions: In a limited retrospective pilot cohort study, response to GLP-1RA therapy did not appear to correlate with 6-month weight loss response to RYGB. Future studies may elucidate improved understanding of optimal personalized combination treatment strategies in the optimal management of severe obesity.

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Safety of Concomitant Liver Biopsy During Bariatric Surgery: An Analysis of the MBSAQIP Database

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Introduction: Concomitant liver biopsy during bariatric surgery has gained interest for diagnostic and research purposes, particularly in studying obesity-related liver disease. However, comprehensive data on the safety of this combined approach safety remains limited. This study aimed to evaluate the 30-day rate of serious complications and mortality associated with concomitant liver biopsy during bariatric surgery using the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database.

Methods and Procedures: A retrospective analysis of the MBSAQIP database from 2020 to 2022 was conducted. Patients undergoing laparoscopic primary Roux-en-Y gastric bypass (RYGB) or sleeve gastrectomy (SG) with or without concomitant liver biopsy were included. The primary outcomes were 30-day serious complications and mortality. Secondary outcomes included operative time, length of stay, and specific postoperative complications. Multivariable logistic regression analysis was performed to determine if concomitant liver biopsy was an independent predictor of serious complications or mortality.

Results: Of 511,981 patients, 30,819 (6.02%) underwent concomitant liver biopsy. Biopsy patients had similar age (43.81 vs 43.15 years, $p < 0.001$) and BMI (45.71 vs 45.02 kg/m^2, $p < 0.001$), but higher rates of diabetes (28.25% vs 22.65%, $p < 0.001$) and hyperlipidemia (25.20% vs 22.14%, $p < 0.001$). Mean operative time was longer in the biopsy group (96.10 vs 83.59 min, p[SL1] < 0.001), but and length of stay was similar (1.56 vs 1.54 days, $p = 0.06$). Unadjusted analysis showed slightly higher rates of serious complications (3.15% vs 2.70%, $p < 0.001$) and 30-day readmission (3.32% vs 2.86%, $p < 0.001$) in the biopsy group. Specific complications included anastomotic leak (0.23% vs 0.20%, $p = 0.343$), bleeding (1.11% vs 0.86%, $p < 0.001$), and surgical site infections (0.72% vs 0.62%, $p = 0.039$). There was no significant difference in 30-day mortality (0.04% vs 0.03%, $p = 0.681$). On multivariable analysis, concomitant liver biopsy was not independently predictive of serious complications (OR 0.91, 95%CI 0.79–1.04, $p = 0.164$) or 30-day readmission (OR 1.06, 95%CI 0.94–1.21, $p = 0.344$) when adjusting for age, sex, BMI, comorbidities, and operative time.

Conclusion: Concomitant liver biopsy during laparoscopic bariatric surgery is associated with a modest increase in operative time and slightly higher unadjusted complication rates. However, it does not independently increase the risk of serious complications, readmission, or mortality when accounting for patient factors. These findings support the safety of obtaining liver biopsies during bariatric procedures.

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Prolonged Length of Stay After Primary Bariatric Surgery: Analysis of 455, 019 Patients from the MBSAQIP Database

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Introduction: Enhanced Recovery After Surgery (ERAS) protocols have revolutionized perioperative care, leading to safe reduction of hospital length of stay and optimization of resource allocation. As bariatric surgery becomes more common, applying ERAS principles to this field is essential. While serious complications, like those leading to reoperation, are known to extend hospital stays, the factors contributing to prolonged LOS (PLOS) in bariatric patients without major adverse events remain poorly understood. The present study uses the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database to define PLOS in primary bariatric surgery and identify predictors of extended hospitalization among patients without major complications.

Methods and Procedures: A retrospective analysis of the MBSAQIP database (2020–2022) was conducted. Patients that underwent primary bariatric surgery were included. PLOS was defined as > 2 standard deviations (SD) from the mean. Patients that underwent reoperation, re-intervention, or had a major complication like anastomotic leak or gastrointestinal bleed were excluded. Multivariable logistic regression analysis was performed to determine independent predictors of PLOS.

Results: Of 455,019 patients, 22,074 (4.9%) had PLOS. Mean length of stay among patients with and without PLOS were 3.6 $\pm$ 1.5 days

and 1.3 ± 0.4 days, respectively. Patients with PLOS were older (45.5 v.s. 43.1 years, $p < 0.001$), had higher body mass index (46.1 v.s. 45.1 kg/m^2, $p < 0.001$), were more likely to be female (84.4% vs 81.8% $p < 0.001$) and to have undergone Roux-en-Y gastric bypass (RYGB) (40.0% vs 26.9%, $p < 0.001$). Extended LOS patients also had higher rates of diabetes (30.1% vs 22.4%, $p < 0.001$), hypertension (53.9% vs 44.2%, $p < 0.001$), dyslipidemia (28.5% vs. 22.1%; $p < 0.001$) and gastroesophageal reflux disease (GERD) (36.9% vs 29.7%, $p < 0.001$). They had longer operating times (108.7 ± 65.0 vs 84.7 ± 47.5 min, $p < 0.001$) and an increase in deep surgical site infections (0.14% vs 0.02%, $p < 0.001$), acute kidney injury (0.36% vs 0.01%), cardiac complications (0.25% vs 0.01%, $p < 0.001$), pneumonia (0.76% vs 0.03, $p < 0.001$), and unplanned intubations (0.35% vs 0.01%, $p < 0.001$). On multivariable analysis, PLOS was independently associated with increasing age, female sex, lower functional status, renal insufficiency, racial status and RYGB ($p < 0.001$).

Conclusions: This analysis demonstrates that, among primary bariatric surgery patients without major complications, 4.9% experience prolonged LOS. Key risk factors include female sex, advanced age, comorbidities, and postoperative events. These findings underscore the need for tailored perioperative strategies to optimize care pathways and resource utilization in this growing patient population, especially for high-risk subgroups.

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Analyzing Robotic Sleeve Gastrectomy Learning Curve by Component Tasks

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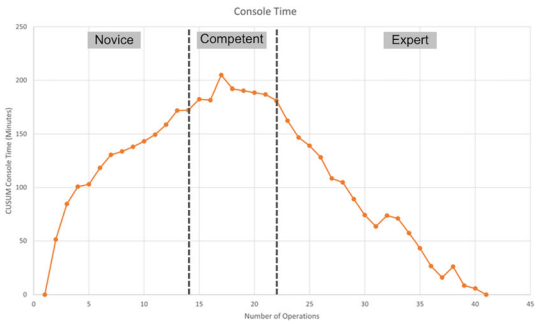
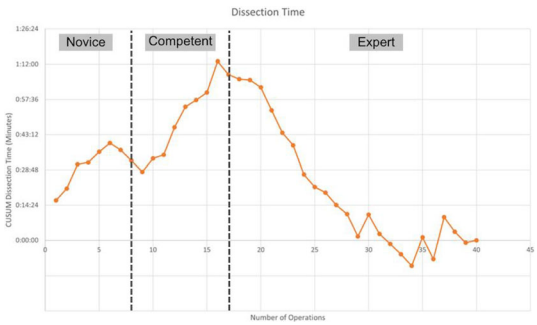
Introduction: Minimally invasive bariatric surgery is increasingly performed via the robotic approach. However, the learning curve for robotic surgical skills as broken down by critical tasks of an operation is not well characterized. As an example, the most commonly performed bariatric operation—the sleeve gastrectomy—can be divided into phases of dissection (mobilization of the stomach) and resection (stapling). This study aims to characterize the learning curve for robotic sleeve gastrectomy (RSG) as broken down into operative phases or tasks. We hypothesized that this more granular analysis of operations will allow for new insights into portions of the case that may be more difficult to learn, which can inform additional targeted training.

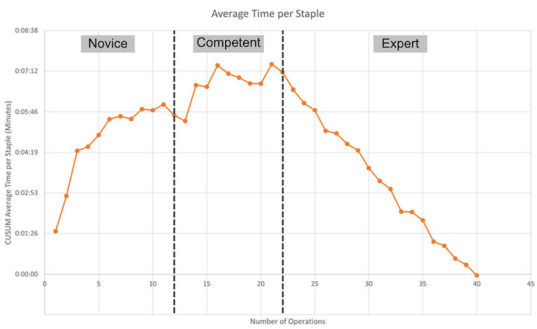
Methods and Procedures: The operative logs for the first consecutive RSG performed by an experienced bariatric fellowship-trained minimally invasive surgeon were obtained using the DaVinci My Intuitive platform. Console time, dissection time, and duration of stapler utilization were captured. Console time was defined as the total time between the first and last instrument movements from the console during a case. Dissection time was defined as the total time between the first instrument movements from the console to the last movement of the vessel sealer prior to stapling. Duration of stapler utilization was defined as the total time between first stapler movements to the end of stapler firing. An average time per staple was calculated for each case. Cases involving trainees or in which a secondary operation was performed were excluded. Cumulative sum (CUSUM) analysis was performed for console time, dissection time, and average time per staple fire.

Results: 40 RSG were analyzed. The average console time was 52 min. The number of cases to reach competency was 14 cases, and 22 cases for proficiency/expert. The average dissection time was 21 min, with 8 cases to reach competency, and 17 cases to reach proficiency/expert. The average staple time was 1 min and 51 s per staple fire, with 12 cases to reach competency, and 22 cases to reach proficiency/expert.

Conclusions: Robotic console data allows analysis of specific portions of a case and demonstrates that each component of a surgery may have its own learning curve, allowing us to identify which skills within a case may need additional training.







P193

One Year Institution Review of the Titan SGS Stapler Compared to Traditional Multi-fire Stapler for Robotic-Laparoscopic Sleeve Gastrectomy

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Introduction: The single use Titan SGS stapler offers a standardized approach when compared to multi-fire stapling devices with comparable and improved peri-operative outcomes when compared with traditional multi-firing stapler devices.
Methods and Procedures: Retrospective review of a single institution outcomes for patients who underwent sleeve gastrectomy between January 2023 and May 2024. Patients were subdivided by staplers utilized during the procedure; Titan SGS^{TM} Stapler or traditional stapler. Exclusion criteria included any other concurrent surgical procedure, including lap band removal.
Results: A total of 90 RA-LSG were performed using the Titan SGS stapler. Data from these patients was compared to 119 patients who underwent RA-LSG using a multi-firing stapling device during the same timeframe. The average pre-operative BMI for the Titan cohort was 43.89 (IQR 42.5–51.9) comparable to 44.13 (IQR 43.3–52.3) for sequential staple firing. Overall operative times were evaluated and compared, with the Titan group having a mean operative time of 66 min versus 82 min in the control/traditional stapler group. Titan patients also had a decreased hospital length of stay, and had less post-operative nausea/vomiting. Weight loss measured at 30 days was comparable when evaluating BMI (41.44 Titan vs 42.33 Traditional).

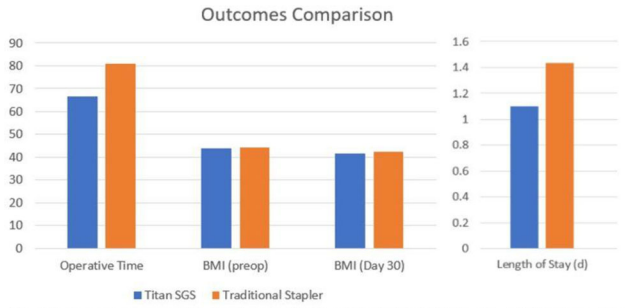

Figure 1. Demonstrates the difference in operative time (minutes) between the Titan SGS group and the Traditional stapler group, as well as the preoperative vs postoperative (30 day) BMI and length of stay (days).

Conclusion(s): This report identifies an institution's results for robotic assisted-laparoscopic sleeve gastrectomy. Our results demonstrate an effective alternative to traditional stapling technique with decreased operative times, post-operative nausea/vomiting, and comparable weight loss/BMI within 30 days from surgery.

P194

Conversions to Open Approach in Bariatric Surgery: A MBSAQIP Cohort Study Evaluating Complications and Risk Factors for Conversion

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Introduction: Bariatric surgery is primarily performed using minimally invasive techniques (laparoscopy or robotic). Intraoperative conversion to an open approach is generally associated with increased complications. This study aimed to assess the frequency of conversion to open in the most common anastomotic bariatric procedures, compare complication rates in patients who are converted and determine factors associated with risk of conversion.
Methods: The MBSAQIP database from 2020 to 2022 was analyzed and two cohorts were outlined, those who underwent laparoscopic surgery and those who required conversion to open. Adult patients undergoing primary Roux-en-Y gastric bypass (RYGB), biliopancreatic diversion with duodenal switch (BPD-DS) and single anastomosis duodenal-ileal bypass (SADI) were included. Univariate analysis was performed to characterize differences and assess for rate of complications between these cohorts. Multivariate logistic regression analysis was performed to determine factors associated with conversion to open and 30-day serious complications.
Results: A total of 189 148 patients were identified of which 191 (0.10%) required conversion to open. Factors associated with increased risk of conversion to open included age (aOR 1.75, $p < 0.001$), undergoing BPD-DS (vs RYGB, aOR 1.82, $p = 0.012$) and previous abdominal surgery (aOR 3.31, $p < 0.001$). Factors associated with decreased likelihood of conversion included female sex (aOR 0.48, $p < 0.001$), higher albumin (aOR 0.45, $p < 0.001$) and more recent operative year (2022 vs 2020, aOR 0.54, $p = 0.002$). SADI-S was associated with a similar risk to RYGB (aOR 0.74, $p = 0.770$). Patients converted were more likely to have 30-day reoperation (13.1% vs 2.0%, $p < 0.001$), reintervention (6.3% vs 1.5%, $p < 0.001$) or readmission (15.7% vs 5.1%, $p < 0.001$) on bivariate analysis. Patients converted to open were more likely to have 30-day serious complications (26.2% vs 5.0%, $P < 0.001$), which also independently predicted conversion to open in multivariate analysis (aOR 2.84, $p < 0.001$) and was one of the strongest predictors.
Conclusions: Conversion to open bariatric surgery is rare but is greatly associated with increased risk of postoperative complications. Patients who are at increased risk may benefit from preoperative identification and risk mitigation, such as those with lower albumin, undergoing BPD-DS, older, and with a history of previous abdominal surgery.

P195

Disparities in Bariatric Care: Modernization of Bariatric Surgery Coverage Improves Access to Care

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Introduction: Bariatric surgery continues to be an underutilized tool and this has an even larger impact on patients of lower socio-economic background who have less access to healthcare services. This is further magnified as these patients have additional social determinants of health and financial barriers that limit ability to receive care or specialty services. Multiple insurance plans also may include requirements that make if difficult patients to quality for coverage of bariatric surgery. In this project, we look at the impact of implementing evidence-based guidelines on the number of bariatric surgical cases performed in patients with Oklahoma Medicaid.
Methods: Data regarding Bariatric Surgery cases done within the state of Oklahoma was obtained from the Oklahoma Health Care Authority. Total number of cases on an annual fiscal year from 2018 to 2023 along with complexity and Diagnosis-Related Group (DRG) breakdown were obtained. Impacts of Medicaid expansion along with changes in Bariatric Surgery requirements were analyzed to evaluate the impact of these changes on the number of patients who underwent bariatric surgery over the timeframe.
Results: In 2018, 2019, and 2020, there were 5, 10, and 4 patients who had bariatric surgery in this and the annual utilization rate approaches 1/100,000 lives covered (0.001%). In 2021, the year in which Medicaid expansion was enacted, 15 patients had bariatric surgery with a utilization rate very similar to the prior years. New Bariatric Surgery guidelines were implemented in 2021. In 2022, 47 patients underwent surgery, a 213% increase from the prior year. In 2023, 183 patients underwent bariatric surgery, a 289% increase from the prior year, and 1120% increase from 2 years prior.
Conclusion: Patients who have Medicaid have very low rates of utilization of bariatric surgery. Medicaid expansion demonstrated similar rates of utilization for these services when compared to years before Medicaid expansion was enacted. Adoption of evidence based bariatric guidelines has led to more than 1100% increase in utilization of these services in the immediate 2 years after policy changes. Additional hospital and surgical services are necessary to provide care for patients covered by Medicaid who qualify for bariatric surgery.

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Staying on Track: Identifying Predictors of Follow-up After Metabolic and Bariatric Surgery

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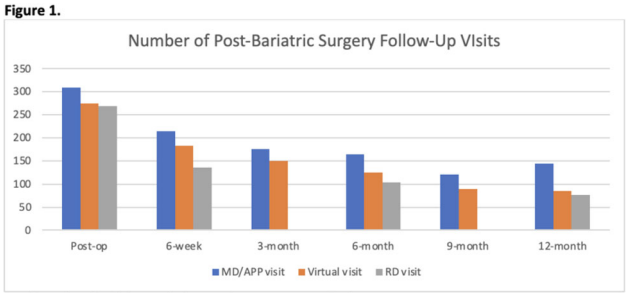
Introduction: Despite evidence suggesting follow-up after metabolic and bariatric surgery (MBO) may impact weight loss outcomes, significant patient attrition persists. This study sought to identify factors associated with number of follow-up visits during the first year after MBO.
Methods and Procedures: Review was performed on a prospectively maintained patient questionnaire database at a regional health system, including patients who underwent MBO from 2020 to 2022. Patient demographics, insurance type, operative characteristics, and number of post-operative follow-ups were collected. There were six routine follow-up visits with the surgeon or advanced practice provider (MD/APP) and four visits with the registered dietician (RD) scheduled within 12 months post-operatively. Univariable and multivariable linear regression analysis were performed to identify predictors of total number of follow-up visits at 12 months postoperatively.
Results: A total of 316 patients (241 females, 76.3%) underwent MBO with a preoperative mean body mass index (BMI) of 43.6 ± 17.4 kg/m^2 and age of 48.7 ± 12.1 years. Sleeve gastrectomy was performed in 199 (63%) patients, Roux-en-Y gastric bypass in 98 (31%) patients, and other in 19 (6.0%) patients. Seventy (22.2%) of these operations were revisional. Most patients (n = 200, 63.3%) lived within 20 miles of the health system. Decreasing number of follow-ups were noted for both MD/APP and RD visits as the year progressed (Fig. 1). The total number of visits (median [interquartile range]) with MD/APP was 4 (2–5) with 3(2–4) virtual, and 2 (1–3) RD visits. On univariable analysis, female sex (β = 1.24, $p < 0.001$) was positively associated with the number of follow-up visits while other race (β = − 1.22, p = 0.001), distance per 20-mile increase (β = − 0.42, p = 0.001), revisional procedure (β = − 0.94, p = 0.003), and percentage of virtual visits (β = − 1.60, p = 0.001) were negatively associated with the total number of follow-up visits. On multivariable analysis, female sex (β = 1.42, $p < 0.001$) remained an independent positive predictor, while other race (β = − 1.28, p = 0.001), distance per 20 mile increase (β = − 0.32, $p < 0.001$), revisional procedure (β = − 0.89, p = 0.014), and percentage of virtual visits (β = − 1.43, p = 0.003) were independent negative predictors of number of total follow-up visits. Insurance type, preoperative BMI, and type of primary bariatric operation were not significant predictors.
Conclusions: Distance from the medical office, a higher percentage of virtual visits, and undergoing revisional procedures are associated with fewer total number of follow-up visits within the first year after MBO. These potential risk factors highlight important considerations and discussion points during pre-and post-operative period to optimize post-MBO outcomes.

Figure 1.



MD/APP (medical doctor/advanced practice provider)
RD (registered dietician)

P197

Efficacy and Safety of Tranexamic Acid in Bariatric Surgery: A Systematic Review and Meta-analysis

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Background: Current evidence supports the efficacy and safety of intravenous tranexamic acid (TXA) use in various surgical contexts. However, evidence for TXA utilization specifically in the bariatric

surgery and obese patient setting is lacking. Obesity promotes chronic states of low-grade systemic inflammation, which in turn, induces hypercoagulable states. Evidence dedicated to this unique population is needed. Since the previous systematic review ($n = 753$), three additional studies have been published that double the previous sample size, supporting the need for an updated review.

Methods: The PRISMA guideline was followed. Medline, Embase, and Cochrane Library databases were searched from inception to August 2024. We included all comparative studies involving bariatric surgery patients (laparoscopic gastric bypass and sleeve surgeries), that studied the effect of TXA on perioperative bleeding and safety parameters. Bleeding events were defined as bleeding associated with hemodynamic changes or requiring an intervention (i.e., re-operation or transfusion). Meta-analyses were performed using random effects models. The Mantel–Haenszel method was used to report relative risk (RR) values for dichotomous variables, and inverse variance weighting was used to calculate difference in means for continuous variables.

Results: Four randomized controlled trials (RCT; $n = 404$), 3 retrospective cohort ($n = 1007$), and 2 prospective cohort ($n = 111$) studies involving 1504 patients were included in this systematic review. Meta-analyses demonstrated that TXA use, compared to no TXA, led to reduced risk of transfusion (RR 0.28, 95% CI 0.08–0.95, $p = 0.04$, $i2 = 0\%$, $n = 1371$), bleeding events (RR 0.47, 95% CI 0.32–0.69, $p < 0.001$, $i2 = 0\%$, $n = 1523$), post-operative hemoglobin reduction (0.20 g/dL, 95% CI 0.02 to 0.38, $p = 0.03$, $i2 = 38\%$, $n = 797$), length of hospital stay (LOS) ($-$ 2.72 h, 95% CI $-$ 4.95 to $-$ 0.49, $p = 0.02$, $i2 = 44\%$, $n = 678$), and operative time ($-$ 6.70 min, 95% CI $-$ 11.0 to $-$ 2.40, $p < 0.01$, $i2 = 84\%$, $n = 796$). There were no differences in intraoperative blood loss ($-$ 20.0 ml, 95% CI $-$ 47.7 to 7.8, $p = 0.16$, i2 = 85%, $n = 431$). Subgroup analyses restricted to RCTs demonstrated reduced risk of bleeding events (RR 0.46 [0.24 to 0.87]), hemoglobin reduction (0.4 [0.1 to 0.7] g/dL), and LOS ($-$ 1.67 [$-$ 2.87 to $-$ 0.47] hours) with TXA use. There were no deep venous thromboembolic (DVT) events across all studies.

Conclusion: Updated evidence demonstrates that TXA use in bariatric surgery is associated with reduced perioperative transfusion rates, bleeding events, hemoglobin reduction, LOS, and operative time with no differences in intraoperative blood loss. There were no DVTs across all included studies, suggesting TXA likely does not increase DVT risk. However, larger RCTs are needed to corroborate these findings.

P198

Bariatric Postoperative Card: Streamlining Surgical Data

Antonio M Marmolejo, MD, PhD; Lizbeth Guilbert, MD, PhD; Jorge Farell, MDPhD; Jorge Daes, MD, PhD; Universidad Nacional Autonoma de Mexico

Introduction:

The number of bariatric procedures has substantially increased in recent decades. (1) In 2022, the United States alone recorded approximately 279,967 procedures, (2) whereas global documentation exceeded 500,000. (3) Sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB) are the primary bariatric surgeries, accounting for 65% and 24% of the cases, respectively. (4) Although less prevalent, One-Anastomosis Gastric Bypass (OAGB) has gained traction. Despite the growing accessibility of bariatric surgery, only 2% of the population with obesity will pursue this therapy. (5) The primary obstacles preventing broad expansion include the cost of the procedure and lengthy waiting times. Medical tourism has emerged as a viable option for patients with restricted access to healthcare or a modest socioeconomic standing. (6) The assessment and subsequent monitoring of these patients in their nation of origin are challenging because of inconsistent medical documentation and specifics of the perioperative phase, encompassing surgical methodology, complications, and so forth. However, tracking these patients' medical histories upon their return is highly relevant for facilitating an appropriate and safe transition of care to providers. Therefore, we introduced the Bariatric Postoperative Card (BP Card) to streamline this process.

About the BP Card

The BP Card captures essential information from the patient's bariatric surgery journey:

Basic patient details and surgeon contact information.

Preoperative health conditions and potential risks.

Key surgical events and postoperative conditions for enhanced follow-up. See Fig. 1.

Why is the BP Card Necessary?

1. *Preoperative Insights:* Understanding current health issues enables better patient preparation and prediction of post-surgical outcomes. Recognizing these conditions enables safer and more successful surgery. (7, 8)
2. *During Surgery Observations:* Occasionally, surgical findings necessitate alterations to the planned procedure. Documenting these changes is essential for appropriate postoperative care and management of potential complications. (9, 10)
3. *Postoperative Monitoring:* The postoperative period can be associated with the emergence of complications. Therefore, maintaining readily accessible medical records enables the healthcare team at the patient's home location to effectively monitor their progress and provide the necessary interventions. (6)

In Conclusion

The growing popularity of medical tourism for bariatric procedures requires standardized patient records to ensure seamless continuity of care. The BP Card serves as a valuable resource in this regard, providing healthcare professionals with critical surgical information that improves patient follow-up and outcomes.

Web Page Link

https://bariatricpostoperativecard.com/

P199

Concomitant Laparoscopic Cholecystectomy with Bariatric Surgery: Current Insights from the 2015–2021 MBSAQIP Database

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Introduction: Obesity and cholelithiasis frequently coexist, leading to the consideration of combining bariatric surgery with laparoscopic cholecystectomy (LC) to address both conditions in a single procedure. This study analyzed short-term outcomes of sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB) with concomitant LC using data from the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) data registry.

Methods: Adults undergoing primary SG or RYGB, with and without concomitant LC (SG-LC and SG-only or RYGB-LC and RYGB-only, respectively), were analyzed from the 2015 to 2021 MBSAQIP database. Differences in baseline characteristics by LC status for each procedure were adjusted using entropy balancing. Multivariable

weighted logistic and linear regressions were subsequently developed to evaluate the independent association between concomitant LC and outcomes of interest.

Results: Of 1,182,126 patients who met inclusion criteria, 72.8% (n = 853,613) underwent SG and 27.2% (n = 328,513) underwent RYGB, of which 1.0% (n = 8,710) and 1.5% (n = 5,102) received concomitant LC, respectively. Compared to SG-only, SG-LC had higher unadjusted 30-day rates of superficial (0.6% vs 0.3%, $p < 0.001$) and organ-space surgical site infections (0.4% vs 0.2%, $p = 0.029$), pneumonia (0.3% vs 0.1%, $p = 0.043$), and readmission (3.9% vs 3.0%, $p < 0.001$). Compared to RYGB-only, RYGB-LC had higher unadjusted rates of septic shock (0.3% vs 0.2%, $p = 0.020$), acute renal failure (0.5% vs 0.1%, $p < 0.001$), and reoperation (3.5% vs 2.7%, $p = 0.007$). After multivariate adjustment, despite no significant association with in-hospital mortality or readmission, SG-LC and RYGB-LC were associated with significantly increased operative length, length of stay, and odds of superficial surgical site infection (Table 1).

Conclusions: This entropy-balanced analysis of seven-year data from the MBSAQIP registry demonstrated that concomitant LC with bariatric surgery was linked to increased rates of postoperative infection but had no association with serious morbidity or mortality. Bariatric surgery with concomitant LC can be considered a safe and viable option for appropriately selected patients, weighing the potential benefits against the risk of postoperative infection.

Table 1 Adjusted outcomes of concomitant LC by bariatric surgery procedure

Outcome	SG-LC		RYGB-LC	
	AOR/ β	P value	AOR/ β	P value
Superficial surgical site infection, AOR	1.92	**0.002**	1.54	**0.013**
Operative length, β, min	29.92	< **0.001**	24.20	< **0.001**
Length of stay, β, days	0.15	< **0.001**	0.31	< **0.001**

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Reduction in Comorbid Conditions in Patients with Severe Obesity Who Underwent Bariatric Surgery

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Introduction: According to the CDC, 42% of individuals 20 years or older have obesity, with a body mass index (BMI) greater than 30 kg/m^2. Since the year 2000, the growth rate of individuals with a BMI of $\geq$ 50 kg/m^2, has increased at three times the rate of those with moderate obesity. While bariatric surgery is highly efficacious in patients with grade II and III obesity, little is known about the effect on the severe obesity. The objective of this study was to characterize the impact of bariatric surgery on this population.

Methods: A meta-analysis was conducted to evaluate the effectiveness of bariatric surgery, specifically, sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB), in decreasing BMI and reducing the prevalence of diabetes mellitus and hypertension in patients postoperatively. The bariatric surgery groups were compared to a control group consisting of patients who received medical therapy for weight loss. 52 studies published between 2000 and 2024 were identified with a total of 116,610 patients. Data was collected on pre and postoperative comorbidity rates and complications.

Results: Of the articles meeting inclusion criteria, 67,991 patients had BMI > 50 kg/m^2. 43,638 underwent RYGB and 24,353 underwent SG. RYGB patients had a 43% reduction in BMI at 6 years, as compared to 40% for SG. In comparison, the control group had a 2% reduction. 1783 patients with severe obesity were identified to have diabetes, of which 1733 underwent RYGB and 50 underwent SG. RYGB patients had a 72% reduction in the prevalence of diabetes at 4 years, as compared to a 50% reduction for SG, and a 43% increase in the control group. Hypertension data was available for 1451 patients at 5 years. RYGB patients had a 9% reduction in the prevalence of hypertension compared to 25% for SG, while there was a 19% increase in hypertension rates in the control group.

Conclusions: In patients with severe obesity with a BMI greater than 50, bariatric surgery is effective at long term weight reduction and resolution of obesity-related comorbidities. Although RYGB and SG have similar rates of BMI reduction in this population, patients who undergo RYGB have a greater decrease in the prevalence of diabetes at 4 years, while patients who undergo SG have a greater decrease in the prevalence of hypertension at 5 years.

P202

Utility of Routine Pre-operative Abdominal Ultrasound in Detecting Diet-Resistant Metabolic Dysfunction-Associated Steatotic Liver Disease in Bariatric Surgery Patients

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Background: A large proportion of patients undergoing bariatric surgery exhibit concomitant Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD), detectable by abdominal ultrasound. Despite this, routine use of abdominal ultrasound in the preoperative workup of bariatric surgery patients remains controversial. The purpose of this study was to determine the utility of routine preoperative abdominal ultrasound in detecting diet-resistant MASLD in patients undergoing bariatric surgery.

Methods: A cohort of 40 obese patients undergoing bariatric surgery (laparoscopic Roux-En-Y gastric Bypass or sleeve gastrectomy) between May and September 2024 were included. All patients underwent routine abdominal ultrasound during pre-operative workup. Liver function test values were normal for all patients at the time of ultrasound. All subsequently underwent nutritionist-guided dietary modification for at least two months prior to surgery as well as strict shrink liver diet for 2 weeks pre-operatively. Patients with evidence of hepatic steatosis on ultrasound underwent liver biopsy at the time of bariatric surgery.

Results: Nearly half (45%; 18/40) of bariatric patients exhibited signs of MASLD on routine abdominal ultrasound, as evidenced by increased echogenicity, lobulations, or coarsened parenchymal echotexture. Despite dietary therapy and adherence to shrink liver diet, wedge liver biopsy at the time of bariatric surgery demonstrated hepatic steatosis in one third of this subset (33%; 6/18), ranging from mild to moderate (10–40%) steatosis. An additional two patients demonstrated borderline steatosis. Of those patients with definitive steatosis, four (or 10% of the total cohort undergoing routine abdominal ultrasound) demonstrated perisinusoidal or macrovesicular

fibrosis and were referred to hepatologists for further evaluation and follow-up.

Conclusion: With growing incidence of hepatic steatosis progressing to end stage liver disease, it becomes imperative to screen and treat high risk obese patients for MASLD. Routine pre-operative abdominal ultrasound detects a significant prevalence of MASLD amongst patients undergoing bariatric surgery. Furthermore, routine pre-operative abdominal ultrasound can serve as an indicator of the need for liver biopsy at the time of bariatric surgery, which uncovers significant MASLD-related damage requiring further specialized treatment and follow-up.

P203

Does Cannabis Use Affect Metabolic and Bariatric Surgical Outcomes?

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Introduction: Despite its legality, marijuana use in metabolic and bariatric patients remains controversial. Previous literature has suggested that cannabis use may improve surgical outcomes with regard to post-operative nausea, vomiting and pain control, while other studies have found an increased risk of perioperative complications and mortality after elective non-cardiac surgery. Our study aimed to investigate whether cannabis use leads to difference in short and long-term outcomes following metabolic and bariatric surgery (MBS).

Methods: The SPARCS database was used to identify patients who underwent Roux-en-Y gastric bypass (RYGB), sleeve gastrectomy (SG) and gastric banding (GB) between 2017 and 2022. Cannabis use was assessed using diagnosis records within 2 years prior to MBS. For each patient, demographic factors, LOS, readmission and in hospital complications (as defined by ACS NSQIP criteria) were analyzed. Multivariable regression models were used to examine differences in each outcome based on cannabis use.

Results: A total of 103,548 MBS patients were included in the study. Of these, 944 were cannabis users and 102,604 were non-users. LOS and 30-day readmission after metabolic and bariatric procedure were significantly different between cannabis use and non-cannabis use patients: cannabis use patients had longer LOS (OR = 1.06, 95% CI: 1.00–1.11, P-value = 0.0356) and a higher risk of having 30-day readmission (OR = 1.44, 95% CI: 1.06–1.97, P-value = 0.0211) compared to non-cannabis use patients. There was no significant difference in the risk of in-hospital complication (p-value = 0.5855), or in the risk of revision/conversion after the metabolic and bariatric procedure between users and non-users (P-value = 0.0505).

Conclusion: Although individuals who use cannabis may have a higher risk of 30-day readmissions and a longer initial hospital LOS, cannabis use is not associated with worse outcomes with respect to in-hospital complications and revision/conversion surgery.

P204

Comparative Efficacy of Roux-en-Y Gastric Bypass Versus Sleeve Gastrectomy in Children and Adolescents - A Systematic Review and Meta-analysis

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Introduction: Bariatric surgery is an effective and increasingly prevalent treatment for obesity. Recent large-scale trials have shown that Roux-en-Y gastric bypass (RYGB) results in superior weight loss outcomes compared to sleeve gastrectomy (SG) in adults. In the adolescent population, however, relatively little is known about the comparative safety and efficacy of these two procedures. As bariatric surgery continues to become increasingly popular amongst younger patients, we sought to conduct a systematic review and meta-analysis comparing weight loss outcomes of RYGB and SG in the adolescent population.

Methods: We systematically searched MEDLINE, Embase, Web of Science, CENTRAL, and ClinicalTrials.gov from inception until September 2024 for all studies comparing RYGB and SG on patients $\leq$ 21 years of age. Our primary outcome was postoperative BMI change at a minimum of 1-year of follow up. Secondary outcomes included percent change in total body weight and incidence of peri- and post-operative complications. We conducted meta-analyses using a DerSimonian-Laird random effects model for continuous variables and a Mantel–Haenszel random effects model for dichotomous variables. Heterogeneity was assessed using the inconsistency (I^2) statistic, with $>$ 50% representing considerable heterogeneity. All statistical analyses were completed on R version 4.3.3 and Cochrane Review Manager 5.4.

Results: Following abstract and full-text screening, 12 studies fulfilling eligibility criteria were included in the meta-analysis. All studies were observational in nature (9 retrospective and 3 prospective cohort studies). A total of 1459 patients were included across our analyses, with a weighted mean age of 17.64. At a median follow-up of 12 months, there was no significant difference between RYGB and SG in the change in BMI from baseline (Mean Difference (MD) 1.12 kg/m^2 greater BMI loss with RYGB [95% CI − 0.45 to 2.68], I^2 = 51%, p = 0.16, n = 865 patients) (Fig. 1). Similarly, there was no difference in the percent change in total body weight from baseline with RYGB compared to SG (MD 2.08% [95%CI − 0.34 to 4.5], I^2 = 0%, p = 0.09, n = 442). There was no difference in the incidence of complications between RYGB and SG (Odds Ratio 1.19 [95%CI 0.80–1.77], I^2 = 0%, p = 0.40, n = 1130).

Conclusions: Based on the existing literature, we observed no significant differences in weight loss or incidence of complications between RYGB and SG in adolescent patients. However, these findings were not supported by any RCT evidence, underscoring the need for future high-quality RCTs comparing RYGB and SG in the adolescent population.

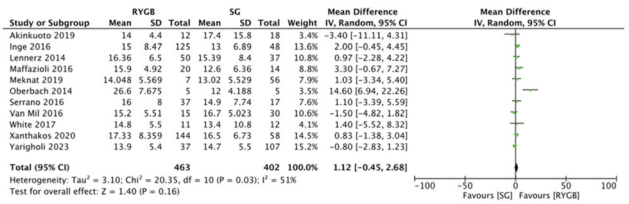

Figure 1: Decrease in BMI following surgery. Values are shown as absolute values and all represent decreases from the original BMI.

P205

Conversion of Sleeve Gastrectomy to Roux-en-Y Gastric Bypass in a Rural Population

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Introduction: In the past decade, sleeve gastrectomy (SG) has become the most popular bariatric operation in the United States. The most common indications for revision of SG to Roux-en-Y gastric bypass (RYGB) are medical refractory gastroesophageal reflux disease (GERD), inadequate weight loss, or weight regain. The objective of the current study was to examine the indications and outcomes for bariatric patients who underwent revision from SG to RYGB at an academic medical center in a rural state.
Methods and Procedures: This was a retrospective review from years 2017 to 2024 using the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database information from a rural academic tertiary care center. Individuals included were adult (age 18 and greater) bariatric patients who underwent SG and had subsequent revision to RYGB.
Results: Sixty nine patients underwent SG to RYGB, sixty six of whom were female (96%). Indications for revision included reflux ($n = 56$), inadequate weight loss or weight regain ($n = 5$), or both ($n = 8$). The average pre-operative BMI was 40.8. Hiatal hernias were repaired in 42% of patients. Percentage of excess weight loss (PEWL) was 12.0%, 33.3%, 41.0%, 41.3%, and 55.9% at 1, 6, 12, 24, and 36 months respectively. Percent total weight loss (PTWL) was 3.7%, 12.1%, 16.2%, 17.8%, and 24.0% at 1, 6, 12, 24, and 36 months respectively. The rate of intra-op/post-op complications was 10.1%. 72% of patients did not report GERD symptoms at their most recent post-operative visit.
Conclusion(s): SG to RYGB is an effective procedure for patients who have undergone SG with medication resistant reflux or inadequate weight gain/weight regain, with weight loss occurring up to 36 months postoperatively. Reflux was the most common indication for revision with hiatal hernia repair occurring frequently at the time of revision. Further studies are needed to examine long-term weight loss and GERD outcomes from this bariatric revision.

P206

Diagnostic Utility of Non-invasive Test ELF for Detecting Liver Fibrosis in Correlation with Liver Biopsy in Morbidly Obese Patients Undergoing Bariatric Surgery

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Background: Liver fibrosis is closely associated with liver-related complications and mortality in Metabolic Dysfunction-Associated Fatty Liver Disease (MAFLD). While liver biopsy is the gold standard for assessing fibrosis, it is invasive. Non-invasive alternatives such as fibroscan loses its sensitivity to detect fibrosis correctly due to obesity. We aimed to evaluate efficacy of Enhanced Liver Fibrosis (ELF) panel for diagnosing liver fibrosis in obese patients undergoing bariatric surgery.
Materials & Methods: This prospective study, conducted at AIIMS, New Delhi from January 2022 to June 2024, involved preoperative assessments using ELF, fibroscan, hemogram, and liver function tests, followed by intra-operative liver biopsy. Liver biopsy was avoided in cases with gross cirrhosis. We analysed the performance of various non-invasive tests, including ELF, Liver Stiffness Measurement (LSM), FIB4, FAST, NAFLD fibrosis score, BARD, and FNI score.
Results: Among 120 patients, primarily female with an average age of 42.7 years and a mean BMI of 45.6 kg/m^2, liver biopsies revealed advanced fibrosis (stage ≥ 3) in 16.7% and cirrhosis (F4) in 9.16%. To detect advanced liver fibrosis, ELF, with a cut-off of 9.29, demonstrated the highest AUROC of 0.86.
Conclusion: ELF panel with high AUROC and negative predictive values, are effective for ruling out advanced liver fibrosis and could reduce the need for liver biopsy in morbidly obese patients undergoing bariatric surgery and thus may be a prospective tool to follow up these patients without need for follow up biopsy.

P207

Rates and Factors Associated with Preventable Emergency Department Utilization Following Primary Elective Bariatric Surgery: An Mbsaqip Analysis of 491,493 Patients

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Purpose: Preventable emergency department (PED) visits following elective bariatric surgery are defined as emergency room presentations which are not a result of major complications and do not require readmission, reoperation or reintervention. PEDs are thought to be largely avoidable and are associated with excess healthcare burden, however, their prevalence and underlying predictors have not yet been studied.
Materials and Methods: The MBSAQIP registry identified all patients who underwent primary sleeve gastrectomy and Roux-en-Y gastric bypass from 2020 to 2022. PED utilization was captured using the ed_vstnm variable and defined a priori by ED visits due to modifiable factors including abdominal pain, nausea or emesis, dehydration, and musculoskeletal pain. Patients with major complications including bleeds or leaks along with patients requiring readmission, reoperation, or re-intervention at 30-days were excluded. Primary outcomes were to identify rates and characteristics of PED. Secondary outcomes included identifying independent predictors of PED using multivariable logistic regression modelling.
Results: A total of 491,493 patients were identified of which 18,078 (3.7%) experienced PED presentations due to pain (58%) and nausea/vomiting (42%). PED rates increased from 26.0% in 2020 to 39.6% in 2022. Patients with a PED visit were younger (40.0 ± 11.1 vs. 43.2 ± 11.7 years; $p < 0.0001$), had increased body mass index (45.7 ± 7.7 vs. 45.0 ± 7.6 kg/m^2; $p < 0.0001$), more likely to be female (90.2% vs. 81.7%; $p < 0.0001$) and to receive RYGB (25.7% vs. 37.3%; $p < 0.0001$). PED patients had an overall small burden of metabolic comorbidities including lower rates of dyslipidemia (18.8% vs. 22.2%; $p < 0.0001$), insulin-dependent diabetes (15.6% vs. 16.8%; $p < 0.0001$), and hypertension (41.4% vs. 44.4%; $p < 0.0001$). Independent predictors of PED presentations included female sex (OR 2.0, 95% CI 1.79–2.24; $p < 0.0001$), RYGB (OR 1.79; 95% CI 1.65–1.93; $p < 0.0001$), and black racial status (OR 1.50; 95% CI 1.39–1.62; $p < 0.0001$). Protective factors for PED visits included increasing age (OR 0.75 per decade, 95% CI 0.72–0.78; $p < 0.0001$) and higher albumin levels (OR 0.86; 95% CI 0.79–0.94; $p < 0.0001$).
Conclusions: PED utilization following primary bariatric surgery occurs in almost 5% of all patients and has increased by 50% over the

last three years due to pain and poor tolerance of oral intake. Independent predictors of PED included female sex, black racial status and RYGB procedures while albumin and increasing age were found to be protective. Strategies to address these factors to prevent unnecessary emergency department utilization and improve bariatric delivery costs should be identified and implemented.

P208

Educational Handout for Postoperative Constipation Reduces Healthcare Utilization Post Bariatric Surgery

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Introduction: In our bariatric practice, one of the most common reasons patients call or present to the emergency department after bariatric surgery is for constipation. Therefore, our team developed a handout which contained a constipation treatment algorithm for patients to follow independently to manage their symptoms post-operatively. The primary objective of this study was to evaluate the impact of this handout on postoperative healthcare utilization, specifically, the number of patient-initiated messages and calls related to constipation. Secondarily, we aimed to determine its impact on constipation related emergency department visits.
Methods and Procedures: A retrospective analysis was conducted using electronic medical record data for all patients undergoing bariatric surgery over two 6-month periods: October 2022 to March 2023 (no handout) and May 2023 to October 2023 (with handout). The number of messages and phone calls related to constipation were recorded, as well as the secondary data including prior history of constipation, ED visits related to constipation, and surgery type. Statistical analysis was performed using R version 4.3.2. Chi-squared and *t*-tests were used to compare outcomes between the two groups, using a p-value of < 0.05 to assess significance.
Results: Patients who received the handout sent and made significantly fewer messages and calls regarding constipation respectively ($p = 0.008$), with lower mean and standard deviation of communications ($p < 0.001$), compared to those who did not receive the handout. Furthermore, emergency department visits related to constipation were significantly higher in the non-handout group ($p = 0.041$).

Study characterisits	No handout ($n = 181$)	Received handout ($n = 228$)	p-value
Number of calls/messages related to constipation per patient			0.008
0	147 (81%)	206 (91%)	
≥ 1	34 (19%)	21 (9.3%)	
Mean number of calls/messages related to constipation per patient (SD)			
	0.31 (0.74)	0.11 (0.35)	< 0.001

Conclusion: The implementation of an educational handout for managing constipation was effective in reducing the number of postoperative messages and phone calls and lowered the incidence of ED visits related to constipation. This suggests that providing bariatric surgery patients with targeted information on constipation management improves their ability to independently manage their constipation while reducing healthcare utilization.

P209

Efficacy of Pre-operative Shrink Liver Diet on Metabolic Dysfunction-Associated Steatotic Liver Disease in Bariatric Surgery Patients

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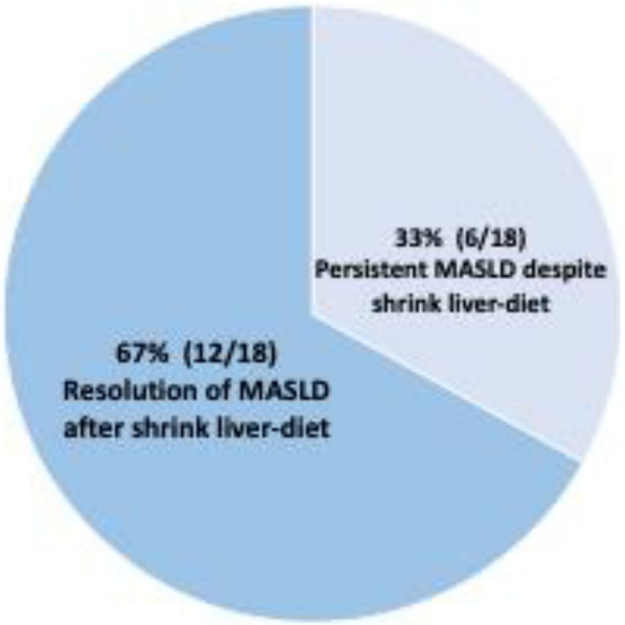
Background: Over 80% of patients undergoing bariatric surgery exhibit concomitant Metabolic Dysfunction-Associated Steatotic Liver Disease, or MASLD. Ultrasound is a reliable imaging technique for detecting steatohepatitis, with a published sensitivity and specificity of 85% and 93%, respectively. With no definitive pharmacotherapy yet established for the treatment of MASLD, lifestyle and dietary modifications are the current mainstays of treatment. The purpose of this study was to determine the ability of pre-operative shrink liver diet to ameliorate ultrasound-detected MASLD in patients undergoing bariatric surgery.
Methods: A cohort of 18 patients undergoing bariatric surgery (laparoscopic Roux-En-Y gastric Bypass or sleeve gastrectomy) between May and September 2024 with evidence of MASLD on ultrasound were included. All adhered to a strict shrink liver diet consisting of a low calorie, low carbohydrate, low fat, high protein regimen for 2 weeks pre-operatively and underwent wedge liver biopsy at the time of bariatric surgery. Statistics were presented and tested with independent *t*-test and multiple logistic regression analysis was performed to determine if any factors contributed to MASLD.
Results: The average age of the cohort was 49 years old with an average BMI of 43.2 kg/m^2. Mean pre-operative laboratory values included: AST—23, ALT—21, total cholesterol—173, triglycerides—120, HDL—55, LDL—113, and HgA1c—6.1. Of the 18 patients, two-thirds (67%; 12/18) with ultrasound evidence of MASLD who adhered to a strict pre-operative shrink liver diet demonstrated resolution of steatosis on intra-operative wedge liver biopsy. There was no significant difference ($p > 0.05$) in age, BMI, or any pre-operative laboratory value between patients whose MASLD resolved with pre-operative shrink liver diet versus those whose did not.
Conclusion: Pre-operative shrink liver diet has the potential to ameliorate MASLD in bariatric surgery patients even with a brief duration of implementation. Larger studies and longer follow up are necessary to determine the factors predicting successful diet-based treatment of MASLD in bariatric surgery patients.



P210

Long-Term Outcomes in the Pediatric vs. Adult Populations Undergoing Bariatric Surgery at The Mount Sinai Hospital

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Introduction: The purpose of this study is to assess the long-term outcomes of pediatric patients compared to adult patients undergoing bariatric surgery at The Mount Sinai Hospital.
Methods: All patients aged 18 and under who underwent bariatric surgery at The Mount Sinai Hospital between the years 2015 and 2019 were identified. Our primary endpoint included weight loss up to 4 years after bariatric surgery. Our secondary endpoints included improvement of metabolic comorbidities and complications following surgery. A retrospective chart review was completed for all patients identified. These pediatric patients were compared to adult patients aged 19–79 undergoing bariatric surgery at the Mount Sinai Hospital between 2015 and 2018.
Results: A total of 37 pediatric patients, and 450 adult patients were identified. A total of 17 pediatric patients were lost to follow-up and were excluded from analysis. The mean age at time of surgery was found to be 17.8 years for the pediatric patients, and 42 years for the adult patients. The mean BMI at time of surgery was 43.0 for the pediatric patients and 43.8 for the adult patients. There was no statistically significant difference between the groups. At 4 years post-operatively, the mean BMI was found to be 33.3 for the pediatric patients, versus 33.6 for the adult patients. There was no statistically significant difference between the groups. There were no intra-operative or post-operative complications recorded for any pediatric patients. One pediatric patient had insulin-dependent diabetes at time of surgery and was off insulin by the 6-month follow-up. One pediatric patient had PCOS on metformin, which was discontinued by the 6-month follow-up. Of the 17 pediatric patients excluded who were lost to follow-up, 82% were found to be white, Jewish and from 2 zip codes geographically adjacent to one another.
Discussion: Bariatric surgery in the pediatric population is safe and leads to similar long term weight loss when compared to adult patients. Bariatric surgery in the pediatric population has the potential to improve metabolic comorbidities.

P211

When ERAS Meets DROP: A Preliminary Study of Bariatric Surgery Readmission at Metropolitan Hospital

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Introduction: During recovery from bariatric surgery (BS), preventable immediate postoperative emergency department (ED) visits and hospital readmission (HR) occur due to complaints such as abdominal pain, nausea, emesis, and wound checks. Reducing ED visits and HR within 30 days post-BS is crucial for improving patient outcomes and resource utilization. This study aims to evaluate BS postoperative ED presentation and decrease 30-day readmission from 10% in 2023 to 5% by December 2024 at Metropolitan Hospital by utilizing Discharge Reassessment and Outreach Program (DROP) phone calls4 and implementation of the Enhanced Recovery After Surgery program (ERAS).
Methods: ERAS and DROP protocols began January and May 2024 respectively. ERAS is a protocol designed to enhance postoperative recovery consisting of preoperative patient counseling, multimodal opioid-sparing pain control, fluid resuscitation, and prophylaxis for nausea, vomiting and thrombus. The DROP protocol consists of a phone call and standardized questionnaire BS patients receive 3–4 days postoperatively to triage concerns appropriately, including IV hydration referrals or ED if necessary.
Data Collection and Analysis: A data warehouse termed Snowflake was populated with exported data from Epic electronic medical records of BS patients beginning in 2023. The data includes surgery date, ED visits or HR encounters if present during the 30 day post-operative window which was then examined via an SQL query. Chart review determined if DROP calls were made 3–4 days post op. Utilizing 2023 rates as a control, the percentage of 30 day postoperative ED visits, readmission rates, and DROP phone calls were analyzed monthly beginning in January and May of 2024 respectively.
Results: DROP calls were performed with 87% and 85% of patients during May and June 2024. ED visits within 30 days was 11% in 2023 compared to 0%, 11%, 5%, 9%, and 4% from January to May of 2024. HR within 30 days was 3% in 2023 compared to 4% in February and May of 2024 and 0% in January, March and April of 2024.
Discussion: Initiation of DROP phone calls during May 2024 led to a significant decrease in 30 day postoperative ED visits when comparing 2023 and April 2024, with reductions of 7% and 5% respectively. No ED visits occurred within 30 days postoperatively during January 2024. Furthermore, no readmissions occurred within 30 days during March and April 2024.
Conclusion: ERAS and DROP protocols minimize ED visits and HR 30 days post-BS providing cost effective patient-centered care and enhanced patient-provider communication.

P212

Utility of Diagnostic Laparoscopy Following Gastric Bypass in Patients with Abdominal Visceral Pain

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Introduction: After gastric bypass, patients may present electively with visceral pain from numerous causes. Partial small bowel obstructions secondary to postoperative adhesions, internal hernia, and intussusception aren't reliably detected radiographically as the sensitivity of CT scan for these etiologies are low. The purpose of this study is to retrospectively evaluate the utility of elective laparoscopy in the diagnosis and treatment of visceral abdominal pain in gastric bypass patients.

Methods and Procedure: This is a case series of gastric bypass patients evaluated in clinic between 2015 and 2024 with gastrointestinal symptoms. Patients seen in the ED or inpatient who received an urgent or emergent operation were excluded. Patient characteristics, imaging, and operative findings were extracted retrospectively from the electronic medical record. Patients were grouped based firstly on imaging findings and secondly on intraoperative findings and compared to determine which patients are likely to experience symptomatic relief after an elective diagnostic laparoscopy. Data were analyzed via basic descriptive statistics.

Results: A total of 47 patients were included. The mean age was 50.6 years with 91.5% being female. 70.2 percent (33/47) of patients were discharged home same day. 44.6% (21/47) of patients had negative CT findings but positive intraoperative findings, including 9.5% (2/21) patients who had internal herniation of their entire small bowel. Of patients with negative CT scans who underwent diagnostic laparoscopy, 23.8% (5/21) of patients had full symptom resolution, 9.5% (2/21) had full resolution but subsequent recurrence, 28.6% (6/21) had symptom improvement, 9.5% (2/21) had symptom improvement but subsequent recurrence. The most frequently observed intraoperative finding in patients with symptom resolution after surgery was adhesions, while hernia defect was observed to be the most common finding in those with no symptom resolution after surgery.

Conclusion: In patients with visceral abdominal pain following gastric bypass, CT scans do not definitively rule out partial or intermittent small bowel obstruction. In this small retrospective study, diagnostic laparoscopy for symptoms of partial or intermittent obstruction in the setting of a negative CT scan resulted in symptom improvement in 71.4% of patients with almost 24% having complete symptom resolution. In patients with visceral pain following gastric bypass and negative CT imaging, diagnostic laparoscopy can provide additional information and partial or complete symptom resolution in a majority of patients with the potential to be safely performed on an outpatient basis.

P213

Assessing GLP-1 Receptor Agonist Effects on Retained Gastric Contents During EGDS of Bariatric Patients and Developing a Food Retention Grading Scale

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Introduction: Our study has two objectives: (1) to evaluate the incidence and severity of food retention observed during esophagogastroduodenoscopies (EGDs) in patients taking glucagon-like peptide 1 (GLP-1) receptor agonists and (2) to create a grading scale to standardize the language regarding food retention. GLP-1 receptor agonists have gained attention for treating obesity and type 2 diabetes (T2DM), largely due to their ability to reduce gastric motility. We aim to evaluate if this reduction leads to increased gastric food retention, raising the risk of aspiration.

Methods & Procedures: A retrospective cross-sectional study was performed on patients who underwent an EGD from 2022 to 2024. Patients on Dulaglutide, Exenatide, Liraglutide, Lixisenatide, Semaglutide, and Tirzepatide were included. Data was obtained from electronic medical records, and SPSS 29 was used for statistical analysis. Fisher's test was used to compare EGD results across patients with T2DM and gastroparesis diagnoses. The Kruskal–Wallis test was used to compare the days on medication leading up to the EGD between grades.

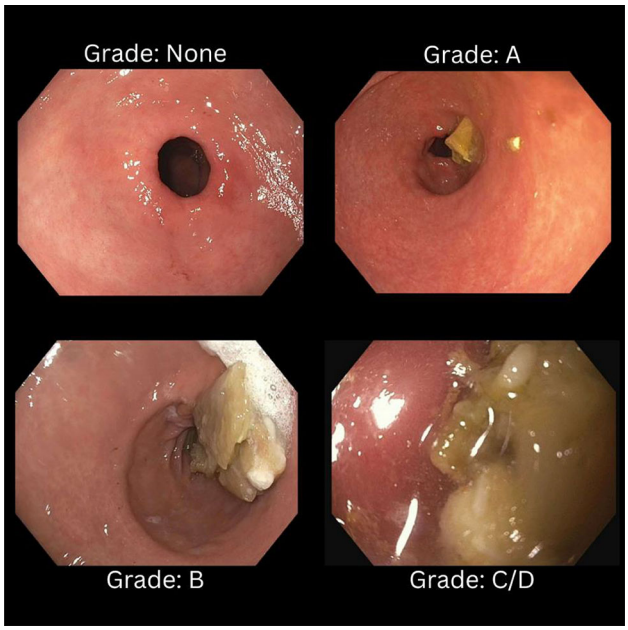
Results: Of the 73 EGDs recorded, 9.6% had any amount of gastric residue near the pylorus. No cases were aborted due to significant food retention. No significant association between EGD results and T2DM ($p = 0.053$) or gastroparesis ($p = 0.478$) diagnoses was found, and no significant difference in the distribution of days on medication was found between grades ($p = 0.920$).

Conclusions: Previous studies have shown a gastric residue prevalence of 3% to 3.5% in patients not taking GLP 1 receptor agonists, as compared to the 2.8% that were labeled as moderate to significant gastric residue in this study. Our initial data suggests these medications do not lead to substantial gastric food retention observed in EGDs. We propose using this study's grading scale as the standard for quantifying gastric food retention. By defining stages from no residue to severe obstruction, it enhances study comparisons and procedure planning while promoting a shared understanding among providers.

Data

Tampa Food Retention Grading Scale

Grade	description	Prevalence
None	No gastric residue	90.4%
A	Minimal gastric residue, pylorus easily visualized and not obstructed, EGD completed	6.8%
B	Moderate gastric residue, pylorus partially obstructed, EGD completed	1.4%
C	Significant gastric residue, pylorus not visualized, EGD completed	1.4%
D	Significant gastric residue, pylorus not visualized, EGD aborted	0%



P214

Marginal Ulcer Rates in Primary Roux-en-Y Gastric Bypass vs Conversion from Sleeve Gastrectomy to Roux-en-Y Gastric Bypass

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Background. Sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB) are well-established surgical interventions for morbid obesity which offer excellent weight loss and can eradicate obesity-related comorbidities. Some patients who initially undergo SG later elect for conversion to RYGB due to inadequate weight loss. Marginal ulceration (MU) is a known complication following RYGB, with a mean prevalence of 4.6%, however MU rates in conversion-RYGB are not well understood. This study seeks to compare the incidence of MU in patients who underwent primary RYGB compared to those who underwent conversion-RYGB, at a single bariatric institution.

Methods. A retrospective cohort study was conducted at Mercy Fitzgerald Hospital from 2015 to 2023. The electronic medical record and MBSAQIP databases were queried to identify patients who underwent primary or conversion-RYGB. Reports were reviewed and the incidence of gastrojejunal anastomotic ulcers, identified by endoscopy or CT scan, was recorded. Additionally, patient demographics and perioperative factors were analyzed. Binary variables were compared using Fisher's exact test. $p < 0.05$ marked statistical significance.

Results. A total of 103 patients were included, with $N = 46$ in the primary RYGB group, (69.6% female) and $N = 57$ in the SG to RYGB group (61% female). Mean age was 45.3 years and 44.7 years for the primary and conversion groups, respectively. MU was observed in 17% of patients in the primary group compared to 26% in the conversion group ($p = 0.47$). Statistical analysis did not reveal a significantly higher incidence of MU in the conversion group. Among those who developed MU, there was no significant difference in smoking status or NSAID use.

Conclusion. In this single-institutional retrospective cohort, patients who underwent conversion from SG to RYGB experienced a similar incidence of MU to those with primary RYGB. This incidence was not associated with smoking or use of NSAIDs. Compared to recent studies, our study did not find an increased rate of MU with conversion RYGB. We hypothesize that even with the anatomical changes after sleeve gastrectomy, the perfusion of the gastric pouch is not impacted significantly enough to cause a higher rate of marginal ulceration. Additional research at our institution is being conducted to evaluate MU rates in patients undergoing conversion of SG to biliopancreatic diversion with duodenal switch. These findings represent an important consideration in the revisional bariatric population.

P215

The Effect of Marital Status on Bariatric Surgery Outcomes

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Introduction: Bariatric surgery requires broad lifestyle changes, and patients who undergo bariatric surgery likely benefit from strong social support. Marital status has been well documented to have effects on cancer survival, but the effects on bariatric surgery outcomes are largely unknown. We aimed to examine the effects of marital status on outcomes after bariatric surgery.

Methods and Procedures: Patients at our single US academic hospital who underwent bariatric surgery between 2018 and 2022 were compared using their self-reported marital status (married/life partner [partnered], single, or divorced). Outcomes included pre-operative BMI, percent total body weight loss, length of stay (LOS), emergency department visits within 30 days, readmission within 30 days, and first-year follow-up duration. Categorical variables were compared with Pearson's Chi-Squared testing. Continuous variables were presented in medians (IQR) and compared with Kruskal–Wallis testing.

Results: 783 patients were analyzed—partnered ($n = 340$), single ($n = 365$), divorced ($n = 78$). Pre-operative BMI was significantly different among the groups with those in the single group at the highest BMI (partnered = 44, single = 46, divorced = 44, $p < 0.02$). Percent total body weight loss was not significantly different among the groups. LOS was significantly longer in the divorced group (2.08 days) compared to the partnered and single groups (1.71 days and 1.76 days, respectively, $p < 0.01$). Emergency department visits and readmissions rates within 30 days and first-year follow-up duration were not significantly different among the groups.

Conclusion: While divorced patients experienced a slightly longer length of stay, marital status did not significantly impact overall weight loss, emergency department visits, readmissions, or follow-up adherence. To gain a deeper understanding of the role of social support in bariatric surgical outcomes, further research is needed to identify patients who may benefit from additional support resources.

Outcomes	Partnered N = 340	Single N = 365	Divorced N=78	P value
Total body weight loss (%)	23	24	23	0.7
Length of stay (days)	1.71	1.76	2.08	<0.017
Emergency department visits (%)*	12.9	13.4	6.4	0.2
Readmissions (%)*	2.1	2.2	1.3	>0.9
First-year follow-up duration (days)	281	262	269	0.2

*Within 30 days

P216

Small Bowel Length Variability in Hypoabsorptive Procedures

J. R. Salameh, MD; VHC Health

Introduction: Small bowel length has implications on the outcomes of hypoabsorptive bariatric procedures. Studies have suggested that total alimentary limb length of 400 to 450 cm in gastric bypass patients is associated with lower incidence of nutritional issues. However, the entire small bowel length is rarely measured in primary gastric bypass procedures. We measured the small bowel length in consecutive patients undergoing gastric bypass in order to determine variability and correlation with other metrics.

Methods: Consecutive patients undergoing primary Roux-en-Y gastric bypass with long biliopancreatic limb had their entire small bowel length measured, prior to any small bowel division. The total small bowel length (TSBL) was measured from the ligament of Treitz to the ileocecal valve using a bowel grasper marked at 10 cm from its tip, with the small bowel in moderate stretch. Retrospective chart review was performed to record the gender, height, weight and body mass index (BMI) of patients at time of surgery. Variables were compared using unpaired t test with $p \leq 0.05$ indicating statistical difference. Correlation between variables was measured using Pearson correlation coefficient.

Results: 90 consecutive patients undergoing laparoscopic or robotic gastric bypass were identified. 12 patients were excluded because of incomplete small bowel measurement, either due to adhesions (5), or a decision to perform standard gastric bypass (7).

78 patients in total were studied. 66% of patients were female and average age was 47.4 years. Mean BMI was 43.34 ± 5.87 (range 34.56 to 66.79).

The entire small bowel measured 624 ± 98 cm [range 450 to 860]. TSBL was ≤ 500 cm in 11.5%, ≤ 550 cm in 27%, and ≤ 600 cm in 51% of patients.

TSBL was longer in men (679.44 ± 90.26) than women (606.83 ± 94.12) and this was statistically significant ($p = 0.0049$). No male in this series had a small bowel shorter than 570 cm. In women on the other hand, TSBL was ≤ 550 cm in 35%, and ≤ 600 cm in 56%. Men were also statistically taller than women (1.80 m versus 1.64 m, p 0.0001).

Small bowel length did correlate positively with patient height, but the correlation was weak ($R = 0.3303$).

Conclusion: There is significant variability in small bowel length between patients. Measuring the entire small bowel length is recommended in patients undergoing Roux-en-Y or single anastomosis gastric bypass if a biliopancreatic limb over 100 cm is being planned, specially in women.

P217

Outcomes of Transoral Outlet Reduction with Neoadjuvant and Adjuvant Anti-obesity Medications in Patients with Weight Regain after Roux-en-Y Gastric Bypass: A Single-Institution Case Series

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Introduction: The Roux-en-Y gastric bypass (RYGB) has a reported incidence of weight regain reported in up to 20% of patients (Meguid 2008), which is typically observed when the gastrojejunal anastomosis (GJA) enlarges beyond 2 cm in size (Abu Dayyeh 2011). Endoluminal revision of a dilated GJA with a Transoral Outlet Reduction (TORe) procedure has been previously reported. Concomitantly, use of anti-obesity medications (AOM) has become widespread (Sher 2024). We present a case series from a single institution demonstrating outcomes for TORe in conjunction with AOM.

Methods: We retrospectively analyzed 22 patients who underwent TORe between 05/2022 and 12/2023, using a purse-string suturing approach. Nineteen of these patients were on AOM from one year before TORe to up to one year after the procedure. Weights from pre-bypass to up to two years following TORe (where available) were obtained. The primary endpoints were total weight loss (TWL) and excess weight loss (EWL).

Results: The average patient age at the time of revision was 54 years. Three patients were male, and sixteen were female. The mean BMI at the time of RYGB was 51.97, and at the time of revision, it was 43.06. The postprocedural average BMIs were 39.06 at six months (18 patients), 39.65 at one year (11 patients), and 38.89 at two years (6 patients). The corresponding TWL intervals were 9.54%, 11.06%, and 14.48%, while the EWL intervals were 25%, 28%, and 35%, respectively.

Conclusion: Historically, TORe has produced TWL of 8.5%, 6.9%, and 8.8% at 1, 3, and 5 years, respectively (Jirapinyo 2020). In comparison, patients in our study who received both surgical revision and weight loss pharmacotherapy achieved greater TWL at one year (11.06%). Given that our patients not only lost weight but also appeared to benefit from the addition of neoadjuvant and adjuvant AOM, TORe, combined with neoadjuvant and adjuvant AOM, merits further investigation in comparison to TORe alone.

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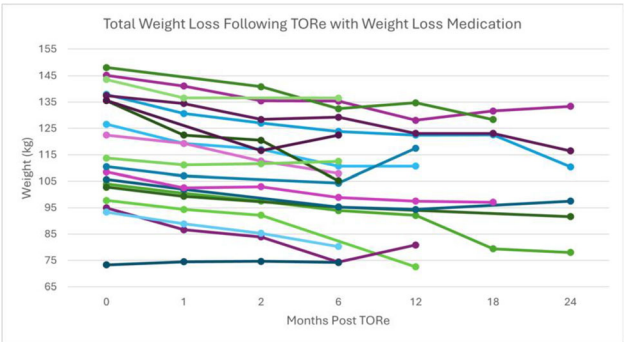

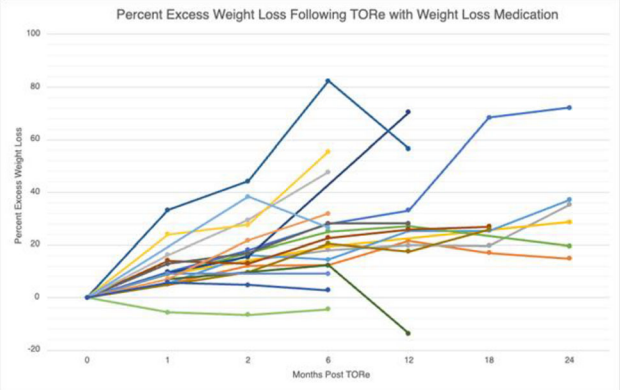

P218

Robotic Roux-en-Y Gastric Bypass for Chronic Leak After Sleeve Gastrectomy

Oluwaseun Olusanya; Atrium Health Navicent

Sleeve gastrectomy has become one of the most frequently practiced bariatric procedures in the US. Staple line leak is one of the most feared life-threatening complications of a sleeve gastrectomy. These leaks can occur anywhere along the staple line but most commonly are located proximally, close to the angle of His. This may be attributable to the high intraluminal pressure at this point, and relative ischemia at this location due to ligation of the short gastric vessels. Persistent leaks can become chronic, either draining to an intra-abdominal collection or fistulizing to nearby structures. Initial management consists of conservative therapy with broad-spectrum biotics and prompt drainage. If this fails, endoscopic intervention with internal drainage or clips should be considered. IN patient whom all conservative and endoscopic techniques fail, surgical reconstructive procedures be considered.

We present a 38-year-old female with presented to our tertiary center hospital for left lower quadrant. She has a history of sleeve gastrectomy in 2019. She had chronic issues with GERD and subsequently underwent sleeve revision and hiatal hernia repair in September 2022. After this operation, patient had left lower quadrant pain and recurrent pneumonia for approximately 4 months. She had a CT scan in October 2022 which demonstrated tiny air and contrast collections along the margin of the postoperative stomach which appeared to communicate with the gastric lumen concerning for a postoperative leak.

CT at admission demonstrated gastric sleeve with contained leak extending toward the splenic hilum. This leak was confirmed on Gastrografin upper GI. Patient was taken to the operating room for robotic sleeve to gastric bypass conversion with jejunostomy tube placement. She has a contained perforation was along the greater curvature of the stomach which was left as part of the gastric pouch. The patient did well postoperatively. She was seen at 2 weeks, 1 month, 3 months, 6-month intervals after discharge. At her 3-month visit, she had CT scan with p.o. contrast that did not show any evidence of a leak.

Chronic gastric leaks are a serious and rare complication after bariatric surgery. Diagnosis can be difficult due to nonspecific symptoms or false negative imaging results. In patient with chronic sleeve leaks who fail conservative therapy, esophago-jejunal and Roux-en-Y gastrojejunal anastomosis to the fistula orifice have been described. In our case, a standard Roux-en-Y was performed and the leak was allowed to heal due to the decreased intraluminal pressure of the stomach.

P219

Routine Bariatric Surgery with Unfamiliar Anatomy: Gastric Bypass in the Setting of Situs Inversus

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In patients with Situs Inversus, intra-abdominal organs are in a reversed configuration in combination with the heart situated in the right thorax. This reversed alignment does not cause alteration in organ function. Severe obesity (class III) involves a BMI $>$ 40 and is a disease process that continues to rise in prevalence. Among US adults, the prevalence of severe obesity almost doubled from 2000 (4.7%) to 2018 (9.2%). Weight loss surgery has shown to be an effective means of weight loss with low levels of morbidity and complications. We present a case of a 40-year-old female with history of hypertension, kartageners, and morbid obesity. Her preoperative weight was 232 pounds (BMI 40.5 kg/m^2). She underwent a laparoscopic gastric bypass with a standard 100 cm roux limb and 50 cm biliopancreatic limb configuration. In this case, the procedure was performed by flipping trochar placement with regard to right and left orientation and with the surgeon standing on the patient's left side. Opposite hands were used for each instrument and to complete each step of the procedure. Due to the altered anatomy, the procedure took an extra 45 min in part to confirm the proper orientation of all the anastomoses (180 min vs 120 min). The operation was performed without complication and at an 11-month postoperative visit, she had lost 79 pounds (BMI 26.7 kg/m^2). In conclusion, Situs Inversus presents a unique challenge for a bariatric surgeon, especially in performing a bypass requiring two separate anastomosis. Standard trochar placement/technique with a mirror image configuration is a safe method for completing this operation.

P220

Gastroduodenal Intussusception as a Complication of Laparoscopic Gastric Plication

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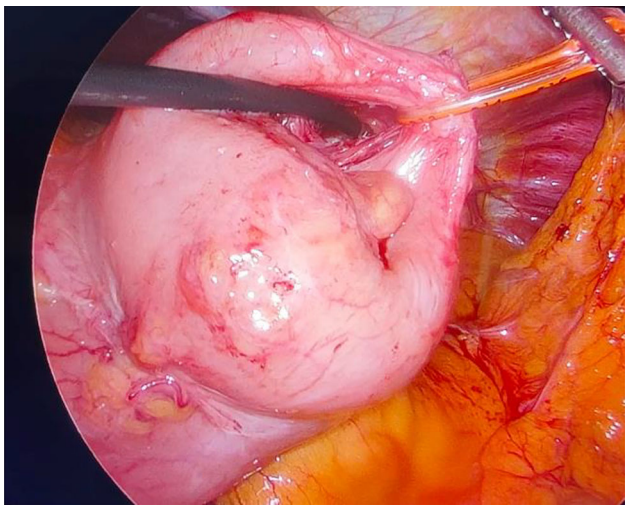
Background: This is a novel case report of gastroduodenal intussusception as a late complication from laparoscopic gastric plication (LGP). LGP is a bariatric surgical technique based on the anatomical principles of a laparoscopic sleeve gastrectomy and may be an alternative for patients not interested in standard bariatric procedures. LGP typically involves two layer suture plication of the greater curve of the stomach. LGP achieves gastric restriction, without resection or implantation of foreign bodies. However, there is insufficient data with regard to the long term effects on weight loss, resolution of comorbidities and associated complications.
Method: We present the case of a sixty-one-year-old female who underwent LGP in San Diego for obesity fourteen years ago. She presented to the emergency department with acute nausea, vomiting and melena. Investigations revealed mild leukocytosis of 12 109/L and hemoglobin of 84 g/L (previously 134 g/L). Diagnosis of gastric intussusception was made based on abdominal computed tomography and preoperative endoscopy. The obstruction was not reducible by gastroscopy. Prior to taking the patient to the operating theater, they were resuscitated and the stomach decompressed via endoscopically inserted nasogastric tube. Diagnostic laparoscopy was performed, which demonstrated gastroduodenal intussusception as well as presence of gastrogastric fistula along the greater curve plication line.

Despite great efforts, the intussuscepted stomach was not amenable to laparoscopic reduction due to distorted anatomy and edema, thus the decision was made to convert to an open procedure. Successful reduction of the intussuscepted fundus through the pylorus was performed by application of manual pressure on the duodenum distally. The fundus was grossly dilated and redundant. As a definitive management, sleeve gastrectomy was performed using a 44 Fr bougie. The stomach wall was thickened requiring multiple firings of black cartridges (Tri-Stapler with 4 mm, 4.5 mm, 5 mm staples).
Result: The patient tolerated the procedure well. She was discharged postoperative day two with return of her bowel function, once tolerating oral intake. She recovered well from the surgery with no acute postoperative complications. Pathology was negative for dysplasia.
Conclusion: Gastric greater curve plication has risen in popularity. However, this procedure is not without its own unique complications. Complications include gastro-gastric fistulas and gastroduodenal intussusception of the fundus. Clinicians should be aware of these potential late complications when assessing patients who have had gastric plication.



P221

Perioperative Endoscopic Findings of Hill Grade II in the Bariatric Patient: When to Explore During Surgery?

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Introduction: Hiatal hernia is characterized by a protrusion of the stomach into the thoracic cavity through a widening of the diaphragm crus, causing gastroesophageal reflux disease (GERD). In obese patients undergoing bariatric surgery, the presence of a hiatal hernia could be asymptomatic. Preoperative esophagogastroduodenoscopy (EGD) is the most frequently used method to determine hiatal abnormalities, with the Hill grade classification being the most commonly used. Notwithstanding, evidence to decide to explore the hiatus during bariatric surgery is still scarce. Therefore, we aim to describe the association between clinical and surgical variables of patients endoscopically classified as Hill grade II and surgical findings of hiatal hernia.
Methods: A retrospective observational study with a prospective database was conducted from January to December 2022. The study included all patients who underwent metabolic and bariatric procedures, had preoperative or intraoperative EGD and were classified as Hill grade II. Endoscopic results were compared to surgical findings. Descriptive analysis, Chi2, and predictive values were calculated.
Results: Out of 1083, 193 patients were included from January 1st to December 31st of 2022. All patients were classified as Hill grade II endoscopically. 8.8% were males and 92.8% were females. Mean age was 41.41 $\pm$ 9.6. Twenty-five patients had a history of GERD. 9.8% had a history of type 2 diabetes. Mean body mass index was 41.94 kg/m^2 before the intervention. The procedures included 117 cases of sleeve gastrectomy, 71 cases of Roux-en-Y gastric bypass, and 5 cases of one-anastomosis gastric bypass. Eighty-five hiatal hernias were documented, and all were repaired laparoscopically. In our population, patients classified as Hill grade II had an incidence of hiatal hernia of 44.04%. A positive association was found in patients with a history of GERD, OR 3.125 (95% CI 1.277–7.648). Additionally, two patients presented with postoperative bleeding unrelated to the hiatal hernia repair and did not require reintervention.
Conclusions: Patients with perioperative endoscopic findings of Hill grade II and a history of GERD should undergo hiatal exploration. However, prospective studies are needed to validate these results.

P222

Do High BMI and Operative Time Really Affect Portomesenteric Venous Thrombosis After Laparoscopic Sleeve Gastrectomy: Data from 13 Cases out of 3,050 Cases by a Single Surgeon in One Center

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Background: Portomesenteric venous thrombosis (PMVT) is a rare but serious complication after laparoscopic sleeve gastrectomy (LSG). Identifying risk factors is crucial for prevention and early detection. The impact of high body mass index (BMI) and operative time on PMVT development post-LSG remains unclear.
Objective: To evaluate whether high BMI and operative time significantly influence PMVT incidence after LSG.
Methods: Retrospective analysis of 3050 patients undergoing LSG by a single surgeon at Chularat 3 International Hospital from December

2020 to August 2024. Thirteen patients (0.43%) developed PMVT. Data included demographics, BMI, operative time, and outcomes. BMI was analyzed both continuously and categorically (< 40 kg/m^2 vs. ≥ 40 kg/m^2). Operative time was categorized as less than 45 min and 45 min or longer. Univariate and multivariate analyses assessed associations between PMVT, BMI, and operative time.

Results: The mean time to PMVT diagnosis was 14.69 days post-operatively. The overall mean BMI was 39.23 kg/m^2, while PMVT cases had a mean BMI of 37.06 kg/m^2. As a continuous variable, BMI showed a significant association with PMVT in univariate analysis (p-value = 0.042) but not in multivariate analysis (p-value = 0.968). Categorically, patients with BMI? ?40?kg/m^2 had a crude relative risk (RR) of 2.11 (p? = ?0.257) and an adjusted RR of 2.95 (p? = ?0.397), indicating no significant association. The mean operative time was 45.2 min overall and 37.62 min in PMVT cases. Patients with operative times? = ?45 min had a crude RR of 0.35 (p? = ?0.106) and an adjusted RR of 1.24 (p? = ?0.823), suggesting no significant association with PMVT risk.

Conclusion: PMVT occurred in 0.43% of patients following LSG. Neither high BMI nor longer operative time significantly affected PMVT development. Interestingly, PMVT was observed more frequently in patients with lower BMI and shorter operative times, though these findings were not statistically significant. These results suggest that PMVT may occur independently of BMI and operative duration. Clinicians should remain vigilant for PMVT in postoperative patients regardless of these factors. Further research is needed to identify other potential risk factors contributing to PMVT after LSG.

P223

A Tailored Approach for Reflux Management After Sleeve Gastrectomy: Dispelling the Notion that All Need Conversion to a Gastric Bypass

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Introduction: Gastroesophageal reflux disease (GERD) after sleeve gastrectomy (SG) can be challenging to manage, with conversion to Roux-en-Y gastric bypass (RYGB) as a common surgical therapy. This study demonstrates an algorithmic approach guided by GERD evaluations, to demonstrate successful alternatives to SG conversion to RYGB.

Methods and Procedures: This is a single-center, retrospective review of all consecutive patients with persistent GERD after SG between 01/2015 and 07/2021. After lifestyle optimization, all patients were evaluated with esophagram, manometry, Bravo pH studies, and esophagogastroduodenoscopy. Thereafter, the algorithm was followed to determine intervention (Fig. 1). Prospective data was collected in an institutional database, with comparisons at long-term follow up.

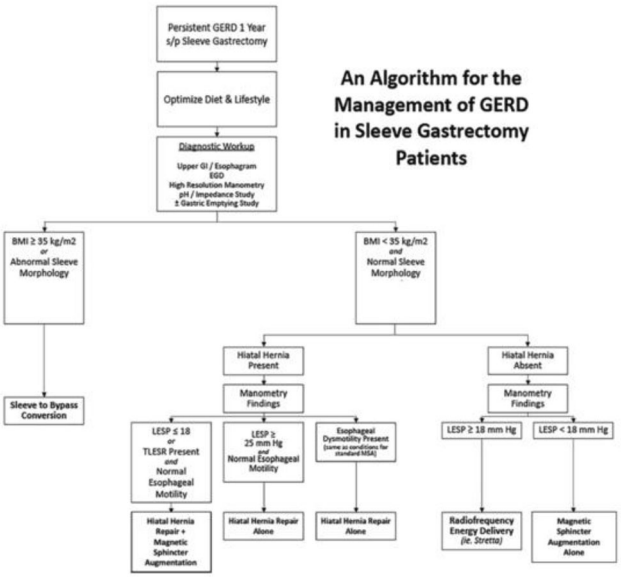
Results: 64 patients were managed using the algorithm. Average age was 46 years and 59 were female. Average time from index SG to surgical intervention was 4.04 years and mean follow-up was 5.8 years. Procedures included conversion to RYGB (n = 41), of which 26 had concomitant hiatal hernia repair (HHR), magnetic sphincter augmentation (MSA; n = 19), of which 12 had concomitant HHR, HHR alone (n = 3), and radiofrequency ablation (RFA; n = 1). Average BMI was higher for those converted to bypass (41.4 vs. 32.5). Long-term outcomes are in Table 1. Average pre-op GERD-HRQL was 38.9 and 9.3 at follow-up. High-dose or daily PPI use fell from 95% pre-op to 64% post-op, with 28% requiring no PPIs at long-term follow up. There was no difference in GERD-HRQL scores or PPI use at follow-up based on procedure performed (p = 0.455 and 0.817, respectively). 4 patients did not experience any change in GERD-HRQL scores, without association with procedure performed (p = 0.455).

Conclusions: Utilizing a rigorous protocol, patients with 36% of patients with GERD after SG were spared conversion to bypass with excellent long term outcomes, as demonstrated by improved GERD-HRQL scores and reduced PPI use. This proof-of-concept study asserts the utility of a standardized algorithm to deliver optimized and patient-tailored therapies for GERD in the post-SG population.

Table 1: Long-term outcomes based on management approach

	n	GERD-HRQL score	Daily PPI Use	Postoperative Interventions
RYGB	15	Pre: 34.4 Post: 8.3	Pre: 73.3% Post: 46.7%	53.3%
RYGB + HHR	26	Pre: 32.0 Post: 4.7	Pre: 65.4% Post: 53.8%	23.1%
HHR alone	3	Pre: 45.0 Post: 30.0	Pre: 66.7% Post: 66.7%	33%
MSA + HHR	12	Pre: 50.3 Post: 12.8	Pre: 58.3% Post: 50.0%	14.3%
MSA alone	7	Pre: 48.8 Post: 12.7	Pre: 71.4% Post: 42.9%	41.7%
RFA	1	Pre: 20.0 Post: 20.0	Pre: 100% Post: 100%	100%

Figure 1. Institutional Algorithm for Management of GERD in SG Patients



P224

The Role of Intraoperative Leak Testing in Bariatric Surgery. Is It Useless?: A Retrospective Case Series

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Introduction: Intraoperative testing of staple lines and anastomoses is a common practice in bariatric surgery to reduce the risk of postoperative leaks. However, the true impact of this intervention remains uncertain. This study aims to evaluate the outcomes of bariatric surgery performed without routine leak testing.
Methods: Between 2019 and 2024, 293 patients underwent bariatric surgery at a single private practice center. No leak testing was performed in any of the patients. Data were collected and analyzed retrospectively, considering surgical technique, patient characteristics, and postoperative outcomes.
Results: Of the 293 patients, 169 (58%) underwent (Laparoscopic Sleeve Gastrectomy (LSG), 109 (37%) Roux-en-Y gastric bypass (RYGBP), and 15 underwent revisional bariatric surgery. Three patients were readmitted within 72 h of discharge. One was an LSG patient who experienced a leak on postoperative day 1, which was managed endoscopically with a stent. The other two were bypass patients who developed leaks intraoperatively, which were treated with drainage and stenting. One gastric bypass patient developed early stenosis, requiring laparoscopic revision of the anastomosis. One patient with late sleeve stenosis underwent conversion to RYGBP eight months postoperatively. The mean follow-up period was 18 ± 35 months.
Conclusions: This retrospective cohort demonstrates that bariatric surgery can be performed safely without routine intraoperative leak testing. The absence of leak testing did not adversely affect outcomes for LSG, RYGBP, or revisional cases. While further studies are needed to confirm these findings, these results suggest that intraoperative leak testing may not be a necessary component of standard bariatric surgical practice.

P225

Establishing Weight Specific Prehabilitation Program in Elective Total Hip and Knee Arthroplasty

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Background: Hip and knee osteoarthritis (OA) is highly prevalent and disabling. Obesity is the leading modifiable risk factor for incidence and progression. Prehabilitation prior to orthopedic surgery has shown to improve functional outcomes among patients undergoing total hip arthroplasty (THA) and total knee arthroplasty (TKA). This study examined the effectiveness of a multidisciplinary weight specific prehabilitation program for orthopedic surgery patients.
Methods: Patients referred by the Edmonton Bone and Joint center from 2022 to 2023 with at least six month follow up at the Alberta Obesity Center (AOC) undergoing THA and TKA were included. Following the Canadian Obesity practice guidelines, AOC provided nutritional support, behavioral therapy, physical therapy and pharmacotherapy. The primary outcome was clinically significant weight loss, defined as $> 5\%$ reduction in body weight at 6-months and 1-year. As a secondary outcome, we compare our Pilot program (defined as patients enrolled in March 2022) to our Established program (with patients enrolled after Sept 2022).
Results: 502 patients were screened. 259 patients met the inclusion criteria, of which 160 patients were followed for over 1 year. Overall average age was 64.9 with average initial BMI of 44.8 kg/m^2, with 87 males and 172 females. The average time to surgery was 9.7 months. At 6 months ($n = 259$), average weight loss of $> 5\%$, 10%, 15% was seen in 56%, 23% and 6% respectively. At 1 year ($n = 157$), average weight loss was 69%, 38% and 16% respectively.

For the Pilot subgroup ($N = 50$), the average weight loss at 6 months and 1 year was 4.8% and 6.8% respectively which improved to 6.5% and 9.8% in the Established subgroup ($N = 50$).

Of the 243 patients excluded, 142 were lost to follow-up, 52 self-discharged from the program, 29 were not TKA/THA candidates, 16 had previous bariatric surgery and 2 were deceased. Notably, from the Pilot to the Established, the number of patients to self-discharge decreased from 14 to 9.
Conclusions: Our study validates that weight-specific prehabilitation programs facilitate clinically significant weight loss for patients on orthopedic surgery waitlists. The reduction in body weight from 6 months to 1 year highlights a sustained, safe and gradual weight reduction program. Better weight specific outcomes and reduced attrition are demonstrated by a more established program. Further studies should be conducted to explore the benefits of prehabilitation on postoperative outcomes including pain and quality of life.

P227

Graham Patch Is a Reasonable Initial Intervention for Post-bariatric Marginal Ulcer Perforation or Bleeding

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Introduction: The current standard of care prefers a revisional surgery for marginal or gastrojejunal (GJ) ulcer perforation or bleeding following bariatric surgery. However, some emerging literature asserts that Graham patch is a safe alternative in the acute setting. We aim to compare the short-term safety profile of Graham patch versus immediate GJ revision.
Methods and Procedures: Using National Surgical Quality Improvement Project data from 2017–2019 and 2021–2022, we identified all patients presenting with marginal ulcer after bariatric surgery. We excluded patients who presented with marginal ulcer without hemorrhage or perforation. We divided patients into Graham patch and revisional surgery groups and performed logistic regression analysis using Graham patch as the reference category. The primary outcome was mortality. A group of common morbidities was used as secondary outcomes as detailed in the results section. The regression analysis was appropriately adjusted for smoking status, steroid use, pre-operative sepsis, case type (emergent/urgent or elective), and acute vs chronic nature of the ulcer.
Results: We identified 345 patients for analysis. Of these, 263 underwent Graham patch and 82 underwent revisional surgery. Demographic analysis revealed no significant differences between the two groups relating to age, sex, and ASA score. Moreover, the groups were similar concerning comorbidities including hypertension, steroid use, smoking, diabetes mellitus, COPD, and congestive heart failure. Logistic regression indicates that patients who underwent revision surgery for gastrojejunal ulcer perforation or bleeding were more likely to have respiratory complications including postoperative

pneumonia (OR 9.396, *p*-value 0.007) and ventilator dependence for more than 48 h (OR 6.31 *p*-value 0.012). Additionally, the revision surgery group had a significantly greater incidence of organ space infections (OR 5.226 *p*-value 0.018) along with a greater need for blood transfusions (OR 5.806 *p*-value 0.006). The groups were similar for the outcomes of unplanned reoperation, wound disruption, hospital length of stay, and 30-day mortality.
Conclusion: Initially, patients who present with a gastric ulcer perforation or bleeding following bariatric surgery should be managed with Graham patch instead of revision surgery, as the former approach is associated with lower incidence of early morbidity including postoperative pneumonia, need for blood transfusions, ventilator dependence, and organ space infections. This may be used to temporize the patient until they are stable enough to undergo the GJ revision shown to be superior in the long-term.

P228

Remnant Stomach Bleeding Ulcer as a Rare Complication of Roux-en-Y Gastric Bypass Surgery: A Case Series and Review of the Literature

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Bleeding peptic ulcers in the remnant stomach after a Roux-en-Y-gastric bypass (RXYB) surgery remain a rare but serious complication. The altered anatomy after a RXYB surgery makes for a diagnostic and therapeutic challenge often requiring surgery. Here we present a case series of three patients found to have a bleeding ulcer in the remnant stomach resulting in severe anemia and requiring transfusion of blood products. All three patients had similar presentations with abdominal pain and symptoms consistent with upper gastrointestinal bleeding (UGIB). All three patients had minimal risk factors for development of marginal or peptic ulcers. Esophagogastrojejunoscopy (EGJ) of the pouch, gastrojejunal anastomosis, and the roux limb was negative for marginal ulcer or an active bleeding source. Computed tomography angiography was used to help elucidate the source of bleeding, which localized to the gastric remnant. Each patient underwent mesenteric angiography for embolization, but no active source of bleeding was noted. One patient had embolization of a branch supplying the remnant stomach as she was at elevated risk for recurrence of bleeding due to anticoagulation use. All patients had emergency surgery, with two undergoing a total remnant gastrectomy, and one patient having a partial remnant gastrectomy. All three patients had an uneventful post operative course with successful treatment of the UGIB. While a laparoscopic assisted gastroduodenoscopy of the remnant stomach and duodenum can be performed, this approach presents significant challenges with visualization and therapeutic intervention in the setting of acute bleeding. A remnant gastrectomy, therefore, appears to be a more definitive management for complicated peptic ulcer disease of the remnant stomach following RXYB.

P229

Complications After Robotic Sleeve Gastrectomy: Does Staple Load Color Affect Outcome?

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Introduction: Robotic sleeve gastrectomy is one of the most commonly performed bariatric surgeries in the United States. During the procedure, the stomach size is reduced with the assistance of a stapler. The Intuitive SureForm 60 mm stapler has four different staple load colors that correspond to different staple heights: White (2.5 mm), Blue (3.5 mm), Green (4.3 mm), and Black (4.6 mm). The staple colors used vary from surgeon to surgeon, and different colored staple loads are often used during the same case. In our study, we examine whether there is an association between staple load color and complications after robotic sleeve gastrectomy.
Methods and Procedures: We conducted a retrospective review of bariatric surgeries performed at our institution between 2015 and 2022. We identified patients who had a complication following robotic sleeve gastrectomy and performed a detailed chart review to include their preoperative workup, operative details, and postoperative course. To understand the staple colors commonly used by our surgeons for a robotic sleeve gastrectomy, we used individual Da Vinci Intuitive system profiles. A chi square analysis was used to determine significance.
Results: We identified 24 patients who had a major complication following robotic sleeve gastrectomy. The mean age was 37 (range 19 to 61) and the mean BMI was 44 (range 34 to 64). Their comorbidities include diabetes ($n = 6$), sleep apnea ($n = 6$), hyperlipidemia ($n = 5$), and hypertension ($n = 9$). Major complications included bleeding requiring transfusion or operative intervention ($n = 10$), thrombosis requiring anticoagulation ($n = 4$), and leak ($n = 3$). For patients with complications, staple load colors used were blue only ($n = 7$), blue-to-white ($n = 4$), black-to-green ($n = 1$), black-to-blue ($n = 5$), and green-to-blue ($n = 7$). Among our surgeons, the most commonly used colors are green-to-blue (31%), blue only (25%), blue-to-white (22%), and black-to-blue (20%). Chi square analysis shows a p value of 0.96, indicating no significant difference between staple load color and complication rates.
Conclusions: Though continuous blue staple load usage and green-to-blue staple usage (longer staple heights) are prevalent in our patients with complications, it is not statistically significantly different from patients who did not have complications. As a result, our data does not suggest that staple load color is associated with complications for robotic sleeve gastrectomy.

P230

Incidence and Risk Factors for Smoking Recidivism After Bariatric Surgery

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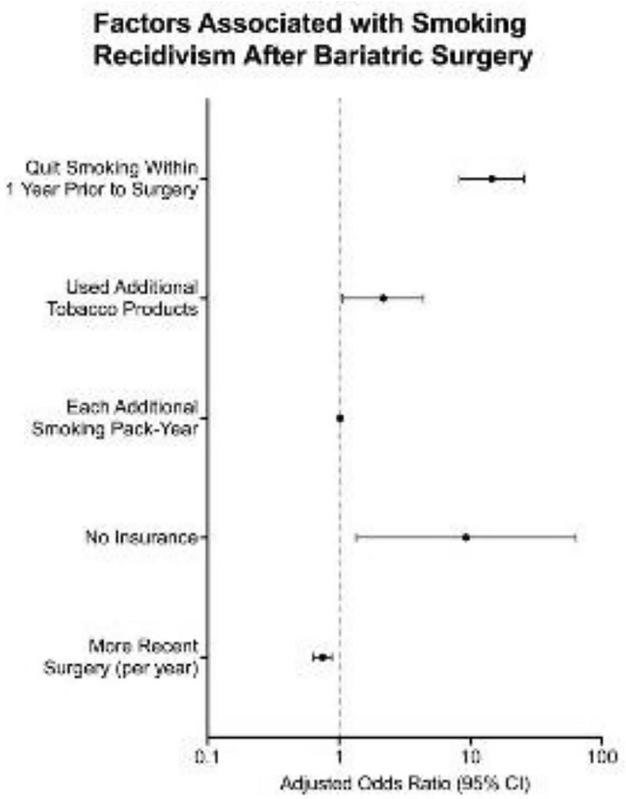
Introduction: Smoking recidivism after bariatric surgery can lead to devastating outcomes for patients. However, it is currently unclear which patients are most at risk of resuming smoking postoperatively. This study aims to evaluate factors associated with smoking recidivism after bariatric surgery to help inform preventative care delivery.
Methods: We utilized a statewide clinical registry to perform a retrospective review of patients who underwent primary bariatric surgery between 2014 and 2022. Patients were included if they were former smokers, meaning that they smoked previously but did not

smoke at the time of surgery. The primary outcome was resuming smoking, which was assessed one year postoperatively. Explanatory variables included patient characteristics (age, sex, race, insurance, body mass index, and comorbidities), surgical characteristics (type of surgery), clinical characteristics (year of surgery, length of stay, adverse postoperative events), and smoking characteristics (smoking pack years, quitting within the year prior to surgery, and using additional tobacco products). Multivariable logistic regression was performed to assess the association (adjusted odds ratios [aOR]) of all explanatory variables with resuming smoking after surgery.

Results: 15,421 former smokers underwent surgery during the study period. Mean age was 46.5 (11.6) years, 12,397 (80.4%) patients were female, and 12,487 (81.0%) patients underwent laparoscopic sleeve gastrectomy. One year after surgery, 1139 (7.4%) patients reported resuming smoking. In multivariable logistic regression, the factor most strongly associated with resuming smoking was quitting within the year prior to surgery (aOR 14.55 [95% CI 8.28–25.56]) (Fig. 1). Other smoking-related factors associated with resuming smoking included using additional tobacco products (aOR 2.17 [95% CI 1.07–4.39]) and smoking pack-years (aOR 1.02 [95% CI 1.01–1.04] per pack year). Compared to patients with private insurance, uninsured patients were also more likely to resume smoking [aOR 9.25 [95% CI 1.34–63.77]). Finally, compared to patients who underwent surgery at the start of the study period, patients who underwent surgery more recently were less likely to resume smoking after surgery (aOR 0.75 [95% CI 0.64–0.88] per year). There was no difference in recidivism by type of operation performed.

Conclusion: In this study of former smokers undergoing bariatric surgery, approximately one in every thirteen patients resumed smoking within one year postoperatively. Patients were most at risk of recidivism if they quit in closer proximity to their operation, used additional tobacco products, or were uninsured. These findings may help inform targeted efforts to help prevent smoking recidivism after bariatric surgery.



P231

Type 2 Diabetic Remission and Prevented Long Term Vomiting After Laparoscopic Sleeve Gastrectomy with Improved Quality of Life (Vertical and Buttress Technique) (Preliminary Report)

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Background: Overweight and obesity are significant risk factors for the development of type 2 diabetes. Laparoscopic sleeve gastrectomy is effective surgery for treatment of obesity and diabetic patients. And the clinical nausea/vomiting and GERD are most common symptom after laparoscopic sleeve gastrectomy for treatment the morbid obesity patients and impaired to quality of life. We observed the other technique, laparoscopic vertical sleeve gastrectomy, is less in clinical nausea/vomiting and quality of life is better than classical laparoscopic sleeve gastrectomy.

Objectives: The primary end point was diabetic remission after operative treatment and secondary end point was % total weight loss, clinical vomiting, GERD and Gastrointestinal quality of life index(GIQLI).

Materials&Methods: This retrospective cohort study includes patients morbid obesity who underwent laparoscopic vertical sleeve gastrectomy (70 patients) at King Taksin Memorial Hospital Thailand(between January 1st 2023 and January 1st 2024, average follow up 9 months).

Results: The morbid obesity patients who underwent laparoscopic vertical sleeve gastrectomy was female 74.24%, average age 37.71 ± 9.06 years old. There was diabetic 16 patients and the HbA1C was decrease from 7.76 ± 1.25 to 5.98 ± 0.72 within 1 years. The remission of diabetic mellitus was 61.54%. The body weight 117.68 ± 23.26 kg and BMI 43.33 ± 6.79 kg/m^2. There was no clinical vomiting and only 11.86% had clinical GERD (GERDQ score). The average % total weight loss was 21.93 ± 6.56 kg, total weight loss was 25.72 ± 7.04 kg within 1 year(comparable to other standard technique). There were no perioperative complications, reoperation and readmission. The total score gastrointestinal quality of life was 73.38%.

Conclusions: There was diabetic 16 patients and the HbA1C was decrease from 7.76 ± 1.25 to 5.98 ± 0.72 within 1 years. The remission of diabetic mellitus was 61.54%. The % total weight loss comparable to other standard technique. There was 0% of the patient had clinical vomiting and only 13.33% of the patient had GERD. In this study, laparoscopic vertical sleeve gastrectomy is less in clinical vomiting and GERD. However, the data comparison between laparoscopic vertical sleeve gastrectomy with laparoscopic classical sleeve gastrectomy in nausea/vomiting, gastrointestinal quality of life with long term outcomes and randomized controlled studies are still needed.

Keywords: Laparoscopic vertical sleeve gastrectomy, gastrointestinal quality of life index, GERDQ score

P232

BMI-Based Lovenox Dosing for VTE Chemoprevention Post-bariatric Surgery is Safe and Effective

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Background: Lovenox® has been validated as a safe and effective means of venous thromboembolic prophylaxis after bariatric surgery. However, the optimal dosing protocol in patients with extreme

obesity is unclear. Higher dosing may be more effective but may also increase the risk of bleeding. Our aim was to evaluate the risk of post-operative complications between Weight-based (WBD) and BMI-based (BMIBD) Lovenox® dosing protocols after bariatric surgery.
Method: A retrospective study was conducted utilizing a bariatric registry from 2015 to 2023 for a single institution. WBD (roughly 0.5 mg/kg) was employed from 01/2015 to 10/2019 and BMIBD (< 40 kg/m^2 = 40 mg, 40–49 kg/m^2 = 80 mg, or ≥ 50 kg/m^2 = 120 mg daily) was used from 11/2019 to 12/2023. The 30-day post-operative outcomes were compared for patients receiving WBD and BMIBD. Outcomes, including readmissions, gastrointestinal bleeding, blood transfusions, and thromboembolism, were analyzed using Chi-square and Fisher's exact tests, and multiple logistic regression was utilized to adjust for baseline demographic differences.
Results: A total of 4339 cases were included in the analysis with 2233 (51.5%) receiving BMIBD Lovenox® dosing. The dose was higher in the BMIBD group (Table 1). The two groups had similar mean age, sex, and BMI; however, the WBD group had slightly higher Caucasian race (86% vs 80%) and fewer patients with Roux-en Y gastric bypass (72% vs 78%). Roux-en Y gastric bypass was the most common procedure type (75%), followed by sleeve gastrectomy (19%), and biliopancreatic diversion with duodenal switch (6%). There were no significant differences in 30-day adverse outcomes between WBD and BMIBD (Table 1). Adjusting for baseline differences did not impact the results.

	Overall N=4339	WBD N=2106	BMIBD N=2233	p-value
Lovenox® dose (mg daily)				
40	28% (n=1214)	38% (n=808)	18% (n=406)	<0.0001
60	23% (n=977)	46% (n=977)	0% (n=0)	
80	34% (n=1454)	12% (n=258)	54% (n=1196)	
100	1% (n=63)	3% (n=63)	0% (n=0)	
120	15% (n=631)	0% (n=0)	28% (n=631)	
Readmission related to Lovenox®	0.6% (n=25)	0.5% (n=11)	0.6% (n=14)	0.649
GI Bleed	0.4% (n=18)	0.4% (n=8)	0.5% (n=10)	0.728
Blood transfusion	1.0% (n=44)	1.2% (n=25)	0.9% (n=19)	0.269
DVT/PE	0.2% (n=9)	0.2% (n=4)	0.2% (n=5)	0.999
Any of above	1.6% (n=69)	1.6% (n=33)	1.6% (n=36)	0.905

Table 1 Lovenox® dosing and the unadjusted comparison of post-operative outcomes in weight-based and BMI-based dosing

Conclusion: Our study found that there were no statistically significant differences between weight-based and BMI-based Lovenox® dosing in the selected post-bariatric surgery outcomes.

P233

Fast Track Bariatric Surgery: Preliminary Outcomes

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Introduction: Bariatric surgery has emerged as a highly effective treatment for morbid obesity and its associated comorbidities. While traditional inpatient procedures have demonstrated significant benefits, the associated hospital stay and costs have limited accessibility. Outpatient bariatric surgery offers a potential solution by reducing costs, improving patient satisfaction, and minimizing the risk of nosocomial infections. However, concerns regarding safety, long-term effectiveness, and optimal patient selection criteria have hindered its widespread adoption. This study aims to evaluate the short- and long-term outcomes of outpatient bariatric surgery, identify factors influencing success, and establish guidelines for informed clinical decision-making and optimal resource allocation.
Methods: A retrospective cohort study was conducted to analyze data from patients who underwent outpatient bariatric surgery between January and September 2024 in ambulatory surgery center Endoolap in Bogotá, Colombia. Patients aged 18–65 with a BMI ≤ 50, ASA physical status I or II,and surgery duration less than 90 min were included. Exclusion criteria included difficult healthcare access, lack of postoperative support, and concerns regarding safety raised by the care team. Variables such as demographics, anthropometrics, perioperative variables, and postoperative outcomes were recorded and analyzed.
Results: A total of 35 patients underwent surgery with a hospital stay of less than 24 h (majority between 18 and 20 h). Operative time ranged from 35 to 90 min. The majority of patients underwent a sleeve gastrectomy, and all patients commenced ambulation and a clear liquid diet within the first 6–8 h. 31 patients did not require home care. Five patients were discharged on the same day (within the first 6 h post-op), including one Roux-en-Y gastric bypass and four sleeve gastrectomies, who requires home care. There were two revision surgeries (one bypass reconstruction and one sleeve-to-bypass conversion), with discharges occurring at 16 and 18 h, respectively. No readmissions were required and the 30-day complication rate was not negatively impacted due to ambulatory management.
Conclusion: This study demonstrates the feasibility and safety of outpatient bariatric surgery. The majority of patients experienced minimal complications and were discharged within 24 h. And ambulatory management did not adversely affect outcomes for LSG, RYGBP, or revisional cases. Ambulatory bariatric surgery offers significant cost reductions due to reduced medication use, faster hospital bed turnover, improved unit availability, and faster return to work for patients, Further follow-up and monitoring are needed to establish long-term outcomes and identify optimal patient selection criteria.

P234

Euglycemic Diabetic Ketoacidosis in the Postoperative Period: A Case Series of Bariatric Surgery Patients

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Introduction: Euglycemic Diabetic Ketoacidosis (EDKA) is a rare form of metabolic disorder occurring in 2–3% of diabetic ketoacidosis (DKA) cases, characterized by blood glucose levels < 250 mg/dL, acidosis, and ketones in urine. Risk factors include Sodium Glucose Cotransporter-2 Inhibitors (SGLT2i) and fasting periods with surgical procedures. In bariatric surgery patients, EDKA may be overlooked as its symptoms can mimic complications such as anastomotic leak, portal vein thrombosis, or bleeding. We are presenting two cases of severe EDKA in postoperative bariatric surgery patients.
Methods: Clinical presentation, management, and outcomes were reviewed and described, emphasizing the potential impact of SGLT2i use on postoperative complications.
Results: The first case involved a 53-year-old female with class III obesity (BMI 40), hypertension, and type 2 diabetes who underwent a Laparoscopic Roux-en-Y Gastric Bypass. She stopped her GLP1 agonist a month prior and her SGLT2i for 3 days as per our Institution's guidelines. The surgery was uncomplicated, and she was initially discharged home on post-operative day 1 after meeting her discharge criteria. On postoperative day 3, she presented to the emergency room with tachycardia, vomiting, reduced oral intake, and severe anion gap metabolic acidosis (34 mmol/L) with elevated Beta-Hydroxybutyrate (> 8.0 mmol/L), though her blood glucose was < 250 mg/dL. After ruling out sepsis and thrombosis, she was diagnosed with EDKA and admitted to the MICU. Treatment with insulin and fluids led to rapid improvement, and she was discharged home on postoperative day 5.
The second case is a 35-year-old male with class III obesity (BMI 41) hyperlipidemia, obstructive sleep apnea, and type 2 diabetes taking a biguanide and a SGLT2i (stopped 3 days before surgery) who underwent an uncomplicated Laparoscopic Sleeve Gastrectomy. Immediately postoperatively, he developed significant anion gap metabolic acidosis (27 mmol/L), elevated Beta-Hydroxybutyrate (6.1 mmol/L), and glucose level < 220. He was treated in the SICU with rehydration and insulin drip. His acidosis and electrolytes improved with treatment. Both patients were sent home on basal and corrective insulin dosages as per endocrinology.
Conclusions: EDKA, though rare, can occur in bariatric surgery patients due to a combination of reduced caloric intake, surgery, and possible persistent ketosis despite cessation of SGLT2i. Management involves administering insulin and dextrose to address ketosis, even with normal blood glucose, unlike in DKA patients. Further studies are needed to fully understand the risk of developing EDKA in patients on SGLT2i preparing for bariatric surgery, particularly in prolonged states of hypoalimentation/protein malnutrition.

P235

Outcomes and Experiences of Indigenous Patients in Newfoundland and Labrador's Bariatric Surgery Program: A Pilot Study

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Introduction: Canadian Indigenous Peoples have higher rates of obesity (30–51%) compared to the non-Indigenous (12–31%). Previous literature has shown no difference in weight loss outcomes in Indigenous compared to non-Indigenous bariatric surgery patients. 8.9% of Newfoundland and Labrador's (NL) population are Indigenous compared to < 3.4% in previous study populations. Given the higher Indigenous population density, this study looked to compare bariatric surgery outcomes and patient experiences in NL's Bariatric Surgery Program amongst the Indigenous versus non-Indigenous.
Methods: This is a mixed methods retrospective cohort study including patients that underwent bariatric surgery in NL's Bariatric Surgery Program from 2011 to 2022. Indigenous patients were compared to non-Indigenous patients. Bariatric surgery outcome measures were obtained through chart review. Data on patient experience, access to care, postoperative supports, and suggestions for program improvement were gathered through phone survey questionnaires.
Results: 30 patients were included in the study (8 = Indigenous, 22 = non-Indigenous). There was no difference in outcomes for percentage of excess weight loss (45% vs. 48%, $p = 0.35$), improvement in comorbidities ($n = 5$[63%] vs. $n = 16$[73%], $p = 0.30$), or postoperative complications ($n = 2$[25%] vs. $n = 4$[18%], $p = 0.35$) at 1-year follow-up between the Indigenous and non-Indigenous population. On a 1–10 scale, Indigenous patients compared to non-Indigenous, stated they were less satisfied with their weight loss (6.3 vs. 8.2, $p = 0.03$) and less likely to refer a community member to the bariatric program (5.6 vs. 8.8, $p = 0.04$) but had similar difficulty being referred to the bariatric program (5.5 vs. 3.2, $p = 0.06$), transportation accessibility (6.6 vs. 5.9, $p = 0.30$), postoperative supports (6.5 vs. 7.5, $p = 0.20$) and overall experience with the program (7.3 vs. 8.6, $p = 0.08$). Both groups suggested longer follow-up than 18 months (total $n = 11$[37%]) and need for more mental health services (total $n = 10$[33%]), dietician counseling (total $n = 4$[13%]) and cosmesis education (total $n = 3$[10%]).
Conclusion: In a high density Indigenous region, bariatric surgery outcomes are similar amongst the NL Indigenous and non-Indigenous population, similar to previous findings. However, the Indigenous patients were less satisfied with their weight loss and less likely to refer another person to the NL Bariatrics Program versus the non-Indigenous. Both groups highlighted the need for longer postoperative follow-up and interdisciplinary services, particularly mental health services.

P236

Moderate GERD Before Sleeve: Can We Predict Post-operative GERD?

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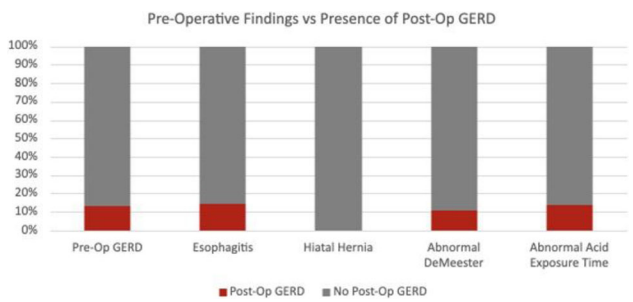
Introduction: New onset or worsening gastro-esophageal reflux disease (GERD) has been typically reported after sleeve gastrectomy (SG). However, to date we have not been able to predict which patients will develop worsening symptoms post-operatively. We therefore sought to characterize what findings from preoperative Bravo pH testing and endoscopy were associated with the development or persistence of GERD after SG.

Methods: A cohort of patients with history of SG who had undergone preoperative 48 to 96-h Bravo pH studies were identified. Patients with severe GERD who underwent Roux-en-y Gastric Bypass were excluded. Abnormal DeMeester score was defined as > 14.7. Abnormal acid exposure time (AET) was defined as $> 4\%$ of time with a pH < 4. We also reported the presence of esophagitis based on LA grade and the presence of a hiatal hernia. Post-operative GERD was defined as GERD symptoms requiring Proton Pump Inhibitor (PPI). We performed a multivariate analysis comparing patients with preoperative GERD to analyze the impact of these markers on the presence of post-operative GERD.

Results: A total of 76 patients were included, with 35 patients (46.1%) reporting preoperative GERD symptoms. Of those with symptoms, 20% had LA Grade A or B esophagitis, 25% had a hiatal hernia, 56.1% had an elevated DeMeester score, 58.5% had an elevated AET, and 14.2% (5/35) of patients required a PPI post-operatively, compared to 6.1% ($p = 0.4$) in patients without preoperative GERD symptoms. Of those with preoperative symptoms, there was no difference in the rate of post-operative PPI use between those with a normal vs abnormal preoperative Demeester (13.3% vs 13.0%, $p > 0.9$). In multivariate analysis of patients with preoperative GERD, abnormal DeMeester score (OR 1.3, $p = 0.87$), esophagitis (OR = 0.89 $p = 0.93$), or abnormal AET (OR = 0.78, $p = 0.86$) were not predictive of post-operative GERD. In patients who developed post-operative GERD, there was no statistically significant difference in the rates of esophagitis or the presence of abnormal Demeester or AET compared to those without post-operative GERD.

Conclusion: In patients with moderate GERD, preoperative pH testing was not predictive of the development of post-operative GERD. Even in patients with abnormal Demeester and AET, the rates of post-operative PPI use were similar to those with normal studies. Finally, the rate of post-operative GERD requiring PPI in our study in those with pre-existing GERD symptoms and abnormal DeMeester was low, 14.25%, which is helpful for counseling patients who have moderate GERD and abnormal pH studies but are interested in pursuing SG.



P237

If You Catch My GISTs: A Single Team Case Series of Incidental GISTs Discoveries During Sleeve Gastrectomies

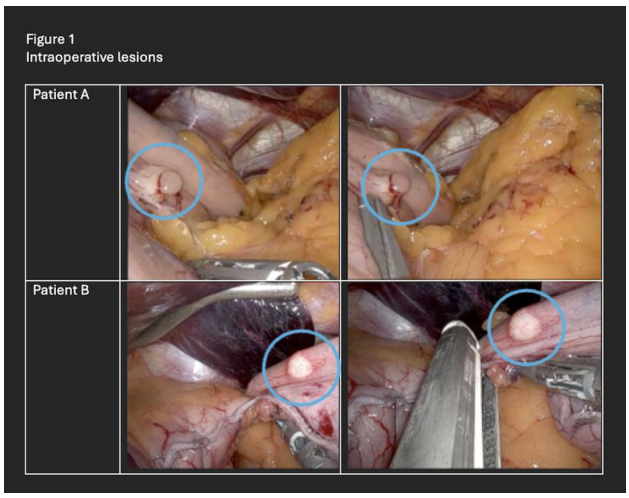
Loic Tchokouani; Nicole Uzor, MD; New York University Langone

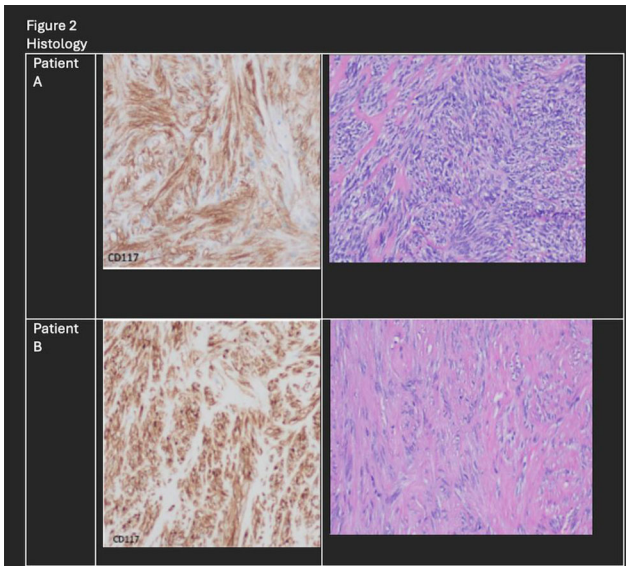
Gastrointestinal stromal tumors (GISTs) are rare stromal neoplasms representing just 1–2% of Gastrointestinal (GI) Tumors (1). GISTs are more common in African Americans (AA) with an overall incidence of 7–8 cases per million population per year in the US and Canada (4,5). They arise equally in men and women and are usually asymptomatic, found incidentally on endoscopy or on CT imaging. GISTs can be found anywhere along the gastrointestinal tract but most commonly arise in the stomach. Their cellular origins are believed to be the interstitial cells of Cajal, GI "pacemaker" cells, located in the bowel wall muscular layers and responsible for gut peristalsis. On immunohistochemistry, these spindle shaped neoplastic cells almost universally stain positive for the CD117 (c-kit). The treatment of choice is R0 resection for small low grade lesions (1). For metastatic or recurrent disease, treatment may include a wider resection and Imatinib.

We report a case series of 2 incidental finding of GISTs following sleeve gastrostomies at a single institution over the span of 1 week. Patient A is a 46 yo (AA) male with a history of hypertension and obesity (BMI 46). Patient B is a 55 yo AA F with a history of hypertension, sleep apnea and obesity (BMI 41). Both patient's pre operative endoscopies were unremarkable. Each patient underwent robotic sleeve gastrectomies of which suspicious lesions were noted near the fundus (Fig. 1).

Immunohistochemistry for both patients revealed positive stains for + CD117 (Fig. 2). In addition, each specimen had a ki67 positivity in less than 2% of the cells. The lesions were removed in their entirety in both cases with negative margins. Referrals to surgical oncology were made for each patient and final recommendations were surveillance given low grade disease in the setting of R0 resections.

If found early, low grade GISTs can be treated swiftly with low risk of recurrence (3). Complete resection can be completed without altering the course of the procedure. Current liturature quotes the incidence of GISTs found incidentally in sleeve gastrectomies to be 0.6–0.8% (2) and there has been no literature clearly correlating obesity to increased risk of these tumors. Though rare, GISTs should remain in the differential diagnosis when lesions are encountered during abdominal surgery as early detection can alter both the treatment options and prognosis for these patients at the time of surgery.





P238

Preoperative Hypoalbuminemia is Associated with an Increased Risk of Mortality in Patients with Super Obesity Undergoing Bariatric Surgery: Propensity Score Matching Analysis Using the 2015–2022 MBSAQIP Database

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Background: Hypoalbuminemia has been associated with poor postoperative outcomes. However, there is limited data on this in the bariatric population. Patients with super obesity undergoing bariatric surgery may represent a higher-risk group of malnutrition. We compared 30-day outcomes in super obese patients with albumin < 3.5 versus ≥ 3.5 undergoing either Sleeve Gastrectomy (SG) or Roux-en-Y gastric bypass (RYGB).
Methods: Patients who underwent primary SG or RYGB within the MBSAQIP data registry from 2015 to 2022 were included in this study. Using Propensity Score Matching analysis, the cohorts were matched for 23 preoperative characteristics. We then performed four analyses comparing 30-day postoperative outcomes and bariatric-specific complications of patients with albumin < 3.5 (hypoalbuminemia) versus ≥ 3.5 when undergoing SG with BMI ≥ 50 (analysis 1), RYGB with BMI ≥ 50 (analysis 2), SG with BMI < 50 (analysis 3), and RYGB with BMI < 50 (analysis 4).
Results: 728,915 patients were included. The matched cohorts in analyses 1 ($n = 17{,}548$), 2 ($n = 9459$), 3 ($n = 16{,}025$), and 4 ($n = 6787$) had similar pre-operative characteristics. Propensity-matched outcomes in all four analyses showed that hypoalbuminemia is associated with more comorbidities, mainly renal complications and interventions, as shown in Table 1. More importantly, patients with super obesity and hypoalbuminemia had higher rates of mortality (for SG, 0.2% vs. 0.1%, $p = 0.011$; and for RYGB, 0.3% vs. 0.1%, $p < 0.001$), compared to patients with albumin ≥ 3.5, leading to higher rates of unplanned ICU admissions (for SG, 1.0% vs. 0.7%, $p = 0.020$; and for RYGB 1.6% vs. 1.2%, $p = 0.034$), and non-home discharge (for SG, 0.8% vs. 0.5%, $p < 0.001$; and for RYGB, 0.9% vs. 0.6%, $p = 0.009$). These differences in mortality were not found in patients with BMI < 50 and hypoalbuminemia (for SG, 0.1% vs. 0.0%, $p = 0.438$; and for RYGB, 0.2% vs. 0.1%, $p = 0.133$) compared to patients with albumin ≥ 3.5.
Conclusion: Patients with hypoalbuminemia undergoing bariatric surgery have a higher rate of complications. While this increased risk does not significantly impact mortality in patients with a BMI < 50, it is associated with a higher mortality rate in patients with super obesity. Nutritional optimization is strongly advised in patients with hypoalbuminemia, specifically in patients with super obesity prior to bariatric surgery.

Table 1. 30-Day outcomes and bariatric specific complications in patients with and without hypoalbuminemia, super or morbid obesity undergoing Sleeve Gastrectomy (SG) or Roux-en-y Gastric Bypass (RYGB)

	BMI < 50						BMI ≥ 50					
	SG			RYGB			SG			RYGB		
	< 3.5 (n = 16,025)	≥ 3.5 (n = 16,025)	P	< 3.5 (n = 6,787)	≥ 3.5 (n = 6,787)	P	< 3.5 (n = 17,548)	≥ 3.5 (n = 17,548)	P	< 3.5 (n = 9,459)	≥ 3.5 (n = 9,459)	P
30-Day outcomes												
Mortality	9 (0.1)	6 (0.0)	0.438	11 (0.2)	5 (0.1)	0.133	34 (0.2)	16 (0.1)	**0.011**	33 (0.3)	14 (0.1)	**<0.001**
Cardiac complications	6 (0.0)	8 (0.0)	0.593	10 (0.1)	6 (0.1)	0.317	16 (0.1)	12 (0.1)	0.450	23 (0.2)	9 (0.1)	**0.013**
Pulmonary complications	29 (0.2)	13 (0.1)	**0.013**	20 (0.3)	16 (0.2)	0.504	46 (0.3)	31 (0.2)	0.087	49 (0.5)	23 (0.2)	**0.002**
Renal complications	26 (0.2)	8 (0.0)	**0.002**	35 (0.5)	16 (0.2)	**0.008**	61 (0.3)	27 (0.2)	**<0.001**	58 (0.6)	20 (0.2)	**<0.001**
Unplanned ICU admission	87 (0.5)	68 (0.4)	0.211	84 (1.2)	62 (0.9)	0.067	168 (1.0)	128 (0.7)	**0.020**	147 (1.6)	113 (1.2)	**0.034**
Blood transfusion	88 (0.5)	90 (0.6)	0.881	63 (0.9)	78 (1.1)	0.204	95 (0.5)	91 (0.5)	0.769	107 (1.1)	92 (1.0)	0.285
Readmissions	511 (3.2)	399 (2.5)	**<0.001**	453 (6.7)	376 (5.5)	**0.006**	715 (4.1)	561 (3.2)	**<0.001**	606 (6.4)	553 (5.8)	0.108
Reoperations	148 (0.9)	126 (0.8)	0.182	145 (2.1)	150 (2.2)	0.769	161 (0.9)	146 (0.8)	0.390	193 (2.0)	222 (2.3)	0.150
Interventions	151 (0.9)	98 (0.6)	**<0.001**	178 (2.6)	115 (1.7)	**<0.001**	161 (0.9)	159 (0.9)	0.911	252 (2.7)	172 (1.8)	**<0.001**
Emergency visits	999 (6.2)	994 (6.2)	0.908	611 (9.0)	653 (9.6)	0.215	1,218 (6.9)	1,1556.6)	0.180	930 (9.8)	879 (9.3)	0.207
Venous thromboembolism	67 (0.4)	46 (0.3)	**0.048**	28 (0.4)	23 (0.3)	0.483	88 (0.5)	54 (0.3)	**0.004**	62 (0.7)	33 (0.3)	**0.003**
Surgical site infection	8 (0.0)	2 (0.0)	0.058	23 (0.3)	12 (0.2)	0.063	12 (0.1)	10 (0.1)	0.670	27 (0.3)	20 (0.2)	0.307
Incisional hernia	4 (0.0)	2 (0.0)	0.687	3 (0.0)	5 (0.1)	0.479	5 (0.0)	8 (0.0)	0.424	17 (0.2)	11 (0.1)	0.256
Wound disruption	4 (0.0)	2 (0.0)	0.687	4 (0.1)	0 (0.0)	0.125	11 (0.1)	8 (0.0)	0.503	12 (0.1)	5 (0.1)	0.089
Sepsis or septic shock	--	--	--	--	--	--	--	2 (0.0)	--	0 (0.0)	0 (0.0)	0.500
Conversion to open	17 (0.1)	14 (0.1)	0.590	29 (0.4)	16 (0.2)	0.052	27 (0.2)	17 (0.1)	0.131	45 (0.5)	39 (0.4)	0.512
Non-home discharge	48 (0.3)	35 (0.2)	0.153	34 (0.5)	29 (0.4)	0.528	137 (0.8)	79 (0.5)	**<0.001**	86 (0.9)	55 (0.6)	**0.009**
Postoperative-LOS (days)	1.51 ± 1.18	1.42 ± 0.92	**<0.001**	1.90 ± 1.98	1.78 ± 1.47	0.063	1.64 ± 1.81	1.52 ± 1.35	**<0.001**	2.02 ± 2.07	1.93 ± 2.37	0.655
Operative Time (minutes)	65.99 ± 33.06	65.36 ± 33.98	0.153	116.03 ± 52.12	114.42 ± 52.28	0.058	72.34 ± 37.75	71.99 ± 36.37	0.217	124.66 ± 57.15	121.57 ± 55.12	**<0.001**
Bariatric-specific complications												
Staple/Anastomotic line leak	40 (0.2)	29 (0.2)	0.185	25 (0.4)	19 (0.3)	0.365	46 (0.3)	42 (0.2)	0.669	35 (0.4)	25 (0.3)	0.196
Postoperative bleeding	15 (0.1)	21 (0.1)	0.317	41 (0.6)	25 (0.4)	**0.048**	32 (0.2)	20 (0.1)	0.096	56 (0.6)	49 (0.5)	0.493
Stricture/stomal obstruction	13 (0.1)	10 (0.1)	0.531	32 (0.5)	22 (0.3)	0.173	19 (0.1)	8 (0.0)	**0.034**	61 (0.6)	36 (0.4)	**0.011**
Intestinal obstruction	2 (0.0)	7 (0.0)	0.180	36 (0.5)	28 (0.4)	0.316	3 (0.0)	3 (0.0)	1.000	26 (0.3)	35 (0.4)	0.248
Internal hernia	3 (0.0)	2 (0.0)	1.000	6 (0.1)	9 (0.1)	0.438	6 (0.0)	5 (0.0)	0.763	6 (0.1)	8 (0.1)	0.593
Gastrointestinal perforation	3 (0.0)	2 (0.0)	1.000	6 (0.1)	6 (0.1)	1.000	7 (0.0)	0 (0.0)	**0.016**	5 (0.1)	8 (0.1)	0.405
Anastomotic ulcer	1 (0.0)	0 (0.0)	1.000	20 (0.3)	17 (0.3)	0.621	2 (0.0)	0 (0.0)	0.500	30 (0.3)	22 (0.2)	0.267
Gallstone disease	13 (0.1)	17 (0.1)	0.473	3 (0.0)	7 (0.1)	0.344	21 (0.1)	18 (0.1)	0.631	14 (0.1)	19 (0.2)	0.384

Bold values represent significant differences defined as $p < 0.05$

P239

Extended Study Comparing Weight Loss Outcomes After Conversion from Sleeve Gastrectomy to Either Roux-en-Y Gastric Bypass or Duodenal Switch at a Community Hospital

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Background: The trend of converting sleeve gastrectomy(SG) to Roux-en-Y gastric bypass(RYGB) or duodenal switch(DS) for enhanced weight loss is rising.This study aims to compare weight loss outcomes of converting SG to RYGB vs DS over an 8 year period.
Method: This single-institution retrospective study reviewed data from 105 patients who underwent conversion from SG to RYGB or DS between 2015 and 2023. Patient demographics were compared between cohorts. The analysis examined excess body weight loss(EBWL) at 3, 6, and 12 months, then annually up to 5 years. Secondary measures such as length of stay, procedure length, 30-day readmission rate were also reviewed.
Results: Statistically significant decrease in %EBWL for RYGB vs. DS were as follows: 26.3% vs 23% at 3 months ($p = 0.5123$), 33.11% vs 29.87% at 6 months ($p = 0.3699$), 39.47% vs 35.70% at 12 months ($p = 0.3460$), 36.94% vs 33.74% at 2 years ($p = 0.5671$). There was no significant weight loss at longer follow-up intervals. There was not a significant difference in weight loss between RYGB vs. DS at any time interval. Average LOS was 2.45 vs. 2.75 days ($p = 0.3465$) with procedure duration 133 vs 180 min ($p < 0.0001$). Both groups experienced statistically significant weight loss for up to 12 months (RYGB $N = 37$, $p < 0.0008$; DS $N = 27$, $p < 0.001$) without significant weight loss at longer follow-up.
Conclusion: Both revisional RYGB and DS demonstrated significant weight loss over the first 12 months without significant differences in EBWL between the two procedures for up to 5 year follow up. The DS procedure was significantly longer than RYGB without difference

in LOS. Overall, both procedures are appropriate choices for conversion in patients who have undergone sleeve gastrectomy who are still looking to benefit from further weight loss and show durable weight loss for 12 months after the procedure.

P240

Patient Outcomes and Indications for Revisional Bariatric Surgery Following Roux-en-Y Gastric Bypass: An Observational Analysis

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Introduction: Patients who have undergone bariatric surgery may experience complications such as vomiting and food intolerance, leading to malnutrition and a reduced quality of life. Additionally, weight regain can undermine the benefits of the initial procedure, resulting in the recurrence of comorbidities like diabetes and hypertension. These issues frequently indicate the need for revisional surgery. This study aims to clarify the indications and outcomes of revisional gastric bypass surgeries by analyzing clinical data from procedures performed by a single surgeon between 2009 and 2024.
Methods: It's a retrospective cohort. Clinical data, including indications, endoscopic findings, weight progression, symptoms, postoperative complications, and surgical techniques, were collected from medical records and organized in a spreadsheet.
Results: A total of 48 patients who had previously undergone gastric bypass surgery were analyzed, including 7 men and 41 women, with 42 having had a gastric ring placed during the initial procedure. The time between the initial bypass and revisional surgery ranged from 3 to 24 years. The primary reasons for revision were weight regain (90%), vomiting (86%), and epigastric pain (66%). Notably, 64% of patients experienced frequent vomiting combined with weight regain, all of whom had a gastric ring. Endoscopic findings revealed an enlarged gastric pouch, stenosis, ring migration (with or without pouch enlargement), stasis, esophagitis, and dilation of the jejunal blind loop. The most common revisional procedures were lateral gastrectomy, with or without ring removal, and the creation of a smaller gastric pouch. Patients undergoing revisional surgery for weight regain achieved notable weight loss, with a median reduction of 11.6 kg at 12 months post-surgery. Furthermore, 98% of patients who underwent revision for refractory symptoms (vomiting, pain, or food intolerance) reported complete resolution of their symptoms. We had three postoperative fistulas following the revisional surgeries, and no deaths were recorded.
Conclusion: Revisional gastric bypass surgery is effective for patients facing complications such as weight regain and vomiting. Notably, 87% of the cohort had undergone a banded procedure, highlighting a significant link between gastric rings and postoperative complications. Furthermore, the presence of a gastric ring or food intolerance does not seem to prevent weight regain, as 64% of patients experienced both vomiting and food intolerance alongside weight gain. These findings underscore the complexity of post-bariatric outcomes. Most patients achieved significant weight loss and symptom resolution after revisional surgery, reinforcing its importance in managing ongoing issues following initial bariatric interventions.

P241

Single Institution Experience with Ursodeoxycholic Acid Use After Bariatric Surgery

Russell Herberg; K Mellion; Emplify Health System

Background: Data suggests post-operative use of ursodeoxycholic acid (UDCA) after bariatric surgery significantly reduces risk of post-operative biliary symptoms requiring intervention (RR 0.35) [1]. This study aimed to compare the incidence of biliary intervention after bariatric surgery between patients prescribed UDCA postoperatively versus those who were not.
Methods: A retrospective review was conducted of patients undergoing laparoscopic sleeve gastrectomy (SG) or laparoscopic Roux-en-Y gastric bypass (RYGB) at a single institution between January 1, 2013, and February 28, 2022. All patients aged $\geq$ 18 years undergoing bariatric surgery during the study period were included. Patients who had a prior cholecystectomy were excluded. Postoperative UDCA (600 mg/daily for 6 months for RYGB and 500 mg/daily for SG) was prescribed for 435/1164 (37%) of patients. The incidence of biliary intervention was compared between patients not prescribed UDCA postoperatively and those prescribed UDCA. Baseline comparisons between patients with and without UDCA prescribed were made using Wilcoxon rank-sum test, Pearson chi-square test, or Fisher's exact tests.
Results: A total of 1164 patients were included in the study (51% RYGB, 49% SG). Patients prescribed UDCA were more likely to be male (25% vs 16%, $p < 0.001$) and to have hypertension (44% vs 32%, $p < 0.001$). Treatment arm patients were less likely to utilize Medicare/Medicaid insurance (8.7% vs 19%, $p < 0.001$), or to have heart disease (15% vs 20%, $p = 0.03$), OSA (47% vs 59%, $p < 0.001$), substance use disorder (1.6% vs 4.8%, $p = 0.005$) or a psychiatric diagnosis (52% vs 66%, $p < 0.001$) prior to surgery.
The rate of cholecystectomy within 1 year of bariatric surgery was significantly higher for those taking UDCA (3.4% vs 1.6%, $p = 0.048$). No significant difference was noted in the rate of gallbladder disease (such as symptomatic cholelithiasis, cholecystitis, choledocholithiasis, biliary sludge, gallstone pancreatitis, other symptomatic gallbladder-related pathologies [e.g., symptoms that prompted an ERCP]) ($p = 0.3$) or of antibiotic prescription associated with a gallbladder/biliary diagnosis ($p = 0.3$). After matching patients based on age, BMI, and sex, no significant difference was noted in rate of cholecystectomy ($p = 0.18$), gallbladder/biliary diagnoses ($p = 0.51$), or antibiotic prescription associated with gallbladder/biliary diagnoses ($p = 0.41$).
Conclusions: Post-operative use of UDCA was not associated with increased rate of cholecystectomy at 1 year following bariatric surgery. Limitations include inclusion of data from a single institution, follow-up limited to 1 year, lack of compliance data, and the study's retrospective nature.

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Evaluation of the 2024 Metabolic and Bariatric Surgery Clinical Trial Pipeline

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Introduction: Randomized clinical trials (RCTs) are considered the gold standard in clinical research. Metabolic and bariatric surgery (MBS) has transformed through contemporary RCT results, which have shaped modern operative technique and defined society MBS guidelines through the proven benefits of surgical weight loss. While

offering the highest-level evidence of study, surgical RCTs have historically lagged behind other areas of medical research. Because medical weight loss has evolved recently with the advent of new anti-obesity medications, we aimed to evaluate the current state of MBS clinical trial activity in 2024.

Methods: Clinicaltrials.gov is a clinical research database maintained by the US National Institutes of Health. The search terms "bariatric surgery" and "obesity", along with registry-specific synonyms, were used to identify all currently active MBS trials (accessed September 1, 2024). After excluding non-surgical trials (i.e. medication, exercise, diet-related or supplements), we abstracted the trial characteristics and primary outcomes of the remaining studies in phase I, II, III, and IV. Completed, suspended, and withdrawn trials were also excluded. Trial interventions were categorized based on their relation to the perioperative timeline (pre-operative, intraoperative, postoperative). Descriptive statistics were used for analysis.

Results: 483 clinical trials were identified using search criteria. 26 (5%) were relevant to MBS after excluding non-surgical and duplicate trials. Most RCTs (77%) were in phase 3 and 4, with an average trial size of 120 participants and study period of 55 months. Half of trials ($N = 13$) focused on intraoperative interventions, while nine and four assessed for pre- and post-operative treatments, respectively. Trials primarily focused on post-procedure outcomes like pain, nausea and vomiting (54%), followed by diabetic control (19%) and weight loss (8%). One study directly evaluated operative technique. Compared to the sixteen RCTs being conducted internationally, only ten were US-based trials.

Conclusion(s): MBS trials currently represent a vast minority of ongoing obesity-related RCT activity, which may partly be due to recent successes with medical weight loss. Modern trials are small and tend to focus on minor clinical events, possibly reflecting the recruitment and study design challenges inherent to surgery trials. US-conducted MBS trials primarily take place in academic referral centers, likely due to their high patient volumes and dedicated bariatric programs.

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Single-Fire Stapler Sleeve Gastrectomy Results in Less Nausea and Shorter Hospital Stay

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Introduction: Sleeve gastrectomy has traditionally been created using multiple sequential linear stapler fires. This technique creates significant variability in the shape of the sleeve and introduces potential twisting in the sleeve if each sequential firing is not appropriately aligned with the previous one. Performing the sleeve gastrectomy using a 23-cm single-fire stapler may create a straight and reproducible gastric sleeve. We compare early outcomes of sleeve gastrectomy using single staple-fire (SS) versus multiple staple fires (MS).

Methods: We retrospectively reviewed all patients undergoing sleeve gastrectomy at our institution from January 2022 to April 2024. Patients were identified using our Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program database.

All sequential firings were performed using Echelon 60-mm powered stapler (Ethicon Biosurgery, Inc., Somerville, NJ, USA) or SureForm 60-mm robotic stapler (Intuitive Surgical, Inc., Sunnyvale, CA, USA). Single firing was performed laparoscopically and robotically using Titan stapler (Standard Bariatrics, Inc., Cincinnati, OH, USA).

Demographics, perioperative data, operative data, and post-operative course were extracted from the database. Postoperative pain and antiemetic medication requirements were obtained from chart review. We compared outcomes between groups using *t*-test; statistical significance was set at $p = 0.05$.

Results: 228 patients were identified, with 148 patients in MS group and 80 patients in SS group. Average age was 42.8 years (MS) and 43.0 years (SS) [$p = 0.889$]. Preoperative BMI was 44.6 (MS) and 44.4 (SS) [$p = 0.897$]. There was no statistical difference in average procedure length [83.2 min (MS) vs 80.5 min (SS) [$p = 0.840$].

SS patients had statistically significant shorter length of hospital stay [1.57 days (MS) vs 1.31 days (SS), $p = 0.029$]. SS patients also had statistically significantly lower oral morphine equivalents on POD 0 [55.66 vs 43.21, $p = 0.0059$] and POD 1 [32.50 vs 20.10, $p = 0.0015$] as well as fewer anti-emetic doses on POD 0 [1.53 vs 1.11, $p = 0.026$] and POD 1 [1.58 vs 0.63, $p = 0.0001$].

There was no difference in 30-day readmission [0.03% vs 0%, $p = 0.165$]. There were no reports of staple line leaks, surgical site infections, pulmonary embolism, deep vein thrombosis or acute renal insufficiency in either group.

Conclusion: Patients undergoing single staple-fire sleeve gastrectomy have less postoperative pain and nausea, and shorter length of stay as compared to those undergoing traditional sleeve gastrectomy with multiple sequential staple-fire, with no difference in short-term complications or re-admissions.

P244

The Effects of Gastric Bypass on the Brain-Liver Inflammatory Axis and Cognition

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Introduction: This pilot study investigated the impact of Roux-en-Y gastric bypass (RYGB) on the liver-brain axis using total-body, dynamic 18F-fluorodeoxyglucose positron emission tomography (FDG-PET). Multi-organ inflammation, such as metabolic dysfunction-associated steatohepatitis (MASH) and neuroinflammation, is a hallmark feature of obesity.

While RYGB improves MASH and obesity-related cognitive impairment, the response of the liver-brain inflammatory axis to RYGB is understudied. Inflammation can alter glucose transport and metabolism. Using kinetic modeling of FDG, we previously showed that the severity of biopsy-evaluated MASH correlated with hepatic glucose transport (K1, delivery rate from blood-to liver). Therefore, we hypothesized that post-RYGB changes in weight, adiposity, and MASH severity as measured by hepatic K1 and glucose metabolism (Ki, net influx rate) may correlate with alterations in (1) cerebral glucose transport and metabolism as measured by kinetic modeling of FDG-PET and (2) postoperative cognitive improvements.

Methods: Ten patients underwent RYGB with intraoperative liver biopsy and completed pre-and 6-month post-operative labs, total-body FDG-PET, MRI evaluation of steatosis and fibrosis, and cognitive testing for attention, executive function, memory, and language. Tracer kinetic modeling provided quantitative measures of K1 and Ki. Wilcoxon signed-rank tests were used to compare pre/-post-operative mean values and Spearman's correlation coefficients between imaging parameters and cognitive results were calculated.

Results: Of 10 patients (80% female), 6 had steatosis, 3 MASH, and 5 fibrosis on pathology scoring. Significant decreases in % total weight loss, hepatic steatosis and fibrosis by MRI, and visceral adipose tissue (VAT) volume were found postoperatively. Attention, executive function, and memory mostly improved between 5 and 35% relative to test standard deviations, while language declined. While hepatic glucose metabolism significantly increased ($p = 0.03$), there were no significant changes in hepatic or brain glucose transport or brain glucose metabolism. Greater % total weight loss was associated with increased brain glucose transport and metabolism. Worse preoperative hepatic fibrosis was also associated with greater increases in brain glucose transport.

Improvements in executive function were associated with increases in hepatic glucose metabolism. Improved memory correlated with greater reductions in VAT volume, MRI steatosis and fibrosis, but decreased brain glucose transport and metabolism. Lastly, language improvement was associated with lower hepatic glucose metabolism and increased brain glucose transport.

Conclusions: We demonstrate that multi-modal, non-invasive imaging can measure RYGB-induced improvements in steatotic liver disease severity, cognition, and alterations in glucose transport and metabolism. Postoperative alterations in hepatic and neuroinflammation may be reflected in glucose alterations, which correlate with cognitive improvements.

Table. Changes in Liver and Brain Imaging Variables after Roux-en-Y Gastric Bypass

	Preoperative	Postoperative	Change (Post - Pre)	Signed-Rank test P-value
Clinical & Imaging Variables (n=10)		**Mean (±SD)**		
Age at Surgery	48.10 (±15.39)	-	-	
Weight (kg)	119.76 (±17.73)	95.14 (±14.15)	20.53% (±3.29%)	**0.006**
BMI (kg/m^2)	41.71 (±3.88)	33.15 (±3.36)	-8.56 (±1.54)	**0.006**
MRE: Fibrosis (kPa)	2.68 (±0.44)	2.43 (±0.31)	-0.25 (±0.32)	**0.036**
MR-PDFF: Steatosis (%)	11.85 (±9.53)	4.08 (±3.70)	-7.77 (±6.32)	**0.006**
Liver K1 (mL/min/cm^3)	1.38 (±0.5)	1.8 (±0.8)	0.43 (±0.73)	0.103
Liver Ki (mL/min/cm^3)	0.013 (±0.003)	0.025 (±0.024)	0.012 (±0.022)	**0.032**
Brain K_1 (mL/min/cm^3)	0.15 (±0.03)	0.15 (±0.03)	0.00 (±0.02)	1.000
Brain Ki (mL/min/cm^3)	0.06 (±0.01)	0.06 (±0.01)	0.00 (±0.01)	0.333
Brain SUV	10.08 (±1.61)	9.21 (±1.64)	-0.87 (±1.24)	0.053
Brain SUVR	4.19 (±0.58)	4.22 (±0.74)	0.03 (±0.44)	0.683
Brain Volume (cm^3)	1318.52 (±133.02)	1317.71 (±133.44)	-0.81 (±3.24)	0.610
Visceral Adipose Tissue Volume (cm^3)	229.10 (±67.94)	124.19 (±54.23)	-104.91 (±50.65)	**0.006**
SQ Adipose Tissue Volume (cm^3)	615.70 (±84.10)	406.10 (±84.25)	-209.60 (±76.24)	**0.006**
Visceral Adipose Tissue %	27.11% (±7.44%)	23.09% (±7.63%)	-4.02% (±5.2%)	0.083
Neuropsychological Domain Tests (n=8)		**Mean T Score (±SD)**		**Change/SD of Test***
Domain Averages				
Attention	27.37 (±3.00)	28.62 (±3.75)	1.25 (±2.62)	-
Executive Function	51.38 (±4.18)	52.41 (±4.38)	1.03 (±3.93)	-
Memory/Learning	72.59 (±5.12)	73.27 (±5.62)	0.68 (±5.67)	-
Language	13.56 (±1.45)	12.81 (±3.03)	-0.75 (±2.00)	-
Attention				
Digit Span Forward[1]	11.25 (±1.75)	12.12 (±1.73)	0.88 (±2.64)	29.2% (±88.1)
Digit Span Backward[2]	11.00 (±3.55)	11.62 (±2.83)	0.62 (±2.33)	20.8% (±77.5%)
Trail Making Test Part A[3]	59.88 (±5.99)	62.12 (±9.20)	2.25 (±6.41)	22.5% (±64.1%)
Executive Function				
Trail Making Test Part B[3]	59.88 (±8.59)	62.38 (±12.00)	2.50 (±9.12)	25.0% (±91.2%)
Verbal Interference: Word[4]	43.50 (±8.35)	45.38 (±4.21)	1.88 (±8.98)	18.7% (±89.8%)
Verbal Interference: Color[4]	49.50 (±6.57)	48.25 (±5.37)	-1.25 (±6.30)	-12.5% (±63.0%)
Verbal Interference: Color-Word[4]	52.62 (±5.76)	53.62 (±9.09)	1.00 (±7.19)	10.0% (±71.9%)
Memory				
Visuospatial Total Recall[5]	54.12 (±10.63)	57.62 (±6.76)	3.50 (±8.42)	35.0% (±84.2%)
Visuospatial Delayed Recall[5]	56.00 (±4.14)	55.88 (±6.94)	-0.12 (±6.69)	-1.3% (±66.9%)
Verbal Learning: Trials 1–5[6]	103.88 (±8.61)	105.75 (±12.61)	1.88 (±11.37)	12.5% (±75.8%)
Verbal Learning: Delayed Recall[6]	106.75 (±4.50)	104.38 (±6.86)	-2.38 (±8.33)	-15.8% (±55.5%)
Verbal Learning: Total Recall[6]	104.62 (±7.07)	105.38 (±8.88)	0.75 (±8.61)	5.0% (±57.4%)
Verbal Learning: Recognition[6]	10.12 (±2.30)	10.62 (±2.56)	0.50 (±3.38)	16.7% (± 112.7%)
Language				
Letter Fluency[7]	13.00 (±2.20)	12.62 (±4.07)	-0.38 (±2.62)	-12.5% (±87.2%)
Category Fluency[7]	13.25 (±3.06)	13.00 (±2.93)	-1. 13 (±2.80)	-37.5% (±93.3%)

Abbreviations: SD, standard deviation; BMI, body mass index; MRE, magnetic resonance elastography; MR-PDFF, magnetic resonance proton density fat traction; K1 = net influx ~glucose metabolism; Ki = blood-tissue glucose transport SUV, standard uptake value; SUVR, standard uptake value ratio. SQ, subcutaneous.

1, WAIS-IV: Digit Span – Forward; Immediate Memory, auditory
2, WAIS-IV: Digit Span – Backward; Immediate Memory, Executive Function
3, Trail Making Test: Part A for Attention & Processing Speed; Part B for Executive Function
4, Stroop color and word test for Executive function
5, Brief Visuospatial Memory Test for memory
6, California Verbal Learning Test 3rd Edition
7, Delis-Kaplan Executive Function System Verbal Fluency

Changes in T scores were not significant;* Represents changes in T scores relative to each test's SD to demonstrate the relative magnitude of change.

P245

Morbidity Following Hiatal Hernia Repair During Bariatric Surgery: A Comparison of NIS and MBSAQIP Outcomes

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Background: Hiatal hernia repair (HHR) is often performed concurrently with bariatric surgery to reduce the risk of reflux-related complications. The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database is widely used to assess quality and safety of bariatric surgery. The National Inpatient Sample (NIS), which provides a sampling of inpatient hospital stays, is less utilized. No existing studies compare the differences between these databases in outcomes for bariatric patients. This study aims to identify and compare predictors of morbidity in patients undergoing HHR concurrent with vertical sleeve gastrectomy (VSG) and Roux-en-Y gastric bypass (RYGB) between the NIS and MBSAQIP.

Methods: The core NIS and the MBSAQIP data files from 2016 to 2021 were aggregated, and patients who had elective VSG and RYGB with concurrent HHR were included. A set of health variables including demographics, comorbidities, social determinants of health, and operative factors were compared using chi-squared tests of independence and continuous *t*-tests assuming an equal variance. A multivariable logistic regression was created on the dependent composite endpoint of morbidity, defined as the composite of (any of) postoperative sepsis, pneumonia, infection, myocardial infarction, cardiac arrest, deep venous thrombosis (DVT), pulmonary embolism (PE), acute renal failure, required blood transfusion, required ventilator management, or urinary tract infection.

Results: A total of 29,269 and 151,295 patients underwent VSG or RYGB in the NIS and MBSAQIP, respectively. Six factors were associated with higher risk of morbidity in both databases, while two factors were discordant, including robotic approach and female gender (Table 1). The NIS database also contained patient factors not considered in the MBSAQIP, including insurance payer, geographic region, and history of DVT. Alternatively, the MBSAQIP contained factors not contained in the NIS including operation length and previous foregut surgery.

Conclusions: Despite limitations inherent in retrospective analyses, significant differences in morbidity after bariatric surgery with HHR were noted between the NIS and MBSAQIP databases. Further research should integrate insights from both databases to provide a more comprehensive understanding of bariatric surgery outcomes.

Table 1: Significant predictors of morbidity after concurrent hiatal hernia and bariatric surgery between the NIS and MBSAQIP from 2016 to 2021.

Variable	NIS, OR[95% CI]	MBSAQIP, OR[95% CI]	Dataset Agreement
Hypertension	4.59 [2.34, 9.01]	1.12 [1.02, 1.22]	Yes
Sleep apnea	3.15 [2.71, 3.67]	1.12 [1.03, 1.22]	Yes
History of DVT	1.79 [1.28, 2.51]	1.94 [1.57, 2.4]	Yes
Robot assist	1.32 [1.12, 1.56]	0.81 [0.72, 0.91]	No
Black race	1.26 [1.06, 1.51]	1.12 [1.01, 1.24]	Yes
Advanced age	1.19 [1.09, 1.29]	1.15 [1.1, 1.21]	Yes
VSG (ref: RYGB)	0.68 [0.59, 0.78]	0.65 [0.59, 0.71]	Yes
Female	0.76 [0.65, 0.9]	1.14 [1.01, 1.29]	No

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Streamlined Surgery: Combining Single-Port Gastric Bypass with Cholecystectomy

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Since fast weight loss is an important risk factor for gallstones and the risk increases with weight losses greater than 1 kg/week, bariatric surgery has been shown to be associated with an increased risk of symptomatic gallstones.

The procedure starts with the patient in lithotomy position, under balanced general anesthesia, a 4 cm transumbilical incision is made. Pneumoperitoneum is performed with a Verres needle and a 10 mm trocar and two other 5 mm trocars are placed at a distance of 1.5 cm in a triangular shape. A 30° lens is inserted through the 5 mm port and tweezers are placed through the other ports. A 5 mm accessory port is added to the left flank and instruments are introduced. A liver retractor was used to retract the liver and expose the gastric chamber. A 36 Fr esophageal tube is placed, the gastric chamber is identified, and a retrogastric tunnel is made 6 cm distal to the gastroesophageal junction. The new reservoir is created using a laparoscopic stapler with 60 mm cartridges. An hermetic test is performed without evidence of leaks. Subsequently, the angle of Treitz is located and 90 cm distal from it, a cut of the small intestine with endogia is performed. Then the jejuno-jejunum laterolateral anasmotosis is performed 115 cm distal to the previous cut using again endogia. The anastomosis is closed with 2-0 vicryl and the mesenteric gap is closed with ethibond 2-0. The alimentary loop is grabbed and the antecolic gastro-jejunum anastomoses is made manually in two planes with 2-0 vicryl. Subsequently, a cholecystectomy is performed, mobilizing the liver retractor to retract the gallbladder laterally and cephalad, dissection is performed with monopolar energy and subsequently the hepatocystic triangle is exposed to place two proximal clips and one distal on the duct and cystic artery. Instruments are removed at the same time as the surgical specimen and the single incision is closed with cross stitches of absorbable suture and skin with inverted 3-0 Monocryl sutures. The patient was discharged after 48 h of hospital stay without complications.

The main limitation is the limited number of trocars that can be placed within the single incision. However, the advantages are better aesthetic result, are the reduction of trauma to the abdominal wall which results in less pain, less bleeding and a faster recovery. Single-port gastric bypass showed that it is feasible and that it offers the opportunity for wider use of a single-incision approach.

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Gastrojejunostomy Stenosis Rate by Anastomosis Technique After Roux-en-Y Gastric Bypass: A 10-Year Single Center Study

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Introduction: Currently, there is no consensus on the ideal surgical technique to reduce postoperative stenosis requiring endoscopic dilation for gastrojejunostomy (GJ) performed during minimally invasive Roux-en-Y gastric bypass (RYGB). The GJ anastomosis can be performed hand-sewn, circular stapled, linear stapled, or a combination, laparoscopically or robotically. We compared early (within 3 months) stenosis rates requiring dilation by anastomosis technique at a single center.

Methods: In this retrospective cohort study, patients who underwent minimally invasive primary or revisional RYGB at a single institution between 2014 and 2024 were included. Patients were stratified by operative approach and GJ anastomosis technique. The primary outcome was stenosis requiring dilation within 90 days of RYGB. Statistical analysis included a description of patient demographics, operative characteristics, and time-to-event analysis.

Results: Of the 1145 patients who were included, the median age was 49 years (interquartile range 40–58) and 934 (81.6%) were female. Sixty-two (5.4%) patients required dilation within 90 days from RYGB. There was a statistically significant difference between the age of patients requiring dilation versus no dilation (42 [32–52] vs. 50 [40–58], $p < 0.001$) and patients who underwent RYGB laparoscopically were more likely to require dilation compared to robotic approach (relative risk 1.04 [95%CI 1.01–1.07], $p = 0.03$). There was no statistically significant difference between sex (88.7% female vs. 81.2%, $p = 0.18$) or percentage of revisional RYGB (12.9% vs. 12.7%, $p > 0.99$) for patients who underwent dilation versus those who did not. Laparoscopic stapled and robotically sutured GJ anastomoses had a lower likelihood of stenosis requiring dilation within 90 days compared to laparoscopically sutured GJ anastomosis (hazard ratio 0.49 [0.27–0.90], $p = 0.02$; 0.26 [0.10–0.73], $p = 0.01$, respectively).

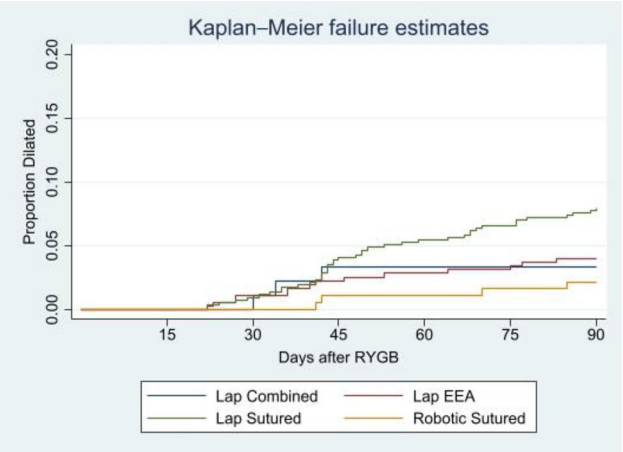

Fig. 1 Time-to-event Graph

Conclusion: As early stenosis rates are more likely to be associated with anastomosis technique, we focused our study on patients who required endoscopic GJ dilation within 3 months. We report an endoscopic GJ dilation rate of 5.4% which is similar to the literature (2–30%). Patients requiring dilation were younger and more likely to undergo laparoscopic versus robotic approach. Compared to a laparoscopic sutured GJ anastomosis, laparoscopically stapled and robotically sutured anastomoses were less likely to require dilation within 90 days.

P248

Comparing Long-Term Weight Recurrence After Sleeve Gastrectomy Versus Roux-en-Y Gastric Bypass: A Systematic Review and Meta-analysis

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Introduction: Sleeve Gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB) are effective treatments for obesity. However, some patients may experience weight recurrence (WR). Evidence remains limited in comparing long-term WR prevalence for both procedures. We aimed to systematically review the literature to determine whether differences in WR exist between SG and RYGB.
Methods and Procedures: A systematic review of the literature for studies on WR after bariatric surgery was performed using the PubMed database. Studies reporting weight outcomes in adult patients with a minimum follow-up of five years after primary SG or RYGB were included. Studies had also to report original data and a well-defined measure of WR. Revisional surgeries or interventions, non-English publications, and in-vitro or animal studies were excluded. Quality assessment was done using the Newcastle–Ottawa Scale. Each study was evaluated by 2 reviewers. The PRISMA reporting guidelines for systematic reviews were followed. A proportional meta-analysis was performed to determine and compare the prevalence of long-term WR for both procedures when appropriate.
Results: Out of 3705 non-duplicate studies, 518 were eligible for full-text review, and 22 were included in our analysis. Of these, 8 studies reported long-term outcomes after SG, 10 after RYGB, and 4 studies after both procedures. Outcomes were reported on 7793 SG patients and 26,952 RYGB patients. WR was defined as $> 15\%$ regain from nadir weight by 10 studies and $> 10\%$ by 4. On proportional meta-analysis for studies using $> 15\%$ WR definition, SG had a WR prevalence of 43% (CI: 28–59%), while WR prevalence for RYGB was 28% (CI: 23–34%), p-value = 0.08. The 4 studies comparing both procedures all concluded that RYGB leads to less WR than SG after controlling for potential confounders.
Conclusion: RYGB had a 15% lower prevalence of long-term WR compared to SG. While this difference did not reach statistical significance, our review indicates that RYGB patients may experience lower WR rates compared to SG patients in the long term. This was supported by comparative studies included in this review. This information is vital for patient counseling and decision-making regarding procedure choice.

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Patient Values and Preferences in Bariatric Surgery Guidelines: A Systematic Review

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Introduction: Clinical practice guidelines (CPGs) are crucial for standardizing quality of care, but their applicability can be enhanced by incorporating patient input. This is particularly important in the elective setting, such as with bariatric surgery, where post-operative lifestyle changes are significant. Despite this, studies suggest that many CPGs fail to adequately account for patient values and preferences, even though modern methodologies recommend their inclusion. This study aims to investigate whether existing CPGs for bariatric surgery effectively consider patient values and preferences.
Methods: A comprehensive search of MEDLINE and EMBASE databases was carried out from January 2000 to May 2024 for bariatric surgery clinical practice guidelines. Reviewers worked independently and in duplicate to evaluate guidelines for consideration of patient values and preferences using the Armstrong Framework.
Results: The initial search yielded 3290 citations, of which 70 were included in final analysis. 54% of guidelines used an evidence-based grading model in their development. Patient values and preferences were considered in 19% of guidelines. Of those that considered values and preferences, this was mostly done during development of recommendations (92%), conducting systematic reviews and conclusion formation (46%), topic prioritization (38%), guideline development (38%) and creating the framework and research plan (31%). No guidelines considered patient values and preferences in dissemination and implementation of guidelines. Most guidelines considered patient values and preferences through incorporating a patient representative on the guideline development panel (77%). All guidelines that considered patient values and preferences used an evidence-based grading methodology, but not all guidelines that used evidence-based methodologies considered patient values and preferences.
Conclusion(s): Most guidelines for bariatric surgery failed to consider patient values and preferences, even those using evidence-based methodologies. This may impact patient acceptance and public perception, highlighting the need for improved patient engagement in the guideline development process to enhance care and patient experience.

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Comparing Morbidity and Factors Selective of Primary SADI-S vs BPD-DS

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Purpose: The increased frequency of primary bariatric surgical options allows for improved individualized procedure selection and risk–benefit analysis for the patient. Two procedures increasing in popularity include primary single anastomosis duodeno-ileal bypass with sleeve gastrectomy (SADI-S) and biliopancreatic diversion with duodenal switch (BPD-DS). As the frequency of these procedures increases, comparison of short-term morbidity and patient selection will be pertinent to provide optimized care.
Material and Methods: Data was extracted from the MBSAQIP registry from 2020 to 2022. Two cohorts were created of those undergoing primary laparoscopic or robotic SADI-S or BPD-DS. Bivariate analysis was used to compare differences between cohorts and multivariate logistic regression models for 30-day complications and procedure selection.
Results: Of 14,927 procedures, 2661 (17.8%) underwent SADI-S and 12,266 (82.2%) BPD-DS. Patients undergoing BPD-DS were more likely to be male (23.8% vs 21.4%, $p = 0.008$), have higher BMI (50.3 ± 9.3 vs 49.4 ± 8.9, $p < 0.001$), higher ASA class, be active smoker (8.2% vs 5.2%, $p < 0.001$), and have GERD (43.1% vs 26.1%, $p < 0.001$), but less likely to be on immunosuppressives (1.8% vs 2.8%, $p = 0.001$). BPD-DS patients were less likely to

undergo robot-assisted surgery (25.6% vs 28.7%, $p < 0.001$), but more likely to have anastomosis checked (90.2% vs 84.6%, $p < 0.001$) or drain placement (17.2% vs 9.1%, $p < 0.001$). The frequency of both SADI-S (n = 488 to 1333) and BPD-DS (n = 3002 to 4919) increased between 2020 and 2022 ($p < 0.001$). Most complications occurred in similar frequencies including anastomotic leak, bleed, reoperation, readmission, surgical site infection, and serious complication. On multivariate analysis, each procedure had similar risk of serious complications, but black race, older age, smoking status, and drain placement were associated with increased likelihood. On multivariate analysis, patients were more likely to undergo BPD-DS if higher BMI, smoker, black race (vs white race), diabetic or had GERD. Patients were more likely to undergo SADI-S if female, hyperlipidemic, and more recent year of operation (2022 vs 2020).
Conclusion: Both primary SADI-S and BPD-DS procedures are increasing in frequency. After adjusting for comorbidities, complication rates between primary laparoscopic or robotic BPD-DS and SADI-S are similar. Patients who are more comorbid or have higher BMI were more likely to undergo BPD-DS, but patients were more likely to undergo SADI-S in recent years. Longer term comparative studies are required to compare long-term efficacy and metabolic outcomes and complication rates between these two procedures.

P251

Association of Bleeding and Staple Line Dehiscence in Sleeve Gastrectomy - An Analysis of the MBSAQIP Data

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Introduction: Bleeding from the Sleeve Gastrectomy staple line could potentially disrupt its consistency and potentially lead to leak. We aimed to evaluate the association between staple line leak and bleeding after laparoscopic sleeve gastrectomies.
Methods and procedures: This was a retrospective study of patients who underwent laparoscopic sleeve gastrectomy from 2015 to 2022 using data from the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database. To identify possible confounders, an univariate analysis of pre-, intra-, and postoperative variables was performed using chi-square tests for categorical data and independent sample t-tests for continuous data. Logistic regression was used to assess the association between any bleeding within 30 days and leak accounting for confounders in patients who developed postoperative bleeding.
Results: A total of 951,329 patients were included. 4931 (0.52%) had postoperative bleeding, and 1789 (0.19%) presented with leak. Risk factors associated with bleeding were age, history of myocardial infarction, hypertension, renal insufficiency, chronic therapeutic anticoagulation, diabetes, smoking, chronic pulmonary obstructive disease, sleep apnea, duration of the operation, intraoperative anastomotic assessment, and BMI, as shown in Table 1. Intraoperative anastomotic assessment (95% Confidence Interval [CI]: − 0.296, − 0.176; $p < 0.001$) and having lower presurgical BMI (95% CI: − 0.02, − 0.10; $p < 0.001$) were identified as protective factors for bleeding. Leak remained strongly associated with bleeding within 30 days even when adjusted for risk and protective factors identified in the univariate regression (Estimated Effect of 2.35; Odds Ratio = 10.49; 95% CI: 2.12, 2.58; $p < 0.001$).
Conclusion: Postoperative bleeding within 30 days is strongly associated with leak even when adjusted for previously known risk factors in patients who underwent laparoscopic sleeve gastrectomy.

Table 1 *– Multivariate logistic regression*

Variables	*Estimate effect*	*Odds Ratio*	*P-value*	*95% Confidence interval*
Intercept	-5.874	0.005	<0.001	-6.111; -5.638
Leak	2.351	10.491	<0.001	2.120; 2.581
Sex	0.065	1.068	0.069	-0.005; 0.0136
Age	0.015	1.015	<0.001	0.013; 0.018
History of MI	0.287	1.033	0.001	0.112; 0.463
Presurgical Hypertension	0.314	1.369	<0.001	0.248; 0.380
Renal Insufficiency	0.899	2.457	<0.001	0.708; 1.090
Presurgical Therapeutic anticoagulation	0.812	2.253	<0.001	0.705; 0.920
Presurgical Diabetes Mellitus	0.195	1.216	<0.001	0.131; 0.260
Smoking history	0.155	1.168	0.003	0.055; 0.256
COPD	0.309	1.368	<0.001	0.140; 0.478
OSA	0.192	1.212	<0.001	0.131; 0.253
Operation lenght	0.004	1.004	<0.001	0.003; 0.004
Checking the anastomosis	-0.236	-7.770	<0.001	-0.296; -0.176
BMI	-0.014	-7.230	<0.001	-0.018; -0.010

MI = myocardial infarction; COPD = chronic obstructive pulmonary disease; OSA = Obstructive Sleep Apnea; BMI = body mass index

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Robotic Bariatric Surgery in Patients with BMI > 50 kg/m^2: A Systematic Review and Meta-analysis

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Introduction: Bariatric surgery poses a challenge in patients with BMI > 50 kg/m^2. The current literature lacks sufficient data comparing robot-assisted and laparoscopy in this population. This systematic review aims to evaluate the effectiveness and safety of robotic bariatric surgery in patients with a BMI > 50 kg/m^2.
Material and Methods: PubMed, Cochrane Central and EMBASE were searched for studies comparing robotically-assisted and laparoscopic bariatric surgery in patients with BMI > 50 kg/m^2 from inception until May 2024. We included all robotic bariatric techniques as the intervention group. Studies lacking control groups or having overlapping populations were excluded. Our outcomes were mean operative time, postoperative and intraoperative complications, reoperation, conversion to open, surgical site infection, anastomotic leak, length of hospital stay (LOS) and mortality.
Results: From 163 initial results, nine studies comparing laparoscopy and robotic approaches were included in our final analysis. Our sample comprised 149.047 patients, of which 10,761 (7.2%) were submitted to robotic surgery. Mean BMI of the population ranged from 53.4 to 65.9 kg/m^2. The robot platform use significantly increased the operative time (MD = 31.9 min; 95% CI 2.8; 61; $p = 0.032$). However, there were no statistically significant differences observed in: postoperative or intraoperative complications

(RR = 1.3; 95% CI 0.4; 4.1; $p = 0.6$) and RR = 0.4; 95% CI 0.04; 4.46; $p = 0.4$); reoperation rates (RR = 0.9; 95% CI 0.4; 1.9; $p = 0.8$); conversion to open (RR = 0.8; 95% CI 0.2; 3.6; $p = 0.8$); surgical site infection (RR = 1.1; 95% CI 0.8; 1.6; $p = 0.5$); anastomotic leak (RR = 0.9; 95% CI 0.09; 9.1; $p = 0.9$); length of hospital stay (MD = − 0.07; 95% CI − 0.6; 0.4; $p = 0.7$) and mortality (RR = 0.7; 95% CI 0.3; 1.7; $p = 0.4$).

Conclusion: Our analysis suggests that robotic bariatric surgery in patients with BMI > 50 kg/m^2 extends the operative time with no differences in postoperative or intraoperative complications, reoperation rates, conversion to open, surgical site infection, anastomotic leak, LOS and mortality. Future prospective studies should prioritize investigating long-term outcomes and cost-effectiveness to enhance clinical decision-making for this patient demographic.

P253

Laparoscopic Guided Peri-Wound Transversus Abdominis Plane Block: A Novel Insertion Technique, Comparing to Local Wound Infiltration on Postoperative Opioid Usage in Laparoscopic Sleeve Gastrectomy, A Prospective Randomized Controlled Study

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Introduction: Transversus abdominis plane (TAP) block has shown great potential usefulness in managing postoperative pain. Laparoscopic-assisted TAP block was first described in 2011 by Chetwood et al., performed by injecting analgesia into the transversus abdominis plane at the lateral abdominal wall. We have developed a novel technique for administering the TAP block, using the presence of the laparoscopic camera. After the port was inserted, A 22G needle was inserted into the TAP plane in 4 quadrants around the wound, 1 cm from the wound opening. Using direct vision from the laparoscopic camera to confirm the insertion into the TAP plane, 2 ml of bupivacaine was injected in each insertion. This study aimed to compare the effectiveness of this novel technique versus the conventional local wound infiltration in reducing postoperative opioid usage and postoperative pain.

Methods: A double-blind randomized controlled trial was performed. 100 patients undergoing laparoscopic sleeve gastrectomy at Srinagarind Hospital from June 2023 to February 2024 were assessed for eligibility. They consented to the study and randomized into two groups, peri-wound TAP block and local wound infiltration. The cumulative dose of Fentanyl usage 48 h postoperatively, pain quantification as measured by visual analog scale (VAS), time to ambulation, length of hospital stays, and wound infection rate were evaluated.

Results: Ninety-two patients were included—46 in each group. The mean operative time was 94.3 + 27.8 min in the peri-wound TAP block group and 107.5 + 32.5 in the local wound infiltration group. The mean cumulative fentanyl usage 48 h after surgery was 92.7 mcg in the peri-wound TAP block group and 133.0 mcg in the local wound infiltration group (mean difference 40.3 mcg; 95%CI 1.8–78.9; $p = 0.02$). The postoperative pain measured by VAS 4 h after surgery was 2.4 in the peri-wound TAP block group and 3.4 in the local wound infiltration group (mean difference 1.0; 95%CI 1.9–0.1; $p = 0.016$). The mean time to ambulate was 20.7 h in the peri-wound TAP block group and 29.6 h in the local wound infiltration group (mean difference 8.9 h; 95%CI 12.8–5.0; p-value < 0.001). The postoperative pain at 1, 8, 12, 24, 48, length of hospital stays, and wound infection rate were not statistically different between groups.

Conclusion: Laparoscopic-guided peri-wound TAP block can reduce opioid needs, postoperative pain at 4 h after surgery, and time to ambulation when compared with local wound infiltration with the same analgesic drug, without increasing the operation time and complication.

P254

Post-obesity Surgery Esophageal Dysfunction and Epiphrenic Diverticulum Detection Post-laparoscopic Sleeve Gastrectomy: A Rare Case Report

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Esophageal dysfunction after bariatric surgery, known as post-obesity surgery esophageal dysfunction (POSED), is a recognized complication that includes similar symptoms to achalasia. This can occur following procedures such as laparoscopic sleeve gastrectomy (LSG) and Roux-en-Y gastric bypass (RYGB). POSED is characterized by the absence of peristaltic waves in the esophagus and increased intragastric pressure, significantly affecting esophageal motility and causing dysphagia. These conditions can contribute to the development of epiphrenic diverticula because of the esophagus's difficulty in properly managing the transit of esophageal contents, leading to the formation of these diverticula as a result of abnormal pressure and altered motility.

Methods and Procedures: A 30-year-old female patient, in 2018 with BMI 34, severe hypertriglyceridemia, xanthelasmas, and fatty liver, was managed with GLP-1 analogs with medication intolerance and insufficient weight loss. Therefore, it was decided to perform a laparoscopic sleeve gastrectomy without complications. She reached her target weight six months after surgery. Five years postoperatively, she began experiencing mild dysphagia and food regurgitation, prompting further studies.

Results: Endoscopy showed evidence of a small orifice above the esophagogastric junction, compatible with an epiphrenic diverticulum. An esophagram showed evidence of a sac above the esophagogastric junction filling with contrast medium, measuring 3 cm. Manometry could not be performed due to the patient not tolerating the study. The patient underwent laparoscopic epiphrenic diverticulectomy and myotomy She was hospitalized for one night and discharged the next day without complications or postoperative reflux.

Conclusion: An epiphrenic diverticulum of the esophagus is an outpouching of the mucosal and submucosal layers of the esophagus, generally affecting the distal third segment of the esophagus. Lesions are considered pulsion type, as they are accompanied by esophageal dysmotility and are related to esophageal dysfunction secondary to bariatric surgery. Treatment consists of laparoscopic diverticulectomy and cardiomyotomy. In patients with laparoscopic surgery, partial fundoplication is not possible, and in this particular patient was not an option convert to gastric bypass, for patient choice. Currently, the patient has no reflux and no recurrence of symptoms.

P255

Dynamic Magnetic Resonance Imaging to Evaluate Stomach Geometry Modifications Following Endoscopic Sleeve Gastroplasty

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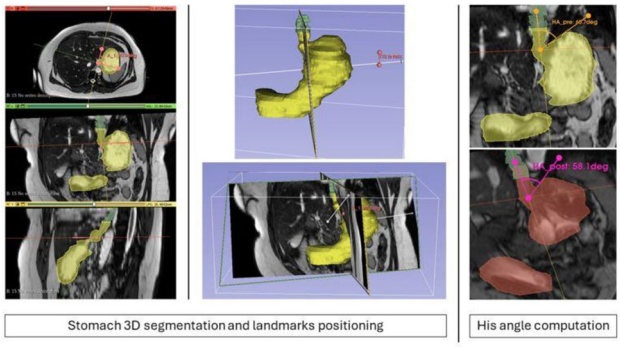
Introduction: Sleeve gastrectomy (SG) is a common bariatric procedure leading to sustained weight loss. The tubulization of the stomach achieved with SG has been associated with development of Gastroesophageal Reflux Disease (GERD) in up to 35% of cases. However, the underlying mechanism for GERD development remains unclear. Endoscopic Sleeve Gastroplasty (ESG) is a bariatric procedure leading to weight loss and obesity comorbidity resolution through tubulization and shortening of the stomach. Despite similarities among the two procedures, stomach modifications during ESG do not involve the most proximal portion of the stomach, with less impact on the gastroesophageal axis (GEA) and the His angle, which may account for the lower incidence of GERD following ESG. The aim of this study was to quantify the geometrical modifications of the GEA following ESG.
Methods: Patients scheduled for ESG were enrolled to undergo Dynamic Magnetic Resonance Images (Dy-MRI) before the procedure and 6 months after. Clinical preoperative and follow-up data was collected. Dy-MRI consisted in the ingestion of 400 ml of liquid meal, images were acquired every 20 min for 120 min after ingestion. A 3D segmentation of the stomach was generated on pre- and postoperative Dy-MRI and adjusted to mitigate imaging artefact impact. Landmarks were added on sagittal, coronal and transverse planes, including T10 vertebra, allowing for comparison between pre- and postoperative images and the His angle degree was computed (Figure).
Results: Of the 26 included patients, 12 completed the pre- and postoperative Dy-MRI series. Clinical data regarding the presence of GERD prior ESG was in line with reported incidence of the condition in France. Only one patient (8.3%) developed GERD ex-novo following ESG (Table). Computation of the gastric geometry changes revealed a significant (p-value = 0.01) difference between the mean pre-procedure His angle degree 62.3° (56.2°–84.4°), and the mean post-procedure (6 months) degree 57.4° (37.8°–76.1°).
Conclusions: The reduced degree of the His angle may represent a protective factor for GERD development. Next steps of this ongoing research include His angle calculation for the remaining 14 included patients that completed the Dy-MRI at 6 months post ESG. Moreover, development of automatic segmentation algorithm and use of software as VTK could reduce measurements variability.

	GERD yes (n, %)	GERD no (n, %)	GERD ex novo (n, %)
Pre-ESG	4 (33.3%)	8 (66.6%)	NA
Post-ESG	3 (25%)	9 (75%)	1 (8.3%)



P256

Bariatric Surgery with Zero Perioperative Mortality in a Teaching Institution. Detailed Analysis of Perioperative Outcomes of 3271 Consecutive Patients

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Objective: Laparoscopic bariatric surgery is well accepted for the treatment of morbid obesity. The purpose of this study was to evaluate perioperative outcomes and provide an update on improved safety of bariatric procedures performed in a teaching institution with minimal morbidity and mortality.
Methods: Perioperative data from a detailed, prospectively collected database was analyzed for each bariatric procedure as well as for all procedures collectively. All patients were evaluated in a multidisciplinary setting using the same clinical pathways. All patients met the NIH criteria for bariatric surgery. All operations were performed by a single surgeon (PG) with the assistance of surgical residents. In this study we used perioperative mortality and reoperations as the ultimate outcomes studied, since both represent the most important and visible quality and safety measures.
Results: Between August 2001 and July 2024, 3271 consecutive laparoscopic bariatric operations were performed, including 710 primary Roux-en-Y gastric bypasses (LRYGB), 429 primary adjustable gastric bands (LAGB), 1669 primary sleeve gastrectomies (LSG) and 463 secondary bariatric surgeries and revisions. All bariatric procedures were approached laparoscopically (2552 procedures were stapled and 719 were nonstapled). All reoperations and major perioperative complications were presented at the departmental educational (Morbidity and Mortality) and quality improvement conferences. The mean patient age was 41.7 years (15–75), females represented 85.8% and mean BMI was 46.66 kg/m^2 (35–73).
There were no perioperative mortalities, no conversions to open surgery in any elective procedure and no intraoperative blood transfusions. In addition, there were no accidental organ resection or retained foreign bodies. There we two major intraoperative complications (hypopharyngeal perforation-1, malignant hyperthermia-1). Mean hospital stay was 1.85 days (0–40 days). Sixteen patients (0.49%,11 in gastric bypass group and five in LSG group) required 30-day reoperations for postoperative complications (staple line gastrointestinal or peritoneal hemorrhage - 6, anastomotic leak- 4, strangulated port site hernia-1, unexplained abdominal pain-1, intestinal obstruction -2, retained hiatal hernia -1, and intraabdominal abscess -1). There were no 1-year mortalities in patients that required reoperation.

There was one transfer to another institution. Detailed subgroup analyses will be provided.

Conclusions: With well-controlled and structured pre-, intra-, and post-operative care, laparoscopic bariatric surgery can be performed with minimal reoperations and zero mortality in a teaching institution. Such favorable outcomes further optimize the benefits of bariatric surgery and may encourage more potential patients and referring primary physicians to pursue and recommend bariatric surgery as a preferred therapeutic management of morbidly obese patients.

P257

Comparative Analysis of the Efficacy and Safety of Single Anastomosis Duodenoileostomy with Sleeve Gastrectomy (SADI-S) Versus Sleeve Gastrectomy: A Systematic Review and Meta-analysis

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Introduction: Single-Anastomosis Duodenoileostomy with Sleeve Gastrectomy (SADI-S) has been reported as a safe and effective surgical procedure with durable weight loss and a high rate of obesity-associated disease resolution. However, a systematic review or meta-analysis has never been made comparing SADI-S with Sleeve Gastrectomy (SG), the most commonly performed bariatric procedure worldwide. This study aimed to evaluate and compare weight loss and perioperative bariatric outcomes of patients undergoing SADI-S versus SG.

Methods: Systematic search of PubMed, Embase, Cochrane Library, Scopus, Web of Science, and Science Direct was conducted on April 15th, 2024. The study followed PRISMA guidelines. Related articles comparing SADI-S and SG, reporting at least one clinical outcome of interest with follow up of 1 year, were selected and analyzed.

Results: Five studies published between 2019 and 2023 were included in the analysis, reporting data from 3593 patients, with 461 (12.8%) undergoing SADI-S and 3132 (87.2%) undergoing SG. The mean age was 42.96 years, and 89.6% of the patients were female. Compared to patients undergoing SG, SADI-S patients had a higher Body Mass Index (MD = 3.83, 95% CI = 0.52–7.14, $p = 0.02$), a higher risk of having hypertension (OR = 1.38, 95% CI = 1.04–1.84, $p = 0.03$), longer operative time (MD = 65.97 min, 95% CI = 61.71–70.25, $p < 0.001$), and longer length of stay (MD = 1.03 days, 95% CI = 0.70–1.37, $p < 0.001$). Patients undergoing SADI-S had a higher %EWL with a MD of 12.42% when compared with SG (95% CI = 0.92–23.92, $p = 0.03$). No statistically significant differences were found in complications and reoperation rates between the groups. However, SADI-S had a significantly higher risk of readmission compared to SG (OR = 2.14, 95% CI = 1.08–4.26).

Conclusion: SADI-S demonstrates substantial improvements in weight loss and perioperative outcomes compared to SG. Overall, both procedures were found to be safe, demonstrating comparable rates of complications and reoperations.

P258

Impact of Medicaid Expansion on Access to Bariatric Surgery and Postoperative Insurance

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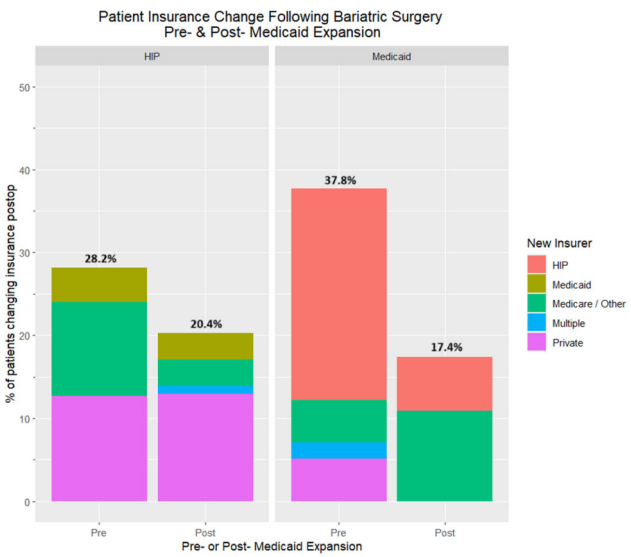
Introduction: Patient insurance plays an important role in receipt of bariatric surgery. Following the Affordable Care Act (ACA), Indiana enacted Medicaid expansion through the Healthy Indiana Plan (HIP) 2.0. While previous work has described patient preoperative insurance after the ACA, less is known about patient insurance changes following bariatric surgery. Our objectives were to describe distributions of insurance coverage for bariatric surgery in a Medicaid expansion state and to identify rates of insurance change following bariatric surgery.

Methods: Data were collected for all patients who underwent bariatric surgery at a high-volume center within a Medicaid expansion state (e.g., Indiana) from 2012 to 2022. Patient insurance at time of procedure and insurance changes up to two years after were identified. Trends in insurance were observed before and after ACA Medicaid expansion.

Results: A total of 2491 patients underwent bariatric surgery from 2012 to 2022, with 1516 (60.9%) carrying private insurance, 383 (15.4%) with Medicare, 144 (5.8%) with Medicaid, 380 (15.3%) with HIP, and 68 (2.7%) with other payment methods. Prior to Medicaid expansion, 14.9% of patients were covered by Medicaid and 37.8% changed insurance postoperatively, most often to HIP (25.5%). Additionally, 7.5% of patients were covered by HIP pre-expansion, with 28.2% changing insurance postoperatively, most often to private coverage (12.7%). Following Medicaid expansion, a greater proportion of patients were covered by HIP (21.5%) rather than Medicaid (2.9%). Postoperatively, 20.4% of HIP patients changed insurance and were again most likely to switch to private insurance (12.9%). Of those with Medicaid post-expansion, 17.4% switched insurance, most often to Medicare (10.9%). Patients lost insurance at low rates among all insurance groups (HIP 0.3%, Medicaid 1.4%, Medicare 0%, private 1.7%).

Conclusion: Medicaid expansion within Indiana led to an increase in patients insured with HIP who underwent bariatric surgery at a single high-volume center. Rates of postoperative insurance change for those with HIP remained similar pre- and post-expansion, with the largest proportion switching to private insurance. Further work is necessary to better understand factors responsible for patients gaining private insurance following bariatric surgery (e.g., employment status, marital status).



P259

Laparoscopic Management of Perforated Ulcers After One Anastomosis Gastric Bypass

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Background: The one anastomosis gastric bypass (OAGB) is considered a safe, simple and as effective surgical technique as the traditional gastric bypass method with Roux-en-Y reconstruction (RYGB) for treating morbid obesity and Diabetes Mellitus II (DMII). Incidence of perforated ulcers are considerable and laparoscopic management needs evaluation. Most of the patients present in acute condition but some may present in a chronic manner.
Methods: 10 patients presenting with perforated ulcers after OAGB were operated laparoscopically.
Results: All 10 patients were successfully operated laparoscopically. All of them were managed by refreshing of the anastomosis and was converted to Reux en Y. 7 patients were acute and had peritonitis and needed feeding jejunostomy. 3 patients were chronic and no feeding jejunostomy was done. One patient presented by lung abcess and had persistent pleuro-peritoneal fistula. Postoperative follow up showed no special events. Average time of presentation was about 12 months, earliest was 6 months and latest was 18 months.
Conclusions: Perforated ulcers' incidence after OAGB is considerable and cannot be neglected. Laparoscopic management is feasible with uneventful postoperative follow up.

P260

Geographic Proximity to Accredited Bariatric Surgery Centers: A County-Level Geographic Information System Analysis

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Introduction: In the United States (US), surgical centers accredited through the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) represent important locations for safe, high-quality metabolic and bariatric surgery (MBS). While there are nearly one-thousand of these accredited centers throughout the country, the extent to which they are geographically accessible for patients is unclear, particularly for those residing in the most socially vulnerable areas of the country. We aimed to examine the association between distance to the nearest MBSAQIP center and county-level markers of social vulnerability.
Methods and Procedures: Using Esri ArcGIS, we geocoded MBSAQIP center street addresses obtained from the MBSAQIP directory. We excluded centers in Puerto Rico and Canada. We also geocoded coordinates of US county population centroids obtained from the 2020 US Census Bureau. We used the closest facility ArcGIS analysis tool to calculate the distance from each county centroid to the nearest MBSAQIP center. We then examined the associations between distance (in miles) to the nearest MBSAQIP center and county-level measures of social vulnerability obtained from 2020 US Census data.
Results: In total, we geocoded 945 MBSAQIP centers and 3126 US county centroids. Of all counties, 466 (14.9%) had at least one MBSAQIP center. The county with the most centers (20) was Harris County (Houston, Texas). The number of MBSAQIP centers per state ranged from 1 to 94 (Fig. 1). States with the most centers included Texas (10.1%), New York (7.72%), and California (7.62%). States with only one center included Wyoming and Vermont. At the national level, the median distance and travel time from a county centroid to an MBSAQIP center were 44.2 miles (IQR 24.5–75.1) and 52.1 min (IQR 31.7–81.3), respectively. Counties with proportionally more uninsured individuals ($r = 0.16$, $p < 0.01$) and those with proportionally more individuals 65 years and older ($r = 0.22$, $p < 0.01$) were likely to be further from an MBSAQIP center.
Conclusions: Our county centroid-based analysis suggests that most individuals live at least 40 miles away from the nearest MBSAQIP center. Future studies are warranted to elucidate the relationship between distance from an MBSAQIP center and the likelihood of undergoing MBS among eligible candidates and variability in post-MBS outcomes.

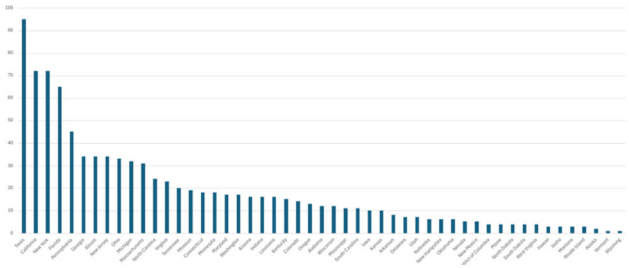

Fig. 1 Number of MBSAQIP centers per state

P261

The Landscape of Bariatric and Metabolic Surgery on TikTok: A Mixed-Methods Social Media Analysis

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Introduction: TikTok, a rapidly growing audio-visual social media platform, has become a notable resource for the distribution of healthcare-related information including first-hand patient accounts and medical service promotion for bariatric and metabolic surgery. Media portrayals of bariatric surgery are known to influence patient perceptions and decision-making. Previous social media analyses exist in bariatric surgery; however, TikTok, a platform of more than 1 billion monthly active users, remains largely underexplored. Therefore, this study aims to evaluate the prevailing perceptions surrounding bariatric surgery on TikTok.
Methods and Procedures: A comprehensive search was conducted as of August 18, 2024 on TikTok (tiktok.com) to identify the top 10 most frequently used hashtags associated with bariatric and metabolic surgery. For each hashtag, the 10 most liked posts ($n = 100$) were selected for analysis. Inclusion criteria for hashtags and posts included language and relevance to bariatric surgery. The primary outcome was viewer engagement which was a composite metric combining the numbers of views, saves, comments, likes, and shares. Descriptive statistics were utilized and a thematic analysis was conducted to qualitatively assess the portrayal of bariatric surgery.
Results: The majority of top posts originated from the United States ($n = 71$) and were primarily created by female content creators ($n = 84$) on accounts dedicated to bariatric and metabolic surgery ($n = 62$). The average post length was 28.5 s (SD: 11.5), with a mean

viewer engagement of 6.3 million (SD: 4.5). Posts using the hashtag #Bariatrica, predominantly in Spanish and Portuguese from South America, had the highest engagement, reaching 17.3 million. Notably, the vast majority of posts were created by patients who had undergone bariatric surgery ($n = 92$), serving as influencers or motivational figures, compared to those by physicians or clinics ($n = 8$), which focused on marketing. Vertical sleeve gastrectomy was the most frequently discussed procedure ($n = 61$), followed by Roux-en-Y gastric bypass ($n = 18$). Most posts portrayed bariatric surgery positively ($n = 84$), while a smaller proportion were neutral or slightly negative ($n = 16$), typically aimed at educating viewers. The most prevalent themes included diet and eating habits, body positivity, postoperative lifestyle, and before-and-after comparisons.
Conclusions: This analysis shows that TikTok plays a key role in shaping largely positive perceptions of bariatric surgery, with most content driven by patient influencers. However, the limited presence of healthcare professionals raises concerns about the accuracy of the information shared. Further research into social media trends will help bariatric surgeons address patient concerns, enhance education, and tailor follow-up care effectively.

P262

Emergency Department Visits Following Bariatric Surgery Conversions: An MBSAQIP Analysis

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Introduction: Bariatric surgery conversion (BSC) is increasingly common, yet the rates of emergency department (ED) visits following BSC have not been investigated. Using the dataset from the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP), we sought to analyze trends in ED visits within 30 days after BSC from a prior sleeve gastrectomy.
Methods: A retrospective analysis of the 2020–2022 MBSAQIP database was performed. A total of 30,942 conversions from sleeve gastrectomy were noted. The analysis included patients who underwent BSC from sleeve gastrectomy to Roux-en-Y gastric bypass (RYGB), biliopancreatic diversion with duodenal switch (BPD/DS), single-anastomosis duodenal-ileal bypass sleeve (SADI-s), Roux-en-Y distal gastric bypass (RYGB-d), and one-anastomosis gastric bypass (OAGB). Descriptive analysis and multiple logistic regression models were employed to evaluate factors associated with ED return.
Results: BSCs from 2020 to 2022 included 26,362 RYGB (85%), 1891 BPD-DS (6.1%), 1348 SADI-s (4.3%), 1031 RYGB-d (3.3%), and 310 OAGB (1%). 2,195 (7%) patients returned to the ED within 30 days. Significant differences were observed ($p < 0.001$) among the groups, with BPD/DS and SADI-s showing lower rates of return (5.4% and 4.6%, respectively) compared with RYGB, RYGB-d, OAGB (7.3%, 8.5%, and 6.4%, respectively). Significantly higher return rates ($p < 0.001$) were noted among female than male patients (7.2% vs 6%), and among Black/African-American patients (8.4%) compared to White (6.5%), Asian (3.7%), and other racial groups (5.8%). Returning patients had significantly lower weight and BMI closer to the date of surgery (108.1 kg vs 111.3 kg and BMI 36.4 vs 37.8, respectively; $p < 0.001$). Common postoperative occurrences associated with return to ED included bowel obstruction (14.8%), organ space SSI (8.1%), GI tract bleed (4.9%), and anastomotic leak (4.4%). Additionally, significant differences were observed in days to discharge ($p < 0.001$), with higher return rates associated with longer hospital stays (5.7% for 0–1 days, 8.1% for 2–4 days, 20% for 5–9 days, 14% for > 10 days).
Conclusions: Although BSC is increasingly prevalent, the rate of ED returns within 30 days is comparable to that reported for primary bariatric surgery. The data indicate that RYGB, RYGB-d, and OAGB have higher ED return rates than BPD-DS and SADI-s. Additionally, female patients and those identifying as Black/African-American demonstrated higher return rates to the ED. BMI, weight near the time of surgery, and length of hospital stay also influenced the likelihood of ED return. Further research is warranted to explore these factors to aid with interventions that mitigate ED returns after BSC.

P263

Learning Curve of Single Anastomosis Duodeno-Ileal Bypass with Sleeve Gastrectomy: Outcomes at a Multi-center Academic Institution

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Introduction: Single anastomosis duodeno-ileal bypass with sleeve gastrectomy (SADI-S) has shown promising results for weight loss and comorbidity resolution. However, barriers to its widespread adoption exist, and studies on the learning curve are limited. This study presents early data on the learning curve at a large multi-center academic institution.
Methods: SADI-S was introduced at a large multi-center academic instutition, with an increase in cases in 2024. Adult patients who underwent primary and revisional were evaluated via electronic medical records. "Textbook outcome" (TO) for robotic SADI-S was defined by four criteria: operative time $\leq$ 267 min (75th percentile), postoperative hospital stay $\leq$ 1.7 days (75th percentile), no conversion to laparotomy, and no rehospitalization or death. The TO rate was calculated using cumulative sum analysis to assess mastery. Secondary outcomes included complication rates, reoperation, readmission, and operative time. A significance level of $P < 0.05$ was used.
Results: Currently, five bariatric surgeons are performing SADI-S at our institution, with four of them having completed fewer than 10 cases. One surgeon completed 46 SADI-S procedures with an average operative time of 245.43 $\pm$ 86.39 min. There were no conversions to laparotomy or deaths. The complication rate was 8.7% ($n = 4$), with reoperation and readmission rates of 6.5% ($n = 3$) and 8.7% ($n = 4$), respectively. A total of 35 patients achieved the TO standard. The TO rate increased after the 35th case, leading to the division of patients into two groups: the learning stage (first 35 cases) and the mastery stage (last 11 cases). Operative time was significantly shorter in the mastery stage group ($P = 0.004$), but no significant differences were observed in demographics, complications, reoperations, readmissions, drainage tube use, or length of stay.
Conclusions: Preliminary data suggest that mastery of SADI-S is achieved after 35 cases. Improvements in operative time are likely due to the post-pyloric dissection and duodeno-ileal anastomosis techniques. The model will be refined as more data become available.
Bibliography: 1) Wang et al. "Evaluation of the learning curve for Robotic SADI-S." Front Surg. Jul 2022.

Table 1. Patient demographics

Factor	All patients ($n = 46$)
Gender: Male/Female	11/35
Mean age (years)	40.39 ± 11.89
Preoperative body weight (kg)	136.35 ± 25.94
Preoperative BMI (kg/m^2)	49.23 ± 7.10
ASA Classification	
Grade III	46 (100%)

Table 2. Comparison of the demographics between the 2 study groups.

	Learning stage group ($n = 35$)	Mastery stage group ($n = 11$)	Statistic	*P*-value
Gender (Male/Female)	8/27	3/8	X^2<0.001	1
Age (years)	40.43 ± 12.24	40.27 ± 11.26	t = 0.039	0.969
Preoperative body weight (kg)	135.09 ± 25.85	140.35 ± 27.06	t = -0.569	0.577
Preoperative BMI (kg/m^2)	48.91 ± 6.85	50.24 ± 8.12	t = -0.085	0.631

Table 3. Comparison of the operation-related outcomes between the 2 study groups.

	Learning stage group ($n = 35$)	Mastery stage group ($n = 11$)	Statistic	*P*-value
Operative time (min)	260.26 ± 91.51	198.27 ± 43.53	t = 3.055	0.004*
Complications overall	3	1	X^2<0.001	1
Conversion to laparotomy	0	0	–	–
Reoperations	2	1	X^2<0.001	1
Readmission	2	2	X^2=0.445	0.505
Mortality	0	0	–	–
Abdominal drainage tube	2	0	X^2<0.001	1
Postoperative hospital stay (days)	1.40 ± 1.04	1.36 ± 0.92	t=0.111	0.913

Figure 1. Scatter graph for operative time

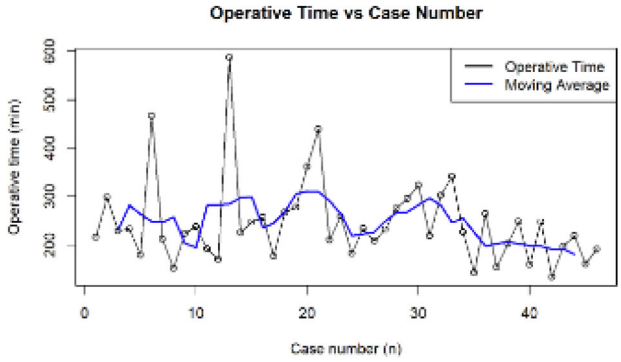
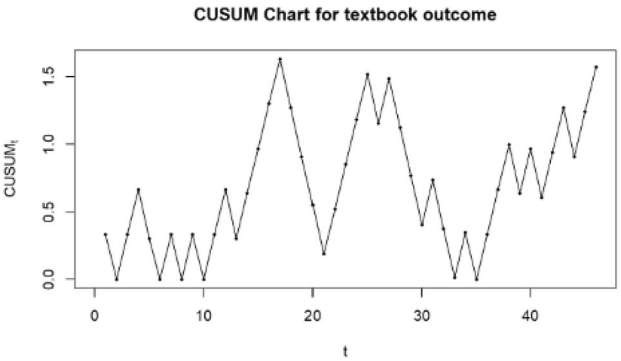


Figure 2. CUSUM chart



P264

GERD as an Independent Risk Factor for Adverse Outcomes Following Metabolic and Bariatric Surgery

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Introduction: Previous studies with multivariate analysis have suggested preoperative GERD as a risk factor for adverse outcomes following metabolic and bariatric surgery (MBS). The primary goal of our study was to elicit causality between preoperative GERD and adverse outcomes following both Roux-en-Y Gastric Bypass (RYGB) and Sleeve Gastrectomy (SG).

Methods: A retrospective analysis of The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) Participant Use Data File (PUF) from 2015 to 2022 was performed. Odds ratio (OR) was calculated to determine the risk of adverse outcomes within 30 days following RYGB and SG. Criteria for the diagnosis of GERD was defined as a patient who regularly takes prescribed or over-the-counter medication within 30 days of the primary procedure. Patients were propensity matched by preoperative GERD status and logistic regression was used to measure the association with adverse outcomes and specific complications.

Results: A total of 312,080 RYGB and 820,889 SG were performed during the study period. There were 117,419 RYGB cases and 215,570 SG cases propensity matched, GERD versus no GERD, for

final analysis. GERD was an independent risk for major complications, minor complications, readmissions, reoperations, reintervention and ED visits. RYGB patients' propensity matched by GERD status were at a significantly increased risk for major complications (Table 1) most notably acute renal failure (OR 1.39 95% CI 1.06–1.81) and respiratory complications including unplanned intubation (OR 1.31 95% CI 1.08–1.59) and post-operative ventilator > 48 h (OR 1.37 95% CI 1.08–1.74). Minor complications also included postoperative pneumonia (OR 1.39 95% CI 1.21–1.61). SG patients with GERD were at an increased risk for post-operative anastomotic or staple leak (OR 1.41 95% CI 1.10–1.81), whereas RYGB were not. There was an increased risk following both procedures for postoperative organ space infection and unplanned ICU admission.

Conclusion: GERD is a statistically significant, independent risk factor for adverse outcomes following MBS. Our study identifies that respiratory and renal complications are specific sequela of GERD following RYGB whereas there is an increased risk of anastomotic or staple leak in patients with GERD following SG. As a significant proportion of MBS patients carry a preoperative diagnosis of GERD, it is imperative to understand its association with adverse outcomes.

	RYGB with GERD N = 124,868			Sleeve with GERD N = 216,105		
	% with Comp	OR	PropOR	% with Comp	OR	PropOR
Postop organ/space SSI	0.45%	**1.39 [1.24, 1.56]**	**1.23 [1.08, 1.40]**	0.23%	**1.48 [1.33, 1.65]**	**1.39 [1.21, 1.59]**
Unplanned intubation	0.22%	**1.58 [1.33, 1.87]**	**1.31 [1.08, 1.59]**	0.10%	**1.49 [1.26, 1.76]**	1.10 [0.90, 1.33]
Postop ventilator >48 hours	0.14%	**1.60 [1.30, 1.97]**	**1.37 [1.08, 1.74]**	0.04%	**1.46 [1.14, 1.88]**	0.99 [0.74, 1.32]
Acute renal failure	0.11%	**1.54 [1.22, 1.96]**	**1.39 [1.06, 1.81]**	0.05%	**1.41 [1.12, 1.76]**	0.95 [0.73, 1.23]
Stroke/CVS	0.02%	1.76 [0.92, 3.37]	1.14 [0.56, 2.34]	0.02%	**1.85 [1.33, 2.95]**	1.17 [0.75, 1.84]
Cardiac arrest	0.06%	1.33 [0.98, 1.80]	1.08 [0.77, 1.52]	0.03%	1.19 [0.90, 1.57]	0.86 [0.63, 1.19]
Myocardial infarction	0.05%	**1.89 [1.30, 2.74]**	1.25 [0.84, 1.86]	0.03%	**1.51 [1.12, 2.04]**	0.83 [0.60, 1.16]
Postop sepsis	0.19%	**1.33 [1.12, 1.58]**	1.21 [0.99, 1.47]	0.09%	**1.41 [1.19, 1.67]**	1.20 [0.98, 1.47]
Postop septic shock	0.12%	**1.37 [1.10, 1.70]**	1.15 [0.90, 1.48]	0.04%	**1.69 [1.29, 2.20]**	1.38 [1.00, 1.90]
Unplanned ICU admission	1.07%	**1.38 [1.28, 1.48]**	**1.20 [1.10, 1.30]**	0.58%	**1.53 [1.43, 1.64]**	**1.19 [1.09, 1.29]**
GI tract bleed*	0.75%	1.13 [0.99, 1.29]	1.02 [0.88, 1.18]	0.26%	**1.21 [1.03, 1.41]**	1.05 [0.87, 1.27]
Bowel Obstruction*	1.02%	**1.46 [1.29, 1.64]**	**1.33 [1.16, 1.53]**	0.04%	1.26 [0.85, 1.86]	1.33 [0.81, 2.20]
Postop anast/staple leak*	0.25%	1.21 [0.96, 1.53]	1.02 [0.79, 1.30]	0.18%	**1.50 [1.23, 1.82]**	**1.41 [1.10, 1.81]**

*Only available in 2020 and 2021 MBSAQIP. RYGB with GERD N = 53,759 and Sleeve with GERD N= 83,890.

PropOR=Propensity model OR.

Table 1 Rate of major complication type in GERD

P265

Bright Light Therapy Post-bariatric Surgery Enhances Mood, Well-Being, and Patient Empowerment to Manage Chronic Disease: A Pilot Study

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Background: Bright light therapy (BLT) has been shown to improve symptoms of seasonal affective disorder (SAD), helping relieve mood slumps and circadian dysrhythmias. Circadian dysrhythmias are closely related with many mental health issues, and these psychiatric co-morbidities are risk factors for obesity and bariatric outcomes. We explored the effects of BLT on bariatric patients' mood, attitude towards weight loss, appetite, and likelihood of managing their chronic disease after receiving surgery.

Methods: In this pilot study, we prospectively examined the impact of BLT on patients undergoing bariatric surgery in the post-procedure time frame (2 weeks to 6 months post-operatively). Patients were instructed to use the lamp 20 min daily over a 12-week duration. Several psychometric surveys were administered: a modified Personal Inventory for Depression and SAD (PIDS) measuring seasonal depressive symptoms, a self-reported motivation towards weight loss measure, an abbreviated Profile of Mood States questionnaire (POMS), a Simplified Nutritional Assessment Questionnaire (SNAQ) assessing appetite, and the Stanford self-efficacy for managing chronic disease (SEMCD), assessing patient confidence in disease management. Patients then discontinued lamp use over a second 12-week duration and completed the same surveys.

Preliminary Results: Twenty patients participated in the survey from July 2023 to September 2024. Nine patients underwent Roux-en-Y gastric bypass (RYGB), 4 had vertical sleeve gastrectomy (VSG), and 7 had endoscopic revision of a gastrojejunal anastomosis (EGJR). There were no statistically significant differences in race, gender, or medical co-morbidities across procedures. Preliminary data ($n = 8$) after lamp usage demonstrates compliance with mean lamp utilization reported 6.4 days per week, 19 min per day for 2.48 months. After BLT treatment, patients had significantly higher SEMCD scores (7.60 vs. 6.28, $p < 0.05$). Patients reported higher appetite scores (14.13 vs. 11.76, $p < 0.05$) and higher positive mood states ($-$ 0.6 vs. $-$ 9.17, $p < 0.05$) after BLT treatment. Patients in the BLT arm had significantly lower weights and BMIs (weight = 244.5 lbs vs. 200 lbs, $p < 0.05$; BMI = 41.08 kg/m^2 vs. 33.08 kg/m^2, $p < 0.05$).

Conclusions: Following BLT, patients were more confident in their ability to manage their chronic conditions, indicating that patients may be able to better maintain their lifestyle modifications and attain long-term weight loss success. Patients also reported increased appetite after their surgery, consistent with typical post-operation outcomes. Increased motivation and positive mood states were seen as well, suggesting that BLT may improve depressive mood and increase motivation for weight loss. BLT should be further studied to validate these positive impacts post-operative recovery after bariatric surgery.

P266

The Safety and Efficacy Profile of Re-redo Bariatric Surgery

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Background: While metabolic and bariatric surgery (MBS) offers a safe and effective approach to achieve sustainable weight loss and resolution of obesity-related medical conditions, a certain number of patients require revisional bariatric surgery (RBS) following primary MBS due to insufficient weight loss, weight recurrence or surgical complications. The literature has demonstrated the effectiveness of RBS, but there are still patients that require further revision or re-redo procedures and there is limited research examining the sustainability, safety and efficacy of such bariatric procedures. As such, we aim to evaluate the safety and efficacy of re-redo bariatric surgery.
Methods: A retrospective single-center review was conducted for patients who underwent a second revisional bariatric surgery or re-redo between 2000 and 2023. Patient demographics, type and approach for primary and revisional procedures, indications for revision, weight outcomes and postoperative outcomes were reported at baseline and after 5 years of re-redo surgery. The primary endpoints of the study were early and late postoperative outcomes.
Results: 49 patients (89.8% female, median age 51 years (39–62), median preoperative re-redo BMI 29 kg/m^2 (25–35)) were included. RYGB was the most commonly performed primary MBS procedure (57.1%) and RYGB revision was the most common re-redo intervention (42.9%), with the open approach (55% for primary, 83.7% for re-redo) being the most utilized (Fig. 1). The most common indication for the first RBS was weight-related complications (weight regain or insufficient weight loss) (20.4%) from the primary procedure, while the most common indications for the second revision were malnutrition (26.7%) and GJ stenosis (26.7%), typically considered to be procedure-related complications (Fig. 2). Re-redo patients did experience postoperative complications with an early complication rate (< 30 days) of 32.7% and late complication rate (> 30 days) of 51.1% with the most common being malnutrition (29.1%). The overall all-cause mortality rate 5 years after the re-redo procedure was 8.2% and was unrelated to re-redo surgery complications.
Conclusion: While re-redo bariatric surgery may carry a risk of postoperative complications, the long-term mortality rate is low. Despite the challenges in establishing a proper patient selection criteria, it should be considered as an effective treatment for patients with weight-related or procedure-related complications following prior bariatric surgeries. Further long-term studies are required to fully report the safety and efficacy of re-redo bariatric surgery.

Figure 1: Patient baseline characteristics and postoperative outcomes following Re-Redo surgery

Baseline characteristics	N (%) or Median (IQR)
2nd Revisional Bariatric (Re-Redo) Surgery	
Age at the time of re-redo, years (IQR)	51 (39-62)
Female gender, N (%)	44 (89.8)
Weight, kg (IQR)	81 (70-93)
BMI, kg/m² (IQR)	29 (25-35)
Diabetes (DM), N (%)	10 (20.4)
Hypertension (HTN), N (%)	16 (32.7)
Hyperlipidemia (HLD), N (%)	10 (20.4)
Obstructive sleep apnea (OSA), N (%)	5 (10.2)
1st Revisional Bariatric (Redo) Surgery	
Age at the time of redo, years (IQR)	46 (36-53)
Weight, kg (IQR)	85 (75-113)
BMI, kg/m² (IQR)	32 (27-43)
DM, N (%)	7 (14.3)
HTN, N (%)	14 (28.6)
HLD, N (%)	9 (18.4)
OSA, N (%)	4 (8.2)
Primary Bariatric Surgery	
Age at the time of primary bariatric procedure, years (IQR)	35 (33-44)
Weight, kg (IQR)	131 (113-145)
BMI, kg/m² (IQR)	48 (43-53)
DM, N (%)	12 (24.5)
HTN, N (%)	19 (38.8)
HLD, N (%)	10 (20.4)
OSA, N (%)	10 (20.4)

Postoperative characteristics	N (%) or Median (IQR)
Re-Redo Surgery	
Type of procedure performed, N (%)	
RYGB revision	21 (42.9)
Conversion to RYGB	9 (18.4)
Conversion to RYEJ	8 (16.3)
RYGB reversal	6 (12.2)
Other	5 (10.2)
Approach, N (%)	
Open	41 (83.7)
Laparoscopic	6 (12.2)
Robotic	2 (4.1)
Early complication rate, N (%)	16 (32.7)
Late complication rate, N (%)	24 (51.1)
Malnutrition	7 (29.1)
GI stenosis	3 (12.5)
Marginal ulcer	3 (12.5)
Bile reflux	2 (8.3)
Internal hernia	2 (8.3)
SBO	2 (8.3)
Other	5 (20.8)
Late reoperation rate, N (%)	11 (22.4)
Late mortality rate, N (%)	4 (8.2)
Redo Surgery	
Type of procedure performed, N (%)	
RYGB revision	19 (38.8)
Conversion to RYGB	10 (20.4)
Conversion to SG	6 (12.2)
RYGB reversal	3 (6.1)
Other	11 (22.4)
Approach, N (%)	
Open	31 (63.3)
Laparoscopic	18 (36.7)
Primary Bariatric Surgery	
Type of bariatric surgery, N (%)	
RYGB	28 (57.1)
SIBO	10 (20.4)
ADB	6 (12.2)
Loop GB	3 (6.1)
Sleeve gastrectomy	2 (4.1)
Approach, N (%)	
Open	27 (55)
Laparoscopic	22 (45)

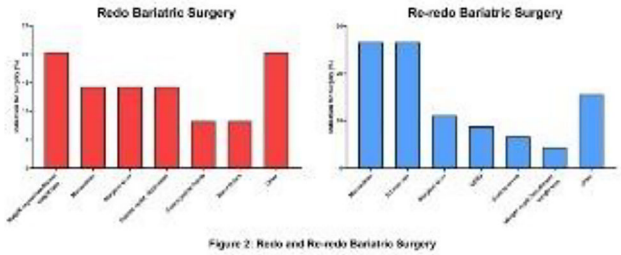

Figure 2: Redo and Re-redo Bariatric Surgery

P267

Correlation of Body Composition Analysis Parameters with Prevalence of Metabolic Dysfunction-Associated Steatotic Liver Disease in Bariatric Surgery Patients

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Background: A large proportion of obese patients undergoing bariatric surgery exhibit concomitant Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD). Several non-invasive methods exist to evaluate for MASLD in obese patients, including abdominal ultrasound. SECA, a type of body composition analysis scanner, has been previously validated in obese patients across multiple ethnicities. The purpose of this study was to evaluate the potential of body composition analysis parameters to predict MASLD in bariatric surgery patients.
Methods: A cohort of 39 patients undergoing bariatric surgery (laparoscopic Roux-En-Y gastric Bypass or sleeve gastrectomy) between May and September 2024 were included. On routine pre-operative abdominal ultrasound, 18 patients exhibited evidence of MASLD versus 21 who exhibited normal sonographic liver parenchyma. Liver function test values were normal for all 39 patients at the time of ultrasound and body composition analysis. Patient demographics, body composition, and laboratory values were compared using multiple logistic regression and *t*-test for evaluation of MASLD.
Results: Age (46 vs 49; $p < 0.48$) and BMI (41.1 vs 43.9 kg/m^2; $p < 0.32$) did not significantly differ between patients with and without evidence of MASLD on ultrasound, respectively. Additionally, pre-operative AST (21 vs 23; $p < 0.48$), ALT (16 vs 21; $p < 0.30$), and total cholesterol (189 vs 173; $p < 0.47$) did not significantly differ between patients with and without evidence of MASLD on ultrasound, respectively. Patients without MASLD on ultrasound exhibited lower pre-operative triglyceride levels (84 vs 120; $p < 0.09$, trending towards significance) and lower HgA1c (5.5 vs 6.1; $p < 0.006$) than those with evidence of MASLD on ultrasound. Interestingly, body composition parameters including fat mass index (16.7 vs 22.0; $p < 0.05$) and basal metabolic rate to resting energy expenditure ratio (BMR/REE) (6.8 vs. 8.5; $p < 0.10$ trending towards significance) were lower in those without MASLD on ultrasound compared to those with evidence of MASLD on ultrasound.
Conclusion: Further research and larger sample size is needed to determine whether body composition analysis may serve as a screening modality to assess for MASLD. Body composition analyses, including fat mass index, may be indicators of MASLD in obese patients and may delineate patients who can benefit from further imaging and/or liver biopsy at the time of bariatric surgery.

P268

Combined Spyglass Choledochoscopy and Laparoscopic Assisted ERCP retrieval of an Obstructing Choledocholith

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Transoral access to the biliary tree is often not feasible after Roux-en-Y gastric bypass. Endoscopic, laparoscopic and open techniques have been described to assist with endoscopic access to diagnose and treat biliary pathology. Novel in this regard, we report our 76-year-old female patient status post remote open Roux-en-Y gastric bypass and open cholecystectomy who presented with a primary 1.5 cm obstructing choledocholith. Extensive intraabdominal adhesions precluded safe dissection for laparoscopic common bile duct exploration. Thus, our patient was treated with combined laparoscopic-assisted ERCP and spyglass choledochoscopy for stone retrieval. We review the available literature and discuss optimal management for this particular patient population.

P269

Sleeve Gastrectomy Leak: Successful Laparoscopic/Endoscopic Management

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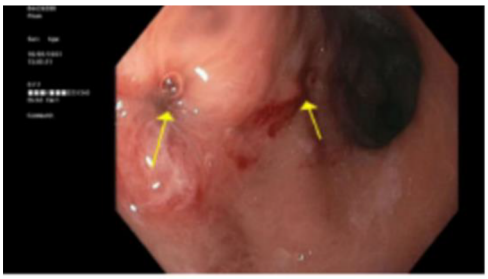
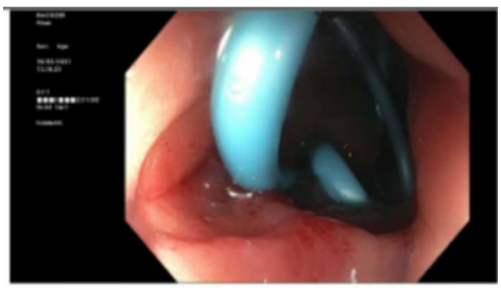
Sleeve gastrectomy is the most common metabolic bariatric surgery performed worldwide. While metabolic bariatric surgery has a favorable safety profile and staple line leak rates are low, they can be technically challenging to treat. We present the case of a sleeve gastrectomy leak that was successfully managed with endoscopic closure after transabdominal drainage, laparoscopic washout, feeding jejunostomy, endoscopic internal drainage, and Botox pyloroplasty.

A 34 year old female with a BMI of 32.0 kg/m^2 presented to an outside hospital with abdominal pain after laparoscopic sleeve gastrectomy in Peru two weeks prior. Index operation was complicated by bleeding and return to the operating room for clot evacuation and drain placement, which was eventually removed. Imaging was significant for a gas containing fluid collection, suspicious for leak. She had a transabdominal drain placed, then was transferred to our bariatric center for further management. She was admitted and underwent laparoscopy and endoscopy, which confirmed two areas of proximal gastric perforation and an intra-abdominal walled off collection lateral to the sleeved stomach. Simultaneously the patient underwent feeding jejunostomy, endoscopic trans-gastric pigtail drainage and Botox pyloroplasty. Cultures from her abdominal drain grew multidrug resistant enterobacter, Klebsiella, and Staphylococcous. She was started on intravenous antibiotics and tube feeds. She was discharged home on hospital day ten. Later that month, she was able to tolerate twelve ounces of oral intake with less than one ounce leaking out of the transabdominal drain. She underwent upper GI that revealed a persistent leak. Four weeks later, after drain output continued to decline, she underwent repeat endoscopy and removal of two internal pigtail stents and her transabdominal drain. Eight weeks later, she underwent another endoscopy, internal pigtail drain removal and endoscopic suture closure of the remaining defect. She was followed for four months, completed her antibiotics, and had the jejunostomy tube removed. She was able to tolerate fluid and protein goals by mouth and remained at a BMI of 25.9 kg/m^2.

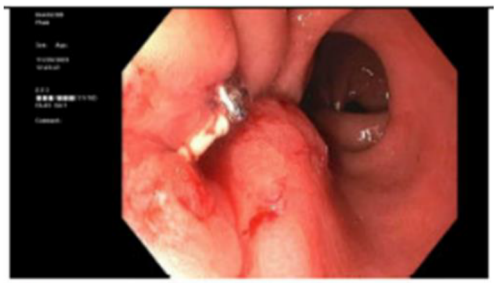
For patients with gastric sleeve staple line leaks, a high index of suspicion, prompt detection, and early intervention can help decrease morbidity and mortality. It is vital to obtain source control of any intra-abdominal infection and maintain nutrition to promote wound healing. Definitive surgical planning should be done by a bariatric surgeon after the patient is stabilized and the leak is controlled. Endoscopic defect closure can be considered for stable patients with viable tissue approximation.



19 Gastric Sleeve, proximal and distal leak



21 Gastric Sleeve, 3 pigtail drains (2 in distal, 1 in proximal)



11 Post endoscopic suturing

P270

The Impact of Reduced Intraoperative Mean Arterial Pressure on Postoperative Hemorrhage in Bariatric Surgery

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Introduction: Postoperative hemorrhage (POH) is a life-threatening complication, occurring in 1.3–1.7% of bariatric surgeries and still constitutes a recognized challenge. This study examined the effect of intraoperative mean arterial pressure (MAP) on the development of POH.

Methods: A retrospective observational study with a case–control design was conducted on adult patients who underwent bariatric surgery between 2015 and 2023 at a high-volume academic center. Intraoperative MAP (including MAP in the last 10 and 30 min) was collected in patients who developed POH. Cases were matched with controls by sex, gender, type of procedure, and ASA classification.

Results: From 204 participants, 102 patients with POH were matched with 102 controls. The most common procedure performed was Roux-en-Y gastric bypass ($n = 98$, 48%), followed by sleeve gastrectomy ($n = 77$, 37.7%). Patients with POH had statistically significant lower intraoperative MAP during the last 10 min (92.41 ± 14.25 vs 97.44 ± 14.64, $p = 0.014$) and 30 min (87.93 ± 12.32 vs 91.93 ± 11.26, $p = 0.016$) of surgery compared to controls. An intraoperative MAP lower than 90 mmHg in the last 10 min (OR = 2.067, 95% CI = 1.156–3.695), 30 min (OR = 2.231, 95% CI = 1.27–3.919), and whole procedure (OR = 1.834, 95% CI = 1.024–3.285) was associated with increased risk of POH. No significant differences were found in comorbidities, smoking, preoperative laboratory results, history of antiplatelet therapy (APT) or anticoagulation (AC) use, and operative time between the two groups.

Conclusion: Our study demonstrates that patients with POH had lower intraoperative MAP during the last 10 and 30 min of surgery. An intraoperative MAP < 90 mmHg was identified as a risk factor for developing POH.

P271

Single Anastomosis Sleeve Ileal (SASI) Bypass vs One Anastomosis Gastric Bypass (OAGB) Outcomes: Systematic Review and Meta-analysis

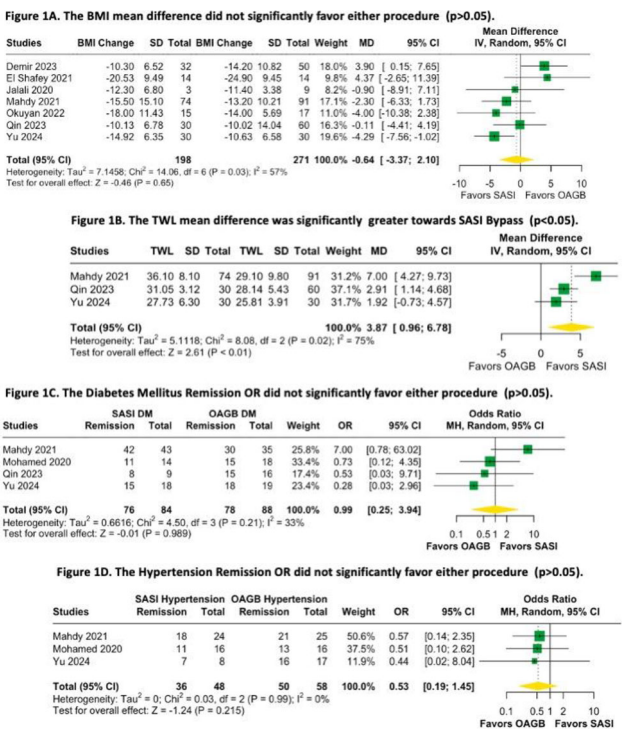
Joselio Rodrigues de Oliveira Filho, MD[1]; Pedro Bicudo Bregion[2]; Rafaela Hamada Juca[2]; Giulia Almiron da Rocha Soares[3]; Victor Kenzo Ivano, PhD, MD[2]; [1]Dr Clementino Fraga Hospital Complex for Infectious Diseases; [2]State University of Campinas (UNICAMP); [3]Santos Metropolitan University

Introduction: Obesity and its associated comorbidities are a global health concern. Combining metabolic and restrictive approaches may yield better results, as in One Anastomosis Gastric Bypass (OAGB) and Single Anastomosis Sleeve Ileal (SASI) bypass, which evolved from Santoro's technique.

Methods and Procedures: We conducted a literature search across PubMed, Scopus, Embase, and Cochrane databases, initially retrieving 386 articles. Primary outcomes were comorbidity remission. Secondary outcomes were albumin, vitamin B12 and vitamin D measures.

Results: After screening, 8 articles, 232 and 298 patients who underwent SASI and OAGB procedures, respectively, were included. Follow-up ranged from 6 to 12 months. Comparing SASI vs OAGB, mean difference BMI was not statistically different − 0.64 (95%-CI [− 3.37; 2.10]), with EWL of 10.33 (95%-CI [− 3.07; 23.73]) and TWL of 3.87 (95%-CI [0.96; 6.78]) in favors of SASI. Only TWL had a p value < 0.05. Comorbidity remission was assessed based on improvement from baseline. Diabetes Mellitus (DM) remission had no difference between groups (OR 0.99, 95%-CI [0.25–3.94]) and the same was observed with hypertension (OR 0.53, 95%-CI [0.19–1.45]), dyslipidemia (OR 1.05, 95%-CI [0.39–2.81]), and obstructive sleep apnea (OSA) (OR 3.46, 95%-CI [0.49–24.20]). Secondary outcomes had no difference between groups regarding Albumin (MD 0.13, 95%-CI [− 0.17; 0.44]), Vitamin D (MD 0.93, 95%-CI [− 13.64; 15.50]), with p value > 0.05, and Vitamin B12 (MD 99.78, 95%-CI [26.61; 172.95]) favoring SASI, with p value < 0.01.

Conclusion: High comorbidities remission rates are observed in both OAGB and SASI Bypass with limited data suggesting no superiority between procedures. Either procedure may be preferred depending on complications, biliary access necessity, gastroesophageal reflux disease and surgeons' ability to perform the procedure. Such key points should be analyzed whenever data are sufficient.



P272

Single Anastomosis Sleeve Ileal Bypass (SASI) vs Sleeve Gastrectomy (SG) Outcomes: Systematic Review and Meta-analysis

Joselio Rodrigues de Oliveira Filho, MD[1]; Pedro Bicudo Bregion[2]; Rafaela Hamada Juca[2]; Giulia Almiron da Rocha Soares[3]; Victor Kenzo Ivano, PhD, MD[2]; [1]Dr Clementino Fraga Hospital Complex for Infectious Diseases; [2]State University of Campinas (UNICAMP); [3]Santos Metropolitan University

Introduction: Obesity surgical treatment combining metabolic and restrictive approaches may yield better results. Single Anastomosis Sleeve Ileal (SASI) bypass consists of ileal bipartition added to sleeve gastrectomy, evolved from Santoro's technique. Isolated sleeve gastrectomy is a less morbid technique, but has a higher probability of

weight regain, higher rates of gastroesophageal reflux (GERD), and lower rates of metabolic syndrome resolution. The question remains whether its promising results are due to the initial sleeve gastrectomy or the bipartition.

Methods and Procedures: We conducted a literature search across PubMed, Scopus, Embase, and Cochrane databases, initially retrieving 386 articles. Primary outcomes were comorbidity remission, Excess Weight Loss (EWL) and Body Mass Index (BMI).

Results: After screening, 11 articles with 328 and 880 patients undergoing SASI and SG procedures, respectively, were included. Follow-up ranged from 6 to 60 months. Comparing SASI to SG, mean difference in BMI was − 2.30 (95%-CI [− 3.87; − 0.73]) and EWL was 9.82 (95%-CI [− 5.82; 13.80]) favoring SASI. Comorbidity remission was assessed based on improvement from baseline. Diabetes Mellitus (DM) remission had the most significant value toward SASI (OR 4.05, 95%-CI [1.56–10.51]). The same trend was observed with dyslipidemia (OR 2.47, 95%-CI [1.11–5.53]) and GERD (OR 9.5, 95%-CI [1.76–51.22]). Obstructive sleep apnea (OSA) (OR 5.16, 95%-CI [0.86–30.98]) and hypertension (OR 1.23, 95%-CI [0.55–2.73]) did not significantly favor either procedure ($p > 0.05$).

Conclusion: Higher comorbidity remission rates are observed in both SASI and SG, with data suggesting SASI's superiority in treating DM, dyslipidemia, and GERD. Hypertension and OSA should be reanalyzed when more data is avaliable.

Figure 1A. The Diabetes Mellitus Remission OR was significantly greater towards SASI Bypass (p<0.05).

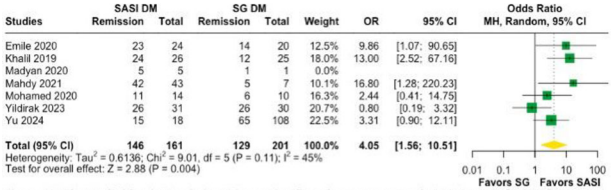


Figure 1B. The Dyslipidemia Remission OR was significantly greater towards SASI Bypass (p<0.05).

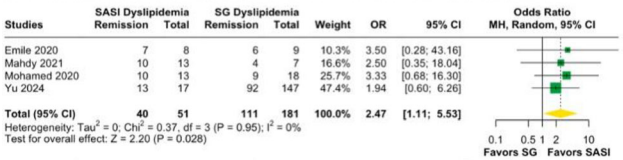
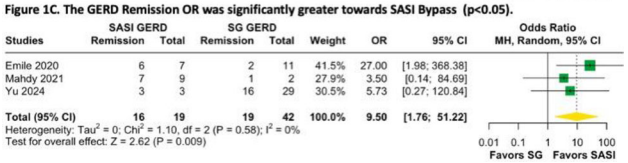


Figure 1C. The GERD Remission OR was significantly greater towards SASI Bypass (p<0.05).



P273

Frailty, Age, and Post-bariatric Surgical Outcome Study

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Introduction: Frailty is a state of diminished resiliency, loss of ability to adapt, and increased vulnerability to stressors. It can be thought of as a pre-disability state. When frail patients are exposed to a stressor, they are at increased risk of developing a disability because their body has less reserve to adapt. The purpose of this research study is to understand how a patient's level of frailty changes after undergoing bariatric surgery. This will help us understand if bariatric surgery is beneficial for frail people, by helping them become stronger, more mobile, and more independent.

Methods: This is a prospective, single center study where we are currently enrolling patients with a goal of 150 participants. Patients are evaluated in the initial pre-operative visit with different tests, including time up and go (TUG), grip strength test, walking speed test, and questionaries regarding activity level and fatigue level, which are the components for the validated frailty score from John Hopkins. Patients will be then re-evaluated at in the regular post-operative visits at 3-months, 6-months, and 12-months. In addition, data regarding weight loss will be recorded.

Results: On preliminary data with the enrolled patients with an average age of 65.5 years that have follow-up at 3 months the TUG has decreased by 22.5% from an average of 12 s to 9.3 s; Grip strength has increased by 7.5% from an average of 33.11 kg to 35.48 kg; and walking speed test increased by 11.14% from 5.34 s to 4.75 s. In addition, patients were noted to lose an average of 14.8% of pre-operative weight from average of 306 lbs. to 260.72 lbs.

Conclusion: Frailty is an important determinant of health, life expectancy, and quality of life in which morbid obesity and its repercussions can have a significant impact. This study, although preliminary, it's showing that bariatric surgery and weight loss can be a meaningful tool to decrease the frail status of our patients, and thus improve their quality of life, especially in the growing geriatric population.

P274

SADI-S Initial Experience in Chile

Marcos Berry, MD; Lionel Urrutia, MD; Carlos Sandoval, MD; Jose Estruga, MD; Clínica Las Condes

Background: In 2007, Sa´nchez Pernaute and collaborators published a surgical alternative called duodeno-ileal bypass with vertical gastrectomy or Single Anastomosis Duodeno-Ileal Bypass with Sleeve Gastrectomy (SADI-S). This was described as a technical solution to simplify a complex surgical technique, the duodenal switch, transforming it into a restrictive and derivative procedure, highly useful in patients with severe obesity (BMI > 50) or poorly controlled Diabetes Mellitus.

Objective: To evaluate the safety of SADI-S surgery, its metabolic and anthropometric effects, in patients with high BMI, undergoing the procedure at Clinica Las Condes, Santiago between 2019 and 2023.

Methods: Retrospective, descriptive, single-center, study on patients operated with the SADI-S technique in the Bariatric Surgery Unit of Clinica Las Condes between 2019 and 2023, with at least 1 year of post-surgery follow-up.

Results: Of a total $n = 24$, at 1-year follow-up: 14 patients (58%), Female: 8 (57%), Male: 6 (43%), Average BMI (50.5 kg/m2), %TWL 41%, %EWL 84%, remission of comorbidities: T2 DM (80%), HTN (75%), Hyperlipidemia (100%), Dyslipidemia (80%), Complications: 4,2%, one patient with an anastomotic leak resolved.

Conclusion: SADI-S is a safe and effective procedure in high BMI patients. Its weight loss and metabolic benefits outperforms other derivative techniques, such as gastric bypass, with superior resolution of comorbidities. A larger number of patients and longer follow up is needed.

P275

Rate and Predictors of Opioid-Free Analgesia After Hospital Discharge Following Laparoscopic Bariatric Surgery: A Prospective Cohort Study

Gaida Noman[1]; Francesca Fermi[1]; Samin Shirzadi[2]; Makena Pook[1]; Maxime Lapointe-Gagner[2]; Shrieda Jain[2]; Pepa Kaneva[2]; Lawrence Lee[1]; Liane Feldman[1]; Michel Gagner[3]; Amin Andalib[1]; Julio Fiore Jr.[1]; [1]Department of Surgery, McGill University, Montreal, QC, Canada; [2]Perioperative Care and Outcomes Research (PCOR) Lab, McGill University, Montreal, QC, Canada; [3]Clinique Michel Gagner MD Inc., Montreal, QC, Canada

Introduction: Patients undergoing bariatric surgery are often prescribed excessive opioids for pain management after discharge. This may lead to opioid-related harms and contribute to the opioid crisis through the diversion of unused pills to the community. To overcome these issues, there has been increasing interest in opioid-free analgesia; however, evidence regarding the prevalence and characteristics of bariatric patients who do not consume opioids after discharge remains limited. To address this gap, this study aimed to estimate (1) the rate of patients who do not consume opioids after discharge following laparoscopic bariatric surgery, and (2) the extent to which patient and perioperative care characteristics predict opioid-free post-discharge analgesia.

Methods: This nested study of secondary outcomes from a prospective multicenter cohort study involved adult patients undergoing laparoscopic bariatric surgery at two academic hospitals and a private surgical clinic in Montreal, Canada. Preoperative data collection included demographics and patient-reported measures. Surgical and perioperative care data were retrieved from medical records. Following discharge, patients self-reported their opioid use weekly for up to 30 days. Data were analyzed using descriptive statistics and Bayesian Model Averaging (BMA) to assess the association of potential predictors with opioid-free analgesia. A posterior effect probability (PEP) $\geq$ 50% supported evidence of association (higher PEP = stronger evidence).

Results: 351 patients undergoing bariatric surgery were analyzed (44 $\pm$ 11 years, BMI 45 $\pm$ 8.0 kg/m^2, 77% female, 71% sleeve gastrectomy, length of stay 1.6 $\pm$ 0.6 days). The median [IQR] of inpatient (postoperative day 0 and 1) opioid consumption was 92.5 [55–142.5] Morphine Milligram Equivalent (MMEs). Discharge prescriptions included non-opioid (acetaminophen [100%], NSAIDs [3.7%]) and opioid (99.7%) medications. At 30 days, 37% of patients reported not using opioids post-discharge (39% after sleeve, 31% after anastomotic procedures). Patients who consumed less in-patient opioids (< 100 MMEs [$\sim$ 20 pills of hydromorphone 1 mg or 13 oxycodone 5 mg]; OR 0.45, 95%CI 0.26–0.78; PEP 97%) and patients with longer length of stay (> 1 day; OR 2.5, 95%CI 1.23–5.07; PEP 94%) were less likely to consume opioids post-discharge.

Conclusion: This study supports that a considerable proportion of patients undergoing laparoscopic bariatric surgery do not use opioids post-discharge. Patients with low in-patient opioid consumption and longer hospital stay may be suitable candidates for opioid-free analgesia prescriptions. These findings highlight the potential feasibility of opioid-free post-discharge analgesia after bariatric surgery, warranting further investigation in randomized trials.

P276

Sleeve Gastrectomy, Conversion Rate in a Community Hospital: When and Why

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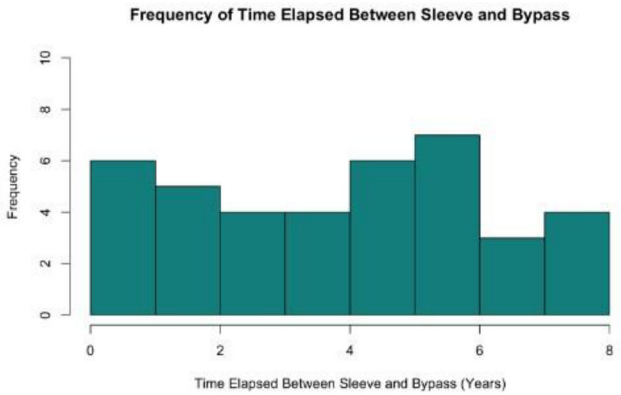
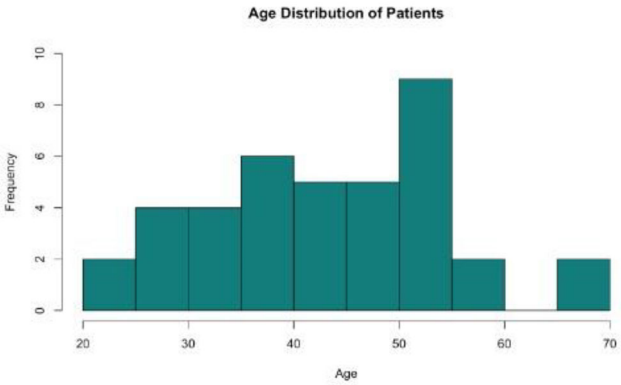
Introduction: In the United States, over 2 in 5 adults are obese, contributing to nearly $173 billion in medical expenses in 2019. Bariatric surgeries, such as laparoscopic sleeve gastrectomy and Roux-en-Y gastric bypass (RYGB), help patients lose weight and manage obesity-related conditions. Some patients experience suboptimal weight loss after sleeve gastrectomy, necessitating conversion to RYGB. Additionally, complications like leaks, stenosis, torsion, hiatal hernia, and GERD can be addressed with conversion. Li et al. reported a 10.4% conversion rate to RYGB, increasing to 22.6% with extended follow-up. Dirnberger et al. reported 33.8% of patients were converted for GERD. This study presents our experience with sleeve conversions to RYGB, focusing on risk factors and outcomes.

Methods: A retrospective review of patients who underwent sleeve gastrectomy conversion to RYGB from January 2015 to August 2024 was conducted using EPIC. Data collected included demographics, comorbidities, time elapsed between sleeve and bypass, and reasons for conversion (e.g., suboptimal weight loss, GERD, leaks, hiatal hernia, stenosis). BMI was recorded at four key points: initial consultation, sleeve gastrectomy, bypass, and 6 months to 1 year post-bypass. Other factors, including EGD findings prior to the sleeve, presence of H. pylori, symptomatic reflux at the time of sleeve, and number of follow-up visits, were also recorded.

Results: A total of 1232 sleeve gastrectomies were performed between January 2015 and August 2024, with 39 conversions to RYGB, resulting in a 3% conversion rate. The time between sleeve and bypass ranged from 1 day to 8 years, with a mean of 4.3 years. Half of the patients underwent conversion between 2 and 6 years post-sleeve (IQR = 4) (Fig. 1). Twenty-six patients were younger than 50, and 13 were older (range: 24–69 years) (Fig. 2). The conversion rate was 8% in males and 92% in females. The primary indications were suboptimal weight loss in 87% of patients and symptomatic reflux in 8% of patients.

Conclusion: Conversion from sleeve gastrectomy to RYGB typically occurs around the 4-year mark, peaking after 6 years. Patients who adhered to follow-up protocols demonstrated successful weight reduction at 1 year post-conversion.





P278

Early Endoscopic Interventions in Bariatric Surgery: Global Practices and Risk Factors from the MBSAQIP Registry

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Introduction: Predictors for early complications following bariatric surgery remain poorly defined. This is particularly true for those associated with endoscopic interventions within 30 days after surgery. This study aims to identify risk factors and indications for early endoscopic intervention following laparoscopic sleeve gastrectomy (LSG) and laparoscopic Roux-en-Y gastric bypass (LRYGB) through a matched case–control analysis of a large international database.
Methods and Procedures: We conducted a retrospective cohort study with matched case–control analysis using Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) data from 2020 to 2022. The study included adults who underwent LSG or LRYGB. Cases were defined as patients requiring endoscopic stenting and/or dilation within 30 days post-surgery. Univariate, multivariable, and nearest 1:1 neighbor matched analysis were performed to identify covariates associated with increased odds of requiring early endoscopic intervention for all indications in both primary and revisional cases.
Results: After merging all adult MBSAQIP cases between 2020 and 2022 and excluding cases with missing data for complete-cases analyses, 387,901 primary LSG and 178,035 primary RYGB were identified. The rates of early endoscopy following primary LSG and LRYGB between 2020 and 2022 were 0.1% and 0.3%, respectively (0.15% combined). Leading indications for early endoscopic intervention in primary cases were anastomotic/staple line leaks (34%), strictures (40%), and symptoms related to oral intolerance such as nausea, vomiting, and dysphagia (24%). Multivariate analysis demonstrates preoperative active proton pump inhibitor (PPI) prescription is an independent predictor of increased odds of early endoscopic intervention after LSG (OR 1.63, $p < 0.001$) and LRYGB (OR 1.2, $p = 0.027$). While this effect is conserved in sensitivity analyses of primary LSG (OR 1.61, $p < 0.001$), its significance is lost among primary LRYGB (OR 1.16, $p = 0.13$) and revisional cases (LSG: OR 1.2, $p = 0.47$; LRYGB: OR 0.99, $p = 0.96$).
Conclusion: Early endoscopic intervention following bariatric surgery remains a rare occurrence, but identification of perioperative risk factors may assist with risk triage and outcomes optimization. While an imperfect proxy for pre-existing gastroesophageal reflux disease, active PPI prescription serves as an independent predictor of early endoscopic interventions after primary LSG and LRYGB, largely driven by higher anastomotic/staple line leaks and strictures. Our findings resonate existing concerns regarding operative planning of bariatric patients with reflux disease and heighten need for further investigation into mechanistic explanations behind the association of PPI use and devastating complications such as staple line/anastomotic failures and strictures.

P279

Roux-en-Y to the Rescue: Robotic Repair of a Gastropleural Fistula due to Chronic Sleeve Leak

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Introduction: Weight loss surgery is a highly effective approach for improving health outcomes for patients with obesity. However, accessibility to these treatments can be hindered by restrictive health insurance coverage. An estimated 2% of bariatric surgeries performed abroad are for medical tourism, and the facilities offer these services at 40–80% less than the cost in the US. Despite these financial incentives, significant gaps exist in follow up care and treatment of surgical complications.
Case: Here, we present the case of a 35-year-old female who underwent a sleeve gastrectomy in Mexico in 2022. One month following surgery, her course was complicated by a proximal sleeve leak requiring prolonged hospitalization, long-term antibiotic therapy, esophageal stent placement, and percutaneous pleural drainage. She later returned with cavitary pneumonia requiring thoracotomy and decortication. During that hospitalization, gastric contents drained from the thoracotomy site prompting an esophagram revealing the gastropleural fistula (Image 1). She was transferred to our institution for evaluation by the bariatric surgical team. A feeding jejunostomy was placed and she underwent a prolonged NPO period to allow the fistula tract to mature. In July 2024, she was taken to the OR for a robotic takedown of the gastropleural fistula, takedown of the feeding jejunostomy, and Roux-en-Y fistulojejunostomy reconstruction. After a prolonged adhesiolysis and difficult dissection around the fistula, the surgery was successfully performed. On post-operative day one, a fluoroscopic upper GI study was negative for a leak (Image 2). She was started on clear liquids and discharged home on post-operative day 2. She has advanced to a normal diet outpatient and is doing well.
Discussion: Roux-en-Y fistulojejunostomy is a described technique for treating chronic sleeve leaks resulting in gastropleural fistula. Here we demonstrate a case of a gastropleural fistula treated successfully using this technique. Sleeve gastrectomy remains a safe and effective bariatric procedure for weight loss. Barriers to care and limited access have increased medical tourism for these procedures. As this trend grows, we must address limited access to bariatric procedures in this country and surgeons should be equipped to manage complications that may arise.

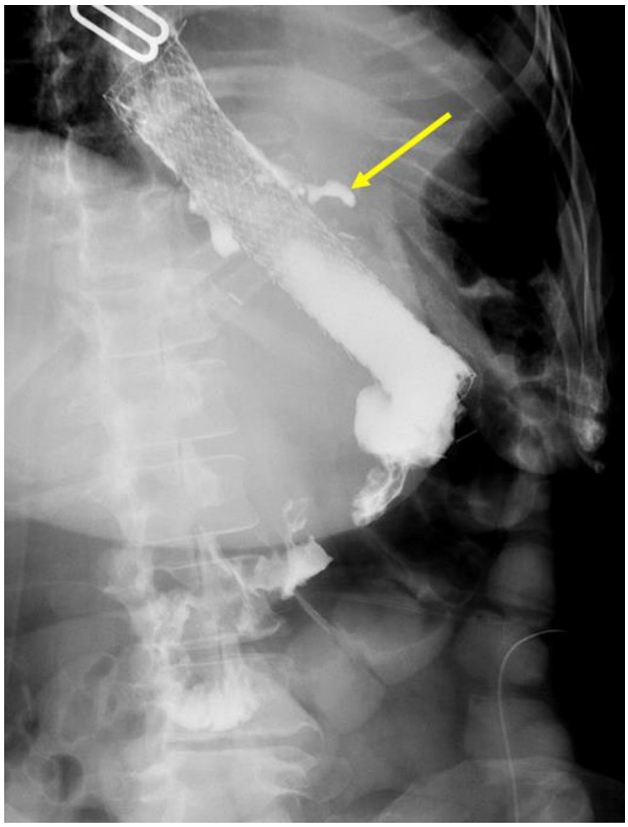

Image 1 Swallow study demonstrating contrast entering the endoscopic stent within the esophagus and stomach. Contrast can be seen leaking from the proximal stomach around the stent (arrow)

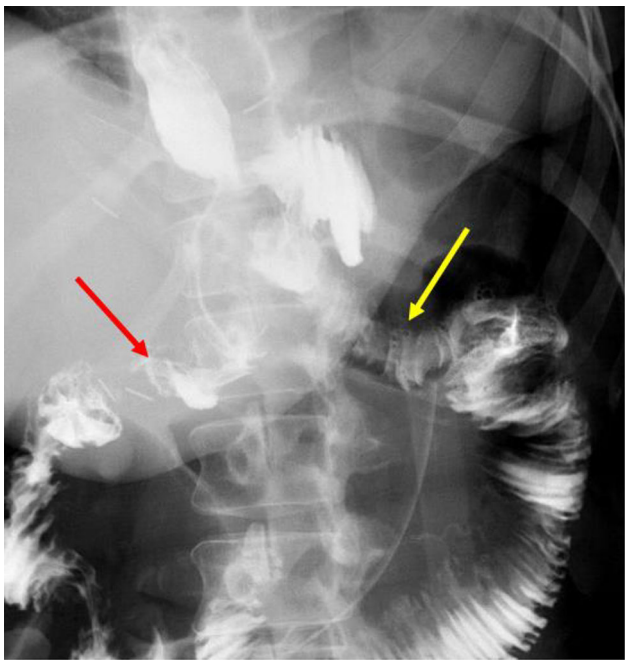

Image 2 Post-operative swallow study demonstrating a patent Roux-en-Y fistulojejunostomy without evidence of leak. Contrast is seen going through both the roux limb (yellow arrow) and sleeve stomach (red arrow) (Color figure online)

P280

Antidiabetic Impact of Bariatric Surgery: A Meta-analysis of Long-Term Outcome Data

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Background: Bariatric surgery is known to be effective in reducing obesity-related comorbidities such as diabetes and hypertension. Less is known about the relative impact on the diabetic population. The objective of this study was to evaluate the relative outcomes of bariatric surgery on the diabetic population for reduction in obesity—related comorbidities as it compares to the general population.
Methods: A meta-analysis was conducted between the years of 2000–2024 collecting articles containing primary data on the outcomes of bariatric surgery including data on BMI, type-2 diabetes (DM), and hypertension. These studies must have evaluated either the roux-en-y gastric bypass (RYGB) or gastric sleeve bariatric procedures or medical weight loss controls. These data were incorporated into a database and statistical analyses were performed using Graphpad Prism.
Results: A total of 28 studies met inclusion criteria for a total of 116,610 patients included in the study. As compared with the general bariatric surgery population, data available for DM-only patents had a lower starting BMI (45 vs. 49 kg/m^2). At 5 years the general bariatric population had BMI reduction of 33% for RYGB and 22% for sleeve while both the DM RYGB and sleeve groups both had 33% reduction. In the general population DM rates precipitously drop with a slow rise over time. At 12 years the general population demonstrate sustained DM reduction rates of 57% and 41% for RYGB and sleeve, while the DM population had 50% and 22% respectively. Hypertension completely resolved at 1-year in the general population for both RYGB and sleeve, while the DM population had 58% and 42% reduction for RYGB and sleeve.
Conclusions: This study demonstrates the effectiveness of bariatric surgery for the diabetic-specific population, but also identifies that these patients respond differently. Sleeve gastrectomy is seen to be more effective for weight loss in this group, while less effective at stimulating DM remission. Both RYGB and sleeve were seen to be highly effective at reducing obesity-related comorbidity rates, however the impact appears to be tempered in the diabetic population.

P281

Is Magnetic Sphincter Augmentation During Bariatric Surgery Safe in the Short Term: Trends Over Time From a National Database

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Introduction: Magnetic sphincter augmentation (MSA) emerged as an FDA-approved intervention for the management of gastroesophageal reflux disease (GERD) in patients with sleeve gastrectomy (SG) in 2023. The role of MSA for GERD in patients with Roux-en-Y gastric bypass (RYGB) and during primary bariatric surgery is less established.
Methods and Procedures: The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database was queried for MSA from 2017 to 2020. Chi-square or Fisher's

exact test and Wilcoxon rank-sum tests were conducted to assess short-term outcomes and patient characteristics between MSA and non-MSA groups. Multivariate logistic regression was employed to compare outcomes between groups. Further comparative analyses were performed to evaluate outcomes between MSA during SG versus RYGB, and to assess trends in MSA implantation.

Results: 779,461 patients underwent metabolic and bariatric surgery, with 300 receiving MSA, 149 during SG and 83 [OP1] during RYGB. MSA patients had higher rates of GERD and fewer obesity-related comorbidities ($p < 0.001$). The MSA group had longer operative time compared to non-MSA (126.1 vs 88.8 min; $p < 0.001$) (Table 1). No outcome difference was observed in MSA during SG versus RYGB (Table 2). MSA was more common in 2019–2020 (85%), with more interventions required in 2017 (8.7%, $p = 0.028$). MSA patients had twice the likelihood of 30-day readmission as compared to no MSA (OR = 2.06; CI = 1.21–3.50; $p = 0.007$).

Conclusions: MSA during primary bariatric surgery is becoming more common with relatively consistent short-term outcomes over time, though with increased readmission rates. While this practice is increasing in popularity, further study is needed to establish the safety of MSA during primary bariatric surgery.

Table 1: Demographics and outcomes based on MSA implantation

	No MSA	MSA	p-value
Total	N=779,461	N=300	
Age (years)	44.8(36-53.8)	46.9(40.4-54.9)	<0.001
Sex			
Female	631,581(81.0%)	260(86.7%)	0.043
Male	148,260(19.0%)	40(13.3%)	
Comorbidities			
Diabetes	185,737(23.8%)	46(15.3%)	<0.001
Hypertension	221,189(40.0%)	78(41.9%)	0.58
Hyperlipidemia	175,080(22.4%)	52(17.3%)	0.034
GERD	221,189(23.8%)	143(47.7%)	<0.001
Sleep apnea	279,002(35.8%)	82(27.3%)	0.002
Year of operation			
2017	200,351(25.7%)	23(7.7%)	<0.001
2018	204,815(26.3%)	22(7.3%)	
2019	206,416(26.5%)	154(51.3%)	
2020	168,467(21.6%)	101(33.7%)	
Operative time (min)	88.8(55.1)	126.1(51.0)	<0.001
Length-of-stay (days)	2(2)	(1)1	0.29
30-day outcomes			
Readmission	29,740(3.8%)	22(7.3%)	0.001
Reoperation	11,460(1.5%)	4(1.3%)	0.84
Re-intervention	9,896(1.3%)	5(1.7%)	0.54
Mortality	676(0.1%)	1(0.5%)	0.20
*Data presented as mean(SD) or n(%)			

Table 2: Outcomes of MSA implantation during SG and RYGB

	MSA during SG	MSA during RYGB	p-value
Total	N=149	N=83	
Operative time (min)	113.3(42.8)	164.1(46.8)	<0.001
Length-of-stay (days)	1(1)	1(0)	0.29
30-day outcomes			
Readmission	8(5.4%)	10(12.0%)	0.068
Reoperation	1(0.7%)	2(2.4%)	0.26
Re-intervention	0(0.0%)	2(2.4%)	0.057
Mortality	0(0.0%)	1(1.2%)	0.36

P282

Rate of Conversion to Laparoscopic 4-Port and Risk Factors During Laparoscopic 3-Port Sleeve Gastrectomy in Asian Individuals with Severe Obesity

Sang Hyun Kim; Soonchunhyang University Seoul Hospital

Introduction: With the development of technology and experience, reduced port surgery is becoming more and more popular, and it is also gradually increasing in bariatric-metabolic surgery. The aim of this study was to evaluate the feasibility of laparoscopic 3-port sleeve gastrectomy (LSG-3) in Asian individuals with severe obesity and to assess the risk factors for conversion to 4-port surgery (LSG-4).

Methods and Procedures: We conducted a retrospective review of the electronic medical records of all patients who underwent LSG-3 and LSG-4 between May 2021 and May 2023 at a single institution. Perioperative parameters, percent of total weight loss (%TWL) and gastric volume on CT scan at 1 year follow-up were assessed.

Results: One hundred twenty-one patients were enrolled in this study. Body weight was significantly higher in LSG-4 (128.6 ± 32.5 vs. 107.1 ± 19.2kg, $p < 0.001$). Operative time was significantly shorter in LSG-3 (107.5 ± 18.5 vs. 127.6 ± 27.7, $p < 0.001$). There were no differences between two groups in postoperative stays, intra- and postoperative complications, readmission, and reoperation rate. At 1 year follow-up, %TWL in LSG-3 was 30.7 ± 7.4% like LSG-4 (30.0 ± 6.4) and % of gastric volume measured at about 20% in both groups. Seven cases (7/88, 8%) in LSG-3 were converted to LSG-4, and preoperative BMI (OR 1.57, CI 1.01–2.44; $p = 0.04$) and estimated blood loss (OR 1.26, CI 1.02–1.57; $p = 0.05$) are independent predictors for conversion in multivariable analysis.

Conclusion: LSG-3 is feasible in Asian individuals with severe obesity, and in patients with high BMI or who experience bleeding during surgery, it is recommended to add a port without delay.

P283

Biliary Complications Following Bariatric Surgery

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Obesity is considered as global epidemic- GLOBESITY.

Surgical treatment of obesity is the most effective means of weight loss and also associated with improvement in comorbid conditions.

Among all bariatric operations- LRYGB is considered the gold standard.

Commenest biliary complications following Bariatric surgery are:

- Acute cholecystitis (18.1%)
- Chronic cholecystitis (70.2%)
- Acute pancreatitis (9.4%)
- Choledocholithiasis (5.7%)
- Jaundice (2.8%)

Univariate analysis identified female gender, age > 50, cholelithiasis at time of bariatric procedure, and Roux-en-Y gastric bypass independent of excess weight loss as predictive factors of biliary complications.

Multivariate analysis confirmed advanced age as an independent predictive factor

Rapid weight loss after Roux-en-Y gastric bypass (RYGB) is a risk factor for the development of biliary complications, particularly cholelithiasis, with subsequent risk of choledocholithiasis and gallstone pancreatitis.

Complications are mostly due to the extensive surgically induced anatomical changes incurred by the patient's gastrointestinal tract.

Obesity and rapid weight loss are risk factors for gallstone development.

With the increase in global obesity, the need for bariatric surgery will be exponentially augmented, therefore the problem of biliary pathology is likely to increase as well.

As a consequence of bariatric surgery, clinicians encounter an increasing number of pancreatobiliary pathology (e.g. choledocholithiasis) requiring ERCP within a Roux-en-Y anatomy.

Bariatric centres therefore need to strategically plan resources such as interventional radiology in order to manage such problems safely, efficiently and in a cost effective manner.

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Patient-Perceived Barriers to Bariatric Surgery in the Rural Deep South

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Introduction: Obesity is highly prevalent in the Deep South yet bariatric surgery is underutilized. Many in the Deep South live in rural areas. We aim to explore challenges experienced by patients in the rural Deep South in accessing bariatric surgery.

Methods: A prospective, multi-institutional study was conducted at three hospitals throughout Alabama ranging from rural community to tertiary referral center. Participants were recruited to complete a survey based on the NIH PhenX tool kit assessing socioecological determinants of health. Additional questions about perceptions of bariatric surgery were included. Participants were geocoded and survey responses were compared by rurality and facility.

Results: 127 participants completed the survey, including 59 (46.5%) from rural areas. There was no difference in total household income, primary language, and education level between rural and non-rural participants. Rural patients were more likely to be female (84% vs 68%, $p = 0.05$), unemployed (15% vs 3%, $p < 0.01$), and have 5 or more dependents (31% vs 17%, $p < 0.01$).

There were no differences in access to primary care physicians, health literacy, patient activated measures (i.e. ability to care for self), and social support between rural and non-rural areas. Rural participants were more likely to trust their doctor (88% vs 74%, $p = 0.04$), less likely to use electronics to track health goals (64% vs 88%, $p < 0.01$), and less likely to use social media (85% vs 97%, $p = 0.01$).

A significantly higher proportion of rural participants reported being afraid of bariatric surgery (63% vs 16%, $p < 0.01$), and had concerns about risks (67% vs 35%, $p < 0.01$), costs (53% vs 28%, $p < 0.01$), and travel (23% vs 10%, $p = 0.05$) associated with surgery.

Among the subgroup of participants recruited in bariatric surgery clinic ($n = 79$), rural participants ($n = 11$) continued to have higher reported concerns about costs (60% vs. 28%, $p = 0.04$) and be less likely to use electronics for health (64% vs 88%, $p = 0.04$). Yet, they were more likely to recommend bariatric surgery to others (100% vs. 88%, $p = 0.04$).

Conclusions: Participants in the rural Deep South were less likely to use electronics or social media and more likely to be concerned about the safety, cost, and travel to receiving bariatric surgery. In the subgroup of participants recruited in bariatric surgery clinic, rural participants were more likely to recommend bariatric surgery to others despite cost concerns and lower rate of electronics use for health. A "foot-in-the-door" policy with in-person education may improve perception of bariatric surgery among patients from the rural Deep South.

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Chronic Anticoagulation Therapy is Associated with Adverse Outcomes in Patients Undergoing Sleeve Gastrectomy Conversions: Analysis of 30,664 Patients from the MBSAQIP Database

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Introduction: The impact of chronic anticoagulation therapy (CAT) on outcome and hospital length of stay following sleeve gastrectomy (SG) conversions remains unclear. This study compared outcomes between patients with and without CAT undergoing SG conversions using the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database.

Methods and Procedures: A retrospective analysis of the MBSAQIP database from 2020 to 2022 was conducted, as this period was selected due to the availability of data on conversions. Patients undergoing conversion from SG to Roux-en-Y gastric bypass (RYGB), single anastomosis duodeno-ileal bypass (SADI), or biliopancreatic diversion with duodenal switch (BPD-DS) were included. Primary outcomes were indications for conversions and 30-day serious complications. Secondary outcomes included specific postoperative complications, length of stay, and operative time. Multivariable logistic regression analysis was performed to determine if CAT was an independent predictor of outcomes.

Results: Of 30,664 patients, 935 (3.05%) were on CAT. CAT patients were older (52.08 vs 45.73 years, $p < 0.001$), had higher BMI (42.34 vs 40.33 kg/m^2, $p < 0.001$), and were more likely to be male (19.25% vs 9.55%, $p < 0.001$). They had higher rates of diabetes (24.71% vs 11.55%, $p < 0.001$) and hypertension (82.21% vs 71.32%, $p < 0.001$). Conversion procedures included RYGB (86.10% vs 89.42%), SADI (5.45% vs 4.36%), and BPD-DS (8.45% vs 6.22%), $p = 0.005$. Primary indications for conversion were: gastroesophageal reflux disease (51.45%), weight gain (26.40%) and suboptimal weight loss (14.86%). CAT patients had higher rates of serious complications (14.12% vs 6.42%, $p < 0.001$), 30-day readmission (13.80% vs 6.88%, $p < 0.001$), and reoperation (4.92% vs 2.77%, $p < 0.001$). They also had longer operative times (158.63 vs 144.01 min, $p < 0.001$) and hospital stays (2.27 vs 1.68 days, $p < 0.001$). Specific complications more common in the CAT group included bleeding (4.81% vs 1.68%, $p < 0.001$) and deep surgical site infections (2.03% vs 1.05%, $p = 0.004$). Other complications such as anastomotic leak (1.07% vs 0.60%, $p = 0.116$) and venous thromboembolism (0.43% vs 0.32%, $p = 0.566$) showed no significant differences between groups. On multivariable analysis, CAT was not independently associated with increased odds of serious complications (OR 1.06, 95%CI 0.61–1.85, $p = 0.824$) when adjusting for confounding factors including age, gender, BMI, and comorbidities.

Conclusion: Patients on CAT undergoing sleeve gastrectomy conversions experience higher complication rates and longer hospital stays. However, anticoagulation therapy is not independently associated with increased serious complications after adjusting for comorbidities.

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Factors Associated with Anastomotic Leak in Conversion Bariatric Surgery: An MBSAQIP Analysis

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Background: Anastomotic leak is one of the most feared complications following bariatric surgery, carrying a significant risk of increased morbidity and mortality. Given the increasing number of bariatric conversions being performed nationally, we sought to identify risk factors associated with anastomotic leak following conversion bariatric surgery.
Methods: The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database was queried for all patients undergoing conversion procedures during the years 2021 and 2022. Multivariate logistic regression was used to identify factors associated with anastomotic leak. 30-day postoperative outcomes were also assessed.
Results: 40,837 bariatric conversions were reported during the study period, of which 266 (0.65%) were found to have anastomotic leak. The most common conversion was sleeve gastrectomy (SG) to Roux-en-Y gastric bypass (RYGB) (20,491, 50.2%), followed by adjustable gastric band (AGB) to SG (7849, 19.2%), and AGB to RYGB (4963, 12.2%). The highest leak rates were seen in RYGB to SADI (6.14%), RYGB to SG (5.5%), and RYGB to Biliopancreatic diversion with duodenal switch (BPD/DS) (4.3%). Among the most frequent conversion procedures, leak rates were low: SG to RYGB (0.46%), AGB to SG (0.48%) and AGB to RYGB (0.64%). Factors predictive of anastomotic leak were organ space infection at time of reoperation (OR 190.5, 95% CI 37.1–977.6, $p < 0.001$), myocardial infarction (OR 65.7, 95% CI 12.1–354.8, $p < 0.001$), cardiac arrest requiring CPR (OR 14.67, 95% CI 4.27–50.3, $p < 0.001$), and intra or post operative transfusion (OR 7.83, 95% CI 4.8–12.8, $p < 0.001$). Several factors, such as preoperative diabetes mellitus and COPD, approached significance but were not conclusively associated. Anastomotic leak was associated with an increase in several 30-day outcome measures including reoperation, readmission, and reintervention.
Conclusions: Anastomotic leak following conversion bariatric surgery remains a rare, but serious complication associated with organ space infection at time of reoperation, myocardial infarction, cardiac arrest and perioperative transfusion. Both patient and procedural selection may be critical to reducing complication rates in conversion bariatric surgery.

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The Effect of One Anastomosis Gastric Bypass (OAGB) on Glomerular Filtration Rate (GFR) and Quality of Life (QOL).

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Introduction: Obesity has a negative effect on renal function, both independently and indirectly, through diabetes and hypertension. Weight loss has positive effects on renal function. One Anastomosis Gastric Bypass (OAGB) is a new, effective bariatric procedure that has not been explored thoroughly.
Aims: To study the association between OAGB and renal function over time. Second, we aimed to understand the association within the analyzed subgroups (diabetes, hypertension, etc.).
Methods: This retrospective cohort study of patients who underwent OAGB and were randomly selected from our surgical department files. Surgeries were performed at Soroka Medical Center in Beersheba between 2015 and 2023. Demographic data, BMI, and renal function were extracted from the "Ofek" system. Quality of life (QOL) and weight data were received via telephone questionnaires using BAROS.
Statistical analysis: Univariate analysis was performed using independent *T*-test, Mann–Whitney, and Chi-Square. Univariate survival analysis was performed using the Kaplan–Meier estimate and log-rank test. Multivariate analysis was performed once for survival analysis using Cox proportional hazard regression and once for repeated measurements using repeated measurements ANOVA to study improvement in renal function over time.
Results: 150 patients met the criteria and agreed to respond. 2/3 were women. Post-operatively, weight and BMI decreased significantly after surgery. Few subjects had comorbidities associated with obesity, which improved post-operatively. BAROS questionnaire showed an increase in QOL. In the two years post-operatively, there was a significant decrease in creatinine and an increase in eGFR in the study population. No significant difference in renal function improvement was found when dividing the population by gender, type-2 diabetes, and BAROS score. There was a significant difference in renal function in patients without pre-operative hypertension compared with patients with per-operative hypertension.
[Text Box: II] Discussion: Weight loss post-operatively improved renal function in the study population two years following surgery. The gender and BAROS score did not affect renal function improvement. Comorbidities improved post-operatively. The presence of pre-operative diabetes did not affect renal function improvement.
Conclusions: OAGB bariatric surgery improved renal function without significant differences between gender or the presence of diabetes, but pre-op hypertension did affect the improvement of renal function.

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National Trends in Revisional Bariatric Surgery: Eight-Year Analysis of the MBSAQIP Registry (2015–2022)

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Introduction: Since 2014, the average annual revisional Metabolic and Bariatric surgery (MBS) volume is estimated at 13.5% in the United States. The Metabolic and Bariatric Surgery Accreditation Quality Initiative Program (MBSAQIP) database was evaluated for trends in revisional MBS perioperative patient characteristics, procedures completed, and 30-day outcomes.
Methods and Procedures: Using MBSAQIP Participant Use Files between 2015 and 2022, 1,577,175 records were identified of which 219,659 were revisional/conversional procedures, identified using a composite variable capturing the 'Revision/Conversion Flag' variable

"Yes" (2015–2019) or "Revision" or "Conversion" under the 'Procedure Type' variable (2020–2022). After excluding pediatric and open cases, missing/non-binary gender, missing or BMI < 30 kg/m^2, or missing operative time, 178,831 revisional/conversional cases were identified. Patient variables, intraoperative details, and 30-day outcomes were compared for yearly trends using Kruskal–Wallis and Cochran-Armitage tests.

Results: Over the 8-year period, there was an increase in patients of African American race (43% increase; 17.1% in 2015 vs. 24.7% in 2022; $p < 0.001$) and Hispanic ethnicity (63% increase; 8.9% in 2015 vs. 14.5% in 2022; $p < 0.001$). Data demonstrated increased prevalence of gastroesophageal reflux disease (37.7%, 2015 vs. 56.8%, 2022; $p < 0.001$), obstructive sleep apnea (23.5%, 2015 vs. 28.2%, 2022; $p < 0.001$), and immunosuppression use (1.8%, 2015 vs. 2.9%, 2022; $p < 0.001$). Significant increases in patient history of pulmonary embolism (1.3%, 2015 vs. 2.1%, 2022; $p < 0.001$), deep venous thrombosis (1.7%, 2015 vs. 2.4%, 2022; $p < 0.001$), and therapeutic anticoagulation use were noted (2.4%, 2015 vs. 3.6%, 2022; $p < 0.001$). Prevalence of ASA 3 status (65.2%, 2015 vs. 75.7%, 2022; $p < 0.001$) was significantly higher along with median operative time (94 min, 2015 vs. 123 min, 2022; $p < 0.001$) but significantly lower conversion rates to an open procedure (1.5%, 2015 vs. 0.55%, 2022; $p < 0.001$). There was a significant decrease in postoperative procedural interventions (2.7%, 2015 vs. 1.7%, 2022; $p < 0.001$), unplanned ICU stay (1.3%, 2015 vs. 0.9%, 2022; $p < 0.001$), unplanned intubation (0.24%, 2015 vs. 0.18%, 2022; $p < 0.001$), superficial surgical site infection (SSI) (1.3%, 2015 vs. 0.8%, 2022; $p < 0.001$) and deep SSI (0.4%, 2015 vs. 0.1%, 2022; $p < 0.001$); however, there were significant increases in organ space SSI (peaking at 1.2%) and venous thrombosis (peaking at 0.24%).

Conclusions: Retrospective review of national trends of revisional MBS reveals significantly increased incidence of perioperative comorbidities over the last eight years, suggestive of increasing perioperative risk profile of revisional MBS patients. Despite this, rates of conversion from minimally invasive approaches and numerous serious 30-day complications have significantly decreased, underscoring the increasing safety of revisional MBS.

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Fellows' Overall Satisfaction and Self-Perceived Proficiency in Bariatric and Metabolic Surgery Fellowship Program

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Introduction: In the last decade, there has been a significant increase in the use of minimally invasive techniques in metabolic and bariatric surgery, driving general surgeons to seek advanced training in laparoscopic surgery. The International Federation for the Surgery of Obesity and Metabolic Disorders Latin America Chapter (IFSO LAC) has established a fellowship training program for surgeons from various countries to become competent in practicing advanced laparoscopy in metabolic and bariatric surgery. This study aims to assess the overall satisfaction and self-perceived proficiency of the first-year IFSO LAC fellowship program and understand the expectations of the second-year group.

Methods: We conducted a cross-sectional survey that involved all bariatric and metabolic surgery fellows from the IFSO LAC fellowship program. The survey was conducted among the five hospital locations of the program. We evaluated operative volume, hands-on training, academic sessions, research opportunities, and rounds in order to assess satisfaction and self-perceived proficiency.

Results: Thirty-four fellows from 20 different countries were assessed. Overall satisfaction was 9,23 (Rated from 0 to 10). The mean age of fellows was 34.04 ± 3.2. The median time of experience as a general surgeon was one year. A positive association was found between operative volume and overall satisfaction t:8.12 ($p < 0{,}01$). Research opportunity was found to be the most important aspect to improve by fellows.

Conclusion: Bariatric and metabolic surgery fellows of IFSO LAC fellowship program from five different hospitals had high satisfaction scores. Case volume and hands-on training seem to be determinant factors. It's clear that research opportunities, as highlighted by the fellows, should be considered a key component, acknowledging their needs and ensuring the continuous improvement of the program.

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Laparoscopic Sleeve Gastrectomy as a Bridge to Transplant in Patients Evaluated at a Single Center with Heart Failure and Left Ventricular Assist Devices

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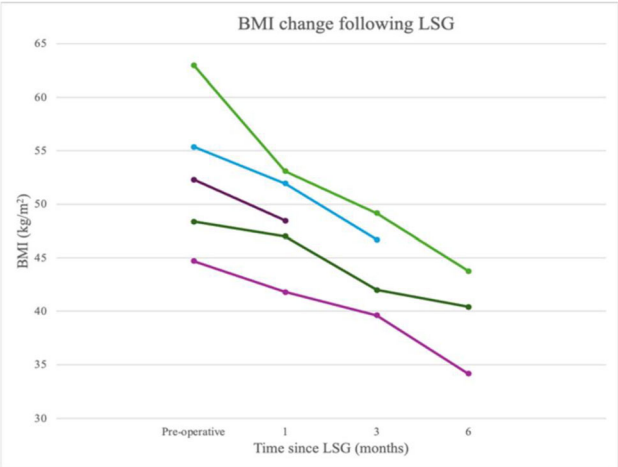
Introduction: Advanced heart failure (AdHF) is associated with a high risk of mortality. The left ventricular assist device (LVAD) support cardiovascular function as a bridge to transplantation. Class 2 obesity (BMI > 35 kg/m^2) is a relative contraindication to heart transplant. We evaluate the safety and efficacy of bariatric surgery to achieve weight loss and improve access to transplantation for patients with obesity and AdHF.

Methods: Adults with a BMI ≥ 35 kg/m^2 and LVAD were evaluated for bariatric surgery between 2023 and 2024 at a single academic institution. All patients received preoperative nutrition counseling and laparoscopic-sleeve gastrectomy (LSG). Cardiac anesthesiologists monitored the patient during surgery. The LSG was performed over a 40F bougie. The primary outcome is weight loss and secondary outcomes include mortality, heart transplant, readmission, and length of stay.

Results: Over 12 months, 5 patients underwent LSG. Median patient age at time of surgery was 44 years. Mean preoperative BMI was 52.7 kg/m^2, median ejection fraction (EF) was 15%, and median NYHA II. At 3 months the average BMI was 44.4 kg/m^2 and average BMI decline was 8.5 kg/m^2 (Fig. 1). The average length of stay was 5 days, and 0 patients required readmission at 30 days. One patient was successfully listed for transplant 8 months after LSG. Another patient experienced an EF increase of 20% at 4-months post-operative. At 6 months postoperatively, one patient died from with worsening HF and bowel perforation.

Conclusion: Bariatric surgery is a safe and effective option for patients with obesity and AdHF. Patients with obesity and AdHF should be referred to academic centers with bariatric surgery to improve access to transplantation.



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The Impact of Band Type, BMI, and Gastrointestinal Symptoms on Laparoscopic Adjustable Gastric Band Removal

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Introduction: Laparoscopic adjustable gastric banding (LAGB) was introduced over 20 years ago as a less invasive bariatric procedure. However, complications such as meal intolerance, band slippage, erosion, and aggravated reflux often necessitate band removal or revision, which can increase morbidity. Identifying factors associated with band removal could help patients and providers recognize warning signs, reducing the need for emergency interventions.
Methods and Procedures: A retrospective review was conducted on patients who underwent LAGB or removal at Johns Hopkins Bayview Medical Center (JHBMC) between 2004 and 2020, including those who had LAGB performed elsewhere but underwent band removal at JHBMC. Outcomes, including body mass index (BMI), percent excess weight loss (%EWL), and percent total weight loss (%TWL), were specifically analyzed for patients whose LAGB was placed at JHBMC. Potential factors associated with band removal were assessed using multivariate logistic regression.
Results: Of the 146 patients who received LAGB at JHBMC, 55.5% (n = 81) required band removal. Among these, 48.15% (n = 39) had the band removed without further procedures, 33.3% (n = 27) were revised to sleeve gastrectomy, and 18.52% (n = 15) to gastric bypass. The median time to band removal was 5.0 years. The median follow-up was 45 months, and the median BMI decreased from 43.39 to 40.33 kg/m^2 at five years (p = 0.007). The mean %EWL and %TWL at five years were 22.77% and 10.79%, respectively. Removal rate was higher for Lap-Band VG® compared to the Realize band^{TM} (OR 13.83, 95% CI: 2.46–167.67, p = 0.002). The proportion for band removals increased with higher BMI, 0 of 19 for BMI < 40, 5 of 46 for BMI 40–50, and 76 of 81 for BMI > 50 kg/m^2 (p < 0.001). 83 patients with LAGB from outside institutions presented for removal, with a median BMI of 37.97 kg/m^2 and a median time to removal of 7 years. Common reasons for removal in both groups included meal intolerance (55.82%), aggravated reflux (52.76%), and abdominal pain (21.47%).
Conclusion: Band type and high BMI were significant factors associated with LAGB removal. Gastrointestinal symptoms, particularly meal intolerance, aggravated reflux, and abdominal pain, were the most common indications for removal. Patients with these symptoms and risk factors should be monitored with a low threshold for referral to a bariatric surgeon for removal. Given the limited sample size, larger studies are needed to develop a predictive model to implement preemptive removal before complications occur.

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Disruption Index Analysis of Recent Bariatric Surgery Literature: Identifying Innovative Trends and High-Impact Publications

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Introduction: The rapidly expanding landscape of scientific literature presents challenges in identifying groundbreaking research. While citation count is a popular metric, there is a need for more nuanced measures of impact. This study aims to apply the Disruption Index (DI) to recent bariatric surgery literature to identify innovative trends and high-impact publications.
Methods and Procedures: We conducted a comprehensive analysis of bariatric surgery literature from 2010 to 2020 using the MEDLINE and EMBASE databases. The Disruption Index was calculated for each article using a custom-built tool leveraging the Semantic Scholar Application Programming Interface (API). We analyzed DI trends over time, compared characteristics of disruptive and consolidating papers, and identified top papers based on DI and citation counts. Correlation between DI and traditional bibliometric measures was also assessed.
Results: Of 46,724 initially identified papers, 20,428 met inclusion criteria. The mean DI score was − 0.00073 (SD 0.0063), with a weak correlation to citation count (r = 0.21). From 2010 to 2020, consolidating articles increased from 860 to 1808, while disruptive articles only increased from 304 to 363. Disruptive papers had lower author counts (mean difference: − 0.91, p-value < 0.001), higher citation counts (mean difference: + 18.22, p-value < 0.001), and lower reference counts (mean difference: − 3.07, p-value < 0.001) compared to consolidating papers. Reviews (p-value < 0.001) and case reports (p-value = 0.014) were more likely to be disruptive than clinical trials (p-value < 0.001) and primary studies (p-value < 0.001). Of the top 10 most disruptive articles, 6 overlapped with the top 10 most cited papers. The most disruptive article was "Metabolic/bariatric surgery worldwide 2011" (DI: 0.2975), while the most cited was "Clinical practice guidelines for the perioperative nutritional, metabolic, and nonsurgical support of the bariatric surgery patient-2013 update" (2090 citations). Surgery for Obesity and Related Diseases had the most publications (9.8% of all articles), while JAMA had the highest average DI (0.00299).
Conclusion: This first application of the Disruption Index to bariatric surgery literature reveals that while the field is producing more consolidating work, highly disruptive papers continue to emerge. The weak correlation between DI and citation count suggests DI captures unique aspects of scientific impact. These findings can guide researchers and editors in identifying innovative work and understanding the evolving landscape of bariatric surgery research.

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Expedited Higher Protein Post-operative Diet Advancement After Bariatric Surgery: A Descriptive Comparative Cohort Study

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Background: Enhanced Recovery After Surgery (ERAS) diet protocols have demonstrated successful outcomes in other surgical domains, however, optimal postoperative dietary advancement guidelines in bariatric surgery remain unclear. This study aimed to assess the impact of a standardized high-protein diet on the use of healthcare resources in bariatric surgery patients.
Methods: This single-institution, descriptive comparative cohort study examined patients who underwent sleeve gastrectomy (SG) or Roux-en-Y gastric bypass (RYGB) from June 2023 to June 2024. Patients with intraoperative complications or inability to tolerate a high-protein diet were excluded. Two groups were compared: the conservative group (June–December 2023) followed a non-standardized advanced diet plan with five variations, while the expedited group (January–June 2024) followed a standardized diet advancement with protein shakes on postoperative day 1. Primary outcome was healthcare resource use (including emergency department (ED) visits and hospital readmissions due to diet intolerance within 30 days). Secondary outcomes included postoperative leaks and operations. Comparisons made using Chi-squared analysis.
Results: Study included 648 patients, 300 in the expedited diet group and 348 in the conservative group. In the expedited group, 44% had RYGB and 56% had SG, while the conservative group had 43% RYGB and 57% SG. The expedited group had 30 (10%) ED visits for diet intolerance versus 22 (6.3%) in the conservative group ($p = 0.99$). There were 10 (3.3%) readmissions in the expedited group compared to 1 (0.3%) in the conservative group ($p < 0.01$). There were no postoperative anastomotic leaks during the study period. There were 2 reoperations in the conservative group, both for obstruction at jejunal-jejunal (JJ) anastomosis. There were 3 reoperations in the expedited group; JJ obstruction, acute cholecystitis, and bleeding (hemostatic upon entry).
Conclusion: Early high-protein postoperative diet advancement was associated with a higher rate of readmissions due to diet intolerance in bariatric surgery patients. However, neither group observed major complications in the study period. Differences in patient education may contribute to study findings.

Outcomes	Conservative group	Expedited group
Total patients	348	300
SG	198 (57%)	168 (56%)
RYGB	150 (43%)	132 (44%)
ED visits	22(6.3%)	30(10%) (**$p = 0.99$**)
Readmits	1(0.3%)	10(3.3%) (**$p < 0.01$**)
Major complications		
Leaks	0	0
Reoperations	2	3

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One Port, Many Possibilities: A Series on Gastric Bypass for Obesity Management

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Conventional laparoscopic Roux-en-Y gastric bypass has not yet been established as the gold standard in bariatric procedures. Laparoscopic Roux-en-Y gastric bypass, has numerous advantages over the open approach, however the laparoscopic approach typically requires 5 to 7 laparoscopic ports. We present the first described series of cases of laparoscopic Roux-en-Y gastric bypass with single 5 mm port access.

A 4 cm transumbilical incision is made. Pneumoperitoneum is performed with a Verres needle and a 10 mm trocar and two other 5 mm trocars are placed at a distance of 1.5 cm in a triangular shape. A 30° lens is inserted through the 5 mm port and tweezers are placed through the other ports. A 5 mm accessory port is added to the left flank and instruments are introduced. A 36 Fr esophageal tube is placed, the gastric chamber is identified, and a retrogastric tunnel is made 6 cm distal to the gastroesophageal junction. The new reservoir is created using a laparoscopic stapler with 60 mm cartridges. An hermetic test is performed without evidence of leaks. Subsequently, the angle of Treitz is located and 90 cm distal from it, a cut of the small intestine with endogia is performed. Then the jejuno-jejunum laterolateral anasmotosis is performed 115 cm distal to the previous cut using again endogia. The anastomosis is closed with 2-0 vicryl and the mesenteric gap is closed with ethibond 2-0. The alimentary loop is grabbed and the antecolic gastro-jejunum anastomoses is made manually in two planes with 2-0 vicryl. The single incision is closed with cross stitches of absorbable suture and skin with inverted monocryl 3-0 sutures. The procedures takes an average of 90 min and 30 ml of bleeding were quantified. All our patients were discharged after 48 h of hospital stay without complications. The patient was followed monthly, obtaining expected weight loss, good aesthetic results and an imperceptible scar.

Adaptation of a multiport laparoscopic approach to a single port requires mastery of the surgeon's technique and skills. The main limitation is the limited number of trocars that can be placed within the single incision. The advantages, in addition to a better aesthetic result, are the reduction of trauma to the abdominal wall which results in less pain, less bleeding and a faster recovery. Single-port gastric bypass showed that it is feasible and that it offers the opportunity for wider use of a single-incision approach.

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Quality of Life Outcomes Post Sleeve gastrectomy, Roux-en-Y, and Duodenal Switch: A Systematic Review and Meta-analysis

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Introduction: Gastric bypass surgery is a common bariatric surgery that induces weight loss and improves quality of life (QoL) in patients. The objective of our study is to evaluate the quality of life in various aspects following three specific bariatric surgeries, including sleeve gastrectomy, Roux-en-Y, and duodenal switch, by using diverse scores and questionnaires.
Methods and Procedures: A search of PubMed, Embase, Ebsco, and Scopus from 2010 to 2023 was performed using PRISMA guidelines. Data was extracted by two independent authors. Inclusion studies were randomized controlled trials. Studies were initially screened

based on titles and abstracts, followed by full-text assessments. Patients who underwent RYGB, SG, or DS were included. Exclusion criteria included use of synthetic mesh, fewer than 20 patients, inability to compare QoL questionnaires, and only addressing specific patient populations (diabetics). The QoL questionnaires used among the five studies were the BAROS, GIQLI, and Moorehead questionnaires. Studies with similar QoL questionnaires were compared against each other. QoL questionnaire outcomes data were pooled and analyzed to create forest plots and report 95% confidence intervals. Heterogeneity was investigated using $I2$ statistics.

Results: The initial search found 628 studies. After removing duplicates and screening of abstracts, 18 eligible studies were found. Only five studies were eligible for meta-analysis. Among these studies, there was only data comparing RYGB with either SG or DS. Timepoints analyzed for QoL were at baseline, 1-year, 3-year, and 5-year post surgery. There were three studies that used GIQLI or Moorehead and two studies that used BAROS.

Overall, post-operative QoL was similar between RYGB and SG/DS among the different questionnaires. In all three questionnaires, there was no significant difference in mean QoL between RYGB and SG/DS at baseline, 1-year, and 5-year post surgery timepoints. There was a significant difference in mean QoL between RYGB and SG/DS at the 3-year post surgery timepoint in the Moorehead questionnaire, with RYGB having higher QoL (0.32, [0.02, 0.61]). Looking at heterogeneity, only the three-year Moorehead time point had moderate heterogeneity with an $I2$ score of 55%. All other heterogeneity scores were under 10%.

Conclusions: In our study, post-operative QoL was similar between different types of bariatric surgery, specifically RYGB, SG, and DS. At the 3-year post surgery timepoint, RYGB had a significantly higher QoL compared to SG/SD with the Moorehead questionnaire. Further studies with more standardized QoL questionnaires would be beneficial in confirming these findings.

P298

Identifying Trends and Predictors of Bariatric Surgery Selection in Adolescent Patients: An MBSAQIP Analysis of 2,140 Patients

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Purpose: With expanding indications for bariatric surgery and the increasing rates of adolescent obesity, there has been significant interest of its efficacy in this population. Literature of adolescent bariatric surgery is limited by quantity of studies and small sample sizes. This study aimed to assess the largest cohort of adolescent patients undergoing bariatric surgery regarding safety of delivery and predictors of procedure choice.

Material and Methods: Data was extracted from the MBSAQIP registry from 2020 to 2022. Adolescent patients were defined as patients 18. Patient population was organized into two cohorts depending on surgical procedure, sleeve gastrectomy (SG) or Roux-en-Y gastric bypass (RYGB). Bivariate analysis and multivariate logistic regression modeling were performed to compare demographics and complication rates, and to identify predictors of serious complications and undergoing SG vs RYGB, respectively.

Results: Of 2140 included patients, most underwent SG (n = 1976, 92.3%) and a minority RYGB (n = 164, 7.7%). While the absolute number of patients undergoing bariatric surgery increased from 2020 to 2022 (605 to 809 patients), this seemed to be driven by increases in SG (from 550 to 764 patients), while number of RYGB performed ranged from 45 to 64 in these years. Patients undergoing RYGB were more likely to be older (17.3 ± 1.0 vs 17.0 ± 1.2, $p < 0.001$) and female (81.7% vs 69.6%, $p = 0.001$) but had no difference in BMI (48.1 ± 8.4 vs 47.1 ± 8.1, $p = 0.131$). Patients undergoing RYGB tended to have more comorbidities such as diabetes. RYGB patients were more likely to have drains placed (13.4% vs 2.4%, $p < 0.001$). Absolute rates of complications were very low and remained similar between groups, and surgical procedure was not predictive of 30-day serious complications in a multivariate model. Predictors of undergoing RYGB versus SG include female (aOR 1.93, $p = 0.002$), insulin-dependent diabetes (IDDM, aOR 3.15, $p < 0.004$), gastroesophageal reflux disease (GERD, aOR 2.52, $p < 0.001$), other race (vs. white race, aOR 0.62, $p = 0.025$), older age (aOR 1.31, $p < 0.001$), and more recent operative year (2022 vs 2020 aOR 0.62, $p = 0.025$). When only patients ≤ 17 were included, only GERD (aOR 5.52, $p < 0.001$) was predictive of procedure choice, though many factors approached significance, such as IDDM ($p = 0.051$), black race ($p = 0.082$), other race ($p = 0.080$) and 2022 operative year ($p = 0.062$).

Conclusion: Sleeve gastrectomy is currently the most common bariatric procedure in adolescent populations and is increasingly performed. Complication rates overall remain low, and there does not seem to be significantly increased risk with RYGB. Predictors of RYGB selection include older age, presence of GERD and increasing metabolic disease burden.

P299

Conversional Surgery in the Young: An MBSAQIP Analysis of 13,000 Patients

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Background: As the incidence of bariatric surgery increases, including in younger patients, there will be an increasing proportion of patients who will require conversional surgery, from one procedure to another, either due to complications or insufficient weight loss. We aim to provide an up-to-date large-scale cohort study to describe the complication rates between different conversional procedures, as well as compare complication rates between conversional procedures among the two most commonly revised procedures.

Methods: Utilizing the MBSAQIP database, we included all patients undergoing a conversion procedure to SG, roux-en-Y gastric bypass (RYGB), single anastomosis duodeno-ileal bypass (SADI-S) or biliopancreatic diversion with duodenal switch (BPD-DS) and compared bivariate complication rates. We then performed two sub analyses in multivariate models: the first assessing complication rate impact of patients with AGB being converted to SG versus RYGB and the second of patients being converted from SG to RYGB versus SADI-S versus BPD-DS.

Results: Of 13,486 included patients, 842 were converted to SG, 9812 to RYGB, 549 to SADI-S, and 2283 to BPD-DS. On multivariate analysis, compared to conversion to SG, conversion to RYGB (aOR 2.14) and BPD-DS (aOR 2.30) were associated with increased risk. As this does not control for initial operation, the above-mentioned subanalyses were performed. Conversion of AGB to RYGB had a higher likelihood of having 30-day serious complication compared to conversion to SG (aOR 2.18). For patients with an index SG, compared to those who were converted to a RYGB, those who were converted to BPD-DS had a similar likelihood of 30-day complication (aOR 0.78, $p = 0.302$) while those converted to SADI-S had a lower likelihood (aOR 0.47, $p = 0.031$).

Conclusion: Depending on the initial operation, different subsequent conversional options exist. Conversion to SADI-S and SG seem to have a lower likelihood of serious complications for all initial procedures. For patients undergoing AGB, RYGB had a higher risk than SG conversions, and for those with an index SG, SADI-S provided less risk than RYGB and BPD-DS conversion.

P300

The Association of Preoperative Opioid Use with Clinical Outcomes Following Bariatric Surgery

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Introduction: A number of patients who undergo bariatric surgery are on opioid medications for chronic pain. While previous work has linked preoperative opioid use to prolonged postoperative length of stay and increased complications across general surgery procedures, less is known regarding its impact on bariatric surgery. In this study, we aimed to determine the rates of preoperative opioid use before bariatric surgery and investigate its effects on postoperative outcomes.

Methods and Procedures: We queried our Metabolic and Bariatric Surgery Accreditation Quality Improvement Program (MBSAQIP) Center of Excellence institutional data between 2021 and 2022. We identified adult patients who underwent primary and revisional minimally invasive sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB). Patients with opioid use in the year prior to index surgery were identified. Patient demographics and ASA class were recorded. Outcomes included length of stay (LOS), prolonged LOS (pLOS; $\geq$ 3 days), 30-day complications, readmissions, and emergency department (ED) visits, and reasons for these visits. Associations were examined using multivariable linear and logistic regression models adjusting for patient demographics, ASA class, and procedure.

Results: Out of 530 patients, 62 (11.7%) had opioid prescriptions in the year prior to bariatric surgery (Table 1). Medications included Hydrocodone (23, 37.1%), Tramadol (13, 21%), and Oxycodone (9, 14.5%) with 10 patients (16.1%) using a combination regimen and the rest using other formulations. Patients who used opioid medications preoperatively did not experience a longer LOS (2.08 vs. 1.80 days, coefficient: 0.17, 95%CI: − 0.21 to 0.56). Additionally, there were no statistically significant differences between patients on- and off-opioid medication preoperatively in pLOS (22.6% vs. 15.8%, aOR: 1.31, 95%CI: 0.67–2.58), complications (1.6% vs. 7.7%, aOR: 0.16, 95%CI: 0.02–1.20), readmissions (8.1% vs. 8.5%, aOR: 0.78, 95%CI: 0.29–2.10), or ED visits (16.1% vs. 15%, aOR: 1.14, 95%CI: 0.54–2.39). Patients taking preoperative opioids had higher rates of ED visits due to postoperative pain, but this difference did not reach statistical significance (50% vs. 24.3%, $p = 0.29$).

Conclusion: Preoperative use of opioids in bariatric surgery patients is common. While postoperative outcomes including LOS, complications, readmissions, and ED visits seem to not differ significantly from patients not taking opioids, patients on preoperative opioids had higher rates of pLOS and were more likely to present to the ED for postoperative pain after surgery. To minimize such visits, a more aggressive pain management approach may be needed for this patient population, but larger studies are needed to confirm our findings.

Table 1. Demographics, ASA class, procedure data, and outcomes of patients who underwent bariatric surgery categorized according to preoperarive opioid utilization

	No preoperative opioids 468 (88.3%)	On opioids 62 (11.7%)	*p*-value
Age (years)			
-	44.8 ± 10.9	47.7 ± 11.6	0.05
Race			
White	309 (66%)	41 (66.1%)	0.61
Black or African American	130 (27.8%)	19 (30.7%)	
Others or Unknown	29 (6.2%)	2 (2.2%)	
Sex			
Female	387 (82.7%)	54 (87.1%)	0.38
Male	81 (17.3%)	8 (12.9%)	
BMI (kg/m^2)			
-	46.5 ± 7.9	46.0 ± 7.5	0.85
ASA Classification			
Class II	59 (12.6%)	11 (17.7%)	0.21
Class III	399 (85.3%)	48 (77.4%)	
Class IV	10 (2.1%)	3 (4.8%)	
Procedure			
Roux-en-Y gastric bypass	264 (56.4%)	41 (66.1%)	0.15
Sleeve gastrectomy	204 (43.6%)	21 (33.9%)	
Revision/Conversion			
No	411 (87.8%)	53 (85.5%)	0.60
Yes	57 (12.2%)	9 (14.5%)	
30-day Outcomes			
Length of Stay (days)	1.80 ± 1.5	2.1 ± 1.4	0.16
Prolonged LOS (≥3 days)	74 (15.8%)	14 (22.6%)	0.18
Complications	36 (7.7%)	1 (1.6%)	0.08
Readmissions	40 (8.5%)	8 (8.1%)	0.90
Emergency Department Visits	70 (15%)	10 (16.1%)	0.81

P301

Small Bowel Obstruction Secondary to Intra Luminal Bleeding After Roux-en-Y Gastric Bypass

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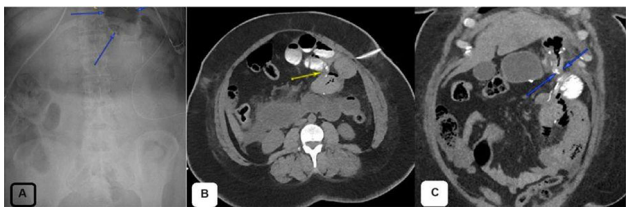

Introduction: Small bowel obstruction is a known complication of Roux-en-Y gastric bypass (RYGB) and it can be more dreadful when the cause is intra luminal bleeding (ILB). In this situation, the surgeon should deal with the cardiovascular decompensation secondary to bleeding while dealing with the possible consequences of SBO including leak or perforation. The incidence of SBO secondary to ILB is as low as 0.05–1.9% [1]. Here we are reporting a case of SBO secondary to hemobezoar following RYGB.

Case Report: 41 year-old woman with BMI of 39 and history of laparoscopic sleeve gastrectomy eight years ago with failure to lose weight underwent an uneventful robotic-assisted laparoscopic RYGB with Sureform 60 mm White (2.5 mm) stapler load, no hemostatic agent applied over the stapler line. She was placed on prophylactic dose of heparin to prevent deep vein thrombosis. In 28 h after surgery, she started to complain of vague abdominal pain, mild distention, new onset nausea, with mild tachycardia. Further workup, showed a

dilated loop on abdominal x-ray (Fig. 1A) which prompted an urgent abdominal CT scan that revealed small bowel obstruction distal to jejunojejunostomy (J–J) (Fig. 1B and C). The patient was immediately brought back to the operating room. Following attempted diagnostic laparoscopy we converted to laparotomy with intraoperative finding of SBO 30 cm distal to the J–J. The hemo-bezoar was evacuated via an enterotomy at the transition point. Intra-operative esophagogastroscopy ruled out gastro-jujenal anastomosis bleeding. Therefore, we attributed the bleeding to staple line bleed from J–J. The enterotomy was closed followed by peritoneal wash out. Post-operative course was complicated with the formation of intra-abdominal abscess which was managed with interventional radiology drain placement. She was discharged on hospital day 14 in good overall condition.

Discussion: There is not enough data about the type of the stapler or using hemostatic agents over the stapler line during RYGB. SBO secondary to ILB is extremely rare and usually happens in the first 1–3 days from the index surgery [1]. Furthermore, almost all reported cases have been on prophylactic doses of anticoagulation medication per bariatric guidelines [1,2,3]. To avoid any significant consequences either from bleeding or obstruction urgent intervention is paramount.

Conclusion: ILB causing obstruction following RYGB is extremely rare. Considering possible lethal consequences prompt surgery is required. The surgeons should be encouraged to report their cases to gather enough data to compare different staplers, hemostatic agents, DVT prophylaxis status, and patient's comorbidities.

P303

Veiled Malignancy: How Metabolic Syndrome Management Can Obscure Cancer Detection

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Introduction: In the pursuit of managing obesity, weight loss medications such as GLP-1's and phentermine are frequently prescribed. While effective for weight reduction, these medications can inadvertently obscure the early diagnosis of underlying cancer. This case exemplifies how phentermine's desired weight loss effects can act as a veil, leading to a dangerous delay in cancer diagnosis. We use this patient's unfortunate presentation as a reminder for physicians to incorporate routine cancer screening before starting weight loss treatments. By addressing this gap, healthcare providers can prevent the tragic consequences of undiagnosed cancer and improve patient outcomes.

Case Report: We present a case of a 53-year-old male with a history of hypertension and dyspepsia, who presented with progressive abdominal distention over two months, hematochezia, accompanied by a significant 50-pound weight loss. The primary care provider prescribed phentermine for weight management prior to the onset of symptoms. He had no prior cancer screening nor significant family history. On arrival, CT imaging revealed a large 27×35 cm abdominal mass with evidence of malignant neoplasm, thrombus in the portal and mesenteric veins, and compression of nearby organs. Initial pathology was inconclusive, but subsequent biopsies confirmed high-grade leiomyosarcoma. Despite aggressive diagnostic and therapeutic efforts, including surgery, chemotherapy, and palliative care, the patient's condition deteriorated, and he was eventually discharged to hospice care.

Discussion: In the effort to assist this patient with weight loss and prevent cardiovascular decline, the broader necessity of routine cancer screening was overlooked, ultimately contributing to the patient's untimely demise. The significant weight loss achieved with phentermine concealed a dire, underlying malignancy. This lead to a perilous delay in diagnosis and treatment. It's a sobering reminder of the impact that routine cancer screening could have had in detecting the malignancy earlier. The rapid progression of the patient's disease highlights the urgent need for physicians to conduct thorough evaluations, including cancer screenings, before prescribing weight loss therapies. This proactive approach could prevent similar tragedies and significantly enhance patient care.

Conclusion: There are potential risks associated with the use of weight loss medications without prior cancer screening. The patient's prolonged undiagnosed Leiomyosarcoma and subsequent rapid decline emphasize the necessity for routine cancer evaluations in patients prior to prescribing weight loss medications. Awareness as primary care providers about the masking effects of weight loss treatments is crucial to prevent similar delays in cancer diagnosis and ensure timely intervention.

P304

Impact of Inflammatory Bowel Disease on the Risk of Development of Deep Vein Thrombosis and Venous Thromboembolism Following Bariatric Surgery

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Introduction: Individuals with inflammatory bowel disease (IBD), such as Crohn's disease and ulcerative colitis are predisposed to a prothrombotic state due to chronic inflammation [1–3]. This risk is further elevated after bariatric surgery, which is increasingly being performed in this population to address obesity related comorbidities. Despite the availability of various risk assessment tools for determining the need for chemoprophylaxis following bariatric surgery, none are specifically tailed to account for the unique thrombotic risk associated with IBD [4, 5]. This study aims to evaluate the incidence of venous thromboembolism (VTE) in IBD patients undergoing bariatric surgery.

Methods: We conducted a retrospective cohort study to identify patients with IBD who underwent bariatric surgery from July 1, 2015 and March 30, 2024. Post-operative outcomes and the incidence of VTE events including deep vein thrombosis (DVT), pulmonary embolism (PE), and porto-mesenteric venous thrombosis were documented within 6 months post-operatively. Patients were identified in the electronic health record using specific Current Procedural Terminology (CPT) and International Classification of Disease (ICD) Codes at all hospitals affiliated with a large hospital system.

Results: We identified 36 patients with IBD who underwent bariatric surgery during the study period. The majority of patients were female (80.6%), with a median age at time of procedure of 45 years and a mean body mass index (BMI) of 41.07 (SD 5.89). Of these patients, 55.6% had Crohn's disease and 44.4% had ulcerative colitis; most were in remission at time of surgery. The most common procedure was sleeve gastrectomy (86%).

No patients in this cohort experienced a VTE event within 6 months postoperatively. The mean duration of chemoprophylaxis was 2.9 days (SD 0.69), with 2 patients (5.5%) being discharged on extended chemoprophylaxis (4 weeks). The majority of patients (66.7%) did not experience any major complication within 30 days of surgery. Minor complications such as dehydration requiring intravenous fluids and nausea/vomiting were noted in 8.3% and 11.1% of the patients, respectively. Two patients required initiation of new IBD medications within 30 days of surgery due to a flare or recurrence of their disease.

Conclusions: Bariatric surgery in patients with IBD was not associated with increased postoperative VTE risk within 6 months in this

cohort, with sleeve gastrectomy being the predominant procedure. These findings underscore the potential for bariatric surgery to be safely performed in IBD patients without the need for extended chemoprophylaxis, although larger cohorts are needed to refine chemoprophylaxis recommendations.

P305

Reinforcement of the Esophageal Hiatus Using Ligamentum Teres During Sleeve Gastrectomy: Outcomes Regarding Gastroesophageal Reflux Disease and Hiatal Hernia

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Background: Laparoscopic sleeve gastrectomy (LSG) is a surgery that involves removal of 75–80% of the stomach. It offers benefits like less postoperative pain and better recovery compared to open surgery but it also carries the risk of developing gastroesophageal reflux disease and hiatus hernia.
Patients and Methods: This retrospective study included a group of patients who underwent LSG, divided into two groups: Group A, which contained 30 patients who received LSG without Ligamentum Teres Reinforcement (LTR), and Group B, with 30 patients, who underwent LSG with the additional LTR procedure.
Results: Group B experienced significantly fewer reflux symptoms during follow-up at 3, 9, and 18 months ($p < 0.05$). Additionally, Group B had a lower incidence of endoscopic reflux at 6 and 18 months (3.3% vs. 26.7% and 6.7% vs. 30.0%, respectively). Hiatus hernia size was significantly smaller in Group B (1.2 cm vs. 2.5 cm, $p < 0.001$).
Conclusion: Incorporating LTR during Laparoscopic Sleeve Gastrectomy (LSG) may reduce postoperative GERD. The small sample size and retrospective design suggest the need for larger studies to confirm LTR's long-term benefits as an adjunctive technique in bariatric surgery.
Keywords: Ligamentum Teres Reinforcement; Hiatal; GERD.

P307

The Validation of GLIM Criteria for Diagnosis of Malnutrition in Adult Patients with Obesity Post Sleeve Gastrectomy

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Background and Objective: Prevalence of Malnutrition is common among post- bariatric surgery (BS) patients and could lead to higher complications, raising the morbidity rates and length of stay (LOS) at the hospital. There are not many studies on the prevalence and severity of malnutrition post-sleeve gastrectomy (SG). Global Leadership Initiative on Malnutrition (GLIM) is a new tool recently developed for diagnosing malnutrition in a different clinical setting. The study's main aim is to explore the validity of GLIM criteria in assessing nutrition status and malnutrition post-SG from six months up to two years of surgery in the Kingdom of Saudi Arabia (KSA) and compare it to Subjective Global Assessment (SGA).
Method: A cross-sectional study was conducted on adult post-SG patients who were followed up at the outpatient surgical clinic at King Saud University hospital. The first step was assessing the nutrition status using the Nutrition Risk Screening Tool 2002 (NRS-2002) to diagnose malnutrition based on GLIM criteria and then by GLIM and SGA. Agreement between tools was calculated using Kappa (κ) statistics and Receiver Operation Characteristics (ROC) analysis determined the Sensitivity (Se), Specificity (Sp), and Area Under the Curve (AUC) to investigate the tool's accuracy. Additionally, a dietary assessment tool was used; multiple pass 24-h diet recall was collected twice, once during weekdays and once during weekends, followed by ESHA food processor software analysis to analyse their diet's macronutrient, Vitamin D, and Vitamin B12 content. (Se), (Sp) and (κ) values were measured to evaluate the performance of the nutritional assessment tools, GLIM, SGA, and NRS2002.
Results: A total of 47 patients post-SG, 18 males (38.3%) and 29 females (61.7%) with an average age of 35 years (IQR 22 years) were recruited for the study. In patients who were followed up for six months or longer following surgery, the GLIM and SGA criteria for malnutrition prevalence were 48.9% and 42.6%, respectively. The GLIM criteria demonstrated a failure rate of 0.553 (95% CI, 0.38–0.72) with a sensitivity and specificity of 55.0% and 55.6%, respectively. The tools' agreement was poor ($\kappa = 0.104$).
Conclusion: GLIM criteria for malnutrition diagnosis presented unsatisfying criterion validity and seemed unacceptable for assessing nutritional status among post-SG patients. This could be due to the criteria of GLIM, where weight loss and BMI reduction are considered success factors with patients post-SG.

P308

A Case of Biliary Stone Clearance by Laparoscopic Transcystic Lithotripsy After Failed Endoscopic Retrograde Cholangiopancreaticogram

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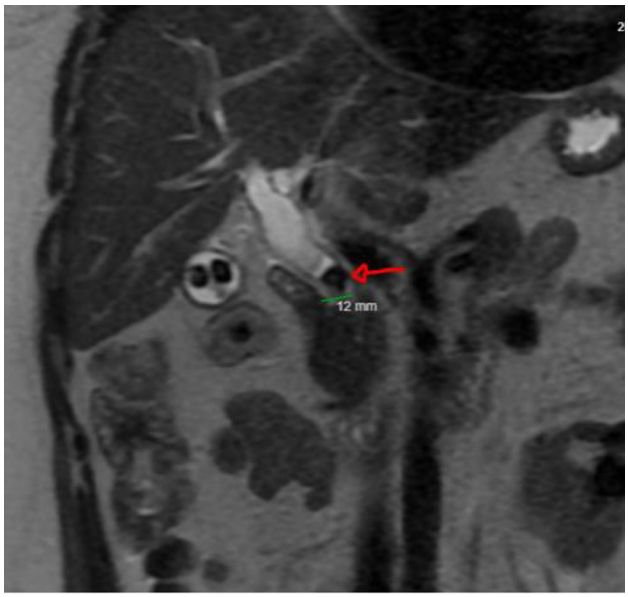
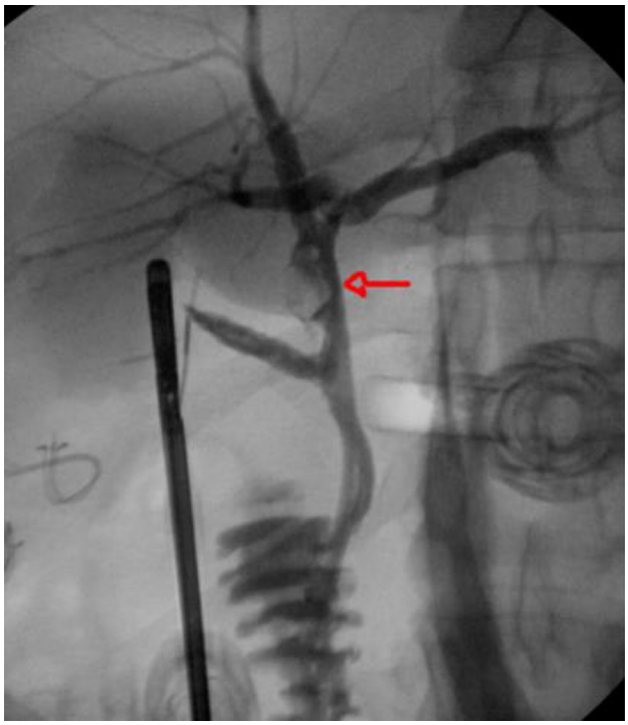
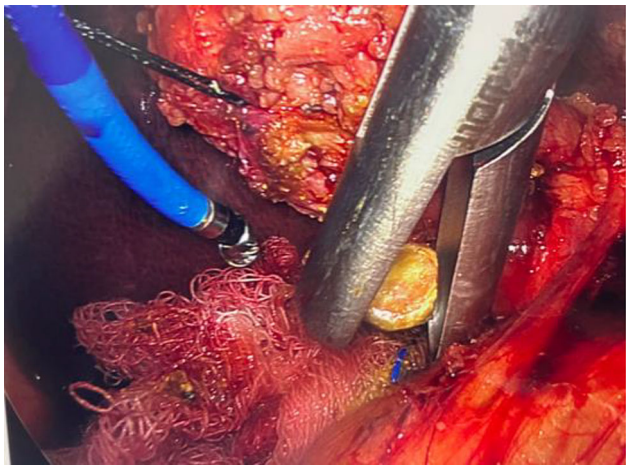
Choledocholithiasis remains one of the most common reasons for biliary related admissions in the United States. Stone clearance can be accomplished by both ERCP and laparoscopic common bile duct exploration (LCBDE). While LCBDE offers a single procedure and decreased length of stay, ERCP remains the most popular procedure nationally. Familiarity with LCBDE and the necessary equipment remains a major hurdle to widespread adoption by surgeons. However, ERCP can and does fail to clear the common bile duct in some circumstances. We report a case of an otherwise healthy 27-year-old female in whom ERCP failed to resolve 5 obstructing biliary stones measuring 10 mm or greater—eventually requiring LCBDE and lithotripsy. The patient was able to be discharged the next day further reinforcing the benefits of LCBDE in managing choledocholithiasis, especially with the use of more novel techniques like choledochoscopic lithotripsy.







P309

Laparoscopic Management of Abdominal Wall Foreign Body Granuloma with Liver Involvement Secondary to Cholecystectomy

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Introduction: Cholecystectomy is one of the most frequently performed surgical procedures. Although it is generally considered a safe surgery, postoperative complications may arise such as bile duct injuries, surgical site infections, and chronic collections associated with residual foreign bodies. We present the case of a patient with a chronic collection secondary to a previous cholecystectomy, in which a residual foreign body was identified. This report highlights the importance of proper diagnosis and management for the reduction and resolution of these complications.

Methods and Procedures: We present the case of a 40-year-old female patient with a history of laparoscopic cholecystectomy performed 7 years ago. The patient consulted for a long-standing history of an indurated lesion with production of foul-smelling fluid for which she had been treated with antibiotic therapy without improvement and the lesion persisted. Imaging studies were performed with the discovery of an inflammatory lesion affecting the hepatic dome and the abdominal wall. Given these findings, it was decided to perform a laparoscopic approach with revision of the abdominal cavity for drainage of the collection and management of possible foreign body granuloma.

Results: The patient was taken to a laparoscopic approach with release of severe adhesion syndrome above the right hepatic lobes, a granuloma was identified in the abdominal wall identifying metal clips. The patient had an adequate postoperative evolution with tolerance of diet, antibiotic treatment guided by microbiological isolation and continuous outpatient follow-up was given, in the 6-month follow-up the patient was asymptomatic.

Conclusions: Foreign body granulomas after surgical procedures turn out to be a disabling entity for patients due to the symptoms they generate, so surgical management with minimally invasive techniques turns out to be an efficient option for the resolution of this entity.

P310

Occult Thumbnail Gallbladder: A Rare Case Report for a Common Pathology

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Background: Thumbnail gallbladder, also known as a severely contracted gallbladder, presents a surgical challenge in the context of chronic cholecystitis. Patients with this condition are at higher risk for open conversion and bile duct injury during cholecystectomy. We report a case of thumbnail gallbladder and outline an ideal surgical approach.
Case Description: A 74-year-old female experienced recurrent right upper quadrant pain radiating to her back over the course of a year. She had a history of gastroesophageal reflux disease, confirmed by endoscopy. Her comprehensive metabolic and hepatic panels were unremarkable. An abdominal ultrasound performed months before surgery showed a suboptimally distended, low-lying gallbladder, without evidence of calculi or biliary duct dilation. A follow-up abdominal magnetic resonance imaging (MRI) cholangiogram with 3D reconstruction failed to visualize the gallbladder, neither hypoplastic nor surgically absent. However, mild extrahepatic and central intrahepatic biliary dilation was noted, with diffuse hyperintensity on T1-weighted images, possibly due to concentrated bile or hemobilia. No choledocholithiasis or obstructing lesions were identified. Due to persistent pain, a laparoscopic cholecystectomy was performed. Intraoperatively, a severely contracted, thumbnail-sized gallbladder was encountered. A posterior infundibular approach was used, preserving the Shield of McElmoyle. The resected specimen measured 3.8 × 1.6 × 1.1 cm, consisting of fibromembranous tissue with adherent yellow adipose tissue, but no stones or masses were identified. These findings were confirmed by final pathology. The patient's postoperative course was uneventful, and she was discharged the same day.
Conclusion: We present a rare case of thumbnail gallbladder with acute on chronic cholecystitis revealed by cholecystectomy. We propose surgical intervention when there is a high index of suspicion for cholecystitis despite confounding imaging. We propose a posterior infundibular dissection to ensure the safety of critical structures during surgery.

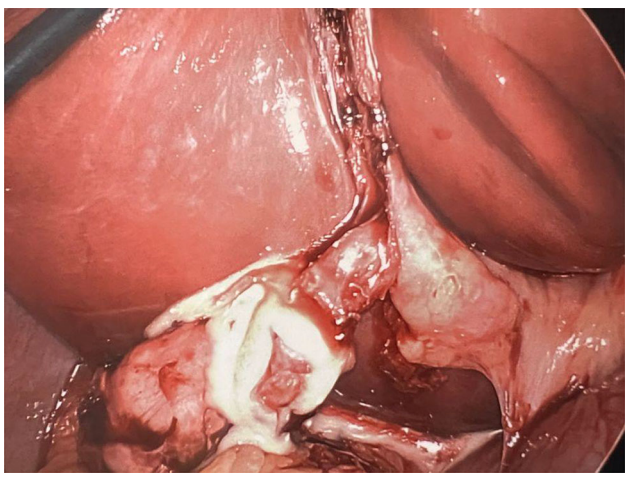

Fig. 1 Laparoscopic posterior infundibular dissection of gallbladder without violation of the Shield of McElmoyle

Fig. 2 Contracted bladder specimen

P311

Our Experience in the Laparoscopic Management of Patients with Remnant Gall Bladder

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Introduction: Remnant gall bladder or cystic duct stump calculi are an uncommon but important cause of 'Post-cholecystectomy Syndrome'. A high index of suspicion is needed to diagnose this condition in a symptomatic post-cholecystectomy patient. We present our experience with the surgical management of this condition.
Methods: This prospective study included 25 patients with residual gallstone disease who underwent completion cholecystectomy between February 2019 and January 2024. Patients were evaluated with routine blood investigations, ultrasound, and Magnetic Resonance Cholangio-Pancreatography (MRCP).
Results: The study included 20 women and 5 men. The mean age was 45 years (range, 28–73 years). The most common presentation was dyspepsia (21 out of 25) however, 18 patients had pain abdomen. Other symptoms included vomiting and jaundice. One patient who was asymptomatic for stump cholelithiasis, presented with an incisional hernia and on workup was found to have gall bladder stump calculi. The onset of symptoms from index surgery ranged from 4 months to 11 years. The initial surgery was open cholecystectomy in 16 while nine patients underwent laparoscopic cholecystectomy. MRCP was performed in all cases. Completion cholecystectomy was performed laparoscopically in all cases. Up to two additional ports other than the standard four ports were required in four patients for adhesiolysis. Dissection of Calot's triangle was satisfactory in 15 patients. Majority (53%) of patients had Nassar grade 3 adhesions. The cystic duct was clipped in 14 cases (57%). In the rest of the patients, the gall bladder stump was sutured (n = 6, 28%) or stapled (n = 5, 14%). The mean operative time was 64 min (range, 45–120 min), and the median blood loss was 50ml (range, 20–200 ml). A subhepatic drain was placed in all cases. The median hospital stay was 4 days (range, 1–15 days).

One patient was readmitted four days after surgery with hypotension and underwent diagnostic laparoscopy with evacuation of omental hematoma. There was no post-operative mortality.

Conclusion: Laparoscopic management of the remnant gall bladder/cystic duct stump is feasible and safe even after previous open cholecystectomy. Preop MRCP is mandatory for the road map of hepatobiliary surgery. It is increasingly becoming the treatment of choice where expertise is available.

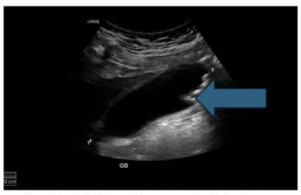

Figure 1: Distended gallbladder with gallstones

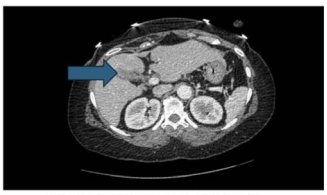

Figure 2: Contracted irregular gallbladder

P312

Driving through the Unexpected Road: Intraoperative Challenges in a Rare Septate Gallbladder Case

Calista Kee, BS[1]; Tara Ranjbar[2]; Katerina Jou, MD[2]; Sourodip Mukharjee, MD[2]; Indraneil Mukherjee, MD[2]; Bruce Brenner, MD[2]; [1]CUNY School of Medicine; [2]Staten Island University Hospital Northwell Health

Introduction: Cholelithiasis, or gallstones, is a common pathology affecting about 20% of the population in developed countries. A rare occurrence of a septate gallbladder is typically seen congenitally but may also be seen in adults. It is believed to result from failure of normal development of the gallbladder lumen. It is often diagnosed with ultrasound examination, viewing visible septa crossing the gallbladder lumen forming 'cyst-like compartments'. Patients typically present with biliary pain ± stones, likely from impaired gallbladder function due to bile stasis? Common management methods in symptomatic patients is cholecystectomy, but other options include a laparoscopic trans-cystic-common bile duct exploration or ERCP-based removal of the stone. We present a case of the intraoperative challenges faced while operating on a bilobed gallbladder.

Case: A 60-year-old female, with a history of hypertension, hyperlipidemia and cerebrovascular incident, presented to the ED complaining of sudden onset, severe mid-epigastric and RUQ pain. The patient underwent laboratory and radiological investigations suggesting acute cholecystitis. The patient was planned for an elective laparoscopic cholecystectomy. Intraoperatively, dense adhesions were attempted to achieve the critical view of safety. After injection of indocyanine green, the anatomy was still indiscernible and a bailout procedure was employed. The dissection continued in the sub-serosal plane between the gallbladder wall and cystic artery in a top-down approach. The bile was aspirated and stones removed. As the dissection continued distally, the gallbladder lumen showed narrowing resembling the cystic duct opening. On further review of radiographic images, a diagnosis of septate gallbladder was made. CT scan did not present with the typical Boyden classifications, showing an irregular dumbbell shape instead. The gallbladder-cystic duct junction was identified using indocyanine green cholangiogram and two 2 PDS endoloops were applied. The cholecystectomy was completed without any further complications. Patient was discharged on postoperative 1 after removal of the JP drain. Patient was followed up on POD - 10 with no complaints and histopathological diagnosis of acute-on-chronic cholecystitis was made.

Conclusion: Septate gallbladder is considered a risk factor for complications following a laparoscopic cholecystectomy as seen in our patient. Consequently, identification and definition of biliary anatomy is mandatory to prevent biliary system injury. Injury to the ductal system usually occurs during dissection of Calot's triangle. Timely enactment of bailout procedures, low threshold for suspecting aberrant anatomy and employment of intraoperative indocyanine green cholangiogram is pertinent for appropriate management of these complex cases.

P313

ICG and Robotic Platform in Elective Cholecystectomy: Successful Management of an Exceptionally Rare Hisatsugu Type V Biliary Anomaly

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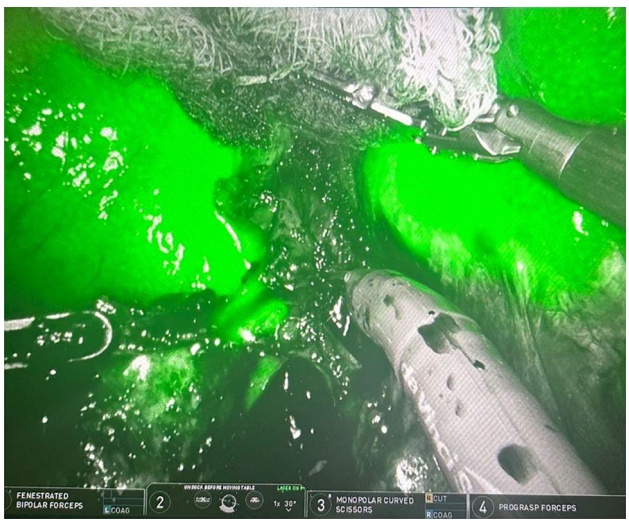
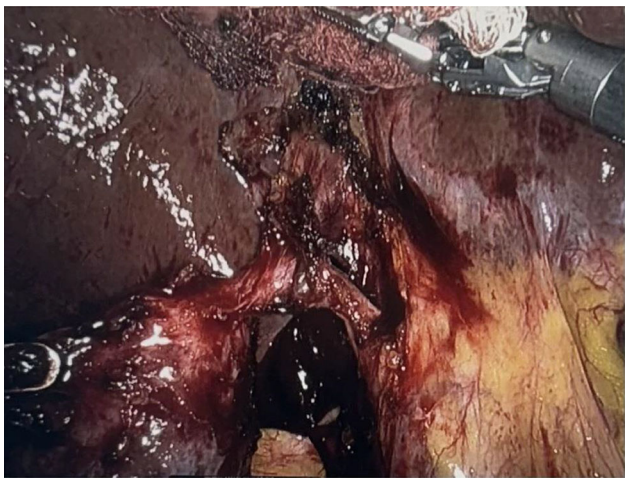
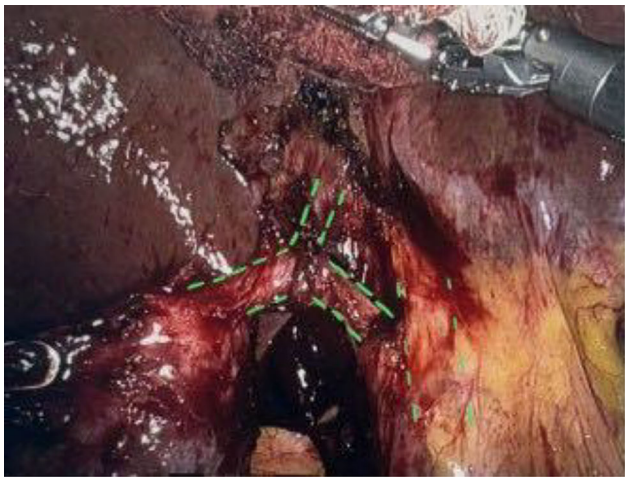
Introduction: Laparoscopy is the current gold standard for cholecystectomy. Bile duct injuries remain a concern and are often due to unrecognized biliary tree anomalies. Among these, the aberrant right hepatic duct (ARHD) is an uncommon variant, draining primarily into the common hepatic duct, common bile duct, or left hepatic duct [1]. A rare subtype, Hisatsugu Type V ARHD, occurs when the right posterior sectorial duct drains into the cystic duct [2]. While intraoperative cholangiography may reduce the incidence of bile duct injury during laparoscopic cholecystectomies, the utility of near-infrared fluorescent cholangiography (NIFC) remains unclear. Our case highlights the utility of the robotic platform's NIFC in recognizing and managing anomalous biliary anatomy.

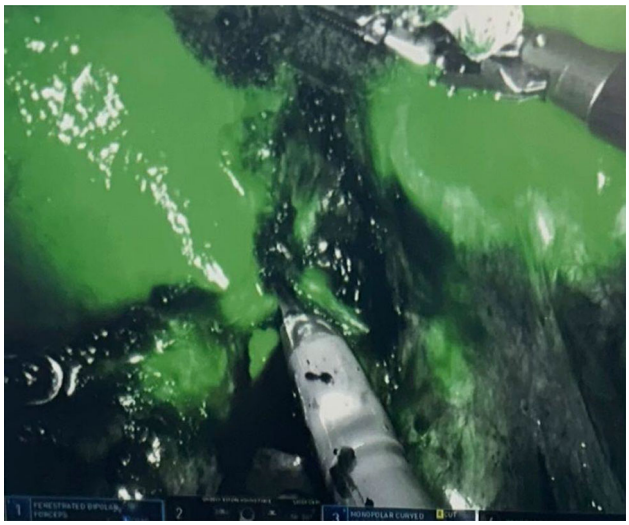
Case: Our patient presented for an elective robotic cholecystectomy. During dissection of Calot's triangle, the cystic duct and artery were easily identified and isolated. However, during the clearance of the cystic plate, fatty tissue was visualized with no additional structures apparent. Before proceeding with dissection to achieve the Critical View of Safety, Firefly fluorescence was activated.

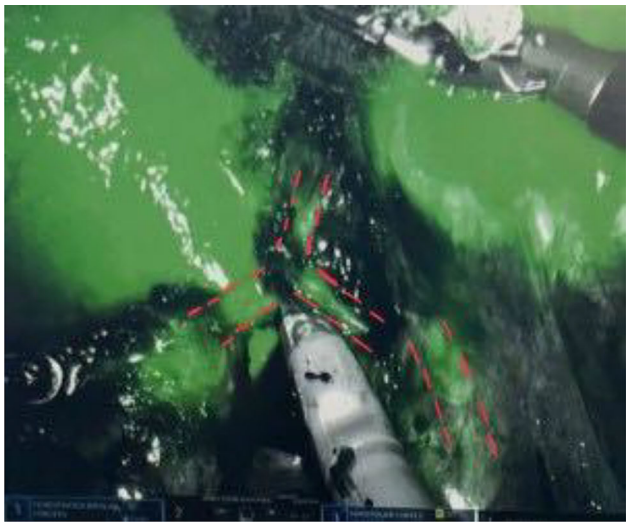
Upon activation, a green tubular structure illuminated parallel and posterior to Hartmann's pouch. The nature of the structure was unclear. A top-down dissection was performed to expose and preserve the structure. After complete dissection we were able to identify it as an aberrant right posterior sectorial duct draining into the cystic duct; the abnormal junction of this duct with the cystic duct was approximately 3 mm from the gallbladder.











Discussion: In Hisatsugu Type V cases, the aberrant right hepatic duct (ARHD) typically joins the cystic duct closer to the common hepatic duct. However, in our case, the junction was located less than 5 mm from the gallbladder. This specific location is described in the literature as carrying an extremely high risk of injury [3].

This case underscores both the advantages of the robotic platform in addressing complex biliary anatomy and the critical role of indocyanine green fluorescence in identifying the ARHD. Without the fluorescent imaging capabilities of the robotic system, there was a significant risk of duct injury, potentially leading to serious complications. This emphasizes the necessity of incorporating advanced intraoperative imaging techniques routinely, especially in cases where preoperative imaging may not be indicated.

Conclusion: Enhanced visualization using the robotic platform, combined with ICG fluorescence imaging, is helpful for preventing bile duct injuries. The findings from this case support the routine use of these imaging modalities in all cases to ensure optimal surgical outcomes.

P314

Outcomes of Biliary Stone Disease in a Newly Established ERCP Service at a District General Hospital in the UK

Amanda Suk Fun Cheng; Amarah Shaikh; Jada Saunders; Vasha Kaur; Christos Christodoulou; Ralph Greaves; Kingston Hospital

Introduction: 'Endoscopic retrograde cholangiopancreatography (ERCP) is an essential diagnostic and therapeutic procedure for the management of obstructive biliary stone disease. In the UK, there has been a drive to centralise ERCP services, but this led to delays in the service previously, causing significant waiting times for patients. To address these delays, the rationale for establishing a localised ERCP service at a district general hospital was to improve timely access to care and reduce complications associated with delayed treatment. In July 2023, an in-house ERCP service was introduced, prompting this audit to evaluate the service's quality, safety, and adherence to NICE guidelines that patients with choledocholithiasis causing jaundice should undergo ERCP within 72 h of diagnosis.
Methods: A retrospective audit was conducted using data from the electronic system and endoscopy logs for all patients admitted with choledocholithiasis, cholangitis, or biliary pancreatitis between July 2023 and March 2024. A total of 46 patients were included. Key performance indicators were assessed, focusing on compliance with the 72-h guideline, procedural success rates, and complications.
Results: The average time from imaging confirmation of bile duct obstruction to ERCP was 5.6 days, exceeding the 72-h target. Inpatients had slightly better outcomes, with an average wait time of 4.8 days compared to 6 days for outpatients. Despite these delays, the ERCP success rate was high at 91%, with 9% of cases either abandoned or unsuccessful. Complications were minimal, with two cases of post-ERCP pancreatitis, one case of post-procedure bleeding, one peripancreatic collection, and one duodenal perforation, all of which were managed conservatively.
Conclusions: While the introduction of ERCP services has improved access to care, significant delays in performing the procedure were identified, preventing full adherence to the NICE 72-h guideline. To improve service delivery, the introduction of an electronic referral system and formal outpatient pathways for stent removal are recommended. These steps will enhance efficiency, reduce waiting times, and ensure better patient outcomes. Overall, ERCP has proven to be a successful and safe procedure, but further optimisation is needed to maximise its benefits.

P315

Efficacy of Common Bile Duct Saline Irrigation to Reduce the Rate of Residual Choledocholithiasis: An Updated Systematic Review and Meta-analysis

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Introduction: Endoscopic stone removal is currently the standard of care for patients with common bile duct stones (CBDS), yet post-procedural recurrence remains a clinical challenge. Preventive saline irrigation of the common bile duct (PSIB) has been proposed to mitigate recurrence by enhancing the clearance of residual microlithiasis and biliary sludge. Therefore, this study aims to assess the efficacy of PSIB in reducing recurrence rate of CBDS.
Methods and Procedures: We searched PubMed, Embase, and Cochrane Central for studies comparing the use of saline irrigation versus no irrigation in patients undergoing endoscopic CBDS removal. Outcomes were stone-recurrence rate, operative time, and post-procedure complications. Risk ratios (RRs), mean differences (MDs), and their 95% confidence intervals (CIs) were computed using a random-effects model. This systematic review and meta-analysis followed Cochrane and PRISMA recommendations. The statistical analysis was conducted using Review Manager 5.4.
Results: A total of 1121 patients from six studies were included in this meta-analysis, of whom 363 (32.38%) underwent PSIB. The mean age of all patients was 63.52 years old. In our pooled analysis, we observed a significant decrease in stone recurrence in the saline group (RR 0.37; 95% CI 0.26–0.53; $p < 0.00001$; $I^2 = 0\%$). On the other hand, PSIB was associated with longer operative time (MD 3.96; 95% CI 2.30–5.62; $p < 0.00001$; $I^2 = 4\%$). There was no statistically significant difference between both groups in post-procedural cholangitis (RR 1.40; 95% CI 0.61–3.24; $p = 0.43$; $I^2 = 0\%$), post-procedural pancreatitis (RR 0.60; 95% CI 0.24–1.51; $p = 0.28$; $I^2 = 0\%$), and gastrointestinal bleeding (RR 0.68; 95% CI 0.09–5.48; $p = 0.72$; $I^2 = 0\%$).
Conclusion: In this comprehensive meta-analysis comprising 1,121 patients who underwent endoscopic CBDS removal (encompassing 798 more patients than the previous meta-analysis), PSIB was associated with a significant reduction in stone recurrence.

P316

Laparoscopic Management of Variant Ductal and Vascular Anatomy in Children with Choledochal Cysts

Ankur Mandelia; Nishant Agarwal, Dr; Anju Verma; Pujana Kanneganti; Rohit Kapoor; Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS), Lucknow, India

Aims: Variations in biliary ductal and hepatic vascular anatomy increase the complexity of surgery for choledochal cyst (CDC). Laparoscopic approach for management of pediatric CDCs with variant anatomy is underreported. This study aimed to describe anatomical variations, operative techniques, and early outcomes of laparoscopic hepatico-jejunostomy (HJ) in children with CDCs and variant anatomy.
Methods: We conducted a retrospective review of 40 children who underwent laparoscopic CDC excision with HJ between 2019 to 2024 in a single surgical unit. Patients were divided into Group I (with anatomical variations, $n = 20$) and Group II (without variations, $n = 20$). Data on demographic details, clinical presentation, imaging findings, pre-operative interventions, ductal and vascular anatomical variations, surgical techniques, intra-operative variables, postoperative complications, and outcomes were collected and analysed.
Results: Ductal variations were found in 10 patients, with aberrant right posterior sectoral duct (RPSD) being the most common. Vascular variations were identified in 12 patients, with anteriorly crossing right hepatic artery (RHA) being the most frequent. Group I had a higher mean age (7.32 vs. 3.57 years, $p = 0.014$) and longer operative times (415 vs. 364 min, $p < 0.0001$). Conversion to laparotomy was necessary in 10% of Group I and 15% of Group II patients ($p = 0.634$). Post-operative complications, primarily minor (Clavien-Dindo Grade I or II), occurred in 40% of Group I and 30% of Group II ($p = 0.495$). Group I had a significantly shorter time to full feeds (72 vs. 80 h, $p = 0.015$). Both groups had similar post-operative hospital stays and follow-up durations. At last follow-up, all patients, except one with liver failure in Group II, were asymptomatic with no significant biliary dilatation or liver function abnormalities.
Conclusion: Laparoscopic management of CDCs with variant ductal and vascular anatomy in children is feasible, safe and effective.

Detailed preoperative imaging, meticulous intra-operative assessment and tailored surgical techniques are crucial for successful outcomes.

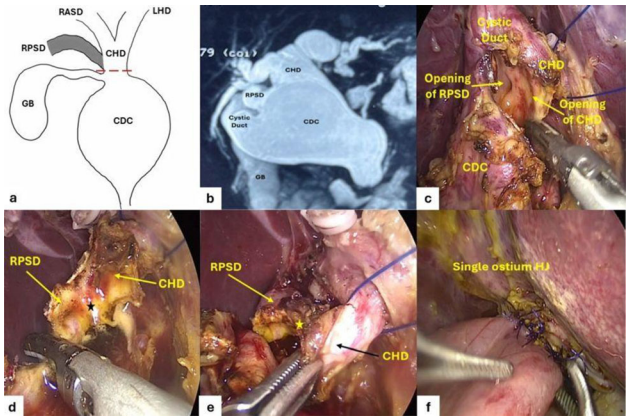

Fig. 1 Aberrant right posterior sectoral duct (RPSD) joining the common hepatic duct (CHD) and its surgical management

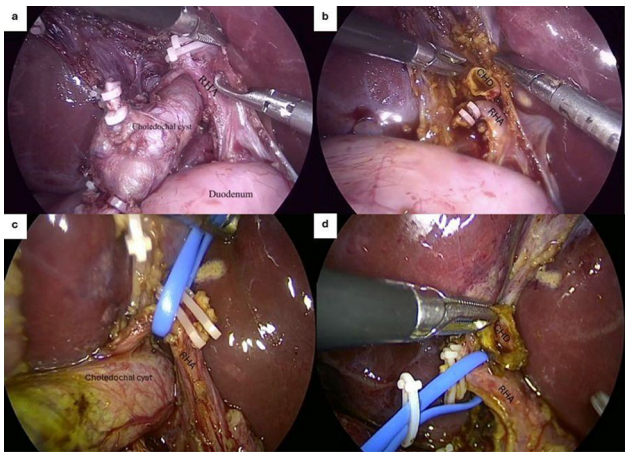

Fig. 2 Anteriorly crossing right hepatic artery (RHA) and its laparoscopic management

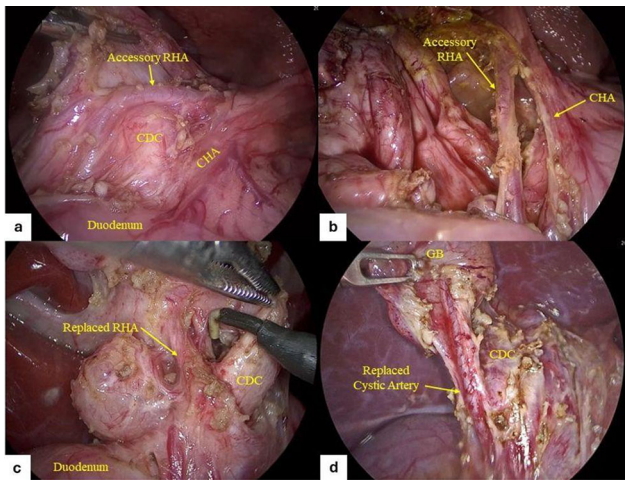

Fig. 3 Vascular anomalies encountered during laparoscopic choledochal cyst management

P317

Histopathologic Analysis of Prophylactic Cholecystectomies for Gallbladder Cancer is Resource-Demanding and Inefficient. Results of the Study of 2208 Cases in Two Academic Hospitals in Chile

Jorge Kutscher, MD[1]; Constanza Chabour[2]; Vicente Andrades[2]; Eugenio Grasset, MD, MEd[3]; [1]Universidad de Chile, Hospital del Salvador; [2]School of Medicine, Universidad de Chile; [3]Universidad de Chile, Hospital Santiago Oriente

Introduction: Gallbladder cancer is a rare malignant neoplasm, but it has a high mortality rate worldwide. Chile has the highest global incidence, estimated between 10 and 28 cases per 100,000 inhabitants, and it represents the ninth leading cause of cancer-related deaths in the country. The preventive cholecystectomy program, aimed at a low-risk population for neoplasms, is a key strategy in Chile. As a result, 26,500 cholecystectomies are performed annually under this program at a national level. This study aims to evaluate the results of these biopsies, their impact on oncological decision-making, cancer-specific mortality, and the associated costs.
Materials and Methods: This was a cohort study. All patients treated under the preventive cholecystectomy program of the Explicit Health Guarantees plan between January 2020 and December 2023 at Luis Tisné and Salvador hospitals were included. Cases without available pathology reports were excluded. Demographic variables, biopsy results, oncological decisions made by the multidisciplinary committee, total costs of the pathological studies, and cancer-related mortality in the cohort were analyzed.
Results: A total of 2208 patients were included, of whom 79.3% were women (1751). 114 patients who underwent surgery at other institutions due to exceeding the legal maximum waiting time were excluded due to lack of biopsy results. The average age was 41(7,8) years. Thirty-one biopsies showed some degree of atypia (77.4% in women), 13 cases of dysplasia (100% in women), and 4 cases were positive for cancer (0.19%). Three of these cases corresponded to biliopancreatic cancer; one required a hepatic resection, while the other two are under follow-up. The cancer-related mortality in the series was 0.09%. The total cost of the analysis was USD 50,957 (CLP 47,135,940).
Discussion: Of the total samples, 0.19% presented neoplasms, including one case of carcinomatosis due to cervical cancer. One gallbladder cancer case required hepatic resection, while the remaining cases (pT1a) are still under follow-up. Preventive cholecystectomy is a primary screening strategy. The low incidence of this cancer at early ages, combined with the resources used, suggests the need to identify subgroups at higher risk to optimize resource allocation.

P318

Bouveret Syndrome in Roux en Y Gastric Bypass: Obstruction in the Biliopancreatic Limb and Gastric Remnant

Judy Wong, MD, MPH[1]; Justine Kandolo[2]; Alexandra Abruzzo[2]; Kelly Sanchez[2]; Zachary Onkeo, MD[1]; Adelso Tejada-Jackson, MD[1]; Maria Sava, DO[1]; Gagandeep Samra, MD[1]; Lauren Bishop, MD[1]; Craig Biegel, DO[1]; Dmitriy Kim, DO, FACS[1]; Amit Gupta, MD[3]; Rodolfo Colaco, MD, FACS[3]; [1]St John's Episcopal Hospital; [2]St. George's University School of Medicine; [3]RWJ Barnabas Trinitas Regional Medical Center

Introduction: Bouveret's syndrome is a rare phenomenon which an impacted gallstone causes a gastric outlet obstruction.

Case Presentation: A 65-year-old female, hx Roux-en-Y gastric bypass 15 years ago, presented with 3-days worsening epigastric abdominal pain with associated nausea. Abdominal examination with epigastric tenderness.Vital and laboratory values were unremarkable. CT abdomen and pelvis demonstrated perforated cholecystitis with small collections posterior to the gallbladder, a fistulous connection to the duodenal bulb, and a gallstone causing obstruction of the gastric remnant with pneumobilia and mild dilatation of common bile duct. Patient was taken to the operating room for risk of perforation of gastric remnant due to duodenal obstruction secondary to the gallstone. Midline laparotomy performed and gastric remnant was identified with dilatation and severe induration in RUQ abdomen. Unable to identify the gallbladder and the fistula itself, it was decided to create a gastrotomy on the anterior gastric remnant and pass nasogastric tube to see if the tube could pass the site of obstruction; however unable to palpate the tube or the stone in distal biliopancreatic limb. It was then decided to administer gastrografin contrast through nasogastric tube to see if contrast passed distally,but this was unsuccessful. Due to limited resources in the hospital, it was decided to create a gastrostomy tube through the gastric remnant to temporize the obstruction. Postoperatively, patient had improved epigastric pain with gastrostomy site with bilious output.

Discussion: Bouveret Syndrome is a rare condition in which an impacted gallstone in the proximal part of the duodenum or pylorus secondary to fistula formation. While endoscopy can detect gastroduodenal obstruction in patients, visualizing the gallstone is less common. One study reported that the obstructing gallstone was identified in only 69% of cases. Bouveret Syndrome is usually managed with nasogastric tube decompression, endoscopic intervention, mechanical lithotripsy, and laparoscopic transgastric ERCP. However, Bouveret Syndrome in the setting of Roux-en-Y gastric bypass procedures have rarely been discussed; many case reports highlight patients with cholecystoduodenal fistulas that lead to gallstone obstruction in the first part of the duodenum.

Conclusion: This case report illustrates the rare instance of Bouveret's syndrome in a patient with altered gastrointestinal anatomy, and standard interventions were unavailable such as double balloon ERCP necessitating an urgent exploratory laparotomy. This case scenario has not been defined in the literature and shows the need for guidelines and management options for patients that have altered anatomy.

P319

Gallstone Ileus: A Rare and Elusive Cause of Intestinal Obstruction

Carla Campos; Gerardo Aguirre; Daniel Islas; Gerardo Garmendia; Manuel García; Mariana Treviño; Christus Muguerza Alta Especialidad

Gallstone ileus is a mechanical intestinal obstruction caused by the impaction of a gallstone within the gastrointestinal tract, accounting for less than 1% of intestinal obstruction cases. The symptoms can be acute, intermittent, or chronic, with the most common being nausea, vomiting, pain, and abdominal distension. Imaging is usually performed with computed tomography, with pneumobilia being the most characteristic finding and the presence of a detectable gallstone in the intestinal lumen.

The objective is to present a case of a patient with biliary ileus, as well as the therapeutic approach used. Additionally, this study aims to provide a comprehensive literature review on the subject.

Male, 70 years old, who began experiencing generalized abdominal pain five days prior, accompanied by nausea and vomiting of gastroalimentary content. A plain abdominal CT scan revealed pneumobilia, gas at the level of the gallbladder with wall thickening and irregularity, fat stranding, and an image suggestive of a fistulous tract at the second portion of the duodenum.

A diagnostic laparoscopy was performed, identifying dilated loops of the small intestine and a stone 50 cm from the ligament of Treitz. An enterotomy was performed, and the stone was extracted from the intestinal lumen, followed by primary closure of the enterotomy.

The patient had a good in-hospital recovery. He was discharged due to improvement and was followed up in outpatient consultations without any complications.

Gallstone ileus is a rare complication of cholelithiasis and is one of the rarest forms of all mechanical intestinal obstructions caused by the impaction of a gallstone within the gastrointestinal tract in which enterotomy with stone extraction is the preferred treatment.

P320

Covered Metal Stent for Intractable Biliary Stricture and Bile Leakage After Cholecystectomy: A Case Report

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Background: Covered metal stents are usually used only for malignant obstructive jaundice in Japan. In case of operative biliary tract injury, plastic stents are mainly used and metal stents are not usually applicable for this kind of benign strictures. We present a case utilizing a covered metal stent for intractable stricture and bile leakage after cholecystectomy and review the relevant literature.
Case Presentation: A 77-year-old female underwent laparoscopic cholecystectomy 3 months after percutaneous transhepatic gallbladder drainage (PTGBD). Biliary tract injury was observed during surgery due to dense adhesion caused by cholecystitis. Although suture closure was attained intraoperatively, bile leakage relapsed on the second postoperative day. Endoscopic retrograde cholangiopancreatography (ERCP) was performed and endoscopic nasobiliary drainage (ENBD) tube was placed for depressurizing and drainage of the biliary tract. Since her condition did not improve and the biliary stricture was admitted, a covered metal stent was placed to prevent leakage and expand the stricture 3 weeks postoperatively. Her condition improved and she was discharged at 1 month after the operation. The covered metal stent was removed by ERCP at 5 months after stent placement, bile leakage and biliary stricture were improved, and endoscopic retrograde biliary drainage (ERBD) tube was placed. The course after removal of the covered metal stent has been uneventful, there is no recurrence of bile leakage or biliary stricture, and the ERBD tube will be removed 7 months after stent placement.
Conclusion: We experienced a case of using covered metal stent for intractable biliary stricture and bile leakage after cholecystectomy.

P321

Feasibility and Safety Evaluation of a Novel Minilaparoscopic Appendectomy Technique Using Percutaneous Instruments Across Varying Degrees of Acute Appendicitis

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Introduction: Various laparoscopic techniques have been developed to reduce incisions' number and invasiveness, leading to shorter recovery times, hospital stay, decreased analgesic use, and fewer complications. Needlescopic/minilaparoscopic surgery employs instruments with a diameter of 3 mm or less. The MiniLap System utilizes a 2.4 mm percutaneous shaft with an integrated tip, eliminating the need for a trocar, reducing tissue trauma and a defect 12 times smaller than the 5 mm trocar. Several studies have demonstrated the safety and feasibility of minilaparoscopic appendectomy (MLA) for the treatment of acute appendicitis(AA) across various age groups and severities. This study aimed to report the outcomes and feasibility of a novel technique using minilaparoscopic/percutaneous instruments during MLA.
Methods: A prospective study evaluated the demographic, surgical variables and 30-day morbidity associated with MLA performed by a surgical team between June 2023 and August 2024. The procedure was performed using a 10mm trocar for the camera, either a 5mm trocar for minilaparoscopic-assisted cases or a 3mm trocar for totally MLA, placed suprapubically. A percutaneous handle (Teleflex Incorporated, Morrisville, NC, USA) was introduced through the right flank for appendix traction. Patients were discharged within 24 h with mild analgesics and antibiotics.

Figure 1. Trocar distribution

Results: A total of 32 patients were included, 22 (68.75%) were male. The mean patient age was 32.1 years, with a mean BMI of 29.5 kg/m^2. The mean operative time was 38.5 min(21-115min). Drainage was required in only 3 patients (1 with 4C-degree AA and 2 with 5-degree AA; exteriorizing it through the suprapubic trocar. Lavage was performed when necessary. Conversion of the suprapubic trocar was required in 10 patients, and 2 patients required conversion of the percutaneous instrument to a conventional trocar (both cases involved grade 5 appendicitis). During follow-up, 28 patients reported mild or no pain, with only 4 patients requiring additional analgesics and antibiotics due to intraoperative findings. No complications were reported during the follow-up period, and 93.75% of patients expressed high aesthetic satisfaction.

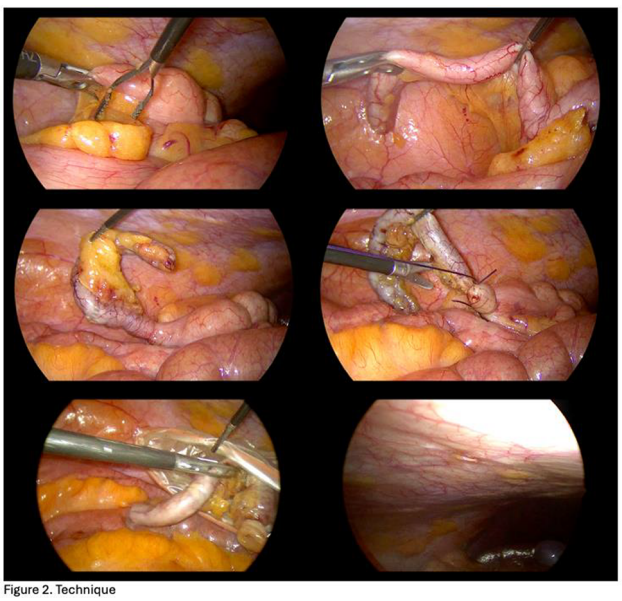
Figure 2. Technique

Conclusions: This novel approach utilizing a combination of minilaparoscopic and minilaparoscopic-assisted appendectomy with the

percutaneous MiniLap system appears to be both feasible and safe, with low morbidity, minimal postoperative pain and high aesthetic satisfaction;.outcomes were highly satisfactory, and the technique offers a promising alternative for the treatment of acute appendicitis.

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Laparoscopic Subtotal Cholecystectomy as a Safe Bailout Procedure: 3 Year's Experience in a Tertiary Teaching Institute

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Introduction: Laparoscopic subtotal cholecystectomy is bailout procedure in difficult cholecystectomy. This study aims to review the safety and feasibility of laparoscopic subtotal cholecystectomy.
Methodology: This is a retrospective analysis of prospectively recorded data of all the patients undergoing laparoscopic cholecystectomy over a period of three years (Jan 2021–August 2024) after covid pandemic, in a single surgical unit of a tertiary teaching hospital at India. The cases were divided into the following groups based on the type of cholecystectomy: laparoscopic cholecystectomy, laparoscopic subtotal cholecystectomy and open cholecystectomy. The primary outcome was the proportion of patients undergoing laparoscopic total, subtotal and laparoscopic converted to open cholecystectomy. The secondary outcomes were the incidence of intraoperative complications, bleeding, intra/postoperative bile leak, re-exploration, surgical site infection and postoperative hospital stay.
Result: A total of 872 cases of cholecystectomy were performed between the study duration. Among them, laparoscopic total cholecystectomy could be performed successfully in 805 (92.3%) patients. Sixty-four (7.3%) patients underwent laparoscopic subtotal cholecystectomy and conversion to open was seen in 3 (0.4%) patients. Majority of the patients in subtotal cholecystectomy were difficult cholecystectomy and status post ERCP. In the subtotal group, one patient had postoperative bile leak on day one and underwent re-laparoscopy. The rest of the complications were comparable.
Conclusion: Laparoscopic subtotal cholecystectomy is a safe alternate technique for laparoscopic conversion to open cholecystectomy in our unit, without increasing the morbidity and morbidity significantly.

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Recurrent Biliary Symptoms in Choledocholithiasis After Duct Clearance with Gallbladder In Situ

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Introduction: Preoperative endoscopic retrograde cholangiopancreatography (ERCP) for stone removal and elective cholecystectomy is indicated in patients with choledocholithiasis. The requirement and timing for elective cholecystectomy after ERCP in patients with common bile duct (CBD) stones and GB in situ are still controversial. In this COVID-19 era, elective cases were postponed and conservative treatment became more frequent. Several risk factors associated with post-ERCP, such as recurrent gallstone-related symptoms, and other complications have also been studied. This study can help surgeons in selecting patients and appropriate timing for post-ERCP elective LC in a limited operating room situation. The aim of this study is to identify risk factors for recurrent biliary symptoms in choledocholithiasis after ERCP completion in clearing CBD stones and deciding an optimal time for gallbladder removal.
Methods and Procedures: A total of 152 patients with CBD stones who underwent ERCP and completed CBD stone removal from Jan 2019 to Jan 2024 at Bhumibol Adulyadej Hospital were enrolled in the study. Six patients were dead; all were non-biliary causes, 35 (23.9%) patients underwent elective cholecystectomy, and 111 (76.0%) patients had gallbladder in situ. The demographic data, time of entry to cholecystectomy, and symptom occurrence were evaluated. The chi-square test and multivariable analysis were used to identify the risk factors of recurrent biliary symptoms. The survival analysis was used to assess the optimal time for gallbladder removal in patients with recurrent biliary symptoms and gallbladder in situ.
Results: Patients who underwent elective cholecystectomy have an average 147.31 $\pm$ 160 days interval after CBD stone removal. Of the patients who had gallbladder in situ, 40(36%) patients developed gallstone-related symptoms with a mean time of 186.57 $\pm$ 258.34 days. While 71(63%) patients can survive without any symptoms with the mean time of 1400.56 $\pm$ 684.93 days. The independent significant risk factors associated with gallstone-related symptoms are multiple CBD stones (OR 12.86, 95%CI, 5.0–32.8) and difficult choledocholithiasis (OR 27.4, 95%CI, 8.91–84.4). The survival analysis of recurrent biliary symptoms in patients with gallbladder in situ showed the incidence of recurrent biliary symptoms started from 2.5% at 186.6 $\pm$ 81.5 days and increased almost linearly thereafter.
Conclusion(s): Significant predictors for gallstone-related symptoms after ERCP clearing CBD stones are multiple CBD stones and difficult choledocholithiasis. The optimal timing for elective cholecystectomy is around 186 days (6 months) in patients with gallbladder in situ.

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Outcomes of Laparoscopic Subtotal Cholecystectomy for Severe Inflammatory Cholecystitis

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Background: With laparoscopic cholecystectomy becoming the standard surgical procedure, its indications have expanded from non-inflammatory cases such as cholelithiasis and adenomyomatosis to cholecystitis with severe inflammation. The difficulty of surgery varies greatly depending on the degree of inflammation, requiring flexible responses and techniques.
Methods: Among the surgical cases from January 2023 to May 2024, 22 cases involved subtotal or partial cholecystectomy with mucosal removal or mucosal ablation. We examined the waiting days from onset to surgery, approach methods, complications, and postoperative hospital stay. The surgery was performed by inserting two 5 mm ports through an umbilical incision, with one or two additional 5 mm ports and one 10mm port.
Results: The waiting days until surgery were 4.5 (1–21) days. All cases were completed laparoscopically without conversion to open surgery, but there were two cases of bile leakage. These two cases were treatable endoscopically and there was no case of postoperative biliary peritonitis or wound infection. The high number of elderly patients affected the postoperative hospital stay data, as it was influenced by the ongoing management of internal medical conditions and the need for rehabilitation due to reduced physical strength.
Conclusion: In the cases reviewed, there was a tendency for longer waiting days due to preceding medical treatment, but it did not lead to conversion to open surgery. Even in difficult-to-treat cases, selecting subtotal cholecystectomy allowed for the completion of surgery laparoscopically, avoiding fatal complications.

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Laparoscopic Radical Cholecystectomy for Carcinoma Gallbladder- Our Early Experience

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Introduction: Gallbladder cancer, though generally considered rare, is the most common malignancy of the biliary tract, accounting for 80–95% of biliary tract cancers.1We herein present our experience of two years in treatment of patient with gall bladder cancer by laparoscopic approach.
Material and methods: Data was collected retrospectively through electronically maintained patient database. Data collected included demographic details, imaging characteristics, incidentally detected caGB and histopathology reports. Patients with suspected Gall Bladder cancer/GB wall thickening went under CECT abdomen. In patients where CECT report showed features of malignancy, were planned for a diagnostic laparoscopy and radical cholecystectomy with portal lymphadenectomy. Few patients who had undergone laparoscopic cholecystectomy in outside hospital and come with histological proof of malignancy underwent wedge resection of liver and portal lymph node dissection. The data was analysed and outcomes were assessed.
Result: There were 23 patients diagnosed with carcinoma gall bladder and were almost equally distributed among male/female (11/12). Mean age of presentation was 54 years. All patients underwent laparoscopic radical cholecystectomy with portal lymphadenectomy. Out of 23 patients, 5 patients were incidentally detected with carcinoma gall bladder; 4 patients were preoperatively suspected with malignancy, and rest of 13 patients had definite malignancy and resectable disease on the basis of CECT findings. Among 5 patients which were incidentally detected underwent wedge resection of liver with portal lymphadenectomy; 2 were converted to open due to dense adhesions. In 4 cases which were suspected case of malignancy went underwent radical cholecystectomy, 2 cases histopathology report showed xanthogranulomatous cholecystitis and two cases showed moderately differentiated adenocarcinoma. In another 13 patients, laparoscopic radical cholecystectomy was performed. Final histopathology report showed adenocarcinoma in 9 patients and ICPN with high grade dysplasia in 2 patients and low-grade dysplasia in 2 patients. In all cases liver resected margin was free of tumour. The average hospital stay was 4.5 days, 5 patients had transient bile leak and 1 patient had delayed wound closure due to surgical site infection. The patients received adjuvant chemotherapy in post operative period. There was no 30 days mortality.
Conclusion: Laparoscopic radical cholecystectomy with portal lymphadenectomy is feasible option for carcinoma gall bladder. Radical surgery has good short term outcome.
Keywords: Carcinoma gall bladder, Adenocarcinoma, CaGB, Radical cholecystectomy
References:
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The Impact of Laparoscopic Cholecystectomy on Pregnancy Outcomes Throughout the US

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Introduction: In the early days of laparoscopic surgery, there were concerns of adverse outcomes with laparoscopic cholecystectomy during pregnancy especially later in the gestational period. Currently, laparoscopic cholecystectomy has been demonstrated to be safe during any trimester of pregnancy. The purpose of this study was to compare outcomes of cholecystectomy during pregnancy after the widespread use of laparoscopy throughout the United States.
Methods: The 2016–2020 Nationwide Readmissions Database was queried for all patients aged 18–45 years old undergoing cholecystectomy during pregnancy. The primary outcome was stillbirth and the secondary outcome was prolonged length of stay (LOS) > 5 days. Univariable comparison with chi-squared was performed for each outcome using covariables of laparoscopic versus open surgery, trimester of surgery, patient age, comorbidities, hospital characteristics, and socioeconomic status. Multivariable logistic regression was performed for each outcome using significant covariables from the univariable analysis.
Results: There were 5742 patients undergoing cholecystectomy during pregnancy. Laparoscopic surgery was performed in 5477 (95.4%) patients. Stillbirth occurred in 92 (1.6%) patients overall and there was no significant difference in patients undergoing laparoscopic versus open surgery, The risk factors for stillbirth included: surgery during the second trimester (OR 5.4 [1.6–18.3]) $p = 0.01$), 2 or more comorbidities (OR 3.1 [1.9–5.1] $p < 0.001$), and investor-owned hospitals (OR 1.9 [1.2–3.3] $p = 0.01$). Prolonged LOS was experienced by 1,240 (21.6%) patients. The risk of prolonged LOS was increased with open surgery (OR 3.6 [2.7–4.6] $p < 0.001$) and the presence of 2 or more comorbidities (OR 3.1 [2.6–3.7] $p < 0.001$).
Conclusions: This study provides reassuring evidence regarding the safety of laparoscopic cholecystectomy during pregnancy, affirming its viability as a preferred surgical approach. Stillbirth was rare and prolonged length of stay was associated with open surgery. Clinicians should recognize the risk factors such as the timing of surgery and the presence of comorbidities, which may influence the likelihood of adverse outcomes.

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Two-Year Outcomes Following Laparoscopic Radical Cholecystectomy For Carcinoma Gallbladder

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Introduction: Carcinoma gallbladder is an aggressive malignancy and opting for a minimally invasive approach remains debatable and is currently not widely accepted. Recently, several studies have shown better outcomes with similar survival rates. This study was conducted to evaluate outcomes following laparoscopic radical cholecystectomy for resectable carcinoma gallbladder.
Methods and procedures: All patients with an incidentally detected or preoperative diagnosis of carcinoma gallbladder that underwent laparoscopic radical cholecystectomy were included in the study. Demographic details, clinical presentation, and preoperative

investigations were recorded in a pre-structured proforma. Intraoperative and postoperative outcomes including final histopathology were noted.

Results: A total of 31 patients underwent radical cholecystectomy between 2021 and 2023, of which 13 patients underwent laparoscopic radical cholecystectomy. Most of the patients were males (58%) and the mean age was 48.5 years. The majority presented with pain (92%). All patients with suspicious imaging (61.5%) underwent preoperative FNA, with a positive yield of 83.3%. Five cases were incidentally diagnosed during or immediately after surgery. The mean operative time was 91 ± 18.5 min. Perforation of malignant gallbladder with bile spillage was present in two cases. Stones were found in 62% of cases with the mass. No significant intraoperative or postoperative complications were noted. The mean length of hospital stay was 2.3 days. The final histology reported adenocarcinoma (11 cases, 85%) stages T1b through T3, low-grade biliary intraepithelial neoplasm (1) and xanthogranulomatous cholecystitis (1). On six monthly follow-up, there was one patient with lymph nodal recurrence at the porta causing obstructive jaundice and hematemesis, at 17 months of follow-up. This patient was lost to follow-up and had not received adjuvant chemotherapy. There were five other cases planned for laparoscopic radical cholecystectomy, noted to be inoperable intraoperatively due to metastases to the liver, omentum, and or peritoneum.

Conclusion: The oncological safety of laparoscopic radical cholecystectomy for carcinoma gallbladder parallels that of open surgery, besides having all the advantages of a minimally invasive approach. We recommend laparoscopic radical cholecystectomy routinely in all cases that have no other contra-indications to laparoscopy.

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Lemmel's Syndrome Presenting as Biliary Pancreatitis: A Rare Case of Periampullary Duodenal Diverticulum Diagnosed by MRCP and EUS

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Background: Lemmel's syndrome is a rare cause of biliary pancreatitis, resulting from periampullary duodenal diverticulum compressing the CBD. Although periampullary diverticula are common, complications such as obstruction and pancreatitis are infrequent, complicating diagnosis and management. We present a case of Lemmel's syndrome initially mimicking more common biliary pathologies.

Case Description: An 83-year-old female presented with acute epigastric pain, non-radiating, associated with neurological symptoms. Her medical history included biliary colic managed conservatively without prior surgical intervention. Laboratory findings showed elevated amylase and lipase, and initial imaging revealed a dilated CBD with no clear obstruction. MRCP and EUS subsequently confirmed a large periampullary diverticulum compressing the CBD, consistent with Lemmel's syndrome. The patient was treated conservatively with ursodeoxycholic acid and fat-free diet.

Discussion: Lemmel's syndrome is a rare but important differential diagnosis in cases of obstructive jaundice and biliary pancreatitis in the absence of choledocholithiasis or malignancy. Our case emphasises the importance of considering periampullary diverticula as a differential in patients with biliary symptoms and highlights the utility of MRCP and EUS in making an accurate diagnosis. Early recognition is essential to prevent unnecessary invasive procedures.

Conclusion: Clinicians should maintain a high index of suspicion for Lemmel's syndrome in cases of biliary obstruction without evidence of stones or neoplasm. Conservative management can be effective in most cases, but surgical or endoscopic interventions may be required depending on symptom severity and response to treatment.

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Surgical Outcomes of Cholecystectomies Among Racial Groups in the United States: A Comparative Analysis Among American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) Hospitals

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Introduction: The cholecystectomy is one of the most common general surgery procedures in the United States, with more than 750,000 individuals undergoing the procedure annually. Disparities in the postoperative outcomes of minority groups are widely documented in the literature, showing that patients from these groups have higher rates of postoperative complications, readmissions, and mortality. Given existing data, we sought to investigate disparities in the postoperative outcomes of cholecystectomies, among participants of the American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP).

Methods and Procedures: Retrospective cohort study including all patients that underwent cholecystectomy between 2017 and 2021 in the 702 ACS NSQIP participant hospitals. Postoperative outcomes were compared across four racial groups defined by NSQIP: White non-hispanic, Black, American Indian or Alaskan Native, Asian, and Hispanic. NSQIP defines postoperative outcomes as (1) 30 day postoperative readmission and (2) 30 day postoperative reoperation. Patients with incomplete demographic/perioperative data were excluded.

Results: 323,765 cholecystectomies were performed between 2017 and 2021. 204,282 of all cholecystectomies (63.1%) were elective cases, while 37,777 (11.7%) were emergent cases. The remaining 25.24% of cases were not specified, and were excluded from the study. Of all included cases, 71% identified as White Non-hispanic, 8.6% as Black, 0.8% as American Indian/Alaskan Native, 3.8% as Asian, and 15.8% as Hispanic. Hispanic patients had the highest rates of emergent surgery (17%, $p < 0.0001$, $R = 0.9983$), while Black patients had the highest number of postoperative readmissions (6.3%, $p < 0.0001$, $R = 0.9788$). Black patients had the highest rates of postoperative reoperations (1.54%, $p = 0.008$, $R = 0.9702$), which was significant when compared to White patients and American Natives, however not when compared to other minority groups. Among emergent cases ($n = 26{,}293$), Black patients had the highest rates of postoperative readmission (5.6%, $p < 0.0001$, $R = 0.9901$), while White Non-Hispanic patients had the highest rates of postoperative reoperation (2%, $p < 0.0001$, $R = 0.9718$).

Conclusion: Among all cholecystectomies documented in NSQIP between 2017 and 2021, patients from minority backgrounds have the highest rates of emergent surgeries and postoperative complications. Among emergency cases alone, Black patients have the highest rates of postoperative readmissions while White Non-hispanic patients have the highest rates of postoperative reoperation. Future studies will aim to determine and address the causes of these disparities.

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Transduodenal Sphincteroplasty: Lessons from a Tertiary Care Center's Experience

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Background: Transduodenal sphincteroplasty (TDS) was first introduced to manage peri-ampullary tumors. Currently, it is reserved when endoscopic sphincterotomy has failed or when the ampulla is inaccessible due to altered anatomy. Our group has utilized TDS for patients with choledocholithiasis with history of Roux-en-Y gastric bypass (RYGB), sphincter of Oddi dysfunction (SOD), and ampullary tumors that were refractory to endoscopic treatments.
Methods: This retrospective study included fifteen consecutive TDS cases performed between 2017 and 2024 for choledocholithiasis, SOD and ampullary tumors in patients with prior RYGB. Patient demographics, clinical scenarios, and operative outcomes were examined. Differences between patient groups were analyzed using ANOVA.
Results: The mean patient age for the group was 61.3 (33–83). Majority (80%) of the patients were female. All eight patients with stone diseases had previous bypass procedures (1 duodenal switch). Two patients underwent TDS for SOD and five for ampullary mass. A sixth patient with the ampullary mass required extensive sphincterotomy and was converted to the Whipple procedure and excluded from the study. Demographics were similar between these two groups. Statistical analyses were not significant among the three groups.

		PRIMARY DIAGNOSES		
		Choledocholithiasis (n=8)	SOD (n=2)	Ampullary mass (n= 5)
PREOP	Age (years)	62	45.5	66.6
	Female (%)	75	100	80
	BMI (kg/m2)	29.79	33.8	23.74
	ASA	3	2.5	2.8
	CBD Diameter (mm)	17.59	13	9
INTRAOP	Operative Time (Min)	112.5	80.5	99
	EBL (mL)	82.5	80	220
POSTOP	PO-LOS (days)	4.75	2.5	11
	Readmission (%)	25	50	20
	Complications (%)	12.5	0	40

TDS was successful in 100% of stone cases, providing symptomatic resolution in 100% of patients with SOD and 80% of peri-ampullary masses. No operative leaks or mortalities occurred. The overall 90-day readmission rate was 26%, where patients were treated for wound dehiscence, surgical site infection, c. diff infection, and dysphagia.
Conclusion: TDS is a rarely performed operation that is useful in choledocholithiasis, SOD patients after failed ERCP, those with altered anatomy, such as RYGB, or those with ampullary masses requiring resection. It is safe and effective.

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Left Behind: A Rare Case of True Gallbladder Sinistroposition and Surgical Implications

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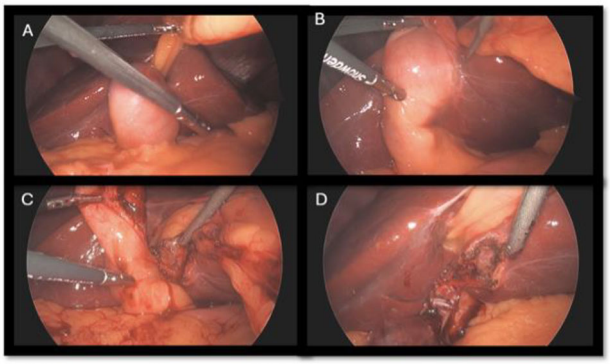

Figure 1: Intraoperative images of left sided gallbladder. A) attachment to left lateral segment, B) retraction of gallbladder laterally with attachment to cystic plate, C) top-down approach with fundus retracted laterally, D) left sided cystic plate with surgical clips after completion of cholecystectomy

Objectives: Encountering aberrant biliary anatomy is a known risk factor for inadvertent injury while performing biliary surgery. One described anatomic aberrancy, sinistroposition of the gallbladder (also known as "left sided gallbladder"), is a rarely seen anatomic abnormality with an incidence of 0.2% to 1.1%. Given the infrequent encounters with this abnormality and its association with other anatomic anomalies, extreme care and caution should be exercised when performing a cholecystectomy in this patient population.
Methods: We present the case of a 37-year-old male who presented with abdominal pain and was diagnosed with Tokyo Grade I acute calculous cholecystitis. An ultrasound of the abdomen demonstrated gallstones, evidence of acute cholecystitis, and an 11 mm common bile duct, but no other abnormalities. The patient was taken to the operating room for laparoscopic cholecystectomy. The abdomen was entered using a supraumbilical Hassan cutdown technique with subsequent standard laparoscopic port placement in the epigastrium and right upper quadrant. On initial inspection, the gallbladder was found to be attached to the left lateral segment, consistent with sinistroposition of the gallbladder. The decision was made to proceed with a laparoscopic, top-down (fundus first) approach to decrease the risk of injuring other aberrant vascular structure or biliary radicles. After difficult dissection off of the cystic plate we identified a solitary artery and duct terminating into the gallbladder. Preoperative indocyanine green (ICG) was also used, helping further characterize the patient's biliary anatomy prior to control and division of any structures. No other aberrant biliary anatomy was identified, and the gallbladder was removed without incident. Final pathology demonstrated acute cholecystitis.
Conclusion: Sinistroposition of the gallbladder is a rare anatomic abnormality that when encountered should be approached with caution and likely a change in standard operative approach. The condition is often discovered incidentally and intraoperatively, and this anatomy should alert the operator to the possibility of abnormal anatomy that may lead to an overall increased risk of complications. To more clearly define biliary and vascular anatomy in this clinical scenario, we recommend using a "top down" approach starting at the fundus, combined with ICG or further biliary imaging prior to dividing any structures.

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Development of a New Endoscopic Treatment for Bile Duct Injury Using Bioabsorbable Covered Stents

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In laparoscopic cholecystectomy, bile duct injury can occur and treatment can be difficult. Endoscopic repair of bile duct injury is the least invasive method, but currently, no tools or techniques have been developed to repair and regenerate the bile duct. We are developing a bioabsorbable bile duct substitute (artificial bile duct: ABD) that allows regeneration of bile duct injury without stenosis. At this conference, we would like to introduce an endoscopic treatment for bile duct injury using ABD, which is currently under investigation.

Bile Duct Regeneration Using ABD: In the past, we have successfully regenerated a ring-shaped bile duct with a long diameter of 3 cm using a bioabsorbable bile duct substitute (BBDS) (Am J Transplant 2005, World J Gastroenterol. 2022). Furthermore, using this ABD, we have demonstrated that it is possible to perform patch repair of bile duct damage (Surgery 2010), circular bile duct regeneration between native bile ducts (J Gastrointest Surg 2012), and bile duct regeneration at infection foci (Int Surg. 2015), and have aimed to develop a treatment method to restore the bile duct at the bile duct resection site.

Endoscopic Bile Duct Injury Treatment Using ABD: A hole of about 5 mm is made in the extrahepatic bile duct of a pig, and a bioabsorbable covered stent is inserted to endoscopically close the hole (the stent part is also made of bioabsorbable material). In early studies, this ABD was used to repair damaged bile ducts, and no stenosis was observed after treatment, showing promising results for clinical application.

Conclusion and Discussion: By using the ABD we are developing, it will be possible to treat bile duct damage (part of bile leakage) minimally invasively. It is expected that in the near future, endoscopic treatment using such bioabsorbable materials will provide a new minimally invasive treatment for bile duct damage.

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The Rare Face of Gallbladder Volvulus: A Dive into Uncommon Presentation

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Introduction: Gallbladder volvulus is a rare condition characterized by the twisting of the gallbladder around its mesentery leading to impaired blood flow and gangrene. The atypical presentation of this condition often poses diagnostic challenges. This case demonstrates the importance of considering gallbladder volvulus in the differential diagnosis of abdominal pain, even when initial laboratory findings and imaging are unremarkable.

Patient and Methods: We present a case of an 89-year-old woman with an otherwise unremarkable medical history who presented with severe epigastric pain radiating to the right upper quadrant, accompanied by nausea with no similar prior episodes. Although she was hemodynamically stable, she exhibited significant pain and tenderness on examination. Despite her distressing symptoms, laboratory tests, including white blood cell count and liver function tests, were normal. Further imaging studies, including ultrasound and cross-sectional imaging revealed a distended gallbladder with edematous wall and possible early ischemic changes. Therefore, diagnostic laparoscopy and cholecystectomy was offered to the patient for presumed acute acalculous cholecystitis.

Results: The patient was taken to the operating room for laparoscopic cholecystectomy. The procedure started with a diagnostic laparoscopy which revealed an ischemic gangrenous gallbladder. Further dissection revealed that the gallbladder was twisted along its mesenteric access causing the ischemic changes. There was minimal attachment to the liver from the posterior gallbladder wall leading to the volvulus. We proceeded to untwist the gallbladder along its access to expose the infundibulum. The cystic artery was found to be thrombosed and narrowed along with the cystic duct. Critical view was achieved, and both the cystic duct and artery were controlled with clips. The gallbladder was detached from its cystic bed without any perforation. The operative time was 80 min with minimal blood loss. Patient was discharged on post-operative day 3 and final histopathology of the specimen reported ischemic/necrotic gallbladder.

Discussion and Conclusion: Gallbladder volvulus is an uncommon yet critical diagnosis that requires high clinical suspicion, particularly in elderly patients presenting with atypical symptoms. In the early presentations, gallbladder volvulus can compress both the artery and vein, preventing the release of inflammatory markers into the systemic circulation, which may result in normal laboratory findings. This case underscores the importance of considering gallbladder volvulus in the differential diagnosis of acute abdominal pain and emphasizes the critical role of a thorough physical examination, particularly when laboratory and imaging results are contradicting. Prompt surgical intervention is essential for optimal outcomes.

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Dangers of a Dislodged Percutaneous Cholecystostomy Tube: Common Femoral Artery Mycotic Aneurysm

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Infected aneurysms, also called mycotic aneurysms, are rare in native vessels. Salmonella is the second most common isolate in mycotic aneurysms reported in the literature. Large, femoral mycotic aneurysms require prompt surgical intervention and provide a unique and challenging scenario to repair large native vessels in an infected field.

We present a case of a 69-year-old male with chronic kidney disease, prior debilitating stroke on antiplatelet therapy, and diabetes who presented to the emergency department with several days of abdominal pain, sepsis and a pulsatile left groin mass one month after a percutaneous cholecystostomy tube (PCT) was placed for acute cholecystitis. PCT placement at that time was pursued due to his high anesthesia risk. He was aggressively resuscitated and his PCT was interrogated, and it was found to be dislodged outside the gallbladder wall. Unfortunately, the gallbladder was severely contracted and the PCT was unable to be cannulated by Interventional Radiology. Vascular Surgery was engaged for evaluation of his 4 cm left femoral artery aneurysm. This was consistent with a mycotic aneurysm in the setting of Salmonella positive blood cultures as well as prior biliary fluid sampling positive for the same during his last admission. Once he was adequately resuscitated and placed on targeted antibiotic therapy, the decision was made to proceed first with laparoscopic cholecystectomy for source control. This was followed by left common femoral artery aneurysm resection, interposition grafting with cryopreserved femoral vein, and reimplantation of the profunda femoral artery. Aneurysmal tissue cultures demonstrated Salmonella enterica. The patient progressed well post operatively and was discharged with long-term antibiotic therapy.

P336

Transgastric Polypectomy for Benign Giant Gastric Polyps as an Alternative to Endoscopic Resection

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We allow ourselves to propose a laparoscopic technique for the management of giant hyperplastic polyps associated with a pyloric syndrome, not susceptible to endoscopic resection as the identification of gastric polyps incidentally in endoscopies of the upper digestive tract has increased its incidence, varying between 0.5 and 23%. 10% of these polyps have symptoms, 40% are hyperplastic.

A series of patients approached by laparoscopic transgastric polypectomy due to the giant gastric polyps associated with pyloric syndrome, in Bogotá, Colombia, from January 2015 to December 2018.

Seven patients, 85% female, with an average age of 51 years, who were admitted for pyloric syndrome and were taken to laparoscopic management, with an average surgical time of 42 min, intraoperative bleeding 7–8 cc, tolerance to the oral route 24 h, no conversion, without mortality.

In conclusion, Transgastric polypectomy for the management of benign giant gastric polyps that cannot be resected endoscopically turns out to be a feasible method, with a low rate of complications and without mortality.

P338

Arteriobiliary Fistula and Post-Traumatic Pseudoaneurysm in the Right Hepatic Artery: A Case Report

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Introduction: Hemobilia, resulting from an abnormal communication between a blood vessel and the biliary tract, can be caused by trauma, tumors, or aneurysms. This condition is more common in older males and is associated with vascular degeneration. Symptoms include gastrointestinal disturbances, and diagnosis involves imaging and endoscopy. Preferred treatment is transarterial embolization, with surgery for refractory cases.

Objective: To describe a case of an arteriobiliary fistula in the right hepatic artery, including clinical presentation, diagnosis, management, and patient outcome.

Patient: A 21-year-old female with no chronic diseases and a history of laparoscopic cholecystectomy in September 2023 presented with intermittent hematemesis and hematochezia in February 2024. She was referred to gastroenterology for further evaluation.

Diagnostic Workup

- Endoscopy (Feb 9, 2024): Showed chronic gastropathy with erosive and follicular changes. Biopsies indicated moderate chronic gastritis with H. pylori, without metaplasia or dysplasia.
- Endoscopy (Feb 27, 2024): Revealed hyperemic mucosa and a subepithelial lesion with minor bleeding in the antrum. Adrenaline injection and hemoclip placement were performed. The duodenal papilla showed bile flow without bleeding.
- Endoscopy (Mar 5, 2024): Detected self-limiting mucosal bleeding at the gastroesophageal junction, likely inactive hemobilia.
- Endoscopy (Mar 6, 2024): Confirmed hemobilia of undetermined etiology.
- CT Abdomen (Mar 6, 2024): Showed intrahepatic bile duct dilation and pneumobilia post-cholecystectomy. A round image in the right hepatic artery branch, compatible with an aneurysm, was observed.

The patient exhibited hypovolemic shock and was hospitalized. She was on mechanical ventilation, sedated, with a nasogastric tube output of bile, suboptimal hydration, weak pulses, and capillary refill of 3 s. Vital signs: BP 106/48 mmHg, HR 90 bpm, RR 18, Temp 37.4 °C, O_2 sat 100% with FiO_2 25%. Lab results: hemoglobin 5.5 g/dL, hematocrit 16.4%, leukocytes $7.69 \times 10^3/\mu L$, platelets $300 \times 10^3/\mu L$, PT 17.6 s, aPTT 35.2 s, INR 1.55, creatinine 0.5 mg/dL, sodium 134 mEq/L, potassium 3.8 mEq/L, total bilirubin 2 mg/dL, direct bilirubin 0.1 mg/dL, indirect bilirubin 1.9 mg/dL, LDH 164 U/L, alkaline phosphatase 195 U/L, AST 107 U/L, ALT 130 U/L.

Results: This case illustrates post-cholecystectomy hemobilia with severe complications requiring hospitalization and interventional procedures to control bleeding and improve patient condition.

Conclusions: Hemobilia, characterized by bleeding into the biliary tract due to abnormal vascular communication, can result from trauma, surgery, tumors, or aneurysms. Diagnosis requires imaging and endoscopy. Transarterial embolization is preferred, though surgery may be needed in severe cases.

P339

Trauma/Emergency General Surgery Experience with the Choledocoscope at a Rural Tertiary Care Institution

Emma K Satchell; Shannon M Baron, MD; Robert Behm, MD; Guthrie Robert Packer Hospital

Introduction: Management of choledocholithiasis has traditionally involved an ERCP with GI followed by a laparoscopic cholecystectomy. Technological advancements have introduced the choledocoscope, allowing surgeons to offer one operation that simultaneously removes the gallbladder and clears the common bile duct, bypassing the ERCP. The purpose of this study is to determine the operative time, length of stay, and post-operative complications including NSTEMI and pancreatitis, in patients with choledocholithiasis who underwent laparoscopic common bile duct exploration with our trauma/emergency general surgery department.

Methods and Procedures: Approval was obtained from our institutional IRB. Patients who had laparoscopic cholecystectomies with laparoscopic common bile duct explorations performed by the

emergency general surgery service were identified by searching the procedure field for "spyglass" and "common bile duct exploration." Average operative time, length of stay, and complications including STEMI/NSTEMI, pancreatitis, and death were calculated. The need for post-operative ERCP was also examined. Due to the small n, averages, percentages, and ranges are reported.
Results: Spyglass was used at our institution in the trauma/emergency general surgery department starting in 2022. Nine patients were identified, 6 women and 3 men. The average age was 56 with a range of 20 to 82. Six of the nine were successful (66%), four of nine (44%) required a post-operative ERCP. One patient who had an unsuccessful duct exploration died during the hospitalization. No other complications were observed: there were no cases of pancreatitis, NSTEMI, return to OR, or readmission within 30 days. The average operative time was 181 min (3 h), range 109–293 min. The average length of stay was 4.44 days, range 1–11 days. Four surgeons and six residents performed these nine cases.
Conclusions: Here we report outcomes for laparoscopic cholecystectomy with common bile duct exploration within the trauma/emergency general surgery department at our rural tertiary hospital. Our success rate (66%) is somewhat below those published by other authors, who have reported success rates that approach 90%. Average length of stay reported for patients at other institutions ranges between 2 and 3.5 days, below our 4.44 days. Complication rates vary widely in the literature; our only reported complication was one death. This initial investigation will lead to our next step, comparing these outcomes to our patients who have ERCP first followed by laparoscopic cholecystectomy.

P340

Management of Dysfunctional Bile Duct Secondary to Choledocholithiasis in Octagenary Patients with Reconstruction Through Choledochoduodenostomy

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Objective of the Study: The objective of this study is to evaluate the surgical outcomes of patients with dysfunctional bile duct secondary to choledocholithiasis not resolved by endoscopy. Additionally, it aims to determine the clinical characteristics of the patients for whom this surgical technique is chosen and the postoperative period of patients who undergo choledochoduodenostomy.
Methods and Procedures: We performed a retrospective series of elderly patients who underwent choledochoduodenostomy with a dysfunctional bile duct, defined as higher than 2 cm in our medical center (Hospital Simon Bolivar) with choledocolithiasis. We analyzed preoperative, intraoperative, and postoperative outcomes.
Results: A total of 15 patients underwent choledochoduodenostomy between 2000 and 2024. The median age was 70 years, with a male-to-female ratio of 7:8. The main symptoms are abdominal pain associated with jaundice. The average stone size was 20 mm. Intraoperative findings confirmed the presence of choledocholithiasis in all cases. The mean operative time was 90 min, and the mean hospital stay was 7 days. With an overall complication rate of 10% (seromes). Successful stone clearance was achieved in 100% of the cases. There were no mortalities reported during the follow-up period of 24 months. The readmission rate was 5% of patients after initial discharge.
Conclusión: In patients with dysfunctional bile duct with secondary choledocholithiasis who undergo choledochoduodenostomy, the procedure shown to be safe, effective and reproducible in elderly patients unfit for major surgery.

P341

A Case Report and Review of the Management of Hepatic Subcapsular Bilomas After Laparoscopic Cholecystectomy

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Introduction: Bile leaks are known complications of laparoscopic cholecystectomy (LC) affecting roughly 1% of patients. The resulting bile leak, biloma, and/or biliary peritonitis are well-studied and managed accordingly. However, the postoperative formation of hepatic subcapsular bilomas (HSBs) is a rare complication without specific recommendations on management. We report our management of a postoperative HSB and review the literature for similar reported cases and effective management strategies.
Case: A 67-year-old female with a complex medical history presents with epigastric abdominal pain and is diagnosed with gallstone pancreatitis. After the resolution of her pancreatitis and normalization of liver function tests, she underwent an uncomplicated LC and was subsequently discharged. She presented again on postoperative day 17 with right upper quadrant (RUQ) pain and a notable RUQ mass. Computed tomography (CT) revealed a 13 cm subcapsular hepatic fluid collection, and percutaneous drain placement immediately yielded 3L of bile. This was consistent with a diagnosis of an HSB. Despite an unsuccessful initial endoscopic retrograde cholangiopancreatography (ERCP), a repeat ERCP found a retained gallstone not seen on magnetic resonance cholangiopancreatography, and a sphincterotomy and a biliary stent placement were performed. She was discharged with the drain when clinically stable.
Method: We report one patient with an HSB after LC and review the clinical record. Additionally, we perform a comprehensive literature review of case reports in the English language describing HSB after LC.
Results: A comprehensive literature review identified 7 other reports of similar post-LC HSB diagnoses. The most common indication for LC was acute cholecystitis (62.5%). The median postoperative presentation of HSBs was 13.5 $\pm$ 2.4 days. 7 out of 8 cases developed HSBs affecting the right hepatic lobe. All patients underwent percutaneous drainage of the HSB, and 50% of patients underwent ERCP. Percutaneous drains were removed in 6 $\pm$ 2.7 days. A majority of the cases reported repeat imaging in the form of CT or ultrasound after or at the time of drain removal for confirmation of the resolution of the HSB.
Conclusion: HSBs are infrequent complications of LC with no specific recommendations on management. Literature review shows half of HSBs resolved with drainage alone while the remainder underwent ERCP as well. Clinically, drainage plus or minus ERCP has proven to be an effective HSB management. However, further research will help elucidate comprehensive management guidelines, including possible risk factors, anatomical predispositions, clinical decision-making, or follow-up imaging.

P342

Unique Presentation of Perforated Gallbladder and Gangrene in an Advanced Pregnancy: Management and Other Considerations

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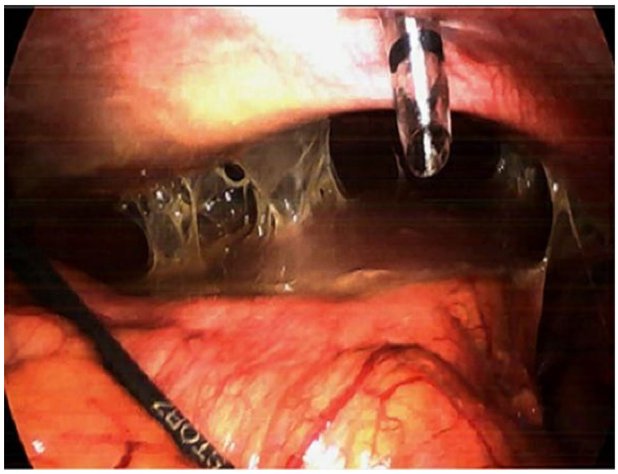
Introduction: Acute cholecystitis is a common general surgery procedure in the United States. However, acute cholecystitis in pregnancy presents significant risks to both fetal and maternal health, especially in the third trimester. There are conflicting viewpoints on the appropriateness of conservative versus surgical management in gravid patients with acute cholecystitis. This is a report of a woman in advanced pregnancy with complicated acute perforated cholecystitis and signs of preterm labor who successfully underwent laparoscopic cholecystectomy and later had an uncomplicated term vaginal delivery.

Case: A 41-year-old female at gravida 3 para 2-0-0-2 with past medical history of diet controlled gestational diabetes at 34 weeks gestation presented as a transfer from an outside facility with concerns for acute cholecystitis and preterm labor. A RUQ ultrasound showed gallstones and biliary sludge without dilation of the common bile duct. Labs showed a white blood cell count of 15.5, aspartate aminotransferase of 19, alanine aminotransferase of 23, and alkaline phosphatase of 248. On presentation, the patient appeared septic and endorsed 10 out of 10 pain in the RUQ and nausea. Her exam demonstrated tenderness to palpation with light touch, worst in the RUQ, however, she had diffuse peritoneal signs. She had regular contractions and cervical dilation from 1 to 3 cm within a few hours. Betamethasone and piperacillin/tazobactam were given to enhance fetal lung maturity and for antibiotic prophylaxis in the case of preterm labor. General surgery was consulted and recommended laparoscopic cholecystectomy on day 1 of admission. A subtotal cholecystectomy was performed due to gallbladder perforation noted upon entry and difficulty identifying the cystic duct and the common bile duct. A Blake drain was placed without noticeable leakage of bile. On postoperative day 2, the patient had increased bilious output from the drain, requiring ERCP on postoperative day 3 with sphincterotomy and stent placement. The patient's contractions ceased after surgical intervention, and she remained 3 cm dilated without further progression. Patient was discharged on postoperative day 4 on antibiotic prophylaxis and weekly antepartum fetal surveillance until induction at 37 weeks, which resulted in a normal vaginal delivery without fetal or maternal complications.

Discussion: The risks and benefits of surgical management of complicated acute cholecystitis during late term pregnancy should be individualized after a careful discussion between the patient and the healthcare team. This case underscores the importance of individualizing treatment plans and supports the safety of laparoscopic cholecystectomy during any trimester.



P343

Does PTGBD Affect Surgery Time and Hospital Stay in Acute Cholecystitis? A Single-Center Retrospective Study

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Introduction: This study examines the influence of the ASA (American Society of Anesthesiologists) score and percutaneous transhepatic gallbladder drainage (PTGBD) on surgery time and hospitalization duration in patients with cholecystitis. PTGBD is often applied in severe cases of acute cholecystitis, and this study aims to determine its effect on surgical outcome.

Methods and Procedures: A retrospective review was conducted on 75 patients who underwent cholecystectomy, either with or without PTGBD, between September 2023 and August 2024. All PTGBD procedures were performed via a transhepatic approach by a single surgeon using ultrasound guidance and local aneshesia.

Results: Out of 75 patients, 69 underwent laparoscopic cholecystectomy, while 6 underwent open cholecystectomy. Among the patients, 42 were diagnosed with acute cholecystitis and 33 with chronic cholecystitis. A total of 35 patients with acute cholecystitis and 2 with chronic cholecystitis underwent PTGBD before surgery. Most patients had ASA scores of 2 or 3, reflecting advanced age and underlying conditions.

The average hospital stay was 27.9 days for acute cholecystitis patients and approximately 20 days for those with both acute and

chronic cholecystitis. The interval between PTGBD and cholecystectomy averaged 28.1 days for both acute and chronic cases.

Statistical analysis showed that the ASA score did not significantly impact surgery time(ANOVA; p: 0.770) or hospital stay(ANOVA; p: 0.670). Similarly, in cases of acute cholecystitis, the presence of PTGBD did not significantly affect surgery time(independent t-test; t: 1.10, p: 0.362). However, patients who underwent PTGBD had significantly longer hospital stays compared to those who did not receive the procedure(independent t-test; t: 2.39, p: 0.023).

Conclusion: PTGBD does not significantly impact surgery time in acute cholecystitis but is associated with longer hospital stays. Cholecystectomy without prior PTGBD results in shorter surgeries, though PTGBD is typically necessary for more severe cases, contributing to extended hospitalization. The ASA score had minimal effect on both surgery time and hospital stay, while PTGBD notably extended hospital stay in acute cholecystitis patients.

P344

The Double Gallbladder: Case Report

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Gallbladder duplication is a rare congenital anomaly formed due to exuberant budding along the developing fetal biliary tree in utero. These typically occur when the caudal head and hepatic diverticulum divide; these variants can be separated into numerous types according to Boyden's classification. Fully bifid gallbladders can be seen in "Y-shaped" or "H shaped" types, based on the attachment sites of each cystic duct into the rest of the biliary tree. In this case report, we describe the workup & operative management of a 27-year-old woman who is approximately four months post-partum who presented with several weeks of biliary colic symptoms. She had been seen in the emergency room for evaluation of an acute exacerbation of her waxing-and-waning right upper quadrant abdominal pain, undergoing both CT and ultrasound imaging showing cholelithiasis without signs of acute cholecystitis. Imaging did not reveal the presence of a double gallbladder, only a fold within the gallbladder. Patient underwent an elective robotic cholecystectomy with ICG. Intra-operatively, however, there was significant difficulty in identifying biliary anatomy. A second duct was encountered during the dissection of a critical view of safety. Initially thought to be the common hepatic duct, indocyanine green was used and showed the second ductal structure to be a bile duct. A plane between this ductal structure and dissected portion of the gallbladder was not identified. We then decided to approach it top down and connect the planes of dissection laterally and medially around the upper half of the gallbladder. During that dissection we noted an unusual, thickened peritoneum in the middle of the gallbladder. With blunt dissection, that peritoneal fold separated and a plane opened up to the posteriorly dissected liver bed. At this point we confirmed with ICG and realized that the patient likely has an H-Shaped double gallbladder variant. This is a very rare anomaly with an incidence of 1/4000 births with unknown incidence of symptomatic cholelithiasis or cholecystitis. It poses anatomic danger in cholecystectomy as it can be misleading and increases risk for bile duct injuries. Adhering to principles of safe cholecystectomy is crucial in identifying these anomalies and avoiding bile duct injuries. Use of robotic platforms and ICG proved very useful for our patient as it allowed for better visualization, retraction and clear identification of anatomy.

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Overcoming Surgical Adversity: Laparoscopic Cholecystectomies in Extreme Pathologies- A Case Series of Complex Challenges

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Laparoscopic cholecystectomy (LC) is the gold standard treatment for symptomatic cholelithiasis. This case series highlights a variety of challenging scenarios & demonstrates bail-out strategies which can successfully address these high-risk conditions while maintaining patient safety.

CASE 1: GANGRENOUS GALL BLADDER

35/F C/O: fever, chills, pain abdomen, vomiting

P/A: epigastric tenderness+

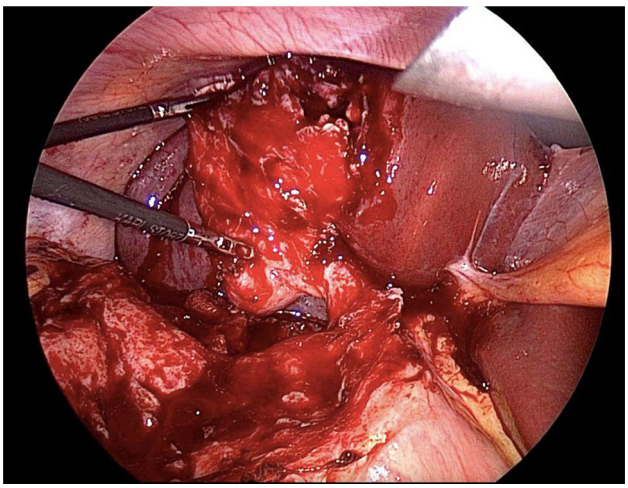
Labs: Hb:10.4, TLC:7000, Plt:238000, CRP:300.25, T.bili:0.74, D.bili:0.47 ALP: 113, SGOT:25, SGPT:28

CT: 2.6 cm calculus, GB perforation

Intra-op: Dense omental and colonic adhesions, frozen Calot's triangle, posterior wall of GB gangrenous with abscess cavity extending into the liver.

Bail-out procedure: fundus first technique.

HPE: acute cholecystitis, transmural necrosis.



CASE 2: PSEUDO MIRIZZI SYNDROME (ACALCULUS CHOLECYSTITIS)

51/M C/O: Pain abdomen, fever, chills, vomiting

O/E: Icterus+

P/A: Murphy's sign+

Labs: Hb:12.4 TLC:15160, Plt:249000, CRP:223, Creat:1.43, T.bili:2.70, D.bili:2.50 ALP: 165, SGOT:143, SGPT:68, GGT:188

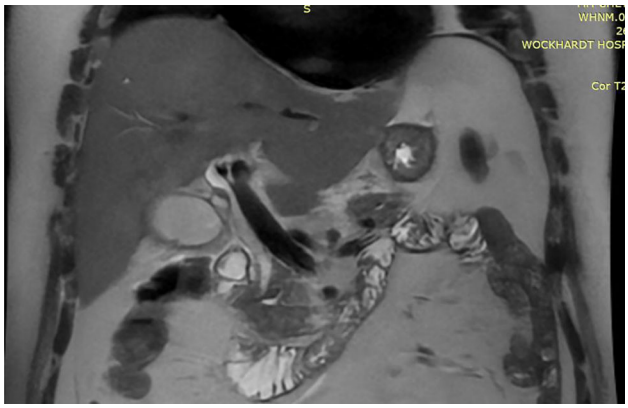
CT/MRCP:GB distended, sealed perforation at fundus, localized collection, Compressed CHD between GB neck and portal vein, Mild IHBR-D.

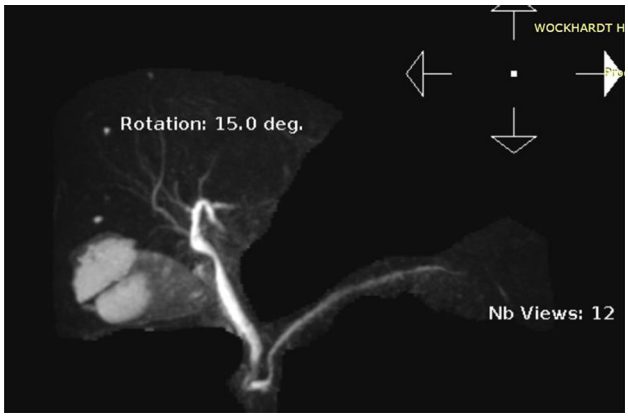
ERCP: narrowing at CHD, cholangitis, CBD stenting done

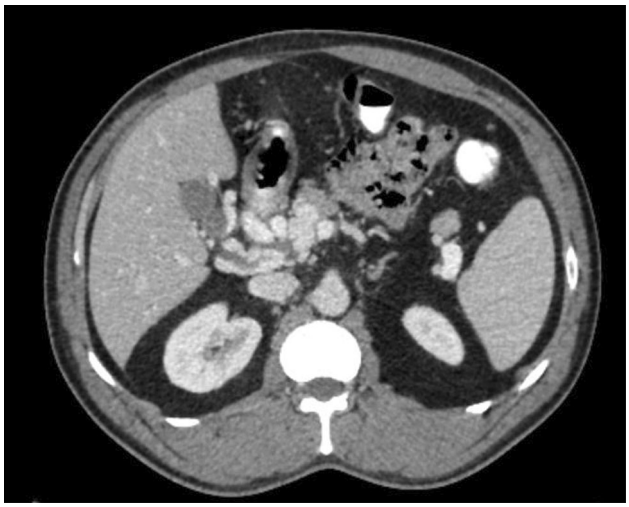
Intra-op: Dense omental and colonic adhesions, frozen Calot's triangle, GB neck compressing CHD, empyema with type-2 perforation, no calculus.

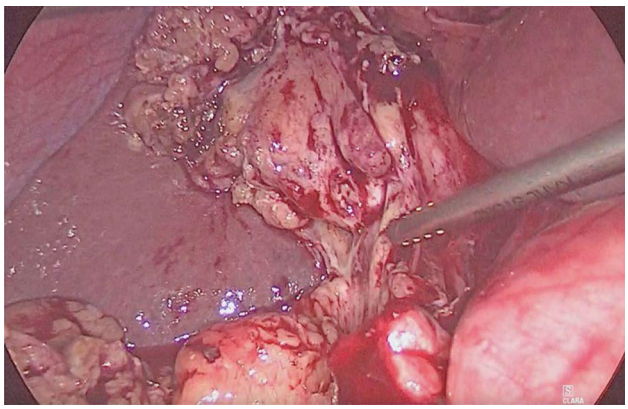
Bail-out procedure: fundus first approach.

HPE: emphysematous cholecystitis.

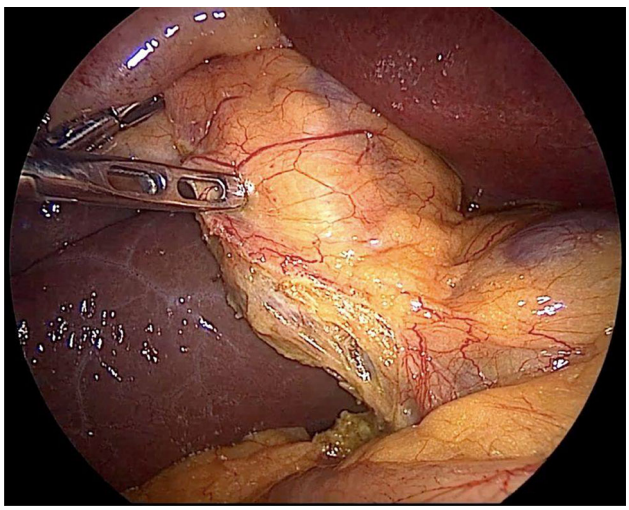








CASE 3: CHOLELITHIASIS WITH PORTAL CAVERNOMA
38/M C/O Epigastric pain, Vomiting
O/E: Icterus+
PA: Epigastric tenderness
Labs: Hb:13.5 TLC:5200, Plt:124000, T.bili:5.75, D.bili:4.01, ALP: 226, SGOT:71, SGPT:133, GGT:558
CT/MRCP: Portal cavernoma, Calculus cholecystitis, Choledocholithiasis.
ERCP: Choledocholithiasis, CBD stenting.
Intra-op: portal cavernoma, multiple collaterals in GB fossa
Bailout and strategy: fundus first approach, meticulous dissection and ligation of collaterals with bipolar.
HPE: Cholecystitis.



CASE 4: SYMPTOMATIC CHOLELITHIASIS WITH LARGE LIVER HEMANGIOMA
52/M C/O: Pain Abdomen, dyspepsia
PA: Mild RH tenderness

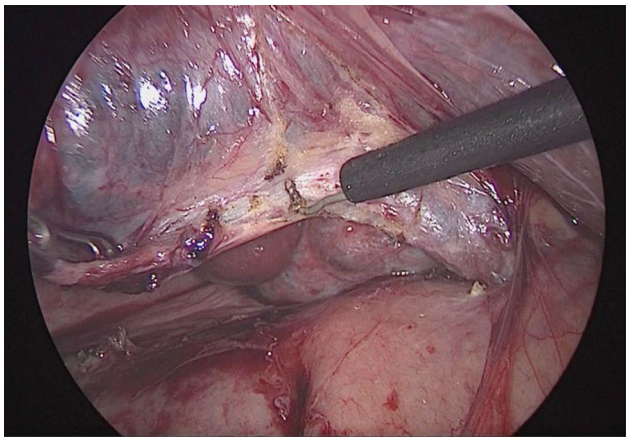
CT: Large hemangioma 8.2 × 7.6 × 10.4 cm in segment: V,VI,VII,VIII, exophytic, indenting posterior surface of GB

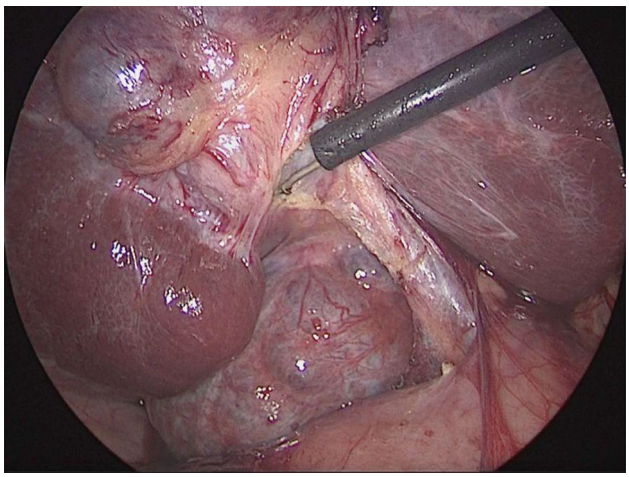
Intra-op: Dense omental, duodenal and colonic adhesions, Large exophytic hemangioma.

Labs: CBC,LFT:WNL

Operative Strategy: Achieving Critical View of safety, meticulous dissection at GB fossa.

HPE: Cholecystitis.





CASE 5: CALCULUS CHOLECYSTITIS WITH CHOLEDOCOLITHIASIS WITH MIRIZZI SYNDROME

38/F C/O: Epigastric pain, Nausea, Vomiting

PA: Murphy's sign+

Labs:Hb:11.4,TLC:14580, Plt:278000, T.bili:0.42, D.bili:0.8, ALP: 92, SGOT:28, SGPT:18, GGT:59, CRP:270

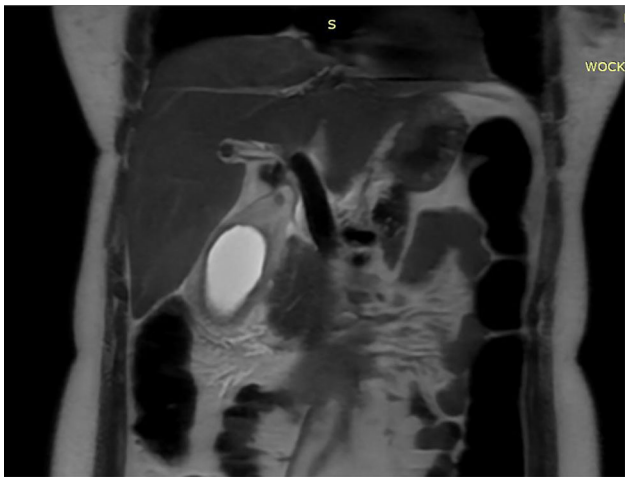
CT/MRCP: Acute calculus cholecystitis, Mirizzi syndrome, Choledocholithiasis

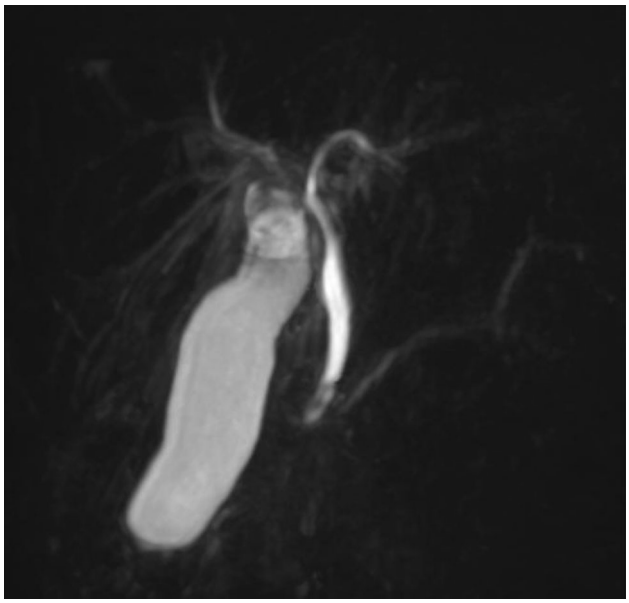
ERCP: Choledocholithiasis, CBD stenting.

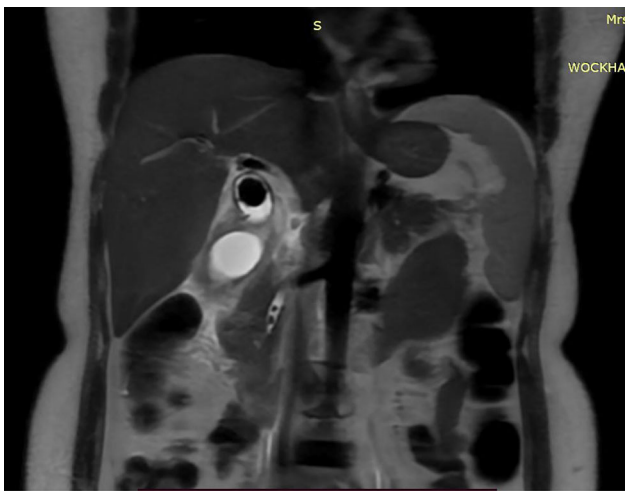
Intra-op: Dense omental adhesions, tense thick-walled GB, Frozen Calot's triangle.

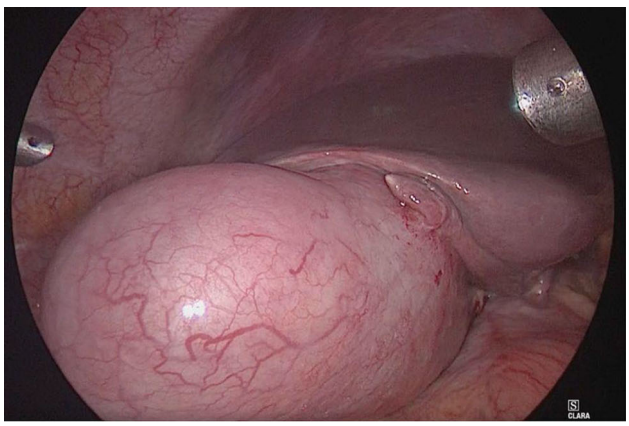
Bail-Out: GB aspiration, Fundus first approach.

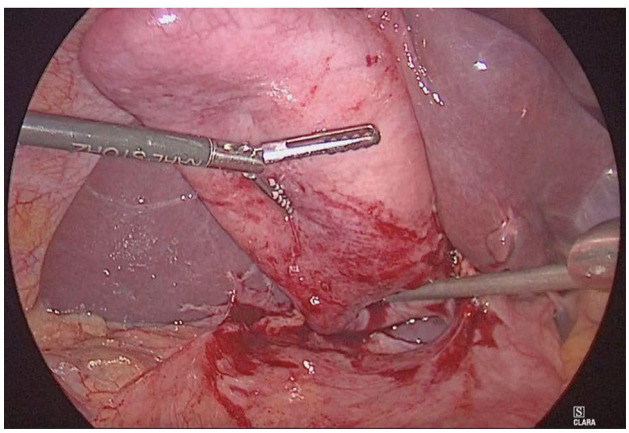
HPE: Acute on chronic cholecystitis.











Conclusion: Achieving CVS is highest priority, if not possible opt for bail-out procedures to avoid BDI. Fundus First approach is most commonly used, however to avoid VBI keep plain of dissection close to GB.

P347

Laparoscopic Cholecystectomy with Laparoscopy Assisted Transgastric Rendezvous ERCP in Gastric Bypass Patients

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Introduction: Laparoscopy Assisted Transgastric Rendezvous ERCP (LAERCP) is a perioperative treatment option for common bile duct stones (CBDS) in Roux-en-Y Gastric bypass (RYGP) patients. Although rendezvous ERCP (RV-ERCP) is a safe treatment for CBDS, it is not known how safe LAERCP is compared to RV-ERCP in a larger material. This study compares the outcome of laparoscopic cholecystectomy (LC) with concomitant LAERCP in RYGB patients to patients with unaltered anatomy having an ordinary rendezvous ERCP for CBDS during LC.
Methods and Procedures: A retrospective registry-based study on data from the nationwide Swedish Registry of Gallstone Surgery and ERCP (Gallriks) with patients included between 2016-09-01 and 2021-06-20. Only patients having rendezvous procedures were included. Main outcome measures were therapeutic success, peri- or postoperative adverse events, procedural time, and readmissions within 30 days.
Results: There were 70 LAERCP procedures and 4342 RV-ERCP during the study period. There were more women in the LAERCP group compared to the RV-ERCP group (81% vs 60% $p < 0.001$). When CBDS was found during ERC (in 60 vs 3067 patients), there was 100% therapeutic success in the LAERCP group vs 91,4% in the RV-ERCP group ($p = 0.018$). Peri- and postoperative adverse events and readmissions within 30 days were similar in both groups. There was significant longer procedural time in the LAERCP group (180 vs 131 min) ($p < 0.001$).
Conclusions: Laparoscopy Assisted Transgastric Rendezvous ERCP is a safe treatment option in RYGB patients with CBDS during laparoscopic cholecystectomy when compared to patients with unaltered anatomy.

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Squamous Cell Carcinoma of the Gallbladder

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Background: Squamous Cell Carcinoma of the Gallbladder (SCCGB) is an extremely rare entity, and most patients present with advanced disease at diagnosis. SCCGB has a poor prognosis with a low five-year survival rate. We present two cases with this pathology.
Summary:
Case 1: 61-year-old female presented to our institution with five days of altered mental status, jaundice, and abdominal pain. Initial laboratory work showed evidence of biliary obstruction, severe hypercalcemia, and severe leukocytosis. Computer tomography scan (CT) and magnetic resonance cholangiopancreatography (MRCP) showed an infiltrating mass at the gallbladder neck and hepatic hilum resulting in severe intrahepatic biliary ductal dilation with metastatic adenopathy along with concern for spine and pelvis metastasis. Endoscopic ultrasound (EUS) with fine needle aspiration (FNA) was positive for invasive poorly differentiated squamous cell carcinoma. PTH-Related Peptide was elevated. The patient expired during the hospital admission.
Case 2: 74-year-old male presented to our institution with right upper quadrant abdominal pain for one month. Liver enzymes and inflammatory markers were within normal limits. CT scan and gallbladder US showed a significantly distended gallbladder with wall thickening and a focal mass like area present in the body of the gallbladder. HIDA scan showed non-visualization of the gallbladder worrisome for acute cholecystitis. The patient underwent laparoscopic cholecystectomy with laparoscopic wedge liver biopsy. Pathology was significant for moderately differentiated invasive squamous cell carcinoma. The patient elected for hospice care and was lost to further follow up.
Conclusion: SCCGB are extremely rare tumors, and the pathogenesis is not well understood. These cancers can closely resemble gallbladder adenocarcinomas but are thought to grow quicker. Although treatment options are improving, SCCGB continues to have a very poor prognosis. More research should be done to gain a better understanding of the disease process and possible curative treatment options.

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Symptomatic Gallbladder Diverticulosis, a Rare Anomaly

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Diverticular disease of the gallbladder is a rare entity that can be congenital or acquired. Its incidence has been reported to be 0.06% out of which 0.0008% is specifically diagnosed through surgical pathology [1].

Gallbladder diverticulums can present with clinical symptoms that mimic the presentation of other more common causes of biliary disease. Diagnosis represents a true challenge. Ultimately it is more often diagnosed after surgery during evaluation of the pathology specimen pathology. [1,2].

We present a case of a 40 y.o female with a history of cholelithiasis who presented with recurrent right upper quadrant abdominal pain, nausea and vomiting. Imaging and blood work was unremarkable. Patient was advised to present to the clinic for elective cholecystectomy planning to resolve her symptomatic cholelithiasis; she later underwent laparoscopic cholecystectomy. Pathology reported inflamed pseudodiverticulum described as outpouching of the gallbladder filled with neutrophils, plasma cells and macrophages. Post operative course was unremarkable and symptoms resolved.

True congenital diverticulums have all 3 layers of the gallbladder while pseudo-diverticulums tend to be the results of an underlying pathology or traction. The clinical implications of this condition remain unclear [2]. The rarity of this diagnosis represents a diagnostic challenge especially when accompanied by atypical clinical presentation.[3].

More research would be beneficial to diagnostic accuracy and management of this rare entity. Gallbladder diverticulosis can potentially have the same pathophysiology as colonic diverticulosis leading to inflammation of the diverticulum and potentially causing recurrent episodes of cholecystitis without cystic duct obstruction or cholangitis warranting surgical intervention. [4].

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Endoscopic Management of Gallstones After Cholecysto-Duodenal Fistula

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Introduction: There many complications associated with cholelithiasis. Bouveret syndrome is a form of gallstone ileus in which a gallstone causes gastric outlet obstruction after it migrates through a fistulous tract between the gallbladder and the duodenum or the stomach. Bouveret syndrome represents approximately 1–3% of cases of gallstone ileus and is thus extremely rare. There are no guidelines on management of patients with Bouverets syndrome. We present a case of Bouveret syndrome that was endoscopically managed.
Case report: The case is of an 86-year-old male with multiple comorbidities who presented to the emergency department with shortness of breath, chest pain, and tremors. He was admitted to cardiology in complete heart block with plan for pacemaker insertion. During this admission he then experienced an episode of coffee-ground emesis and melena, associated with abdominal pain and ongoing nausea, vomiting, and inability to tolerate a diet. He remained hemodynamically stable, and gastroenterology was consulted, who suggested a CT scan. This demonstrated a 4.5 cm calcific gallstone in the 3rd portion of the duodenum with proximal duodenal and stomach distention suggestion partial obstruction. There was a cholecysto-duodenal fistula involving the 1st portion of the duodenum with associated pneumobilia. At this point, general surgery was consulted for management of gallstone ileus, and in discussion with gastroenterology, a plan was made for an attempt at endoscopic removal. At the first attempt, there were stones impacted in the 3rd portion of the duodenum, and they were not mobile enough to move into the stomach. At second attempt, using a side-viewing scope, the stone was fractures with electrohydraulic lithotripsy (EHL) and spyscope, then once the pieces were small enough, they were crushed with mechanical lithotripsy. The second stone was crushed with mechanical lithotripsy and then brought into the second portion of the duodenum with a balloon, where it was completely crushed with mechanical lithotripsy and then stone fragments were removed.
Discussion: We have presented a case of endoscopic management of gastric outlet obstruction secondary to a gallstone ileus after cholecysto-duodenal fistula formation. Using EHL the obstructing stones were broken apart and then removed from the duodenum. There have been other reports of successful EHL for treatment of Bouveret syndrome. This is an effective minimally invasive technique to manage this complex gallstone complication that historically required a laparotomy.

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Metastatic Journey: Squamous Cell Carcinoma's Rare Spread to the Gallbladder

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In the realm of hepatobiliary surgery, we occasionally encounter cases that challenge our diagnostic acumen and surgical prowess. In the case of a 68-year-old male who presented to our hospital with clinical symptomatology suggestive of acute cholecystitis. However, this patient's complex medical history, specifically recurrent metastatic squamous cell carcinoma of the head and neck, set the stage for an unexpected twist in his diagnosis and treatment.

Initial imaging studies uncovered a convoluted clinical profile. Ultrasound revealed gallbladder wall thickening without evidence of cholelithiasis. CT scans confirmed these findings and additionally showed intrahepatic biliary ductal dilation. HIDA scan demonstrated nonvisualization of the gallbladder, suggesting cystic duct obstruction. MRCP findings were consistent with acute cholecystitis, as well as intrahepatic ductal dilation with peribiliary edema suggestive of cholangitis. Notably, no cholelithiasis or choledocholithiasis were identified, raising the possibility of cystic duct stenosis. Given the clinical presentation and overwhelming pertinent radiographic findings, the decision was made to proceed with surgical intervention.

The patient underwent a robotic cholecystectomy with indocyanine green cholangiography. Intraoperatively, we immediately encountered a grossly gangrenous gallbladder and cystic duct, a scenario that added layers of complexity to an already challenging case. ICG cholangiography proved invaluable in identifying crucial biliary structures amidst the overwhelming inflammation.

The seemingly straightforward case of cholecystitis unveiled its true nature: a 1.5 cm malignant epithelioid/squamoid tumor within the gallbladder, with positive cystic duct margins. This rare finding of squamous cell carcinoma metastasis to the gallbladder—a phenomenon scarcely reported in medical literature—transformed a routine cholecystectomy into a case study of diagnostic vigilance and surgical adaptability.

This case serves as a powerful reminder of the potential for unexpected metastatic spread in patients with a history of malignancy. It underscores the importance of maintaining a high index of suspicion, even when initial presentations and imaging studies suggest benign pathology. For both gastroenterologist and hepatobiliary surgeons alike, it highlights the need for thorough preoperative workup in high-risk patients and the value of advanced intraoperative techniques in managing complex cases.

In the ever-evolving landscape of surgical and medical oncology, this case stands as a testament to the unpredictable nature of cancer and the critical importance of clinical acumen, technological advancement, and surgical flexibility in providing optimal patient care.

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Outcomes Following Difficult Laparoscopic Cholecystectomy - Experience of a Tertiary Care Center from India

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Introduction: Laparoscopic cholecystectomy is one of the most commonly performed surgical procedures worldwide. Certain conditions including Post-Endoscopic Retrograde Cholangio-Pancreaticography (ERCP), acute biliary pancreatitis, acute calculous cholecystitis, cholangitis, and stump cholecystitis pose a difficulty during laparoscopic as well as open cholecystectomy.
Methods: This is a retrospective analysis of prospectively collected data of patients who underwent difficult cholecystectomy between January 2019 to December 2023. Patients were evaluated with routine blood investigations, ultrasound, and magnetic resonance cholangiopancreatography when required.
Results: There were 364 out of 1735 patients between January 2019 to December 2023. The majority of patients were females (54.3%) with the mean age being 42.7 years (range, 15–80). The mean duration of symptoms was 10.6 months (range, 1–24) with the most common presenting symptom being pain in the abdomen. Majority of

the patients were post-acute biliary pancreatitis (23.5%), belonging to the moderately severe category, followed by post-acute cholecystitis (21.4%), post ERCP/cholangitis(18%), simple biliary colic ((8%) and stump cholecystitis. Laparoscopic surgery was successfully performed in 94.3% and open conversion was required in 5.7% of patients because of frozen Calot's triangle, bleeding, and unclear anatomy. The critical view of safety was achieved in 70.6% of patients and in the rest 29.4% of patients we used bailout procedures. None of the patients had bile duct injury. Intraoperative cholangiogram was performed in three patients. The mean operating time was 46.5 min (range, 35–140) as compared to simple cholecystectomy (18 min). Drains were placed in all difficult cases and removed on post-op day two (range;1 to 14 days). The median postoperative hospital stay was 2 days (range, 1–4). Five patients (1.3%) required re-exploration for bleeding and one (0.2%) for biliary peritonitis. The most common complication was superficial surgical site infection (2.9%). There was no postoperative 30-day mortality.

Conclusion: Laparoscopic management of difficult gallbladders is safe and feasible if expertise is available with acceptable intra and post-operative complications with good outcomes.

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Laparoscopic Cystogastrostomy for Giant Pancreatic Pseudocysts: A Safe and Effective Definitive Treatment Approach

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Laparoscopic cystogastrostomy should be considered by surgeons as a drainage alternative for giant pancreatic pseudocysts,offering as it represents a definitive and effective therapeutic option.

We report the case of a 54-year-old male with a contrast-enhanced abdominal CT scan revealing a giant pancreatic pseudocyst of 10 cm in diameter, who underwent laparoscopic cystogastrostomy with a 90-min operative time.

Postoperatively, he tolerated oral intake, had adequate pain control, and no early complications. He continued with a favorable recovery and was discharged on the third day. At a 6-month follow-up, he was asymptomatic.

In conclusion, laparoscopic cystogastrostomy is a safe alternative to other less invasive procedures for the drainage of giant pancreatic pseudocysts, offering a definitive and effective therapeutic option associated with lower mortality, shorter hospital stay, and fewer complications.

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Risk Factors for Incisional Hernia Development After Pancreatic Surgeries: A Systematic Review and Meta-analysis

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Background: The development of incisional hernias (IH) is an uncommon but complex outcome following pancreatic surgery, especially through the open approaches. The etiology of this complication is multifactorial and can be related to the patient and to the surgical technique. We aimed to perform a systematic review and meta-analysis assessing the risk factors for development of IH following pancreatic surgery.

Methods: Pubmed, Cochrane, and EMBASE databases were systematically searched from inception to September 2024. Observational studies and randomized controlled trials assessing patients > 18 years old undergoing pancreatic surgery and reporting data on incidence and risk factors for IH were selected. Outcomes were mean age, mean body mass index (BMI), diabetes mellitus, female and male gender, active smoking, and surgical site infections (SSI). We used RStudio for statistical analysis.

Results: 686 records were reviewed, and 7 observational retrospective studies were included, totaling 3,391 patients. The incidence of IH in the pooled analysis was 368 (10.8%), and after performing a proportional meta-analysis, we found that 12.5 per 100 (95% CI 7.1, 20.9) patients undergoing pancreatic surgery develop IH. Our pooled analysis found that older patients (MD 2.7 years; 95% CI 0.5, 4.8; $p = 0.014$) and patients with higher BMI (MD 1.8; 95% CI 0.9, 2.7; $p < 0.001$) present higher risk of developing IH. In our analysis, female and male gender, active smoking, diabetes mellitus, and SSI were not significant risk factors for IH after pancreatic surgery.

Conclusion: Our study showed that patients with older age and higher weight present a significantly higher risk of developing IH after pancreatic surgery. Considering pancreatic surgery is frequently carried out in emergent conditions, sometimes due to malignant causes, the preoperative optimization to reduce weight before surgery is not always a possible alternative. On the other hand, surgeons must consider the possibility of optimizing the patient in terms of weight loss if feasible, with the aim of reducing morbidity after the procedure.

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Case Report: Retained Stone Post-cholecystectomy in a Patient with Roux-en-Y Reconstruction

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Introduction: Retained common bile duct (CBD) stones post-cholecystectomy are challenging, particularly in patients with altered anatomy from previous surgeries, like Roux-en-Y reconstruction. Accessing the biliary tree in such cases often requires advanced techniques. This case report highlights a laparoscopic trans-cystic approach in managing retained CBD stones in a patient with Roux-en-Y anatomy where endoscopic and radiologic methods failed.

Case Presentation: An 84-year-old female with a history of gastric cancer, treated with distal gastrectomy and Roux-en-Y gastrojejunostomy in 1999, presented with symptomatic gallstones and underwent laparoscopic cholecystectomy in 2020. She experienced intermittent CBD obstruction over the following months. Initial endoscopic retrieval attempts were unsuccessful due to the complex altered anatomy, and interventional radiology could not access the CBD as there was no intrahepatic biliary ductal dilation.

A laparoscopic trans-cystic CBD exploration was then determined to be the operation of choice. After extensive lysis of adhesions, the CBD and cystic duct remnant were exposed, and dissection to the confluence with the common duct was completed. A ductotomy allowed choledochoscopy, revealing multiple small cholesterol stones in the CBD, which were retrieved using a wire basket. Cholangiography confirmed no residual stones, with clear passage of contrast into the duodenum. The cystic duct was closed with an Endo GIA stapler. The patient tolerated the procedure well, with no further CBD obstructions.

Conclusion: This case demonstrates the challenges of managing retained CBD stones in patients with post-gastrectomy reconstructive anatomy. While transgastric ERCP is common, it requires a level of expertise and may not always be feasible. The laparoscopic transcystic approach provided an effective alternative for direct access and stone retrieval, showcasing the need for individualized surgical strategies and the flexibility of minimally invasive techniques in complex cases.

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Management of a Rare Cause of Mechanical Bowel Obstruction in an Urban Community Hospital: A Case Series

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Gallbladder affliction is among the most common indications for surgical intervention in the USA. Estimated that more than 700 thousand cholecystectomies are performed annually. Gallstone ileus constitutes a rare entity with an overall incidence of 0.3–0.5% from which 1–4% are the cause of mechanical bowel obstruction. Due to the lack of prospective and retrospective studies, true incidence and key characteristics of this entity are difficult to find. A meta-analysis of over 1000 papers found the ileum to be the most common site of impaction.

Gallbladder ileus is more common in the elderly population, clinical suspicion to aid prompt diagnosis is important as the mortality rates for this condition are as high as 27%. We present the case of 3 patients presenting with this affliction in 2 safety net hospitals in a metropolitan area. One was the case of a 88-year old male diagnosed with gallstones 4 months prior to presentation with small bowel obstruction in the setting of pneumobilia and ectopic gallstone. Laparotomy revealed areas of thickened mesentery in the distal ileum and mid jejunum with pressure necrosis and patchy areas of ischemia with a 2 cm stone within the lumen. An 18 cm of small bowel was resected with primary anastomosis. No interval cholecystectomy performed. Patient was discharged on day 20 post surgery.

Second was the of a 62-year-old female, presented with severe abdominal pain, obstipation, nausea, and vomiting.Imaging revealed a contracted gallbladder with multiple stones, pneumobilia, air tracking from small bowel to gallbladder fossa. Laparotomy revealed gallstone 100 cm from the ileocecal valve with distal bowel collapse, 2 cm enterotomy performed and gallstone extracted. No interval cholecystectomy performed. Patient was discharged on day 6 post surgery.

Last one was the case of a 92-year-old female, presented with severe abdominal pain, on examination mild distended abdomen with generalized tenderness. CT scan revealed collapsed gallbladder, pneumobilia, possible cholecystoduodenal fistula, small bowel obstruction with transition point. Laparotomy revealed a large gallstone inside the ileum 50 cm from the ileocecal valve, enterotomy performed in the antimesenteric zone in a longitudinal axis. Stone removed. No interval cholecystectomy performed. Patient was discharged on day 14 post surgery.

Surgical intervention is the primary treatment as it is unlikely to resolve with conservative management. Gallstone ileus represents a diagnostic challenge in the setting of uncommon presentations, high index of suspicion in the appropriate clinical setting contributing to decrease mortality/morbidity.

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Development of Ascending Cholangitis Following Prolonged Course of TPN: A Case Report

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Total parenteral nutrition (TPN) is a critical intervention for patients with severe malnutrition or gastrointestinal dysfunction, but it can cause significant complications with prolonged use, including hepatobiliary dysfunction and cholestasis. These complications may progress to life-threatening conditions such as cholangitis. The management of cholangitis, especially in patients with prior Roux-en-y gastric bypass surgery, poses a unique challenge as traditional diagnostic and therapeutic methods including endoscopic retrograde cholangiopancreatography (ERCP) may be infeasible. There is limited evidence of complications arising from transitioning from TPN to enteral nutrition. We present a patient who developed acute cholangitis during the transition from TPN to enteral feeds postoperatively, which was managed successfully with percutaneous transhepatic catheter (PTC) placement.

A 66-year-old female with a complex history of multiple abdominal surgeries, including cholecystectomy and Roux-en-Y gastric bypass with revision, was admitted for post-operative care following elective G and J-tube placement for gastroparesis. This patient had been on prolonged TPN for 1.5 years. On postoperative day 5, this patient developed all of the cardinal symptoms of Reynolds Pentad and required ICU admission. CT imaging revealed dilated intra- and extrahepatic bile ducts, all of which were concerning for cholangitis. Given her bypass history, ERCP was not feasible, and interventional radiology performed PTC placement for biliary drainage. The patient's condition improved post-procedure, and she was discharged home with a plan for prolonged antibiotics. The PTC tube was removed 4 weeks later without complications.

Prolonged TPN use is associated with hepatobiliary dysfunction, including cholelithiasis and cholangitis. The etiology of TPN-induced cholestasis is complex and multifactorial, involving the absence of normal enteral nutrition signaling, direct toxicity from TPN components, and the underlying disease necessitating TPN. While complications during the transition from TPN to enteral nutrition are rare, in this case, reintroducing enteral feeds likely reactivated biliary function, exacerbating the patient's pre-existing common bile duct obstruction and precipitating cholangitis. Additionally, in patients with a Roux-en-Y gastric bypass, traditional ERCP is not feasible, which makes alternative methods like PTC placement necessary for biliary drainage.

This case highlights the challenges of transitioning from prolonged TPN to enteral nutrition, which can precipitate complications such as cholangitis in patients with underlying cholestasis or biliary obstruction. In cases where traditional ERCP is not feasible, particularly in patients with altered gastrointestinal anatomy, alternative approaches like PTC can effectively manage cholangitis. Careful monitoring during the weaning process from TPN to enteral feeds is essential to prevent complications and ensure successful recovery.

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Luschka Duct Type 2 Post Laparoscopic Cholecystectomy Treatment Without Bile Duct Stent

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Introduction: A Luschka duct type 2 leak is a rare complication post laparoscopic cholecystectomy. Standard treatment is still stenting the bile system but sometimes conservative treatment without stenting can be successful.
Case Presentation: A 42-year-old male presented with biliary pain for more than 4 days without features of acute cholecystitis or obstructive jaundice. Abdominal ultrasound showed multiple large gall bladder stones without features of pericholecystic edema. Patinet denied any previous recurrent attacks. During laparoscopic cholecystectomy, extensive adhesions were found in the infundibulum and cystic duct to the common hepatic duct. After successful separation of adhesions, Luschka type 2 discovered a drained liver bed to the common hepatic duct and tried to be clipped but failed. Abdominal drain kept under the liver surface after completion of cholecystectomy without conversion to open. The bile leak happened on the first day post-surgery, but the patient was not complaining of abdominal pain and there were no signs of biliary peritonitis. The patient kept on conservative coverage of antibiotics and was discharged to be followed in the outpatient clinic. MRCP done after 19 days post-operation showed no bile leak and normal biliary ducts. Liver function tests were normalized. follow-up patient after one month from surgery and he had not complained of any abdominal pain or jaundice.
Summary: Luschka type 2 is a rare cause of bile leak and standard treatment still stent the bile ducts but conservative treatments with abdominal drain and close follow-up can be successful.

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The Impact of Comorbidities and Surgical Approach in Incisional Hernia Development After Minimally Invasive Cholecystectomy: A Systematic Review and Meta-analysis

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Background: Laparoscopic cholecystectomy is a widely preferred method for gallbladder removal due to its minimally invasive benefits, including reduced postoperative pain and quicker recovery. However, the risk of incisional hernia remains a significant concern. Understanding the role of comorbidities in influencing this risk is crucial for improving patient management and surgical planning. This systematic review and meta-analysis aim to identify and evaluate the impact of comorbidities on the risk of incisional hernia following minimally invasive laparoscopic cholecystectomy.
Methods: We conducted a comprehensive search of PubMed, Embase, and Cochrane databases from inception until August 2024. We included studies that investigated risk factors for incisional hernia in minimally invasive cholecystectomy. A subgroup analysis was performed to compare hernia rates between single-incision laparoscopic cholecystectomy (SILC) and multi-port laparoscopic cholecystectomy (MPLC). Comorbidities analyzed were age, diabetes mellitus (DM), BMI > 30 kg/m^2, female gender, and history of umbilical hernia repair for single-port cholecystectomy studies. Statistical analyses were conducted using the meta-package in R Studio.
Results: 551 articles were screened by title and abstract, from which 19 were selected for full-text review. A total of 10 studies were included, comprising 7177 patients. The proportional meta-analysis found an IH rate of 2.68%; 95%CI [1.1; 6.6]; $I2 = 97\%$). We found that older age (MD 8.25 years; 95% CI [2.1; 14.4]; $P = 0.008$), DM (RR 2.15; 95%CI [1.1; 4.2]; $p = 0.02$), and a BMI higher than 30kg/m2 (RR 2.5; 95% CI [1.9; 3.2]; $p < 0.001$) were associated with postoperative IH development. We found no association between sex (RR 1.09; 95% CI [0.95; 1.26]; $P = 0.68$) and IH development. Also, for studies performing SILC, previous umbilical hernia repair was not associated with increased IH rates (RR 2.12; 95% CI [0.86; 5.22]; $p = 0.1$). No subgroup differences were found between SILC (2.88%; 95%CI [1.1; 7.3]) and MPLC (2.46%; 95% CI [0.45; 12.4]; $p = 0.87$).
Conclusion: Our meta-analysis revealed that older age, BMI > 30 kg/m^2, and DM are risk factors linked to IH following MIS cholecystectomy.

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Cholecystectomy Related Complaints: A 20-Year Review of the Canadian Medico-Legal Experience

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Introduction: Cholelithiasis is a common problem amongst adults, with 1–2% becoming symptomatic. Laparoscopic cholecystectomy remains the standard of care for symptomatic patients and is one of the most commonly performed procedures by general surgeons in Canada. Significant post cholecystectomy complications are rare, but can have devastating consequences on patient, surgeon, and healthcare system. This is especially true for common bile duct injuries (BDI). This study aims to provide a 20-year review and examination of trends in Canadian medico-legal data related to post-cholecystectomy complaints.
Methods: This is a 20-year retrospective review of the Canadian Medical Protective Association's (CMPA) repository of medico-legal cases involving cholecystectomy related complaints between 2003 and 2022. Cases included all those in which the physician contacted the CMPA for assistance, and included civil legal actions, medical regulatory (College) complaints, and hospital level complaints. Data analysis was limited to descriptive statistics using SAS software.
Results: A total of 488 cases were closed during the study time period, with initial events occurring from 1991 to 2021. There was a trend of decreasing complaints during the study period (p-value = 0.0004), with the majority of patients identifying as female (66%), and majority being generally healthy (ASA I/II-73.6%). The top 5 complications leading to complaint initiation were BDI (35.9%), leak (15.2%), bowel injury (12.7%), sepsis (10.9%), and hemorrhage (10.2%). A total of 555 physicians were involved, with 484 operating surgeons named in complaints. Most surgeons had ^{3} 11 years in practice (70%). The mean time from incident to case closure was 63.2 ± 42.3 months. BDI cases were significantly more likely to result in a favourable medico-legal outcome for the patient (77%) compared to all cholecystectomy cases (54%).
Conclusions: This study demonstrates that in the Canadian medico-legal landscape, the majority of post cholecystectomy complaints involved generally healthy female patients. Unsurprisingly, BDI was the most common complication resulting in a complaint and these

cases were more likely to result in a successful claim for the patient. Surgeons later in practice were more likely to be named in a complaint in comparison to their early in practice colleagues.

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Timing of Indocyanine-Green (ICG) Administration in Robotic Assisted Laparoscopic Cholecystectomy

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Introduction: Robotic-assisted laparoscopic (RAL) cholecystectomy is a widely performed procedure, however the optimal timing for administering Indocyanine-Green (ICG) dye remains unclear. This study aimed to determine the ideal pre-operative timing for ICG administration in RAL cholecystectomy to optimally visualize biliary structures.

Methods and Procedures: This prospective cohort study included adult patients undergoing robotic cholecystectomy at our institution from April 2023 to August 2024. Patients with severe inflammation or intraoperative bile/blood leakage were excluded. Outpatients were administered 7.5 mg ICG in the pre-operative hold, while inpatients received 7.5 mg ICG at varying times prior to surgery. Java based Image J (NIH, Bethesda, MD) was used to measure the color intensity of the liver, common bile duct, and cystic duct. Ratios were calculated, and statistical significance was determined using a two-sample *t*-test.

Results: Of 216 total patients evaluated, 113 met study criteria. There were 52 outpatients and 61 inpatients. Outpatients received ICG 1.2 (0.6–1.5) hours before incision, while inpatients received it 6.7 (4.2–11.6) hours prior. The CBD-to-liver ratio was significantly higher in inpatients compared to outpatients (1.50 ± 1.19 vs 0.65 ± 0.30, $p < 0.01$). Similarly, the cystic duct-to-liver ratio was also higher in inpatients (2.06 ± 2.10 vs 0.67 ± 0.29, $p < 0.01$). As the pre-operative ICG duration increased, the contrast between biliary structures and the liver improved. At approximately 3–4 h, biliary structures appeared brighter than the liver.

Conclusions: This study suggests that administering ICG 4 h before RAL cholecystectomy can improve the visibility of biliary structures, making it easier for surgeons to identify and avoid critical anatomical landmarks. However, individual patient factors such as hepatic clearance, peri-ductal tissue thickness, and inflammation can influence ICG uptake and contrast enhancement. Future research should investigate the impact of these factors on ICG administration timing, dose and surgical outcomes in RAL cholecystectomy.

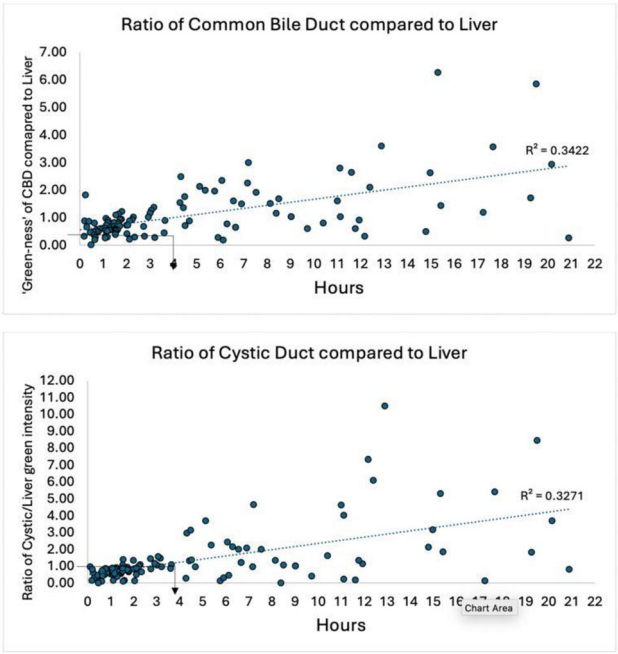

Figure.1: Common bile duct and cystic duct green-ness compared to liver plotted against duration prior to incision. As time duration increases, CBD/cystic duct becomes brighter. Linear line of best-fit displayed.

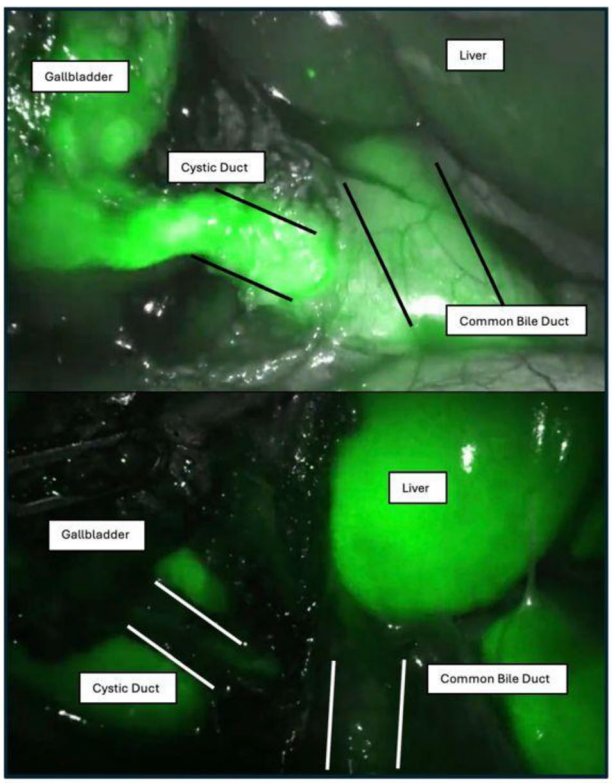

Figure.2: ICG administered 7 hours prior to surgery (top) compared to ICG administered 0.5 hours prior to surgery (bottom). As time passes, ICG is cleared by the liver and accumulates in the gallbladder if the cystic duct is patent. This allows clear visualization of the biliary tree under near-infrared fluorescence.

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A Tale of Two Cancers: Synchronous Gallbladder and Rectal Cancer

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Gallbladder carcinoma is a relatively rare entity with an estimated incidence of only 1.13 cases per 100,000 in the United States. Conversely, colorectal cancer is the third leading cancer worldwide. Both gallbladder and colorectal carcinomas have well established management guidelines when found independently. However, there are no current guidelines directing management in circumstances where these tumors are found concurrently. The occurrence of synchronous gallbladder and rectal carcinoma is exceedingly rare, with only a handful of cases reported in the literature. We, therefore, present a case of an 81-year-old male who presented with synchronous stage III rectal adenocarcinoma and stage II gallbladder adenocarcinoma. Per current NCCN guidelines, management of stage III rectal cancer consists of total neoadjuvant therapy followed by surgical resection, while management of stage II gallbladder carcinoma consists of surgical resection followed by adjuvant chemotherapy. In this presentation, we will review described management paradigms as compared to our institution's approach and discuss complex considerations including sequence of treatment modality, dosing, and drug choice of chemotherapy and its potential impact on patient outcomes.

P366

Did My Anastomosis Leak? Comparing Dutch Leak Score and Colon Leakage Score Following Emergency Colorectal Surgery, A Cohort Study. with Insights from a Systematic Review of Colon Leakage Score"

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Introduction: Anastomotic leak following colorectal surgery is one the most feared complications, with incidence rates ranging from 3 to 27%. Early detection and management of anastomotic leak are paramount to reduce the morbidity and mortality. Despite its importance, there is no standard definition for an anastomotic leak, with upto 29 different descriptions in literature. Various studies have been published to explore different tools to predict anastomotic leaks.This study aims to evaluate the utility of Dutch Leak Score (DULK) in predicting anastomotic leak following emergency colorectal surgery and to compare its effectiveness with Colon Leakage Score (CLS).
Methods and Procedures: In this prospective study, 103 patients who underwent emergency colorectal surgeries involving Colonic or Colorectal anastamosis were included. Post operative assessment using both Dutch Leak Score and Colon Leakage score for predicting leak was done on days 3, 4, 5 and 6. High scores were defined as ≥ 4 for Dutch leak score and ≥ 11 for Colon leakage score. Occurrence of an anastomotic leak was the primary endpoint. Sensitivity, specificity, negative and positive prediction values were calculated along with the accuracy for each score. Dutch leak score performance was compared with Colon leakage score within the same group. The Dutch leak score was validated against pooled data from existing literature on Colon leakage score which was obtained after systematic review.
Results: Out of 103 patients, 14 (13.5%) experienced an anastomotic leak. The Dutch Leak Score showed a sensitivity of 93%, specificity of 94.3%, negative predictive value of 98.8%, and positive predictive value of 72.2%, with an accuracy of 94.1%. In comparison, the Colon Leakage Score had a sensitivity of 85%, specificity of 87.6%, negative predictive value of 98%, and positive predictive value of 52.8%, with an accuracy of 87.3%. A systematic review of Colon leakage score indicated a mean sensitivity of 84.5%, specificity of 82.1%, positive predictive value of 71.4% (range 58.3–85.7%), and negative predictive value of 92.5%.
Conclusion: Dutch Leak Score is an effective tool for predicting an anastomotic leak following emergency colorectal surgery. Demonstrating better sensitivity, specificity and accuracy than Colon Leakage Score. Enabling early detection and timely interventions in such scenarios. This study shows that the Dutch Leak score is a reliable predictor of anastomotic leaks, validating its utility in clinical practice.

P367

"Can I treat my diverticulitis without antibiotics?": Assessing Online Patient-Facing Health Information for Non-antibiotic Treatment of Uncomplicated Diverticulitis

Maher Al Khaldi; Ajia Syed; Sameh Rizkalla; Nir Horesh; Giovanna da Silva; Marcus Oosenbrug; Ebram Salama; David Maron; Dana Sands; Eric Weiss; Juan Nogueras; Steven Wexner; Marylise Boutros; Cleveland Clinic Florida

Introduction: The management of acute uncomplicated diverticulitis (AUD) without antibiotics has gained acceptance as a safe treatment strategy because of accrued high-quality evidence. An important hurdle to implementation of non-antibiotic management is patient awareness and acceptance. Since the internet has become one of the greatest sources of medical information for patients, we sought to determine whether online health-related information and education could fill this gap. This study aimed to systematically review the quality, readability, and appropriateness of online health patient information about non-antibiotic management of AUD.
Methods: This systematic review assessed online patient information available on the searchable internet and on a publicly available online Artificial Intelligence (AI) interface. Three reviewers participated in this study. A Google search in private mode was conducted using the query, "Can I treat my diverticulitis without antibiotics?" The top 25 retrieved websites were assessed for readability using the Flesch Kincaid Grade Level index, quality using the DISCERN instrument, and content based on a predefined checklist of 7 key concepts from diverticulitis guidelines. Websites intended for healthcare professionals were excluded. Based on guidelines, we also created 11 layman questions addressing fundamental concepts of non-antibiotic management for AUD. Each question was posed on Google's AI Overview feature and the responses were recorded. Reviewers graded each response as either "appropriate," "partly appropriate," or "inappropriate" based on their clinical judgment and the content of the response.
Results: Of 46 unique websites, 25 met the inclusion criteria. The median readability level was 9.5 (min7.0–max13.8) indicating a required reading level $\geq$ 9th grade education to understand. The median DISCERN score was 33.5 (min15–max60). Six (24%) websites had clearly defined aims, 11 (44%) disclosed their sources, and 16% were deemed high quality overall. Only 9 (36%) websites specifically addressed the non-antibiotic management of AUD. On average, websites only included 2 out of 7 key concepts. Online AI responses were consistent and factually accurate for 82% of the questions (9/11), with 90% of references deemed appropriate to support the responses.
Conclusions: Current online information regarding non-antibiotic management of AUD is generally insufficient, with significant

variability in readability, quality and content. Much of the searchable online information does not cover key concepts regarding non-antibiotic management of AUD. However, online AI shows potential in delivering accurate and consistent information, possibly surpassing standard internet search results. Tailored, high-quality patient materials should be created to support the effective implementation of non-antibiotic management of AUD.

Three of the highest rated websites

Title	URL
How Is Diverticulitis Treated? Traditional, Alternative, and Surgical Options to Consider	https://www.everydayhealth.com/diverticulitis/guide/treatment/
Diverticulitis : pockets of knowledge	https://bpac.org.nz/2023/diverticulitis.aspx
A new approach to diverticulitis	https://immattersacp.org/archives/2022/04/a-new-approach-to-diverticulitis.htm

P368

NSQIP Database Trends in Neoadjuvant Therapy and Surgical Outcomes for Rectal Cancer

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Introduction: Neoadjuvant therapy with resection as the foundation of rectal cancer treatment has undergone a recent evolution, largely due to advancements in neoadjuvant therapy regimens and surgical techniques, as well as an increasing adoption of the watch-and-wait approach for select patients with locally advanced disease. This study aimed to examine trends in neoadjuvant therapy, surgical approaches and short-term outcomes following oncologic rectal resection over the past 8 years.
Methods: This study included all patients who underwent proctectomy for rectal cancer from 2016, 2021, and 2022 as reported by the ACS-NSQIP Targeted Proctectomy databases. Frequencies in neoadjuvant chemotherapy and radiation utilization and operative approach were analyzed using SPSS software, as well as short-term outcomes including surgical site infections (SSIs) and transfusion requirements. Statistical significance was evaluated using chi-square tests.
Results: The analysis included 5377 patients undergoing proctectomy for rectal cancer (1700 in 2016, 1813 in 2021, 1864 in 2022). Neoadjuvant chemotherapy alone significantly increased from 6.9% in 2016 to 15.9% in 2021 to 18.9% in 2022 ($p < 0.001$), combined chemotherapy and radiation (CRT) decreased from 46.8% in 2016 to 28.4% in 2021 to 22.8% in 2022 ($p < 0.001$), and no neoadjuvant therapy increased from 40.6% in 2016 to 51.2% in 2022 ($p < 0.001$). Robotic proctectomies demonstrated a notable rise from 20.3% in 2016 to 40.9% in 2022. For short-term outcomes, both superficial and deep incisional SSIs showed no significant change across the 3 years assessed (1.8% to 1.4%). Intraoperative/postoperative transfusion requirements remained statistically stable as well.
Conclusions: This study highlights several interesting trends in the evolution of rectal cancer management. The significant increase in the use of chemotherapy alone for neoadjuvant therapy, as well as a reduction in the use of CRT, may reflect similar findings to the PROSPECT trial, as well as an adaption to newer clinical strategies, including total neoadjuvant therapy (TNT). The consistent SSI rates from 2016 to 2022 is particularly interesting with the advent of preventative strategies such as "colon bundles" in the last 5–7 years and thus may be indicative of a need for further investigation into additional or different infection control methods. Additionally, the significant increase in robotic surgery confirms clinically-witnessed trends towards embracing advancements in surgical technology. However, it should be noted our study is limited by imperfect NSQIP data and we therefore are unable to accurately assess this trend further. Further studies are essential to evaluate long term outcomes and continued optimization of care.

P369

Optimizing Pain Management: A Systematic Review and Meta-analysis of Opioid-Sparing and Opioid-Free Analgesia in Minimally Invasive Colorectal Surgery

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Background: Opioid analgesia is commonly employed in abdominal surgeries but is associated with adverse effects, including postoperative nausea, hyperalgesia, and increased postoperative opioid consumption. With enhanced recovery after surgery (ERAS) protocols, opioid-sparing and opioid-free anesthesia arose as possible solutions for these issues. We conducted a systematic review and meta-analysis comparing opioid and opioid-sparing perioperative analgesia in minimally invasive colorectal surgeries.
Methods: We searched Cochrane, MEDLINE, and EMBASE for comparative studies comparing opioid-free or opioid-sparing with opioid-based analgesic strategies for perioperative analgesia in minimally invasive colorectal procedures. Primary outcomes included pain, evaluated using the visual analog scale (VAS) at 24 h and 48 h postoperative, opioid consumption (morphine equivalents), and hospital length of stay (LOS). Secondary outcomes comprised complications (nausea, pruritus, overall complications, postoperative ileus, readmission, and mortality). Statistical analyses were performed using R software.
Results: Out of 1345 studies screened, 8 comparative studies were included for final analyses. These included 2 randomized controlled trials, encompassing 21,216 patients, with 1840 (8.6%) in the opioid-sparing group. No differences were found between the groups in postoperative pain at 24 h (MD − 0.86; 95% CI [− 1.8 to 0.07]; $p = 0.07$) and 48 h (MD − 0.77; 95% CI [− 1.6 to 0.04]; $p = 0.06$) after surgery. Opioid-sparing strategies reduced postoperative opioid consumption significantly (MD 29.7 mg of morphine equivalents; 95% CI − 45.2 to − 14.1; $p < 0.001$). No differences with statistical significance were found for overall postoperative complications, nausea, pruritus, ileus, readmission, or mortality rates.
Conclusion: Opioid-sparing strategies showed a significant reduction in postoperative opioid consumption without differences in postoperative pain or complications, suggesting it can be an alternative to opioid-based analgesia in minimally invasive colorectal surgeries.

P370

Efficacy of Robot-Assisted Colectomy: Future Perspectives Through Video Presentation and Short-Term Outcomes Using Propensity Score Matching

Mai Kasai; Junichi Mazaki; Ryutaro Udo; Tomoya Tago; Kenta Kasahara; Tetsuo Ishizaki; Yuichi Nagakawa; Tokyo Medical University

In Japan, robotic-assisted laparoscopic surgery for colorectal cancer (RALS-C) has been covered by insurance since 2022, and our hospital performs it in 80–90% of colon cancer cases. RALS-C involves diverse techniques and approaches, and we optimize surgical choices based on patient factors, surgeon factors, and educational factors, focusing on port placement, approach method, devices, and reconstruction methods. Port placement: We utilize a 4–5 port technique with Pfannenstiel and umbilical incisions based on the anastomosis type. Approach method: Due to the absence of a motion bed, all handling of the transverse mesocolon and omental release is conducted via caudal approach. Devices: We incorporate scissors and double/triple bipolar devices depending on the cases. Reconstruction: Intracorporeal anastomosis is standard, with indications determined by preoperative abdominal ultrasound assessing bowel preparation. We retrospectively analyzed the short-term outcomes of 243 cases of minimally invasive surgery for colon cancer (appendix to sigmoid colon) performed from February 2021 to May 2024, comparing the laparoscopic group (LAP, 125 cases) and the RALS-C group (118 cases) using propensity score matching. 92 patients were matched in each group. No significant difference was recognized between the LAP group and the RALS-C group in median age (73 vs 74 years), gender (men, 46.3% vs 44.6%), distribution of tumor locations (V:C:A:T:D:S = 17:21:15:8:31 vs 1:17:20:16:7:31), average BMI (22.6 vs 22.1), average blood loss (26 vs 22 g), conversion rate to open surgery (5.4 vs 3.3%) pStage (0:1:2:3:4 = 7:26:28:27:4 vs 3:27:31:25:6), proximal margin (68 vs 70 mm), and complication rate (Clavien-Dindo grade > 3) (0 vs 4.3%). There were significant differences in the anastomosis method (extracorporal: intracorporal = 75:14 vs 61:31, $p = 0.01$), operation time (218 vs 237 min, $p < 0.01$), median hospital stay (13 vs 10 days, $p < 0.001$), distal margin (55 vs 73 mm, $p = 0.02$), and the number of harvested lymph nodes (16 vs 20, $p = 0.02$). Although the RALS-C group resulted in slightly longer operation time compared to the LAP group, no significant differences in complications were observed. Moreover, the RALS-C group was associated with shorter hospital stays and faster postoperative recovery. The higher frequency of intracorporeal anastomosis in the RALS-C group is likely to contribute to the secure distal margin and the greater number of harvested lymph nodes. While long-term outcomes remain unclear, the data suggests that RALS-C may offer a more effective lymphadenectomy. We will present the utility of RALS-C, demonstrating a video.

P371

Remembering Childhood Diseases: A Case of Hirschsprung Disease in an Adult with Chronic Constipation

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Introduction: Hirschsprung disease is an acquired genetic disorder commonly presenting in the first 24 to 48 h of life. It is characterized by the absence of ganglion cells in the myenteric and submucosal plexuses in the anorectum, resulting in a lack of peristalsis and relaxation and a contracted anorectum. Persistence beyond childhood is rare and is usually secondary to failure to follow-up. We present a case of an adult male who suffered from chronic constipation and was diagnosed with Hirschsprung disease.

Case: A 24-year-old male with chronic constipation since age 13 presented to the emergency department with severe abdominal pain. For several months prior to presentation, he experienced intermittent constipation with only liquid bowel movements, no solid stool formation, and no relief with laxatives and enemas. Vitals signs were within normal limits on arrival, and physical examination was remarkable for decreased bowel sounds throughout the abdomen and left lower quadrant tenderness. A contrast tomography of the abdomen and pelvis (CTAP) showed massive rectosigmoid feces with large feces in the proximal colon (Fig. 1). The maximum distension of the colon was 18 cm. Gastroenterology was consulted for a colonoscopy which was performed one week later after an aggressive bowel preparation with 11 doses of oral Golytely, 12 doses of oral magnesium citrate, 7 doses of bisacodyl enema, and 9 doses of oral bisacodyl. There were no structural abnormalities on colonoscopy; however, a rectal biopsy performed after discharge showed the absence of ganglion cells, confirming the diagnosis of Hirschsprung disease. Colorectal surgery suggested a temporary colostomy, which the patient was scheduled for and has not yet received.

Discussion: Hirschsprung disease in adults is a delayed presentation commonly manifesting as mild constipation that progresses into lifelong constipation or intermittent bowel obstruction. Diagnosis in adulthood is usually due to a lack of follow-up or ignoring symptoms. Although findings on a barium enema x-ray or anorectal manometry can suggest Hirschsprung disease, rectal suction biopsy showing an absence of ganglion cells remains the gold standard. The treatment is a pull through procedure where the aganglionic part of the colon is removed and the healthy portion is connected to the rectum. However, extensive colonic involvement may require a temporary or permanent colostomy on a case by case basis.

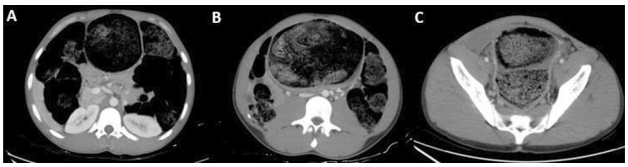

Fig. 1 Axial cuts of CT abdomen and pelvis showing massive colonic distension with stool burden **(Panel A and B)** and stool burden in the rectum **(Panel C)**

P372

Rare Malignant Transformation of Endometriosis into Endometrioid Adenocarcinoma of the Rectosigmoid: Case Report

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Background: Malignant transformation of endometriosis is quite rare, occurring in 0.7–1% of patients with endometriosis, with 78.7% occurring in the ovaries. The colon and rectum are involved in only 5% of endometriosis associated malignancies among extragonadal sites. These tumors can mimic primary colonic adenocarcinoma and can be misdiagnosed as colorectal malignancy. Herein, we report a

rare case of postmenopausal woman without predisposing factors who presented with rectosigmoid tumor of endometrioid origin.
Case Presentation: An asymptomatic 81 year-old female presented with positive Cologuard test. She had prior remote history of right sided complex adnexal mass and underwent laparoscopic salpingoophorectomy. At the time, surgical pathology showed infarcted, hemorrhagic material with isolated mummified atypical cells suggestive of underlying tumor, but no further typing was available. She underwent colonoscopy (Fig. 1) and was found to have infiltrative mass at the rectosigmoid junction, involving one-third of the lumen circumference. The biopsy revealed at least high-grade dysplasia. Endorectal ultrasound was done during attempted endoscopic mucosal resection (Fig. 2), and suggested invasion into the muscularis propria. CT chest, abdomen, and pelvis revealed rectosigmoid thickening without metastatic disease (Fig. 3). Subsequently, the patient underwent robotic low anterior resection. Her postoperative course was unremarkable. Surgical pathology revealed moderately differentiated invasive endometrioid adenocarcinoma with multifocal residual benign ectopic endometriosis with negative margins and no nodal involvement. By immunohistochemistry, the tumor cells were diffusely and strongly positive to CK7, patchy positive to PAX8, but were negative to CK20, CD2, and Villin. They were further positive to estrogen receptors (ER) and progesterone receptors (PR). Tumor markers including CEA, CA 19-9, and CA 125 were all within normal limit. Transvaginal ultrasound was previously normal. Genetic molecular testing showed proficient Mismatch Repair status (MMR-p), Microsatellite Instability low (MSI-stable), ER+, PR+. The patient declined adjuvant chemotherapy but agreed to Letrozole therapy. Patient also agreed to continue surveillance.
Conclusion: In this report we present a rare case of endometriosis-associated intestinal tumor in a postmenopausal patient without prior history of endometriosis nor hormone replacement therapy. Endometriosis-associated neoplasm in extragonadal locations is a rare entity. It requires a high index of suspicion in addition to careful pathologic and immunohistochemical analysis. The diagnosis is often made in postoperative specimen with a specific immunohistochemical pattern (CK7+/CK20−). Literature is lacking and further research is needed to standardize targeted approach to this disease entity.

P373

Bleeding Complications of Colorectal Surgery: Lessons Learned from a French National Database of Serious Adverse Events Related to Health Care

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Introduction: Bleeding is a frequent complication of colorectal surgery, especially during the postoperative period. However, there are few publications on this topic, and most of them focus on anastomotic bleeding. The aim of this study was to evaluate the main concerns of surgeons regarding postoperative bleeding in colorectal surgery.
Patients and Methods: From January 2020 to January 2023, all serious adverse events related to care (SAERC) involving bleeding complications of colorectal surgery were extracted. Data about proctology were not evaluated in this study. Data were extracted from the REX database, a governmental national database hosted by the Haute Autorité de Santé. In France, the declaration of 3 SAERC per year per surgeon is required for individual accreditation of surgeons. After extraction of the declarations of interest, all SAERC were reviewed by three surgeons to confirm the relevance and quality of the declarations. A qualitative analysis of these SAERC was performed using MAXQDA24 software by another surgeon.
Results: During the study period, a total of 7544 SAERC were declared by surgeons, 1571 of which were about hemorrhage. After review by the three surgeons, a total of 1331 SAERC related to bleeding were included. There were 247 SAERC (19%) related to colorectal surgery and proctology, and 85 related specifically to colorectal surgery, making it the second most common surgery after parietal surgery. The most common codes used in SAERC were reoperation (n = 56), peritoneal hemorrhage (n = 45), anticoagulation (n = 26), postoperative hemorrhagic shock (n = 24), and stoma (n = 17). Hemorrhage of the anastomosis was identified in only 8 cases of the SAERC.
Conclusion: Even though most publications on bleeding after colorectal surgery focus on the management of anastomotic hemorrhage, this is not the main concern of surgeons, as indicated by the SAERC data. To better address surgeons' concerns, more studies on the management of peritoneal bleeding are necessary.

P374

Impact of Bariatric Surgery Induced Weight Loss on Mesorectal Fat Area

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Introduction: Total mesorectal excision (TME) quality is critical for optimal outcomes in mid- and low-rectal cancer. A larger mesorectal fat area (MFA) has been linked to increased surgical difficulty and a higher risk of local recurrence. Interventions to reduce MFA remain unexplored. This study aims to evaluate the impact of bariatric surgery-induced weight loss on MFA. Our findings have the potential to inform preoperative strategies to improve the outcomes of rectal cancer patients with severe obesity.
Methods and Procedures: A retrospective review of patients who underwent elective bariatric surgery and experienced a postoperative complication (as these patients were hypothesized to have at least 1

postoperative abdominal computed tomography [CT] scan) at a single university-affiliated centre from 2018 to 2023 was performed. Patients were included if they had a perioperative CT scan within 6 months before and 2 weeks after bariatric surgery and a repeat CT scan post-surgery at either 1–6 months, 6–12 months, or 12+ months. MFA was calculated by subtracting the area of the rectum from the area of the mesorectal package measured using dedicated software at the level of tips of the ischial spine. Measurements were obtained perioperatively and at the three time periods if possible. Absolute MFA reduction and % excess weight loss (%EWL) were analyzed.

Results: A total of 250 patient charts were reviewed, and 25 patients met the inclusion criteria. Preoperative mean body mass index (BMI) was 46.2 kg/m^2 (SD10.3), with a corresponding mean MFA of 20.9 cm^2 (SD6.4). At 1–6 month time period, the %EWL was 33.1% ($p < 0.001$) and the mean MFA decreased by 5.1 cm^2 (SD1.9) corresponding to 22.1% reduction compared to baseline ($p < 0.001$). At the 6–12 and 12 + time periods, %EWL continued to decrease to 47.2% ($p = 0.003$ compared to baseline) and 80.2% ($p < 0.001$ compared to baseline), respectively but MFA reduction remained relatively stable at 19.3% ($p = 0.07$ compared to baseline) and 27.3% ($p < 0.001$ compared to baseline), respectively.

Conclusion: Bariatric surgery-induced weight loss may significantly reduce MFA, especially in the first 6 months after surgery. Beyond 6 months, weight loss continues but without significant further reduction in MFA. This reduction may lower surgical difficulty in rectal cancer surgeries requiring TME if offered bariatric surgery prior to their oncologic resection. Further research is needed to confirm the impact on surgical outcomes.

	Pre weight loss			1-6 months						6-12 months						>12 months					
Average:	n=	BMI	MFA	n=	BMI	MFA (cm2)	MFA decrease (Absolute)	MFA decrease (%)	%EWL	n=	BMI	MFA (cm2)	MFA decrease (Absolute)	MFA decrease (%)	%EWL	n=	BMI	MFA (cm2)	MFA decrease (Absolute)	MFA decrease (%)	%EWL
All	25	46.2	20.86	11	39.6	17.7	5.04	23	33.06	5	36.9	15.65	4.75	22	47.2	17	29.9	14.3	5.38	26	80.2
Females	19	45.2	19.74	7	38.3	15.51	5.00	26	34.58	2	36	11.96	6.28	44	42.8	14	29.6	14.07	5.17	25	83
Males	6	49.4	24.4	4	42	21.53	5.11	18	30.39	3	37.5	18.12	2.06	7	50.2	3	31.1	15.35	6.34	22	67.1

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Neo Anus Creation - A Boon to Patients with Colostomy Post-APR Surgery

Prashant Rahate, Dr; Nachiket Rahate, Dr; Seven Star Hospital, Nagpur, India

Post-APR patients have psychological, economic, and social problems due to Colostomy. Selected motivated patients can be offered Neoanus creation. Complete left Colostomy can be brought down to the perineum with the reconstruction of the anal sphincter by bilateral alpha loops of gracialoplasty and covering ileoplasty. Postoperatively patients are trained to hold at least 200 ml of water. Physiotherapy and faradic stimulation play a good role. Covering ileostomy is closed once the patient is fully qualified to hold 200 ml liquid and semisolid jelly. The satisfaction level of patients is good. They improve psychologically. The recurring cost of the ileostomy/colostomy bag and all sequelae of colostomy care are not there now, patients' social life and sexual function, daily bathing, and swimming are restored. Very gratifying experience shared by patients.

P376

A comparison of Outcomes of Traumatic Left and Right Sided Colonic Injuries

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Introduction: Traumatic colorectal injuries are common in penetrating abdominal trauma. We aimed to study differences in outcomes based on relation of the injury to the splenic flexure.

Methodology: Using ICD-9 codes penetrating colorectal injuries in the National Trauma Databank were identified for years 2011–2015. Subjects with missing data or cardiac arrest at time of arrival were excluded. Patients were divided into two groups based on injury distal or proximal to splenic flexure.

We studied age, gender, injury severity score (ISS), pulse rate and systolic blood pressure (SBP). We analyzed acute kidney injury (AKI), acute respiratory distress syndrome (ARDS), deep vein thrombosis (DVT), pulmonary embolism (PE), pneumonia, deep surgical site infection (SSI), severe sepsis, unplanned intubation and unplanned return to OR.

Statistical analysis was conducted using SPSS for windows. $P < 0.05$ was considered statistically significant.

Results: Of 4,212,717 patients, 12,372 (0.29%) sustained a colonic or rectal injury. Of these 5085 (41.1%) sustained injury distal to splenic flexure (Group 1) while 7287 did not (Group 2).

Groups 1 and 2 were noted to be similar in terms of age (mean of 31.1 vs 32.4 years), percentage of male patients (89.3% vs 87.8%), ISS (13 and 14), mean SBP (122 vs 123 mmHg) and pulse rate (97 vs 98 bpm) respectively.

Statistically significant differences were found in the incidence of pneumonia (4.7 vs 5.6%; $p = 0.029$), organ SSI (4.2 vs 5.7%; $p = 0.0008$), deep SSI (2.6 vs 3.7%; $p = 0.0009$), severe sepsis (2.4 vs 3.3%; $p = 0.005$) and unplanned intubation (1.4 vs 1.9%; $p = 0.03$) between groups 1 and 2 respectively.

Conclusion: There appears to be a slightly higher morbidity rate in patients sustaining injury proximal to splenic flexure. This may be due to concomitant injuries associated with proximal colorectal penetrating injuries.

P377

Laparoscopic Intestinal Ostomy Reversal: Efficacy and Postoperative Outcomes

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Introduction: Intestinal ostomies are a common procedure in emergency surgery for conditions such as bowel obstruction and complicated diverticulitis, typically managed with exploratory laparotomy. This approach often results in severe adhesions, complicating subsequent ostomy closure. Ostomy reversal is one of the most frequently performed follow-up procedures, commonly done via open surgery. However, in selected cases, laparoscopic surgery offers significant postoperative benefits. This study evaluates the outcomes and efficacy of laparoscopic intestinal ostomy reversal.

Methods: This retrospective, observational study includes a series of patients who underwent laparoscopic intestinal ostomy reversal at three academic medical institutions in Cúcuta, Colombia, between January 2015 and June 2023. Demographic data, preoperative characteristics, intraoperative details, and postoperative outcomes were collected from medical records. All surgeries were performed by the same surgical team, ensuring consistency across procedures. The surgical steps included ostomy release, initial port placement, adhesion removal, insertion of additional ports, mobilization of the colon or intestinal loops, and entero-colonic, colo-colonic, colo-rectal, or entero-rectal anastomosis.

Results: A total of 112 laparoscopic intestinal ostomy reversals were performed. The mean patient age was 59 years (SD: ± 12), with an equal distribution of men and women (50%, $n = 56$). The most common BMI range was 25–27 (52%, $n = 58$). 74% ($n = 66$) of patients were classified as ASA II indicating mild systemic disease without functional limitation. A Hartmann's colostomy was present previous to reversal in 83% ($n = 93$) of patients, while 17% ($n = 19$) had a small bowel stoma. The median operative time was 110 min (IQR: 70–210), with conversion to open surgery in 6% ($n = 7$) of cases due to severe adhesions. Intraoperative blood loss was less than 100 ml in 79% ($n = 88$) of cases. Postoperative complications included paralytic ileus in 14% ($n = 16$) of patients and reoperation in 7% ($n = 8$), most commonly due to anastomotic dehiscence ($n = 3$, 4%). The median time to oral intake after surgery was 1 day (IQR: 1–2), and the median hospital stay was 3 days (IQR: 2–6). The 30-day mortality rate was 1% ($n = 1$) due to mesenteric ischemia. At an average follow-up of 8 months (SD: ± 7), all patients were alive.

Conclusion: Laparoscopic intestinal ostomy reversal is a safe and feasible option for appropriately selected patients, even in complex cases. Our findings highlight the low conversion rates and minimal complications associated with this technique when performed by an experienced surgical team following rigorous prehabilitation protocols.

P379

Anal Neuroendocrine Carcinoma Presenting as Severe Rectal Pain: A Diagnostic and Therapeutic Challenge

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Neuroendocrine carcinomas (NECs) of the anus and rectum are rare, with a poor prognosis. The overall survival for metastatic disease is reported as low as 13.8 months. While guidelines exist for treating extrapulmonary NECs, specific guidelines for anorectal NECs are scarce due to the rarity of the condition. Squamous cell carcinoma (SCC) of the anus often responds well to chemotherapy and radiation, but anorectal NECs have poor long-term outcomes, even after surgical resection. As per the National Comprehensive Cancer Network (NCCN), metastatic anorectal NEC is treated with chemotherapy and resectable disease is treated with resection and/or chemotherapy with/without radiation on a case-by-case basis.

We present a 63-year-old female with history of chronic constipation who initially sought medical attention for severe rectal pain and occasional bleeding lasting 2 months. Her prior colonoscopy, performed 2 years prior, was normal. On digital rectal examination (DRE), the patient experienced significant pain, leading to a diagnosis of anal fissure. Non-operative treatment with hydrocortisone was initiated. Due to lack of improvement, she was referred to colorectal surgery. An anoscopy, limited by pain, revealed internal hemorrhoids and a palpable nodular area at the posterior midline.

Further evaluation under anesthesia revealed a 6 cm irregular mass in the posterior midline, extending towards the right levator muscles. Biopsies confirmed poorly differentiated small cell NEC with 8 mitoses per high-power field and lymphovascular invasion. Carcinoembryonic antigen (CEA) levels were elevated at 8.1 (normal < 2.5). CT scan of the chest, abdomen, and pelvis identified a 2.9 cm liver lesion suspicious for metastasis and increased stool burden. MRI showed an ulcerated lesion at the anorectal junction with exophytic extension involving the internal anal sphincter and abutting the right levator musculature, along with the liver lesion and multiple subcentimeter bilobar lesions. The case was presented at a multidisciplinary tumor board, which recommended systemic chemotherapy followed by restaging and potential resection.

This case highlights the importance of a comprehensive physical examination, including anoscopy, in patients with anorectal pain and bleeding to rule out more concerning pathologies—this can be performed under anesthesia or after medical management of presumed fissure if necessary. Although anorectal NEC is rare, it is often associated with a poor prognosis, underscoring the need for further research to develop more effective treatment strategies. Current management for locoregional disease involves resection with or without chemotherapy, while metastatic disease is primarily treated with chemotherapy.

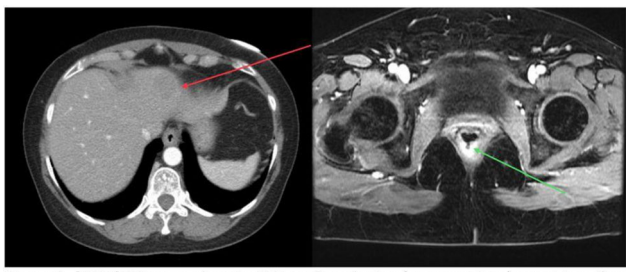

Figure 1: [LEFT]CT image showing 2.9 cm liver lesion (segment two) suspicious for Metastasis (red arrow) and [RIGHT] MRI showing ulcerated lesion at the anorectal junction (green arrow)

P380

SHORT-TERM Outcomes of Minimally Invasive Surgery Compared to Open Surgery for Large (> or = 5 cm) Colonic Adenocarcinomas in Patients Aged More Than 75 Years

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Background: Tumor size and frailty associated with older age are independent factors that may dissuade surgeons from pursuing minimally invasive surgery (MIS), despite literature demonstrating its safety and efficacy. This study aimed to compare short-term outcomes of MIS and open surgery for elderly patients with a large (? 5 cm) colonic adenocarcinoma.
Methods: In this retrospective cohort study, patients aged > 75 years with clinical stage I–III colon cancer were identified in the United States National Cancer Database (NCDB) between 2010 and 2020. Patients were categorized by type of surgery and placed into two surgical groups: laparoscopic and open. The groups were propensity-score matched and outcomes were compared. The primary outcomes were 30- and 90-day mortality, while secondary outcomes were hospital stay, 30-day readmission, number of harvested lymph nodes, and surgical margin status. The main outcomes were stratified by the anatomical location of the tumor in a secondary analysis.
Results: A total of 15,253 patients were included (Laparoscopic: 5860; Open: 8486). The majority of tumors (68.2%) were right sided. After matching, 5672 patients were included in each group. Laparoscopic surgery was associated with significantly lower 30- (OR: 0.56, 95%CI: 0.47, 0.66, $p < 0.001$) and 90-day mortality (OR: 0.58, 95%CI: 0.51, 0.66, $p < 0.001$) compared to open surgery. Laparoscopic surgery was significantly associated with lower 30- and 90-day mortality, and shorter hospital stays for all tumor locations. Laparoscopic surgery for right sided tumors was more often associated with negative resection margins (94.4% vs 92.8%, $p = 0.005$), more harvested lymph nodes, and shorter hospital stays (5.0 [4.0–7.0] vs 6.0 [5.0–9.0] days, $p < 0.001$). Laparoscopic surgery in the right colon was associated with more harvested lymph nodes (median: 20.0 [15.0–26.0] vs 19.0 [15.0–25.0], $p < 0.001$) and left colon cancers (18.0 [14.0–23.0] vs 17.0 [13.0–23.0], $p = 0.001$). Rates for negative margins in the left (93.5% vs 92.2%, $p = 0.273$) and transverse (95.8% vs 92.9%, $p = 0.064$) colon were not significant.
Conclusion: This paper highlights laparoscopic surgery as a beneficial treatment avenue in elderly patients with large colonic adenocarcinomas. These findings were consistent when stratified by tumor location, except in transverse colon cancers where the resection quality was comparable to open surgery. On the basis of this study, patients ≥ 75 years of age should be considered for laparoscopic resection of colon cancer.

P381

A Rare Case of Candida Infection Leading to the Development of a Cecal Candidoma

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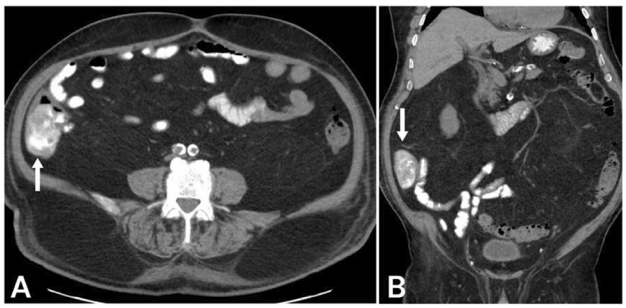
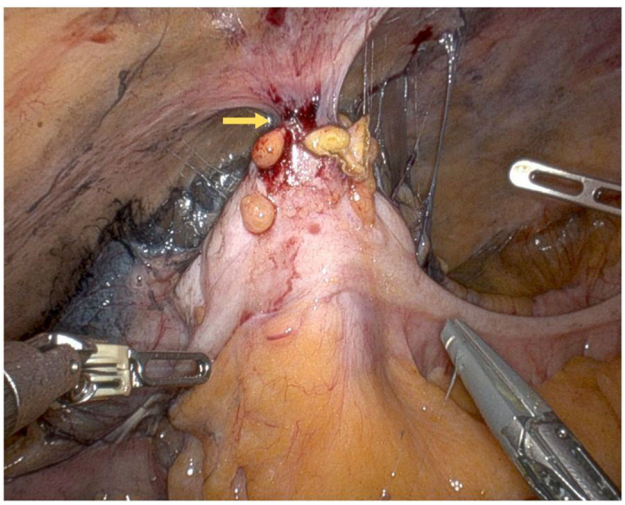
Introduction: Colonic masses are often linked to malignancy, as colorectal cancer ranks third in cancer incidence and is the second leading cause of cancer-related death. Polyps are another frequent cause. Candida species, usually part of the gut microbiome, can become pathogenic under certain conditions, especially in immunocompromised patients, those treated with broad-spectrum antibiotics, or those who have undergone abdominal surgery. Disruption of the gut microbiome, mucosal barrier, or immune response may allow Candida to invade. Invasive candidiasis is rare, occurring in 2.49 per 1000 hospital admissions, and can occasionally lead to mass formation. This case highlights invasive candidiasis causing obstructive symptoms due to candidal overgrowth in the cecum, treated with a right hemicolectomy.
Methods and Procedures: A 78-year-old male with multiple comorbidities was admitted for evaluation of a lower gastrointestinal bleed (GIB). He reported two weeks of abdominal pain and hematochezia, with no other significant symptoms. A prior colonoscopy revealed a cecal mass, which was tattooed. His vital signs were stable, and labs showed moderate anemia without leukocytosis. A CT scan of the abdomen and pelvis with contrast showed an unidentifiable mass in the cecal region without bowel obstruction (Fig. 1).
Figure 1



Results: The patient was medically stabilized, and surgical resection was planned. Tests for CA19-9 and CEA were normal. On hospital day three, a robotic-assisted right hemicolectomy was performed, resecting the right colon, cecum, and distal terminal ileum, with dense adhesions noted around the cecum (Fig. 2). A side-to-side anastomosis was completed without complications. Pathology showed a cecal lesion with ulceration, inflammation, and necrosis. Grocott staining identified fungal yeast forms consistent with Candida, likely colonizing around the necrotic tissue. The patient recovered well, with bowel function restored, and was discharged on post-operative day ten.
Figure 2



Conclusions: This rare case of invasive candidiasis leading to focal colonization and mass formation is unique. Through a thorough literature search, there does not appear to be any reported case of a Candida mass. While aspergillomas are known in lower respiratory tract infections, Candida-related masses are not well-documented. The right hemicolectomy was performed due to the mass's obstructive features and suspicion of malignancy. This case highlights the adaptability of Candida species and their ability to thrive once given the opportunity to invade local tissue, which should be considered in the differential for unidentifiable colonic masses, particularly in the absence of other signs of malignancy.

P382

Descriptive Analysis of Recommendations from Pelvic Floor Meetings in a Large US Health System

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Introduction: Pelvic floor dysfunction encompasses a broad spectrum of structural and functional disorders, requiring management by a diverse group of specialists, including colorectal surgeons, urogynecologists, physical therapists, and radiologists. Multidisciplinary meetings are often held to discuss complex and challenging cases. However, there are no standardized guidelines, and limited data exist on the structure and decision-making processes of these meetings. This study provides a descriptive analysis of the recommendations made during these meetings within a large US healthcare system, offering valuable insights into the collaborative process and interactions among the different disciplines.
Methods: A retrospective review was conducted within a large healthcare system in central Florida, examining patients presented at pelvic floor multidisciplinary meetings across multiple campuses. Data collected included patient demographics, studies performed prior to presentation, and recommendations made during the conference. Descriptive statistical analysis was done.
Results: Between February 2021 and August 2024 (3.5 years), 730 presentations were conducted involving 691 patients, of whom 690 (99.86%) were female. The median age was 63.03 years (range: 18.79–94.05). Thirty-six patients (5.21%) were presented more than once, with a median of 2 presentations per patient (range: 2–4). Dynamic MRI or X-ray defecography was performed in 659 patients (94.9%), and 243 (33.2%) underwent anal manometry before presentation. In some cases, more than one recommendation was provided. Surgery as the first step was recommended in 368 cases (50.41%), with 289 (39.59%) receiving a recommendation for combined abdominal pelvic floor reconstruction, 45 (6.16%) for ventral mesh rectopexy (VMR), 5 (0.68%) for other types of rectopexy, and 17 (2.33%) for perineal repair. Fecal diversion was suggested in 12 cases (1.64%). Non-operative management was recommended in 183 cases (25.07%), including pelvic floor physical therapy in 123 cases (16.85%). Additional recommendations included sacral nerve stimulation (10 cases, 1.37%), Botox injections (15 cases, 2.05%), pessary use (12 cases, 1.64%), and further studies or review of previous studies in 11 cases (1.51%). In 47 cases (6.44%), no recommendation was documented, or the presentation was canceled.
Conclusions: Most cases reviewed at the pelvic floor multidisciplinary meetings resulted in recommendations for surgery, primarily involving combined pelvic floor reconstruction via the abdominal approach. Due to the diversity of this cohort, further analysis is necessary once more detailed pathology and imaging data are available. This information will provide an opportunity to better understand the meetings' processes and improve patient selection for presentation.

P383

Minimally Invasive Converted to Open versus Upfront Open Surgeries for Rectal Cancer - Short Term Outcomes

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Background: Minimally invasive surgery (MIS) has proven to have significantly better short-term outcomes than open surgery. However, it is unclear whether MIS with conversion to laparotomy for rectal cancer carries any benefits compared to planned laparotomy. This study aims to compare the 30-day post-operative outcomes between these groups to inform surgical decision-making.
Methods: This is a retrospective study using data on elective surgeries for rectal cancer from 2016 and 2022 in the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database. Patients were separated into two groups: MIS converted to open (MISC group) and planned open surgery (Open group). Groups were balanced using propensity-score matching. The primary outcome was overall complication rates, and secondary outcomes included unplanned readmission rates, 30-day mortality, and length of stay. Regression models were used to evaluate the association between the comorbidities and surgical approach with postoperative outcomes.
Results: The study included 2551 (86.3%) patients in the Open group and 406 (13.7%) patients in the MISC group, of which 80.5% converted from laparoscopy and 19.5% were converted from robotic surgery. Propensity-score matching yielded 400 patients in each group. On univariate analysis, the groups had comparable rates of overall complications (48.8% vs. 42.8%, $p = 0.103$), unplanned readmission (18.5% vs. 16.5%, $p = 0.515$), 30-day mortality (1.2% vs. 0.5%, $p = 0.451$), but the MISC had a significantly lower median length of stay (6.00 days vs 7.00 days, $p = 0.015$). On regression analysis, the MIS approach that converted to open was not found to be a significant predictor of overall complications (OR = 1.040 [0.843–1.280], $p = 0.716$), unplanned readmission (OR = 1.230 [0.939–1.620], $p = 0.132$), and 30-day mortality (OR = 1.750 [0.648–4750], $p = 0.269$. However, the MISC group was significantly correlated with an decreased length of stay ($\beta = -0.869$ [-1.609 to -0.129], $p = 0.021$).
Conclusion: Patients undergoing planned open proctectomy and those undergoing MIS converted to open proctectomy exhibit similar 30-day post-operative outcomes. As completed MIS offers advantages over open surgeries, and as there are no disadvantages of MISC, MIS should be attempted as the default surgical approach for rectal cancer patients.

P384

Examining the Relationship & Outcome Between Pre-treatment Neutrophil:Lymphocyte Ratio and Lymphocyte:Monocyte Ratio in a Series of Locally Advanced Complex Rectal Tumours

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Introduction: The neutrophil-to-lymphocyte ratio (NLR) is a key marker in assessing immune responses to infections, inflammation, and diseases like cancer and cardiovascular conditions. Neutrophils respond first to bacterial infections, while lymphocytes play a larger role in viral infections and adaptive immunity. An NLR value of 3 is commonly used as a prognostic marker, although values vary slightly across published studies. We retrospectively studied the relationship & outcome between pre operative NLR & Lymphocyte:Monocyte Ratio (LMR), along with their tumour and nodal stages, in a cohort of locally advanced complex rectal tumours.
Procedure: The retrospective data was collected from 2013 to 2023. Cases where rectum resection was not involved were excluded. The Kaplan–Meier curve was employed to estimate the survival function, with overall survival defined as the duration from the date of the first surgery to the final data input point which was either last attendance at the hospital or the date of death. Disease-free survival and disease recurrence was determined based on a combination of radiological, histopathological, and/or endoscopic results.
Results: There was a total of 70 cases of which 98.6% ($n = 69$) of the cases were adenocarcinoma with one case found to be rectal cancer with squamous cell in origination.?80% of cases were moderately differentiated ($n = 48$). M:F ratio of 1:1 and median age was 60.1 years. ?Our results from NLR did not show any significant correlation in overall survival and disease free survival ($p = 0.064$). For LMR, our disease free survival was found to be significant at $p < 0.0425$ suggesting that the likelihood of recurrence is high. Our overall survival did not have any significant findings.?Though no significant statistical p-value < 0.05, our data trend also showed those staged as T3/T4 with low neutrophil:lymphocyte have better over-all and disease free survival.
Conclusion: In LARC, the LNR showed a trend of improved over-all and disease-free survival in those with low LNR and worse T and N staging. Though there was no statistical difference, we anticipate that as our database grows over time, the observation may be associated with a statistical difference.

P385

Feasibility and Safety of Intracorporeal Anastomosis with ICG Fluorescence Guidance in Laparoscopic Colorectal Surgery: An Initial Series

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Background: Intracorporeal anastomosis (IA) in laparoscopic colorectal cancer surgery has gained traction recently. We previously favored extracorporeal anastomosis for lesions proximal to the sigmoid colon due to oncological concerns. However, recent evidence has largely mitigated these issues. We present our experience with IA technique augmented by indocyanine green (ICG) fluorescence angiography in laparoscopic colorectal resections.
Methods: We retrospectively analyzed 8 patients (4 males, 4 females; median age 72.5 years, range 36–89) who underwent laparoscopic colorectal resections with IA and ICG perfusion assessment between July 2021 and April 2024. Procedures included right hemicolectomy ($n = 1$), extended right hemicolectomy ($n = 2$), left hemicolectomy ($n = 4$), and sigmoid colectomy ($n = 1$). Two patients received preoperative endoscopic metallic stent placement. Intraoperative ICG fluorescence angiography was performed before anastomosis. Reconstruction utilized functional end-to-end anastomosis (FEEA) with linear stapler, closing the common enterotomy by two-layer continuous suturing using 4-0 barbed absorbable suture. We reviewed medical records for perioperative outcomes and follow-up data.
Results: Median operative time was 244.5 min (range: 182–402). Estimated blood loss was minimal (median: 25 mL, range: 5–131). Oral intake resumed at a median of 2.5 days postoperatively (range: 2–3). No anastomotic leaks or other postoperative complications occurred. AJCC cancer stages were: Stage I ($n = 2$), Stage IIA ($n = 2$), Stage IIIA ($n = 1$), and Stage IIIB ($n = 3$). All patients were discharged without complications. At the time of analysis, all patients were alive without evidence of recurrence.
Conclusion: This retrospective series demonstrates the feasibility of laparoscopic colorectal resection with IA and ICG fluorescence angiography. The approach minimizes extraction site incisions and excessive bowel traction. ICG perfusion assessment may help prevent anastomosis-related complications. While our experience shows promising short-term outcomes and oncological safety, prospective studies with larger cohorts and extended follow-up are necessary to establish the efficacy and potential advantages of this technique over conventional approaches.

P386

Early identification of the Left Ureter During Extraperitoneal Left-Sided Colorectal Resections

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Background: Failure to locate the left ureter and the risk of ureteric injury are significant concerns for colorectal surgeons performing minimally invasive procedures. Various adjunctive methods have been employed to assist in identifying the left ureter intraoperatively. The extraperitoneal approach offers direct and early access to retroperitoneal structures including the ureter. This study aimed to evaluate the time taken to positively identify the left ureter and assess ureteric injuries during minimally invasive left-sided colorectal resections utilisting the extraperitoneal approach.
Methods: A prospective database was reviewed, including all minimally invasive left-sided colorectal resections performed using a new extraperitoneal approach between February 2020 and August 2024. Comprehensive data on preoperative, intraoperative, and postoperative outcomes were collected. A new parameter, "time to ureter identification," was measured from the skin incision at the start of surgery. Data were recorded in real time on a standardized proforma and incorporated into the database.
Results: A total of 108 patients were included, with 41 females and a median age of 64 years (IQR 60–72). The median BMI was 27 (IQR 25–32). The majority of cases (97 patients) involved cancer, while 11 cases were for complex diverticular disease. The most common procedure was a high anterior resection (46%), followed by low anterior resection (27%). In 88 of 108 patients (82%), the time to left ureter identification was recorded. In the remaining cases, the ureter was identified but the time was not documented. The median time to ureter identification from skin incision was 35 min (IQR 19–35). Ureter identification consistently guided subsequent dissection in the correct anatomical plane.
Conclusion: The extraperitoneal approach facilitated early and reliable identification of the left ureter during minimally invasive left-

sided colorectal resections, reducing the risk of ureteric injury..This method eliminated the need for additional invasive or non-invasive ureter identification techniques The time to ureter identification could be considered a new safety metric in colorectal surgery.

P388

Presentation and Treatment of a Lesser Sac Internal Hernia

Christopher Fan, DO; UPMC Pinnacle

Internal hernias are rare causes of bowel obstruction, usually associated with a prior history of abdominal surgery such as a Roux-en-Y bypass. Herniation into the lesser sac is an exceptionally rare case with small anatomic openings for a hernia to occur. This case report highlights a patient presenting with bowel obstruction secondary to an internal hernia into the lesser sac, discussing the clinical presentation, diagnostic approach, and management.

A 55-year-old female presented to the emergency department with acute onset of severe, diffuse abdominal pain. She had a history of prior cesarean section. On physical examination, she had generalized abdominal tenderness with concern for peritonitis. Initial laboratory tests were unremarkable. A computed tomography (CT) scan of the abdomen and pelvis with contrast revealed dilated loops of bowel, but on initial read, no acute abnormality was noted. The patient was brought to the operating room for diagnostic laparoscopy.

The patient underwent diagnostic laparoscopy and it was discovered that the patient's ascending colon had herniated behind her stomach, into the lesser sac. The case was converted to open. The colon was able to be carefully reduced without damage to surrounding structures. Her colon was found to be very redundant with a long mesentery. With concern that this could recur, a right hemicolectomy was performed to reduce the redundancy of her colon.

Herniation into the lesser sac via the foramen of Winslow is an exceedingly rare cause of internal hernia and bowel obstruction. Early diagnosis is essential to avoid life-threatening complications such as bowel strangulation and necrosis. CT imaging is the gold standard for diagnosis, allowing detailed visualization of the herniated bowel and its relation to the surrounding structures. Surgical reduction and closure of the hernial defect are key to preventing recurrence. In this case, timely surgical intervention led to a favorable outcome.

This case emphasizes the importance of recognizing internal hernias into the lesser sac as a potential cause of bowel obstruction and highlights the role of prompt surgical management in preventing severe complications.

P389

Battling the Bacteria: Clostridium Difficile Enteritis - A Rare But Important Diagnosis

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Introduction: Clostridium difficile enteritis (CDE), infection of the small bowel from gram negative spores is a rare diagnosis with mortality of 25%, therefore it must be promptly diagnosed and treated. C. difficile infection is most commonly associated with colitis, but its extension into the small bowel causing enteritis is a seldomly-reported.
Case Report: We present a 51-year-old Caucasian male with history of hypertension, hepatitis C, coronary artery disease, emphysema, and bipolar disorder, who presented with vague abdominal pain for multiple days found to have C. difficile colitis. He was treated with oral Vancomycin. On hospital day seven, the patient developed pneumoperitoneum and hemodynamic instability. He was emergently taken for an explorative laparotomy. Upon entering the peritoneal cavity, generalized feculent peritonitis was noted. Colonic perforation was noted with multi-focal necrosis along the transverse and descending colon and with multiple necrotic areas of the colon. Total abdominal colectomy was performed with an end ileostomy. Patient did well postoperatively and was discharged, but returned in two weeks with septic shock. He was admitted to the intensive care unit (ICU) with persistent leukocytosis. Ileostomy output noted to be $>$ 1000 on admission. A stool sample from the ileostomy tested positive for C. difficile confirming the diagnosis of small bowel enteritis. The patient was started on oral Vancomycin with minimal improvement, antibiotics were further escalated to oral Fidaxomicin 200 mg every 12 h and Vancomycin enemas every 6 h via rectal stump which resulted in resolution of sepsis with full recovery.
Conclusion: Our case helps highlight the importance of maintaining a high level of suspicion of CDE in patients with an ileostomy. Possible reasons for increased risk of CDE in ileostomy patient populations include changes in the terminal ileal epithelium creating a similar environment to the colon and lack of an ileocecal valve which would normally prevent small bowel colonization of colonic bacteria.
Discussion: C difficile enteritis mortality was as high as 25.3–32.1%. Clinically CDE can present with high output ileostomy. Most cases are confined to the colon; but the small bowel may act as a reservoir for CDE. Alterations of the small bowel anatomy after colectomy can resemble intestinal metaplasia with upregulation of Transforming Growth Factor—Beta due to exposure to bile salts. Treatment options are similar to that of C. difficile colitis with vancomycin or metronidazole being first line, but early recognition is key to decreasing mortality and morbidity.

P390

Implementation and Outcomes of Laparoscopic Colorectal Surgery: A Latin American Country Experience

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Introduction: Laparoscopic surgery represents one of the most impactful technical advancements in modern surgery. However, in developing countries, challenges persist due to economic and technological constraints. Despite these barriers, the formation of structured surgical teams has made minimally invasive colorectal surgery a reality in certain settings. This study aims to characterize our experience and outcomes since the establishment of a dedicated laparoscopic colorectal surgery team.
Methods: This retrospective, observational study analyzed patients who underwent laparoscopic surgery for complicated diverticular disease at three medical institutions in Cúcuta, Colombia, between January 2014 and July 2023. We gathered demographic data, preoperative characteristics, intraoperative details, and postoperative outcomes from medical records. All surgeries were performed by a consistent surgical team, ensuring uniformity across cases.
Results: A total of 816 laparoscopic colorectal surgeries were performed. The mean patient age was 61.2 years (SD: $\pm$ 15), with 57% of the patients being female (n = 468). Most patients (n = 558, 68%) had a BMI between 25 and 30, and 622 (77%) were classified as ASA

II, indicating mild systemic disease. Various laparoscopic colorectal procedures were performed, including 236 (29%) partial mesorectal excisions, 184 (23%) colectomies, 112 (14%) stoma closures, 64 (8%) Hartmann's procedures, 58 (7%) total mesorectal excisions, and 49 (6%) proctocolectomies. The median operative time was 120 min (IQR: 60–260), with 43 cases (5%) converted to open surgery due to technical difficulties in 33% ($n = 14$) of those cases. Postoperative complications included 142 cases (17%) of prolonged ileus and 67 reoperations (8%), with 26 (3%) due to anastomotic leakage. Median time to oral intake was 1 day (IQR: 1–6), and median hospital stay was 5 days (IQR: 2–20). Thirty-day postoperative mortality was 27 cases (3%), with 17 (2%) due to non-surgical causes. The mean follow-up period was 12.2 months (SD: ± 17.7), with a 90% survival rate at the last follow-up.

Conclusion: The successful implementation of laparoscopic colorectal surgery in Latin American countries, despite resource constraints, underscores the importance of organized surgical teams. Our findings demonstrate that this approach is not only feasible but also yields outcomes comparable to those in more resource-rich settings. This experience highlights the potential for expanding access to advanced surgical techniques in community hospitals, ultimately improving patient care in developing regions.

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Two Surgeons Co-operating Improve Operative Outcome than a Single Surgeon During Critical Decision Making in Left Sided Colorectal Resections

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"To address the elephant in the room, there needs to be more elephants in the room"

Introduction: Anastomotic leak is a devastating complication affecting patients as the main victims of this complication both physically and psychologically. Despite extensive research into the causes of anastomotic leakage, surgeon's personality has been the elephant in the room with little data to assess how this affects the anastomotic decision making.Surgeons themselves are negatively affected as the second victim of this complication. It is however challenging to draw direct evidence from the impact of the surgeon's personality on complications. The aim of this study was to assess surgical outcomes indirectly based on the number of surgeons involved in the critical decision making process during live surgery.

Methods: All patients who underwent minimally invasive left sided colorectal resection between February 2020 and August 2023 were included in this study. Patients were separated into two groups; single surgeon and two or more surgeons involved especially in the critical decision-making during surgery such as performing a primary anastomosis with or without a stoma and conversion to open surgery. Primary outcome measures were: conversion to open surgery, stoma formation rate and anastomotic leak rate.

Results: 248 patients have met the inclusion criteria, 175 in the single surgeon group and 73 in the two or more surgeons' group. Both groups were comparable for age, sex BMI and indication for surgery including tumour location. Median age was 65 years (24–91). 39% were females and the median BMI was 28(18–44). Overall conversion rate to open surgery was 13% (33/248). There were more conversions in the single surgeon group vs two surgeon group (16% vs 7% $P = 0.06$). There was significantly more diversion ileostomy formation in the single vs two surgeon group (43% vs 26% $P = 0.01$) and more end colostomy (Hartmann's type) in the single vs dual surgeon group (13% vs 7%). Overall anastomotic leak rate did not differ between the groups (6% vs 7% single vs dual surgeon).

Conclusions: Two surgeon operating was associated with less conversion to open surgery, Less diversion stoma and less Hartmann's type procedure. The anastomotic leak rate was not different but could be explained by more stoma formation in the single surgeon group. Similar larger prospective quantitative studies are needed to confirm the finding of our study.

P392

Laparoscopic Surgery for Hinchey Classification III and IV Diverticulitis of the Colon

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Introduction: With the recent increase in the incidence of colonic diverticulitis in Japan, the need for treatments has also increased. Although there are some reports of laparoscopic surgery for colonic diverticulitis requiring surgical treatment, patients with Hinchey III and IV are often in poor general and intra-abdominal condition makes them hesitant to choose laparoscopic surgery.

Methods: We examined various clinical factors and treatment results in 30 patients with Hinchey stage III and IV diverticulitis of the colon who had been surgically treated at our hospital between January 1994 and May 2024.

Results: Age: 69 (22–84) (years), sex: male/female = 18/12, body mass index (BMI): 21.8 (15.1–35.3) kg/m^2, site of diverticulitis: A/T/D/S/RS = 2/2/2/23/1 (patients), and Hinchey stage: III/IV = 16/14 (patients). In all patients, emergency surgery was performed. We compared 19 patients in whom laparoscopic surgery was performed (Lap group) with 11 in whom laparotomy was performed (Open group). No significant difference were observed between the Lap and Open groups in the age, sex, BMI, site of diverticulitis, concomitant

disease, operative time, or blood loss, but there were significant differences in the Hinchey stage (III/IV) (14/5:2/9 (patients) ($p = 0.003$)), colostomy (78.9:100 (%) ($p = 0.04$)), postoperative complications (Clavien-Dindo classification grade III or higher) (10.5:54.6 (%) ($p = 0.009$)), and length of postoperative stay (16 (11–48):45 (21–78) (days) ($p = 0.002$)).

Conclusion: Most Hinchey IV cases were treated by open surgery due to poor general condition, with a trend towards more post-operative complications and longer post-operative hospital stays. On the other hand, laparoscopic surgery was relatively safely performed in Hinchey stage III patients. This procedure is technically difficult, but it may be an option for surgeons with expertise in laparoscopic colorectal surgery.

P394

Sexual Functional Outcomes in Robotic vs. Laparoscopic Rectal Cancer Surgery: A Comparative Meta-analysis

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Background: Sexual dysfunction is a prevalent postoperative concern in rectal cancer surgery, significantly affecting both quality of life and psychological well-being. Minimally invasive techniques, such as laparoscopic and robotic surgeries, aim to preserve autonomic nerves to reduce this issue. However, evidence on which technique better preserves sexual function remains conflicting, and understanding the impact of each approach is critical for surgical decision-making.

Aim: This study compares changes in sexual function from preoperative status to six months postoperative between laparoscopic and robotic rectal cancer surgeries in male and female patients.

Methods: A comprehensive literature search was performed up to August 2024 using PubMed, Embase, and the Cochrane Library. Studies reporting preoperative and six-month postoperative sexual function scores using the International Index of Erectile Function (IIEF) for males and the Female Sexual Function Index (FSFI) for females were included. Mean differences (MD) between pre- and postoperative scores were calculated for laparoscopic and robotic surgery groups using a random-effects meta-analysis model. Statistical analyses were conducted using R version 4.0.3 with the 'metafor' and 'meta' packages.

Results: Four studies involving 316 female patients (162 robotic, 154 laparoscopic) and three studies involving 146 male patients (71 robotic, 75 laparoscopic) met the inclusion criteria. For male patients undergoing laparoscopic surgery, the mean difference in IIEF scores was 4.48 (95% CI: − 1.01 to 10.05, $p = 0.11$, $I^2 = 84\%$), indicating a non-significant improvement in sexual function from preoperative to 6 months postoperative. Similarly, for males in the robotic surgery group, the mean difference was 2.54 (95% CI: − 1.88 to 6.96, $p = 0.26$, $I^2 = 87\%$), also reflecting a non-significant change in sexual function.

For female patients, those undergoing laparoscopic surgery showed a mean difference in FSFI scores of 6.97 (95% CI: 3.93 to 10.02, $p < 0.01$, $I^2 = 87\%$), indicating a significant decline in sexual function. Females in the robotic surgery group had a mean difference of 4.45 (95% CI: 2.65 to 6.25, $p < 0.01$, $I^2 = 65\%$), also showing a significant decline, though less pronounced compared to the laparoscopic group.

Conclusion: Both laparoscopic and robotic surgeries are associated with declines in sexual function at six months, especially in female patients. While no significant changes were observed in males, females experienced significant declines in both groups, with robotic surgery showing a lesser decline, suggesting better preservation of sexual function. Further randomized controlled trials are needed to confirm these findings.

P395

A Case of Recurrent Small Bowel Obstruction Secondary to Intestinal Tuberculosis

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Introduction: Abdominal tuberculosis can present with a wide range of manifestations affecting the gastrointestinal tract ranging from abdominal pain and diarrhea to perforation, abscesses, and small bowel obstructions. Due to the rarity of intestinal tuberculosis in the United States, misdiagnosis can delay initiation of treatment resulting in worsening outcomes.

Case Presentation: Patient is a 74-year-old female from Myanmar, with a history of tuberculosis and colorectal cancer status post resection with colostomy presenting due to nausea, vomiting, and abdominal pain. She was recently diagnosed with active tuberculosis a few days prior but had not yet started treatment. The patient reports chronic abdominal pain for the past several years and prior small bowel obstructions in 2016, 2019, and 2023. The patient had a recent stool test outpatient which was positive for TB. During this admission, CT of the abdomen showed a distended small bowel measuring up to 5.6 cm, air fluid levels throughout the abdomen, and a transition point in the lower posterior pelvis. A nasogastric tube was placed and the patient was started on intravenous rifampin, levofloxacin, amikacin, and linezolid. Follow-up abdominal x-ray showed resolution of small bowel obstruction and the patient was sent home on oral TB therapy. Two weeks following discharge, the patient presented with vomiting, abdominal pain, and distention. Abdominal x-ray was consistent with a small bowel obstruction with distention of the small bowel up to 4.8 cm in diameter. The patient's IV tuberculosis regimen was restarted with successful resolution of her small bowel obstruction.

Discussion: Patients with abdominal TB should be treated with anti-tuberculous therapy similar to that of pulmonary TB. However, surgery may be indicated in patients presenting with complications including perforation, fistulas, or obstruction. Patients presenting with multiple strictures may be less likely to respond to anti-tuberculous therapy and in certain instances, these medications may worsen the obstruction. Intestinal tuberculosis may be difficult to diagnose as it can present similarly to pathologies such as intra-abdominal infections, inflammatory bowel disease, or malignancy. Misdiagnosis rates of intestinal TB have been reported to be as high as 50–70%, even in countries with a high prevalence of TB.

Conclusion: Abdominal tuberculosis may present with a wide variety of manifestations throughout the gastro-intestinal tract making diagnosis difficult. Intestinal tuberculosis should be included in the differential for recurrent small bowel obstructions, especially in patients presenting from regions with a high prevalence of TB, to prevent delays in initiation of anti-tuberculous therapy.

P396

Laparoscopic Total Mesorectal Excision with Transanal Dissection (taTME) vs Laparoscopic Total Mesorectal Excision (LaTME): Systematic Review and Meta-analysis of Randomized Controlled Trials

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Introduction: Since the introduction of taTME in 2010 by Sylla et al., the approach has been increasingly used for the excision of lower rectal cancers. However, the studies comparing taTME to LaTME are limited. For this reason, we decided to perform a meta-analysis to compare the two approaches based on evidence from randomized controlled trials (RCTs).
Methods: We performed a systematic literature search of PubMed/Medline, Cochrane Library, ClinicalTrials.gov and Google Scholar, to identify RCTs comparing taTME and LaTME. The systematic review was conducted using the reporting items for systematic reviews and meta-analyses guidelines (PRISMA). Meta-analysis was performed using R software (version 4.3.2) with the meta-package for frequentist models. Results were synthesized as odds ratios (OR) or mean differences (MD) with 95% confidence intervals (CI), and heterogeneity was assessed using the I^2 statistic. Risk of bias was assessed using the National Institutes of Health (NIH) Quality Assessment Tool for controlled intervention studies.
Results: Eight RCTs were selected (3801 patients, median age 61 years): 1782 patients underwent taTME and 2019 underwent LaTME. Age, BMI, and disease stage were similar in both groups.
Conversion rates were 75% lower for taTME (OD: 0.25, 95% CI: 0.15 to 0.41, $p < 0.0001$, and hospital stay was significantly shorter for taTME (MD: − 0.66 days, 95% CI: − 1.02 to − 0.29, $p = 0.0004$). There was no statistically significant difference for anastomotic leaks (OR: 1.37, 95% CI: 0.95 to 1.97, $p = 0.093$) and overall complication rates (OR: 0.93, 95% CI: 0.75 to 1.15, $p = 0.5264$), and only 3 cases of urethra injury and 2 cases of CO_2 embolism were reported for taTME. Local recurrence and major complication rates showed no significant differences between the groups (OR: 0.93, 95% CI: 0.49 to 1.76, $p = 0.83$; OR: 1.08, 95% CI: 0.75 to 1.55, $p = 0.6746$, respectively). Mortality (OR: 0.50, 95% CI: 0.09 to 2.90, $p = 0.4392$), operative time (MD: 5.28 min, 95% CI: − 12.52 to 23.09, $p = 0.5609$) and reoperation rates (OR: 0.89, 95% CI: 0.53 to 1.48, $p = 0.6437$) were not significantly different.
Conclusion: TaTME was associated with lower conversion rates to open surgery and shorter hospital stay compared to LaTME. No clinical difference was observed in complication rates, mortality, local recurrence, anastomotic leaks and reoperation rates.

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A Case of an Appendiceal Diverticulum Mimicking as an Appendiceal Mucocele

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Introduction: Appendiceal diverticulum is rare and classified as a congenital or acquired diverticulum. While benign, acquired appendiceal diverticula are associated with malignant appendiceal neoplasms which may negatively impact survival if not adequately resected. In this case, we present a patient with an appendiceal diverticulum who underwent surgery for a suspected appendiceal mucocele.
Case: A 67-year-old African American female with past medical history of HTN, DM, COPD, colonic diverticulosis, and remote history of perforated peptic ulcer disease status post Roux-en-Y gastric bypass presented to the hospital with increased epigastric pain, diet intolerance due to postprandial nausea and vomiting. EGD and CT scan of the abdomen and pelvis identified gastric outlet obstruction secondary to a stricture in the gastrojejunostomy. She subsequently underwent a robotic revision of her gastric bypass. She was also referred to colorectal surgery for an incidental finding on CT revealing a marked appendiceal dilatation with irregular contour which extended into the cecal base concerning for a mucocele or a malignancy (Fig. 1). There was no obvious lymphadenopathy on imaging. Patient denied any family history of colorectal cancer. Tumor markers such as CEA, CA-19-9, and CA-125 were all within normal range. To further investigate, she underwent a colonoscopy which revealed a 20 mm protrusion of the appendiceal orifice suspicious for a mucocele (Fig. 2). Given her age and the concerns for a possible malignant mucocele involving the base of the appendix, we performed a robotic right hemicolectomy taking care not to rupture the specimen.
Results: The pathology report of the right hemicolectomy specimen identified a benign appendiceal mass consistent with a large appendiceal diverticulum. 25 nodes were found in the specimen and negative for malignancy. The appendix was found to be 6.7 cm in length and 1.1 cm wide in diameter with a 4 × 1.5 × 1.5 cm bulging mass on the serosa. The mass appeared grossly involved in the mesoappendix and was abutting the external serosa. The appendiceal diverticulum did not involve appendiceal orifice or the cecum.
Conclusion: We present the case of a 67-year-old female who received a right hemicolectomy for an appendiceal mass with malignant suspicion. Pathology report identified a benign diverticulum and it remains unclear if this was of congenital or acquired origin. A wide differential diagnosis is needed when evaluating patients presenting with an appendiceal mass as preoperative tissue biopsy is often not feasible. If a malignant process is high on the differential, performing an oncologic operation is appropriate.
Figure 1

Figure 2

P399

The Implementing Robotic Surgery for Colorectal Cancer is a Significant Investment for the Hospitals in Japan

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Background: Currently robotic surgery has spread worldwide, and in Japan, it has been covered under the health insurance system for rectal cancer since 2018 and for colon cancer since 2022. However, for the first 10 cases of each surgical procedure, all surgical costs, including material expenses, were required to be borne by each institution. Moreover, since limited number of experiences, surgical qualities and outcomes may be expected to vary between hospitals. The aim of this study is to calculate the costs of implementing robotic surgery for colon and rectal cancer surgery in our institution, analyze the actual account of costs concretely.
Patients and Methods: The first 10 cases each of robotic surgery for rectal cancer and colon cancer were enrolled in this study. All robotic surgeries were performed using Da Vinci Xi system. The total revenue was calculated based on procedure fees, anesthesia fees, and material surcharges, while the total expenditure was determined by adding the cost of surgical materials and the one-time usage fees for the Da Vinci instruments. Results: For rectal cancer, the average total revenue per case was 1371,932 JPY, and the total material costs amounted to 450,969 JPY, with the Da Vinci instruments costs being 243,966 JPY, resulting in a balance of 676,997 JPY. For colon cancer surgery, the average total revenue was 868,148 JPY, and the total material costs was 405,026 JPY, with the Da Vinci instruments costs being 180,024 JPY, resulting in a balance of 274,694 JPY. If revenue were obtained under the health insurance system, rectal cancer surgeries would result in a higher net balance compared to colon surgery in Japan. However, in these cases, no revenue was received, the total expenses covered by the hospital were 6,949,350 JPY for rectal cancer and 5,850,500 JPY for colon cancer. Conclusion: In Japan, during the early stages of implementing Da Vinci surgery for colorectal cancer, hospitals require a significant amount of costs.

P400

Impact of Neoadjuvant Chemotherapy With or Without Radiation on Local Recurrence in Patients with Locally Advanced Rectal Cancer

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Introduction: The traditional treatment of clinical stage II or III locally advanced rectal cancer (LARC) involves preoperative chemoradiation followed by total mesorectal excision (TME) and postoperative adjuvant chemotherapy. For over thirty years, this approach of preoperative chemoradiation has been the standard of care for patients with LARC and has been shown to decrease the rate of local recurrence by 25% and improve 5-year overall survival by 30%. However, pelvic radiation poses both long-term and short-term risks to bowel, bladder, sexual function, and quality of life. In this study, we investigate the feasibility of removing radiation therapy from the treatment regimen of patients with LARC by assessing the rates of local recurrence in patients who received neoadjuvant chemotherapy without radiation therapy.
Method: A single-center retrospective cohort analysis was conducted at Methodist Richardson Medical Center and included 30 patients who had confirmed clinical stage II or III LARC requiring either abdominoperineal resection (APR) or low anterior resection (LAR) in a 10-year study period. The patients were stratified into two groups: (1) those that received neoadjuvant chemotherapy alone; CT, or (2) those that received both neoadjuvant chemotherapy and radiation therapy prior to surgery; CT-RT. We compared the rates of local recurrence of both groups.
Results: In a comparison between the CT-RT group ($n = 10$) and CT group ($n = 20$), 60% of patients in the CT-RT group had an R0 resection, compared to 80% in the CT group ($p = 0.563$). Local recurrence was observed in 10% of the CT-RT group, with none (0%) in the CT group ($p = 1.000$). Recurrence-free survival (RFS) was a mean of 27.1 months in the CT-RT group versus 22.4 months in the CT group ($p = 0.539$). Overall survival (OS) was significantly higher in the CT-RT group at 44.1 months compared to 23.1 months in the CT group ($p = 0.007$).
Conclusion: Recent studies have shown that selected patients with LARC may achieve low rates of local recurrence and comparable disease-free survival with neoadjuvant chemotherapy alone and without radiation therapy. Our data supports these findings and suggest that eliminating the routine use of pelvic radiation can be accomplished in patients who may not acquire additional benefit from chemoradiation as opposed to chemotherapy and surgery alone without compromising outcomes, thereby sparing patients from unnecessary radiation toxicity.

P401

Comparison of Short-Term Outcomes Between Intracorporeal Anastomosis and Extracorporeal Anastomosis in Laparoscopic Left Colectomy for Left-Side Colon Cancer: A Retrospective Study

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Background: In recent years, laparoscopic colectomy (LC) has been became the standard of care for treating colon cancer worldwide. LC have two main techniques: Laparoscopic-assisted colectomy with extracorporeal anastomosis (LAC/EA) and Total laparoscopic colectomy with intracorporeal anastomosis (TLC/IA). There were many studies compared LAC/EA and TLC/IA for laparoscopic right colectomy, while studies that compared these two techniques for laparoscopic left colectomy to treat colon cancer remain scarce. The purpose of our study is to compare short term outcomes between intracorporeal anastomosis and extracorporeal anastomosis in laparoscopic left colectomy for left-side colon cancer.
Method: A series of 103 patients underwent laparoscopic left colectomy for left-side colon cancer with intracorporeal anastomosis (IA group) and extracorporeal anastomosis (EA group) in Binh Dan Hospital from 01/2021 to 06/2023 were retrospectively analyzed. Propensity score matching analysis was performed to overcome patient selection bias between the two groups.
Result: After propensity score matching, 21 patients in IA group and 21 patients in EA group were compared. There was no significant difference in terms of age, sex, BMI, and ASA score between the two groups. Post-surgical history and stage of disease according to AJCC/UICC TNM were also similar. The IA group has less intraoperative blood loss than EA group (35.2 ml and 51 ml, $p = 0.023$), mean length of mini-laparotomy was also shorter in IA group (3.88 cm and 5.88 cm, $p < 0{,}001$), the mean operative time was no significant difference (183 min and 192 min, $p = 0.61$). Recovery after surgery was also better in patients who underwent IA, as confirmed by the shorter time to flatus and time to stool in the IA group (2.67 days versus 2.95 days, $p = 0.045$ and 4.48 days versus 5.48 days $p = 0.016$), shorter postoperative length of stay (6.67 days and 7.67 days, $p = 0.006$) and lower

postoperative pain expressed in the mean VAS score in the EA group (2.48 and 3.38, $p < 0.001$). Beside, Laparoscopic left colectomy with intracorporeal anastomosis has a lower rate of post-operative complications (0% and 38,1%, $p = 0.003$).
Conclusions: A total laparoscopic colectomy with IA for the treatment of left-side colon cancer is safe and efficient technique, with better short-term outcomes than laparoscopic-assisted colectomy with EA.
Key words: Left-side colon cancer, laparoscopic colectomy, intracorporeal anastomosis, extracorporeal anastomosis.

P402

Rates, Predictors, and Consequences of Potential Opioid-Related Adverse Events Following Discharge After Colorectal Surgery: A Prospective Cohort Study

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Background: Opioids are a leading cause of adverse drug events after colorectal surgery. While many studies have investigated potential opioid-related adverse events (ORADEs) during postoperative hospital stay, the burden of ORADEs after discharge remains understudied. This study aimed to estimate the extent to which potential ORADEs (1) are experienced by colorectal surgery patients after hospital discharge, (2) can be predicted based on patient and care characteristics, and (3) are associated with 30-day unplanned healthcare utilization.
Methods: This prospective cohort study included adult patients undergoing elective colorectal surgery at two university-affiliated hospitals in Canada. The primary outcome was the incidence of ORADEs within 30 days after discharge, reported by patients using the opioid-related symptom distress scale (OR-SDS). The OR-SDS addresses the presence, frequency, severity, and bother of adverse symptoms related to opioid use, including gastrointestinal (GI) (i.e., nausea, constipation, vomiting), central nervous system (CNS) (i.e., drowsiness, impaired concentration, confusion, dizziness), as well as fatigue, itching, and urination difficulty. Based on previous literature, potential ORADEs were defined as symptoms exceeding a certain threshold for frequency (> "Frequent"), severity (> "Severe" or "Moderate"), and bother (> "Quite a bit"). Demographic characteristics, preoperative health, perioperative care (including analgesia prescription and consumption), and unplanned healthcare utilization (i.e., emergency department visits and/or readmissions) were obtained from medical records or questionnaires. Data were analyzed using descriptive statistics and Bayesian Model Averaging, with a posterior effect probability (PEP) $\geq$ 50% indicating evidence of association.
Results: A total of 347 patients were included (58 $\pm$ 15 years, 53% Male, 64% laparoscopic, 31% rectal resection, length of stay 3 [1–5] days). Most patients (94%) were prescribed opioids at discharge, with 50% reporting opioid consumption. Overall, 81% of patients experienced potential ORADEs post-discharge (31% GI, 32% CNS, 75% fatigue, 19% itching, 15% urination difficulty). Higher preoperative depression (PEP 100%, OR 1.10 [95%CI 1.05–1.15]) and higher postdischarge opioid consumption (PEP 54%, OR 1.51 [95%CI 0.63–3.60]) were associated with potential ORADEs. The presence of GI (PEP 100%, OR 2.66 [95%CI 1.55–4.55]) and CNS ORADEs (PEP 97%, OR 2.47 [95%CI 1.34–4.55]) were associated with increased post-discharge healthcare utilization.
Conclusion: Most patients undergoing colorectal surgery experience post-discharge adverse events that may be associated with opioid consumption and lead to increased healthcare utilization. While the pathophysiology of these events is complex and could be influenced by other factors (i.e., surgical stress response, postoperative complications), the impact of opioid stewardship on potential ORADEs is an important venue for future research.

P403

Tension Pneumothorax in an Elderly Jehovah's Witness Secondary to Colopleural Fistula Complicating a Splenic Flexure Mass

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Introduction: Tension pneumothorax resulting from a colopleural fistula is extremely rare with most case reports focusing on the presentation of colopleural fistulas with empyema or pneumothorax. Intestinal fistulas typically connect with surrounding abdominal or pelvic tissues due to trauma, malignancy, or inflammation. Although rare, fistulas between the alimentary tract and pleural cavity can occur as complications of conditions such as inflammatory bowel disease, diaphragmatic trauma, or colonic malignancies. This abstract presents a case highlighting the exceptional occurrence of tension pneuomothorax resulting from a colopleural fistula.
Case Description: A 76-year-old Jehovah's Witness female presented with sepsis and acute respiratory distress. Her symptoms included worsening shortness of breath, fever, chills, and unintentional weight loss over the past year. She had no abdominal pain or peritonitis, and her previous colonoscopy was 8 years prior. Laboratory tests revealed leukocytosis (37,000/μL), anemia (hemoglobin 7.3 g/dL), and elevated lactate (6.4 mmol/L). Chest x-ray was complicated with large cystic foci of air superiorly. Laterally, the basilar regions were collapsed, displacing the lung parenchyma and mediastinum to the right. Subsequent computed tomography (CT) imaging of the abdomen and pelvis showed multiloculated left hydropneumothoraces, compressive atelectasis of the left lung, mediastinal shift to the right, and small pockets of free air in the left upper quadrant. The splenic flexure wall appeared low attenuating and lobulated. A left chest pigtail catheter was placed, treating the hydropneumothorax, and along with air, drained purulent, feculent fluid. The patient was resuscitated and broad-spectrum antibiotics initiated. A repeat CT with oral contrast demonstrated the fistula from the splenic flexure to the left pleural space, findings consistent with perforated malignancy. The patient underwent a laparoscopic diverting transverse loop colostomy to divert the fecal stream and subsequent IR biopsy was positive for adenocarcinoma.
Discussion: While colorectal cancer perforations typically present with abdominal symptoms and peritonitis. This case shows a very unusual presentation where a splenic flexure mass perforation led to a left-sided feculent tension pneumothorax. This case underscores the rarity of tension pneumothorax secondary to colopleural fistulas, and highlights the importance of including colopleural fistulas in differential diagnoses for patients with acute respiratory symptoms and unexplained anemia.
Conclusion: Colopleural fistulas secondary to perforated colorectal masses, although rare, should be considered in patients presenting with left tension hydropneumothoraces particularly when accompanied by chronic anemia and weight loss. Recognizing this rare complication is important in guiding appropriate diagnostic and therapeutic strategies.

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Spontaneous Bowel and Esophageal Perforation: A Case Report

Kristen Skonieczny, DO; Madison Harris, DO; Frederick Denstman, MD; Charles Mulligan, MD; ChristianaCare

Bevacizumab, also known as Avastin, is a commonly used monoclonal antibody in chemotherapy regimens for colorectal, ovarian, and lung cancers. It has a reported side effect of spontaneous bowel perforation, which is still not entirely understood. Several mechanisms have been proposed but it continues to be an active area of investigation. It is recommended that patients receiving this therapy not undergo surgery for at least 28 days after their last treatment due to the known side effect and long half-life. Similarly, acute esophageal perforation is a rare condition thought to be attributed to microvascular occlusion resulting in mucosal necrosis. Although we tend to associate bevacizumab related bowel perforation to the small or large intestines, retrospective case series show evidence of gastroesophageal perforations in the setting of bevacizumab-based therapy. Here we describe the case of a 73-year-old male with metastatic colon adenocarcinoma treated with neoadjuvant chemotherapy including bevacizumab, complicated by duodenal and esophageal perforation after an elective colostomy reversal. Although the exact etiology of this patient's complications is uncertain, it lends to noteworthy discussion given the known effects bevacizumab can have on bowel perforations as well as limited reports regarding esophageal perforations.

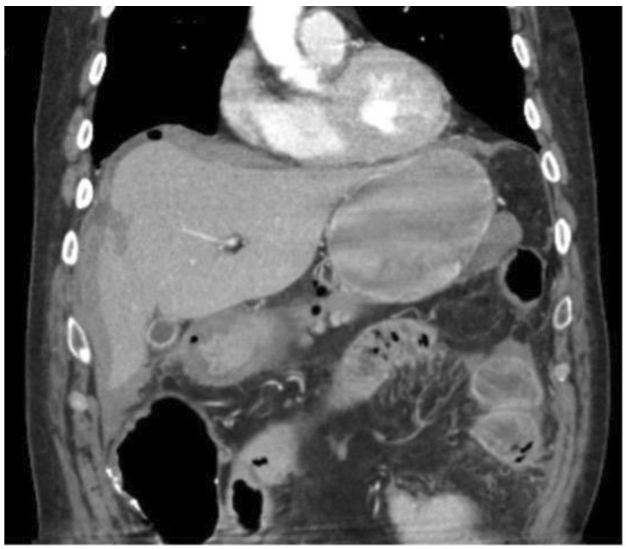

Fig. 1 CT imaging showing pneumoperitoneum concerning for perforation of hollow viscus

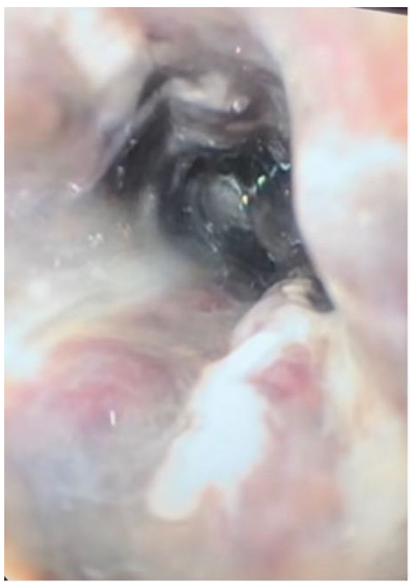

Fig. 2 EGD showing black/necrotic esophagus

P405

Additional Non-scope Based Insufflation via a Transanal Platform Maintains the Proximal Endoscopic Operative Field Despite Sustained Suction During Advanced Polypectomy

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Introduction: During ESD or EMR polypectomy in the proximal colon, suctioning to remove fluid and debris often results in a loss of the "operative" field. It takes time to restore the field and to resume the polypectomy. Ideally, colonic distension would be maintained or minimally affected by suction. This ex vivo bovine large bowel study assessed the impact of added colonic insufflation on maintenance of the intraluminal diameter during colonoscopy.
Methods: Mechanically cleaned and isolated bovine large bowel (with sphincter) 65–75 cm long was placed on a PEG board for this study. A rubber stent was placed across the anal sphincter and a gel faceplate (with insufflation port), through which the colonoscope had been previously passed, attached to the stent (GelPOINT Path, Applied Medical, CA). The conditions assessed in this study were air insufflation via colonoscope only (Group A) and via scope and transanal platform (Group B). A laparoscopic insufflator (CO2) with flow rate 20 L/min and pressure limit of 4–6 mmHg was attached to the anal platform. The time required to fully collapse the proximal colon when applying maximum suction (15 mmHg) via the scope was determined for both sets of conditions as was the time required to fully insufflate. A second model was also used wherein the bovine colon was placed in an opaque abdominal box model containing a dense gelatinous material, simulating the abdominal viscera.
Results: A total of 91 insufflation and desufflation events were carried out. The mean time to fully desufflate the proximal colon was 29 s (range 9–54 s) for Group A. In Group B, despite 3 min of uninterrupted suction, it was not possible to desufflate the proximal colon. Even with lower flow rates (10 L/min) and pressure limit (4 mmHg), suction for 3 min did not cause full collapse. As regards full insufflation of the entire colon, via the scope alone it took, on average, 115 s (range 86–234 s) while via scope and platform the mean result was 36 s (range 26–44 s). Similar results were noted with the abdominal box model.
Conclusions: Maintaining the lumen and exposure while applying maximal suction should facilitate advanced polypectomy. Adding a second means of insufflation, at the flow rates assessed, prevented luminal collapse in these models. In contrast, with scope insufflation only, the proximal colon fully collapsed after 29 s. The use of a transanal platform may facilitate ESD/EMR; further study is warranted.

P406

Splenic and Hepatic Metastasis of Colorectal Cancer: A Case Report and Literature Review

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Metastasis to the spleen from non-hematological cancers is exceedingly rare. In most cases, these metastases are part of multivisceral metastatic cancer, with only a few cases reported of solitary splenic lesions. There seems to be an increasing incidence due to improvements in medical imaging techniques, enhanced long-term survival, and increased surveillance of patients. Treatment with splenectomy has been described for unique metastases compared to systemic therapy. Management dilemmas remain, particularly with multiple metastases.

In this paper, we present a case of a healthy 61-year-old male with superior rectal cancer. The patient first underwent a lower anterior resection with loop ileostomy. Histology showed a ypT3N2b (AJCC Staging System) infiltrative adenocarcinoma, and the patient was referred to oncology for adjuvant chemotherapy. Ileostomy closure was performed seven months later. Almost two years after the initial diagnosis, a follow-up CT revealed a 2.5 cm liver metastasis in segment VII and a solitary epiploic implant. An exploratory laparoscopy was performed to assess for the presence of carcinomatosis, and a unique implant was found. The patient then underwent a partial right hepatectomy with complete epiploectomy, followed by another round of chemotherapy.

One year later, a follow-up CT revealed liver recurrence with a new splenic lesion. The Cancer Diagnosis and Treatment Committee opted for radiofrequency treatment for the liver, along with a splenectomy. The histology report confirmed a 4.1 cm subcapsular metastasis compatible with the original adenocarcinoma. No further systemic therapy was administered, and the patient is disease-free eight months later. This case review discusses the clinical-pathological aspects of splenic metastasis, various hypotheses, and different treatment options. There remains limited data to guide clinicians in the management of solitary as well as multivisceral splenic metastases, making cases like this important to publish to enhance healthcare.

P407

Autonomic Nerve Plexus Preservation with Better Quality of Life in Laparoscopic Rectal Surgery

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Background: Rectal cancer represents a significant healthcare challenge globally. Radical surgery is currently the standard treatment and is necessary in most cases. Due to the complexity of pelvic organs and structures, this operation can sometimes lead to complications that may deteriorate patients' quality of life postoperatively.
The incidences of urinary bladder and sexual dysfunction have been reported, following radical pelvic surgery. The laparoscopic surgery is not only less invasive but also provides superior operative vision, allowing for the preservation of the pelvic autonomic nervous plexus.
Objective: The primary outcome of this study is to compare the incidences of urinary bladder dysfunction between the laparoscopic autonomic nerve plexus preservation technique and the open surgical approach.
The secondary outcomes include the incidences of sexual dysfunction, disease-free survival, length of hospital stay, and the need for blood transfusions both perioperatively and postoperatively between the two approaches.
Materials and Method: In this study, we included 101 patients with rectal cancer who underwent either laparoscopic or open rectal surgery from October 2017 to July 2024, with a six-year surveillance period utilizing computed tomography scans and colonoscopy following NCCN guidelines.
Urogenital function outcomes were collected through perioperative and postoperative records and telephone questionnaires with consent. The assessment tools used included the International Prostate Symptom Score (I-PSS), the International Index of Erectile Function (IIEF), and the International Index of Female Sexual Function (IFSF).
Result: The rate of urinary bladder dysfunction was 0.0% in the laparoscopic group and 74.0% in the open surgery group. The

laparoscopic group had a significantly lower rate of urinary bladder dysfunction by 74.00% (95%CI: − 86.16, − 61.84), with statistical significance (p-value < 0.001).
The rate of sexual dysfunction was 0.0% in the laparoscopic group and 56.0% in the open surgery group. The laparoscopic group had a significantly lower rate of sexual dysfunction by 56.00% (95%CI: − 69.76, − 42.24), with statistical significance (p-value < 0.001).
Conclusion: Regardless of the radical rectal surgery, the laparoscopic approach with autonomic nerve plexus preservation provides the preservation of the urinary bladder and sexual function postoperatively and in a long-term period.

P408

Laparoscopic Surgery for Complicated Diverticulitis: A Nine-Year Retrospective Review of Outcomes

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Introduction: Diverticulitis is a common gastrointestinal condition that can lead to significant morbidity. Its incidence has risen steadily, particularly as the global population continues to age. As diverticular disease progresses, approximately 12% of patients develop complications, including fistulas, perforations, and stenosis. Of these, around 15% require surgical intervention to manage the condition. Minimally invasive approaches, such as those recommended by the Enhanced Recovery After Surgery (ERAS) protocols for colorectal surgery, are increasingly favored for these patients due to their association with better outcomes, including faster recovery and reduced hospital stays.
Methods: This study is a retrospective observational cohort of patients who underwent laparoscopic surgery for complicated diverticular disease at three academic medical institutions in Cúcuta, Colombia, between January 2014 and July 2023. We collected demographic information, preoperative characteristics, intraoperative details, and postoperative outcomes from medical records. All surgeries were performed by the same surgical team, providing consistency across cases.
Results: A total of 62 laparoscopic surgeries were performed for complicated diverticular disease during the nine-year period. The average age of patients was 61 years (SD: ± 12), with a majority being female (63%, n = 39). Preoperatively, 66% (n = 41) of patients were classified as ASA II, indicating mild systemic disease without functional limitation. Colovesical fistula was the most common presentation, occurring in 69% (n = 43) of cases, followed by colovaginal fistula (16%, n = 10), stenosis (10%, n = 6), and free perforation (5%, n = 3). Regarding surgical techniques, 92% (n = 57) of patients underwent colonic resection with primary anastomosis, while 8% (n = 5) required a Hartmann's procedure. The median operative time was 130 min (IQR: 100–190), with conversion to open surgery in 11% (n = 7) of cases, primarily due to technical difficulties (57%, n = 4). Postoperative complications included paralytic ileus in 13% (n = 8) of patients and reoperation in 11% (n = 7), with anastomotic dehiscence only in 1 (2%) patient. The median time to oral intake after surgery was 1 day (IQR: 1–2), and the median hospital stay was 5 days (IQR: 4–8). The 30-day postoperative mortality rate was 2% (n = 1). At a median follow-up of six months (IQR: 1–45), all patients were alive.
Conclusion: Laparoscopic surgery for complicated diverticulitis is a feasible and effective treatment option, offering significant benefits such as shorter hospital stays and low postoperative mortality. Our findings align with global data and underscore the importance of structured, experienced surgical teams in achieving optimal patient outcomes.

P409

Case Series: Hinchey IV Sigmoid Diverticulitis Followed by Major Orthopedic Surgery

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Perioperative opioid use for pain control is widely accepted, particularly for major operations, despite its notorious side effect of constipation that can occasionally lead to bowel perforation. This report discusses four cases of perforated sigmoid diverticulitis in patients with a history of opioid analgesic use following recent major orthopedic surgery. The cohort consists of three male and one female patient, aged 55 to 77 years old (median: 73 years). Three of the four patients had a history of diverticulitis, with two presenting to the emergency department or being admitted for acute diverticulitis a few days prior to perforation. Two patients had previously been diagnosed with diverticulosis via colonoscopy. Significant medical histories include coronary artery disease with stent placement in two patients and anticardiolipin antibody syndrome in one patient. The types of orthopedic surgeries performed included cervical laminectomy, right total shoulder replacement, left total hip replacement, and bilateral total knee replacement. All patients were prescribed opioids for postoperative pain control, including hydromorphone (2 mg), and oxycodone (5 mg and 10 mg). All four patients were found to have Hinchey IV sigmoid diverticulitis and subsequently underwent open sigmoidectomy with end colostomy creation (Open Hartmann's procedure). The interval from the original surgery to the emergency department visit ranged from 3 to 14 days, and the time to the Hartmann's procedure ranged from 3 to 19 days. All patients required admission to the intensive care unit for postoperative care, with lengths of stay ranging from 3 to 102 days (median: 10.5 days). The total length of stay ranged from 8 to 106 days (median: 13 days). Complications following the Hartmann's procedure included postoperative delirium in one patient and multiorgan failure due to septic shock, acute kidney injury leading to long-term hemodialysis, ARDS requiring tracheostomy, NSTEMI, and atrial fibrillation. Given the potentially life-threatening outcomes associated with opioid use, special attention should be given to patients receiving opioid analgesics. Multimodal pain control with non-opioid medications and adequate stool softeners should be considered to minimize side effects when opioids are deemed necessary.

P410

Association Between Elevated Pretreatment CEA Levels and Survival Outcomes of Treatments in Young Patients with Colorectal Adenocarcinoma: A SEER-Based Analysis??

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Background: The incidence of colorectal cancer (CRC) has increased among patients < 45 years of age. These patients often present with more aggressive disease, which necessitates further research to

improve surveillance and treatment modalities. Evidence-based guidance on the prognostic role of carcinoembryonic antigen (CEA) in the young population is sparse. Therefore, this study aimed to assess the association between elevated CEA levels in young-onset CRC and cancer-specific survival (CSS).??

Methods: This study was a retrospective cohort analysis of adult patients with CRC aged < 45 years. Data were derived from the National Cancer Institute's SEER Research Database between 2000 and 2020. Patients who had elevated pretreatment CEA levels were compared to patients with normal pretreatment CEA for demographics, tumor characteristics, and treatment factors. The primary outcome was the association between 5-year CSS and pretreatment CEA levels.??

Results: A total of 7,766 patients (53.2% male) were included in the study. The negative survival effect of elevated pretreatment CEA was most noted in patients who received adjuvant radiotherapy (5-year CSS: 69.3% vs. 80.4%, restricted mean CSS: 50.8 months vs. 55.5 months, $p = 0.047$) or neoadjuvant systemic therapy (5-year CSS: 73% vs. 84.4%, restricted mean CSS: 52.5 months vs. 56.2 months, $p < 0.001$). Elevated CEA was associated with reduced CSS regardless of contiguous organ resection status. Factors that were independently associated with worse CSS were elevated pre-treatment CEA (HR: 1.57, $p < 0.001$), Black race (HR: 1.649, $p < 0.001$), stage III disease (HR: 2.24, $p < 0.001$), mucinous histology (HR: 1.58. $p < 0.001$), signet-ring cell histology (HR: 2.71, $p < 0.001$), poorly differentiated carcinomas (HR: 2.01, $p = 0.001$), undifferentiated carcinomas (HR: 1.74, $p = 0.036$), perineural invasion (HR: 2.30, $p < 0.001$), neoadjuvant radiation therapy (HR: 1.58, $p = 0.004$), and neoadjuvant systemic therapy (HR: 2.07, $p = 0.013$). The negative impact of elevated CEA on CSS was consistent across all disease stages; however, it was most significant in stage I disease (80.4% vs. 96%, 54.5 months vs. 59.1 months, $p < 0.001$) compared to stages II or III.??

Conclusion: This study found a negative association between elevated CEA and CSS varied based on patient, tumor, and treatment factors. These findings can elevate clinician awareness of potential risk factors that may worsen survival in young-onset CRC patients with elevated pretreatment CEA. Consideration for neoadjuvant therapy should be considered in patients < 45 years of age with preoperatively elevated CEA levels.

P411

Ischemic Colitis of Unknown Source: A Case Report of Idiopathic Myointimal Hyperplasia of the Mesenteric Veins

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Introduction: Idiopathic myointimal hyperplasia of the mesenteric veins (IMHMV) is an extremely rare non-thrombotic mesenteric veno-occlusive disease. Given its non-specific symptoms and imaging findings, preoperative diagnosis is difficult.

Methods and Procedures: We present a case of a previously healthy 69-year-old man who was transferred to our hospital.

Results: Patient reported a 12-day history of severe, intractable rectal pain accompanied by non-bloody diarrhea (> 5/d), urgency, tenesmus, and lower abdominal pain. A sigmoidoscopy revealed severe colitis with ulcerations, severe edema, and friable mucosa from the anus to 20 cm proximally. The initial impression was severe UC, but biopsies were inconsistent with active inflammatory bowel disease. Inflammatory, infectious and autoimmune stool and blood testing were negative. The patient was started on budesonide, but the symptoms did not improve. Intravenous steroids were initiated but remained highly symptomatic. The patient was afebrile with an elevated white blood cell count (15,400/mm^3) and C-reactive protein (4 mg/dL). Computed tomography revealed an absence of small bowel involvement with marked wall thickening and inner wall hyperenhancement involving the rectum in a contiguous manner.

Because of the uncertainty and the severe pain, it was decided to perform a laparoscopic transverse loop colostomy. However, the pain did not subside. Epidural analgesia was then applied. However, due to the continued abdominal distention, despite the colostomy, the patient underwent open low anterior resection (7 cm from the anal verge), leaving the rectal stump inside. Intraoperative findings included ascites, dilated, thickened rectum, with pronounced congestion and thickened mesorectum. Postoperative histopathology revealed acute and chronic transmural ischemic injury, hyalinized lamina propria. The veins show thickened walls, reactive endothelial cells and frequent thrombosis. Smaller diameter proliferative vessels show fibrinoid necrosis and thrombosis consistent with IMHMV. Pain improved afterwards.

Conclusions: The purpose of this case report is to increase awareness of IMHMV to delay treatment.

P412

Efficacy and Safety of Temperature-responsive Gel Mixed with Ropivacaine as a Wound Infiltration in Minimally Invasive Colorectal Surgery

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Introduction: While wound infiltration is known to be effective for postoperative pain management, the optimal delivery method remains unclear. Continuous infusion via subcutaneous catheter is recognized for providing extended analgesia but has limitations in terms of convenience and potential catheter-related complications. This study aimed to evaluate the safety and efficacy of a novel approach using a temperature-responsive gel mixed with ropivacaine to prolong the duration of action of wound infiltration.

Methods and Procedures: This study included all patients who underwent minimally invasive colorectal surgery at a single institution from March to August 2024. Following fascial closure, a mixture of 25 mg ropivacaine in 6 mL of temperature-responsive supramolecular gel was infiltrated into the wound between the fascia and subcutaneous fat layer. The drug mixture was infiltrated into mini-laparotomy and all trocar sites of 10mm or greater in length. The primary outcome measure was the requirement for additional opioid analgesics postoperatively.

Results: A total of 49 patients were included in the study. Of these, 41 (83.7%) had malignancies, while the remaining 8 (16.3%) had benign diseases. 39 patients (79.6%) underwent elective surgery, and 10 (20.4%) had emergent surgery. All patients underwent mini laparotomy through a trans-umbilical midline incision, with a median incision length of 7cm. During hospitalization, only 2 patients (4.1%) required additional opioid analgesics. One patient (2.0%) developed a postoperative wound infection. No allergic reactions or unexpected wound complications were observed.

Conclusions: In conclusion, we confirmed that the temperature-responsive gel mixed with ropivacaine is a safe and effective method for wound infiltration in minimally invasive colorectal surgery.

P413

"Abdominoperineal Resection for Anorectal Melanoma: Case Report"

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Introduction: Perineal melanoma is a rare and lethal entity, with a median survival of approximately 15 to 21 months, so making decisions about its management may be challenging. Local and abdominoperineal resection have been the two proposed treatments for non-metastatic disease, however it remains controversial which has better benefits for patient survival.
Objective: In this report, we present the case of a melanoma of the anal mucosa, without positive lymph nodes or distant metastasis, which underwent an abdominoperineal resection and the results of its treatment.
Discussion: 68-year-old female with an insidious increase in volume in the perianal region, accompanied by scant bleeding with defecation, it was misdiagnosed with hemorrhoids but because of the persistence of her symptoms a incisional biopsy was taken which reported anal subepithelial mucosal melanoma. It was decided to perform an abdominoperineal resection wich was performed without complications. The patient is currently stable, with follow-up by the outpatient clinic with control PET every 3 months, with no evidence of recurrence.
Conclusion: In the treatment of anorectal melanoma, the surgical procedure offers the highest 5-year survival and its indications depend on the stage in which it is found, without lymphatic invasion and without evidence of metastasis. There are two surgical options: abdominoperineal resection or local resection; over the years, it remains debatable which decision to take, since there is no significant difference between them in survival.

P414

Single Port, Many Possibilities: A Stepwise Approach to Robotic Colon Resection Using the da Vinci Single Port Platform

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Introduction: Since the introduction of Single Port Laparoscopic Surgery (SPLS) in colorectal surgery, its adoption for colectomies has been slow. The da Vinci Single Port (dVSP) robotic platform offers a promising tool for complex colorectal resections through a single small incision, advancing minimally invasive surgery. This study outlines step-by-step techniques for right sided and transverse colectomies using the dVSP platform, aiming to establish a safe, systematic approach to optimize outcomes and minimize complications.
Methods and Procedures: We conducted a retrospective analysis of patients who underwent an ileocecectomy, right, or transverse colectomy using the dVSP platform, performed by a single surgeon at a single institution between March 2023 and July 2024. All operations were carried out through a single 7-cm transverse incision in the left lower quadrant with the assistance of a qualified surgical bedside assistant. Operative results and short-term outcomes were evaluated to assess the efficacy and safety of the dVSP platform for these procedures.
Results: Eight patients underwent colorectal procedures using the dVSP platform, including right hemicolectomy ($n = 4$), ileocecectomy ($n = 2$), and transverse colectomy ($n = 2$). All surgeries were successfully completed without intraoperative complications or conversion to open surgery. No additional assist ports were required. The average operative time was 164 min, with an average console time of 110.9 min. The average postoperative length of stay was 1.1 days, with no postoperative complications or readmissions. Six of the cases involved malignancy, with patients undergoing colectomy for colon cancer, while the remaining two cases were performed for Crohn's disease and a benign polyp. All surgical margins were negative, and the average lymph node harvest for malignancy cases was 17.3.
Conclusion: Our data indicate that the dVSP platform is a safe and effective option for right hemicolectomy, ileocecectomy, and transverse colectomy. All surgeries were completed without intraoperative complications or conversion to open surgery. Notably, all eight procedures were performed through a 7 cm left lower quadrant incision, without the need for additional ports, showcasing the platform's advantages. The relatively short operative times, minimal postoperative length of stay, and absence of complications or readmissions further highlight favorable short-term outcomes. These results suggest the dVSP platform may accelerate recovery in colorectal surgeries, though larger studies are needed to confirm its broader applicability.

P416

Prediction of Increased Difficulty in Robotic Colorectal Surgery

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Introduction: The objective of this study is to determine whether specific intraoperative factors can influence postoperative outcomes in robotic colorectal surgery.
Methods and Procedures: This retrospective study analyzed data from robotic colorectal surgeries performed at a single academic institution for both benign and malignant diseases from November 2021 to March 2024. Operative time, length of hospital stay, postoperative return of bowel movements, estimated blood loss (EBL), presence of postoperative complications within 30 days, and 30-day readmissions related to surgery were reviewed. Statistical analyses were performed using the Mann–Whitney U and Chi-square tests to identify significant differences. Cases were defined as having increased difficulty based on the application of the modifier-22 code.
Results: 28 patients (25%) were considered difficult. There were no conversions to open surgery. The increased difficulty group experienced significantly longer operative times (median: 5.75 h vs. 4.5 h, $p = 0.001$), extended hospital stays (median: 4 days vs. 3 days, $p = 0.002$), and higher EBL (median: 87.5 mL vs. 50 mL, $p = 0.005$). No significant differences were observed in post-operative bowel movement recovery time, postoperative complications within 30 days, or 30-day readmission rates. A secondary analysis of the difficult group revealed that 18 of 28 (64%) had a BMI ≥ 30, and 23 of 28 (82%) had adhesions or severe fibrosis due to prior interventions.
Conclusion: This study suggests that more challenging robotic colorectal surgery cases caused by obesity, adhesions, and/or radiation fibrosis resulted in prolonged hospital stay. This information may be useful for discharge planning.

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The Impact of BMI on Operative Decision Making in Patients Undergoing Colorectal Surgery in Nova Scotia, Canada

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Introduction: The objective is to explore the extent to which BMI predicts choice of surgical approach (open vs. laparoscopic) as well as unplanned conversion of colorectal surgeries in Nova Scotia, benchmarked against NSQIP (National Surgical Quality Improvement Program). BMI has a long-standing association with higher risks of intra-operative complications and poor post-operative outcomes. Nova Scotia has one of the highest obesity rates (45% have BMI^{3}30) and one of the lowest MIS adoption rates (27.6%) in Canada.
Methods: A retrospective NS cohort study was completed to assess univariate and multivariate associations of BMI with operative approach and conversion rates. The NS (n = 3373) and NSQIP (n = 243,221) cohorts included colectomies or proctectomies (2018 to 2022). Categorical and continuous variables were compared using chi-square and simple linear regression, respectively. Subset selection was used to build the stepwise logistic regression model. All data analysis was performed using RStudio.
Results: Colectomies constituted 92.3% and 90.8% of NS and NSQIP cohorts respectively. 37.6% of colectomies and 22.4% of proctectomies were performed laparoscopically in NS as compared to NSQIP (51.1% and 32.2% respectively). NS had a lower MIS adoption rate (36.4% vs 49.3%) and a higher rate of unplanned intra-operative conversion in colectomies (22.6% vs. 19.4%) and proctectomies (32.1% vs. 17.1%). Notably, BMI was significantly associated with operative approach in NSQIP but not in the NS cohort ($p = 0.643$). In contrast, logistic regression of the NS cohort demonstrated that BMI, rectal involvement, urgent/emergent acuity, non-cancer diagnosis, CPT, surgeon, disseminated disease, bleeding disorder, high WBC, non-mechanical bowel prep and having more than one concurrent/other procedure were all significantly associated with conversion. To benchmark the impact of BMI in NS against NSQIP, a stepwise logistic model was optimized in matched cohorts which revealed a 79% higher conversion risk in NS (OR 4.67 $p = 0.034$ vs. OR 3.04 $p < 0.001$). The higher conversion risk was more pronounced in CPT procedures mostly comprised of elective standalone right hemicolectomy with terminal ileum involvement (NS: OR 4.66 $p = 0.015$; NSQIP: OR 1.61 $p < 0.012$). Provider approach preferences and their individual conversion rates were also contributors to the increased conversion risk in patients with higher BMI in NS.
Conclusion: BMI serves as an independent factor in driving conversion in the provincial cohort at a higher risk than the matched NSQIP standards. This association is particularly robust for certain procedures and providers. Remote proctoring of certain procedures may help reduce conversion rates and ultimately improve outcomes of colorectal surgeries in NS.

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Diagnostic Performance of Artificial Intelligence-Assisted Systems in Detecting Neoplastic and Non-neoplastic Polyps in the Distal Colon: A Diagnostic Accuracy Meta-analysis

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Background: Early detection of colorectal polyps is crucial for the prevention of colorectal cancer, one of the leading causes of cancer-related mortality worldwide. Artificial intelligence-assisted systems (AIAS) have emerged as promising tools to enhance the detection rates of neoplastic and non-neoplastic polyps during colonoscopy. However, their diagnostic performance, specifically in the distal colon, requires comprehensive evaluation.
Aim: To assess the diagnostic accuracy of AI-assisted systems in detecting neoplastic and non-neoplastic polyps in the distal colon through a systematic review and meta-analysis.
Methods: A comprehensive literature search was conducted in PubMed, Embase, and the Cochrane Library for studies published up to April 2024. Studies were included if they evaluated the diagnostic performance of AI-assisted systems in colonoscopy for detecting polyps in the distal colon and provided sufficient data on diagnostic accuracy measures. Statistical analyses were performed using R software (version 4.0.3) with the mada package.
Results: The meta-analysis included 8 studies encompassing a total of 1721 patients, of whom 622 had confirmed malignancies. The pooled sensitivity of AI-assisted systems was 86% (95% CI: 76–92.2%; I^2? = ?85.4%), indicating a strong ability to correctly identify malignant polyps. The pooled specificity was 77% (95% CI: 60.7–87.9%; I^2? = ?93.9%), reflecting a good capacity to correctly identify non-malignant polyps, although significant heterogeneity was observed among studies. The false-positive rate was 23% (95% CI: 12.1–39.3%). The diagnostic odds ratio was 20.49 (95% CI: 7.43–56.47), suggesting excellent discriminatory power. Additionally, the positive likelihood ratio was 3.73 (95% CI: 2.05–6.82), and the negative likelihood ratio was 0.18 (95% CI: 0.10–0.33), indicating that AI-assisted systems are effective in both ruling in and ruling out polyps when used in clinical settings.
Conclusion: AI-assisted systems demonstrate high diagnostic performance in detecting neoplastic and non-neoplastic polyps in the distal colon, with substantial sensitivity and specificity. Despite significant heterogeneity among the included studies, the overall evidence supports the integration of AI technology into routine colonoscopy practices. This integration could lead to earlier detection and removal of polyps, thereby reducing the incidence and mortality associated with colorectal cancer. Future large-scale, multicenter studies are necessary to validate these findings and to further explore the long-term clinical benefits and standardization of AI-assisted colonoscopy.

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From Emergency Surgery to an Unexpected Diagnosis: Perforated Diverticulitis and Hodgkin Lymphoma

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Background: Primary colorectal lymphoma is a rare malignancy, accounting for less than 1% of total colorectal cancers and 10–20% of gastrointestinal lymphomas. Colorectal lymphoma presents with nonspecific symptoms such as abdominal pain, weight loss, and changes in bowel habits. The diagnosis of colorectal lymphoma can be challenging. The following case is unusual in that the patient's initial presentation was an acute surgical emergency, and the lymphoma was found incidentally after surgery.

Case Presentation: A 74-year-old male was admitted to the hospital with progressive right lower extremity weakness and significant weight loss over four weeks with a history of multiple falls recently. The patient had no significant past medical history. Recently, the patient also complained of abdominal pain but had left the emergency department against medical advice before being evaluated. Upon arrival, he was confused and debilitated with a reducible left inguinal hernia, mild leukopenia, and microcytic anemia. An abdominal CT showed early sigmoid diverticulitis.

As his condition continued to progress by the worsening of abdominal pain, a repeat CT showed subdiaphragmatic free air, suggestive of a perforated viscus. An urgent exploratory laparotomy revealed a 2-cm perforation in the anterior sigmoid colon, and a Hartmann's procedure was performed. The pathologic examination of the resected colon confirmed perforated diverticulitis but incidentally also showed Hodgkin lymphoma in one of the regional lymph nodes. Immunohistochemical staining for positivity was done for CD30, CD15, MUM1, and Epstein-Barr Virus. In the postoperative period, she developed ARDS and significant thrombocytopenia requiring platelet transfusion.

Discussion: This case is not typical in two ways acute presentation of perforated diverticulitis with an incidental finding of Hodgkin lymphoma, which is an infrequent association. The thrombocytopenia in this patient presented in the postoperative period adds another level of complexity since thrombocytopenia is generally not a feature of diverticulitis or early lymphoma. Primary colorectal lymphoma often requires a combined modality of treatment, including surgery and chemotherapy. The latter is based on lymphoma type; DLBCL is treated with the CHOP regimen as the backbone. A diagnosis of lymphoma itself dictated further oncological treatment-a multidisciplinary approach that was necessary in the management of complex cases.

Conclusion: The case represents the importance of a detailed postoperative pathology evaluation, especially in the elderly presenting with nonspecific symptoms. Recognition of surgical emergencies, as well as incidentally diagnosed malignancies, is intertwined with early diagnosis for improving outcomes.

P422

Comparative Effectiveness of Laparoscopic vs. Open Colectomy in Emergency Diverticulitis Treatment: A Systematic Review and Meta-analysis

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Aim: Our systematic review and meta-analysis sought to identify the optimal surgical technique for emergency diverticulitis cases featuring perforation and peritonitis by comparing laparoscopic versus open colectomy, addressing the debate on the best surgical approach.

Materials and Methods: Cochrane Central, Embase, PubMed, MEDLINE, and Web of Science were searched for studies comparing laparoscopic and open colectomy for emergency diverticulitis. We focused on key outcomes such as mortality, postoperative complications, dehiscence, leakage, surgical site infections, readmissions, reoperations, prolonged ileus, ICU admission rates, and hospital stay duration.

Results: From 1692 records, 8 studies were included, with four focusing on acute perforated diverticulitis and the remaining four on all emergency diverticulitis causes, involving 10,547 patients, of whom 1922 (18.2%) underwent laparoscopic colectomy. Laparoscopic surgery was associated with decreased mortality (2.6% vs. 6.2%; RR 0.56; 95% CI: 0.42, 0.76; $P < 0.001$), postoperative complications (35.1% vs. 45.7%; RR 0.84; 95% CI: 0.78, 0.90; $P < 0.001$), SSI (5.9% vs. 7.6%; RR 0.67; 95% CI: 0.54, 0.82; $P < 0.001$), and postoperative prolonged ileus (28.2% vs. 34.5%; RR 0.83; 95% CI: 0.73, 0.93; $P = 0.002$) compared to open colectomy. Laparoscopy was also associated with a reduced LOS (MD $-$ 1.75 days; 95% CI: $-$ 2.6, $-$ 0.88; $P < 0.001$). No significant differences were observed in leakage, dehiscence, readmission, reoperation, and ICU admission rates.

Conclusions: Our findings suggest that using a laparoscopic approach for emergency diverticulitis is associated with lower mortality, morbidity, and shorter hospital stays, presenting it as a favorable treatment option.

P423

Extraction of Rectal Foreign Body with Minimally Invasive Technique

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Introduction: Rectal foreign bodies are an uncommon but potentially serious issue encountered in emergency departments. These cases often require a multidisciplinary approach for diagnosis, management, and prevention of complications, where the treatment will depend on the location of the foreign body due to its extraction via the anus is not always possible, so different minimally invasive strategies have been proposed for its management.

Methods and Procedures: Case report of a 29 years old male who came to the emergency department after introducing a foreign object into the rectum with impossibility of removal. Preoperative studies identified that the foreign body was at the lever of the upper rectum with a failed attempt at manual removal. Therefore, a laparoscopic approach was proposed for removal of the foreign body.
Results: The patient underwent a laparoscopic approach with proximal and distal repair of the sigmoid colon, where the foreign body was identified. It was subsequently removed with an Alexis device and a colotomy was performed to remove the foreign body and close it primarily. He completed 48 h of monitoring with no clinical or paraclinical inflammatory response, adequate pain control and no early complications, so he was discharged. The patient was monitored for one week postoperatively with adequate healing of his surgical wounds and was asymptomatic, so he was discharged from follow-up.
Conclusion(s): Laparoscopic surgery is a safe and effective option for the removal of rectal foreign bodies when manual extraction is unsuccessful. This minimally invasive approach offers a high success rate with minimal complications, highlighting its role in the management of complex cases.

P424

Comparative Outcomes of Robotic vs. Laparoscopic Non-Elective Colectomy: A Systematic Review and Meta-analysis

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Aim: Minimally invasive surgery has emerged as a viable and safe alternative for urgent colorectal procedures. However, in the urgent care context, there is no consensus on the superiority of robotic versus laparoscopic techniques. Addressing this gap, our study performs a systematic review and meta-analysis comparing the outcomes of robotic and laparoscopic non-elective colectomies.
Material & Methods: Cochrane, Embase, PubMed, and Web of Science were searched for studies that directly compared laparoscopic and robotic non-elective colectomies. The outcomes of interest included readmission, reoperation rates, anastomotic leak, surgical site infections (SSI), incidence of prolonged postoperative ileus, length of hospital stay (LOS), and rates of conversion to open surgery.
Results: Our search yielded 597 records, from which 3 studies were included, totaling 7471 patients. Of these, 429 (5.7%) underwent robotic colectomies. Our analysis highlighted a significantly lower rate of conversion to open surgery in the robotic group compared to the laparoscopic group (10.3% vs. 28.3%; RR 0.37; 95% CI [0.27, 0.51]; $P < 0.001$). However, laparoscopic colectomies were associated with a lower incidence of postoperative ileus (10.6% vs. 16.5%; RR 1.55; 95% CI [1.19, 2.02]; $P = 0.001$). No statistically significant differences were observed in mortality, readmission, reoperation, SSI, or LOS.
Conclusions: This systematic review and meta-analysis suggest that robotic non-elective colectomy is associated with a lower rate of conversion to open surgery compared to laparoscopic approaches, with no significant differences in major postoperative complications or mortality rates.

P425

Total Abdominal Colectomy for Management of Refractory Immune Checkpoint -Induced Colitis

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Immune checkpoint inhibitors, such as ipilimumab and nivolumab are changing treatment paradigms and improving overall survival for a myriad of cancers. As with all treatments, adverse side effects become more apparent with greater exposure. Ipilimumab activates the immune system by targeting CTLA-4, a protein receptor that down-regulates the immune system. Nivolumab is a human IgG4 monoclonal antibody that blocks PD-1. The combination of both is commonly used in metastatic melanoma. Using both increases the rate of immune-mediated colitis (1). The reported incidence of colitis is about five times greater with ipilimumab than nivolumab and is 13.6% with combination therapy (1). We present a case of a 69-year-old male with metastatic melanoma who developed colitis after starting combination therapy, leading to a total abdominal colectomy. Initially, he underwent a sigmoidoscopy and was conservatively treated with infliximab and steroids but later returned to the hospital with worsening diarrhea and signs of peritonitis. A CT scan revealed pneumoperitoneum suggestive of a perforated viscus. During exploratory laparotomy, multiple areas of friable tissue and perforations in the sigmoid colon were found, resulting in a total abdominal colectomy with end ileostomy. The patient has since recovered well post-surgery. We discuss the risk factors for such extensive colitis including failure of appropriate medical management, greater likelihood of immune-mediated colitis in Caucasian/white patients, those treated with an anti-CTLA4 based regime, NSAID use, and those with prior history of checkpoint inhibitor induced colitis (3). We identify the need for additional studies in which patients will likely fail medical management of immune mediated colitis caused by checkpoint inhibitors. As these medications become the standard of care, it is important to determine which patients may be refractory to conservative management of their immune mediated colitis.

P426

Colonic Gallstone Ileus: An Unusual Presentation of Large Bowel Obstruction

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Introduction: Gallstone ileus is a complication of cholelithiasis, occurring in only 0.3–0.5% of gallstone patients, with colonic gallstone ileus being the rarest variant. This condition develops when a gallstone erodes through the gallbladder wall, forming a cholecystocolonic fistula, and subsequently lodges in the colon, causing large-bowel obstruction. Here, we describe a 61 year-old male who presented with constipation and was found to have colonic gallstone ileus.
Case Report: A 61-year-old male with a history of HTN and CAD presented to the ED with constipation, bloating, and abdominal discomfort. CT imaging showed a stone-filled distended gallbladder, segmental colonic inflammation, and a stone within the sigmoid colon along with sigmoid colitis (Fig. 1). Subsequently, the patient underwent a colonoscopy, which failed to retrieve the stone, leading to its removal using ring forceps during a flexible sigmoidoscopy (Fig. 2). A second colonoscopy was scheduled following the stone removal, in which a cholecystocolonic fistula was identified and biopsied (Fig. 3).

Following resolution of inflammation, the patient underwent a robotic-assisted laparoscopic cholecystectomy with fistula takedown and colon repair. Pathology confirmed chronic cholecystitis with benign tissue findings. The patient recovered well and was discharged the next day.

Discussion: Gallstone ileus is a rare cause of large bowel obstruction, with gallstones most commonly impacting the terminal ileum (50–60%), followed by the jejunum (16–27%), duodenum (3.5–14.6%), and colon (3–4%). Diagnosing large bowel obstruction from gallstone ileus can be challenging, often presenting with non-specific symptoms like abdominal pain, vomiting, and constipation. Key diagnostic tools include CT imaging, which is the gold standard with high sensitivity (93%) and specificity (100%), although abdominal X-rays and MRI can also be used. Treatment involves a multidisciplinary approach, including bowel cleansing, endoscopic retrieval, or surgical interventions like enterolithotomy, with or without cholecystectomy and fistula closure. Postoperative complications can include renal failure, infections, and bowel issues. Timely diagnosis and intervention are crucial for improving outcomes and reducing the risk of severe complications like bowel perforation and sepsis.

Conclusion: Large bowel obstruction secondary to gallstone ileus is a diagnostic and therapeutic challenge. Successful management relies on prompt surgical intervention, contributing to better clinical outcomes and reduced morbidity and mortality.

Fig. 1 CT showing a gallstone lodged within the sigmoid colon

Fig. 2 4.1 × 3.0 × 2.8 cm gallstone after it was retrieved from the sigmoid colon via the anus

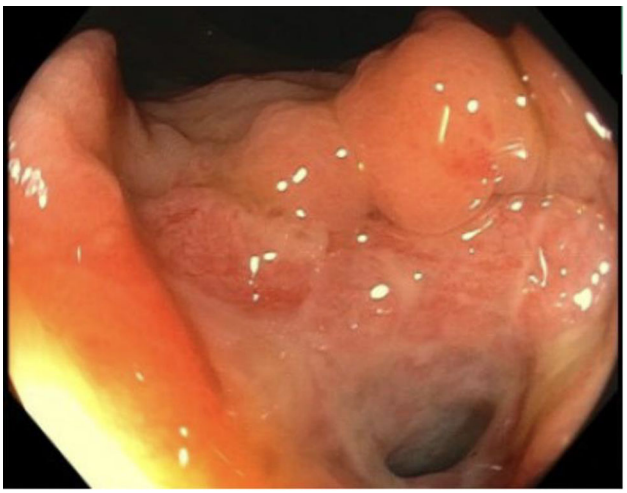

Fig. 3 10mm cholecystocolonic fistula within the transverse colon

P427

The Impact of Obesity on Postoperative Morbidity and Mortality Following Surgery for Left-Sided Diverticular Disease

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Background: Surgical management of diverticular disease remains a cornerstone of treatment in cases where non-operative measures fail to alleviate symptoms or complications arise. While obesity is a well-established risk factor for the development of diverticular disease, studies focusing on the impact of body mass index (BMI) on post-operative outcomes have been scarce. We designed this population-level retrospective cohort study to evaluate the impact of BMI on postoperative outcomes following operative intervention for left-sided diverticular disease.
Methods: This was a population-based retrospective cohort study using the Healthcare Cost and Utilization Project National Inpatient Sample (NIS) (September 1, 2015–December 31, 2019). ICD-10-CM codes were utilized to identify a cohort of adult patients with a primary admission diagnosis of diverticulitis. Patients were stratified according to obesity status (i.e., not obese: BMI under 30 kg/m^2; class I obesity: BMI 30–34.9 kg/m^2; class II obesity: BMI 35–39.9 kg/m^2; class III obesity: BMI greater than 40 kg/m^2). The primary outcome was overall in-hospital postoperative morbidity. Secondary outcomes included postoperative infectious, gastrointestinal, and genitourinary complications, as well as postoperative mortality. Multivariable regression models were fit.
Results: There were 33,029 patients identified in the NIS who underwent left-sided colonic resection for diverticular disease. There were 27,212 patients who were not obese, 2209 patients with class I obesity, 1710 patients with class II obesity, and 1898 patients with class III obesity. Patients with class III obesity, had 73% higher odds (95% CI 1.54–1.94) of experiencing in-hospital postoperative morbidity as compared to patients with BMI less than 30. Patients in with class III obesity had 27% higher odds (95%CI 0.98–1.65) of experiencing in-hospital postoperative infection, 55% higher odds (95%CI 1.35–1.77) of experiencing in-hospital postoperative gastrointestinal complications, and 71% higher odds (95%CI 1.48–1.97) of experiencing in-hospital postoperative genitourinary complications as compared to patients with BMI less than 30. Patients with class I and class II obesity did not have increased odds of postoperative morbidity. Patients with class I obesity had 56% lower odds (95%CI 0.19–0.99) of postoperative mortality as compared to patients with BMI less than 30.
Conclusion: Patients with class III obesity undergoing operative intervention for colonic diverticular disease are at increased risk of short-term postoperative morbidity as compared to patients with BMIs under 30. There may be a protective effect in terms of short-term postoperative mortality for patients with class I obesity as compared to patients with BMIs under 30, in keeping with the previously described obesity paradox.

P428

Entero-Articular Fistula: A Rare Complication of Locally Advanced Cervical Cancer

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Objective: To present the history and clinical course of an entero-articular fistula in a patient with advanced cervical cancer.
Case Presentation: A 62-year-old female presented to the emergency department with hypotension, inability to bear weight on the right lower extremity and erythematous changes to the right lateral hip. The patient had a history of Stage IVb cervical squamous cell carcinoma status post systemic chemotherapy. Her cancer treatment had previously been complicated by obstructive uropathy and development of a rectovaginal fistula. A computed tomography (CT) scan of the right hip demonstrated extensive subcutaneous edema and gas tracking from the pelvis through the right sacroiliac joint. This was concerning for a necrotizing soft tissue infection, likely caused by the development of an entero-articular fistula. She underwent surgical incision and debridement of the right hip, with findings including fat necrosis and purulence tunneling towards the right sacroiliac joint. Surgical pathology and cultures were positive for enteric flora, confirming the diagnosis of an entero-articular fistula. Unfortunately, her postoperative course was complicated by septic shock and she transitioned to hospice care and died soon after.
Discussion: Fistulization from the colon or rectum to an adjacent joint is a rare sequela of advanced cervical cancer and has not been previously reported. The most common fistulas found in locally advanced cervical cancer include vesicovaginal and rectovaginal fistulas. These commonly develop in patients who have undergone radiation therapy. Our patient's presentation is unique in the location of the fistula tract as well as in her lack of previous radiation exposure. Surgical intervention includes diverting ostomies, Martius flap repairs of rectovaginal fistulas, and pelvic exenteration. These procedures are indicated for source control as well as to prevent worsening fistulization and to mitigate the risk of septic shock and further deterioration.
Conclusion: This case highlights the rare presentation of an entero-articular fistula leading to a necrotizing soft tissue infection in a patient with locally advanced cervical cancer. This is the only case reported to date with this finding. Early recognition of these complex and rare fistulas can assist with infection control and prevention of septic shock. This is an important complication to recognize in the early stages of diagnosis given the high morbidity and likely mortality rate of entero-articular fistulas.

P429

A Case of Idiopathic Mesenteric Hematoma

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We present the case of an 88-year-old male with a history of hypertension and hyperlipidemia, who presented with acute onset suprapubic discomfort, constipation, and decreased urine output. The patient was admitted a few weeks ago secondary to an unwitnessed fall during which neuroimaging noted an acute parietal lobe infarct. He then underwent placement of an implantable loop recorder and started on antiplatelets. On recent presentation due to persistent

abdominal pain, a CT scan obtained showed a 14 cm × 7 cm × 7 cm mass in the mesentery reminiscent of a carcinoid tumor though tumor markers such as Chromogranin A and 5-HIAA were negative. Vital Signs were stable and a physical exam was notable for moderate tenderness to palpation in the lower quadrant without signs of guarding or rebound tenderness. However, some ecchymosis was noted in the right inguinal region. A CT-guided core needle biopsy of the mesenteric mass obtained during his previous hospitalization demonstrated spindle cells. A diagnostic laparoscopy was performed with findings of sigmoid colon adhesions to a right femoral hernia defect and a large hematoma within the sigmoid mesocolon. The hematoma was evacuated, and a wedge biopsy was taken from the mesenteric wall for further histopathological examination. The analysis confirmed the absence of malignant cells, with the presence primarily of red blood cells consistent with a hematoma.

A diagnostic laparoscopy was performed uncovered a large hematoma within the sigmoid mesocolon. The mass was evacuated, and a wedge biopsy was taken from the mass's wall for further histopathological examination. The analysis confirmed the absence of malignant cells, with the presence primarily of red blood cells consistent with a hematoma. Histopathology of the biopsy confirmed it as an organizing hematoma.

P430

Trans-Anal/Perineal Endoscopic Surgery for Locally Recurrent Rectal Cancer

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Introduction: The optimal surgical approach for locally recurrent rectal cancer (LRRC) remains controversial. The recent development of trans-anal total mesorectal excision has introduced an endoscopic trans-anal/perineal approach as a novel technique for LRRC. This technique addresses several challenges associated with LRRC surgery, such as intra-abdominal adhesions from previous surgeries, tumor fixation to adjacent organs, prolonged operative times, and a high risk of severe bleeding. This study aims to assess the safety and feasibility of endoscopic trans-anal/perineal surgery for LRRC, comparing its short-term outcomes with those of trans-abdominal surgery.

Methods and Procedures: This single-center, retrospective study included 108 patients who underwent radical surgery for LRRC at our hospital from January 2008 to March 2022. Among them, 50 patients underwent both endoscopic trans-anal/perineal surgery and trans-abdominal surgery (Ta/p group) and 58 patients underwent trans-abdominal surgery only (non-Ta/p group). In the Ta/p group, all procedures were performed simultaneously by two teams: a trans-anal/perineal team and a trans-abdominal team. Short-term outcomes, including operative time, blood loss, complications, and R0 resection rates, were compared between the Ta/p and non-Ta/p groups.

Results: The median operative time and median tumor resection time were significantly shorter in the Ta/p group compared to the non-Ta/p group (380 min vs. 441 min, $P = 0.032$, and 225 min vs. 292 min, $P = 0.003$, respectively). The median blood loss was significantly lower in the Ta/p group compared to the non-Ta/p group (430 ml vs. 1155 ml, $P < 0.001$), with fewer patients requiring intraoperative blood transfusions (18.0% vs. 53.4%, $P < 0.001$). Postoperative complication rates (Clavien-Dindo grade ≥ 3) were comparable between the groups (34.0% in the Ta/p group vs. 41.4% in the non-Ta/p group, $P = 0.551$). The R0 resection rate was 88.0% in the Ta/p group and 81.0% in the non-Ta/p group ($P = 0.429$).

Conclusions: Postoperative complication rates for endoscopic trans-anal/perineal surgery were comparable to those of trans-abdominal surgery, demonstrating that endoscopic trans-anal/perineal surgery is a safe and feasible option for LRRC. Additionally, this surgery showed advantages in terms of shorter operative time and reduced blood loss, suggesting it can be a promising surgery for LRRC.

P431

A Case of Gastro-Colonic-Cutaneous Fistula in a Patient with Crohn's Disease

McKenzie Clapp; Kellen Welch; Summa Health

Introduction: Crohn's disease is the most common cause of spontaneous gastrointestinal fistula formation in developed nations. The risk of fistula formation following initial Crohn's disease diagnosis is approximately 30% at 10 years and 50% at 20 years. Of Crohn's fistulas, previous studies have shown 54% to be perianal, 24% enteroenteric, 9% rectovaginal and 13% involving other anatomic locations. Here we present a rare case of a gastro-colonic cutaneous fistula in a patient with Crohn's disease. We further discuss the surgical management involved in resection of this complex fistula.

Case: A 54-year-old female with a long-standing history of Crohn's disease presented with 3 months of a worsening, painful right-sided abdominal mass. CT imaging was consistent with a subcutaneous abscess along with a probable fistulous process between the colon and right anterolateral abdominal wall. The patient first underwent operative drainage of the acute subcutaneous abscess and then months later an elective colectomy with fistula resection. During this second procedure the patient was found to have formed a gastro-colonic-cutaneous fistula which required a partial gastric resection of the greater curvature of the stomach, an extended right colectomy, and ileocolonic anastomosis.

Conclusion: Management of internal fistulas in Crohn's disease often requires operative intervention. Surgery is typically an effective treatment except in the case of rectovaginal fistulas. In this case study we present a rare case of a gastro-colonic cutaneous fistula in a patient with Crohn's disease. There is limited literature on gastro-colonic-cutaneous fistulas in Crohn's disease. Thus, we discuss how our surgical approach, which included a partial gastric resection, extended right colectomy, and ileocolonic anastomosis successfully treated this complex fistula.

P432

Severe Actinic Proctitis and Ileitis Secondary to Radiotherapy for Anal Cancer. What to Do When Everything Fails?

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Introduction: Actinic proctitis is one of the most frequent complications of radiotherapy applied to cancer patients in the abdominal region. It is a pathology that can seriously compromise hemodynamic response in patients who suffer from it.

Methods and Procedures: Case report of an elderly woman with a history of anal canal cancer who underwent radiotherapy, developing proctosigmoiditis and severe ileitis, symptomatic and with haemodynamic repercussions. Received treatment with argon plasma, together with sucralfate, metronidazole and ciprofloxacin, achieving a significant improvement, avoiding a total proctocolectomy.

Results: Medical therapy was started with sucralfate 3 g/day orally and enemas of 2 g × 12 h with 20 mL, in combination with

metronidazole 500 mg 3 times a day orally × 4 weeks and ciprofloxacin orally 1 g/day × 1 week, with the aim of helping to control the bleeding while endoscopic monitoring was performed. 2 months later the patient had an adequate recovery, the bleeding was reduced by 90% without a new transfusion requirement, and remains asymptomatic from the cardiovascular part.
Conclusion(s): Dual treatment, with endoscopic and pharmacological therapies (argon plasma and sucralfate), is an effective option for this pathology, due to its clinical improvement, good tolerance and low complication rates, as was evident with our patient.

P433

Consequences of Conversion to Open During Minimally Invasive Colectomy: a Systematic Review and Meta-analysis

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Objective: Minimally invasive surgery (MIS) has underscored the consequences of conversion to open colectomies. We performed a systematic review and meta-analysis assessing the impact of conversion during MIS colectomy.
Methods & Procedures: PubMED, Cochrane, Scopus, and SciELO were searched for studies analyzing conversion during MIS colorectal resections. Outcomes were readmission, surgical site infections (SSI), blood loss, postoperative complications, transfusion, cancer recurrence, 30-day mortality, 5-year cancer-free survival rate, 5-year overall survival rate, operative time, ileus, bleeding, and leak.
Results: 5407 studies were screened, and 45 were included, comprising 499,519 patients, from which 68,638 (13.74%) underwent conversion. Converting increases postoperative complications (RR 2.2; 95% CI 1.76, 2.75; $P < 0.001$), readmission (RR 1.54; 95% CI 1.44, 1.66; $P < 0.001$), transfusion (RR 2.73; 95% CI 2.41, 3.08; $P < 0.001$), leak (RR 1.75; 95% CI 1.53, 2.01; $P < 0.001$), ileus (RR 2.26; 95% CI 1.64, 3.12; $P < 0.001$), SSI (RR 2.58; 95% CI 2.1, 3; $P < 0.001$), and recurrence (RR 1.57; 95% CI 1.24, 1.98; $P < 0.001$). Conversion had greater blood loss (MD 196.7 mL; 95% CI 117.4, 275.2; $P < 0.001$), longer operative time (MD 27 min; 95% CI 17.7, 36.3; $P < 0.001$), higher 30-day mortality (RR 3.26; 95% CI 1.5, 7; $P = 0.003$), longer time to flatus (MD 0.8 day; 95% CI 0.52, 1; $P < 0.001$), and lower 5-year overall survival (RR 0.85; 95% CI 0.76, 0.94; $P = 0.002$) and 5-year disease-free survival (RR 0.78; 95% CI 0.65, 0.95; $P = 0.012$). Subgroup analyses showed similar results for malignant and benign diseases.
Conclusion: Converting is associated with increased perioperative complications during MIS colectomy for both malignant and benign colorectal diseases.

P434

Long- and Short-Term Outcomes of Robot-Assisted Rectal Cancer Surgery and Fully Intracorporeal DST Anastomosis for the Future

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Although the short-term outcomes of robot-assisted laparoscopic surgery (RALS) for rectal cancer are well known, the long-term oncologic outcomes of RALS compared with those of conventional laparoscopic surgery (CLS) are not clear. This study aimed to compare the long-term outcomes of RALS and CLS for rectal cancer using propensity score matching. This retrospective study included 185 patients with stage I-III rectal cancer who underwent radical surgery at our institute between 2010 and 2019. Propensity score analyses were performed with 3-year overall survival (OS) and relapse-free survival (RFS) as the primary endpoints. After case matching, the 3-year OS and 3-year RFS rates were 86.5% and 77.9% in the CLS group and 98.4% and 88.5% in the RALS group, respectively. Although there were no significant differences in OS ($p = 0.195$) or RFS ($p = 0.518$) between the groups, the RALS group had slightly better OS and RFS rates. 3-year cumulative (Cum) local recurrence (LR) and 3-year Cum distant metastasis (DM) were 9.7% and 8.7% in the CLS group and 4.5% and 10.8% in the RALS group, respectively. There were no significant differences in Cum-LR ($p = 0.225$) or Cum-DM ($p = 0.318$) between the groups. RALS is a reasonable surgical treatment option for patients with rectal cancer, with long-term outcomes similar to those of CLS in such patients. Furthermore, for the future era of remote surgery, I will present data along with videos demonstrating fully intracorporeal DST anastomosis, which can be performed independently, as well as the double bipolar technique.

P435

Long-Term Outcomes Following Extrasphincteric Laparoscopic Abdominoperineal Resection: A Decade's Experience in the Indian Setting

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Introduction: Minimally invasive procedures including abdominoperineal resection (APR) have revolutionized the management of low-lying rectal and anal cancers. Total mesorectal excision and multimodal therapy have made distal resection margins of even less than 1 cm acceptable. However, in a resource-poor country like India, with difficult health care access, and patients with aggressive tumor presentation, the first chance to treat the patient is often the only chance. This study presents the long-term outcomes following

conventional extra-sphincteric laparoscopic APR, at a tertiary care center in India.
Methods: All patients with low-lying rectal or anal cancers planned for laparoscopic abdominoperineal resection, between January 2013 and September 2024 were included. Demographic details, clinical presentation, tumor histology, neo-adjuvant chemoradiation (if any), intraoperative findings, and postoperative outcomes including histopathology and adjuvant therapy received were recorded and analyzed. Long-term outcomes including survival and quality of life were also assessed every 6 months for the first 2 years and annually up to 10 years.
Results: Eighty patients underwent laparoscopic APR in this duration and tumor histology being primarily adenocarcinoma 70 patients (87.5%), followed by malignant melanoma in seven (8.75%) and squamous cell carcinoma in three (3.75%). The majority of patients were males 52 (65%) with a mean age of 45.1 ± 14.6 years. The most common presentation was bleeding per rectum in 77 patients (96%), with the mean time to surgery from the onset of symptoms was (10.4 ± 7) months. The majority of patients received neoadjuvant chemoradiotherapy 31 patients(38.75%), while 15 patients (20%) underwent upfront surgery. Intraoperatively, dense adhesions with ill-defined planes were encountered in 40 patients(50%). There were four conversions to open, mainly due to difficult dissection and one case due to presacral bleeding causing major blood loss and hypotension. There was one case of intraperitoneal bladder injury, and one case of postoperative urine leak due to ureteric injury, for which ureteroneocystostomy was done. The mean operative time was 104 min, while mean length of hospital stay was 8.8 ± 5 days. The most common postoperative complication was perineal wound infection 15 patients (18.75%) followed by urinary retention 8 patients (10%) requiring re-catheterization. Three patients (3.75%) had parastomal hernia at 10 years. The majority received adjuvant therapy (74%), with a 5-year survival rate of 80%, while 10-year survival rate of 65%.
Conclusion: Laparoscopic APR with multimodal therapy offers good survival benefit and satisfactory long-term outcomes for patients, in resource-poor settings, where follow-up is uncertain.

P439

Postoperative Ileus and Incisional Hernia Rates Comparing Midline vs Pfannenstiel Extraction Site for Laparoscopic Right Hemicolectomy with Intracorporeal Anastomosis

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Introduction: Laparoscopic right hemicolectomy results in reduced peri-operative morbidity and intracorporeal anastomosis can further improve post-operative recovery. There remains a lack of consensus on the optimal extraction site. This study compares the postoperative outcomes of midline vs Pfannenstiel extraction site for laparoscopic right hemicolectomy with intracorporeal anastomosis.
Methods: A retrospective observational cohort study was conducted of all patients who underwent elective laparoscopic right hemicolectomy with intracorporeal anastomosis utilizing either midline or Pfannenstiel extraction site at a single Canadian centre from January 1, 2016, until December 31, 2023. Patients were excluded if they underwent surgery for inflammatory or infectious etiologies, required multiple simultaneous colonic resections or concomitant secondary surgery, or known diagnosis of cirrhotic liver disease. Baseline demographics, operative, pathologic, and postoperative data were collected. Statistical analysis was performed using SPSS 29.0.2.0. Descriptive statistics were performed. Binary logistic regression was conducted to analyze predictors of postoperative incisional hernia.
Results: In this study of 205 patients, 55(27.3%) had midline and 150(72.7%) had Pfannenstiel extraction sites. There was no difference in age, gender composition, smoking history, immunosuppression, or history of incisional or ventral hernia between groups. Midline extraction group included more obese (BMI $\geq$ 35) patients (8(16.3%) vs 5(4.1%), $p = 0.006$) and patients with diabetes (19(34.5%) vs 29(19.3%), $p = 0.027$) than Pfannenstiel group. Mean hospital length of stay was longer after midline extraction (3.7(3.1) days) vs Pfannenstiel (2.8(1.8) days, $p = 0.013$). Midline extraction resulted in later passage of first flatus (2.7(1.1) vs 2.0(1.0) days, $p < 0.001$), later first bowel movement (3.0(1.3) vs 2.0(0.8) days, $p = 0.020$), and greater incidence of ileus (9(16.4%) vs 8(5.3%), $p = 0.011$) than Pfannenstiel. Of midline extraction patients, 3(5.5%) developed a surgical site infection compared to 0(0.0%) after Pfannenstiel ($p = 0.019$). The incidence of postoperative incisional hernia was greater following midline extraction compared to Pfannenstiel (6(10.9%) vs 0(0.0%), $p < 0.001$). Following binary logistic regression to control for confounders, the development of postoperative incisional hernia was associated with postoperative surgical site infection (OR 5.7(S.E. 1.6), $p < 0.001$) and history of incisional hernia (OR 3.4(S.E. 1.2), $p = 0.004$).
Conclusions: Pfannenstiel extraction site was associated with earlier return of bowel function, fewer surgical site infections, and decreased hospital length of stay compared to the midline extraction site. Pfannenstiel extraction was associated with a decreased incidence of incisional hernias, possibly due to increased surgical site infection following midline extraction. Pfannenstiel is the preferred extraction site following laparoscopic right hemicolectomy with intracorporeal anastomosis.

P443

Ostomy-Related Hashtag Utilization on TikTok: A Comprehensive Social Media Analysis

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Introduction: In North America, over one million individuals live with an ostomy, a hidden disability that can significantly impact one's daily functioning. The rise of social media platforms like TikTok—a rapidly growing audio-visual app with over 1 billion monthly active users—offers a new avenue for sharing patient experiences, disseminating healthcare information, and fostering community. While previous studies have examined ostomy-related content on other social media platforms, our study aims to analyze the current landscape and quality of ostomy-related social media content on TikTok.
Methods and Procedures: A search on TikTok (tiktok.com) was conducted in Hamilton, ON on August 4th, 2024, to identify the top 10 most frequently used ostomy-related hashtags. For each hashtag, the 10 most liked posts ($n = 100$) featuring relevant ostomy content in English were selected using TikTok's "Top Post" algorithm. Two independent authors screened posts and excluded those containing hate speech, discriminatory content, inaccurate or misleading information, and duplicates. Viewer engagement, a combined metric consisting of the number of views, saves, comments, likes, and shares,

served as the primary outcome. Top hashtags/posts were examined via thematic analyses, by way of axial coding, and descriptive analyses.
Results: Female content creators (n = 85) produced most top posts, with most content originating from the United States (n = 71). The hashtag "#ostomy" received the highest viewer engagement, totaling 10.5 million. The mean viewer engagement across all posts was 2.9 million (standard deviation [SD] 3.3 million), with a mean post length of 55.5 s (SD: 17.4). Most content was produced by individuals with ileostomies (n = 68), and notably, the majority of posts were from patients (n = 92), with remaining posts from friends/family (n = 8) and no contributions from physicians/allied healthcare providers. Top posts focused on education/awareness or community building (n = 84), with few dedicated to sharing objective facts (n = 3), marketing (n = 8), or negative experiences (n = 8). Common themes included: normalization of ostomies, stoma care routines, post-ostomy self-image, and importance of support systems.
Conclusions: TikTok may provide a valuable platform for patients to share their ostomy experiences and raise awareness about daily challenges, offering a unique opportunity for healthcare professionals to gain deeper insights into patient needs. There are, however, potential concerns about information accuracy, given the limited presence of healthcare professionals and the lack of formally validated information sources present on the platform. Future research on social media trends will help to enhance patient education, identify relevant concerns in real-time, and improve support for individuals living with ostomies.

P445

Reduced Port Laparoscopic Surgery for Right-Sided Colon Cancer Performed Using ArtiSential® Articulated Instruments

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Introduction: Recently, robot-assisted surgery has become widely used in the colorectal field. While it enables precise surgery without handshaking under 3D vision, the higher cost of the main unit and materials is a concern. Another problem is the longer operative time required for the procedure compared to conventional laparoscopic surgery.
Purpose: We will present that a reduced port laparoscopic surgery for right-sided colon cancer was performed through a transverse incision in the lower abdomen using ArtiSential® articulating forceps for non-dominant hand and camera via an access device, plus 5-mm trocar for electric devices and 3-mm trocar for the assistant.
Results: Since March 2024, this surgical procedure has been performed on five patients. Artisential® articulated forceps were used on the non-dominant hand. Of five cases, four were cecal cancer and one was an appendiceal cyst. Laparoscopic ileocecal resection was performed in all cases. The median age was 64, with four men and one woman, and the median BMI was 25.7. The median operative time was 181 min., and the median estimated blood loss was 5cc. Four of the five patients underwent D3 lymph node dissection, and three of the five patients underwent reconstruction with intracorporeal anastomosis. All patients were discharged after 8 days without any postoperative adverse events and are currently under follow-up.
Conclusion: This procedure is inspired by the port setting of robot-assisted surgery, which we expect to be less invasive and more useful for patients. The use of Artisential® articulated forceps allowed for a larger operative field than conventional laparoscopic devices and less interference with the camera.

P446

Rare Case of Fulminant Ischemic Pancolitis Presenting as Abdominal Compartment Syndrome

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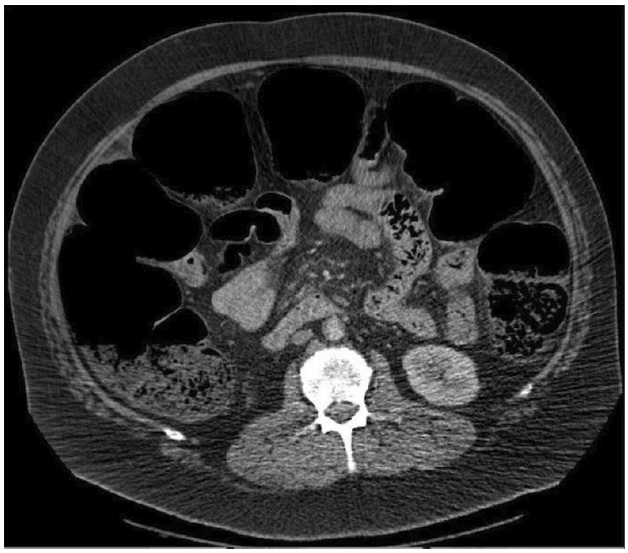
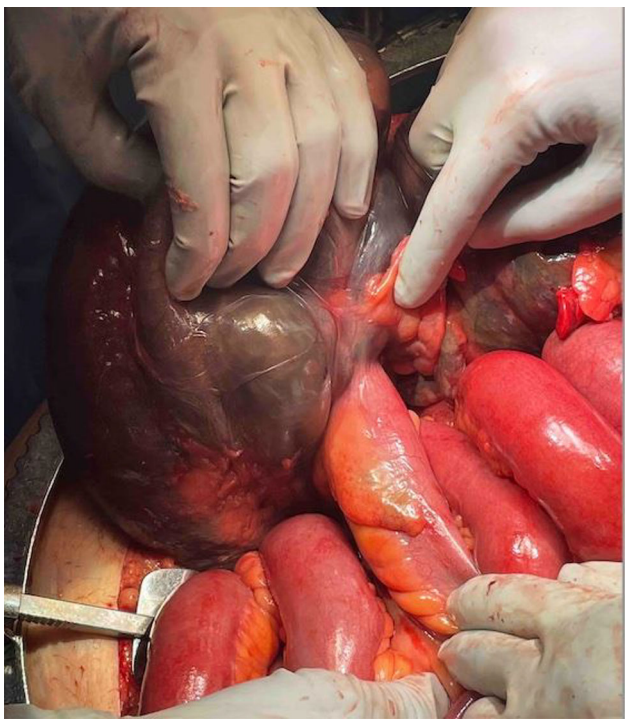
Introduction: Ischemic colitis is a common diagnosis that may present as nongangrenous (80–85%) or gangrenous (15–20%), with varying severity. Fulminant ischemic pancolitis is a rare, severe form that requires operative intervention in all cases. Even with surgery, this presentation has a mortality rate of 75%.
Case Presentation: 43-year-old male with poorly controlled type two diabetes, hypertension, epilepsy, bipolar disorder, and schizoaffective disorder presented to an outlying facility with abdominal pain, diarrhea, and distention. His medications were notable for an antihypertensive, opioid, and several potentially constipating drugs. He was mildly hypotensive, nontachycardic, had a mild leukocytosis and lactic acidosis. CT with contrast showed significant colonic distension, although no evidence of colitis, ischemic changes, obstruction, or perforation.
After transfer to our hospital, the patient suffered a seizure, respiratory failure requiring mechanical ventilation, and hypotension requiring pressor support. He developed abdominal compartment syndrome, as evidenced by profound abdominal distension, elevated bladder pressures, and worsening AKI. An exploratory laparotomy was performed with findings of pancolonic necrosis. A total abdominal colectomy with temporary abdominal closure was performed, with end ileostomy creation and fascial closure at subsequent take-back. Pathology reported mucosal necrosis and areas of full thickness bowel wall necrosis consistent with fulminant ischemic pancolitis.
Discussion: Fulminant ischemic pancolitis is thought to be secondary to acute nonocclusive compromise to colonic blood flow, however the inciting event is often unclear. Patients with ischemic colitis are typically elderly with diffuse small vessel disease and multiple comorbidities presenting with abdominal pain, diarrhea, and hematochezia. Hypertension, COPD, diarrhea, atrial fibrillation, congestive heart failure, diabetes, and medications, namely antibiotics, opioids, and nonopioid potentially constipating drugs, have been independently associated with colonic ischemia. On CT scan, the combination of bowel wall thickening, dilation, mesenteric fat stranding, free fluid, venous distention, and pneumatosis equates $a > 90\%$ probability of severe ischemic colitis. When the presentation doesn't follow this typical pattern, the diagnosis of fulminant ischemic pancolitis requires a high clinical index of suspicion.
Conclusion: This case of fulminant ischemic pancolitis illustrates a rare presentation of abdominal compartment syndrome without overt CT evidence of colonic ischemia in a young patient with diabetes, hypertension, and multiple medications conferring increased risk of colonic ischemia. Given its low incidence, this diagnosis may be delayed or missed, particularly in young patients with atypical presentations and more subtle risk factors. It is imperative to maintain a high index of suspicion for fulminant ischemic pancolitis, a rare condition with high mortality.





P447

Techniques Optimized for Robotic Surgery in Right Hemicolectomy of the Colon

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Background: There are various approaches to robotic surgery (RALS) for right hemicolectomy of the colon (RHC) that can still be improved, including a medial approach similar to the Lap (o-RALS), which is often performed at the beginning of RALS RHC. We present the "pancreas-guided median cordal approach" (PaMC), which takes full advantage of RALS, with videos and results.
Surgical Technique: Double bipolar technique is used. The port is placed in an inverted L-shape. The approach is made from the head of the transverse colon, and the SMV/A is identified using the pancreatic guide; the surgical trunk is dissected caudally, and the transverse colon and mesentery are dissected preemptively to facilitate dissection of the MCA. Continuous mesenteric passaging on the patient's right side allows for en bloc TME.
Result: PaMC had better results than o-RALS in terms of median operative time (233 min vs 303 min; $p = 0.021$), median blood loss (81 ml vs 143 ml; $p = 0.036$), and days to exhaust (1.7 days vs 2.6 days; $p = 0.043$). There were no complications of CD Grade 3 or less in the PaMC patients.
Conclusion: PaMC is a valid surgical technique suitable for RALS.

P448

Colonic Pseudo-Obstruction Caused by Semaglutide: A Case Report

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Semaglutide (Ozempic) is a glucagon-like-peptide-1 (GLP-1) receptor agonist used to treat type 2 diabetes. Recently, it has become more well known for its weight loss properties. Gastroparesis and constipation are documented adverse effects of Semaglutide. We present a 51 year old female who presented to the hospital with a history of increasing abdominal pain, nausea, distension and constipation. Initial labs showed a leukocytosis and lactic acidosis. CT imaging showed significant colonic dilation with a transition point in the descending colon. A gastrografin enema was performed and was non-diagnostic. She was taken for a lower endoscopy which did not show any masses, lesions or signs of obstruction. Findings were consistent with a colonic pseudo-obstruction. She was managed non-operatively and ultimately discharged to home. This case demonstrates one of the lesser discussed, but still very important side effects of the increasingly popular GLP-1 agonists.

P449

Intestinal Perforation in a Patient with Omental Cake Due to Stage IV Gastric Cancer

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Introduction: Intestinal perforation is a serious complication that can arise in patients with advanced gastric cancer, particularly in those who have an omental mass, known as "omental cake." This phenomenon, characterized by the infiltration of tumor tissue into the omentum, can cause a series of pathological alterations that predispose to intestinal perforation.
Methods and Procedures: Case report, we present the case of a young patient with stage IV gastric cancer, with metastatic involvement to the lung and central nervous system, resulting in refractory ascites, requiring weekly paracentesis, with an episode of intestinal perforation that required urgent advanced management with diagnostic laparoscopy.
Results: After paracentesis the patient presented abdominal distension that did not improve despite evacuation of ascitic fluid, so an intestinal perforation secondary to paracentesis was suspected and

was taken to a diagnostic laparoscopy, finding the omental cake. A CVC was left in place to drain the pneumo, it was left in place for two weeks, it resolved, and the patient continued with palliative management.
Conclusion(s): Diagnostic laparoscopy confirmed the diagnosis and managed the complication palliatively, improving the patient's quality of life. This case highlights the importance of a multidisciplinary approach in the treatment of patients with advanced cancer, optimizing the management of complications and symptomatic support.

P450

Inferior Mesenteric Arteriovenous Fistula - Two Case Reports

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Background: Inferior mesenteric arteriovenous fistula (IMAVF) is an extremely rare vascular anomaly involving an abnormal communication between the inferior mesenteric artery and vein. With only 40 cases described in the literature, its etiology can be congenital, iatrogenic, traumatic, or idiopathic. The condition acts as a left-to-right shunt, leading to clinical complications such as ischemic colitis, portal hypertension, and heart failure. Due to the rarity and non-specific presentation, diagnosis is challenging and often delayed until radiological or intraoperative examination.
Case 1: We report the case of a 56-year-old male patient who presented with symptoms of ischemic colitis, including abdominal pain and gastrointestinal bleeding. Physical examination revealed a palpable thrill and mass in the lower abdomen. Multidetector computed tomography (CT) and angiography confirmed the diagnosis of an inferior mesenteric arteriovenous fistula, an unusual cause of his symptoms. Surgical resection of the fistula was successfully performed, and the patient recovered well without further complications. This case highlights the importance of considering vascular anomalies in patients with ischemic colitis of unclear origin.
Case 2: Ten years later, a 76-year-old female patient with a history of recurrent acute pyelonephritis (APN) and diverticulitis presented with similar symptoms, including intermittent abdominal pain, lower gastrointestinal bleeding, and signs of portal hypertension. Despite her past medical history, there was no significant history of trauma or recent abdominal surgery that could explain the development of the fistula. Imaging studies, including multidetector CT and angiography, revealed an arteriovenous fistula involving the inferior mesenteric artery and vein, contributing to ischemic colitis and portal hypertension. She underwent successful laparoscopic colon resection, resulting in complete resolution of her symptoms. This case highlights the potential for idiopathic AVF to occur even in patients with a complex gastrointestinal history, such as diverticulitis, further complicating the clinical presentation and diagnosis.
Conclusion: Both cases illustrate the diagnostic challenges posed by inferior mesenteric arteriovenous fistulas due to their rarity and nonspecific clinical presentation. Preoperative imaging, particularly CT and angiography, plays a crucial role in establishing the diagnosis. Surgical resection remains the definitive treatment with favorable outcomes. These cases emphasize the need for awareness of this rare condition in patients presenting with ischemic colitis, portal hypertension, or unexplained abdominal symptoms. Further study of its pathophysiology and long-term follow-up is warranted to better understand recurrence risks and outcomes.
This abstract presents two rare instances of IMAVF in patients of different ages, with successful treatment through surgical intervention.

P451

At-Home Self-Administered Bowel Stimulation Before Loop Ileostomy Closure: A Single-Center Single-Arm Feasibility Trial

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Objectives: We recently published a randomized controlled trial demonstrating that preoperative bowel stimulation via the efferent limb of the ileostomy prior to ileostomy closure reduced primary post-operative ileus (PPOI) and length of stay (LOS). These stimulations were performed in clinic during daily pre-operative visits. The objective of this trial was to assess the feasibility of at-home self-administered bowel stimulation before loop ileostomy closure.
Methods: After institutional review board approval, we conducted a prospective single-center single-arm feasibility trial for patients undergoing an elective loop ileostomy closure from 2022 to 2024. Exclusion criteria were history of total abdominal colectomy or proctocolectomy, inflammatory bowel disease, peritoneal metastases or planned midline laparotomy. The primary endpoint was feasibility defined as $\geq$ 75% of participants successfully performing at least 5 at-home stimulations. Secondary outcomes included patient-reported difficulties with stimulation, PPOI (defined as intolerance to oral food in absence of clinical/radiological obstruction, on or after postoperative day 3, that either (a) required nasogastric tube insertion; or (b) was associated with two of the following: nausea/vomiting, abdominal distension, or absence of flatus), length of stay (LOS), and patient satisfaction. In an in-person visit, each participant was trained on at-home bowel stimulation using a standard protocol (previously published by our group), and had a foley catheter placed and secured in their ostomy. Patients were instructed to perform nine at-home stimulations. Participants were given stimulation materials, an instructional video https://www.youtube.com/watch?v=Bz1DH2KJzAo and a logbook.
Results: Of 40 patients screened, 39 met inclusion criteria and were approached for participation, and 23 consented to participate and were included. All 23 participants completed the study. The median age of participants was 56 ($\pm$ 9.8) years, 71.7% were male and 95.6% had a low anterior resection. Participants completed a median of 6.2 (5;9) at-home stimulations sessions, with 18 patients (78.3%) completing $\geq$ 5 sessions. Fifty-nine percent of participants reported performing stimulations alone, while assistance from another person was required to inject stimulation material or manage technical difficulties for the remainder (Table-1). All participants underwent ileostomy closure with 1 participant requiring an unplanned laparotomy. Overall, 73.9% of participants passed flatus on post-operative day 1, none experienced PPOI and median LOS was 3 (2;3) days. Most participants (72%) were satisfied/very satisfied with at-home stimulation and 100% would recommend it to a friend.
Conclusion: This trial demonstrated that at-home bowel stimulation prior to loop ileostomy closure is feasible and can be a viable option in future implementation.

			Frequency of sessions	Percentage of sessions	Number of patients	Percentage of patients
Difficulties experienced during the stimulation session						
	Total sessions		136			
		Yes	53	39%	14	60.87%
		No	83	61%	9	39.13%
	With solution preparation					
			3	4.3%	2	8.70%
	Finding the catheter opening					
			0	0%	0	0%
	Injection and overflow					
			25	36.2%	9	39.13%
	Handling the appliances (stoma bag and fl ange)					
			4	5.8%	4	17.39%
	Problems with staying clean/hygiene					
			4	5.8%	2	8.70%
	Required help from another person					
			28	40.6%	5	21.74%
	Leaks from the ostomy appliance					
			10	14.5%	5	21.74%
	Any discomfort, pain or cramps					
			24	34.8%	8	34.78%
	Nausea or vomiting					
			10	14.5%	6	26.09%
	Other					
			19	27.5%	6	26.09%

P452

SafeHeal Colovac Colorectal Anastomosis Protection Device Evaluation (SAFE-2) Pivotal Study: A Multicentre Clinical Trial

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Introduction: Proximal faecal diversion is the standard of care to protect high-risk colorectal anastomoses from the septic sequelae of anastomotic leakage (AL). The Colovac device (CD) is an intraluminal bypass device intended to avoid stoma creation in patients undergoing low anterior resection (LAR). A preliminary study (SAFE-1) demonstrated 100% protection of colorectal anastomoses in 15 patients. We present the preliminary results of SAFE-2, a phase III clinical trial.

Methods: SAFE-2 is an international multicentre, prospective, open-label, randomized, controlled trial. After a run-in period, patients undergoing LAR for rectal cancer were randomized 1:1 ratio to CD or diverting loop ileostomy (control). The co-primary endpoints included the rate of major postoperative complications within 12 months of surgery and stoma creation rate.

Results: Enrollment was conducted across 7 US and 5 European centres between January 2022 and January 2023. 35 patients were enrolled including 17 in the run-in (non-randomized) period and 18 randomized to CD (10) and control (8). 8 CD and 6 control patients completed the 12-month follow-up. There were no significant differences with respect to age, gender, BMI, stage, distance from the anal margin, or neoadjuvant treatment. Rate of Clavien-Dindo Grade (CDG) III+ complications was 30% (3/10) in the CD arm vs 25% (2/8) in controls, which included AL, incisional hernia, colonic intussusception, and malnutrition. Clinically significant ALs were detected in 10% (1/10) of CD patients, and 25% (2/8) of control patients, with one death in the control group. Two patients in the CD arm had CT detected, clinically non-significant AL, and were diverted. Thus, 70% of patients avoided a stoma. In the run-in period, 52.9% (9/17) avoided the creation of a stoma, and the rate of clinically significant ALs was 17.6% (3/17), which is comparable to the randomized CD and control arms. No deaths were recorded, and 5/17 (29.4%) of patients had CDG III complications. The study was voluntarily suspended and closed due to a higher-than-expected rate of device migration, which occurred in 37% (10/27) of all CD patients, 3/10 were clinically significant in the CD arm.

Conclusions: While the SAFE-2 trial was closed to allow for the design of a next generation vacuum system, the Colovac device is a safe alternative to an ostomy in the protection of high-risk colorectal anastomoses. With a stoma avoidance rate of 70%, a CD may potentially omit the need for ostomy, subsequent reversal, and drastically improve the patients' quality of life.

Trial: NCT05010850

P453

The Levels of Cold-Inducible RNA-Binding Protein are Markedly Increased in Both Plasma and Wound Fluid for a Duration of Two Weeks Following the Resection of Colorectal Cancer

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Introduction: Cold-inducible RNA-Binding Protein (CIRP) is activated by stress and primarily found in the nucleus, where it regulates transcription. Under stress, CIRP translocate to the cytoplasm where it regulates mRNA translation and degradation; also, a fraction of CIRP is released from the cell where it becomes extracellular CIRP (eCIRP). eCIRP is as a damage-associated molecular pattern (DAMP) that incites inflammatory responses and can lead to TNF-alpha, IL-6, and HMGB production. Surgery activates lymphocytes/macrophages/PMNs that can produce eCIRP. Increased eCIRP levels may impact macrophage function, foster immune tolerance, and facilitate tumor growth. CIRP facilitates the activation of AMP-activated protein kinase which can enhance wound healing. This study's objective was to determine perioperative (periop) levels of CIRP in plasma and wound fluid (WF) in patients (pts) with colorectal cancer (CRC) who had colorectal resection (CR).

Methods: Elective CRC CR pts enrolled in an IRB-approved tissue and data bank for whom adequate wound fluid (WF) and plasma samples were available were eligible for this study. Clinical, demographic, and operative data was reviewed. Blood samples and WF were obtained (simultaneously) preoperatively (preop) and on postoperative (postop) day 1 (POD1) and between POD 7–13; the latter were bundled into 7 day blocks and considered as single time points. WF was collected from JP drains in the abdomen/pelvis or subcutaneous wounds. eCIRP levels (ng/ml) were assessed in duplicate via

ELISA; statistics were done with the Wilcoxon and Mann–Whitney tests (significance $p < 0.05$).
Results: 29 CRC pts (12 males, 17 females; mean age 66.10 ± 12.27 years; 5 colon and 24 rectal cancers) made up the study population. 25 pts underwent minimally invasive colorectal resection (MICR) (mean incision length (IL) of 8.3 ± 3.5 cm, while 4 pts had open surgery (mean IL 23.8 ± 7.8 cm). There were no major complications noted. Plasma levels of eCIRP were elevated on POD 1, 3, and 7–13 when compared to preop levels ($P < 0.001$ to $P < 0.01$). WF eCIRP levels were 9–22 times greater than the associated plasma levels at all postop time points ($P < 0.0001$;Table 1).
Conclusion: Plasma eCIRP levels were elevated postop when compared to preop values. Of note, wound eCIRP levels were many folds higher than plasma levels at all postop time points. We hypothesize that the very high WF levels may be the main source of the late postop plasma eCIRP elevations noted. Also, although unproven, increased plasma eCIRP levels may facilitate proliferation of residual tumor post-surgery.

Table-1: eCIRP protein levels in preop and post op Plasma vs. postop Wound fluids

Time	Plasma (ng/ml)	(n)	Wound fluids (ng/ml)	(n)	p
PreOp	2.739; 95% CI: 1.929 - 3.449	29	N/A	N/A	N/A
POD1	4.842; 95% CI: 3.568 - 13.139	29	47.322; 95% CI: 18.707- 72.433	29	<0.0001
POD3	4.623 95% CI: 3.668 - 7.947	28	86.984;95% CI: 63.235- 167.273	25	<0.0001
POD 7-13	6.482; 95% CI: 4.036 – 12.842	17	176.549; 95% CI: 85.650 – 335.740	18	<0.0001

P454

Ileocolic Anastomosis Volvulus: A Rare Presentation and Surgical Management Strategy Following Right Hemicolectomy

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Purpose/Background: Intestinal volvulus, a twisting of a segment of the intestine around its mesentery, can lead to vascular compromise, closed-loop bowel obstruction, and eventual bowel necrosis. This condition may arise due to factors like congenital malrotation, prior abdominal surgery, adhesions, or chronic constipation. Mortality rates can exceed 30%, particularly with delayed diagnosis or treatment. We present a rare case of ileocolic anastomosis volvulus with chylous ascites occurring three months after a right hemicolectomy, challenging the conventional notion that right hemicolectomy is curative for cecal volvulus. This case underscores the importance of recognizing subacute progressive presentations and the need for further investigation into standardized management strategies.
Methods/Interventions: We conducted an extensive literature review using databases such as PubMed, Embase, and Cochrane Library, focusing on studies from the last two decades. Keywords included "intestinal volvulus," "transverse colon volvulus," "volvulus post right hemicolectomy," "volvulus and chylous ascites," and "recurrent volvulus." Articles describing pathogenesis, management, and outcomes of intestinal volvulus were selected for review. Additionally, we detailed the clinical course and surgical management of our case, where an exploratory laparotomy revealed a 360-degree volvulus of the ileocolic anastomosis with severe mesenteric congestion and extensive venous collaterals.
Results/Outcomes: Volvulus can present either acutely or subacutely, with symptoms ranging from intermittent obstruction to acute vascular compromise, as seen in our case. The presence of chylous ascites and severe venous congestion in our patient indicated advanced disease progression. Intraoperative findings included a 360-degree counterclockwise rotation of the ileocolic anastomosis and small bowel around the root of the mesentery. Reduction of the volvulus led to immediate resolution of obstruction and vascular compromise. Postoperative recovery was uneventful, and the patient was discharged on postoperative day three. Follow-up was planned for potential elective resection.
Conclusion/Discussion: This unique case of ileocolic anastomosis volvulus post-hemicolectomy, accompanied by chylous ascites, highlights the need for high clinical suspicion and prompt surgical intervention, even in the absence of classic signs such as lactic acidosis or peritonitis. Although right hemicolectomy is considered definitive for cecal volvulus, this report suggests that long-term surveillance and consideration of alternative management strategies may be necessary. Future studies should aim to establish guidelines for managing similar cases to improve patient outcomes and prevent recurrence.

P455

Acute Constipation and a Stercoral Perforation

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Stercoral perforation typically arises as a sequela of chronic constipation and can lead to bowel perforation due to fecal impaction. While uncommon, maintaining a high clinical suspicion in the appropriate setting is crucial. We present a case report involving a 52-year-old female with no history of chronic constipation, who presented with an unexplained large bowel obstruction. Subsequent extensive diagnostic workup revealed stercoral perforation, necessitating diagnostic laparoscopy and sigmoidectomy. This case underscores that while stercoral perforation can be life-threatening, clinical stability permits the use of minimally invasive techniques without compromising patient safety or health.

P456

Minimally Invasive Surgery in the Management of Large Bowel Obstructions for Geriatric Patients

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Introduction: As the population of geriatric patients grows, it is vital to investigate the best surgical practices for managing these patients. Minimally invasive surgery (MIS) has been shown to lead to improved outcomes in geriatric patients with colorectal cancer. However, it has not been established if this is the case for the management of large bowel obstructions, a potential complication of colorectal cancer and diverticulitis. This study aims to compare patient outcomes of MIS and open surgery for large bowel obstructions in the geriatric population.
Methods: ACS NSQIP 2005–2021 data was utilized to evaluate patients 65 and older with large bowel obstruction who had partial colectomies. Univariable and multivariable logistic regression and linear regression analysis were performed to assess the relationship between laparoscopic versus open surgical approach and operative outcomes. Analyses were adjusted for age, sex, and diabetes. Exclusion criteria included subjects with ascites, disseminated cancer, ventilator dependence, age younger than 65, or missing data.
Results: Among 3172 patients, 482 had laparoscopic surgery. Upon univariable analysis, these patients were more likely to be younger,

female, and diabetic. After adjustment, analysis showed decreased likelihood of 30-day mortality (OR 0.32, 95% CI 0.18–0.59), superficial surgical site infection (SSI) (OR 0.59, 95% CI 0.36–0.98), organ space SSI (OR 0.42, 95% CI 0.24–0.73), urinary tract infection (UTI) (OR 0.51, 95% CI 0.26–0.99), and unplanned reoperation (OR 0.44, 95% CI 0.28–0.69) for laparoscopic surgery compared to open surgery. Total length of stay among patients receiving open surgery was approximately 2.07 days longer than patients receiving laparoscopic surgery (95% CI 1.35–2.80). There was no statistically significant difference in total operation time between open versus laparoscopic approach.

Conclusion: This study demonstrated that geriatric patients who underwent minimally invasive surgery for large bowel obstructions had better outcomes than those with open surgery. These improved outcomes included a decreased likelihood of 30 day mortality, complications such as SSIs and UTIs, unplanned reoperation as well as a shortened hospital stay. Given these differences in outcomes, further research is needed to reevaluate guidelines for surgical intervention of large bowel obstruction in geriatric patients.

P457

Rare Case of a Young Male with Metastatic Mixed Adenoneuroendocrine Tumor of the Anorectum

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Modified classification by World Health Organization (WHO) in 2019 has established mixed adenoneuroendocrine carcinoma (MANEC) as a subgroup of a broader category of tumors termed mixed neuroendocrine non-neuroendocrine neoplasms (MiNEN). MiNEN tumors contain both neuroendocrine and exocrine tissue representing at least 30% of the tumor volume. Systematic reviews and population-based studies have identified approximately 800 documented cases of MANEC involving the lower gastrointestinal (GI) tract amongst several additional tumor origin sites. Despite the rarity of this tumor, some significant observations have been made. Notably, the average age of 64 with fairly equal male to female distribution. The most common site of origin in the lower GI tract is the appendix (60.3%) followed by the colon (29.3%), rectum (9.2%) and anal canal (1.2%). Although there remains some debate regarding the aggressiveness of the tumor based on location, MANEC tumors have been confirmed to be a very aggressive entity especially in the presence of a high Ki67 proliferative index and presence of a high grade neuroendocrine component. At diagnosis, lymph node positively and metastatic disease have been reported to be 42–49% and 29–67% respectively. Furthermore, without established treatment guidelines and the inherently aggressive nature of this tumor, median overall survival remains poor at 12.3 months.

We are presenting a case of a 36 year old male who presented with complaints of intermittent rectal bleeding for several years. Flexible sigmoidoscopy identified a 5.0 cm polyp located 1.5 cm proximal to the anal verge. The patient underwent endoscopic submucosal resection with final pathology revealing a MANEC confirmed by histology and immunohistochemistry. Pathology confirmed 1 mm negative margin, however the specimen did have positive lymphovascular and perineural invasion. Further staging by CT scan and MRI revealed perirectal, presacral and obturator lymphadenopathy and a PET/CT scan identified a suspicious liver lesion that was biopsied and confirmed neuroendocrine metastasis.

In this case, we report on a patient with advanced disease who is younger than 98% of the previously reported cases. Additionally, his tumor location within the anorectum is also exceedingly rare and documented in only 10.4% of cases. His tumor also demonstrates a high Ki67 (> 90%), high grade endocrine component, lymph node metastasis and liver metastasis which have all been shown to be independent poor prognostic indicators. After discussion at a multidisciplinary tumor board, the patient has been started on a combination of Durvalumab, Cisplatin and Etoposide with plans for external beam radiation to follow.

P459

How Does Income, Education, and Employment Affect Patient Reported Outcomes in Metabolic and Bariatric Surgery Patients? A Preoperative Cross-Sectional Analysis

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Background: There is limited literature evaluating how income, education level, and employment status impact metabolic and bariatric surgery (MBS) patient reported outcomes. We hypothesize that patients with social and economic inequities will have worse eating-related (ER) behavior, distress, and symptoms.

Methods: All MBS patients at an academic institution were given a social history questionnaire, the BODY-Q ER module, and the BODY-Q physical function questionnaire at their preoperative appointments. The BODY-Q module is a validated questionnaire to assess ER behavior (feeling out of control), distress (feeling embarrassed), and symptoms (feeling pain or bloating) and physical function on a scale of 0–100 with 100 being optimal health. Average BODY-Q scores were compared using an analysis of variance and

independent samples t tests with a p-value of < 0.05 considered significant.

Results: There were 831 questionaries included. Survey compliance was 80%. Patients with an income of < $25,000 reported lower physical function scores compared to patients with an income of $25,000–44,999, $45,000–74,999, and > $75,000 (57.52 ± 22.90 vs. 66.51 ± 18.19 & 66.82 ± 20.89 & 66.43 ± 20.3; $p < 0.01$) and lower ER-symptoms scores compared to those with an income of $45,000–74,999 and > $75,000 (75.05 ± 16.33 vs. 78.69 ± 13.78 & 78.53 ± 13.08; $p = 0.04$). Patients with a high school education reported higher ER-distress scores when compared to patients with a college or postgraduate education (85.15 ± 19.28 vs. 76.65 ± 21.61 & 75.04 ± 19.28; $p < 0.01$) and higher ER-symptoms scores when compared to a college education (80.49 ± 14.84 vs. 76.53 ± 14.41; $p < 0.01$). Patients who were employed reported lower ER-behavior scores (56.41 ± 15.94 vs. 61.87 ± 15.85; $p < 0.01$) while unemployed patients reported lower scores for ER-symptoms (76.06 ± 15.38 vs. 78.39 ± 13.72; $p = 0.03$) and physical function (57.75 ± 22.27 vs. 66.91 ± 19.89; $p < 0.01$).

Conclusion: In the preoperative setting, patients with lower income and unemployment reported worse physical function while employed patients reported worse ER-behavior including feeling out of control or difficulty avoiding unhealthy snacks. Furthermore, there was a correlation with higher education levels and worse ER-distress such as feeling embarrassed or ashamed and negative symptoms like pain and bloating. Patients struggling in these areas may have a suboptimal clinical response to MBS. Future studies should explore how these findings impact outcomes and interventions to promote an optimal clinical response tailored to patient-level social and economic inequities.

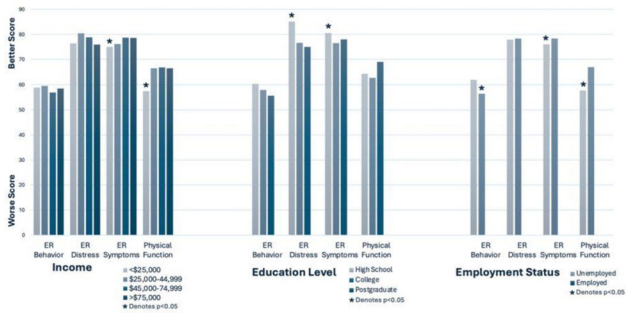

Fig. 1 Difference in BODYQ scores based on income, education, and employment

P460

How is a Successful Academic Surgeon Supposed to Look and Sound Like?

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Introduction: Decisions about career advancements and hiring within academic surgery can be subject to unconscious and conscious biases. In recent years there have been efforts to mitigate some of the better-known biases (race and gender), while other biases have not been assessed. This study evaluated potential bias indicators among academic general and gastrointestinal surgeons to determine if these factors were associated with employment at a top academic hospital.

Methods and Procedures: Academic general and gastrointestinal surgeons presenting at the 2022 SAGES Annual Meeting were divided into two groups: those employed at top-10% hospitals as ranked by Newsweek and those who were not. Surgeons' image and voice samples were gathered from available conference videos. Image processing was used to measure surgeons' relative height, BMI-estimate based on 4 validated facial geometric features, skin tone, as well as 9 validated facial geometric features associated with beauty, leadership, maturity, and trustworthiness. Mean voice pitch was computed from voice samples. Perceived US census race was determined using the validated NAMSOR name-origin tool and, along with gender, was evaluated for significance using a chi-squared test. All other variables were evaluated with the unpaired 2-sample t-test.

Results: Of 434 speakers, 129 met inclusion criteria as an academic general and gastrointestinal surgeon (69 women, 60 men). Sixty-six were from Newsweek top-10% hospitals, and 63 were not. There were no significant differences in gender, height, BMI, skin tone, perceived-name-race, or facial features associated with beauty, leadership, maturity, and trustworthiness between the two groups ($p > 0.05$). However, the mean voice pitch for male surgeons from Newsweek top 10% hospitals was significantly lower by -8.7Hz (95% CI: − 15.1 to − 2.3 Hz, $p = 0.008$).

Conclusions: In the field of academic gastrointestinal surgery top-ranked hospitals on average employ diverse looking surgeons, however this study does suggest they tend to employ male surgeons with deeper voices. The findings require future validation in other data samples, but emphasize the need to assess all potential biases affecting surgical career advancements.

P461

The Diversity Divide: Disparities in Tenure and Academic Metrics Among Mis Fellowship Directors

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Introduction: Minimally invasive surgery (MIS) is a field in which fellowship directors significantly influence training. Despite their importance, limited literature exists on the demographics and academic productivity of MIS program directors (PDs). This study aims to analyze these characteristics and compare PDs to other members of the surgical community (i.e. APDs and residents).

Methods: This retrospective cross-sectional study analyzed publicly available data from the 2023–2024 academic year. Data on MIS fellowship directors, including tenure, sex, and ethnicity, were collected from The Fellowship Council website. H-index values were retrieved from Scopus. Directors were categorized as PDs or APDs. Statistical analyses included chi-squared and Mann–Whitney U tests, with significance set at $p < 0.05$.

Results: A total of 321 directors (157 PDs and 164 APDs) were identified. The majority were male (84% of PDs and 74% of APDs, $p = 0.024$) and White (80% of PDs and 77% of APDs, $p = 0.745$). Asian directors comprised 15% of both groups, while African American and Hispanic/Latino directors were underrepresented, making up 1% and 4% of PDs and 3% and 4% of APDs, respectively. PDs had a higher median tenure (7 years) and H-index (14) compared to APDs (4 years and 8, $p < 0.001$). Male directors had significantly longer tenures (12 years) and higher H-index values (6) than female directors (6 years and 3, $p < 0.001$). Median tenure by ethnicity was 5 years for White and Asian directors, 2 years for African American, and 9 years for Hispanic/Latino directors. Corresponding median H-indices were 11 for White, 10 for Asian, 4 for African American, and 15 for Hispanic/Latino directors. Statistical comparisons by ethnicity were limited due to small sample sizes.

Conclusion: The study highlights significant gender and racial disparities among MIS fellowship directors, with males and White individuals dominating these roles. Although the diversity among surgical residents has been increasing, this trend is not reflected in fellowship leadership, possibly due to systemic barriers. The high median H-index suggests a strong academic orientation within MIS leadership. To promote growth in MIS and recruit top residents, efforts must focus on better representation of race and gender among trainees and faculty. Further research is required to understand and address the barriers to diversity in MIS fellowship leadership, fostering a more inclusive environment.

P462

What It Takes To Be Great: ChatGpt's Top 5 Descriptors of Great Surgeons by Race, Gender, and Sexual Orientation

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Introduction: Barriers in diversity, equity, inclusion, and belonging of surgeons include institutionalized racism and implicit biases that permeate through all facets of surgery. Despite evidence demonstrating the benefits of diversity in medicine, such as improved patient care and outcomes, there remains low rates of recruitment, retention, and academic advancement of Underrepresented in Medicine (URiM) surgeons. The persistently low rates of URiM surgeons highlights the need to investigate the biases that impede the professional growth of minority surgeons and then mitigate these biases within institutions. We hypothesized that the AI system known as ChatGPT could provide insight into existing implicit biases in its descriptions of great surgeons of differing gender, race, and sexual orientation.
Methods: ChatGPT 3.5 was prompted to provide the "top 5 descriptors of a great surgeon," serving as the control group. Subsequent queries added surgeon identifiers based on gender, race, and sexual orientation into the prompt. Fourteen different surgeon identifiers were evaluated. ChatGPT responses were qualitatively compared against the control group to assess for potential influence from implicit biases and stereotypes.
Results: The control group's top five descriptors of a great surgeon included "skilled, confident, meticulous, diligent, and innovative." The same response was generated for a great male surgeon whereas the great female, gay male, and gay female surgeons were "skilled, diligent, innovate, compassionate and empathetic." The great Black male, Black gay male, and Black gay female surgeons were "skilled, exceptional, resilient, trailblazing, and inspirational." The great Black female surgeon was similarly skilled, trailblazing, and inspirational, but also empathetic and tenacious. The great Latin/Hispanic surgeon had none of the baseline characteristics but instead had all paired characteristics including "bilingualism and effective communication, culturally competent and empathetic, resilient and determined, and advocacy and leadership." The Latin/Hispanic male and gay male surgeon identifiers included the same descriptors as the Latin/Hispanic non-gendered surgeon identifiers. In comparison, ChatGPT replaced the Latin/Hispanic female and gay female descriptors of "bilingualism and effective communication" with "mentorship and community engagement."
Conclusion: ChatGPT's descriptions of great surgeons, influenced by race, gender, and sexual orientation provides valuable insights on how implicit biases shape the perception of greatness in surgery. These biases impose on minority surgeons the burden of rigid societal expectations of greatness that leaves little room for deviation. We should question the origins of these expectations and how they negatively impact the academic advancement of minority surgeons who need to be "exceptional" to be great.

P463

Colorectal Cancer Screening Barriers: Does the Ethnicity of the Community Healthcare Worker Matter? A 12-Month Retrospective Analysis of a Rural West Texas Population

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Introduction: The aim of this study was to examine whether the ethnicity of community healthcare workers impacts colorectal carcinoma screening rates in a rural West Texas population with a focus on the African American population. Colorectal carcinoma is the second leading cause of cancer-related deaths in America with African Americans experiencing the highest incidence and mortality rates among all other racial groups. Previous studies have shown how racial discordance between patients and physicians have led to this disparity, but the specific impact of community healthcare workers remains underexplored. We hypothesize that having a minority community healthcare worker will increase the amount of colorectal carcinoma screenings in African Americans in our target population.
Methods and Procedures: A retrospective/cross-sectional analysis was conducted in two West Texas healthcare centers over the course of 12 months. This 12 month period was subsequently divided into two 6 month periods: the first period employed Caucasian, Asian, and Hispanic/Latino community healthcare workers only and the second period included an African American among the community healthcare workers. Data regarding the gender, age, and ethnicity of the patient was collected, as well as the race and gender of the community healthcare worker with whom they interacted during their initial screen. All eligible participants received FIT tests after their initial screen, and the amount of returned tests were compared across both 6 month periods, as well as the entire 12 month period.
Results: A total of 1075 participants were eligible for analysis over the 12 month period. A significant increase in African American, Asian/Pacific Islander, American Indian/Alaska Native, and female screenings were observed during the second 6 month period after the hiring of an African American community healthcare worker. Furthermore, the African American community healthcare worker increased clinic productivity by 68% during the second period.
Conclusions: After the hiring of an African American community healthcare worker, the total number of colorectal carcinoma screenings in the African American population increased by 100%. A 54%

increase in colorectal carcinoma screenings in other minority groups was also observed during this time period, as well as a 65% increase in the amount of women who were screened. Larger randomized studies exploring this topic will be crucial in addressing the low screening rates within the high risk population in the United States.

P464

Emerging Trend of Female Surgical Trainees in Qatar: A Timeline of Pioneering Progress and Diversity

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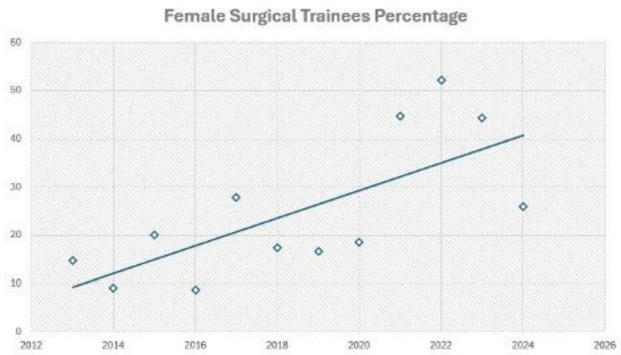
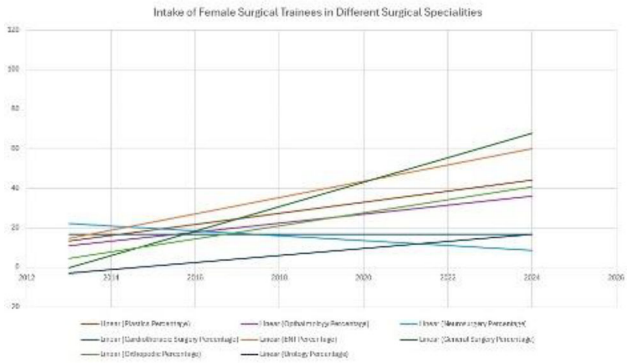
Introduction: In recent years, Qatar's Graduate Medical Education (GME) program has gained significant recognition globally for its rapid progress and development. With its state-of-the-art teaching hospitals, Hamad Medical Corporation (HMC) offers a high-quality training environment in the Middle East, accredited by the Accreditation Council for Graduate Medical Education International (ACGME-I) since 2013. Historically, surgical specialties in the region have been predominantly male-dominated due to cultural norms, selection biases, and a lack of female mentorship and leadership opportunities. However, the landscape is gradually shifting, with more women entering the field. This study aims to analyze the trends in the percentage of female surgical trainees at HMC from 2013 to 2024. The research seeks to identify patterns of change in female participation and explore the factors that may have contributed to increasing representation during this period.

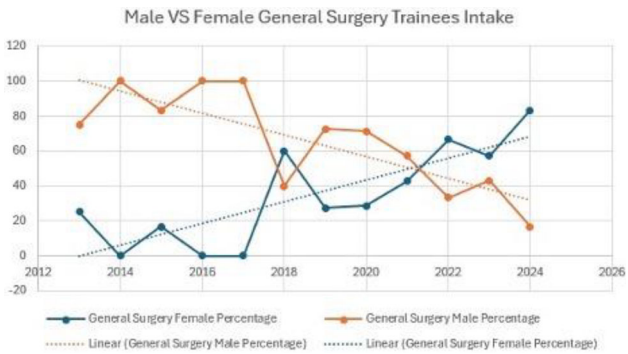
Methods & Procedures: A retrospective review of demographic records was conducted to analyze the intake of female trainees in surgical specialties from 2013 to 2024. The researchers used linear regression to identify any trends in the increase in the percentage of female trainees selected each year. Additionally, the study examined the intake trend in different surgical specialties and the overall percentage of female trainees.

Results: In 2013, female trainees made up 14.7% (5 out of 34) of the total intake. This percentage varied over the years, reaching a peak of 52.17% (12 out of 23) in 2022 and then stabilizing at 25.92% (7 out of 27) in 2024. When we performed a linear regression analysis on the data, plotting the percentage of female trainees against the year of intake, we found a slope (B) of 2.863 with a significance value (p) of 0.01 and a t-value of 3.172. These statistical results confirm a significant and consistent increase in the number of female surgical trainees from 2013 to 2024, which provides a strong basis for our research.

Conclusion: The data shows a significant increase in the percentage of female surgical trainees at Hamad Medical Corporation from 2013 to 2024. The percentage rose from 14.7% to over 50%, with the most notable increase in General Surgery from 25% in 2013 to 83.33% in 2024. This trend indicates a shift towards gender diversity in Qatar's surgical field, reflecting efforts to promote inclusivity in a traditionally male-dominated profession. These findings demonstrate Qatar's progress in creating a more diverse and equitable surgical workforce, setting a positive example for the region.







P465

General Surgery (Among Other Specialties): An Unlikely Favorite for Medical School Reapplicants

Colleen E McDermott, MD, MPH; Laura Lambert, MD, FACS, FSSO; University of Utah

Introduction: Very little is known about medical school reapplicants; despite these students making up a significant portion of residency applicants, there has been no investigation into whether their specialty preferences differ from peers. We hypothesized that this cohort may prefer shorter residency training programs after delaying the start of medical school.

Methods and Procedures: A report from the Association of American Medical Colleges (AAMC) containing robust data for those who applied to medical school from 2015 to 2019 was obtained. Individuals who matriculated during their initial application year were categorized as "First Time Matriculants" (FTM), and those who were

initially unsuccessful, but matriculated in a subsequent year, were defined as "Reapplicant Matriculants" (RM). Graduate Medical Education (GME) data, including specialty matched, was included in this report. Data from the 2024 NRMP "Charting Outcomes in the Match" report was used to identify match rates of various specialties. The 2024 Doximity Physician Compensation Report was used to identify average annual income by specialty. An initial univariate analysis was conducted in STATA using an unpaired *T*-Test to assess differences in continuous variables, and Pearson's Chi2 to assess categorical variables.

Results: 81,141 FTM and 24,729 RM were identified. 71,798 FTM and 22,016 RM had entered a residency program. There was no significant difference in match rates into 4-year programs ($p = 0.13$); however, RM were less likely to match into a 3-year program and more likely to match into a > 5-year program ($p < 0.0001$ for both). There was no difference between groups in terms of specialty competitiveness. ($p = 0.35$). There was also no difference between groups in specialties in the highest tertile for physician compensation. ($p = 0.627$) General surgery was the second most heavily favored specialty by RM. ($p < 0.0001$). See Table 1 for more detail.

Conclusion(s): Although this initial analysis is limited in its univariate nature, these results suggest that our hypothesis that reapplicants may choose shorter programs is incorrect. Although many longer training programs offer higher compensation and may be more competitive, we did not see a difference between groups in these areas of speculation. Despite the lengthy training process, general surgery is among the three specialties most heavily favored by reapplicants, and additional study is needed to investigate this further.

Table 1: Matched Specialty by First-Time Matriculants vs Reapplicants to Medical School

Specialty	FTM (n)	%	RM (n)	%	P
Emergency Medicine	5,829	9.19%	2,216	11.42%	<0.0001
Surgery-General	**5,529**	**8.72%**	**1,936**	**9.98%**	**<0.0001**
Family Medicine	5,950	9.38%	2,058	10.60%	<0.0001
Anesthesiology	2,840	4.48%	922	4.75%	0.11
Neurological Surgery	716	1.13%	241	1.24%	0.197
Neurology	1,025	1.62%	315	1.62%	0.944
Orthopedic Surgery	2,884	4.55%	874	4.50%	0.801
Dermatology	734	1.16%	200	1.03%	0.144
Plastic Surgery-Integrated	611	0.96%	154	0.79%	0.031
Otolaryngology (ENT)	1,230	1.94%	328	1.69%	0.026
Psychiatry	4,416	6.96%	1,170	6.03%	<0.0001
Obstetrics and Gynecology	4,467	7.04%	1,147	5.91%	<0.0001
Internal Medicine	18,471	29.12%	5,411	27.88%	0.0009
Pediatrics	6,831	10.77%	1,722	8.87%	<0.0001
Specialties with < 80% Match Rate US Seniors*	4,945	7.80%	1,469	7.57%	0.302
> 5-year residency**	12,246	19.30%	4,006	20.64%	<0.0001
4-year residency**	19,938	31.43%	6,211	32.00%	0.133
3-year residency**	31,252	49.27%	9,191	47.36%	<0.0001
Specialties with Top Tertile Average Annual Income***	9.015	14.50%	2,719	14.36%	0.627

*Combined data for Dermatology, Integrated Plastic Surgery, Neurosurgery, Orthopaedic Surgery
**>5 years: Combined data for Neurosurgery, General Surgery, Integrated Plastics, ENT, Orthopaedic Surgery.
**4 years: Combined data for: OBGYN, Emergency Medicine, Anesthesiology, Dermatology, Psychiatry, Radiology-Diagnostic, Neurology
** 3 years: Combined data for Pediatrics, Internal Medicine, and Family Medicine
***Combined data for Neurosurgery, Orthopaedic Surgery, ENT, Integrated Plastics, Anesthesiology, Dermatology

P466

Laparoscopic Skill Acquisition and Learning curves: Insights from the GLAP Telesimulation Training Program

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Introduction: Currently, minimally invasive procedures are the gold standard for many surgical interventions, requiring surgeons to have early exposure to this surgical modality during their training. The development of basic laparoscopic skills on simulators/trainers is an indispensable tool for this purpose. The aim of this study is to evaluate the learning curve of basic laparoscopic skills according to the FLS tasks in residents of different academic levels, as well as its impact on performance during laparoscopic procedures on patients.

Methods: Between 2021 and 2023, the intervention was carried out in three different stages, including a total of 24 pediatric surgery residents across all four academic levels. Initially, the times it took them to complete the five FLS tasks were recorded. Then, a telesimulation intervention was conducted with local mentors and SAGES mentors from different countries, consisting of twelve sessions per group (both theoretical and practical). Afterward, the times it took them to perform the five tasks were measured again. Additionally, a survey was conducted with participants after completing the course and following their participation in various laparoscopic surgeries, during which they had the opportunity to serve as lead surgeons under the supervision of a senior surgeon.

Results: All participants in the study showed a significant reduction in the time taken to complete the tasks after the intervention (telesimulation) compared to the initial times. The quality standards for performing the tasks as dictated by the FLS were maintained. The average time reduction across the group for the five evaluated tasks were as follows: 43.4% for the first task, 54% for the second, and 49.2%, 55.2%, and 63.6% for the next three. Interestingly, there were no significant differences in the improvement between different academic levels, meaning the time improvements were similar across all four levels.

Conclusions: Practicing basic laparoscopic skills on simulators is an effective way to develop minimally invasive surgery skills for surgeons in training. Likewise, telesimulation is a useful tool for real-time mentoring, even from a distance. Developing these skills translates into greater proficiency and confidence in the operating room, a better learning curve, and increased safety for patients. This model is safe, reproducible, and yields good results, even for first-year residents.

P468

Multi-continent Validation Study of the Camera Navigation Simulation Task

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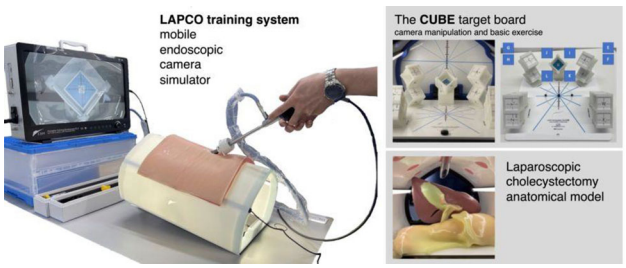
Background: Operating angled endoscopes to visualize target organs is challenging for inexperienced assistants, but it is essential in

endoscopic surgery. Due to the limited availability of simulations for acquiring basic operational skills, we developed a versatile simulation task, "the CUBE", designed to facilitate the mastery of fundamental camera navigation skills through precise adjustments in direction and distance relative to the target. These skills are not effectively taught or assessed using bench-top models. We also established metrics and gathered validity data for this endoscope navigation task, further evaluating its educational value.

Methods: Surgeons and trainees at various levels were recruited from Japan and Canada. Each participant received instruction on the endoscopy simulation system "LAPRO", performed a warm-up for up to 3 min to acquire the targets on the CUBE, and was then asked to complete the task twice. Time to completion and errors were used as performance metrics. Participants also completed a questionnaire regarding demographics and the task's educational value and net promoter score (NPS). A contemporary validity framework was employed to assess evidence supporting the task and metrics as measures of camera navigation skills. Inter-rater reliability was evaluated using intraclass correlation coefficients (ICCs). Inter-group score comparisons were conducted using the Wilcoxon rank-sum test. Task scores and self-reported experience were analyzed using Spearman's correlation. Participants were categorized as novice (PGY1-2) or experienced (PGY3 and above). Results were expressed as numbers (%), medians [interquartile range], and values with 95% confidence intervals for reliability measures.

Results: A total of 30 participants completed the study: PGY1-2, 10 (33.3%); PGY3-5, 8 (26.7%); fellows, 8 (26.7%); and attending surgeons, 4 (13.3%). Sixteen (53.3%) had more than 25 cases of experience with camera navigation annually. Test–retest reliability was 0.95 (95%CI, 0.84–0.98). Experienced surgeons scored significantly higher than novices (n = 30, 229 [212–244] vs. 133 [115–188], $p < 0.01$), with a positive correlation between training level and task performance (rs = 0.73, $p < 0.01$). In both the Japanese and Canadian cohorts, experienced surgeons consistently scored higher than novices, demonstrating similar performance trends. Among the 30 participants, the majority agreed or strongly agreed that the task was relevant to clinical practice (92.3%), helped to improve technical competence (78.6%), and adequately measured camera navigation skills (85.7%). NPS was 14.3 with 14.3% promoter.

Conclusion: This study provides substantial validity evidence for the camera navigation task. The task can help assess and improve camera navigation skill and better prepare assistants for practice.



P469

Costa Ricas' Experience with the Global Laparoscopic Advancement Program (Glap) to Improve Basic Laparoscopic Skills

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Introduction: Since its first implementation in Costa Rica (CR) in 2020, the Global Laparoscopic Advancement Program (GLAP), a simulation-based laparoscopic training program of SAGES, has helped enhance the laparoscopic skills of over 50 CR surgical attending and residents. The GLAP program has been locally reproduced and now incorporated into the residency curriculum. This study demonstrates the impact of CR GLAP program on participants' FLS skills.

Methods: A total of three GLAP workshops were conducted between October 2023 and June 2024, consisting of PGY-1&2 pediatric and general surgery residents (Group 1), urology attending (Group 2), and PGY-1 general surgery residents (Group 3). Each GLAP workshop included two virtual and three on-site sessions. [ZL1] Participants also completed online SAGES FLS modules and practiced manual skills (circle cut, PEG transfer, ligating loops, extracorporeal knot tying). Urologists also practiced simulated tumor excision and urethroplasty (Fig. 1).

Time to completion of circle cut and faculty evaluation of participants' skills (depth perception, bimanual dexterity, efficiency, and tissue handling, on scale of 1–5) [ZL2] was conducted pre-GLAP and post-GLAP. Comparative analysis was performed.

Results: A total of 18 participants completed the 3 GLAP workshops (Group 1: 6, Group 2: 7, Group 3: 5). Time to complete circle cut improved in Group 1 (average 194 vs 152 s, minus 42 s) and Group 3 (average 371.8 vs 230 s, minus 141 s), but increased in Group 2 (average 267.4 vs 289.6 s, plus 22 s).[ZL3] (Fig. 2).

There was an increase in faculty evaluation of participants' depth of perception (average score 3.4 vs 4.2), bimanual dexterity (average score 3.6 vs 4.0), efficiency (average score 3.3 vs 4.2), and tissue handling (average score 3.6 vs 4.5) in all 3 groups. [ZL4] After their GLAP training and with mentorship from SAGES GLAP faculty, 2 urologists from Group 2 successfully performed their first laparoscopic nephrectomy.

Conclusion: Simulation-based education, particularly programs such as GLAP, can be incorporated into training curriculum in CR, improving the laparoscopic basic skills of residents and attendings of general surgery, pediatric surgery, and urology.

Fig. 1 Completion of simulated laparoscopic tasks

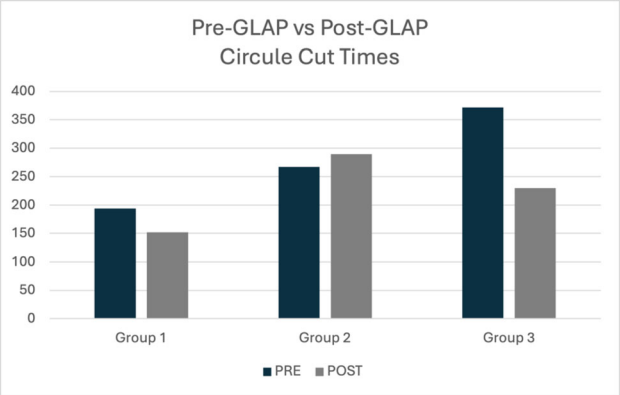

Fig. 2 Pre vs post-GLAP circle cut times

predictor of performance between the novice and expert groups. Since the participants in our study, previously performed on our validated VCOST straight coloanal anastomosis simulator, the learning effect may have had a positive effect on the performance on the anastomosis part of the IPAA simulator.

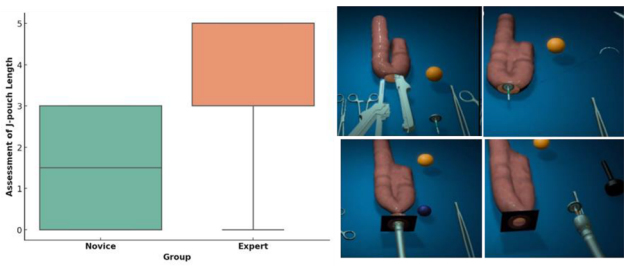

Fig. 1 Left: Performance between groups on the assessment of the length of the J-pouch. Right: VCoST-IPAA simulator

P470

J-Pouch Length is a Significant Predictor of Performance on the Virtual Colorectal Surgical Trainer (VCoST) Ileal Pouch Anal Anastomosis Simulator

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Introduction: The ileal pouch-anal anastomosis (IPAA) is an important surgical skill to master in colorectal surgery and is part of the Colorectal Objective Structured Assessment of Technical Skill (COSATS) tasks of the American Board of Colon and Rectal Surgery (ABCRS). The Virtual Colorectal Surgical Trainer (VCoST-IPAA) was designed as an innovative VR platform to offer a method for training and assessing performance in the IPAA procedure. The aim of this study is to establish the discriminant validity by demonstrating its ability to distinguish between levels of surgical expertise.

Methods: In this IRB approved study, surgery residents and expert colorectal surgeons from our institution were recruited to perform the IPAA procedure on the VCoST-IPAA simulator. Completion time and 18 task-specific metrics previously created using expert consensus were automatically recorded by the simulator. Participants were divided into Novice (PGY 1–2) and Experts (PGY 3–5 and Faculty) groups. The Mann–Whitney U test was used to assess the discriminant validity.

Results: A total of ($n = 20$) equally distributed between the two groups participated in the study. Only data from 9 subjects from the Expert group were included in the analysis due to data corruption. The Mann–Whitney U Test showed no differences in completion time in minutes between the two groups (771.5 vs 649, $W = 24$, $p = 0.09$) nor the total score computed using the 18 metrics (73 vs 76, $W = 65$, $p = 0.1$). Significant differences in performance were found between the two groups on the assessment of the length of the J-pouch (1.5 vs 5, $W = 72.5$, $p = 0.01$). Figure 1.

Conclusion: Assessment of performance on our VCOST-IPAA simulator showed that the J-pouch length assessment was an important

P471

Teaching Landscape of Robotic Anatomic Lung Resection: An Analysis of Dual Console Use in the US

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Purpose: The dual console (DC) allows for active participation of a surgical trainee, but it is unknown how frequently this setup is utilized for teaching robotic lung surgery. We sought to characterize the current utilization of the DC teaching setup on a national level in the US.

Methods: Intuitive da Vinci robotic system data for 38,552 lobectomy and 4955 segmentectomy procedures performed by 868 individual surgeons between 2021 and 2022 was reviewed. Surgeons preforming less than 10 cases per year were excluded. DC utilization was categorized as never, low, medium or high for surgeons performing 0, $< 50\%$, $50 < 90\%$ or $> 90\%$ of resections with DC activation, respectively. Surgeons and procedure factors associated with DC use was analyzed using binary logistic regression.

Results: A total of 555 surgeons (63.9%) performed anatomic lung resections using the DC, whereas 313 (36.1%) never used the DC. Amongst DC users, 176 (31.7%) classified as low, 216 (38.9%) as medium and 163 (29.3%) as high utilizers (Figure A). The vast majority (74.8%) of surgeons who never use the DC performed < 50 anatomic lung resections during the study period, while a larger subset DC users performed > 50 cases (low 45.5% vs. medium 44.4% vs. high 38.7%, $p < 0.001$). DC use varied significantly between surgeons based on experience ($p = 0.018$). The greatest proportion of high utilizers were surgeons with < 5 years of experience using the robot (Figure B). Overall, the DC was used for 42.9% of anatomic lung resection. DC use was higher for segmentectomy than for lobectomy procedures (54.9% vs. 41.4%; $p < 0.001$) and for Xi-system cases (43% vs. non-X, 26.1%; $p < 0.001$). The median console time was 18 min longer with the DC setup (123.9 vs. 105.1 min, $p < 0.001$). Other factors associated with DC use were hospital type (academic 76.0% vs. VA/DOD 87.3% vs. community 24.6%; $p < 0.001$) and region (Northeast 58.1%% vs. rest 37.8%). On multivariable analysis, stapler use and Academic or VA/DOD hospital setting were associated with the highest DC activation.

Conclusion: The dual console teaching setup is being used by almost two thirds of thoracic surgeons in the US but there is significant variation across procedures and practice settings. Dual console cases took longer, and surgeons with less operative volume leveraged the dual console less frequently. Further research is needed on robotic trainee involvement and pathways to autonomy for the next generation of thoracic surgeons.

P472

Initial Experience and Feasibility of Telementoring in Dry Lab Robotic System Training Using a Telementoring Device

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Objective: To evaluate the feasibility of telementoring in dry lab robotic system training using a telementoring device, with the Senhance® Connect (Asensus Surgical, NC, USA) platform as an example.

Methods and Procedures: A non-medical university student underwent robot-assisted dry lab training under remote guidance using a telementoring device with two-way live audio and video communication. The telementor had access to a three-camera view: top, front, and endoscopic, overlaid with the robotic system interface (RHMI). Before the telementoring session, the trainee prepared by reading textual instructions and watching video tutorials. Two different training methods were compared: real-time feedback from the telementor and self-review using video playback. During the telementoring sessions, the telementor provided verbal and visual guidance via an embedded laptop webcam, utilizing telestration (real-time drawing annotations) and two-way audio over a 7000 km distance via a public DSL connection (Max download: 100,000 Kbit/s, Max upload: 40,000 Kbit/s). During the video playback sessions, the trainee reviews the training video after each repeat. The training task was repeated six times, and all sessions were screen-recorded. Post-exercise evaluations included task completion time, skill assessment, and ergonomic analysis. The mentoring interface was rated using a multifactorial Likert-based survey.

Results: The trainee successfully completed the task without any observable latency in video or audio communication. Skills assessment showed no significant difference between telementor and self-review session. Task completion time decreased significantly in self-review session. The compact telementoring cart allowed flexible positioning near the surgical field for optimal viewing, while live annotations significantly improved communication. Robotic skill assessments showed no significant improvement across training sessions. However, ergonomic evaluation suggested low risk but highlighted areas for further investigation and potential adjustments.

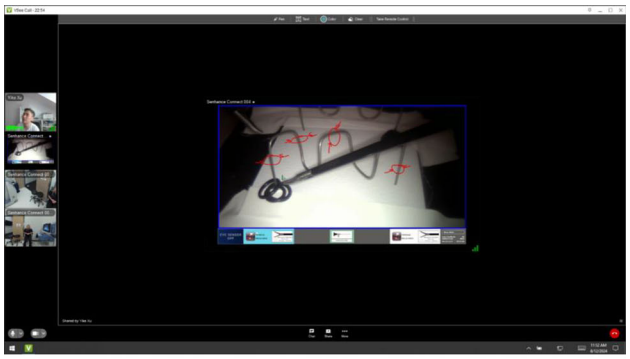
Conclusion: This study demonstrates the feasibility of using telementoring and telestration for robotic dry lab training over the internet. The small, mobile telementoring platform- Senhance® Connect, enables effective remote training and communication. This platform could also potentially be beneficial for live surgery transmission. Future studies with larger sample sizes and clinical validation will be necessary to confirm these findings.

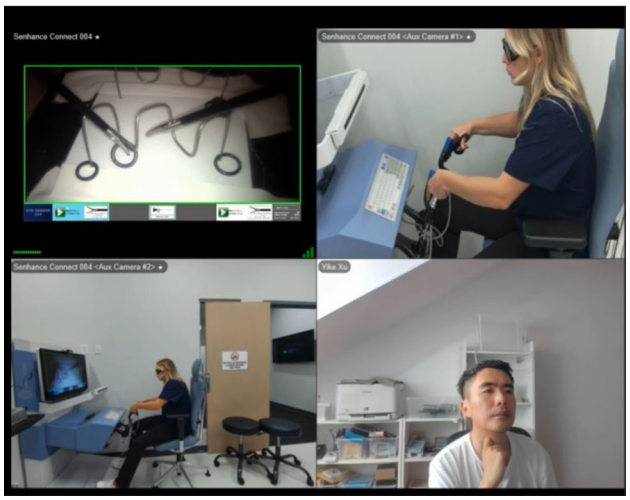
Fig. 1: Small footprint Senhance® Connect cart, A. Pan Tilt Zoom camera, B. Touch-screen computer installed VSeeTM Software, C. Camera for Senhance® console view, D. Speaker & Microphone, E. Standalone mobile cart

Fig. 2: Trainee's interface view with telestration during training

Fig. 3: Telementor's interface view during training

Fig. 4: Senhance® Connect was used in live surgery transmission during congress of the German society of surgery





P473

A Comparison of Proficiency Scores and Work Load of Advanced Training in Laparoscopic Suturing (ATLAS) Training Curriculum to Robotic-ATLAS (R-ATLAS) Training Curriculum

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Introduction: In an effort to standardize skill acquisition between laparoscopic and robotic surgery, we modified the Advanced Training in Laparoscopic Suturing (ATLAS) curriculum for the robotic platform. The purpose of this study was to compare proficiency scores from ATLAS to newly defined proficiency scores for the Robotic-ATLAS (R-ATLAS) curriculum.

Methods and Procedures: The proficiency levels for R-ATLAS were determined using the same methodology as the previously published laparoscopic cohort. Four experts in robotic surgery performed each of the six tasks five times. The NASA Task Load Index (NASA-TLX) assessment tool was used to measure work load. The results were compared using linear mixed effects models with random intercepts accounting for within-surgeon correlation fitted to log-transformed time and score to evaluate the relative (%) difference between approaches (R-ATLAS vs. ATLAS).

Results: The robotic surgeons had less years in practice than laparoscopic surgeons. Robotic surgeons performed better on Task 3. All other tasks were not significantly different. NASA-TLX scores were lower for Tasks 1, 4, 5 and 6.

Conclusion: This study found that expert robotic and laparoscopic surgeons can perform advanced suturing skills on the ATLAS curriculum similarly. However, robotic suturing appears to be less mentally demanding, suggesting it might have an easier learning curve. The robotic platform provides an opportunity for less experienced surgeons to perform advanced suturing tasks. Future study should include larger sample size to examine the validity of this study. ATLAS provides a reproducible and reliable model to assess expert laparoscopic suturing across different platforms.

Table 1. Summary of score by task and approach

	ATLAS		R-ATLAS		p-value
	Mean	SD	Mean	SD	
Task 1	217.85	24.12	212.6	49.62	0.72
Task 2	479.95	20.82	510.75	32.81	0.07
Task 3	474.8	30.69	519.85	17.86	0.02
Task 4	474.75	55.19	501.15	48.69	0.34
Task 5	185.9	18.77	201.4	20.83	0.29
Task 6	642.6	68.56	699.85	21.64	0.15

Task1: Needle handling, Task 2: Off-set camera forehand suturing, Task 3: Off-set camera backhand suturing, Task 4: Confined space suturing, Task 5: Suturing under tension, Task 6: Continuous suturing

Table 2. Summary of NASA-TLX total scores by task

	ATLAS		R-ATLAS		p-value
	Mean	SD	Mean	SD	
Task 1	66.25	12.58	26.75	10.63	0.004
Task 2	69.5	3.79	30.5	28.52	0.052
Task 3	76.25	11.24	34.75	38.52	0.052
Task 4	73	6.78	22.75	20.76	0.015
Task 5	46.75	20.93	19.5	6.24	0.016
Task 6	66.75	22.5	23.5	12.4	0.008

P474

Enhancing Surgical Robotic Skills Through Performance-Guided Training: A Swimmer's Approach for Defining Key Metrics

Jeanne Dahmen, BS[1]; Yike Xu[2]; Jeffrey P Spalazzi, PhD[2]; Sara S Lazzaretti, PhD[2]; Janette Gil, MSN, RN[2]; Edward Chekan, MD, FACS[2]; [1]Texas Christian University; [2]Asensus Surgical Inc.

Introduction: The study explores the application of performance-guided training methods from elite swimming to enhance surgical skill acquisition, particularly in robotic surgery. It aims to identify parallels in training techniques and assess the potential for integrating athletic training principles into surgical education.

Methods and Procedures: The study involved a comprehensive literature review, analyzing methodologies in elite swimming and surgical training. Techniques like video analysis, periodization, and simulation-based training were examined for their potential to enhance precision, efficiency, and cognitive skills in surgeons. The study followed the PRISMA methodology to ensure rigorous analysis and synthesis of data from various sources.

Results: The findings demonstrate that principles such as deliberate practice, feedback loops, and progressive skill development from swimming are highly applicable to surgical training. Techniques like video feedback, cognitive exercises, and periodized training schedules improved skill acquisition and retention in both fields. Simulation-based training, when combined with structured feedback, enhanced precision and reduced error rates in robotic surgery. Cognitive training exercises showed improvements in decision-making and problem-solving among surgeons, akin to strategic planning in swimming.

Conclusion: Integrating performance-guided training methods from elite swimming into surgical education may significantly enhance skill acquisition, precision, and decision-making in surgeons. This interdisciplinary approach offers a novel framework for optimizing surgical training programs, with the potential for improved patient outcomes and the development of more resilient, adaptable surgeons. Further research is needed to validate these findings in real-world surgical settings.

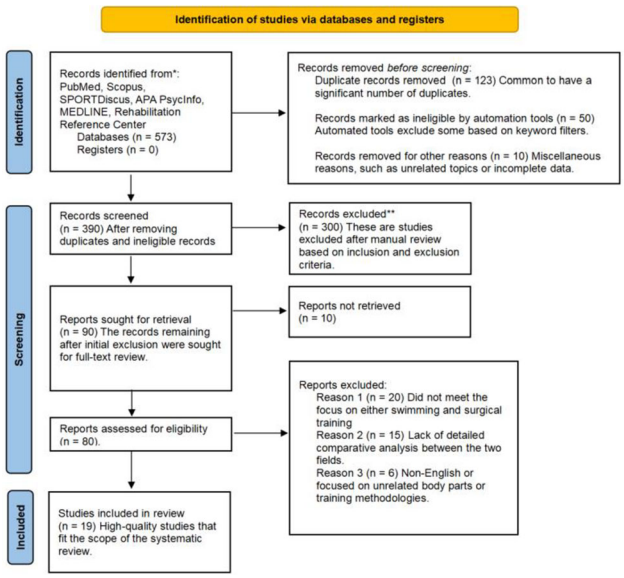

Table 1 Comparison of swimming and surgical metrics

Metric Category	Surgical Metrics[1,2]	Swimming Metrics[3-5]	New Robotic Surgical Metrics
Coordination and Synchronization	Score frequency of instrument conflicts	Synchronize arm and leg movements	Instrument coordination
Grasping and Catching Efficiency	Tally instances of failed grasps	Hand entry and initial pull	Surgical grasping errors
Instrument/Body Part Engagement	Note idle instrument time	Use of core muscles	Compare to underutilized body parts
Tissue Handling and Joint/Muscle Strain	Record tissue damage or strain	Look for overextension	Injury risks
Instrument/Hand Positioning	Assess needle holding technique	Hand shape and angle	Incorrect hand positioning
Movement Efficiency	Measure unnecessary movements	Identify overreaching	Wasted energy
Precision of Instrument/Finger Use	Evaluate precision of tip usage	Finger placement and shape	Tactile Feedback and Precision Control
Angle of Approach	Assess tissue engagement angle	Hand/arm entry angle	Entry Angles
Action Completion	Note multiple attempts	Full pull-through	Achieving movement consistency and completion

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P475

Assessing the Effectiveness of Video-Based Coaching as a Component of Simulation Flexible Endoscopic Training Amongst First Year Surgical Residents - A Pilot Study

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Introduction: There is significant variability in endoscopic training and assessment methods for trainees, despite the recent introduction of competency-based training and transition towards more objective evaluations. Video-based coaching (VBC) is an emerging educational modality with two surgery-focused meta-analyses showing promising trainee performance outcomes on objective scales. The objective of this pilot study is to use a randomized controlled design to evaluate the impact of VBC on endoscopic skill acquisition. We used a validated objective scoring scale in a simulation setting amongst first year surgical residents.

Methods: This pilot study was designed as a single-center, randomized trial which included first-year surgical residents at a tertiary Canadian academic hospital in the 2023 to 2024 academic year. All first-year residents were block randomized into coaching (n = 16) and control (n = 16) arms. All participants conducted a five-minute video recorded peg transfer task on a tabletop endoscopic simulator with a validated scoring system. The coaching arm underwent a fifteen-minute standardized coaching session with a fellow or staff physician to get feedback on endoscopic technique, including going over weaknesses, strengths, and actionable steps to improve performance. All participants then repeated a second round of the peg transfer task. Participants in the coaching trial also completed a questionnaire describing their experience with VBC. Descriptive and non-parametric statistical analyses were used including Wilcoxon signed-rank for within arms, and Wilcoxon rank-sum for between arms.

Results: A total of five participants completed the coaching trial and eight participants completed the control trial. After two rounds, the mean score in the coaching arm was 62.26 compared to 62.28 in the control arm. No significant difference was found between coaching and control arms in the scores for the endoscopic task (W = 13, p = 0.34). No significant difference was found within the coaching (V = 1, p = 0.20) and control (V = 1, p = 0.06) arms between the two rounds of tasks.

Conclusions: In this pilot study, one-on-one VBC did not improve participant objective performance on an endoscopic peg-transfer task.

While there is existing evidence on effectiveness of VBC for surgical skills like laparoscopy, there are challenges with respect to VBC unique to endoscopy which might have contributed to these findings. These include requiring two video feeds (of the endoscopist and the endoscope view), fewer visual cues, and higher reliance on manual feel.

P476

An Inanimate Colonoscopic Model to Teach Scope Torquing Skills: A Preliminary Report

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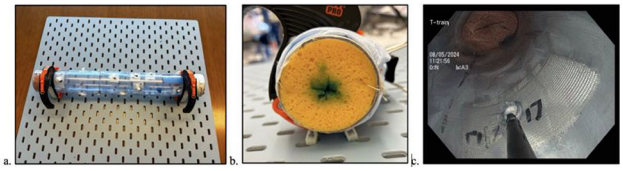
Introduction: To endoscopically biopsy, snare, inject, or otherwise intervene, instruments are passed through a channel and out the scope's tip. Because of uniform colonoscope design (camera and instrument port positioning on scope tip), instruments exit the scope at the bottom of the monitor image (5–6 PM). To see both the target and instrument, the pathology is best positioned at the bottom of the image. For scope insertion and to best align target and instrument, the scope shaft needs to be precisely torqued with the right hand. Learning this skill in the clinical setting is time consuming; what follows is an inanimate model designed to teach torque skills. The model and preliminary results are presented.
Methods: A hollow plastic tube, 37 cm long with a 3.5 cm inner diameter, serves as the "colon"; the tube has 20 numbered 2 mm holes containing cotton that are dispersed along its length/circumference. A round sponge with a central slit is inserted in one end and serves as the anus. A colonoscope and sclerotherapy catheter (with felt marker tip in its end as the pen) are used. Trainees insert the scope and pass the sclerotherapy catheter "pen" through the instrument channel and out the scope's tip. The trainee touches the targets, in order, with the pen (pen left in extended position between targets). The scope must be repeatedly torqued to accomplish this goal. The time to mark all targets is tracked (single session). Trainees completed between 7 and 11 sessions.
Results: A total of 14 residents did an average of 9.21 sessions (range, 7 to 11). The breakdown of the training group was: PGY-1, 1 (7.1%); PGY-2, 4 (28.6%); PGY-3, 2 (14.3%); PGY-4, 2 (14.3%); PGY-6, 2 (14.3%); research MDs, 3 (21.4%). The mean completion time for the first run was 460 s (range, 152–909 s). With practice, times decreased and reached a steady baseline (mean of 259 s) after an average of 6.6 training sessions and did not vary significantly with PGY level.
Conclusions: This training approach's hypothesis is that focus on a single skill if combined with many repetitions in the non-clinical setting notably increases skill levels and shortens training. These preliminary results suggest the skill of scope torque, defined as attaining a steady completion time, is obtained after 6.6 sessions. Other focused modules for different skills follow. The clinical ramifications of this training are unclear and need to be determined.



P477

Postgraduate Training Year Predicts Operative Time and Outpatient Surgical Care Readmission?

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Introduction: Postgraduate training year (PGY) is commonly used to guide intraoperative teaching but seldom considered in planning operative time and postoperative care. We hypothesize that PGY strongly predicts operative time (OT) and 30-day readmission (30R) when interacting with preoperative variables of procedure type (PT), case type (CT), robotic-or-not (RON), diagnosis-related groups (DRG), and patient socioeconomic status (SES) assessed by zip code.
Methods: We extracted PGY, OT, 30R, RON, DRG, SES, PT, and CT from six open/laparoscopic/robotic procedures: Cholecystectomy (CH), Colectomy (CO), Inguinal Hernia (IH), Hysterectomy (HY), Nephrectomy (NE), and Prostatectomy (PR). Only 07/2016–06/2020 cases were included to avoid COVID-related confounders. Descriptive statistics and boosted tree predictive model with independent resampling were applied to examine the predictor total effect (TE).
Results: We included 13,570 cases involving a resident/fellow (Fig. 1). The median OT was 129 (IQR 87, 191) minutes. Overall, PGY had minimal correlation with OT (r = 0.026, p = 0.003) and did not affect 30R ([OR] 0.99, 95%CI 0.94–1.04) in outpatient cases. However, when taken into consideration with other variables, PGY had the strongest predictor TE for OT in all procedures (CO 0.92, NE 0.86, IH 0.83, HY 0.80, CH 0.74, PR 0.70). PGY was also the strongest predictor (0.71) for 30R in outpatient cases, followed by PT (0.68), RON (0.57), DRG (0.48) and SES (0.12), though SES affected overall readmission ([OR]1.72, 95%CI 1.28–2.30).
Conclusions: Our findings suggest PGY may demonstrate predictive value for operative time and patient outcome of cases with resident involvement. Surgeons may safely integrate teaching junior into outpatient care planning without exacerbating readmission. Future algorithms are needed to optimize the planning of teaching and surgical care.

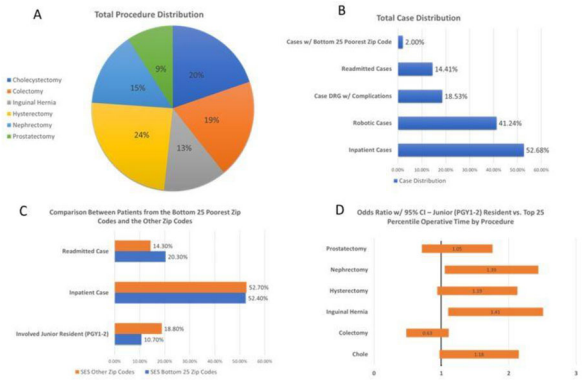

Fig. 1 A) Procedure Distribution, B) Case Distribution, C) Comparison upon SES, 4) Odds Ratio – Junior vs Top 25% OT

P479

Robotic Training in Transplant Surgery Fellowship: Fellow Perception and Trends over Last 7-Years

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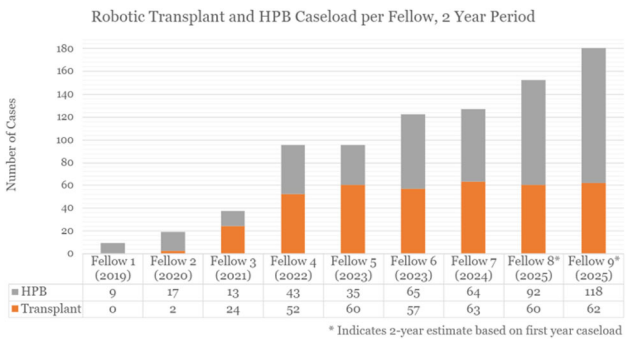
Introduction: The indications for robotic surgery in transplant and HPB procedures are rapidly expanding. However, there is growing concern about the adequacy of robotic training during transplant fellowships in preparing trainees for the evolving demands of modern transplant surgery. This study describes fellows' perception of robotic training at our institution and highlights trends in fellow participation in robotic surgery since initiation of a robotic transplant program in 2017.
Methods: Retrospective review of robotic cases performed by the 9 most recent transplant surgery fellows (2017–2024) during their 2-year fellowship. Details of robotic experience (case numbers, type, complexity, role of participating fellow) were collected, and a 10-question survey regarding views on robotic experience during training was administered. Fellow experience was compared between early (first 4 fellows) and late groups (last 5 fellows).
Results: All fellowship graduates are currently performing robotic surgery in their practice. 90% of the fellows expressed satisfaction with their robotic fellowship training, and all agreed that robotic training was very important to their careers in transplant surgery. All 9 fellows believed that robotic fellowship training improved a fellow's prospects of finding a job, and 87% felt that indications for robotic approaches in transplant surgery will broaden significantly in the near future. Fellows reported confidence in performing the following robotic procedures at end of fellowship: living donor nephrectomy (89%), kidney transplant (44%), minor hepatectomy (89%), major hepatectomy (44%), distal pancreatectomy/splenectomy (78%), Whipple (22%), biliary reconstruction (56%). The fellow cohort completed 675 robotic cases between 2017 and 2024. The average fellow robotic case volume during fellowship was 93 cases (45% transplant, 55% HPB). Comparison of early and late groups demonstrated a significantly higher number of total cases per fellow (40 vs. 135; $p = 0.008$) and greater participation as console surgeon (64% vs 95%) in the later group.
Conclusions: The current generation of transplant fellows expect and desire robotic experience during fellowship, and this must be considered when designing fellowship training frameworks. Incorporating robotic training in the fellowship may help to improve fellow job prospects and prepare fellows for the challenges of modern transplant surgery.



P480

Initial Validation of a Low Cost Model for Training Retrocecal MIS Appendectomy

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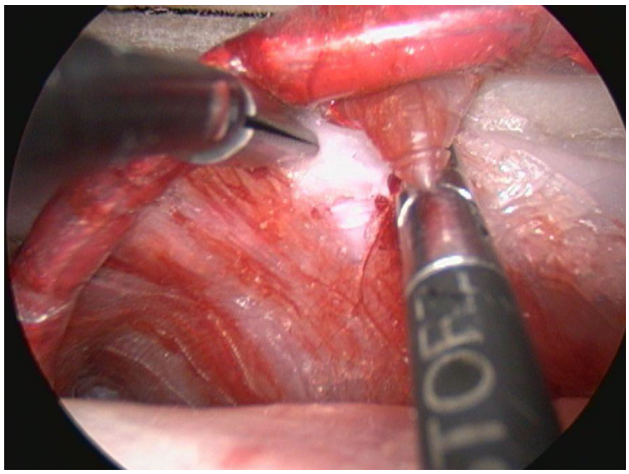

Laparoscopic appendectomy is one of the most common general surgical operation frequently performed by junior residents Training programs using inanimate bench models have been proven to contribute to the acquisition of skills to perform laparoscopic procedures however, validation must be obtained to determine their reliability.
Aim: Show the initial results of a validation of a low cost model to train retrocecal MIS appendectomy.
Materials and Methods: A low-cost model was developed.The students used a Likert-type scale to evaluate: their previous experience, external appearance and dimensions, instrument position, internal dimension and working area, appearance of the endoscopic view, surgical anatomy trocar placement, use of the camera and instruments, dissection and ligation of the structure, bagging and exteriorization of the piece. Statistical analysis was performed with R-Studio®.
Results: 50 participants with different levels of experience evaluated the model: 22 with a novice or intermediate level with less than 20 previous procedures and 28 with an advanced level with more than 20. 76% considered the model to be good or of high degree of similarity in relation to the external appearance and dimensions. More than 80% evaluated with a high and very high degree of similarity with respect to the position of the instruments (84%), the internal dimension and the working area (86%) and the appearance of the endoscopic view (88%). 90% determined that the surgical anatomy compared with the real surgery had a high and very high degree of similarity. Of these 45 participants 24 (53%) were in the advanced level group.
When each participant considered whether the model improved their skills, more than 80% reported good or very good improvement in trocar placement and dissection and 92% said that in the use of the camera (94%), in the use of 5 mm instruments (92%), in the ligation of the structure (92%), in bagging (96%) and in the exteriorization of the piece (94%), the model largely contributed in improvement in the acquisition of skills. The distribution of the level of experience in these groups that improved their skills is symmetrical.
Conclusions: Initial evaluation of this model suggests that it is a useful tool for training essential and advanced skills valued by

participants with different levels of experience. The introduction of the model in the simulation-based surgical education curriculum for pediatric surgeons would improve the learning curve, reduce complications of the surgical technique and surgical times, which should be demonstrated in future studies.

P481

Conquering the Cholecystectomy: Evolution of Resident Robotic Console Participation/Autonomy

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Introduction: While robotic surgery has become foundational in current surgical training and curricula, limited data exists on resident participation in core general surgery procedures completed robotically. The objective of our study was to assess involvement of general surgery residents in robotic cholecystectomies at various time points throughout the case to delineate progression of case involvement throughout training.

Methods and Procedures: A retrospective review of robotic cholecystectomies since the beginning of the 2023–2024 academic year was performed utilizing My Intuitive App case logs. Metrics included operative diagnosis, total console time, and time spent in each of three phases (dissection, clipping, removal). Attending and resident participation were measured for the total case and for each phase of the operation. Analysis by postgraduate year was performed using a one-way ANOVA and by resident seniority (junior (PGY2/3) vs. senior (PGY4/5)) and pre-operative diagnosis (cholecystitis vs. non-cholecystitis) using two-sample *t*-tests. Comparisons of individual resident performance between the three phases were performed with a repeated measures ANOVA.

Results: 151 robotic cholecystectomies performed by five surgeons met criteria for inclusion (217 total). Total console time averaged 30 min with dissection, clipping, and removal phases averaging 14, 5, and 11 min, respectively. Resident involvement measured 50.7% (SD 33.5%) (dissection), 90.5% (SD 24.9%) (clipping), 89.4% (SD 16.5%) (removal), and 72.1% (SD 20.7%) (total case). Across postgraduate years, there was a significant difference in resident involvement in the dissection ($F(3,146) = 26.948$, $p < 0.001$), clipping ($F(3,146) = 5.963$, $p = 0.001$), and total case ($F(3,146) = 24.652$, $p < 0.001$) but not for removal ($F(3,146) = 2.332$, $p = 0.077$) (Fig. 1). Senior residents were more involved in all portions when compared to junior residents. When comparing participation in each phase, residents performed less of the dissection compared to both clipping (50.7% vs. 90.5%; $p < 0.001$) and removal (50.7% vs. 89.4%; $p < 0.001$) with no difference in participation between clipping and removal. Preoperative diagnosis did not impact resident involvement in dissection, clipping, or the totality of the case, but residents were less involved with removal when the diagnosis was acute cholecystitis (83.6% vs. 90.6%; $p = 0.049$).

Conclusion(s): This study demonstrates that significant variations exist in resident involvement in robotic cholecystectomies. There is a greater percentage of resident console time usage with increasing postgraduate year. Residents participate more in the clipping and removal phases while more senior residents are granted more progressive autonomy in the dissection phase. A detailed understanding of resident involvement in robotic cases is crucial as programs develop robotic training curricula and allow graduated operative involvement.

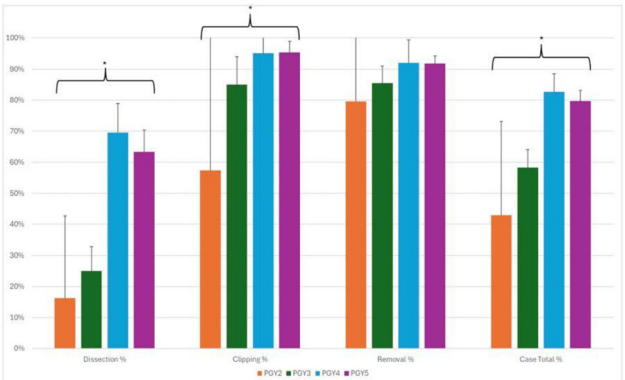

Figure 1: Resident case participation across all phases (dissection, clipping, removal) and for the total case by postgraduate year; * = p < 0.05

P482

Application of an Objective Structured Clinical Examination (OSCE) Based on Endoscopic Simulation for Gastroenterology Certification in Chile

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Introduction: Chile has become an attractive country for the migration of Latin American healthcare professionals, generating a growing demand for medical specialty certification.

Currently, gastroenterology certification in Chile is achieved through passing a theoretical and oral exam, with long waiting lists. This exam does not assess technical skills, such as digestive endoscopy, nor does it represent an objective evaluation process.

Therefore, we set out to design an Objective Structured Clinical Examination (OSCE) based on endoscopic simulation to establish a more efficient and standardized evaluation method.

The present study aims to evaluate the results of the implementation of an endoscopic simulation-based OSCE for Gastroenterology validation applicants in Chile.

Methodology:

A panel of experts developed a OSCE to complete the gastroenterology certification process in Chile. The exam was systematically evaluated by residents and experts from various hospitals.

Candidates underwent five stations with simulated patients and three stations with endoscopic simulators. Passing scores were determined by a panel of experts.

Descriptive statistics were used for result analysis.

Results: Thirteen candidates were evaluated in two groups across eight stations. The time taken for the test was 170 min. The pass rate was 53.8%.

At the actor stations, scores ranged from 40 to 92, with a mean between 56.15 and 85.23, and a standard deviation of 7.53 to 11.40.

In the simulation stations, scores ranged from 28 to 100, with means between 67.77 and 91.00, and higher standard deviations (7.28 to 19.61).

Conclusions: This study shows the first experience applying an endoscopic simulation-based OSCE for Gastroenterology certification in Chile. This exam modality provides a more comprehensive and standardized approach compared to the traditional theoretical-oral model.

The higher standard deviation observed in the simulated stations reflects greater variability in the development of endoscopic skills. Thus, the use of endoscopic simulators allows assessment of the acquisition of endoscopic skills required for safe clinical practice.

We hope to continue applying this new exam modality to future candidates, to further its refinement, along with the incorporation of new evidence-based practices and technological advancements in endoscopic training.

P484

Development of a Laparoscopic Skills Curriculum Based on a Needs Assessment Among Trainees and Faculty at a Canadian Academic Institution

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Introduction: Simulation is an essential part of surgical training and is especially important for advanced laparoscopic skills in order to maximize efficiency of teaching in the operating room. This is a report of a needs assessment survey amongst trainees and faculty at a Canadian academic institution that prompted the development of a laparoscopic suturing curriculum.

Methods: A survey was distributed to all the General Surgery trainees (residents and fellows) and faculty within the Division of General Surgery at Western University in London, Ontario. Trainees and faculty were surveyed about their experience with laparoscopic surgery, advanced laparoscopic skills such as suturing, and how operative learning was allocated. A laparoscopic suturing curriculum was developed in response.

Results: A total of 23 trainees and 17 faculty completed the survey. Of the trainees surveyed, 16 of 23 (69.6%) reported being able to perform a laparoscopic simple interrupted suture while only 7 (30.4%) reported being able to perform a laparoscopic running suture. Five trainees (21.7%) reported being comfortable with laparoscopic suturing in the operating room, and these trainees were all at the PGY4 level or above. Almost all trainees (n = 22, 95.7%) agreed or strongly agreed that a formal laparoscopic curriculum would facilitate intraoperative learning. Faculty responses found that 10 faculty members (58.8%) use simple interrupted intracorporeal suturing routinely in their practice and 7 (41.2%) use laparoscopic running suturing. The most common factors faculty take into consideration when determining resident involvement in laparoscopic suturing are prior experience with the resident (n = 10, 58.8%) and degree of difficulty/progress of the procedure (n = 9, 52.9%). Majority of faculty (n = 14, 82.4%) agreed that they would feel more comfortable letting a trainee perform a given task based on knowing the level they have achieved in a formal laparoscopic curriculum.

Conclusion: We performed a needs assessment which showed that a large majority of both trainees and faculty agreed that a formal laparoscopic curriculum would be beneficial for trainee learning in the operating room. As a result of this survey, a structured laparoscopic curriculum (the Jedi Academy) was created. The program provides faculty with an objective measure of the laparoscopic skills of trainees. Trainees are only allowed to perform certain advanced laparoscopic skills intraoperative once they have completed them in the curriculum, maximizing teaching efficiency in the operating room. A follow up post-intervention survey is planned for participants to determine its effect on residents' performance in the operating room.

P485

Optical Neuroimaging Technique Can Detect Laparoscopic Surgical Skills Learning After Intensive Virutal Reality Training

Irene Suh, PhD[1]; Kelsey Tieken, MD, MHPTT[1]; Lina Adwer[1]; Jorge Zuniga, PhD[2]; Carl Nelson, PhD[3]; Ka-Chun Siu, PhD[1]; Dmitry Oleynikov, MD, FACS[4]; [1]University of Nebraska Medical Center; [2]University of Nebraska at Omaha; [3]University of Nebraska at Lincoln; [4]Rutgers Robert Wood Johnson Medical School

Introduction: This project examined the effect of virtual reality (VR) simulation training for surgeons, detected the surgeons' neural activations, and highlighted key brain areas required in surgical neuroergonomics to modulate learning and performance. Optical neuroimaging allows for a quantitative assessment of cognitive workload. Functional near-infrared spectroscopy (fNIRS) is a non-invasive optical neuroimaging technique for measuring brain activity. We examined the prefrontal cortex (PFC) engagement, primary motor cortex (PMC), and supplementary motor area (SMA) activity to explore the hemodynamic response function based on oxyhemoglobin changes to incorporate process-based measures that capture decision-making, technical execution, and adherence to best practices.

Methods: Two participants (one novice and one experienced surgeon) performed the intracorporeal knot on the Fundamentals of Laparoscopic Surgery (FLS) trainer box for the pre-and post-tests. During VR training, participants intensively practiced fundamental surgical tasks on the LapMentor (basic skills module, essential task module, basic & advanced suturing module) with five 1-h visits for two weeks. We used a 48-channel continuous measurement of the oxygenated blood level for pre-and post-tests. We investigated the hemodynamic responses over the PFC, primary motor cortex (PMC), and SMA during suturing. The hemodynamic responses of suturing and the 3-min rest period were recorded with the NIRSport2 system. Data were sampled at 10 Hz using 690 and 830 nm wavelengths. The cap held two sets of eight sources and eight detectors, separated by 3 cm and positioned on the head following the 10–20 international system. The spatial distribution of hemodynamic responses over the PFC, PMC, and SMA cortical regions during standardized intracorporeal knot tying is shown in Fig. 1, as shown by the change of oxyhemoglobin.

Results: Unlike the experienced surgeon, the novice showed higher brain activity in the PFC during suturing before the intensive training (Fig. 1A). The experienced surgeon showed decreased PFC activation and increased activity in other brain regions, such as the SMA (Fig. 1C). After training, the brain activities in both PFC and PMC

were reduced in the trained novice (Fig. 1B), like those of the experienced surgeon.

Conclusions: In this ongoing pilot study, fNIRS shows potential as a valuable tool for detecting changes in surgical skill acquisition following intensive VR training. This optical neuroimaging technique offers useful insights for developing future surgical training programs. Moreover, enhanced fNIRS data processing through artificial intelligence allows real-time monitoring of surgeons' cognitive states during training, which could further improve training outcomes.

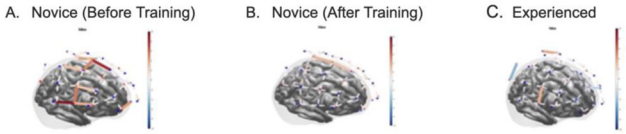

Figure 1: Changes in Oxy hemoglobin in the cortex

P487

A Novel Resident Colonoscopic Training Approach that Utilizes Inanimate, Ex Vivo Animal Tissue, and Computer Simulators

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Introduction: Endoscopic proficiency is mandated by the General Surgery (GS) and GI certifying boards. Some training programs rely solely on clinical cases which is inefficient due to varying case volume and limited independent cases. Computer based simulation (CS) is being used more often but is unrealistic in regards to biopsy and snaring simulation and the role of torque during insertion/loop reduction. Also, often, training starts at the PGY 3 level. Additional training models are needed. Here we present an approach that includes inanimate (IN) and ex vivo animal tissue large bowel (EVLB) models and includes PGY 1 trainees.

Methods: The program consists of 9 modules; 5 are appropriate for GS residents while 4 are for GI and Colorectal fellows. The modules are: (1) computer simulator (for insertion skills), (2) torque training (IN), (3) biopsy and snare polypectomy (EVLB), (4) bowel wall injection (EVLB), (5) scope tip control figure tracing (IN), (6) inanimate ESD, (7) hybrid EMR/ESD (EVLB), (8) ex vivo large bowel ESD, and (9) mucosal wound closure (EVLB). Videos and scores are recorded and generated for each training session. Clinical scopes can be used for IN Modules 2 and 5 whereas a dedicated teaching scope/tower are needed for Modules 3, 4 and 6–9 that involve animal tissue. A dedicated instructor(s) is present for training sessions (except for CS). Five modules focus on a single skill (2–5, 9) and for all modules multiple repetitions of the task are required. Training begins, ideally, at the PGY 1 level.

Results: Thus far, a total of 20 residents and fellows are in training or have finished. Results regarding 6 modules will be presented. The number of sessions needed to reach a steady time or quality baseline (assumed to represent skill acquisition) as well as the time needed to complete the sessions will be presented. To assess the clinical utility of the torque and scope tip control modules, current trainees prior to and post these modules will carry out CS colonoscopies at several skill levels (surrogate for clinical cases). The PGY breakdown of trainees will be shown and compared.

Conclusion: This modular teaching program based on a variety of models can provide a comprehensive education for basic and advanced skills. Focused skill teaching and repetition are the hallmarks of this approach. Unlike clinic based training, this system is limited by trainee availability rather than clinical case volume.

P488

Innovations in Surgical Education (Using Endoscopic Suture Ligation as an Example)

Takehiro Watanabe, MD; Juntendo University School of Medicine Upper-gastric surgery

The shortage of surgeons is currently becoming a serious problem in Japan. Minimally invasive surgery and robotic surgery require long hours of training and can only be performed by older surgeons. As a result, young surgeons do not have a chance to perform these surgeries. We are working hard to solve this problem by providing minimally invasive surgery training from the earliest possible stage.

In this context, surgical education in student training is extremely important, and creating opportunities for students to recruit and acquire surgeons is a very important task in terms of succession planning and human resource development.

We teach our students (4th and 5th year medical students) to measure suture and ligation times in a dry box before and after one month of practical training, quantifying the accuracy and speed of suture techniques and using an evaluation chart.

The training was conducted with specific goals in mind, resulting in significant improvements and reductions in procedure scores and times.

In particular, it takes time to acquire and improve endoscopic techniques, and acquiring these techniques as a student or during the initial clinical training will make the introduction of endoscopic surgery smoother.

We need to make further efforts and innovations so that this initiative will encourage more people to become surgeons in the future.

I will also report on our educational methods and efforts to attract surgeons in our department.

P489

Proficiency Standard Setting for Fundamental Endoscopic Tasks

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Introduction: A proficiency-based skills training curriculum for the Fundamentals of Laparoscopic Surgery (FLS) manual skills examination was outlined by Ritter and Scott in 2007. Currently, there are several proficiency based training curricula for FES using cases from the GI Mentor or other physical simulators, but no proficiency based training curriculum utilizing the Endoscopic Navigation (Task 2), Mucosal Evaluation Advanced II (Task 5), Advanced Targeting with a Tool (Task 9), Loop Reduction (Task 10), and Retroflexion (First Module for Gastroscopy, Case 8) module tasks for the GI Mentor. In development of a comprehensive Minimally Invasive Surgical Skills Elective curriculum for surgery-bound medical students, proficiency-based standards were needed for trainee practice in preparation for FES manual skills exam.

Methods: Study participants were selected based on extensive past and current experience with upper and lower endoscopy. Each participant performed 2 consecutive repetitions of 5 tasks on the GI Mentor Express endoscopy simulation platform: Endoscopic Navigation (Task 2), Mucosal Evaluation Advanced II (Task 5), Advanced

Targeting with a Tool (Task 9), Loop Reduction (Task 10), and Retroflexion (First Module for Gastroscopy, Case 8). Tasks were selected for perceived correlation to the manual skills portion of the FES exam. Performance data was collected from generated reports on the platform. Mean time and scores were calculated for the second repetition of each task, with proficiency cutoffs set as 2 SD below the mean.

Results: Four faculty endoscopists participated in the standard setting process, 2 minimally invasive surgeons and 2 gastroenterologists; one MIS surgeon had previous experience using the GI Mentor Express platform. Minimum proficiency metrics were set (Table 1). All participants achieved 100% of target acquisition in every pass of both Endoscopic Navigation and Advanced Targeting with a Tool. Loop Reduction had the widest variability in faculty performance in time (0:42–6:08), reduction attempts (3–31) and reduction success rates (45.2–100%).

Conclusions: A proficiency-based training curriculum was developed using the Endoscopic Navigation (Task 2), Mucosal Evaluation Advanced II (Task 5), Advanced Targeting with a Tool (Task 9), Loop Reduction (Task 10), and Retroflexion (First Module for Gastroscopy, Case 8) module tasks on the GI Mentor. These proficiency standards will guide simulation practice for medical students enrolled in the Minimally Invasive Surgical Skills Elective. Proficiency standards will undergo evaluation and validation based on future trainee FES performance.

P490

Development of a Simulation-Based Laparoscopic Ventral Rectopexy Module: Design and Construct Validity

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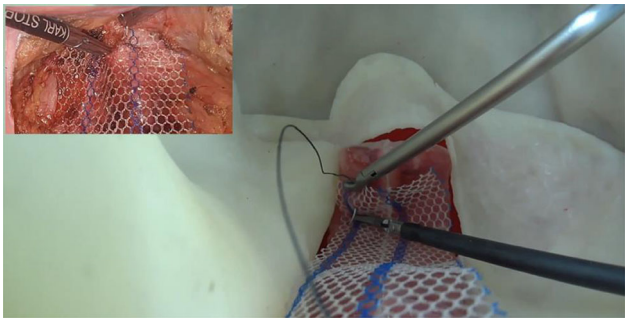
Introduction: Laparoscopic Ventral Mesh Rectopexy (LVMR) provides a safe surgical solution with favorable functional outcomes for rectal prolapse. However, it remains less common than other colorectal surgeries. This, combined with the complexity of pelvic anatomy, makes the LVMR challenging even for surgeons proficient in minimally invasive techniques. Developing a specific training that addresses this procedure could better prepare surgeons prior to clinical exposure. We aim to present the development and validation of a simulated LVMR training model.

Methods: This educational study tested a simulation-based scenario for LVMR. Continuous iterations were performed to develop a functional prototype. Bone structure was 3D-printed based on real measurements, and soft tissues were created using molded platinum silicone. Once a functional prototype was achieved, surgeons with varying levels of expertise performed LVMR on the model, which was installed in an endotrainer. Participants were surveyed to register their surgical experience and opinions on the simulator's fidelity and educational value. Performance was evaluated by two independent, blinded surgeons using procedural time, a modified Objective Structured Assessment of Technical Skills (OSATS), and a Procedure-Specific Rating Scale (SRS), focusing on key steps: peritoneal flap dissection, mesh fixation, and flap closure. A descriptive and non-parametric statistical approach analyzed how surgical experience influenced performance.

Results: A pelvic simulator for LVMR was successfully developed and evaluated by 3 coloproctologists (30%), 3 coloproctology residents (30%), and 4 general surgeons (40%). All participants had formal training in intracorporeal suturing and reported over 200 laparoscopic procedures. Median OSATS score was 18 [IQR 4.75] and the median SRS score, 15 [IQR 2.5]. The subgroup of surgeons with 2 or more LVMR performed as first surgeons, scored significantly higher on OSATS (20.5[IQR 0.625] vs. 16[IQR 2.5], $p = 0.01$) and SRS (16.25[IQR 0.875] vs. 13.5[IQR 1.75], $p = 0.009$). Although no significant difference was found in total procedure duration (29.3 vs. 52.8 min; $p = 0.07$), experts were faster in peritoneal flap opening and mesh placement. All participants reported that the activity enabled them to understand and reflect on the proposed surgical technique, with the global evaluation of the activity receiving a score of 5 out of 5.

Conclusion: These results support the construct validity of this LVMR simulation model, with clinical experience influencing performance. Further studies will explore how training on this model could possibly enhance the LVMR surgical learning curve.



P491

Transforming Pediatric Surgery Education in Northern Mexico: Early Key Findings After the Implementation of GLAP PRO Program in a Training Hub

Jorge Colin-Garnica, MD[1]; Carlos A Colunga-Tinajero, MD[1]; Jacqueline Narvaez[2]; [1]Hospital Regional Materno Infantil; [2]Sages

Introduction and Objective: Pediatric surgery training in Mexico has been slow to adopt emerging surgical modalities, particularly simulation tools, for enhancing minimally invasive surgery (MIS) skills. Consequently, surgical residents have limited opportunities to develop critical MIS techniques. This study aimed to present the preliminary outcomes of the GLAP PRO course, which was recently implemented at a training center in northeastern Mexico.

Methods and Results: A comparative analysis of MIS procedures from 2012 to 2022 showed an average of 107 surgeries per year (nine per month). After the start of our pediatric surgery residency in 2022–2023, this number increased slightly to 114 annually. Following the implementation of the GLAP PRO course in 2024, MIS procedures have increased substantially, with 104 surgeries performed in just eight months, averaging 18 procedures per month. Of these, 93% were performed by residents under supervision, all of whom enrolled in the GLAP PRO course. Additionally, the use of advanced technologies, such as Ligasure, Harmonic Scalpel, ICG, and IRIS U-kit, increased by 80%. A satisfaction survey among participants showed high ratings for course content, lecture clarity, and interactive opportunities, averaging 4.5 or higher on a 5-point Likert scale. The instructor performance was rated 4.67, material quality 4.33, and course recommendation 4.5.

Discussion: The GLAP PRO course significantly improved surgical training, increased the number of MIS procedures, and integrated

advanced technologies. Pre-course assessments showed moderate confidence in basic principles (3.57/5) and preoperative preparation (3.71/5) but lower confidence in managing complications (2.57/5). Post-course evaluations revealed substantial improvements, with participants rating their understanding of basic principles and ergonomics at 4.5/5, and safety protocols at 4.67/5. Confidence in managing complications improved to 3.5/5, although this remains an area of further development.

Conclusion: The GLAP PRO course positively affected the training of pediatric surgery residents by increasing MIS procedures and incorporating advanced surgical technologies. We anticipate continued improvements in surgical time and patient outcomes with ongoing monitoring and evaluation.

P492

Gamification of FLS Peg Transfer: Initial Performance and Satisfaction Evaluation

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Background: Despite the appearance of virtual skill trainers, tabletop simulators have preference because of their fidelity. The FLS Peg Transfer (FPT) has been a highly validated surgical training stalwart since 1996. However, it only evaluates completion time. This project sought to create a gamified version of FPT called Cylinder Transfer (CT) that evaluates accuracy by recognizing errors.

Methods: CT collects errors while giving auditory and visual feedback to participants and uses the same structural parameters and rules of completion. The notable exceptions include an electrified performance arena and metal cylinders.

The performance and satisfaction opinion of this platform were evaluated with two cohorts. Cohort A was collected from the TOP GUN Shootout at the 2024 SAGES annual meeting. Cohort B was collected from six traditional Top Gun Skills Programs. Cohort A completed one trial of FPT and one abbreviated trial of CT. Cohort B completed three trials of FPT and CT. All participants completed a satisfaction survey.

Results: In Cohort A (n = 57), the average age was 31.7 years, with 74% males, 11% (6) attending surgeons, 3.5% (2) fellows, 68% (39) residents, 16% (9) medical students, and 2% (1) other medical professionals. In Cohort B (n = 50), the average age was 24.2 years with 54% males, 4% (2) attending surgeons, 24% (12) medical students, 12% (6) other medical professionals, 44% (22) college students, and 16% (8) high school students.

In Cohort A, the average FPT completion time was 82.6 s (s) (± 32.1) versus Cohort B, 262.8s (± 50.4). Cohort A had an average CT completion time of 199.0s (± 67.9) with an average of 77.2 errors (± 23.6). Cohort B had an average CT completion time of 363.1s (± 111.9) with an average of 119.1 errors (± 31.4). In Cohort A, 48% strongly agreed, or agreed that the light and buzzer motivated them to perform better versus Cohort B (72%). In Cohort A, 60% strongly agreed, or agreed that the registering of errors enhanced their training experience versus Cohort B (78%). In Cohort A, 53% believed that FPT will have more of an impact on their skill development than CT. In Cohort B, 76% believed that CT will have more of an impact on their skill development.

Conclusion: The gamification version (CT) of FPT was positively received by both cohorts. It was most embraced by the younger group with the least experience with FPT and surgical training.

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Experiences and Challenges of Establishing a Simulation Center in Uganda

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Background: In many African countries, where laparoscopic and endoscopic training are uncommon, surgical simulation-based training may offer an alternative method of preparing surgeons for basic laparoscopic and endoscopic skills. In partnership with the Mount Sinai Hospital (MSH), the newly established simulation center at the Kyabirwa Surgical Center (KSC) in rural Uganda is equipped with laparoscopic and endoscopic simulators, aiming to prepare healthcare providers for the Fundamentals of Laparoscopic Surgery (FLS) and Fundamentals of Endoscopic Surgery (FES) exams, as well as for clinical practice. Here, we outline our experiences building an operational simulation center in Uganda.

Methods: A multidisciplinary team from MSH and KSC was formed, comprising of surgical residents, practicing surgeons, the KSC director, and the MSH simulation center director. In pursuit of establishing a center of excellence in simulation, the team identified major challenges to making an efficient simulation center including cost, availability of equipment and lack of local experienced institutions in simulation training. To address these challenges, the team decided to focus on four key areas: securing financial support, addressing logistical needs, training personnel, and developing comprehensive curricula.

Results: Financial support for the initiative was secured from MSH and supplemented by grants and donations from industry partners. In alignment with the MSH simulation center's capabilities, essential supplies were either shipped or hand-carried to Uganda by residents participating in their global surgery rotation. Between 2022 and 2024, the simulation facility was progressively assembled, and a dedicated lab coordinator was identified. Surgical residents devoted over 40 h to training the coordinator, covering tasks such as inventory management, tool functionality, technical troubleshooting under the guidance of the MSH simulation center director, and preparation to become an FLS proctor. To develop internationally recognized training curricula in laparoscopy and endoscopy, KSC partnered with SAGES to launch the Global Laparoscopic Advancement Program (GLAP) in October 2024, and with the African Esophageal Cancer Consortium (AfECC) to host an esophageal stenting course in 2025.

Conclusion: A successful simulation center for training the next generation of surgeons requires a well-equipped facility, a dedicated lab coordinator, and well-structured, comprehensive curricula. KSC is the first official site in Africa for both remote and onsite FLS testing, with plans to become the continent's first FES testing center in the near future. As the team will continue to develop strategies to increase awareness of simulation training in Africa, the KSC simulation center will become a valuable resource for the surgeons of tomorrow.

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Bridging the Gap in Surgical Training: A cost-effective Ostomy Simulation Model

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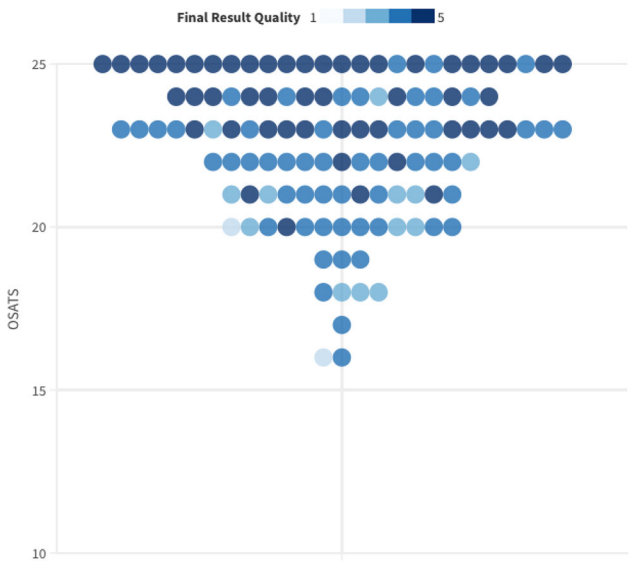
Introduction: In the U.S., approximately 150,000 colostomies and ileostomies are performed annually for conditions like colorectal

cancer, inflammatory bowel disease, and trauma. Globally, these procedures are often performed by non-colorectal specialists, frequently in emergency-settings. Simulation-based training has proven effective in accelerating learning curves and is recognized for assessing surgical competence. This study aims to optimize and validate a cost-effective, simulation model to assess and train surgeons in the proper maturation of a stoma.

Methods: A low-cost, silicone-based model was developed to replicate key abdominal wall layers. The model was integrated into a custom-designed phantom accommodating bovine intestine within a simulated abdominal cavity. To assess construct validity, performance data using the OSATS and a Final Result Quality scale (from 1 to 5) were collected from general surgeons undergoing title revalidation in Chile. Additionally, surgeons of varying experience levels performed an ostomy procedure on the model. In this second group, data included demographic information, procedure accomplishment, and a perception survey to assess the model's fidelity to reality. Tissue realism was measured for the subcutaneous layer opening and muscle dissection (scale 1–10) while overall model fidelity was assessed (scale 1–7). The design will be refined until tissue realism reaches 7/10 and an overall score of 6/7 is achieved.

Results: Performance information from 120 surgeons showed OSATS median 23 (range, 21–24) and Final Result Quality median 4 (range 4–5), with all participants completing the procedure. The distribution of the results is shown in Chart 1, each point is a participant. The second group, 2 colorectal surgeons, 2 colorectal fellows, and 2 general surgeons participated, all completed the ostomy procedure. Median scores for tissue realism of subcutaneous and muscle layers were 6.5 (range, 4,5–7,75) and 5 (range, 4–6), respectively. Overall model fidelity was rated 5.5 (range, 4.25–6). Suggestions for improvement included the addition of inferior epigastric vessels (noted by two participants), posterior aponeurosis (three participants), and enhancement of tissue laxity (two participants). One participant pointed out anatomical misalignment in the phantom's positioning of the ostomy model.

Conclusions: This study demonstrated that the ostomy simulation model can discriminate between different performance levels. Results indicate that this model enables surgeons of all levels to ostomize in a simulated scenario, making it suitable for training. Further iterations will aim to enhance model fidelity. After this is achieved, a learning curve in ostomy performance will be developed using the model.



P495

Video-Based Assessment for Laparoscopic Fundoplication: Validity Evidence for Rater Training Among Intermediate-Level Surgical Trainees

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Introduction: While the association between surgical skill and patient outcomes is well-documented, there is a lack of procedure-specific tools designed to evaluate performance by video-based assessment (VBA). The SAGES VBA for laparoscopic fundoplication (LF) was developed through a rigorous process and has demonstrated content, internal structure, and consequences validity evidence in prior studies. Internal structure validity was supported by robust rater training of subject matter experts (SMEs). However, relying solely on expert raters may challenge scalability. This study aims to contribute validity evidence for the VBA for LF rater training through its use by intermediate-level surgical residents.

Methods: Two intermediate-level general surgery residents completed the SAGES VBA for LF rater training modules and independently scored 10 LF videos. Percentage agreement (PA) for procedure sub-steps was determined and mean PA was calculated. Resident scores were then compared to expert scores from the initial rater training study. After a meeting with SMEs to discuss discrepancies and develop a shared mental model, residents scored an additional set of 8 LF videos. PA was re-calculated and compared to expert data. Pass-fail was defined using a pre-established cut score and pass rates were compared between groups.

Results: For the first round of 10 LF videos, mean PA between residents, resident 1 and expert, and resident 2 and expert was 80%, 85%, and 84%, respectively. Previously reported PA among experts at this stage was 75%. Sub-steps with $< 70\%$ agreement that required discussion with SMEs included quality of hiatal dissection, skill during esophageal mobilization, and quality of hiatal repair. For the second round of 8 LF videos, mean PA between residents, resident 1 and expert, and resident 2 and expert increased to 95%, 95%, and 98%, respectively. Previously reported PA among experts at this stage was 91%. The pass rate for all videos was 42% among resident raters and 89% for the expert rater. Discordance on pass-fail between residents and experts decreased from 7 videos (70%) in round 1 to 3 videos (38%) in round 2.

Conclusion: This study contributes internal structure validity evidence for the SAGES VBA for LF rater training process by demonstrating its application among non-expert assessors. Additionally, the results highlight areas for improvement in the rater training modules to enhance inter-rater reliability and increase scalability. The SAGES VBA Task Force will continue to explore ways to develop and extend this framework to additional VBA tools for surgical competency.

P496

A Randomized Controlled Trial on the Impact of Remote and Asynchronous Feedback on Surgical Performance: Results from an Interim Analysis

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Background: The SAGES Safe Cholecystectomy Program highlights the importance of standardized techniques and continuous education to reduce bile duct injuries during laparoscopic cholecystectomy(LC). While operating room training is vital for developing surgical competency, opportunities for in-depth feedback are often limited. Remote, asynchronous video-based feedback has proven effective in simulation settings and holds potential for real-case surgical education. This study (FONDECYT national grant #1221490) evaluates the impact of such feedback on residents' LC performance, aiming to enhance surgical performance and safety aligned with the Safe Cholecystectomy initiative.
Methods: A multicenter, open-label, randomized controlled trial was conducted. Surgical residents were randomized into an intervention group (FBG) receiving detailed feedback via a web-based platform and a control group (CG) receiving no additional feedback. Residents uploaded videos of their LCs, which were assessed by calibrated surgeons using the Objective Structured Assessment of Technical Skills (OSATS) and a cholecystectomy-specific Operative Performance Rating Scale (OPRS). The primary outcome was to compare the learning curves of both groups using OSATS scores, stratified by simulation training levels. The 10th ± 1 LC was used as a proxy for learning progress in this interim analysis. Secondary outcome: the impact of an advanced laparoscopic simulation course, comparing residents with the course finished (ACF) vs. non-ACF participants.
Results: To date, 27 residents have uploaded 225 LC videos: 13 participants from the CG (129 LCs) and 14 from the FBG (96 LCs). No significant difference in performance was found between the FBG and CG on their 10th ± 1 LC, with mean OSATS scores of 16.6 and 17.3, respectively ($p = 0.79$). Non-ACF residents from both FBG and CG performed similarly (mean OSATS 13.25 vs. 16.0; $p = 0.49$). Comparable results were observed among ACF residents (mean OSATS 20.0 vs. 18.5 for FBG and CG, respectively; $p = 0.17$). Notably, ACF residents performed better in real cases, with a mean OSATS score of 19.1 vs. 14.9 for non-ACF residents ($p = 0.045$) on their 10th ± 1 LC, indicating a significant impact of the advanced laparoscopic course.
Conclusions: Preliminary results from the early learning curve show that remote, asynchronous feedback did not significantly impact overall performance, however exhibited a non-significant trend benefiting previously trained residents. Remarkably, these residents performed significantly better in real cases. Further follow-up will clarify the effect of this feedback on the ongoing learning curve and on Safe-Cholecystectomy practices.

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Influence of Surgical Expertise on Visual Gaze Patterns While Viewing Robotic Adrenalectomy

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In order to quantify and further understand the visual perception differences between expert surgeons and trainees, we investigated the influence of surgical expertise on visual attention while watching a robotic adrenalectomy. We hypothesized that experienced surgeons would routinely scan the surgical field for critical structures in the periphery, while less experienced surgical trainees would primarily focus their gaze on the surgical instrument.

Fifteen surgeons (8 residents, 7 attendings) viewed a video of a robotic right adrenalectomy without knowing the case and were later asked to identify the case afterward. Eye-tracking data was collected using a screen-based tracker (Tobii Pro Fusion). The 10-min edited video included key steps, including the opening of the peritoneum, liver mobilization, clipping and cutting of the accessory and main adrenal vein, and mobilization of the superior pole and inferior vena cava (IVC).

Areas of interest (AOIs) were defined where surgical instruments contacted tissue. The video was segmented by the procedural steps, and AOIs were dynamically mapped to compute fixation duration and count. Surgeons were grouped by experience level (attendings, residents) and case identification accuracy. Mann–Whitney U tests compared fixation metrics between groups for each AOI, while Friedman tests assessed rank differences across AOIs.

Fixation duration on the AOIs was significantly longer for residents ($p = 0.021$) during clipping of the accessory adrenal vein, while attendings demonstrated a broader gaze, dividing attention between the instrument and surrounding anatomy.

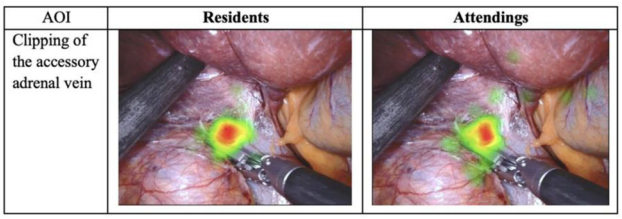

Fig. 1 Gaze heat map (red indicates increased fixation). Residents (left) focus on the instrument tip, while attendings (right) show broader scanning

Significant differences in fixation duration ($p = 0.022$) and fixation count ($p < 0.001$) across AOIs indicate that fixation varied by procedural step. The longest fixations occurred during cutting and clipping of the accessory adrenal vein, IVC mobilization, and dissection off the IVC.

Case identification accuracy differed significantly between groups. Among the attendings, 5 out of 7 (71.4%) correctly identified the case, compared to only 2 out of 8 residents (25%). However, no significant variations in eye-tracking metrics were found based on identification accuracy.

Visual attention varied across procedural steps, influenced by AOI complexity and surgical expertise. Attendings showed broader fixation during less critical steps, such as clipping, while residents focused more narrowly on the instrument. This suggests that experienced attendings have a greater contextual visual understanding of the procedure. These findings enhance our understanding of the differences between less and more experienced surgeons and could be used to facilitate the training process.

P498

3D-Printed Laparoscopic Training Simulators Made from Plant-Based Biodegradable PLA: Sustaining Cost-Effectiveness and Eco-Friendliness

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Introduction: In recent years, there has been a significant expansion in the application of 3D-printing technology in medicine. Although the application in the clinical field is limited, advances in the quality of materials and reduction in the cost of 3D-printers, constitute 3D-printing a suitable candidate for enhancing medical training. The most common 3D-printing option is the fused deposition modeling/fused filament fabrication, due to its affordability, simplicity and availability, using polylactic acid (PLA), which is inexpensive. A limitation in this field, is the lack of expertise in software and hardware skills, to operate and maintain such equipment, by healthcare professionals.

Our team collaborated with engineers to design and manufacture a PLA 3D-printed laparoscopic training simulator.

Methods: Our team used Dassault Systems SolidWorks to design 35 × 25 × 25 cm laparoscopic training box, a pegboard, 5 and 10mm endoscopic trocars and 35 × 0.5 cm laparoscopic graspers with EOS EOSINT P 390 and SOVOL SV01 PRO 3D-printers using plant-based biodegradable PLA. The top panel was designed with 4 instrument access points and a phone mount for easier accessibility. The laparoscopic graspers were printed in 7 pieces and assembled. The trocars were printed in 3 parts, including a cannula, obturator, one way valve and then assembled. The pegboard was designed with 10 peg post ports to allow for different peg post configuration and different post designs. The pegs were made from silicone rubber.

We used 62 medical students and 10 surgical residents who trained and were evaluated with a 6-peg transfer configuration according to the SAGES FLS exam. The simulators were used for a 2-month period and modifications, enhancements and eliminations were made based on feedback from each testing session, addressing instances where the equipment failed. Additional equipment needed for construction of the simulations was purchased separately.

Results: The total cost for production amounted to 16.08 USD/complete kit (one box, 4 trocars, 2 graspers and 6 pegs) and total average time for printing was 23.5 h with 1 h additionally for assembly. The participants reported satisfaction with the simulator and had a significant reduction in time and errors, with continuous training.

Conclusion: The significantly low cost of our simulator offers institutions with a financial and environmentally sustainable alternative for laparoscopic training, allowing the development of different modules and designs, further enhancing medical training. The software design can be shared freely between institutions and provide trainees with an additional option, when industry options are not available or cannot be afforded.

P499

Surgeon Attitudes on Consent Discussion for Laparoscopic Cholecystectomy and Video Recorded Consents: A Multicenter Survey

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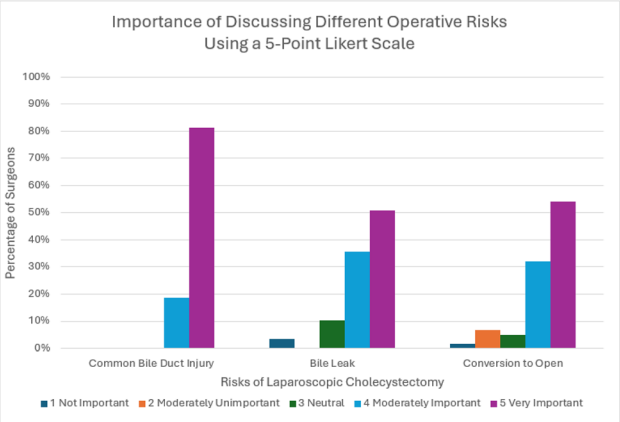
Introduction: Informed consent for laparoscopic cholecystectomy occurs everyday, however limited consensus on what should be included in this discussion exists. We aim to capture surgeon attitudes regarding: what should be included in consent discussions, video recording consents, and impacts of common bile duct (CBD) injury.

Methods and Procedures: A multi-institutional survey was developed assessing surgeons' perceptions regarding the importance of discussing various risks associated with laparoscopic cholecystectomy for symptomatic cholelithiasis, and self-reported frequency discussing each risk. Survey distribution occurred at Washington University (St. Louis), UCSF, UTSW, Mayo-Florida, Mayo-Rochester, Buffalo, and through X posts amplified by SAGES to their followers. Responses outside the United States were excluded. Chi-square/Fisher's exact testing were performed on yes/no and Likert-style questions comparing individuals with and without a prior CBD injury. Thematic analysis was performed on open-ended responses.

Results: Overall, 59 responses were analyzed (35% SAGES members). The most important risks to discuss (Median "Very Important") included conversion to open, bile leak, and CBD injury (Fig. 1), while frequently discussed risks (median "Always Discuss") expanded to include skin infection. Risks with a median response "Usually Do Not Discuss" or "Neutral" included hepaticojejunostomy, drain placement, additional ports, hernias, stroke, cardiac event, and death. Of respondents, 30% reported a previous CBD injury, with 15% of surgeons reporting CBD injuries undergoing subsequent legal proceedings. Respondents with a CBD injury both assigned increased importance to, and discussed more frequently, additional risks compared to surgeons without a CBD injury ($p < 0.05$). Overall, 60% were willing to record their consent discussion and provide it to patients to review prior to surgery; CBD injury did not impacting willingness ($p = 0.749$). Those who opted against recording were concerned about potential legal ramifications.

Conclusions: This study works toward developing consensus on risks to include in consent discussions for laparoscopic cholecystectomy. Conversion to open, common bile duct (CBD) injury, and surgical site infections are consistently discussed, while other risks (stroke/cardiac event/death) are infrequently addressed by surgeons. Prior CBD injury increases the number of risks discussed by a surgeon and the importance assigned to them. The goal of consent discussions is patient comprehension. Video-recordings of a patient's consent made available for their review is proposed to improve their understanding; a majority (60%) of surgeons are comfortable with this, however others are concerned about legal ramifications. The consent process needs to continue to evolve through consensus to provide greater clarity, consistency, and transparency for the benefit of patients and surgeons alike.

Figure 1:



P500

Does More Years in Training Equal to More Advanced Skills? Trends in the Operative Performance of Surgical Residents During Advanced Laparoscopic Training Course

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Introduction: As surgery residents gain experience during their training, their operative skills are expected to improve. However, it's unclear whether this applies to both basic and advanced procedures. The objective of this study was to examine the trend in operative performance of general surgery residents during an advanced laparoscopic course in live porcine lab and to compare faculty assessments with residents' self-assessments.
Methods: Senior general surgery residents (PGY 3 to 5) performed 3 advanced laparoscopic procedures (Nissen fundoplication, low anterior colon resection (LAR) and splenectomy) in anesthetized pigs. The assessment tools with proven validity evidence were used to assess their operative performance. A linear mixed-effects model with a random intercept accounting for within-subject correlation was used to assess score trends by resident level and compare faculty and residents' self-assessments.
Results: Between 2015 and 2023, 93 residents participated and completed 129 Nissen fundoplication, 116 LAR, and 115 splenectomies. The data revealed that senior residents' self-assessment for all procedures was higher than the faculty assessment. With regard to splenectomy and LAR, there was a significant linear relationship between skill level and PGY year from both faculty and residents (Table 1). However, there was no significant improvement demonstrated between the increased years of training and performance during Nissen fundoplication. Even when the scores from faculty and resident's self-assessments increased with PGY level, this trend was not statistically significant (F: 0.12, $p = 0.29$; S: 0.15, $P = 0.14$) (Table 1).
Conclusions: This study demonstrated that there was a significant improvement in the performance of the residents and their PGY level in laparoscopic LAR and splenectomy. However, this trend was not observed in laparoscopic Nissen Fundoplication, which requires advanced suturing. The results also showed a discrepancy between faculty assessments and residents' self-assessments across all procedures. Our study highlights the importance of further focus on skills such as advanced laparoscopic suturing that residents may not be adequately exposed to during their standard surgical training.

	Faculty	L:95% CI	U:95% CI	*p*-value	Self	L:95%CI	U:95% CI	*P*-value
Nissen fundoplication	0.12	− 0.07	0.3	0.2916	0.15	− 0.03	0.33	0.1375
LAR	0.24	0.04	0.44	***0.014***	0.22	0.02	0.43	***0.0273***
Splenectomy	0.29	0.12	0.45	***0.0002***	0.35	0.18	0.51	***0.0001***

P501

Repetition is Key: A Robotic Enterotomy Repair Training Exercise for Junior Surgical Trainees

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Objective: As surgical education evolves with technological advances in surgery, development of improved training protocols and evaluations are needed. Increasing use of the robot across surgical specialites warrants a more robust robotic surgery curriculum for surgical trainees. Our protocol aimed to establish a method to teach junior surgical trainees the advanced robotic task of enterotomy repair following a brief, focused training session.
Methods and Procedures: Junior surgical trainees, defined by postgraduate years 1 (PGY-1) and 2 (PGY-2), watched a 7-min video demonstrating performance of a 2-layer robotic enterotomy repair. The first layer was a running baseball stitch with barbed suture and the second consisted of three Lembert stitches with braided suture. A 3 cm transverse enterotomy was then created on a 10 cm segment of porcine bowel. Participants were timed while performing the repair. A leak test was then performed by submerging the bowel under water and performing air insufflation. The number of distinct leaks was recorded. Residents repeated the procedure two additional times (for a total of 3 trials in a span of 4 weeks).
Results: 17 residents participated (11 PGY-1, 6 PGY-2). 11 residents completed a 1-month dedicated surgical skills lab rotation including robotic training (7 PGY-1, 4 PGY-2). Mean repair time improved between trials ($p < 0.001$; 1st trial, 19 min 5 s; 2nd trial, 14 min 23 s; 3rd trial, 12 min 47 s). Leak rate decreased with subsequent trials, however, was not statistically significantly ($p = 0.26$; 1st trial, 6/17 (35%); 2nd trial, 5/17 (29%); 3rd trial, 2/17 (12%)). There was no difference in leak rate between residents who completed the lab rotation and those who did not, however those with a lab rotation had a faster 3rd trial time ($p < 0.05$; 10 min 57 s vs. 16 min 9 s). There was no difference between repair time or leak rate between PGY-1 and PGY-2 residents.
Conclusions: This novel method of teaching an advanced robotic task with repeated trials demonstrated effectiveness amongst residents with improvement in mean repair time and a trend towards decreased leak rates. Improvement in mean repair time was more profound in residents who completed a dedicated surgical skills lab rotation. These results suggest that focused robotic training exercises with repetition are effective in developing advanced robotic skills. Educators should consider employing this concept as a mean of training and evaluating resident proficiency in the application of the most useful feature of the robotic platform, suturing.

P502

Assessing the Current State of Laparoscopic Training in Canadian General Surgery Residency Programs: A Survey of Residents and Attendings

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Introduction: There is limited national data on perception and satisfaction of residents and attending surgeons on the current state of laparoscopic surgery training. This study aimed to assess the experiences and opinions of these groups across Canada, focusing on the structure and effectiveness of laparoscopic surgery training within General Surgery programs.

Methods: Online surveys were emailed to the program directors of all 14 primarily English-speaking Canadian General Surgery programs. Once approved, program administrators distributed them to current residents and attending surgeons involved in teaching. Demographics, current state, and outcomes of laparoscopic training were assessed using multiple choice, ranking, and short-answer questions.

Results: Eleven out of 14 programs (78.6%) participated, with responses from 27 residents from 4 programs (36.4%) representing all post-graduate year levels and 43 attending surgeons from 0 to 21+ years in practice. 70% of residents and 37% of attending surgeons were female. 59.3% of residents indicated interest in fellowship training. 39.7% of attending surgeons practice in academic settings, and 28.6% in community settings.

Only two programs have a formal, objective-oriented curriculum, with protected time for laparoscopic surgery training outside of the operating room. 75.0% of resident and 66.7% attending respondents from these programs reported they were satisfied with the current training, while 17.4% of resident and 23.5% attending responds from the remaining programs reported satisfaction ($p < 0.05$). 78.3% of resident respondents and 37.2% of attending respondents indicated more time should be dedicated to laparoscopic simulation training prior to operative exposure ($p < 0.05$).

The most common type of laparoscopic training model currently being used in programs are video box trainer and live animal models. These two modalities in addition to video review were the most preferred training tools, while virtual and augmented reality simulators were deemed less useful. Both residents and attendings believe that the main barriers to instituting a formal laparoscopic curriculum are cost of simulators/facilities and faculty availability.

70.3% of residents and 58.1% of attending surgeons believe skills lab training translates to improved performance in the operating room ($p = 0.32$). 70.4% of the residents and 51.2% of attending surgeons believe residents are comfortable performing advanced laparoscopic surgery at the end of their training ($p = 0.14$).

Conclusion: This study highlights the lack of a formalized curriculum and dedicated time for laparoscopic training in most programs. Despite general confidence in the current training outcomes, further research, such as semi-structured interviews with program directors, teaching surgeons, and trainees, is needed to improve quality of laparoscopic training.

P503

External Validity and Reliability of Task-Specific Metrics for Assessment of Performance in Laparoscopic Crural Repair

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Introduction: Laparoscopic hiatal hernia repair is a common foregut procedure performed globally, but proficiency assessments in simulated environments remain limited. At our institution, we developed and validated Task-Specific Metrics (TSM) for assessing the crural repair aspect of this procedure. This study aims to evaluate the external validity of these metrics.

Methods: This IRB approved study recruited participants to perform a simulated laparoscopic crural repair on a silicone model housed in a standard laparoscopic trainer box at the SAGES 2024 Education and Innovation Center in Cleveland, OH (Fig. 1). After verbal consent, participants completed a pre-survey to capture key demographic information, including training level, experience with laparoscopic hiatal hernia repair, and the geographic location of their current practice or training program, categorized as either local (within the United States) or international (outside the United States). Each participant then performed a video-recorded crural repair, and the performance was assessed by three graders using both the Objective Structured Assessment of Technical Skills (OSATS) and TSM. Participants were categorized by experience: novice (PGY 1–2) and experienced (PGY 3–5, fellows and attendings). Intraclass Correlation Coefficient (ICC) was computed for inter-rater agreement. Performance comparison between groups were analyzed using the Wilcoxon–Mann–Whitney test, while the Spearman Rank test correlation was used to assess correlation between OSATS and TSM.

Results: Thirty participants were included (attendings = 9, fellows = 3, PGY-5 = 5, PGY-4 = 3, PGY-3 = 3, PGY-2 = 4, PGY-1 = 3). Twenty-two participants were trained in the USA and eight were from international locations, including Asia, Europe and South America. High inter-rater reliability was observed (ICC = 0.85, $p < 0.001$). A strong positive correlation was found between TSM and OSATS scores ($R = 0.88$, $p < 0.001$). Significant performance differences were observed between novice and experienced groups for both OSATS (14 vs 20, $W = 43.5$, $p = 0.03$) and TSM (18.5 vs 39, $W = 39.5$, $p = 0.02$).

Conclusion: The TSM demonstrated strong external validity and reliability for assessing laparoscopic crural repair performance across diverse training backgrounds. The inclusion of both local and international participants supports the potential for global standardization of these metrics.

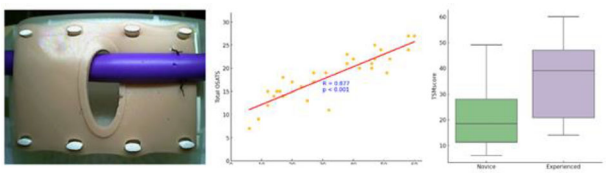

Fig. 1 >(Left) crural repair model (middle) correlation plot (right) TSM score for the two groups

P505

From Bench to Body: Advancing Laparoscopic Training from In Vitro Models to Cadaveric Simulations in General Surgery

Evelyn Dorado, md; Universidad Javeriana

Introduction: In the field of laparoscopic surgery training, there is an ongoing debate about the effectiveness of different training models, including in vitro (bench) models, animal models, live surgery by experts, and cadaveric models. I have used all available models and drawn conclusions about their effectiveness in laparoscopic learning.
Methods and Procedures: Since 2012, I have conducted 10 courses on the fundamentals of laparoscopy, 18 courses on laparoscopic inguinal hernia repair, and 4 courses on advanced abdominal wall reconstruction. In all courses, I use a hybrid model with both recorded and real-time lectures. Over time, we have transitioned from in vitro models (silicone and mixed), live surgery, surgery with animal models, and cadaveric surgery models.
Results: Based on the students' experiences with all types of models, an evaluation was conducted to determine which learning model was most useful. The evaluation included 278 students distributed as follows: 30% (84) in the fundamentals of laparoscopy course, 28.7% (80) in the abdominal wall reconstruction course, and 41% (114) in the laparoscopic inguinal hernia repair course.
100% of the participants used in vitro models.

5.7% (16) used both in vitro and animal models.

29% (82) used both in vitro models and live surgery.

44% (123) used cadaveric models along with in vitro models and live surgery.

Additionally, 3 practices were conducted using fluorescence in cadaveric models.

The satisfaction evaluation of the models used revealed the following:

- 100% of students found the in vitro model very useful for spatial orientation and technique management.
- Those who observed live surgery indicated that, while useful, they wished to participate in the procedure.
- Students who used animal models indicated that the dissimilar anatomy made it less useful as a learning model.
- The frozen cadaveric model combined with the in vitro model was rated as the most successful teaching model, with all participants rating it as excellent.

Conclusion: In teaching, it is essential to adapt to innovations and available models to provide a comprehensive experience for the student. We understand the benefits of in vitro models, which are cost-effective for the student's initial approach without ethical concerns. Animal models offer a more realistic scenario but come with ethical issues and anatomical dissimilarities. The cadaveric model provides anatomical certainty, no ethical issues, and real procedures, making the combination of all three models ideal for the learning process.

P506

Superiority of Cadaveric Models with Fluorescence in Surgical Training: An Innovative Approach to Advanced Medical Education in Colombia

Evelyn Dorado, MD; Javeriana University

Introduction: Effective surgical training requires methods that accurately replicate human body conditions. This study compares the efficacy of human cadaveric models versus animal models in surgical education, utilizing advanced fluorescence techniques. The use of cadavers eliminates ethical concerns associated with animal experimentation, aligning with current trends in medical research. The integration of fluorescence in these models significantly enhances the identification of critical structures, reducing the risk of errors in real practice.
Methods and Procedures: This descriptive study was conducted on 3 fresh frozen cadavers, evaluating the viability of micro and macrostructure assessment with ICG using a reperfusion system.
A cadaver is maintained at a specific temperature. The carotid vein is cannulated, and a perfusion of 1 L of water + 1 ampoule of ICG and 5 sachets of 90% collagen is administered to facilitate fluorescein transport.

A suprapubic incision is made for the passage of a 12 mm trocar and a 5 mm trocar on the right side. With pneumoperitoneum at 15 mm Hg, capillary perfusion in the subcutaneous tissue is observed. An umbilical approach is then made with a 12 mm port and two 5 mm paraumbilical ports, allowing visualization of perfusion in the left gastric artery, intestine, and gallbladder with ICG.
Results: In a practice session involving 2 cadavers over a 3-h period, structures were visualized using ICG without alterations. The model was used for practice in advanced abdominal wall reconstruction and gastrointestinal surgery.
Conclusion: The results demonstrate the superiority of cadaveric models in several key aspects:

1. Precise human anatomy allows for direct skill transfer to the operating room.
2. The application of fluorescence in human tissues offers a more realistic visualization of vascular and lymphatic structures, crucial for microsurgical procedures.
3. Cadaveric models present natural anatomical variations, better preparing surgeons for diverse clinical scenarios.

This approach not only improves the learning curve for surgeons in training but also allows for the practice of advanced surgical techniques in a controlled and ethically sound environment. Widespread adoption of this method could revolutionize surgical education, ultimately improving patient safety and outcomes.

P507

The Reliability of Surgical Gestures for the Assessment of Performance in a Simulated Robotic Pancreaticojejunostomy

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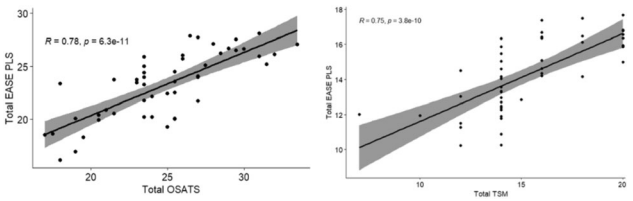
Introduction: Conventional and global assessment methods often fail to capture the complexities of surgical proficiency, limiting their ability to provide targeted feedback. There is a growing need for detailed and granular evaluation tools that can accurately assess technical performance in robotic surgery. This study aims to evaluate the reliability of surgical gestures in assessing surgical skills during a simulated robotic pancreaticojejunostomy (PJ).
Methods: Forty-nine videos of surgery residents performing a previously validated simulated robotic PJ drill using a bio-tissue model were analyzed. The duct to mucosa step, including posterior and anterior rows, were independently graded by three trained raters using the End-to-End Assessment of Suturing Expertise (EASE) tool, Objective Structured Assessment of Technical Skills (OSATS) and Task-Specific Metrics (TSM). Interrater reliability (IRR) between raters was established using the intraclass correlation coefficient (ICC) on a subset of 10 videos. The Spearman's rank correlation test

was computed to assess the relationship between the metrics. The EASE scores were further optimized by computing relative weights using partial least squares regression (PLS).

Results: IRR between graders was high for EASE (ICC = 0.9, $p < 0.001$), and for both OSATS and TSM (ICC = 0.96, $p < 0.001$). The mean of total scores were 36.75 ± 3.87 for EASE, 25 ± 4 for OSATS and 14 ± 2 for TSM. Prior to optimization, a moderate correlation was observed between EASE and OSATS ($R = 0.61$,? $p < 0.001$) and a low correlation was found between EASE and TSM ($R = 0.48$,? $p < 0.001$). PLS regression analysis results for OSATS and TSM are summarized in Table 1. Following optimization using PLS regression, the weighted sum for EASE significantly improved the correlation for both OSATS ($R = 0.78$, < 0.001) and TSM ($R = 0.75$, < 0.001). Fig. 1.

Conclusion: The assessment of performance with surgical gestures proves to be a reliable method for the evaluation of surgical skills in simulated robotic procedures. These findings support the importance of detailed, granular evaluation tools in providing targeted and precise feedback for robotic complex procedures in surgical training.

Computed weights after PLS regression	
OSATS	TSM
Tissue approximation 3.24	Tissue approximation 1.96
Knot tying 1.60	Suture awareness 1.21
Suture awareness 1.35	Knot tying 0.82
Field optimization 1.30	Field optimization 0.76
Wrist rotation 1.21	Wrist rotation 0.57
Cinching 0.56	
Driving smoothness 0.57	



P508

Relationship Between Cognitive Load and Surgical Errors

Nicholas E Anton, MS; Wendy Li, MD; Nicholas Blundell; Dimitrios Stefanidis, MD, PhD; Indiana University School of Medicine

Introduction: Cognitive load (CL), or the cognitive demands imposed on working memory, can impair surgical performance. Electroencephalogram (EEG) and eye-tracking (ET) are accepted methods to measure CL. The purpose of this study was to determine if EEG and ET are associated with the commission of errors during minimally invasive surgical (MIS) simulated tasks.

Methods and Procedures: General surgery faculty and residents were voluntarily recruited. Following the completion of a demographic questionnaire detailing their previous MIS experience, participants were asked to wear an EEG cap and mobile eye-tracker. The EEG measured theta and alpha wave power according to the 10–20 international standard of EEG sensor placement. Participants then completed the fundamentals of laparoscopic surgery peg transfer task robotically and laparoscopically in random order. During these repetitions, participants' cortical activity and pupil size were captured via EEG and ET, respectively. Such data captured around performance errors (dropped pegs) were compared with data during flawless execution of the task (no drops) using non-parametric tests.

Results: Eleven participants completed the study (55% residents, 64% female, 100% right-handed, 100% had laparoscopic experience and 64% had robotic experience). Fifteen errors were committed laparoscopically, and one error was committed robotically. There were no significant differences in ET-measured CL between drops and successful transfers. However, when participants committed errors, they exhibited significantly higher cortical activity in the motor cortex (Theta band: 0.67 vs. 0.13) and suppression in the parietal region (Alpha band: − 1.89 vs. − 1.12) compared to successfully transferring pegs ($p < 0.05$, Fig. 1).

Conclusions: Utilizing EEG sensors, we documented increased participant cognitive load when committing errors on the FLS peg transfer task. Our findings are consistent with the neuroscience literature on cortical activation, cognitive load, and performance of manual dexterity tasks. Additional work may help determine whether early detection of increased CL via EEG can be used for error prevention.

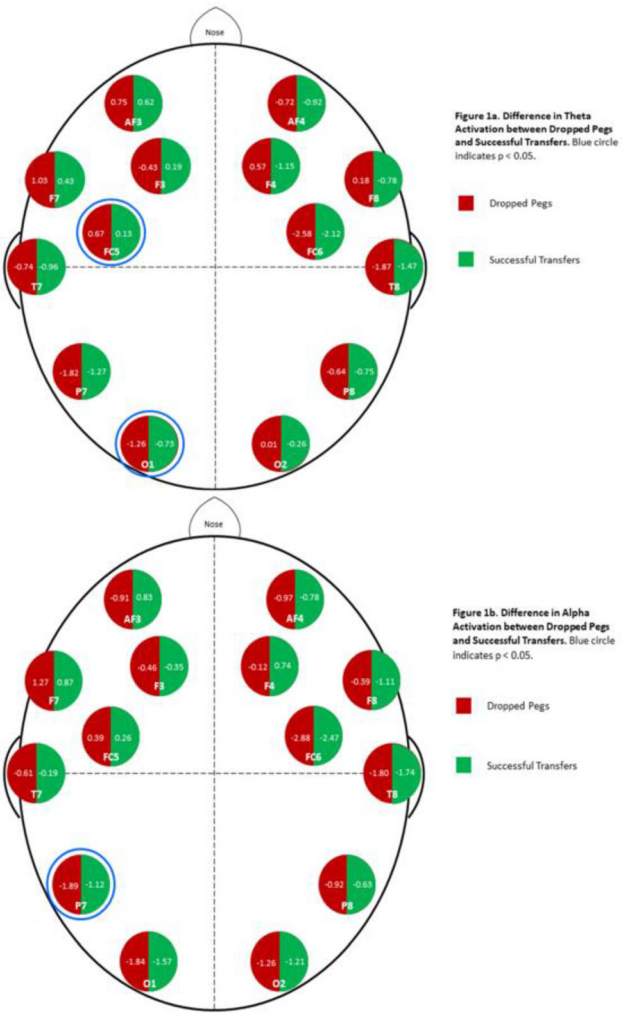


Fig. 1 Differences in cortical activity between drops and successful transfers

P510

We're Talking About Practice: Examining the Shifting Role of FLS in Surgical Education

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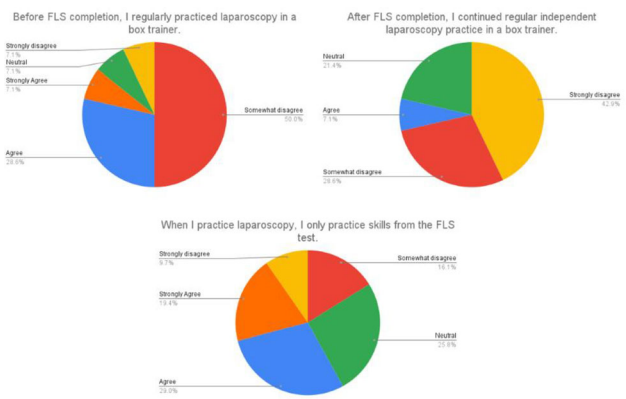
Background: In 2004, the Society of Gastrointestinal and Endoscopic Surgeons launched the Fundamentals of Laparoscopic Surgery (FLS) program to ensure surgeons had the minimum knowledge, judgment, and technical skills required to perform basic laparoscopic operations. In 2009, FLS completion became a requirement for board eligibility per the American Board of Surgery. Since FLS's implementation, the rates of laparoscopic surgery have been on the rise, and its role as a summative assessment has changed as programs are introducing FLS testing earlier in residency. While advanced skills have been suggested as an extension of FLS, none have been universally adopted. We hypothesize that surgical trainees only practice laparoscopy in a box trainer to complete FLS and seek to define the relationship of FLS and attitudes towards the independent practice of laparoscopy in general surgery trainees.
Methods: A survey was distributed to three general surgery residency programs. It utilized questions with five-point Likert, nominal, and ratio scales to collect data on the frequency of independent laparoscopy practice before and after FLS completion, opinions on FLS skills, and its use for preparing for operative cases. The primary data analysis focused on the response rate of answer choices.
Results: Thirty residents responded to the survey, of which 46.7% (14) have passed the FLS exam. Approximately a third of residents who completed FLS state they regularly practiced laparoscopy before FLS completion (28.6% agree, 7.1% strongly agree). However, that number decreased to 7.1% after FLS completion (7.1% agree, 0% strongly agree). Over half of the residents only practice skills from the FLS skills test (20% strongly agree, 30% agree, 26.7% neutral), while less than a quarter say they practice additional skills (13.3% somewhat disagree, 10% strongly disagree). Only a third (33.3%) agree that FLS skills are transferable to complex laparoscopy cases, and 10% practice laparoscopy in preparation for complex operative cases.
Conclusions: Simulated laparoscopic practice drops off significantly after completion of FLS and the majority of residents only engage in practice using skills tested in FLS. While FLS still fulfills its intended role of ensuring safe practice, it has come to serve the role as the main driver of independent laparoscopic practice for many general surgery residents. An emphasis on self-directed learning and expanded laparoscopic skills taught in simulation could increase time spent practicing and more easily transfer skills to the operating room.



P511

Fundamentals of Endoscopic Surgery Program for Low- and Middle-Income Countries- A Pilot Randomized Control Trial in Nigeria

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Introduction- We hypothesize that a locally designed and sustainably produced low-fidelity (LF) colonoscopy simulator is as effective as a high-fidelity (HF) simulator in acquiring the skills required to perform a colonoscopy. This type of simulator may be incorporated into the training of medical practitioners of varying experience and lead to an increase in the local endoscopic capacity in Nigeria.
Methods and Procedures- This randomized control trial was conducted as part of a colonoscopy training program designed to build endoscopic capacity in Nigeria. The program consisted of a nine-week online lecture series and an in-person four-day colonoscopy training workshop. The participants were surgeons, surgical residents and gastroenterologists of varying levels of experience. The participants' knowledge was assessed with a pre- and post-course exam. Their confidence level in performing colonoscopies was also assessed before and after training by a self-designed tool. Participants were blindly randomized 1:1 to use either a HF or LF simulator. Their performance at baseline, after training using their assigned model, and afterwards on patients was assessed using the Mayo Colonoscopy Skills Assessment Tool (MCSAT) and the Global Assessment of Gastrointestinal Endoscopic Skills (GAGES) tool. The primary outcome was the difference in scores between the two groups after training. Secondary outcomes were changes in online exam scores and the confidence level of the participants.
Results- There were 19 participants enrolled in the program out of 40 that applied with one dropout. There was no statistically significant difference between the two groups in the performance scores when a colonoscopy was done on patients after training on their assigned models. For the LF model, there was a statistically significant improvement in the GAGES overall assessment score from a median of 9(9.0–17.5) to 20(15–20.0) $p = 0.027$ and a trend towards improvement in specific skills. For the HF model, there was no statistically significant difference in the performance measures on either tool after training. There was a significant increase in the pre and post-test scores of the online lecture series from a mean of 27.5($\pm$ 5.5) to 34.5($\pm$ 4.0) $p < 0.001$. The training program led to an improvement in the confidence of the participants in performing colonoscopies with an average doubling of scores ($p = 0.001$).
Conclusion- This trial demonstrated that training on HF versus LF model results in similar test scores and can improve the skills needed to perform a colonoscopy. This inexpensive model can be used to facilitate colonoscopy training in LMICs.

P512

Augmenting Surgical Skill Training and Retention Through Simulation: A Low Anterior Resection Model

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Introduction: Graduate medical education is transitioning from a milestone-based to a competency-based model for residency training. Using surgical staplers is a core skill needed for surgical residents to be proficient in colorectal operations. We designed a curriculum to augment resident experience and confidence on end-to-end anastomosis (EEA) in a low anterior resection model (LAR). Technical skills in surgery can be taught and assessed in a simulated setting.
Methods: We conducted a needs assessment at Rush University to determine the need for a reproducible and accessible curriculum focused on surgical stapler use. The curriculum included a pre-simulation web-based cognitive component, pre-post self-confidence questionnaires regarding the use of staplers, and an inanimate LAR model simulation. Three board certified colorectal surgeons established expert-level benchmarks and underwent rater training prior to data collection to minimize rater bias. Faculty evaluated performance by using a modified Global Operative Assessment of Laparoscopic Skills (GOALS) and a modified procedure specific evaluation (PSE). We established an ideal completion time of 15 min. The study recruited surgery residents in postgraduate years (PGY) divided into a novice (PGY 1–2), and an intermediate group (PGY 3–5), to complete an initial session and a 3-month long-term retention session. We evaluated confidence with the Wilcoxon signed-rank test. The Institutional Review Board approved the study.
Results: Fifteen novice residents and eleven intermediate residents completed the entire curriculum, with one intermediate resident not completing the retention session. Significant differences existed between novice and intermediates' experience with the staplers. A significant increase in novices' and intermediates' confidence existed in all measured domains for use of the TA and EEA staplers, and for completing the procedure independently ($p < 0.05$). The intermediate group saw a significant improvement in overall performance (GOALS), while novices saw a significant improvement in ability to complete the simulation without direction (PSE) ($p < 0.05$). Intermediates reported a significantly higher satisfaction with the simulation and preparedness for clinical practice ($p < 0.05$).
Conclusions: Both novice and intermediate groups showed a statistically significant improvement in confidence, overall performance, and ability to complete the procedure independently. A LAR model provides trainees with early exposure to commonly used staplers in a simulated environment that will possibly increase resident preparedness for the operating room. We believe this curriculum should be considered for implementation in surgical education.

P513

Bridging Simulation and Practice: Our Experience of Designing and Implementing a Curriculum for Educating Medical Students as Robotic Surgery Bedside Assistants

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Introduction: Medical students often have a limited role in robotic surgery procedures, which creates an unmotivating learning environment. Identifying level-appropriate, hands-on opportunities in the operating room (OR) can enhance their educational experience. We aim to share our early experience designing and implementing a curriculum to educate medical students as robotic bedside assistants.
Methods: We offered the curriculum to fourth-year medical students completing a surgical sub-internship over a three-month period. Training consisted of approximately two hours of Intuitive Surgical videos covering the role of a bedside assistant and the robotic system. This was followed by a four-hour hands-on simulation session led by general surgery residents, and concluded with a one-hour proficiency demonstration. Students demonstrated proficiency on the tasks of a basic bedside assistant prior to performing the role in the OR.[1] We assigned students to robotic cases across surgical divisions for 4–6 weeks, starting with supervised cases and progressing to greater autonomy. Weekly questionnaires captured the number of cases attended, tasks performed, and challenges faced. At the end of the rotation, students participated in semi-structured interviews. We used directed content analysis to code the interviews and to identify themes.
Results: Eight medical students enrolled in the curriculum, and participated on five surgical services: general surgery, bariatrics, colorectal, surgical oncology, and thoracic surgery. Each student served as a bedside assistant for a median of nine robotic cases (range: 4–24) during their rotations. Students performed all tasks considered essential for basic bedside assistants.[1] Seven medical students participated in interviews at the end of their rotation, from which we identified five main themes: (1) appreciation for collaboration within a multidisciplinary OR team; (2) valuation of diverse learning methods including simulation, hands-on experience, and repetition; (3) focus on professional development by acquiring skills for residency, developing surgeon identity, and strengthening residency applications; (4) educational benefits of the robotic curriculum including autonomy, active defined role, and exposure to diverse cases; and (5) challenges in learning and implementation, such as difficulties with laparoscopic tasks, staff hesitancy, and ensuring opportunities for multiple learners.
Conclusion: We designed and implemented a curriculum to educate medical students as robotic surgery bedside assistants, enabling them to be active learners in the OR. Preliminary data supports that this curriculum enhances students' perceptions of robotic surgery by promoting an active role and fostering team integration, with some room for improvement. This curriculum addresses key challenges in robotic surgery by providing hands-on skills and invaluable OR experience.

References

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P514

Development and Initial Validation of a Skills Suturing Score - Essential Suturing Skills

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Introduction: Suturing skills are paramount for all surgeons. To date, there is no unified validated score that correlates with basic suturing abilities. We sought to develop and validate a score (Essential Suturing Skills – ESS), based on suturing tasks in synthetic materials, in order to evaluate basic suturing performance.
Methods and Procedures: The ESS testing comprises two exercises. The applicant performs seven simple interrupted stitches in a dedicated foam base and follows with a running suture in a carpet-like material (seven throws). The time to perform the sutures and the surgical skills were compiled and combined through a novel mathematical equation, thus generating the ESS score. Fourth-year medical students were evaluated early in a cycle and in the end of the semester, after approximately 30 h of supervised training in a suture skills lab. Professors of surgery performed the ESS tasks and served as control group. The evaluations of the students were blinded. The data was analyzed using mean and standard deviation and the discrimination validity of the ESS score were tested using paired t test. In the ESS score, a lower number indicates a better performance.
Results: Sixty-two medical students (43 females) and six professors have performed the ESS. The mean ESS score of the professors was 3,48 ($\pm$ 0.96). The students had a 9,15 ($\pm$ 2.10) ESS score before training and a 6,29 ($\pm$ 0.98) after 30 h of training. The differences between the professors and students both before training ($p < 0.001$) and after training were statistically significant ($p < 0.001$). The improvement of the ESS score of the students after training was also significant ($p < 0{,}001$). Each evaluation took about 20 min to be completed.
Conclusion: In this pilot validation study, the ESS score correlated well with suturing performance for medical students, with excellent discrimination validity. It is low cost and simple to perform and evaluate. It can prove a useful tool in help teaching basic suturing skills for medical students and junior residents.

P515

Assessment of a Spinal Support System to Reduce Surgeon Lumbar Strain in the OR: Prototype and Preliminary Results

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Introduction: In the last 20 years the prevalence of degenerative cervical spine disease (DCSD) and degenerative lumbar spine disease (DLSD) among doctors, increased by 18% and 27%, while 17% of surgeons suffer from DCSD and 19% from DLSD, leading to burnout and premature retirement. Recent publications have shown that occupational injury costs hospitals $190 billion in liability and lost income, and $100 billion in treatment of these injuries, annually.
In our study we designed a spinal support harness prototype, that is compact, affordable, wearable in the OR and provides a significant reduction on the strain in the lower back.
Methods: Our conceptual design focused on transferring the weight bearing from the lower-back, to the feet. For physical prototyping we used a shoulder back harness, ankle straps, 2.08 m 25 N/m rubber band made of 50% synthetic rubber and 50% natural latex, 80 × 8 mm steel carabiners and 50 mm metal D rings. All components were purchased individually, modified and assembled into a spinal support harness. The shoulder-back harness was connected via rubber bands to ankle straps, designed to be worn on the back and comfortably fit under surgical scrubs. The device was tested by 4 surgeons suffering from lower-back pain, over a 30-day period. The rubber bands were adjusted according to the height of the surgeons to ensure proper support.
Results: Total cost amounted to 50.04 USD/device. Our preliminary data indicated high satisfaction among the surgeons who tested the device, reporting significant lower-back pain reduction. Additionally, the ability to maintain a slightly inclined position throughout the operation, contributed to a reduction in cervical pain associated with a straight neck posture. The device was well-tolerated and demonstrated a high level of comfort and movement during use.
Conclusion: The low cost, ease of production, comfort, and suitability for use in the OR make our device a strong candidate for enhancing surgical ergonomics.
Further investigation is required to enhance the design and materials, which will then be evaluated in an experimental biomechanics laboratory to assess their effectiveness in reducing strain.

P516

Questionnaire Based Survey of Musculoskeletal Dysfunction Among General Surgeons of India

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Introduction: Intraoperative muscle stress during laparoscopic surgery may lead to the development of musculoskeletal disorders among surgeons. Prolonged surgeries and poor ergonomics may increase the risk for the operating surgeon. This questionnaire-based study was conducted to estimate the prevalence of musculoskeletal disorders among surgeons in India.
Materials and Methods: This prospective questionnaire-based study was conducted in the Department of Surgical Disciplines, All India Institute of Medical Sciences, New Delhi between March 2021 and September 2022. We developed a Musculoskeletal Dysfunction questionnaire following standard guidelines and surveyed among more than 2000 general surgeons in India via Email and social media for musculoskeletal symptoms.
Results: The response rate for the questionnaire was 11.2%. The prevalence of musculoskeletal disorders was 96% among the surgeons who perform laparoscopic surgery. The majority of the surgeons were male (91%) with a mean age of 45.8 years. Seventy-one percent of the surgeons performed both open and laparoscopic surgery and the majority were right-handed. Half of the surgeons reported a pre-existing history of musculoskeletal disorder which increases in severity following laparoscopic procedure. Musculoskeletal symptoms increase with the percentage of laparoscopic work (p-value 0.011) and pre-existing musculoskeletal disorders increases in severity due to laparoscopy (p-value 0.002). The most frequent symptoms perceived were hand/wrist pain/stiffness, leg pain, neck pain, and back pain and associated with long duration of procedures. Most of the surgeons neglect their symptoms and do not seek any treatment.
Conclusion: The musculoskeletal problem is a real occupational hazard among minimal-access surgeons and is almost universally reported by all practicing surgeons. The musculoskeletal dysfunction is directly proportional to the amount of laparoscopic work and there is a worsening of preexisting musculoskeletal dysfunction.

P517

Historical Survey of Ergonomic Improvements in Medical Engineering for Endoscopic Surgery

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Background and Objectives: Endoscopic surgery, which requires surgical procedure under two-dimensional imaging in a small working space, put a lot of strain on the surgeon in early days. To solve these problems, advances have been made in the medical engineering. Ergonomic progress and challenges of equipment since the inception of endoscopic surgery were investigated in this study.
Materials and Methods: This study conducted a historical survey of products and published literature regarding ergonomic issues of medical technology and equipment in endoscopic surgery, and analyzed the achievements and problems of medical equipment from ergonomic perspective.
Results: In the field of medical imaging, improved quality of the endoscopic imaging and the preoperative simulation system that constructs three-dimensional images from CT images has been put to practical use. Intraoperative navigation system using Augmented Reality, which integrates preoperative images and actual endoscopic images, has also been put to practical use. These advances had contributed to the safety and speed of surgery. However, the issue of eye fatigue caused by wearing a head mounted display and 3-D imaging remains to be resolved. Development and progress of energy devices and stapling devices for endoscopic surgery has eliminated the need for manual ligation and hemostasis, contributing to reducing the burden on surgeons. On the other hand, ergonomic strain remains with conventional small caliber forceps and scissors. As a result, muscle fatigue of surgeons remains. The emergence of surgical robots expanded the freedom of surgical operation by the improvement of multi-degree-of-freedoms forceps. Also, surgical robot has made it easier for surgeons to operate from the chair. These improvements had greatly reduced surgeon's fatigue. Ergonomic issues to resolved include the complexity and human resources for set up, system connection, docking and undocking of the patient carts, and the workload associated with cleaning and sterilizing of reusable devices.
Conclusion: Thirty-five years have passed since the start of endoscopic surgery, and the burden on surgeons has been steadily reduced through the development of various surgical technology and devices. However, further ergonomic improvement is needed in the design of conventional forceps and workload of OR staffs.

P518

Canadian Portrait of Ergonomics in Bariatric Surgery

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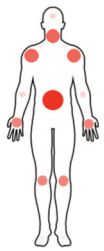
Introduction: Proper ergonomics is crucial for surgeons in the operating room to reduce the risk of musculoskeletal injuries (MSI) and other associated consequences. Laparoscopic surgery performed on patients with high body mass indexes (BMI) is associated with an increase in non-neutral postures and a higher risk of developing MSIs in laparoscopic models [1]. The aim of this study is to establish the prevalence of MSIs and identify the risk factors associated with such injuries amongst bariatric surgeons in Canada.
Methods and Procedures: This cross-sectional study is based on a researcher-administered questionnaire conducted using a videoconference platform with bariatric surgeons across Canada. A comprehensive questionnaire was created following a systematic search of the current literature on ergonomics in bariatric and minimally invasive surgery and through focus groups. A combination of quantitative and qualitative data was collected. The majority (117) of surgeons with a dedicated bariatric practice in Canada were initially contacted through email.
A logistic regression analysis was performed to assess the influence of multiple quantitative variables on the presence or absence of MSI. Inductive thematic analysis was used to analyze the qualitative data, which was then described in proportions to illustrate their relative importance.
Results: A total of 31 bariatric surgeons were interviewed. 61,3% of participants reported experiencing chronic musculoskeletal pain. Of those, 57,9% sought treatment for their injuries. The three most common complaints were lumbar spine, cervical spine and shoulder injuries. More than one quarter of the participants experienced chronic lower back pain.

Figure 1
Type and frequency of musculoskeletal injuries

Site of MSI	Frequency (N)	Prevalence (%)
Lumbar spine	8	25,8
Cervical spine	5	16,1
Shoulders	5	16,1
Knees	4	12,9
Hands	4	12,9
Elbows	2	6,5
Migraines	2	6,5
Feet	1	3,2
Clavicle	1	3,2



Qualitative data analysis revealed the importance of teaching proper ergonomics to residents and fellows, which was the most discussed theme, by 42% of participants. 85% of surgeons mentioned they did not have proper ergonomics education or knowledge. 87% of responders perceived a lack of institutional support towards ergonomics.
Conclusion: MSIs are very prevalent amongst bariatric surgeons in Canada, affecting 61,3%. The results of this study may encourage bariatric surgeons and surgical trainees to pursue additional education in ergonomics and assistive technology. Future research should focus on the benefit of allocating more resources towards ergonomics and the impact of the robotic platform in bariatric surgery.

P519

Evaluation of Ergonomics and Surgeon's Stress Levels During Robotic Assisted Minimally Invasive Surgery Using a New Hybrid Robot (Dexter)

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Background: Although often forgotten and underestimated, especially in a surgical work environment, ergonomics are essential for endurance, efficiency and a long and healthy work life. While many ergonomic challenges faced in open and laparoscopic surgery have been overcome by robotic surgery, new challenges have been created. Nationwide and international guidelines for implementation of an

ergonomic workspace are currently lacking. This study aims to identify ergonomic characteristics of a new hybrid robotic system during a standardized procedure to lay the foundation for a healthy workspace.

Methods: Measurements were performed during a real-life case of a robotic cholecystectomy performed by an experienced robotic surgeon. A video camera was used to capture the surgeon at the console during surgery and is positioned in a 90° angle towards the surgeon so that the armrest of the console and the optimal position of the forearms are horizontal in the image (Fig. 1). For evaluation of the images, axes are placed through the joints of the surgeon and corresponding angles are calculated based on the position of the individual axes in relation to each other and compared to recommendations for a healthy workspace. To evaluate the objective stress level of the surgeon the heart rate variability (HRV) was measured using a chest strap and analyzed using specific scientific software. Furthermore, sound level measurement was performed to evaluate the noise level in the OR. Data was further correlated with the intraoperative course and surgical performance.

Results: $N = 2$ robotic cholecystectomies performed by the same experienced surgeon were measured. Mean sound level was 63.5dB for the first case (range 57.5 dB–77.3 dB) and a mean of 61.2 dB for the second case (range 55.3 dB–82 dB). Correlation of console versus non console time is showcased in Fig. 2. Mean posture during both procedures in correlation to recommendations for a safe workplace are shown in Table 1. Mean heartrate, HRV and stress indices are shown in Table 2. Furthermore, Fig. 3 shows the correlation of heart rate and the intraoperative course.

Conclusion: A variety of different robotic systems do not only offer a variety of technical features and advantages but also differ in ergonomic requirements. The neck can be identified as an area of need for improvement for most systems. Future studies, especially in a randomized controlled fashion need to be performed to further analyze ergonomic features of the different systems and guidelines displaying the variety of systems need to be implemented to create a healthy and safe workplace.

Table 1: Posture of the surgeon during robotic cholecystectomy compared to recommendations for a safe workplace.

	Posture						
	Knee	**Hip**	**Shoulder**	**Neck**	**Elbow**	**Back**	**Forearm**
Mean (°)	117.8	102.3	45.3	33.3	119.6	1.5	14.1
Median (°)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Range (°)	110.8 – 124.8	98.1 – 106.5	43.5 – 47	32.2 – 34.4	113.1 – 126.1	1.1 – 2	8.9 – 19.3
	Knee	**Hip**	**Shoulder**	**Neck**	**Elbow**	**Back**	**Forearm**
Recommendation (°)	≥ 90	110-120	N/A	10-15	≥ 90	0-10	N/A
Within recommendation	Yes	No	N/A	No	Yes	Yes	N/A

Table 2: Measurement of heart rate and stress indices during robotic cholecystectomy.

	Surgery 1	Surgery 2
Heart rate	103	103
Minimum Heart rate	68	79
Maximum Heart rate	136	124
PNS* index	2	-2.19
SNS* index	1.89	2.92
Stress index	7.5	11.9

*PNS – parasympathetic nervous system, SNS – sympathetic nervous system

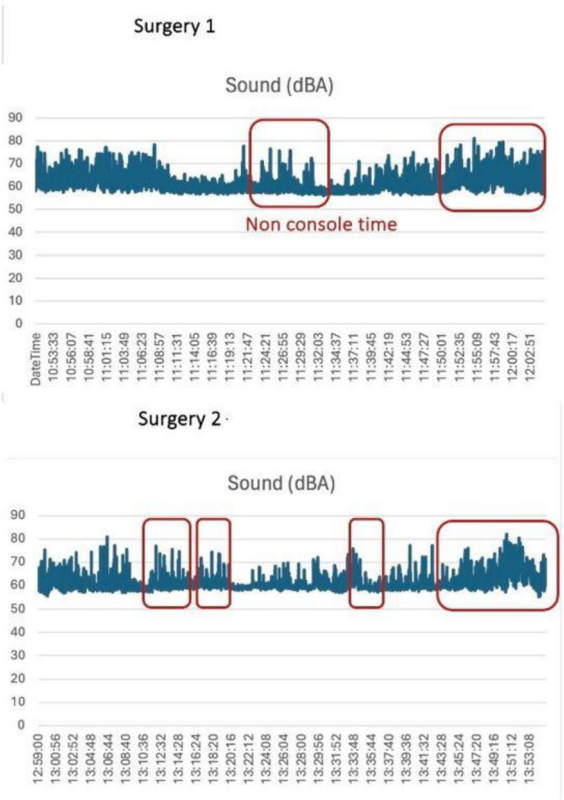

Figure 2: Comparison of sound level during console and non-console time.

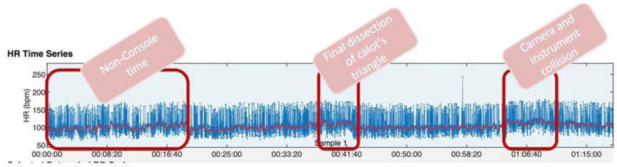

Figure 3: Correlation of heart rate with the intraoperative course. An elevated hear rate was observed during non-console time, final dissection of the calot's triangle and instrument collision.

P520

Circumferential Endoscopic Submucosal Dissection as a Treatment Option for Superficial Esophageal Squamous Cell Neoplasia: A Retrospective Case Series Study

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Objective of the Study: This study aims to present our experience with circumferential endoscopic submucosal dissection for multifocal esophageal squamous cell neoplasia. Traditionally, esophageal cancer treatment includes esophagectomy, often associated with significant morbidity and mortality. However, endoscopic resection emerged as a successful method for diagnosing and treating esophageal neoplastic lesions. Selected superficial squamous cell carcinoma (SCC) lesions are best addressed with endoscopic submucosal dissection (ESD). Circumferential ESD allows resection of the entire circumference of an esophageal segment en bloc for extensive neoplasia. It has been practiced in Asian countries but has limited experience in the United States.

Methods and Procedures: This is a retrospective case study from a single institution from January 2019 to January 2022 of all patients undergoing circumferential ESD for squamous neoplasia. Our institutional review board approved this study. Patients had at least squamous cell high-grade dysplasia or SCC without evidence of invasion on biopsies. They were counseled on endoscopic and surgical options and managed in a multidisciplinary team approach with a gastroenterologist and thoracic surgeon. ESD was performed with a circumferential distal incision, then proximal circumferential incision, and then a repeated tunnel technique with the aid of traction. Endoscopy to assess healing and perform dilation was planned a month post-ESD followed by surveillance endoscopy.

Results: Four patients (mean age 71.8 years (range 57–79), gender 1 F) were included. All patients had extensive alcohol (1), smoking (2) history, or both (1). Surgery was not optimal due to comorbidities (2), gastric bypass anatomy (1), or advanced age (1). All patients underwent successful circumferential ESD. Intralesional steroids post-resection were administered in 2 patients. R0 resection was achieved in all cases. Resection pathology was multifocal HGD in 1, SCC staged T1a m3 in 1, and SCC staged T1b Sm1 in 2. An average of 2 dilations (range 1–4) were performed after ESD. One patient discontinued surveillance due to comorbidities. Of the three patients in surveillance, one patient had evidence of recurrence with focal high-grade squamous dysplasia at 52 months post-ESD for which a repeat ESD was successfully performed. The other two patients without evidence of recurrence over follow-up.

Conclusions: Endoscopic submucosal dissection as a safe and feasible option performed by experienced endoscopists. We demonstrate our experience for this esophagus sparing approach for patients with superficial esophageal squamous neoplasia in a multidisciplinary approach. Surveillance is critical to address any synchronous or metachronous lesions.

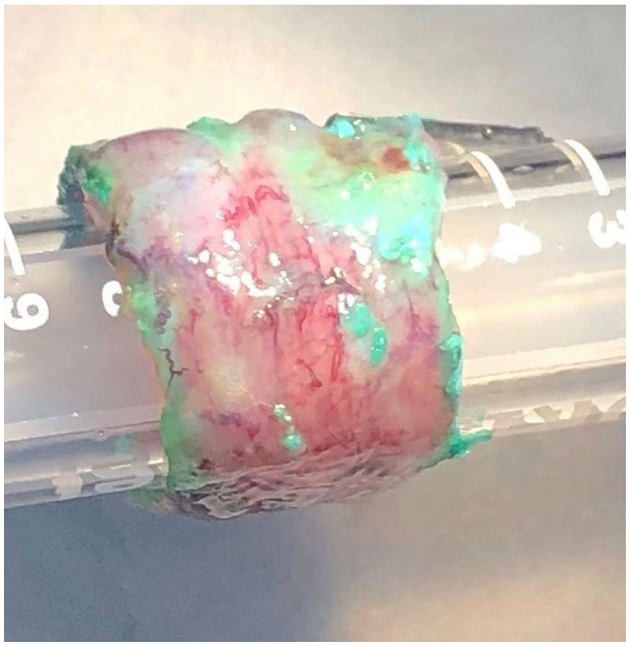

Fig. 1 Tubular en-block circumferential ESD specimen

P522

Current Availability Issues of Reusable Therapeutic Gastroscopes

Mark Gromski, MD[1]; David Hoffman, MSPH, MBA[2]; Christina Cool, MPH[2]; Andrew Storm, MD[3]; [1]Indiana University Health; [2]Ambu USA; [3]Mayo Clinic

Introduction: Therapeutic gastroscope availability is a prevalent issue that can result in delays and disruptions to critical care in endoscopy suites, operating rooms, and intensive care units. If left unresolved, availability of potentially life-saving care may be limited. Over the past decade, single-use endoscopes have shown promise in reducing procedural delays and disruption, given they forgo time consuming reprocessing and the need to be sent out for repairs. The purpose of this study was to better understand the frequency and common causes of delays due to lack of therapeutic gastroscope availability and the potential impact of single-use therapeutic gastroscopes.

Methods and Procedures: Following a study examining the performance of a novel single-use therapeutic gastroscope (SUTG), ten physicians at five large university hospitals across the United States completed a survey that included questions on endoscope-related delays and availability. Data collection occurred from April through June 2024.

Results: The survey highlighted that 89% ($n = 9$) of the physicians surveyed experience procedural delays due to therapeutic gastroscope availability at least once a month, with 11% experiencing availability related delays weekly and 11% experiencing them daily. The most common reasons for delay were: endoscope reprocessing (67%) and the scope being out for repairs (44%). Additionally, 80% confidently believe SUTGs would allow them to treat patients more efficiently than reusable therapeutic gastroscopes given their increased availability.

Table 1. Frequency of and Reasons for Delays	
Frequency of Delays	**Proportion**
Daily	11%
Weekly	11%
Monthly	67%
Never	11%
Reason for delay	
Scope being reprocessed	78.78%
Scope out for repair	44.44%
Scope damaged/broken	11.11%
Scope being used by another provider	11.11%

Conclusion: Nearly 90% of the physicians surveyed have experienced delays due to lack of therapeutic gastroscope availability, with 22% noting it occurs more than monthly. Given that SUTGs avoid reprocessing, outage for repair, use in other departments, and damage since they are only used once, utilizing them may help healthcare facilities see a decrease in availability-related delays and disruptions. Finally, 80% of the respondents agreed that SUTG would help them treat patients more efficiently, indicating that their impact goes beyond increasing availability and access.

P523

Differences in Occurrence of GERD by Sex Following Esophageal per Oral Endoscopic Myotomy

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Introduction: Esophageal Per Oral Endoscopic Myotomy (POEM) is a minimally invasive procedure that has significantly advanced the treatment of esophageal motility disorders, particularly achalasia. However, the incidence of iatrogenic GERD post-POEM is a significant concern, with prevalence estimates ranging from 40 to 50%. There has been an effort to identify preoperative risk factors for developing clinically significant post-POEM GERD, such as obesity. Female sex is known to be a risk factor for higher rates of non-erosive GERD in the general population. Our study aimed to determine differences in occurrence of symptomatic GERD postoperatively between men and women who underwent E-POEM by utilizing quality of life questionnaires.
Methods and Procedures: A retrospective analysis of patients who had undergone E-POEM by a single surgeon at a large academic institution from 2022 to present was performed. Patients were administered questionnaires preoperatively and postoperatively that included GERD Health-Related Quality of Life, Reflux Symptom Index, and Eckardt scoring systems. Patients were divided into two groups by sex and analyzed. Primary outcome was incidence of GERD based on postoperative survey (GERD HRQL and RSI) scores within the first 12 months. Secondary outcome was decrease in Eckardt scores. Analysis included two-sample *t*-tests with $p < 0.05$ considered significant.
Results: 19 patients were included in analysis. 9 patients were female and 10 were male. Female patients were older than male patients (56.3 v. 51.4, $p = 0.60$) and had higher BMI (34.7 v 28.5, $p = 0.09$). Overall, patients of both sexes had low postoperative GERD-HRQL and RSI scores within the first 12 months. The mean female GERD HRQL was 5 and male was 4.6 ($p = 0.87$) The mean female RSI was 2.4 while male was 3 ($p = 0.70$). Of note, there was no significant difference in Eckardt Score decrease between sexes; scores decreased by an average of 4.4 points in females and 4.5 points in males ($p = 0.96$).
Conclusions: We found that, on average, patients' GERD and RSI scores were low. Interestingly, we did not find a difference in symptomatic post-POEM GERD rates between males and females. This data suggests that sex may not be a reliable predictor of developing symptoms of GERD after per oral endoscopic myotomy.

P524

Early Experience of Peroral Endoscopic Myotomy (POEM) in an Ambulatory Endoscopy Unit

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Introduction: Achalasia is a rare esophageal motility disorder characterized by impaired peristalsis and lower esophageal sphincter (LES) relaxation due to ganglion cell degeneration. This leads to dysphagia, regurgitation, chest pain, and weight loss. Despite treatment options like pneumatic dilation and laparoscopic Heller myotomy, peroral endoscopic myotomy (POEM) has emerged as a promising minimally invasive approach. POEM offers several advantages, including the preservation of esophageal structures, reducing the risk of postoperative gastroesophageal reflux disease (GERD). This case series report aims to evaluate the surgical technique and outcomes of patients with achalasia undergoing peroral endoscopic myotomy.
Methods: A retrospective descriptive case series study was conducted to analyze data from patients who underwent POEM between 2021 and 2024. Patients with achalasia types I or II, confirmed by barium swallow, manometry, and endoscopy were included. Demographic characteristics, intraoperative variables (operative time, ICU stay, complications), and postoperative outcomes (Eckardt score, recurrence, reflux-induced esophagitis) were collected.
Results: Eleven patients underwent POEM. The mean preoperative Eckardt score was 10.5. Two patients required ICU stay due to bronchoaspiration and intravascular disseminated coagulation. Intraoperative complications included pneumoperitoneum and subcutaneous emphysema in one patient, upper gastrointestinal bleeding in one patient, and an esophago-pleural fistula in one patient. The pneumoperitoneum and subcutaneous emphysema cases were managed with oxygen and needle aspiration. The upper gastrointestinal bleeding was managed endoscopically with clips, and the esophago-pleural fistula was managed with stent placement and Endovac system. The mean postoperative Eckardt score was 2.6 points, and only two patients developed reflux-induced esophagitis. Only one patient required reintervention after one month, given persistence of symptoms who required additional esophageal dilation. The mean follow-up period was 18 to 24 months.
Conclusion: This case series demonstrates the feasibility and safety of POEM in an ambulatory endoscopy unit. POEM offers a minimally invasive and effective treatment option for achalasia, with low complication rates and significant improvement in patient symptoms. Further studies are needed to evaluate the long-term outcomes of POEM and to compare it with other treatment modalities for achalasia.

P525

Initial Performance and Procedure Preference for Single-Use Therapeutic Gastroscopes

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Introduction: Across endoscopy, single-use endoscopes have demonstrated numerous benefits for healthcare facilities, physicians, and patients such as eliminating costly repairs, reducing endoscope-related infections and readmissions, and increasing ease of access for emergent cases. With the release of the first single-use therapeutic gastroscope (SUTG) (4.2 mm working channel) in June 2024, understanding its potential impact on care is critical. This survey aimed to assess the potential benefits of SUTGs in addressing specific procedures and patient populations.
Methods and Procedures: Following the completion of thirty-two procedures at five hospitals across the United States from April to June 2024 with a SUTG, ten gastroenterologists completed a survey which included questions related to SUTG availability, preference, and potential uses.
Results: 94% (29/31) of the procedures performed were successful with the SUTG. Insufflation connection issues did not allow for the completion in one case while patient instability did not allow completion in another with either a SUTG or reusable therapeutic gastroscope. Additionally, one case was excluded since the SUTG was used to reach a bleed in the distal duodenum, a location not regularly addressed with therapeutic gastroscopes due to length limitations. After all cases were performed, survey results revealed that SUTGs would be preferred over reusable therapeutic gastroscopes in certain cases such as acute upper GI bleeds for better suction (80%) and emergent procedures after hours (70%).
Conclusion: Procedures were successful using the SUTG in 94% of cases. Post-procedural surveys highlight how the SUTG may impact healthcare providers' abilities to quickly and confidently address certain procedures and patients such as acute upper GI bleeds, after-hour cases, out-of-suite interventions, foreign body removals, and immunocompromised patients. Further research should be completed to better understand the impact that SUTGs may have on clinical outcomes.

P526

Comparative Performance of Reusable and Single-Use Therapeutic Gastroscopes

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Introduction: In June of 2024, the first single-use therapeutic gastroscope (SUTG) (4.2 mm working channel) was brought to market. Given its increased working channel size versus most other therapeutic gastroscopes (3.7 mm), this SUTG has the potential to provide increased suctioning abilities to help facilitate the evacuation of fluids from the upper gastrointestinal tract, maximizing patient safety. To evaluate how this new single-use scope compares to the current standard of care, a survey was conducted of individuals who completed procedures with both reusable and single-use therapeutic gastroscopes.
Methods and Procedures: 10 gastroenterologists completed 32 procedures with a SUTG (4.2 mm) from April to June 2024. Following the completion of all procedures, each physician completed a seven-question survey comparing the SUTG utilized to the reusable therapeutic gastroscope (RTG) they normally use where 1 = much worse, 3 = similar to, and 5 = much better. The Ambu aScope Gastro Large (GL) was utilized.
Results: The SUTG scored higher than the reusable model alternative in all but one measure and significantly higher in five of the seven categories, including overall satisfaction, suction with and without tools inserted, maximum retroflexion, and angulation with tools inserted. The SUTG received its highest score in ability to suction with a tool inserted (4.3/5) and received above a 4 out of 5 in ability to suction without tools inserted, maximum retroflexion, and angulation with tools inserted. Overall image quality and scope ergonomics were not found to be significantly different between the two scope types.

Metric	Average Rating Compared to a Reusable Therapeutic Gastroscope 1=Much Worse, 2=Worse, 3=Similar, 4=Better, 5=Much Better	Significance
Overall Satisfaction	3.70	**0.045**
Ability to suction (without tools inserted)	4.10	**0.001**
Ability to suction (with tools inserted)	4.30	**0.000**
Maximum retroflexion	4.11	**0.001**
Angulation with tools inserted	4.00	**0.000**
Overall Image Quality	2.90	0.726
Scope Ergonomics	3.40	0.168

Conclusion: This survey shows that the SUTG rated significantly higher than the RTGs in a majority of the categories measured. For the two categories that the SUTG did not score significantly higher, comparable ratings were reported and should be studied further. These results demonstrate that SUTGs are a viable and highly rated alternative to RTGs.

P527

Emergency Department Presentation Following ERCP in Nova Scotia: High Rebound Rates Related to Progressive Pancreaticobiliary Pathologies Demonstrate the Need for Earlier Palliative Supports in this Population

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Background: Endoscopic retrograde cholangiopancreatography (ERCP) is utilized in the diagnosis and treatment of pathologies affecting the pancreaticobiliary tract. It is a technically challenging procedure associated with complications such as pancreatitis, bleeding, and perforation. To understand local post-procedure outcomes and patient experience, we investigated the rate and reasons for return to the emergency department (ED) following ERCP in Nova Scotia.
Methods: We retrospectively reviewed patients from Nova Scotia central zone sites who underwent ERCP between April 1, 2021 and June 24, 2022 and who presented to ED within 90 days from the procedure. ERCP encounters were identified by Canadian Classification of Health Interventions codes. In-depth chart review was performed on a computer-generated random sample of 200 charts to determine demographic data, reasons for ERCP, reasons for ED presentation, and review of palliative supports if applicable.
Results: 3041 patients underwent ERCP with 1230 (40.5%) presenting to ED within 90 days of the procedure. Of the most recent 200 patients, 39 were excluded from analysis due to incorrect or incomplete records. Results of the chart review indicated ERCPs were performed primarily at a tertiary care center (n = 155;96%, Female n = 85[52.8%], Mean Age = 63.9 + 16.4). One-third of ED visits (n = 54[33.5%]) were due to direct complications from ERCP

including recurrent biliary obstruction/cholangitis (n = 21[13%]), or pancreatitis (n = 12[7.5%]). Most ED visits were unrelated to the ERCP procedure (107, 66.5%), with the most common presentations relating to disease progression, chronic pain, deconditioning or other medical condition relating to an underlying progressive and terminal pathology (41 of 107 [38.7%]). Many of these patients had new diagnosis of pancreaticobiliary pathologies around or at the time of the index ERCP and few of these patients had palliative care team involvement at the time of ED presentation (5 of 41 [12.2%]). After ED presentation, significantly more patients were provided palliative supports (16 of 41 [39%], $p < 0.05$) including pain and symptom management, hospice services, and medical-assistance-in-dying consults.

Conclusions: Patients undergoing ERCP in Nova Scotia have a high rate of return to ED. While a third of presentations are because of procedural complications, most patient presentations are due to progression of underlying incurable diseases. This suggests that earlier involvement from palliative care specialists (i.e. at the time of diagnosis) could alleviate the strain on the ED by preventing their presentation and improve the overall patient experience.

P528

Clinical Success and Rates of Gastrointestinal Reflux Disease with Longer-Term Follow-up for Per-Oral Endoscopic Myotomy Patients in a Single North American Tertiary Care Center

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Background: Per-oral endoscopic myotomy (POEM) is a minimally invasive endoscopic intervention for achalasia and other esophageal motility disorders that has shown initial success as an alternative to Heller myotomy. This procedure has been available since 2008 in Japan, but there is limited long-term data for patients in North America.

Methods: This was a single-institution, retrospective review of consecutive POEM cases performed by a single surgeon-endoscopist team from 06/10/2011 to 07/29/2016. 53 patients were included in this cohort who are now 8 or more years s/p POEM. Of these patients, 51 were diagnosed with achalasia, 1 with nutcracker esophagus, and 1 with esophagogastric junction outflow obstruction (EGJOO). Our chart review focused on post-operative Eckardt scores, recurrent GERD symptoms, persistent proton pump inhibitor (PPI) use and subsequent necessary interventions (i.e. dilations, anti-reflux procedures and esophagectomy).

Results: The median Eckardt score after POEM was 0 with an interquartile range of 0–1. However, over an 8-year period, 20% of patients required at least one balloon dilation. For those who were dilated, the first dilation occurred a mean of 3.3 years after the index operation and the average number of dilations was 1.8. Of note, 1 patient (1.9%) required esophagectomy for achalasia refractory to all other interventions.

64% of patients reported GERD symptoms past their post-operative check in the first month. However, only 41% experienced GERD symptoms at their most recent follow-up visit (range: 4–8 years post procedure). 71% of patients remained on at least intermittent PPI therapy. Only 1 patient (1.9%) required anti-reflux surgery, but an additional 2 patients (3.7%) had significant enough symptoms to warrant referral for consideration of an anti-reflux procedure but never underwent surgery.

Conclusions: POEM remains a durable minimally invasive treatment for achalasia. Long-term concerns about sequelae of GERD must continue to be monitored after POEM. A dilation rate of 20% is concerningly high, although this may reflect cases performed during our initial learning curve.

P529

Use of Glasgow Blatchford Score as a Screening Test for Endoscopy Treatment in a Public Hospital from Mexico

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Introduction: Upper GI hemorrhage is a common indication for endoscopic therapy, in developing countries such as Mexico most public health hospitals have limited resources to perform this kind of treatment which makes critical to identify the patients who will need endoscopic treatment to have an optimal use of the resources.

Methods and Procedures: We performed a retrospective study, we analyzed the clinical history of 115 patients who underwent endoscopy during the year 2023 from which 74 were due to upper GI hemorrhage, we took sex, age, Glasgow Blatchford scores, need of endoscopic treatment and re-bleeding as our main variables. The goal was to compare the GBS in the patients who needed treatment and those who did not, to find a cutoff value in the score to predict the need of endoscopic treatment.

Results: The mean age was 54 years, 28% required endoscopic treatment, the mean GBS for the treatment group was 10.3 while the one who did not was 9. Only 8.1% of patients had a very low risk score ≤ 1, 91% had a high-risk score of ≥ 3 from this group only 30% required endoscopic treatment and 19% had a re-bleeding. The positive predictive value for intervention was 84% in those with a score ≥ 3 with a sensitivity of 31% an specificity of 42%.

Conclusions: According to our results we can conclude that the Glasgow Blatchford score may not be the best tool to classify patients in our population as more than 90% of the cases were in a high-risk position and only a small fraction needed treatment. This encourages us to look for new toll to add or use separately in order to find those patients who may benefit from endoscopic treatment.

P530

Colonoscopy Sedation Practices and Training at General Surgery Residency Programs: A pan-Canadian Survey

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Introduction: Colonoscopy is routinely performed under procedural sedation, to achieve adequate analgesia, anxiolysis and amnesia without cardiorespiratory compromise. Procedural sedation also enhances the quality of colonoscopy, including shorter time to reach the cecum/terminal ileum, improved cecal intubation rate, longer withdrawal times and higher adenoma detection rates. Evidence suggests that current procedural sedation practices for colonoscopy may be suboptimal, related to a lack of formal training. The objective of our study was to evaluate present-day sedation practices at endoscopy units affiliated with general surgery residency programs across Canada, and to determine whether there may be a need for a formal teaching curriculum on procedural sedation.

Methods: We administered a cross-sectional, web-based survey of sedation practices and training for colonoscopy at English-speaking general surgery residency programs across Canada, in accordance with the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). Domains assessed included demographics, procedural sedation training and accreditation of staff endoscopists, sedation practices for colonoscopy and perceptions of various sedation regimes. The survey was distributed by email to the site leads of

endoscopy units affiliated with the 13 English-speaking general surgery residency programs in Canada.
Results: We received a total of 21 responses from 12 programs (92%). No program required formal training in procedural sedation for either staff endoscopists or trainees. Procedural sedation was provided in all units, and 19 (91%) used it in more than 75% of colonoscopies. Sedation was mostly administered by the endoscopist or under their direct supervision (86%), and the most common drug regime was a combination of fentanyl and a benzodiazepine (86%). Anesthetist-administered propofol sedation was reported by three units (14%), all of which were affiliated with the same training program. Reasons for not using alternative drugs such as propofol included lack of training and familiarity, and concerns about safety and side effects.
Discussion: Drugs used for procedural sedation for colonoscopy at general surgery residency programs in Canada seem to be limited by institutional culture, which may be due to a lack of knowledge and experience with alternative drugs and techniques. No training program requires formal training in procedural sedation for either staff endoscopists or trainees. The design and implementation of such a curriculum may serve to appropriately equip providers with the knowledge and skills to allow for tailored, individualized procedural sedation regimens that will add to improved patient satisfaction and colonoscopy quality metrics.

P531

Investigating the Utility of EndoFLIP as a Screening Tool for Pathologic Reflux

John W Keyloun, MD[1]; Andrew Mertz, MD[1]; Bonnie C Carney, PhD[2]; Olaya Gutierrez Brewer, MBBS[1]; Brett C Parker, MD[1]; [1]Johns Hopkins at Sibley Memorial Hospital; [2]Firefighter's Burn and Surgical Research Lab

Introduction: The endoluminal functional lumen imaging probe (Endoflip^{TM}) has become a valuable confirmatory test when other diagnostic testing has proven inconclusive, or when complimentary data is needed to support a diagnosis. Our Heartburn Center protocol includes concomitant Endoflip with wireless pH capsule (Bravo^{TM}) testing at the time of endoscopy (EGD). The updated Lyon Consensus 2.0 considers Los Angeles (LA) grade B esophagitis or greater to be conclusive evidence of gastroesophageal reflux disease (GERD), negating the need for a formal pH study when present. In our experience, patient satisfaction increases in this scenario. Decreased cost, logistical concerns, faster throughput, and sooner resumption of antacids are contributing factors. The aim of this study is to evaluate if Endoflip can predict a positive Bravo pH study.
Methods: This is a single-center retrospective review of patients undergoing placement of a 96-h Bravo pH probe and concomitant Endoflip at the time of the index endoscopy (EGD) between October 2022 and August 2024 by two advanced endoscopists. Included subjects were adults with native gastroesophageal anatomy. Patients with a positive Bravo (Bravo+) were compared to patients with a negative test (Bravo−). The Mann Whitney and Fisher's exact test were used.
Results: This study included 171 patients, and there were 64 Bravo+ and 107 Bravo− patients. The two groups had similar basic demographics including age, and sex. The median BMI was higher in the Bravo+ group (26.3 (23.1–29.6) vs. 24.3 (21.6–27.1), $p < 0.05$). Bravo+ patients were more likely to have LA grade B esophagitis (7.57 vs. 0%, $P < 0.05$) and less likely to have a Hill grade 1 flap valve (9.09% vs. 23.06%, $p < 0.05$). There was no difference in Endoflip balloon diameters or the presence of repetitive antegrade contractions at any fill volume between groups. The distensibility index at 60 mL (DI60) was significantly higher in the Bravo+ group (4 (3.05–5.5) vs. 3.4 (2.7–4.5), $p < 0.05$). Distensibility indices at 50mL (DI50) and 70 mL (DI70) trended towards higher values in the BRAVO+ group (DI50, $p = 0.06$, DI70, $p = 0.17$).
Conclusion: DI60 is significantly higher in BRAVO+ patients. Endoflip may have utility as a screening tool for pathologic reflux. Next steps include identifying DI60 values that serves as a predictive threshold for pathologic reflux, and analyzing patient and clinical factors relevant to screening.

P532

Adult Bochdalek Hernia with Intrathoracic Kidney

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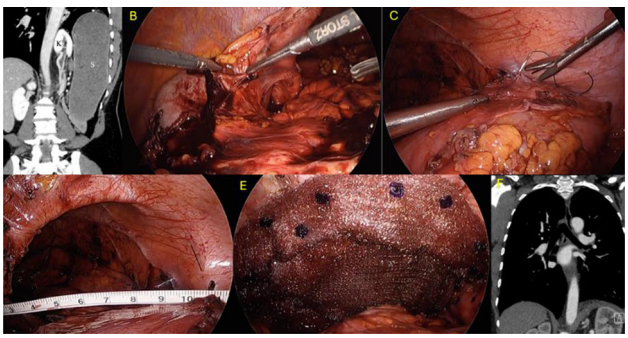

Fig. 1 **A** CT demonstrating a Bochdalek Hernia containing stomach, colon, left kidney, and pancreas. **B** Hernia contents reduced into abdomen. **C** Nephropexy. **D** Hernia defect. **E** Polypropylene mesh sewed into place with continuous barbed 2-0 suture and tacked on the periphery. **F** Six-month postoperative CT demonstrating stability of repair

Introduction: Bochdalek hernia is a type of congenital diaphragmatic hernia in which there is a posterior lateral defect in the diaphragm. It is infrequently seen in adults and rarely is associated with an intrathoracic kidney. Here, we report a laparoscopic repair of a Bochdalek hernia that contained kidney, ureter, pancreas, and colon.
Case: The patient is a 48-year-old woman with a history of fibroids who presented to the emergency department with twelve hours of epigastric pain and nausea. A computed tomography (CT) scan demonstrated a left sided Bochdalek hernia containing left kidney and ureter, pancreatic body and tail, the splenic flexure of the colon, and the obstructed stomach (Fig. 1A). After four days of nasogastric decompression, she underwent laparoscopic reduction and repair. In the operating room she was placed in the right lateral decubitus position. The defect was lateral to the spleen. The descending colon, pancreas, adrenal gland and kidney along with the renal vessels and ureter were mobilized and repositioned into the abdomen (Fig. 1B). To prevent torsion, the left kidney was sutured to the abdominal wall (Fig. 1C). The diaphragmatic defect extended from the muscular portion of the left hemidiaphragm to the posterolateral ribcage (Fig. 1D). A polypropylene mesh with adhesion barrier was sutured to the rim of the defect using continuous 2–0 absorbable barbed suture, placing the suture through an interior ellipse of the mesh to allow an outer layer of mesh overlap with the diaphragm and ribcage. The outer layer of mesh was then tacked to the diaphragm and rib cage (Fig. 1E). The chest was not drained. A six-month postoperative CT showed increased lung volumes and an intact repair (Fig. 1F).

Discussion: Here, we present a rare case of laparoscopic repair of a Bochdalek hernia with intrathoracic kidney. This case raises several points of interest. These include the need to pexy the kidney to reduce the likelihood of torsion, the orientation and fixation of mesh, and whether to drain the dead space in the chest. We achieved a good result, with an intact repair, increased lung volume at six months, and no recurrent symptoms.

P533

Outcomes and Patterns Associated with Hiatal Hernia Repair in MBS Conversion/Revision Cases

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Introduction: Hiatal hernia repairs (HHRs) are increasingly performed in patients undergoing conversion or revision (C/R) metabolic and bariatric surgery (MBS). Despite the rising prevalence of HHRs in this population, its impact on postoperative outcomes remains underexplored. This study sought to investigate factors associated with HHRs in patients underwent C/R-MBS, while also evaluating predictors for HHR development.

Methods: A retrospective analysis was conducted on The MBSAQIP dataset of patients undergoing C/R-MBS between 2020 and 2022. The primary outcome is examining patterns and trends of HHRs, with secondary outcomes including incidence of postoperative complications. Stratified analyses were performed by sex, and BMI (< 50 vs. ≥ 50). Procedural history, C/R-related findings, and patients' demographics were considered. Multivariate logistic regression was used to investigate predictors of HHRs. Statistical significance was set at the level of $p < 0.05$.

Results: A total of 71,737 patients were included, of whom 16,442 (23%) underwent HHR during C/R-MBS. The mean (SD) age for the HHRs group was 49.3 years (10.6) with a mean BMI of 40.5 (8) KG/m^2 when compared to No-HHRs group (48.1 years (10.6), 43.3 kg/m^2 (8.8), respectively $p < 0.001$). The frequency of HHRs steadily increased 2020 to 2022 (22% vs 35%, $p < 0.001$). The majority of HHR patients were female (90.5%) and non-Hispanic (77.9%). The most common performed C/R-procedures were C-RYGB (62%) and C-SG (14.3%). GERD-related findings were strongly associated with HHRs ($p < 0.001$). Index SG had significant association with HHR (OR = 1.45, 95%CI:1.16–1.81, $p < 0.0001$). Postoperative outcomes between the HHR and non-HHR groups showed significant differences in bowel obstruction (1.3% vs 0.8%; $p < 0.001$). Subgroup analysis by BMI revealed no major adverse outcome differences between patients with BMI < 50 and those ≥ 50 ($p > 0.05$), despite minor trends in anastomotic leaks in the higher BMI group (1.1% vs 0.7%, $p = 0.046$), respectively. Additionally, no significant sex disparities in outcomes were observed.

Conclusion: The increasing prevalence of HHR in C/R- MBS does not appear to significantly affect postoperative complication rates, regardless of BMI, sex, or race. However, patients with a history of SG and GERD are more likely to undergo HHRs with minor risk of bowel obstruction and leaks. Future studies should focus on long-term outcomes to further clarify the role of HHRs in C/R-MBS as well as its recurrence rates.

P534

Two Cases of Aortoenteric Fistula Following Foregut Surgery

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Aortoenteric fistula (AEF) is a rare entity with a high mortality rate that presents diagnostic and therapeutic challenges. We report two cases of AEF that were repaired with endovascular intervention.

The first patient was a 63-year-old female with history of distal esophagectomy following complications from a previous paraesophageal hernia repair. She presented with acute onset hematochezia and hematemesis. An esophagogastroduodenoscopy (EGD) found blood in the stomach with no identifiable source. The patient was temporized with a Blakemore tube and resuscitated.

She was taken to the endovascular operating room. Vascular surgery obtained access to the aorta through the femoral artery. The Blakemore tube was deflated during an EGD. Brisk arterial bleeding was noted from an ulceration at the esophagogastric anastomosis. Vascular surgery performed an aortogram which confirmed an AEF. An endovascular stent was placed with complete occlusion of the fistula.

The patient did well for about two years, at which time she required thoracic aortic reconstruction with esophagectomy and diversion following visualization of the aortic stent on EGD. She underwent esophageal reconstruction with colonic interposition about three months later. She is currently doing well 8 years later and describes an excellent quality of life.

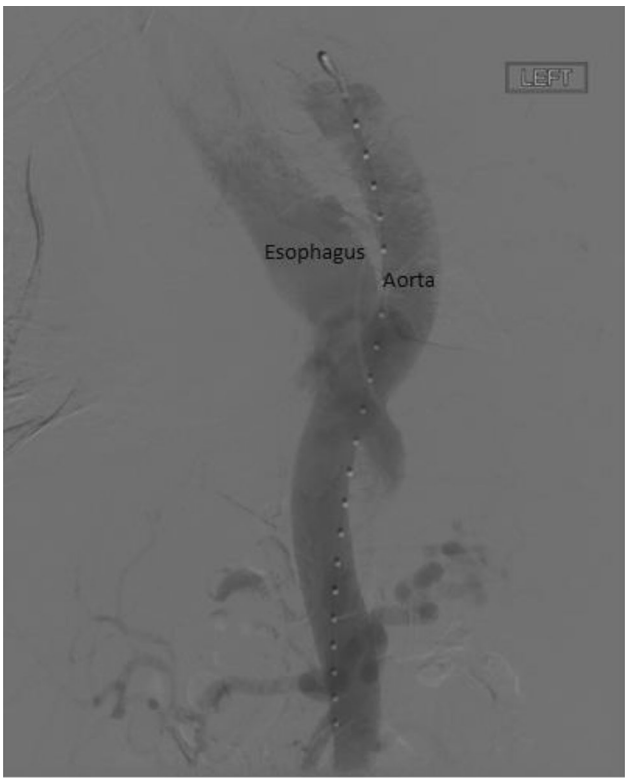

Fig. 1 Aortogram demonstrating AEF

The second patient is a 41-year-old male with a history of Nissen fundoplication for medically refractory GERD at age 17. The patient had a known recurrent hiatal hernia but declined repair. He presented to an outside hospital with syncope and dry heaving. A CT scan

demonstrated a herniated fundoplication and a blood-filled stomach with concern for gastric ischemia and aortogastric fistula. The patient was resuscitated and transferred to our hospital.

Foregut and vascular surgery were consulted. He was taken to the endovascular operating room for emergent laparoscopic takedown of the herniated fundoplication. The fundoplication was reduced except for the adherent posterior stomach overlying the aorta. This tissue was transected, reducing the hernia. There was no immediate bleeding, but with gentle manipulation there was brisk arterial bleeding. He was quickly converted to laparotomy with aortic direct pressure while endovascular access was established via the femoral artery. An aortic stent was placed occluding the fistula. The abdomen was packed open, and the patient underwent definitive paraesophageal hernia repair two days later. The patient was eventually discharged home and with an excellent quality of life now 4 months post operation.

Fig. 2 Aortogastric fistula on CT scan. A: Sagital view. B: Axial view

P535

Gastric Per Oral Endoscopic Myotomy Shows Largest Improvement with Nausea, Retching, and Loss of Appetite

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Introduction - Gastric Per Oral Endoscopic Myotomy (GPOEM) is a procedure used to improve gastroparesis symptoms. Gastroparesis Cardinal Symptom Index (GCSI) is used to assess symptoms subjectively. Although GPOEM has been shown to improve the GCSI score, the individual components of the symptom score have never been evaluated.

Methods and Procedures - A prospective database was retrospectively reviewed for patients undergoing GPOEM for the treatment of gastroparesis between January 2020 and August 2024. The GCSI individually reported nausea, retching, vomiting, stomach fullness, fullness after eating, bloating, and belly visibly larger, each rated on a scale of 0–5. Four-hour gastric emptying studies (GES) were collected.

Results - A total of 133 patients have undergone GPOEM. Postoperative GCSIs were collected at a mean of 2.46 months following GPOEM. Twenty-three patients have both preoperative and postoperative GCSI and GES. All patients showed an improvement in GCSI and GES after GPOEM. Mean GCSI was reduced 11.1 points (8.6, $p < 0.001$), improving from 26.6 (6.7) pre-GPOEM, to 15.4 (9.4) post-GPOEM. Every individual component of the GCSI showed statistically significant improvement. The largest improvement was with nausea ($-$ 1.9, $p < 0.001$), followed by retching ($-$ 1.6, $p < 0.001$) and loss of appetite ($-$ 1.5, $p < 0.001$). Mean GES reduced 30% ($p = 0.005$), improving from 50% pre-GPOEM, to 20% post-GPOEM.

Conclusion - All the GCSI components improved after GPOEM. Nausea, retching, and loss of appetite were the components that improved the most. The GES also showed a significant reduction after GPOEM.

P537

Pseudoachalasia Diagnosed After Three Fundoplications

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Background: Pseudoachalasia, or secondary achalasia, is most commonly associated with malignancy, but it can also result from surgeries involving the gastroesophageal junction. Several cases of pseudoachalasia have been reported following Nissen fundoplication. We present a unique case of pseudoachalasia that developed after an initial Nissen fundoplication, followed by two subsequent redo fundoplications.

Case Presentation: A 30-year-old male initially underwent Nissen fundoplication for GERD. Postoperatively, he developed dysphagia, leading to a redo fundoplication (converted to Toupet) four months later. Despite this, the dysphagia persisted, necessitating another redo fundoplication (converted to Dor) two months after the second procedure. As the symptoms remained unresolved, further evaluation was undertaken.

Barium swallow studies showed equivocal evidence of passage disturbance, and no esophageal dilation was observed. Manometry

confirmed type 1 achalasia, prompting the decision to perform a revisional surgery.

The revisional procedure involved reversing the Dor fundoplication, performing a Heller myotomy, and reconstructing the Dor fundoplication. Postoperatively, the patient's dysphagia completely resolved.

Conclusion: Manometric evaluation is essential in patients with persistent dysphagia after fundoplication. Redo fundoplication combined with esophagomyotomy can be an effective surgical option for these patients.

P538

Assessment of Critical Steps in Hiatal Hernia Repair Using Youtube Videos

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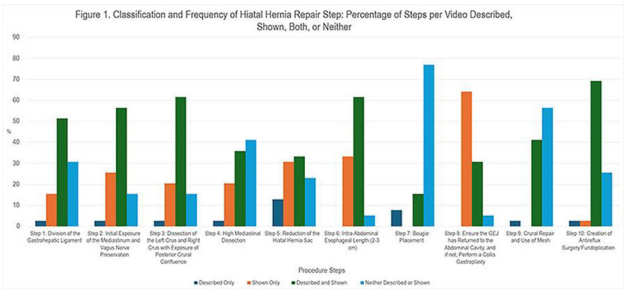
Introduction: The "10 Critical Steps of Hiatal Hernia Repair and Anti-Reflux Surgery" by Tyle et al. was released to provide a framework for standardization of benign foregut operations. This study aimed to determine if currently available educational videos adequately detail these steps.

Methods: We identified hiatal hernia repair and anti-reflux videos using Google that were uploaded between 1/1/2019 to 7/1/2024. Only videos detailing elective, benign foregut surgery on adults and in the English language were included. Two reviewer pairs independently assessed the videos for demonstration and description of the 10 critical steps. The publication date, number of video views, and operative video length were also captured. Data was analyzed using Chi-squared tests and Cohen's kappa for inter-rater reliability.

Results: A total of 52 videos were identified; 39 (75%) videos met inclusion criteria. Adherence to expert-recommended steps was inconsistent. Only 3 (8%) videos described and demonstrated all 10 critical steps. Steps 7 and 9 were most often neither described nor shown (77% and 56%, respectively; Fig. 1), while steps 3, 6, and 10 were the most frequently described and shown (62%, 62%, and 69%, respectively; Fig. 1). Step 8 (64%) was often shown without description (Fig. 1). There was a weak positive correlation between operative video length and number of steps that were both described and shown ($r = 0.24$), and a moderate negative correlation between operative video length and videos that omitted at least one step ($r = -0.4$).

Conclusion: The results of our study highlight the need for standardizing online hiatal hernia repair and anti-reflux surgery educational videos. We recommend updating currently available educational materials to be consistent with expert guidelines.



P539

Evaluating Surgical Outcomes of Hiatal Hernia Repair Techniques With and Without Fundoplication: A Network Meta-analysis

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Introduction: This network meta-analysis evaluated the effectiveness of different hiatal hernia repair techniques—primary repair, absorbable mesh, or non-absorbable mesh—with regard to recurrence, postoperative dysphagia, complications, and the need for reoperation. We hypothesized that mesh reinforcement may reduce recurrence rates but could increase complication rates. Additionally, we posited that fundoplication may reduce recurrence rates but increase dysphagia.

Methods and Procedures: A systematic literature search of PubMed and Scopus was conducted to identify randomized controlled trials (RCTs) evaluating laparoscopic hiatal hernia repair with and without mesh. The primary outcome was recurrence and secondary outcomes were dysphagia, complications, and reoperation. Frequentist network meta-analysis was performed using the netmeta-package in the EZR software. Results were reported using network maps, rankograms with *p*-scores, league tables, and forest plots to compare interventions. Transitivity was assessed for indirect comparisons, the risk of bias in studies was assessed using the Risk of Bias 2 tool, and the confidence in the evidence was evaluated using the CINeMA approach.

Results: Nine RCTs (4 multicenter) published between 2002 and 2020 were included in the analysis. They comprised 815 (73% female) patients with a median age ranging from 60 to 67.5 years and a mean of 91 patients per study. 361 (44.3%) patients underwent primary repair with crural sutures and 454 (55.7%) underwent mesh repair (98 absorbable mesh and 356 non-absorbable mesh). All except 20 patients in the non-absorbable mesh group had concomitant fundoplication. Recurrence was reported in 157 (12.4%) patients, with 21.3% in the primary repair group and 17.6% in the mesh repair group (34.7% absorbable meshes and 12.9% non-absorbable meshes). Network meta-analyses revealed no significant differences between primary and mesh repair in the primary and secondary outcomes. Rankograms showed that non-absorbable mesh repair with fundoplication ranked the best and had the lowest chance of recurrence (*p*-score = 0.764) and dysphagia (*p*-score = 0.727). Absorbable mesh had the lowest chance of complications (*p*-score = 0.9285), while non-absorbable mesh without fundoplication had the lowest chance of reoperation (*p*-score = 0.889). The confidence in evidence on all outcomes was very low.

Conclusions: There were no significant differences in the main outcomes between primary repair and mesh reinforcement techniques. However, non-absorbable mesh combined with fundoplication appeared to provide the best chance of reducing recurrence and dysphagia, while absorbable mesh was associated with fewer postoperative complications. Further randomized controlled trials with long-term follow-up are required to establish clearer guidelines for hiatal hernia repair.

Figure 2. Forest Plots of Network Meta-analysis of the Main Outcomes

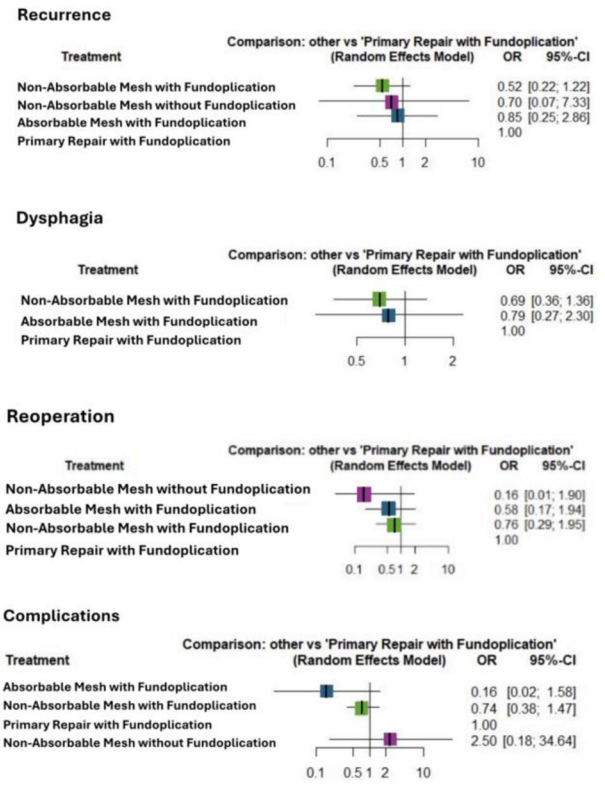


Figure 3. Network Maps of Main Outcomes

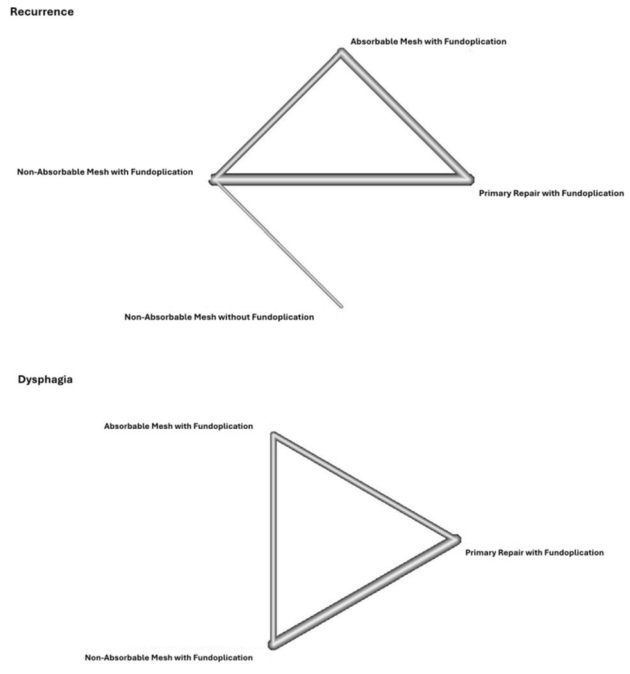


Figure 3 (con'd). Network Maps of Main Outcomes

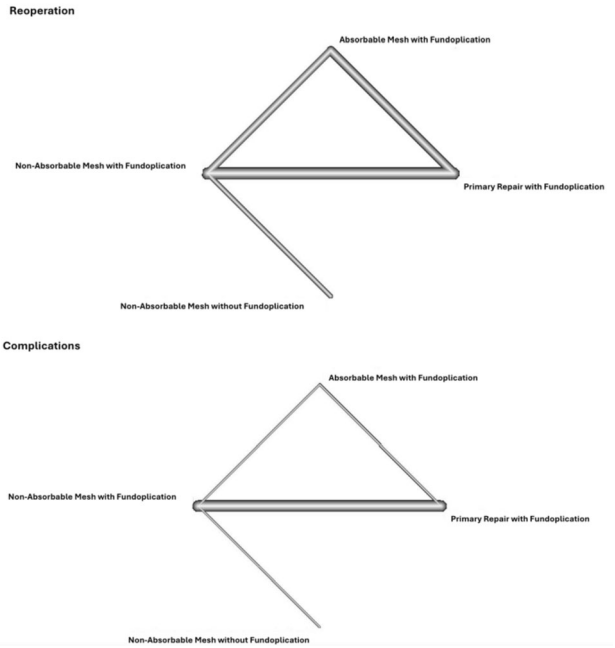


Figure 4: Rank Probabilities of Best Intervention for the Main Outcomes

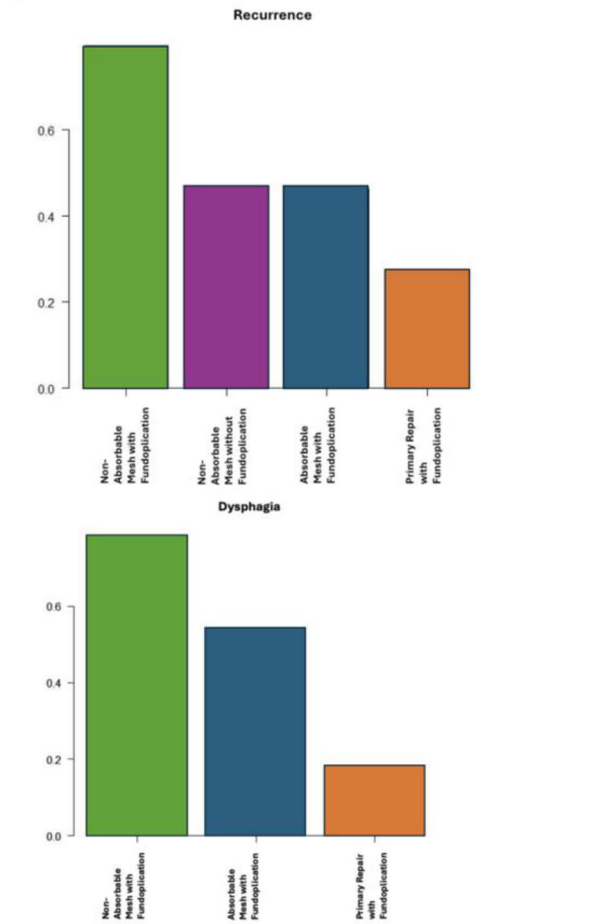
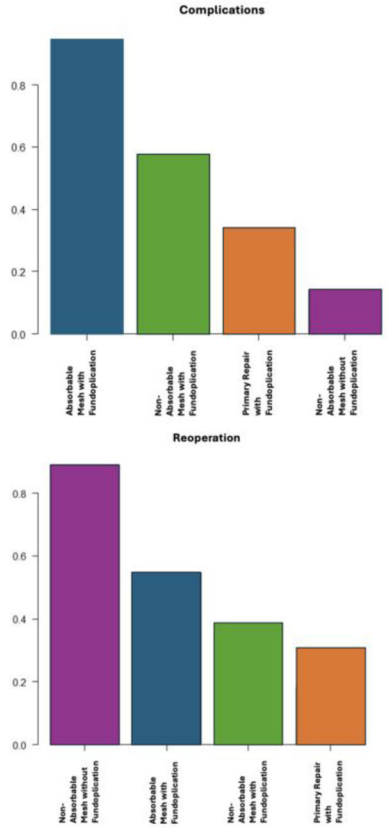


Figure 4 (con'd): Rank Probabilities of Best Intervention for the Main Outcomes



P540

Suspected Esophageal Perforation: Experience of a Tertiary Care Center

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Introduction: An esophageal perforation is associated with high morbidity, and when suspected, patients are transferred to tertiary care centers. This study aimed to assess the outcomes of patients referred to a tertiary care center with a suspected esophageal perforation.
Methods: We performed a retrospective analysis of medical records of patients referred to our service with a suspected esophageal perforation between 4/22/2023 and 4/22/2024. Patients presented as hospital transfers, in-patients, or emergency department consultations. Care was individualized with a contrast study and/or endoscopy performed to further assess as needed. Outcome measures included treatment type, length of stay (LOS), and survival to discharge. Statistical comparisons were made using median LOS and descriptive analysis of survival rates.
Results: Over one year, 79 patients were referred for a suspected esophageal perforation. The most common presenting concern for perforation was pneumomediastinum on CT. Of these, only 15 (19%) had a confirmed perforation, and esophageal injury was ruled out in the remainder. Among the perforation group, 10 (67%) required intervention and 5 were (33%) managed conservatively. In the intervention group, 1 (10%) required resection with spit fistula creation, 6 (60%) underwent primary repair, 1 (10%) underwent VATS drainage with stenting, and 2 (20%) underwent stenting alone. The median LOS for patients with a negative workup was 3 days (IQR: 2, 5), whereas the median LOS for confirmed perforation cases was 17 days (IQR: 11, 23). Survival to discharge was 100% for the entire cohort.
Conclusion: Early referral and prompt treatment of an esophageal perforation shows excellent survival at a tertiary care center. However, more robust diagnostic protocols are needed to reduce unnecessary resource utilization for patients without a perforation. Future studies should focus on optimizing diagnostic pathways and referral processes to enhance efficiency and reduce healthcare costs.

P541

Robotic Remanent Gastrectomy for Recurrent Gastric Perforated Ulcers

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Although peptic ulcer disease may occur in patients with a history of gastric bypass, perforated remanent stomach ulcers have rarely been reported. The anatomical alterations that patients endure with gastric bypasses often prevent them from routine evaluation. Perforation of remanent stomach ulcers are a unique complication and strategies for operative intervention for them is important for surgeons to have a comprehensive armamentarium. Our case involves a robotic remnant gastrectomy to provide a definitive solution for recurrent remnant stomach perforated ulcers. We highlight a rarely reported pathology with an operative solution that can be beneficial in select patients.

P542

Minimally Invasive Repair of Adult Morgagni Hernia: A Single Institution Experience

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Background: The Morgagni hernia is a rare congenital diaphragmatic hernia that causes herniation of intra-abdominal content into the thorax. There is a paucity of literature regarding the appropriate management of these rare hernias. We describe our single institution experience with minimally invasive repair of Morgagni hernias, often in an urgent or acute setting.
Methods: We performed a retrospective review of all patients who underwent laparoscopic or robotic repair of a Morgagni hernia at our center from 2012 to 2023. Patient demographics, presenting symptoms, and perioperative data were collected via chart review.
Results: A total of twelve patients that underwent minimally invasive Morgagni hernia repair were identified. Eleven of these patients were female, with a mean age of 59 $\pm$ 1.6 years old. Half ($N = 6$) of our patients presented with evidence of intestinal obstruction and required urgent surgery. Nine of the patients underwent laparoscopic repair, and three of the patients underwent robotic repair. Mesh was utilized in seven of the cases, with composite mesh in four cases, permanent mesh in one case, and biologic mesh in one case. No cases required conversion to an open laparotomy. Mean hospital stay was 2 days. One patient required reoperation within thirty days with ICU

admission for gastric perforation, and one patient was found to have a postoperative pleural effusion.
Conclusion: Adding to the scarcity of literature, we present our institutional experience with minimally invasive Morgagni hernia repairs. We demonstrate that laparoscopic or robotic repair with and without mesh are safe in the urgent and elective settings.
Keywords: Morgagni Hernia, Laparoscopy, Diaphragmatic Hernia

P543

Observation of the Hiatus for Detection of Undiagnosed Paraesophageal Hernia During Routine Robotic Multiport Cholecystectomy

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Introduction: This is a prospective study to asses a novel screening technique for incidental, undiagnosed paraesophageal hernias (PEH) in patients undergoing robotic multi-port cholecystectomy (rMPCHOLE) and its saftey.
Objective: To demonstrate that during rMPCHOLE, the port placement and patient posistion are conducive to an expedient and safe inspection of the hiatus for the presence of PEH.
Methods: At a single institution a single surgical assistant (SA-C) collected data on 178 consecutive rMPCHOLE patients, performed by three general surgeons and one hepatobiliary/transplant surgeon. After initial insufflation and pneumoperitoneum was achieved and three robotic ports plus one 5 mm assistant port were placed and patient placed in reverse Trendelenburg with six degrees of left tilt, the left lobe of the liver was carefully lifted by a blunt grasper in traditional laparoscopic technique allowing for visualization of the hiatus. This sequence was accomplished just prior to docking the robot for the index procedure. A pre-study safety protocol was established excluding this observation for certain conditions and diagnoses.
Results: Of 178 patients, 20 were excluded per safety protocol, leaving 158 patients that the hiatus was viewed. Sixty patients were found to have Type I or Type III PEH (37%+). Of these 60 patients, eight had a previous diagnosis of GERDs and/or PEH. Thus we found 52 patients had previously undiagnosed PEH (34%+).
Conclusions: Prior research has proven an association with presence of PEH with GERD and longstanding GERD has progression to Barrett's esophagus and esophageal malignancy. This study demonstrates a method to identify PEH by the general surgeon during routine rMPCHOLE, allowing the general surgeon to counsel their patients for further workup, diagnostics and/or treatment if indicated.

P544

Gastro-Esophageal Reflux Test is Useful to Determine the Surgical Indication for GERD Patients: Our Long-Term Outcome of Laparoscopic NISSEN Fundoplication

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Introduction: To determine the surgical indication of laparoscopic anti-reflux surgery for GERD patients is difficult. To find out the GERD patients who really need the surgical treatment, we have established "Reflux Test" as a useful tool.
Surgical Indication:
Reflux Test: At the standing position a patient swallows 300 ml barium solution. After total solution goes into stomach, a patient lies down at the flat position. Then a patient changes the position to left lateral decubitus position, flat position, right lateral decubitus position and flat position again every 10 s in the order. During this procedure, gastro-esophageal reflux was evaluated and assigned to severe, moderate and slight category. If the reflux was observed slightly up to cervical esophagus, the case was assigned to moderate category. The anti-reflux surgery was considered to the patients in the moderate or severe categories.
Results: We have performed laparoscopic Nissen procedure in 139 cases for the GERD patients. In this number, the giant hiatal hernia cases which needed surgery without any doubts and with no need for Reflux Test are excluded. Median follow-up period of this study was 108 months (0–178 months). In 27 cases (19.4%) PPI was restarted before 6 months after the anti-reflux surgery. In 42 cases (30.2%) PPI was restarted after the anti-reflux surgery during the whole follow-up period of this study. The results of the study have shown that the reflux esophagitis was improved obviously after the anti-reflux surgery even in the PPI restarted group WHICH was analyzed by our endoscopic grading score for esophagitis ($p < 0.001$).
CONCLUSION: The anti-reflux surgery is very effective for the patients who really had the obvious gastro-esophageal reflux before surgery. The results of the laparoscopic Nissen fundoplication were good and satisfied by the patients mostly.

P545

Perforated Jejunal Gastrointestinal Stromal Tumor: A Rare Presentation with Peritoneal Carcinomatosis

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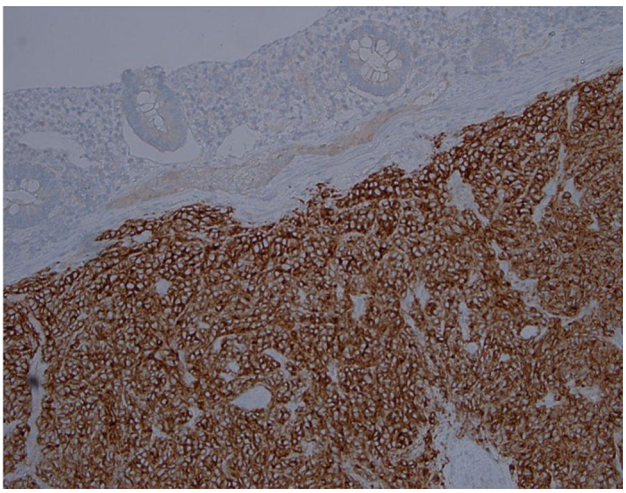
Introduction: Gastrointestinal stromal tumors (GIST) are the most common mesenchymal tumors of the gastrointestinal tract and account for 0.2% of all gastrointestinal neoplasms. Though most of the GISTs occur in the stomach, jejunal GIST is extremely rare and accounts for less than 0.04% of all gastrointestinal tumors. These tumors often present with nonspecific symptoms, which cause the diagnosis to be made when complications such as perforation or peritonitis develop. We present a case of perforated jejunal GIST.
Case Report: A 69-year-old male with significant co-morbidities including coronary artery disease, diabetes mellitus, and gastric carcinoma was admitted from the nursing home for complaining of abdominal pain acutely, hypotension, and melena. On arrival, he was hypotensive and febrile with a laboratory showing leukocytosis, anemia, and elevated C-reactive protein levels. Contrast-enhanced CT scan evidenced pneumoperitoneum, extensive peritoneal carcinomatosis with abnormal soft tissue in mesentery and omentum, and three large peritoneal masses. He subsequently underwent emergency exploratory laparotomy that demonstrated a perforated jejunal mass approximately 125 cm distal to the ligament of Treitz. A resection of the perforated segment was performed, followed by a side-to-side anastomosis. Histopathological findings showed a high-grade GIST, with spindle and epithelioid cell morphology. Immunohistochemistry results were positive for CD117, DOG1, and CD34; the mitotic rate was above 5 mitoses per 5 mm^2, and all margins were tumor-positive.

Final stage pT3N1M1. Postoperatively, the patient remained in critical condition, the prognosis remained poor due to the advanced stage of his disease and expired days after the surgery.

Discussion: Perforation, though rare, is a serious complication arising in GISTs and, as a rule, is followed by peritonitis and the diffuse spread of the tumor within the abdomen. Jejunal GISTs, with KIT exon 11 mutations, are well described to pursue an aggressive course, with a high rate of recurrence following surgical resection of the tumor. The presence of extensive peritoneal carcinomatosis, coupled with positive margins after the surgical removal of the perforated segment, considerably worsened the prognosis. The tumor was then staged as pT3N1M1, reflecting the advanced nature of the disease. High-risk GISTs receive imatinib, recommended postoperatively in cases presenting residual or metastatic disease.

Conclusion: This case illustrates the aggressiveness of jejunal GISTs, particularly in the presence of perforation and peritoneal carcinomatosis. Surgical resection remains the cornerstone of treatment; however, poor prognosis is seen in advanced-stage disease with positive margins. Adjuvant therapy with imatinib is of utmost importance in managing residual disease.



P546

Trends in GERD-Related Quality of Life After Primary Laparoscopic Antireflux Surgery: A Longitudinal Analysis

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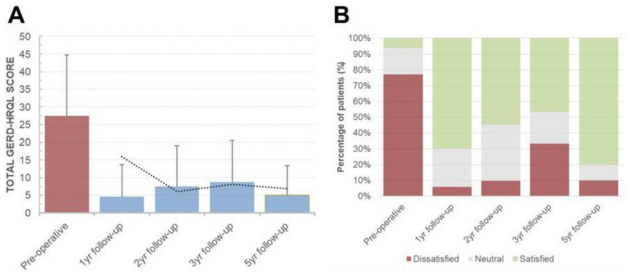
Introduction: Minimally invasive antireflux surgery (ARS) for gastroesophageal reflux disease (GERD) has demonstrated excellent long-term symptom relief and prevention of disease recurrence. However, the persistence of quality of life (QoL) improvements remains under investigation. We aimed to describe QoL trends using the GERD Health-Related Quality of Life (GERD-HRQL) questionnaire in an unselected cohort.

Methods: After IRB approval, we queried a prospectively maintained surgical database of patients who underwent primary elective ARS by a foregut surgeon between September 2016 and July 2024 and conducted a retrospective longitudinal analysis of disease-specific QoL trends. Only patients who completed both preoperative and all scheduled postoperative GERD-HRQL questionnaires were included in the paired analysis. Patients who underwent redo-surgery or other antireflux procedures were excluded. We assessed overall GERD-HRQL scores, subcomponent scores (heartburn, dysphagia, regurgitation), and patient satisfaction (rated 0–100) at 1-, 2-, 3-, and 5-year follow-ups.

Results: A total of 500 patients (355 [71%] women; mean age, 66.6 ± 14.1 years) underwent primary ARS. Of these, 290 (58%) completed preoperative questionnaires, and 234 (47%) completed at least one postoperative questionnaire. However, of the patients who completed the preoperative questionnaire, only 83 (28.6%), 31 (10.7%), 24 (8.1%), and 16 (5.5%) answered all postoperative questionnaires at the 1-, 2-, 3-, and 5-year milestones, respectively. Improvements in the total GERD-HRQL score and patient satisfaction persisted at all time-points after ARS (Fig. 1). Heartburn scores decreased from 13.4 ± 8.7 before surgery to 2.0 ± 4.4 at 1 year, 3.6 ± 5.5 at 2 years, 3.8 ± 5.9 at 3 years, and 2.8 ± 4.7 at 5 years ($p < 0.05$). Dysphagia scores improved from 2.3 ± 2.4 to 0.8 ± 1.7 at 1 year, 1.2 ± 2.6 at 2 years, 1.2 ± 2.1 at 3 years, and 0.3 ± 0.5 at 5 years ($p < 0.05$). Regurgitation scores dropped from 10.7 ± 8.5 to 1.5 ± 4.2 at 1 year, 2.0 ± 4.5 at 2 years, 3.4 ± 5.1 at 3 years, and 1.7 ± 3.3 at 5 years ($p < 0.05$).

Conclusions: Our findings confirmed significant reductions in total GERD-HRQL scores, including heartburn, dysphagia, and regurgitation, after ARS. Moreover, improvements in QoL and patient satisfaction persisted over time (up to 5 years), indicating that primary ARS offers long-term benefits in often underexplored outcomes like QoL. Additional studies with larger sample sizes and longer follow-up periods are highly desirable to further validate these results.



P547

Long Term Outcomes Following Laparoscopic Repair of Large Hiatal Hernias

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Introduction: Managing large para-oesophageal hernias (PEH) is challenging because of the complexity of the condition, diverse surgical results, and insufficient high-quality evidence on long term outcomes. Large PEH, Hill grade III & IV (Kahrilas et al. 2008), can be asymptomatic (incidentally found on endoscopy/radiology) or cause symptoms such as dysphagia, reflux, chest pain, and respiratory problems, significantly impacting the quality of life for patients. The literature emphasizes the necessity for additional research to combine and evaluate various methods within varied patient groups. This article outlines the outcomes, immediate and long-term, of consecutive patients who underwent laparoscopic repair of large PEH from a single institution.

Methods and Procedures: A study was conducted at Doncaster Royal Infirmary. Data on patient demographics, surgical indications, operative details, postoperative complications, and follow-up

outcomes were collected prospectively in a dataset for all patients operated on from 2010 to 2020.
All data collected are stored in NHS SharePoint, and for the purposes of analysis, all data presented in this report do not include any patient identifiable information.
Results: The study included 90 patients who were operated on at Doncaster and Bassetlaw teaching Hospitals from 2010 until 2020 and the data obtained are illustrated in the following table.

Total numebr of patients	90
Male: female ratio	24:66
Mean age	67.5 years
Conversion to open surgery	None
Emergency: elective	6:84
Re-do/revision	3
Mesh repair	16
Average postoperative hospital stay	6.1 days
Common complications	Dysphagia, chronic diarrhoea, surgical site infections
Severe complications	Oesophageal perforation (1), postoperative deaths (2)
Recurrence rate	28.6%
Re-operation rate	16.5%
Median follow up duration	9 years

Conclusion: This study provides valuable insights into the immediate and long-term outcomes PEH. While the study provides evidence of the relative safety of this procedure, the technical challenges and long-term morbidity need to the factored in the decision to operate. Prosthetic reinforcement of Crural repair is likely to have a beneficial effect on long-term recurrence.

Reference

Kahrilas PJ, Kim HC, Pandolfino JE. Approaches to the diagnosis and grading of hiatal hernia. Best Pract Res Clin Gastroenterol. 2008;22(4):601–16. https://doi.org/10.1016/j.bpg.2007.12.007. PMID: 18656819; PMCID: PMC2548324.

P548

Outcomes of Laparoscopic Gastrectomy for Cancer—Experiences from Vietnamese Tertiary Hospital

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Introduction: This study aimed to report outcomes of laparoscopic radical gastrectomy for treating gastric adenocarcinoma at a tertiary hospital in Vietnam.
Methods: A retrospective study was conducted using primary data from the Department of Digesive Surgery, Cho Ray Hospital, Vietnam, from February 2018 to February 2020. A total of 125 patients with adenocarcinoma of the stomach underwent minimally invasive radical gastrectomy.
Results: There were 64.8% (81/125) patients who underwent laparoscopic distal gastrectomy, 30.4% (38/125) patients who underwent laparoscopic total gastrectomy, and 4.8% (6/125) patients who underwent laparoscopic proximal gastrectomy. The mean age of the patients was 60 ± 1 years old, with male-to-female ratio of 2.6:1. The proportion of tumors at stages IA, IB, IIA, IIB, IIIA, IIIB, and IIIC was 2.4%, 11.2%, 24%, 20.8%, 19.2%, 16.8%, and 5.6%, respectively. The complication rate was 4.8% (6/125), including 1 case of gallbladder necrosis, 1 case of gastrointestinal bleeding, 2 cases of postoperative intestinal obstruction, 1 case of splenic rupture, and 1 case of middle colic artery injury. We did not observe any anastomotic leaks or duodenal stump leaks. The 3-year survival rate for stages IA, IB, IIA, IIB, IIIA, IIIB, and IIIC was 100%, 85.7%, 86.7%, 84.6%, 79.2%, 76.2%, and 71.4%, respectively.
Conclusion: Laparoscopic radical gastrectomy is as safe and effective in the treatment of adenocarcinoma of the stomach.

P549

The Incidental Discovery of Mesenteric Cysts in an Asymptomatic Patient

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Introduction: Mesenteric cysts are a rare abdominal pathology occurring in one out of every 250,000 admissions. Cysts can be found throughout the GI tract but are typically found in the duodenal or sigmoid mesentery. They are more common in females and can occur at any age without one specific presentation. Larger cysts may present with symptoms common to other abdominal conditions including abdominal pain, distention, vomiting, and nausea. This pathology is discovered incidentally through ultrasonography and computed tomography (CT) imaging. These cells are usually not malignant and have a very low recurrence.
Case: We present the case of a 38-year-old male with a past medical history of hypertension and hyperlipidemia who presented to our clinic with a two-month history of a wound on his medial malleolus. There had been erythema and purulent secretions around the area, then eventually necrosed turning black and purple. He had significant pain and swelling in the area with no fever, chills, night sweats, or weight loss. He denied abdominal pain, diarrhea, or urinary symptoms. He has not traveled outside of the US since immigrating from Nepal 8 years ago. BP 179/114, HR 100, 36.4C, 100% on RA. WBC 8.14K, N60.5%, Hb 15.8, ALT/AST 110/53, lactate 0.8. The patient underwent abdominal ultrasound for elevated transaminases showing an echogenic liver with steatosis. A midline abdominal septated cystic structure was seen incidentally, so a CT contrast was pursued. CT showed multiple mesenteric cysts extending from the undersurface of the gallbladder through the right side of the abdomen into the proximal right pelvis. He underwent Esophagogastroduodenoscopy with Endoscopic Ultrasound which confirmed the multiple simple cysts. Endoscopic biopsy and aspiration showed rare histiocytes, some lymphocytes, and abundant proteinaceous material consistent with cystic contents but was negative for malignant cells. This patient was discussed in our multi-disciplinary meeting and will be observed for now as he remains asymptomatic with repeat imaging in 1-years-time.
Conclusion: Although a waiting approach has been proposed for asymptomatic cases, surgical excision has been proven to be the most effective treatment option for mesenteric cysts. This significantly reduces the risk of complications such as rupture, infection, torsion, hemorrhage, herniation of the cyst, or ischemia of the bowel from vessel compression. Minimally invasive surgery shows the advantage of having a shorter hospital stay, whereas laparoscopic surgery shows an earlier return to normal functional status. Patients typically have a full recovery and do not require follow-up.

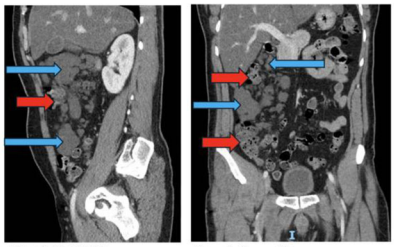
Figure 1: Sagittal**

Figure 2: Coronal**

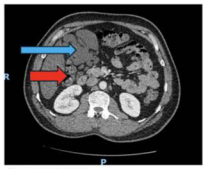
Figure 3: Axial**

Figure 4: Ultrasound**

** Long, thin, blue arrows depict cystic structures. Short, thick, red arrows portray ascending and descending colon

P550

Management of a Giant Mesenteric Cyst: A Case Report

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Introduction: Mesenteric cysts are rare intra-abdominal tumor lesions, usually benign, with an incidence of 1 to 100,000–250,000. They are classified according to clinical and etiological characteristics as: lymphatic, mesothelial, enteric, urogenital, mature cystic teratoma and non-pancreatic pseudocyst. The average size ranges from 2 to 35 cm and patients tend to consult for nonspecific symptoms such as diffuse abdominal pain, distension, nausea and vomiting.
Methods and Procedures: We present the clinical case of a 63-year-old female patient with no significant history, who consults for chronic diffuse abdominal pain associated with abdominal distension, a sensation of a mass with progressive growth and subjective weight loss. She was diagnosed with a multilocular giant mesenteric cyst measuring 40 × 50 cm, which is why he was taken to laparotomy for drainage and resection.
Results: Although laparoscopic resection is recommended, given the magnitude of the cyst, the patient's symptoms and the 3% risk of malignancy, a laparotomy was required in order to verify that the resection was complete and without rupture. In this way, preventing future complications such as hemorrhage, compression, infection and torsion. Therefore, a complete resection was guaranteed and rupture of the cyst was avoided to prevent contamination, chemical peritonitis and recurrence.
Conclusion: This case is of great relevance not only because of its distinctive size, but because mesenteric cysts represent an important diagnostic and therapeutic challenge, since it is a rare pathology, which also presents with very nonspecific symptoms.

P551

Renew: A Blinded Randomized Clinical Investigation of Refluxstop Compared with Nissen Fundoplication in the Treatment of Gastroesophageal Reflux Disease

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Introduction: A prospective, single-arm, multicenter clinical investigation of RefluxStop confirmed its long-term effectiveness and safety in treating gastroesophageal reflux disease (GERD) over 4 years, supporting continued evaluation versus standard of care in ongoing studies, including RENEW—a randomized controlled trial (RCT) comparing RefluxStop with Nissen fundoplication. Previous studies demonstrated that RefluxStop significantly improves GERD Health-Related Quality of Life (GERD-HRQL) scores (> 90%), reduces proton pump inhibitor (PPI) use (> 95%), and achieves near-complete eradication of GERD symptoms while maintaining low rates of adverse events (AEs) with complete avoidance of adverse device effects (ADEs), explantations, esophageal dilations, dislocations, or migrations. Traditional anti-reflux surgeries like Nissen fundoplication are associated with significant complications such as dysphagia, inability to belch/vomit, and gas-bloating, leading to substantial levels of patient dissatisfaction, operative failures, and reoperations. RefluxStop aims to address these concerns by restoring the anti-reflux barrier without encircling the esophagus, thereby minimizing troublesome AEs. Herein, we describe the design and status of the RENEW study.
Methods and Procedures: RENEW is a prospective, blinded, multicenter, double-arm RCT comparing RefluxStop with Nissen fundoplication. Eligible patients (i.e., ≥ 18 years, documented GERD for ≥ 12 months confirmed by abnormal 24-h pH monitoring, off PPI therapy for ≥ 7 days) will be randomized 1:1 to undergo either procedure. The primary endpoint, assessed at 6 months and at 1 year as a secondary endpoint, is Patient-Reported Outcome—Side Effects (PROS)—a composite measure of dysphagia, odynophagia, inability to belch/vomit, and gas-bloating. Other secondary endpoints include effectiveness of reflux control (i.e., composite of 24-h pH monitoring and GERD-HRQL scores; at 6 and 12 months), operative failures (i.e., reoperations, esophageal dilatations, reherniations, and resumption of daily PPI use; 6 and 12 months), and incidence of AEs (including procedure-related and serious AEs, ADEs, device deficiencies [DDs]; 3, 6, and 12 months). Additional assessments include surgical injury and leakage, hiatal stenosis, device position, endoscopic evaluations (wireless capsule placement, esophagitis, gastritis, Barrett's esophagus), procedure time, hospital stay, and treatment-related costs. Patient questionnaires assessing quality of life and symptom control include GERD-HRQL, brief esophageal dysphagia questionnaire (BEDQ), regurgitations (episodes/week), inability to belch/vomit, daily PPI use, patient dissatisfaction, gas-bloating (scale 0 to 5), EuroQol-5D 5-level (EQ-5D-5L), work productivity and activity impairment (WPAI), and healthcare resource utilization (HCRU).
Results: Expected completion Q1 2025, and final data expected Q4 2025.
Conclusions: The completed RCT is expected to provide critical data on the effectiveness and safety of RefluxStop compared to Nissen fundoplication.

P552

Clinical Characteristics Associated with Reoperation Following Recurrence After Paraesophageal Hernia Repair

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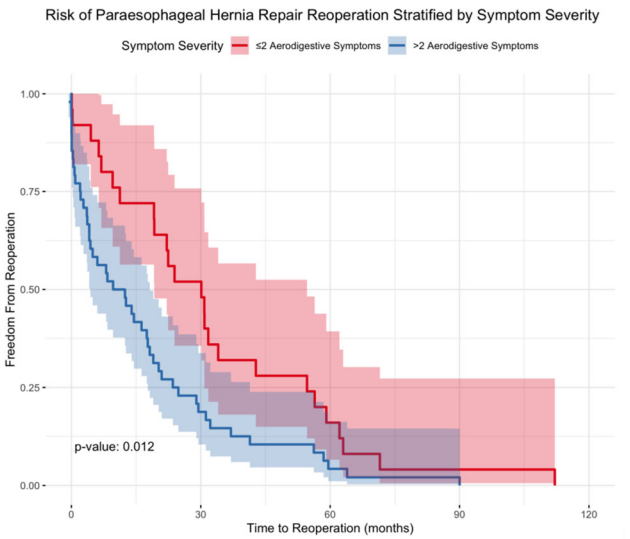
Introduction: Recurrence after paraesophageal hernia repair (PEHR) remains a clinical challenge. Previous studies suggest factors such as younger age, operative approach, and the presence of Barrett's esophagus may contribute to an increased risk. This study aims to explore the clinical characteristics of patients with paraesophageal hernia recurrence and identify factors associated with reoperation.
Methods: We conducted a retrospective cohort study of patients who experienced recurrence after PEHR, performed by surgeons at a single institution between February 2010 and February 2020. The

study population included patients who had previously undergone PEHR and either showed evidence of recurrence or required reoperation.

Results: Out of 2524 patients who underwent PEHR, 208 (8.2%) experienced recurrence, with 75 of those patients (36%) requiring reoperation. Medical comorbidities, such as diabetes, obesity, pulmonary disease, and cardiovascular disease, did not increase the likelihood of reoperation in those who had recurrences. Although patients who underwent reoperation were on average younger (58 ± 18 years) than those who did not (63 ± 15 years), this difference did not reach statistical significance ($p = 0.060$). The median time to reoperation was 17.5 months (IQR 27.0). Mesh placement during the initial operation was rare ($N = 21/208$, 10%) and did not significantly impact the likelihood of reoperation (11% vs 9.3%, $p > 0.9$). However, Surgisis mesh was more commonly associated with recurrence ($N = 3/6$, $p = 0.044$). Posterior suture placement in the diaphragm was less frequently performed in patients who later required reoperation ($N = 98/100$ vs $N = 50/56$, $p = 0.047$). Patients presenting with more than two postoperative aerodigestive symptoms (such as dysphagia, chest pain, GERD, early satiety, nausea, emesis, hematemesis, aspiration, odynophagia, or weight loss) were significantly more likely to undergo reoperation ($N = 25/75$, 33%) compared to those who did not ($N = 21/133$, 16%, $p = 0.006$). In particular, postoperative chest pain and ongoing emesis were notably more common among patients who underwent reoperation (chest pain: 20% vs 4.5%, $p < 0.001$; emesis: 28% vs 16%, $p = 0.054$).

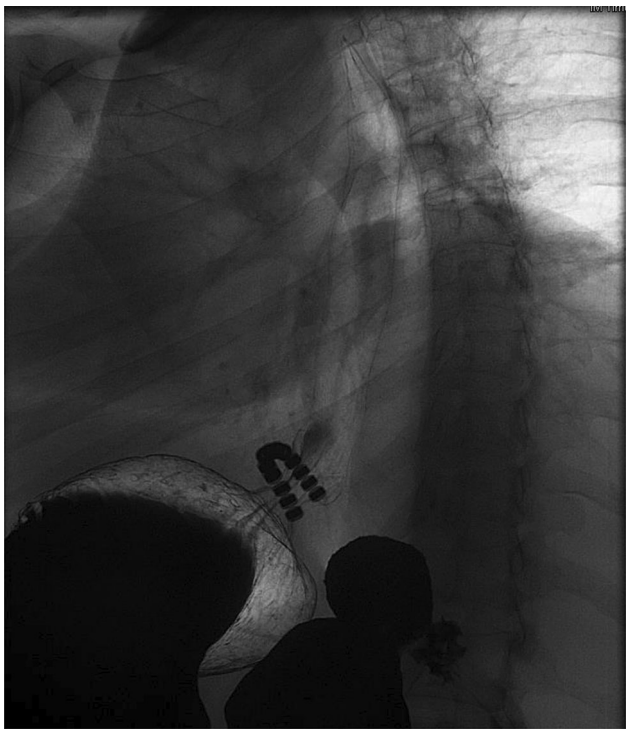
Conclusion: This study describes factors associated with reoperation following PEHR recurrence. While younger age trended toward an increased likelihood of reoperation, multiple postoperative aerodigestive symptoms, notably chest pain and emesis, were more predictive of the need for reoperation. Overall, most recurrences ($N = 162/205$, 79%) after PEHR were minimally symptomatic (≤ 2 aerodigestive symptoms) and did not require operative repair.



P553

Case of LINX Device Failure After Repeat MRI Scans

Irene Y Crittenden, DO; Kristyn Kraus, DO; Robert Houston, MD; William Beaumont Army Medical Center



Introduction: A 48-year old female with gastroesophageal reflux disease was treated with a magnetic sphincter augmentation (MSA) in 2017. Her symptoms were initially well-controlled with the LINX device until 2019, when she began to experience recurrent dysphagia and heartburn. Of note, the patient underwent an MRI in 2019 shortly before the return of her symptoms. During this exam, she experienced acute onset of epigastric pain in addition to a pulling sensation in her epigastrium. The patient underwent a subsequent MRI in 2023 for surveillance of a pituitary tumor which had to be aborted due to excruciating epigastric pain.

The LINX device for magnetic sphincter augmentation (MSA) of the lower esophageal sphincter was approved by the FDA in March 2012 for the treatment of gastroesophageal reflux disease. This device is made of a small ring of magnetic beads placed around the base of the esophagus to augment the lower esophageal sphincter function. The most common complication of the LINX procedure is dysphagia, with additional complications including pain, nausea, vomiting and device erosion. There have been no previous reports about patients with LINX device failure from undergoing MRI study.

Methods and Procedures: Most LINX systems implanted after 2016 are considered safe for MRI scanners up to a strength of 1.5 Tesla (1.5 T). Our patient had a LINX device compatible with 1.5 T and her MRI card was appropriately checked prior to each MRI. On review of MRI strengths used for her annual surveillance scans of her pituitary adenoma, 1.5 T were used.

A work up for recurrent GERD symptoms including upper endoscopy and an upper gastrointestinal series was notable for a small sized hiatal hernia, a failed LINX prosthesis, and large volume gastroesophageal reflux.

Results: To address the broken LINX device and the patient's recurrent GERD symptoms, the patient underwent a laparoscopic LINX explantation with Nissen fundoplication and hiatal hernia repair. The patient tolerated the procedure well and was discharged on post op day 1 after a postop upper gastrointestinal study confirmed complete removal of the LINX device and intact fundoplication.
Conclusion: This case report brings into question the integrity of LINX systems with multiple MRI's despite reported compatibility. This patient with LINX device failure after undergoing repeat MRIs for pituitary tumor surveillance was successfully treated with laparoscopic removal and fundoplication to address her GERD. Patients who require repeat MRI for surveillance with a LINX prosthesis in place may consider alternative imaging when possible.

P556

General and Thoracic Trained Surgeons have Similar Outcomes After Paraesophageal Hernia Repair

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Introduction: General (GS) and fellowship-trained thoracic (TS) surgeons both receive training to operate on paraesophageal hernias (PEH). However, minimal literature exists comparing the operative techniques and postoperative outcomes between the two types of surgeons. Our objective was to identify differences in technique and outcomes between GS and TS.
Methods: This was a retrospective chart review of patients who underwent PEH repair between 2010 and 2023 at an academic tertiary care institution. Patients undergoing non-elective procedures were excluded. Demographics, operative techniques, and postoperative outcomes were compared between the GS and TS cohorts. Continuous variables were compared using Wilcoxon–Mann–Whitney test while categorical variables were compared using the Chi-Squared test. Multivariate regression to predict odds ratios (OR) with 95% confidence intervals (CI) of postoperative gastroesophageal reflux (GERD) beyond 30 days, dysphagia beyond 30 days, and recurrence was completed.
Results: 1212 patients were included in the analysis of whom 988 (81.5%) were operated on by GS. GS patients were younger (59.6 vs 68.4, $p < 0.001$), had higher BMI (33 vs 29, $p < 0.001$), and more frequently had preoperative GERD (67% vs 53%, $p < 0.001$). There were no differences in preoperative dysphagia (26% vs 32%, $p = 0.10$). GS were less likely to excise the hernia sac, divide the short gastrics, use an endostitch, place sutures in the anterior portion of the defect, perform a fundoplication, or perform a gastropexy (all $p < 0.001$) while they were more likely to perform an esophagogastroduodenoscopy (EGD) at the end of the procedure ($p < 0.001$). Postoperatively, there were no differences in 30-day complication rate (8.5% vs 5.5%, $p = 0.17$). Rates of GERD (9.6% vs 5.9%, $p = 0.082$) and dysphagia (6.9% vs 4.1%, $p = 0.13$) beyond 30 days and recurrence (14.9% vs 19.5%, $p = 0.097$) and 1-year reoperation rates (2.2% vs 4.5%, $p = 0.061$) were not significantly different between GS and TS. TS did not have higher or lower odds of GERD (OR 0.11, 95% CI 0.00023 to 60.8), dysphagia (OR 0.10, 95% CI 0.0025 to 4.09), or recurrence (OR 1.18, 95% CI 0.26 to 5.35).
Conclusions: GS trended towards higher rates of GERD and dysphagia and lower rates of recurrence and 1-year reoperation rates on univariate analysis. Although several operative techniques were more commonly used by thoracic surgeons, the difference in fellowship training did not affect dysphagia, GERD, or recurrence on multivariate analysis.

Table. Univariate analysis of operative and postoperative factors compared between cohorts

	General Surgeon	Thoracic Surgeon	p-value
	n = 988	n = 224	
Hernia Sac Excision	154 (19.0%)	136 (70.8%)	<0.001
Division of Short Gastrics	511 (61.4%)	157 (82.6%)	<0.001
Endostitch Used	354 (45.9%)	132 (81.0%)	<0.001
Sutures in Posterior Diaphragm	739 (96.5%)	157 (95.7%)	0.65
Sutures in Anterior Diaphragm	254 (36.2%)	91 (60.7%)	<0.001
Mesh Used	106 (11.2%)	17 (8.2%)	0.2
Fundoplication Performed	368 (39.0%)	170 (80.6%)	<0.001
Bougie Used	411 (43.8%)	138 (67.0%)	<0.001
Gastropexy Performed	201 (21.2%)	70 (33.3%)	<0.001
EGD at End of Case	885 (93.7%)	118 (57.3%)	<0.001
30-Day Complication	82 (8.5%)	12 (5.5%)	0.17
30-Day Readmission	42 (4.3%)	5 (2.2%)	0.18
Postop GERD > 30 Days	92 (9.6%)	13 (5.9%)	0.082
Postop Dysphagia > 30 Days	66 (6.9%)	9 (4.1%)	0.13
Recurrence	143 (14.9%)	43 (19.5%)	0.097
Reoperation at any Time	57 (5.9%)	17 (7.7%)	0.34
1-Year Reoperation	21 (2.2%)	10 (4.5%)	0.061

P557

Implementation of Capsule-Sponge Technology in a Barrett's Surveillance Programme: Assessment of Costs, Outcomes and Benefits

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Background: In the United Kingdom, current guidelines recommend surveillance of Barrett's oesophagus with regular endoscopic assessment and sequential quadrantic biopsies (Seattle protocol). Capsule-sponge technology has recently been utilised as part of a national programme to define its role in Barrett's surveillance. This study describes our experience with capsule-sponge technology in Barrett's surveillance, and further to highlight potential deficiencies in standard surveillance methods.
Method: Between September 2022 and June 2024, 379 patients had capsule-sponge assessment for Barrett's oesophagus. Patients who declined capsule-sponge assessment, or were ineligible, were offered standard endoscopic assessment. Barrett's oesophagus had previously been diagnosed from initial endoscopic assessment.
Capsule sponge assessment was performed using the CytospongeTM and sponges sent to Cyted for cytological analysis. All patients were monitored for progression of symptoms or development of gastro-oesophageal cancer. Cost implications, clinical outcomes and impact on endoscopy resource utilisation were measured. Quality of initial diagnosis of Barrett's oesophagus was also assessed.
Results: 379 patients had Cytosponge assessment for Barrett's oesophagus; of these patients, 34 (9%) required endoscopy (abnormal cytology or an inadequate sample). Other pathologies picked up by Cytosponge assessment included high-grade dysplasia, ulceration or atypia.
All patients who had a Cytosponge have been booked for endoscopy for their next Barrett's assessment (in keeping with current UK guidelines); none have presented with inter-test malignancy. Over the same time period, three patients have presented with oesophageal cancer who have only had endoscopic assessment. Utilisation of capsule-sponge technology has saved almost 350 endoscopies (700 points) over 21 months, or over 70 endoscopy lists.

Patient feedback has been positive; over 80% of patients preferred capsule-sponge assessment over endoscopy and several patients would refuse further endoscopic assessment.

Primary diagnosis of Barrett's oesophagus in this series was poor. Almost one-fifth of patients (19%) did not have a Prague Classification recorded on their first diagnostic endoscopy and 29% of patients did not have any images uploaded onto their endoscopy report. No patients had high resolution endoscopy and over a third of patients did not have intestinal metaplasia on their diagnostic biopsies.
Conclusion: Implementation of a capsule-sponge service for Barrett's surveillance has been safe and effective and has not led to missed malignancies so far. The procedure is better tolerated than endoscopy, reproducible and may be a more accurate method of Barrett's surveillance than endoscopy alone. The project has also highlighted deficiencies in current 'standard' methods of Barrett's surveillance.

P558

Evaluating the Efficacy of Incorporating Restech Procedure with Bravo pH Monitoring and Hiatal Hernia Grading during Initial Esophagogastroduodenoscopy (EGD) for Enhanced Diagnosis and Management of Laryngopharyngeal Reflux (LPR)

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Introduction: This study aims to assess whether incorporating Restech during initial EGD and Bravo pH testing improves the diagnosis and management of LPR in patients referred to a comprehensive GERD center by analyzing data from Restech studies, pH readings, and Hill grade classifications collected in a single procedure.
Methods & Procedures: A prospective analysis of 28 atypical GERD patients assessed Hill grade and mucosal damage via endoscopy, Acid exposure time (AET) through Bravo pH testing, and oropharyngeal pH with a 24-h Restech probe (Ryan score $\geq$ 9.41 indicates pathological reflux). Hill grade $>$ 2 suggests hiatal disruption, and AET $>$ 6% indicates abnormal esophageal acid exposure. Spearman, Chi-squared, and Fisher's exact tests were used for analysis.
Results: 60.7% (n = 16) of patients had positive Ryan score. Of these, 50% (n = 8) had Hill grades of 3 or 4, and 56.3% (n = 9) had AET $>$ 6%. In total, 69% (n = 11) had AET $>$ 6%, Hill grades $>$ 2, or both, while 31.25% (n = 5) had AET $<$ 6% and Hill grades $\leq$ 2. A mean pH drop of 0.34 was observed in 85.7% (n = 24), but only 54.2% (n = 13) had Ryan scores $\geq$ 9.41. No significant correlations were found between Ryan scores and AET, Hill grades, or pH changes. No significant differences in AET $>$ 6% or Hill grades $>$ 2 were found between groups with Ryan $<$ 9.41 and $\geq$ 9.41.

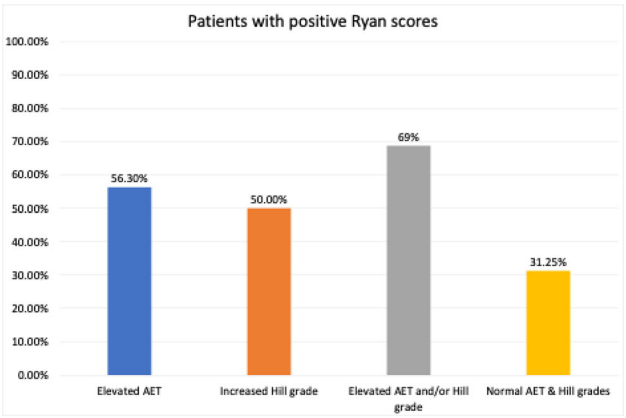

Fig. 1 Findings in Patients with Ryan Scores $\geq$ 9.41

Conclusion: Our study highlights the limitations of using Restech alone for LPR diagnosis. While it detects aerosolized acid at the upper laryngeal level, the lack of significant correlations between Ryan scores, AET, and Hill grades suggests it shouldn't be used in isolation. 69% of patients had Hill grade abnormalities, suggesting acid in the laryngopharynx may result from lower esophageal anatomical abnormalities, potentially benefiting from aggressive treatments like anti-reflux surgery. In contrast, 31.25% had no lower esophageal abnormalities, suggesting non-GERD causes warranting further testing. Additionally, gastric pH dropped during distention in 85.7% of patients. However, Restech detected acid in 54.2% of them, suggesting gastric distention during EGD may not provoke LPR. In summary, our results emphasize the importance of a multifaceted diagnostic approach that incorporates both upper and lower esophageal assessments to accurately diagnose and manage LPR, as Restech alone doesn't provide a comprehensive view of the pathophysiology. Combining Restech with Hill grade and Bravo pH testing allows for a more targeted treatment plan, tailored to the patient's specific underlying condition, ultimately improving outcomes.

P559

Gastric Outlet Obstruction Caused by Intrapericardial Diaphragmatic Hernia: A Description of a Robotic Repair and Review of the Literature

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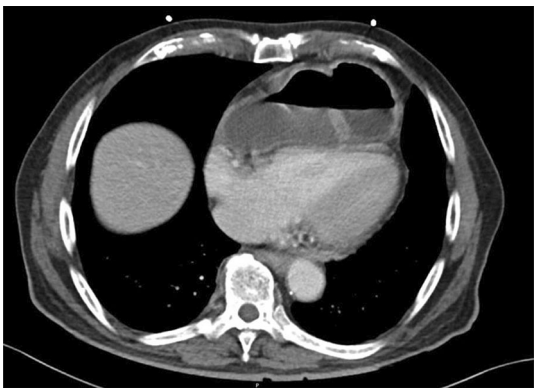
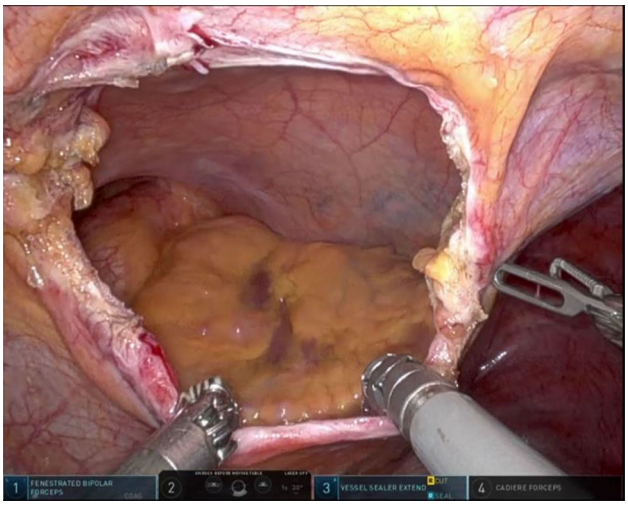
Introduction: Congenital diaphragmatic hernias (CDH) are rare, with an incidence of one in 4,000 newborns. They are typically symptomatic early in life with high morbidity and mortality. Intrapericardial diaphragmatic hernia (IDH) is the rarest form of CDH. This paper reports a unique case of presumed congenital IDH becoming symptomatic in the 9th decade with gastric outlet obstruction (GOO) and it's robotic laparoscopic repair.
Case Description: An 87-year-old man with history of hypertension and hyperlipidemia presented with exacerbation of his six-month history of epigastric discomfort, nausea, self-induced vomiting to relieve symptoms, and 30-lbs weight loss. He developed PO intolerance 3 days prior to presentation. CT scan identified GOO secondary to an anterior diaphragmatic hernia with the distal stomach in the chest. He underwent nasogastric tube decompression until his robotic laparoscopic repair.
After abdominal entry, the stomach was reduced. The heart and pericardial fluid were visualized. Minimal adhesions were present with no identifiable hernia sac. The size of the defect was 6 $\times$ 10 cm. The defect was repaired with an intraperitoneal mesh as the diaphragm could not be reapproximated without tension. This was secured in place with sutures circumferentially. A drain was left in the pericardial space. The patient was discharged home on post-operative day 2.
Discussion: IDH is an incredibly rare clinical entity. There have been less than 90 reported cases. Most frequently, they are secondary to traumatic injury or iatrogenic injury, which our patient had no reported history of. They most commonly present with abdominal pain (44.7%), dyspnea (28.2%), and nausea or vomiting (22.4%). GOO has not been documented as a presenting symptom.
Most IDH reported in the literature have been repaired with open or thoracic approaches; only 15 cases have been repaired laparoscopically. Of the available data, the laparoscopic approach appears to have a shorter length of stay. With the widespread adoption of the DaVinci robotic platform, the most efficient and ergonomic repair may be

robotic laparoscopic repair. Further research is necessary to identify the potential benefits of this approach.

Conclusion: We presented a case of GOO secondary to IDH. As far as the authors are aware, there are no other reported cases of GOO secondary to IDH then repaired robotic laparoscopically. We were successfully able to repair the defect using a robotic platform with a synthetic mesh. This provides evidence that an abdominal robotic laparoscopic approach can be safely utilized to repair IDH.





P560

Comparative Outcomes After Paraesophageal Hernia Repair With and Without the Use of Esophageal Bougie

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Introduction: The use of an esophageal bougie during laparoscopic paraesophageal hernia (PEH) repair is a common but not universally adopted practice. This study aims to evaluate the safety of intraoperative esophageal bougie use during PEH repair and compare outcomes between cases performed with and without its use.

Methods: This was a retrospective review of patients that underwent elective PEH repair with or without use of esophageal bougie use at a single tertiary academic institution between 2010 and 2020. Patients were excluded if data on bougie use or fundoplication status was missing. Statistical analysis was performed using the Wilcoxon rank-sum test for medians (with interquartile ranges) and the chi-squared test for categorical and binary variables.

Results: A total of 1055 patients were included in the final analysis, with 523 (50%) undergoing PEH repair without intraoperative bougie use and 532 (50%) undergoing repair with bougie use. There were no significant differences in age, BMI, and comorbidities between the groups. There was a lower rate of intraoperative leak in the bougie group compared to the group which did not have a bougie used (0.0% vs 1.3%, $p = 0.007$). Additionally, the bougie group had a significantly lower rate of 30-day complications (5.6% vs 9.0%, $p = 0.035$). There were no significant differences in 30-day reintervention ($p = 0.77$), GERD ($p = 0.75$), dysphagia ($p = 0.41$), recurrence ($p = 0.15$), reoperation ($p = 0.35$), or 30-day mortality ($p = 0.12$). In patients who underwent fundoplication at the time of PEH repair, there was no significant difference in the rate of any of these outcomes.

Conclusions: The intraoperative use of an esophageal bougie during laparoscopic PEH repair is associated with a lower incidence of intraoperative leaks and 30-day complications compared to procedures without bougie use. There were no significant differences in other outcomes, such as reintervention, GERD, dysphagia, recurrence, reoperation, or mortality within 30 days. These findings suggest that the use of a bougie is not associated with an increased perforation or

leak rate and its use does not significantly decrease postoperative dysphagia.

Table 1. Postoperative Outcomes After Paraesophageal Hernia Repair With and Without Esophageal Bougie Use

	Total	No Bougie Used	Bougie Used	p-value
	N=1,055	N=523	N=532	
30-Day Complication	77 (7.3%)	47 (9.0%)	30 (5.6%)	0.035
30-Day Reintervention	32 (3.0%)	20 (3.8%)	12 (2.3%)	0.14
GERD > 30 Days	92 (8.8%)	47 (9.1%)	45 (8.5%)	0.75
Dysphagia > 30 Days	68 (6.5%)	37 (7.1%)	31 (5.9%)	0.41
Recurrence	156 (14.8%)	69(13.2%)	87 (16.4%)	0.15
Reoperation	68 (6.4%)	30(5.7%)	38 (7.1%)	0.35
30-Day Mortality	3 (0.3%)	3(0.6%)	0 (0.0%)	0.12

P561

Outcomes of Robotic Pyloroplasty for Gastroparesis and Adult Hypertrophic Pyloric Stenosis: A Case Series

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Background: Gastroparesis and adult hypertrophic pyloric stenosis (AHPS) are both characterized by impaired gastric emptying. While laparoscopic pyloroplasty and gastric peroral endoscopic myotomy (G-POEM) are both well-described for the treatment of gastroparesis and infantile hypertrophic pyloric stenosis, data on robotic pyloroplasty (RP) outcomes, particularly in the treatment of AHPS, remains scarce. This study presents the outcomes of RP for these conditions at our institution.
Methods: We retrospectively reviewed patients who underwent RP for any indication at our institution from April 2022 to August 2024 ($n = 10$ patients). Baseline demographics, perioperative outcomes, and pre- and post-operative symptom scores using the Gastroparesis Cardinal Symptom Index (GCSI) were analyzed. Statistical significance of decrease in GCSI score was determined using paired T-tests.
Results: The surgical indication was gastroparesis in 40% ($n = 4$) of patients, all idiopathic, and pyloric stenosis in 60% ($n = 6$). Among the pyloric stenosis patients, 50% ($n = 3$) were idiopathic, 33.3% ($n = 2$) were related to peptic ulcer disease (PUD), and 16.7% ($n = 1$) had inflammatory bowel disease (IBD). Patients were predominantly female (90%), with a mean age of 47.9 ± 14.6 years and a mean BMI of 26.3 ± 6.7 kg/m^2. All patients had preoperative GERD and PPI use, and 90% had undergone at least one prior invasive intervention for gastroparesis or pyloric stenosis. Average operative time was 139.6 min, or 105.8 min when performed without concomitant procedures. The median length of stay was 2.0 days, with a notable outlier that experienced postoperative delirium. The 30-day complication rate was 10% (1 unplanned ICU admission), with no complications of bleeding, leak, SSI, or reoperation. There was a significant reduction in GCSI scores postoperatively for all patients (pre: 3.76, post: 1.61, $p < 0.001$) and for pyloric stenosis patients (pre: 3.55, post: 1.10, $p < 0.001$), though not significant for gastroparesis patients (pre: 4.17, post: 2.63, $p = 0.097$).
Conclusions: Robotic pyloroplasty appears to be a safe and effective procedure for both gastroparesis and adult hypertrophic pyloric stenosis, with clinically significant improvement, particularly in pyloric stenosis patients. This study is limited by a small sample size, and larger studies are warranted to confirm these findings.

P562

Feasibility and Safety of a Gastroscopy-Guided Laparoscopic Local Resection for Duodenal Submucosal Tumor

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Purpose: Local resection of submucosal tumors in duodenum is challenging due to the difficulty of fine localization and high risk of causing deformity in duodenal passage. In this study, we evaluated the feasibility and safety of gastroscopy-guided laparoscopic wedge resection (GLWR) for duodenal submucosal tumors to overcome the above difficulties.
Methods: A total 16 cases underwent GLWR for for duodenal submucosal tumors During the GLWR procedure, an endoscope was used to provide sufficient dissection around duodenal tumor. Then, the location was confirmed by endoscope, full thickness of wedge resection was performed using a laparoscopy. The clinicopathological characteristics and surgical results were analyzed.
Results: All procedures were successfully performed without requiring a major duodenal resection. The mean operation time was 101 min, estimated blood loss was 15 ml, and postoperative hospital stay was 6.8 days. There were on postoperative complication. Pathological diagnoses were 7 neuroendocrine tumors, 6 gastrointestinal stromal tumors, 1 heterotrophic pancreas, and 1 traumatic neuroma.
Conclusion: GLWR is a feasible and safe treatment option for duodenal submucosal tumors, as reliable minimal invasive procedure to avoid duodenal deformity through fine localization.

P563

A Unique Case on Endoluminal Vacuum Therapy for Salvage of Large Esophagojejunal Anastomotic Dehiscence

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Introduction: Total gastrectomy for gastric volvulus is rare and associated with high morbidity and mortality. Effective management of esophageal anastomotic leaks requires rapid identification of the defect, prompt resuscitation, and urgent intervention. However, surgical correction of these defects is often challenging and carries a high risk of complications.
Case: A 56-year-old male presented with severe abdominal pain and emesis. Imaging revealed a paraesophageal hernia with acute ischemic gastric volvulus (Fig. 1A). During initial emergent laparotomy, a total gastrectomy was performed due to necrosis of the entire stomach. After resuscitation, patient underwent subsequent Roux-en-Y esophagojejunostomy with placement of a jejunostomy feeding tube.
Three weeks later, patient was discharged to a long-term care facility but readmitted with sepsis, and CT scan demonstrated complex 15 × 10 cm intra-abdominal and mediastinal abscess (Fig. 1B) suggestive of an esophagojejunal (EJ) anastomotic leak. A percutaneous transabdominal mediastinal drain was placed within the complex abscess cavity and EGD ultimately confirmed partial dehiscence involving 50% of the left lateral anastomotic circumference. Figure 2 shows EGD with arrows highlighting the transabdominal mediastinal drain that was endoscopically visible through the anastomotic dehiscence. Endoluminal vacuum therapy (EVT) was initiated by suturing granulofoam sponge to a 12 Fr NG tube and advanced to occlude anastomotic dehiscence. Patient had biweekly EVT sponge exchanges.

After 15 weeks, interval EGD and CT scans demonstrated progressive resolution of the mediastinal abscess and closure of the EJ dehiscence, leaving a 3 × 3 cm chronic mediastinal cavity (Fig. 1C). Ultimately, two over-the-scope clips were placed to close the remaining pinhole sized fistula. Afterward CT with oral contrast demonstrated no signs of a leak. The patient was advanced to a post gastrectomy diet, and discharged after 140 days. Now 1.5 years later, he continues to tolerate post gastrectomy diet and has returned to work.

Discussion: Postoperative esophageal anastomotic leaks are potentially fatal if not treated promptly, with mortality rates of 7.4% when managed within the first 24 h, rising to 20.3% if treatment is delayed. Esophageal anastomotic leaks are among the most serious complications following esophagectomy and gastrectomy, with incidence rates ranging from 0 to 35% after esophagectomy and 2.7% to 12.3% after total gastrectomy. This case highlights the successful application of EVT for salvage of a large EJ anastomotic dehiscence in a septic and malnourished patient following total gastrectomy for ischemic gastric volvulus.

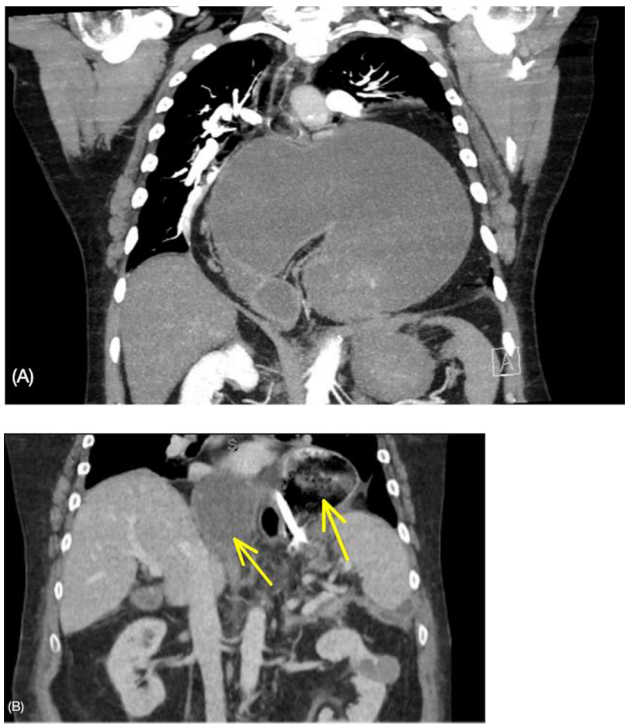


Fig. 1 Initial presentation (A); initial dehiscence and leak (B) and final (C)

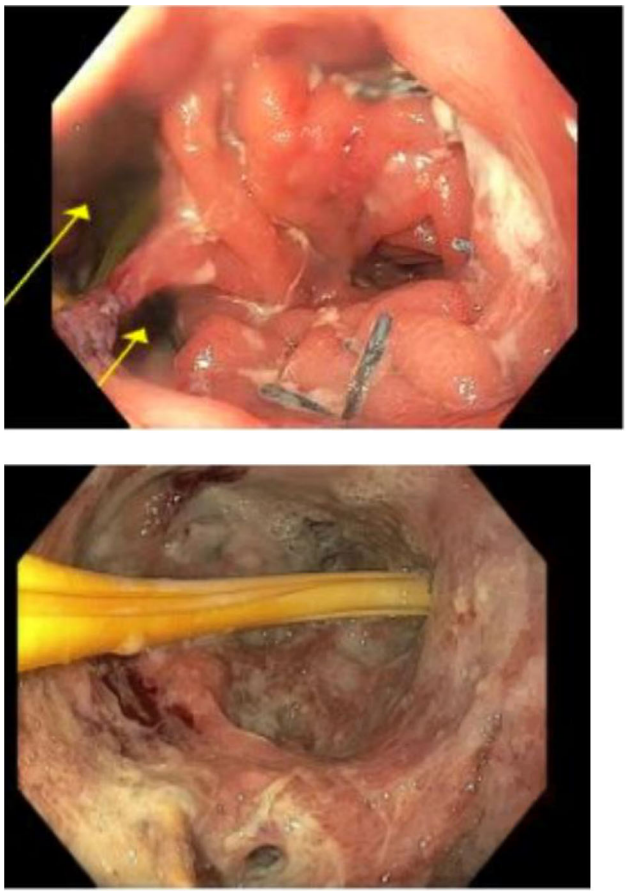


Fig. 2 Initial EGD

P564

Comparative Analysis of Primary and Redo Laparoscopic Antireflux Surgery: Insights from a Single Surgeon's Experience

Joong-Min Park; Eunju Lee; Hyung Ho Kim; Chung-Ang University Gwangmyeong Hospital

Background: Laparoscopic fundoplication is a key treatment for gastroesophageal reflux disease (GERD). However, some patients require redo antireflux surgery (ARS) due to persistent symptoms or complications. This study compares the outcomes of redo ARS with primary ARS, based on the experience of a single surgeon.

Method: A retrospective review was conducted on 261 laparoscopic ARS procedures, comprising 248 surgeries: 17 redo ARS cases and 231 primary ARS cases. Patients who underwent prior endoscopic antireflux procedures were excluded from the analysis.

Results: Of the redo cases, 13 were first-time redos, while 4 were second, third, or fourth redo procedures. Preoperative symptoms included dysphagia (n = 8), typical reflux symptoms (heartburn and acid regurgitation, n = 10), and chest pain (n = 3). Failure patterns observed during redo surgeries included wrap malposition (n = 5), wrap migration (n = 4), wrap disruption (n = 1), achalasia (n = 1), and tight cruroplasty (n = 1). In five cases, no clear anatomical abnormalities were found. Redo fundoplications included Toupet (n = 4), Dor (n = 8), and Nissen (n = 5). One patient underwent a Heller myotomy for achalasia diagnosed after the second redo. The

average operating time for redo ARS was 161.5 ± 35.9 min, significantly longer than for primary ARS (106.4 ± 31.6 min) ($p < 0.01$). One redo case required conversion to open surgery due to a previous laparotomy for hemoperitoneum. No surgical mortality or morbidity occurred in either group.

One week postoperatively, 55.8% of redo ARS patients experienced complete symptom resolution, 11.8% had partial resolution, and 29.4% had ineffective symptom control. In contrast, primary ARS patients reported complete resolution in 87.9%, partial resolution in 7.4%, and ineffective control in 4.8% ($p < 0.01$). Six months after surgery, complete resolution was reported in 37.5% of redo ARS cases, partial resolution in 37.5%, and ineffective control in 25.0%, compared to 53.0%, 36.6%, and 10.4%, respectively, in primary ARS cases ($p = 0.400$).

Conclusion: Redo ARS achieves lower symptom resolution rates than primary ARS, particularly in the immediate postoperative period. However, long-term outcomes are comparable between the two groups. Laparoscopic redo ARS is a safe and effective option for managing failed ARS cases, though larger studies are needed to confirm these findings.

P565

Duodenojejunal Perforation Complicating Aorto-Bifemoral Bypass Graft: A Case Report

Masoud Akbari, DO, MS; Englewood Health Medical Center

Bowel perforation complicating aorto-bifemoral bypass (ABFB) procedures is rare. There are no reported cases of duodenojejunal perforations. The presentation of bowel perforation can be delayed due to patients being asymptomatic or with mild vague abdominal pain.

We describe a case of a patient who presented with severe claudication and underwent an open ABFB procedure. A LigaSure device was used to mobilize dense adhesions from a prior intra-abdominal procedure, a trauma-related diagnostic peritoneal lavage. This may have caused a thermal injury resulting in delayed perforation. Postoperatively the patient did well except for ileus and a mild lactic acidosis, which cleared with fluids during his 3-day ICU course. On postoperative day 5 the patient had increasing SOB, abdominal pain, and lactic acidosis without leukocytosis. CT showed extensive soft tissue air and a moderate amount of fluid in the left abdomen and pelvis, extending proximally to the level of the bypass graft. The source of the air was suspected to be the gastrointestinal tract. The patient was taken to the operating room for exploration. A 3 cm longitudinal perforation was found at the duodenum and jejunum junction. This was repaired with 3-0 silk transversely in two layers in an interrupted fashion. The abdomen was washed out extensively and a Blake drain was left near the repair site. The vascular graft was explanted and arteries were closed primarily. The abdomen was closed temporarily with an AbThera device and the patient was transferred to the ICU.

Duodenal perforation has a high reported mortality rate of 8–25%. The majority of reported duodenal perforations occur after laparoscopic cholecystectomies. Most of these (83%) are primarily repaired.

There are several case reports of bowel perforation after ABFB procedures, typically from graft erosion into a viscus or iatrogenic graft malposition.

Our literature search found no reported cases of duodenojejunal perforation after ABFB procedures. We present this case so that physicians have a high index of suspicion for bowel perforation in a patient with abdominal pain and lactic acidosis after this vascular procedure. CT is a useful adjunct to help diagnosis. Returning to the OR promptly and examining the bowel thoroughly, including the proximal small bowel, is key to management. A duodenojejunal perforation should be repaired primarily in a transverse fashion to avoid narrowing the lumen, with prompt return to ICU for resuscitation.

P566

Case Series on Esophagectomy for Patients with Achalasia After Myotomy.

Jamie R Benson, MD; Christina S Boutros, DO; Patrick Wieland, MD; Saher-Zahra Khan, MD; Hamza Nasir Chatha, MBBS; Emily Simon, MD; Erik Risa, MD; Juan Antonio Paredes, MD; Joshua Lyons, MD; Jeffrey M Marks, MD; University Hospitals Cleveland Medical Center

Background: Per oral endoscopic myotomy (POEM) and Heller myotomy are well-established, safe, and effective treatments for achalasia. However, in a small subset of patients, disease progression leads to worsening esophageal dysmotility and severe dysphagia despite these interventions. In such cases, more invasive treatments, including esophagectomy, may become necessary. Here, we present a case series from our achalasia database of patients who ultimately required esophagectomy for achalasia management.

Methods: We conducted a retrospective analysis of our institutional database from 2011 to 2023. Inclusion criteria consisted of patients with a confirmed diagnosis of achalasia who were evaluated for esophagectomy at our facility. Exclusion criteria included patients with missing data pertaining to achalasia diagnosis or the time frame before intervention. We evaluated demographic data, as well as pre-operative and post-operative outcomes across these patients, as shown in Fig. 1 below.

Results: Out of the 391 patients in our database, 5 patients met inclusion criteria. Four of these patients underwent esophagectomy, while one procedure was aborted due to respiratory symptoms on the day of surgery. Of the five patients, three had previously undergone POEM, and two had prior Heller myotomies. The average patient age was 46.2 years-old (range 23–74). The average time from the onset of achalasia symptoms to myotomy was 4.8 years. The average time from myotomy to symptom recurrence prompting esophagectomy evaluation was 6.3 years. The average pre-esophagectomy manometry data includes: LES pressure 11.1, DCI 247, and ineffective motility on 90% of swallows. Three of the four patients experienced no postoperative complications, while one patient developed a mediastinal abscess requiring drainage but had no long-term complications. At one-year follow-up, all four patients were free from dysphagia and had an average weight gain of 4.9 kg.

Conclusions: In this cohort, we found that 1.3% of patients require esophagectomy for achalasia after myotomy and that the indications for esophagectomy following endoscopic or laparoscopic myotomy include symptom recurrence and manometry data indicating a lower pressure LES and ineffective esophageal peristalsis.

Subject	Sex	Age	Time to Initial Intervention (years)	Type of Intervention	Time to Esophagectomy After Myotomy (years)	Pre-Esophagectomy Manometry	Symptom Improvement
1	M	74	4	Heller	10	Yes	Yes
2	F	61	10	POEM	2	Yes	N/A
3	F	47	3	POEM	0.5	Yes	Yes
4	F	26	4	Heller	15	Yes	Yes
5	M	23	3	POEM	4	Yes	Yes

P567

Laparoscopic Heller Myotomy for the Resolution of Achalasia in a Bariatric Patient: Case Report

Carla Campos; Daniel Islas; Gerardo Aguirre; Gerardo Garmendia; Manuel García; Mariana Treviño; Armando Garcia; Christus Muguerza Alta Especialidad

Achalasia after bariatric surgery is a rare pathological entity. The cardinal symptoms include dysphagia, regurgitation, chest pain, and weight loss. Pneumatic dilation, endoscopic myotomy, and laparoscopic Heller myotomy can provide lasting symptom relief.

The objective is to present the case of the diagnostic and surgical approach in a patient diagnosed with achalasia, along with a review of the literature.

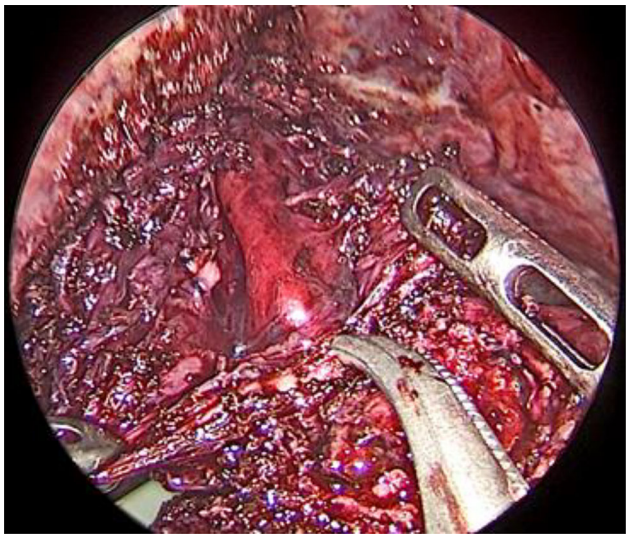
31-year-old male with a history of placement and removal of a conventional gastric band. Five months prior to admission, he began experiencing dysphagia to solids, which improved with the intake of proton pump inhibitors and prokinetics, accompanied by productive cough, hemoptysis, and regurgitation.

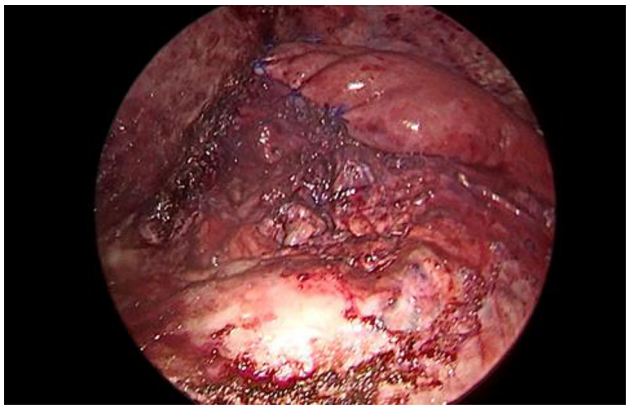
A plain tomography was performed, which reported a distended esophagus throughout its entire length and thickening in the distal third. A panendoscopy was performed, revealing a 100% stenosis of the esophagus with signs of infiltration, preventing the passage of the endoscope. An esophagogastroduodenal series showed a marked delay in the passage of contrast medium at the esophagogastric junction. Manometry confirmed a diagnosis of type II achalasia.

A laparoscopic Heller myotomy was decided upon. A large number of stomach adhesions to the wall were found and released. The right diaphragmatic pillar was located, and dissection of the esophageal hiatus was performed. The left side was then dissected. Next, the esophageal hiatus was dissected for approximately 4 cm of intra-abdominal esophagus, followed by intraoperative endoscopy, showing the gastroesophageal junction with no ability to pass the endoscope due to stenosis at that level. Once the gastroesophageal junction was marked, the Heller myotomy was initiated. Five centimeters of the esophageal side and 4 cm of the gastric side were cut. Adequate passage of the endoscope was verified. A plication of the pillars was performed, and a posterior Toupet fundoplication was then carried out.

The patient had a good in-hospital recovery and was discharged due to improvement. Follow-up consultations were uneventful.

Achalasia after bariatric surgery is a rare pathological entity. However, several cases have been described in the literature. In patients with gastric bands, dysphagia symptoms typically resolve after deflation and removal of the band. However, there are case reports of persistent symptoms following the removal, as seen in our patient. Laparoscopic Heller myotomy has excellent efficacy, with improvement in symptom scores in over 90% of patients and high satisfaction in more than 90% of cases up to 5 years after the procedure.





P568

Surgical Treatment of Refractory Gastroparesis is Successful in Selected Patients

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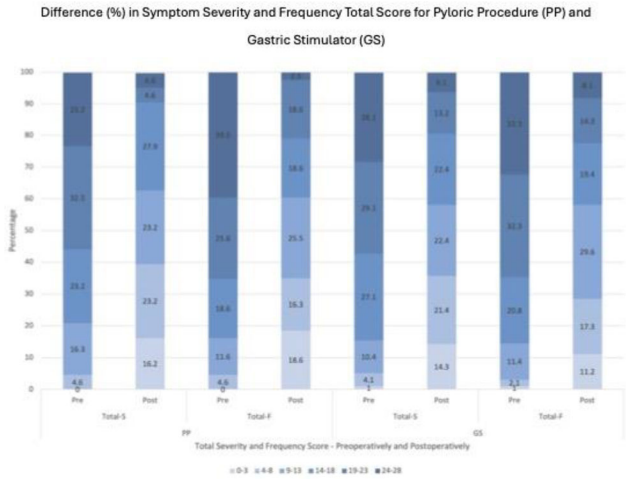
Introduction: For patients with refractory gastroparesis, selecting the appropriate surgical intervention is challenging due to the inability to target therapy to specific etiologies and the paucity of comparative data.

Methods: A prospective cohort study was conducted utilizing GSCI surveys administered preoperatively and two weeks postoperatively for all adult patients who underwent pyloric procedure (PP, pyloroplasty and pyloromyotomy) and gastric stimulator (GS) between 2020 and 2024. 43 PP and 98 GS patients were included. The survey assessed severity (S) and frequency (F) of vomiting (V), nausea (N), early satiety (ES), bloating (B), postprandial fullness (PF), epigastric pain (EP), and epigastric burning (EB). Symptoms were rated from 0 to 4, with a maximum total of 28. *P*-value was calculated using proportional odds ordinal logistic regression, with odds ratio and 95% confidence interval reported.

Results: There was a statistically significant reduction in all scores on the GSCI survey for both PP ($p < 0.005$) and GS ($p < 0.0005$). The highest odds of reporting a lower score was B-F (8.53, 3.53–20.6) and V-F (7.05, 2.99–16.6) for PP, and N-F (6.15, 3.44–11.0) and N-S (6.12, 3.49–10.7) for GS.
For PP, patients with a total symptom severity score of 14–28 dropped from 34 to 16 postoperatively, and those with a frequency score of 14–28 dropped from 36 to 17. For GS placement, patients with a severity score of 14–28 decreased from 81 to 41, and those with a frequency score of 14–28 decreased from 82 to 41. Graph 1 shows the percentage change in total scores.



(Graph 1)
Conclusion: There was significant improvement in severity and frequency of all symptoms two weeks postoperatively for both PP and GS. The results show an improvement over a prior study we conducted, suggesting better patient selection.

P569

Laparoscopic Retrieval of Perforated Lower Esophageal Foreign Body

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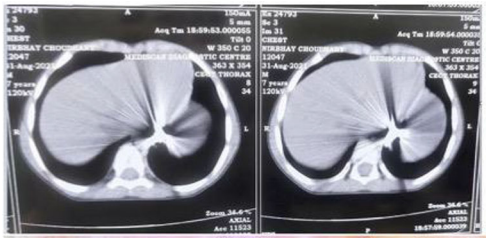
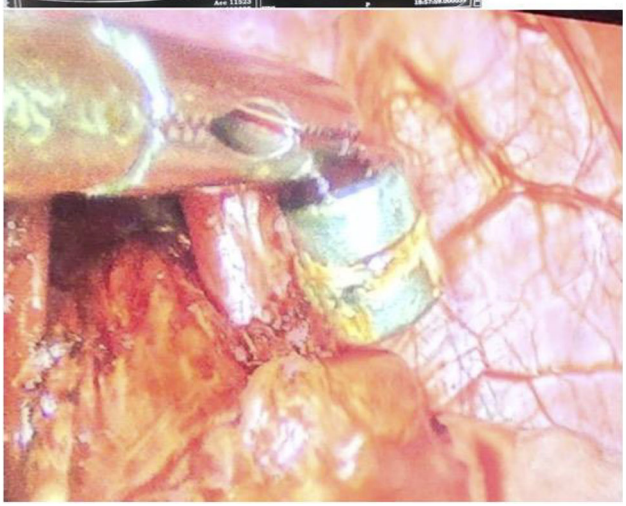
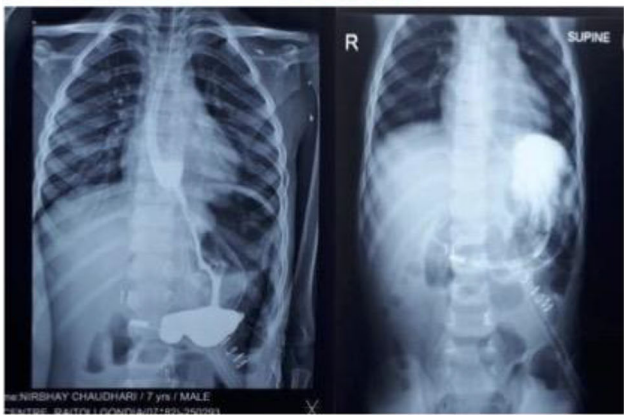
Introduction: Esophageal Foreign bodies continue to pose surgical emergency. Timely intervention is necessary to prevent complications like perforation,obstruction. Treatment options include Endoscopic or Surgical retrieval.
Case Report: 7 year old boy had history of accidental ingestion of metallic magnetic foreign body 10 days back. Immediately after ingestion he was taken up to a Hospital and underwent upper GI endoscopy. It revealed the presence of an impacted foreign body just proximal to GE junction with mucosal tear. Patient was informed about Endoscopic retrieval and its complications. Patient did not opt for the procedure and came to our hospital for further treatment.
On presentation to us, X ray Abdomen revealed a radio opaque foreign body just below the left diaphragm, probably in the esophagus. Repeat endoscopy at our hospital showed ulceration above gastro esophageal junction and foreign body was not seen in the lumen. CECT abdomen with thorax was done to localize the foreign body. The image was scattered at the level with artifact and it was not certain about exact plane of foreign body. Suspecting the Perforation in the esophagus near the GE Junction, the patient was taken up for diagnostic laparoscopy. Hiatus dissection was done and a metallic foreign body was found in the left crus. As the instrument got stuck to magnetic foreign body. Foreign body was retrieved. There was rent of 2 cm in lower end of esophagus extending up to GE junction. It was repaired using 3-0 Vicryl upto GE junction and Toupet fundoplication was done as a protective measure to the repair.

Patient was kept NBM for 3 days. Oral contrast study was done on POD 4 which was normal. Patient was started orally and discharged.
Discussion and Conclusions: Foreign body leading to perforation is a dangerous complication. Intra Thoracic or Abdominal perforation leads to Mediastinitis or Peritonitis respectively. Emergency surgical exploration, retrieval of the foreign body and repair of Perforated esophagus or bowel is the treatment of choice. Esophageal repair in layers and cover with fundoplication is the treatment of choice for Lower esophageal Perforation. In our case, there was perforation and before development of Frank peritonitis, so the patient was planned for Laparoscopic Surgery. With Laparoscopy, patient's recovery was also quick.







P571

Laparoscopic Paraesophageal Hernia Repair with Pan-Gastropexy: A Novel Technique and Propensity Matched Analysis

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Background: The recurrent Paraesophageal hernia presents a challenging problem for surgeons. The relative benefits of mesh implantation, fundoplication, and gastropexy in preventing recurrence are unclear. We present a novel approach, designated Pan-gastropexy (PGX), in which the cardia and majority of the greater curvature are affixed to the diaphragm and abdominal wall with hopes of mitigated recurrence.

Methods: A retrospective chart review was performed on all patients who underwent type II-IV paraesophageal hernia repair our institution between 2012 and 2023. Paired propensity matched cohorts were created for PGX group and traditional gastropexy group based on age, DM, BMI, gender and prior foregut surgeries. The primary outcome measured was objective evidence of recurrence. Secondary outcomes were ICU admission within thirty days, length of stay, dysphagia,

GERD symptoms, PPI use at 3 months, and thirty day mortality. A Wilcoxon sign rank test was applied to both groups for heterogeneity. A chi squared analysis was applied to each outcome metric to assess for significance.
Results: Forty one patients underwent PGX, the paired traditional gastropexy cohort included 82 patients. There were no statistically significant differences in the two groups with regard to age, BMI, gender, diabetes, smoking status, symptom frequency, or the presence of volvulus. Likewise, there were no statistically significant differences in the likelihood of recurrence, ICU admission (4.8%), dysphagia (7%), GERD symptoms (19.5%), PPI use (41%) or thirty day mortality (0%). The recurrence rate in the traditional group was 9.5% and 4.9% in the PGX group. Conclusion: Pan-Gastropexy presents a safe and novel repair strategy with recurrence rates that are comparable to existing literature.
Keywords: Gastropexy, Paraesophageal Hernia, Recurrence

P572

Robotic Assisted Pyloroplasty for Bouveret's Syndrome

Cecilia Lee, DO; Aja H Harding, DO; Corewell Health

A 66 year-old male presented with 2 days of epigastric pain, nausea and emesis. Initial workup demonstrated gastric outlet obstruction on cross sectional imaging secondary to a large mass in the duodenum. Patient underwent an endoscopic gastroduodenoscopy and significant debris was seen causing inability to assess the antrum. The procedure was aborted and an NGT was inserted. The following day, patient returned for endoscopic gastroduodenoscopy where a large round mobile mass was encountered in the duodenum. After multiple unsuccessful attempts utilizing multiple methods, the decision to proceed with robotic assisted pyloroplasty. A transverse pyloroplasty was made from prepyloric channel to proximal duodenum. The 4.5 cm non-adherent, non-tissue appearing mass was able to be extracted and the pylorus was successfully closed and confirmed with a negative leak test during endoscopy. Pathology was consistent with a large gallstone. Bouveret's Syndrome is a rare cause of gastric outlet obstruction and a rare variant of gallstone ileus. A bilioduodenal fistula forms due to chronic inflammation and subsequently the gallstone causes stone migration into the duodenal bulb. Morbidity and mortality rate is up to 30% for Bouveret's syndrome and emergent treatment is recommended due to chance of spontaneous resolution being $< 1\%$.

P573

Multimodal Evaluation of Histologic Patterns of Goblet Cell Distribution in Barrett's Esophagus Shows Varying Cancer Risk

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Intro: Highly-differentiated metaplastic mucosa, reflected by homogenous high-density goblet-cell(GC) epithelium, carries a lower risk of cancer progression compared to heterogeneous Barrett's-esophagus (BE). In-situ histologic evaluation regarding epithelial heterogeneity has historically only been possible after esophagectomy. Preliminary data from prior studies appear to demonstrate an inverse relationship between qualitative GC-ratio and risk of malignant progression of BE. Probe-based laser endomicroscopy (pCLE) allows for real-time large-area optical evaluation to guide biopsy sampling for BE surveillance. Genetic biomolecular risk-stratification is becoming an important tool to help identify high-risk BE. The two technologies can be used in conjunction to evaluate malignant progression risk in BE.
Methods: This is a retrospective data review of patients undergoing concurrent pCLE (Cellvizio^{TM}) and biomolecular risk classification (Tissue Cypher^{TM}) during routine BE surveillance December 2018–May 2024 at a tertiary foregut surgery practice. All patients had pathologic confirmation of BE. GC-density was prospectively recorded by five expert foregut endoscopic surgeons and characterized per high-power-field(HPF): no GC seen, low (1–2/HPF), moderate (2–10/HPF), or high (majority of field). Risk calculation was categorized as low, intermediate, or high based on validated outcomes of a tissue-biomarker risk-assessment algorithm.
Results: This cohort included 34-patients: median age 68 (32–82), 56% male. Six patients were found to be high-risk, 3 intermediate-risk, and 25 low-risk for progression on biomarker-analysis. There were no differences in median length of columnar-lined-mucosa between risk-groups, however there was higher percentage of ultrashort BE (< 1 cm) in the high-risk group than in intermediate and low-risk groups(50% vs 0% and 24%, respectively). Table 1 shows GC-density within each risk-group. The majority of patients with high GC-density were in the low-risk group (92%). No patients in the high-risk group had high GC-density. Compared to low-risk, the high-risk group trended towards lower GC-density ($\leq$ 2/HPF) than high GC-density ($p = 0.0598$).
Conclusion: BE with heterogeneous columnar-lined-mucosa may have higher risk of cancer progression compared to homogenous GC epithelium. When any GC are identified on pCLE, it is imperative that subsequent biomolecular risk-classification be performed regardless of histopathologic presence of GC in concurrent tissue biopsy sample. This preliminary association can aid in development of a novel clinical risk-prediction model, informing more precise management guidelines.

Table 1 Goblet-cell density on pCLE stratified by concurrent biomolecular-risk for BE progression

RISK	No goblet-cells	Low(1–2/HPF)	Moderate(2–10/HPF)	High(majority of the field)
High	1	4	1	0
Intermediate	0	4	1	1
Low	7	4	3	11

P574

Isolated Main Right Hepatic Duct Transection After Laparoscopic Cholecystectomy: Evaluation and Management Challenges of a Very Rare Iatrogenic Event

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Introduction: The incidence of iatrogenic bile duct injury ranges from 0.5 to 1.5%. To our knowledge, isolated right hepatic duct injury following routine cholecystectomy has not yet been reported. Herein, we present our experience in managing a young woman with isolated main right hepatic duct transection.
Methods & Procedures: A 28-year-old postpartum woman presented with right upper quadrant abdominal pain and nausea/vomiting for one day and was found to have acute cholecystitis on abdominal ultrasound. Hepatic function tests (HFTs) were within normal range.

During laparoscopic cholecystectomy, a bile duct leak noted at the Calot triangle, which was managed with two metallic clips. Intraoperative cholangiogram (IOC) was required due to difficulty achieving the critical view of safety (Fig. 1A). There was no evidence of injury on imaging, so the cystic duct was controlled using Endoloop and the surgery continued in standard fashion. Post-operatively, the patient experienced worsening abdominal pain with a rise in her HFTs, including an AST of 122, ALT of 213, ALP of 265.

The patient underwent MRI/MRCP with contrast on POD-3 and was found to disruption between the right main duct and the rest of the biliary tree (Fig. 1B). ERCP was performed on POD-4 with sphincterotomy with placement of a 10 Fr × 7 cm stent into the left hepatic duct. Percutaneous transhepatic cholangiogram was performed and showed abrupt main right duct occlusion with placement of an 8Fr percutaneous transhepatic biliary drain to the right ductal system (Fig. 1C). The patient returned to the operating room on POD-5 and was found to have two metallic clips traversing the main right hepatic duct (Fig. 1D). The patient underwent Roux-en-Y right hepatic duct hepatico-jejunostomy with Hudson Russell technique. A 19Fr Blake drain was left in the right upper abdomen along with an 8Fr hepatico-enteric internal–external pigtail catheter.

Results: The patient's HFTs continued to downtrend after surgery. She remained hemodynamically stable throughout her recovery and was cleared for discharge on POD-3. The patient was followed up outpatient with percutaneous cholangiogram showing prompt transit of contrast from the right-sided bile ducts to the small bowel with no signs of contrast extravasation or leak with successful removal of her drainage catheter.

Conclusion: We advocate for cautious interpretation of IOC with possible false negative results and present our successful hybrid management of isolated right main hepatic duct injury by stenting the left duct and hepatico-jejunostomy of the right duct.

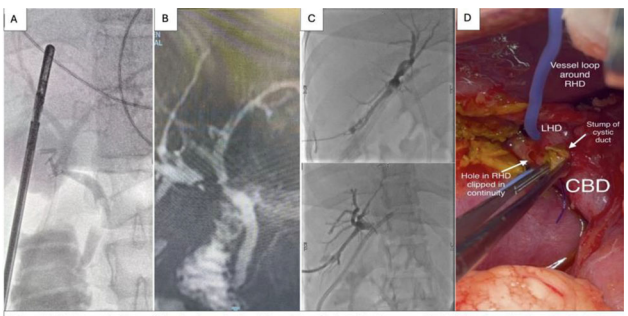

Figure 1A. IOC demonstrating metallic clips traversing the right main hepatic duct; falsely presumed CHD bifurcation which turned out to be the left hepatic duct bifurcation.
Figure 1B. MRCP demonstrating disruption between the right main duct and the rest of the biliary tree.
Figure 1C. Percutaneous transhepatic cholangiogram demonstrating non-dilated right-sided intrahepatic biliary system with no evidence of drainage into the CHD.
Figure 1D. Intraoperative image showing transected right hepatic duct.

P575

Onco-Metabolic Surgery: Comparison of the Effect Between Long-Limb and Conventional Roux-en Y Reconstruction After Subtotal Gastrectomy in Gastric Cancer Patients with Type II Diabetes

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Backgrounds: Bariatric & metabolic surgery induce diabetes remission independent of the resultant weight loss; as a result, gastric cancer surgeons began to investigate whether operations for gastric cancer could have the same beneficial effect on type II diabetes. This multicenter prospective study aims to determine the effect of long-limb Roux-en-Y gastrojejunostomy following radical distal gastrectomy in early gastric cancer patients with type II diabetes.

Methods: The length of biliopancreatic and Roux limb will be increased to over 80 cm respectively in the long-limb group and the effect on glycemic control will be evaluated compared to the conventional group with 20 cm-long alimentary limb and 40 cm-long biliopancreatic limb. Inclusion criteria consisted of clinical stage I gastric cancer less than 80 years old with type II diabetes and body mass index more than 23 obese patients. The primary endpoint is the rate of more than improvement in diabetic control which means that the level of HbA1c is less than 6.5%. The target sample size is 94 with the 30% difference between long limb and control groups and 13 institutions were participated.

Results: The average BMI in both groups was 28, and there was no difference in glycated hemoglobin and duration of diabetes. In both groups, glycated hemoglobin and fasting blood sugar decreased at 1, 3, 6, and 12 months after surgery compared to before surgery, but there was no significant difference between the two groups. In terms of nutritional indicators, BMI and hemoglobin decreased in both groups, but there was no significant difference compared to before surgery, and albumin continued to be maintained. Diabetes control indicators showed statistically more significant improvement in the long-limb group compared to the conventional RY group at 6 and 12 months after surgery (77.1% vs 48.8%, $p = 0.028$).

Conclusion: From above results, we are expecting the simultaneous control of gastric cancer & type 2 diabetes analyzing the relationship between diabetes control & length of bypass and hope to make efficacy of metabolic surgery in non-morbidly obese population in the future.

P576

Refractory Peptic Ulcer Disease Causing Gastric Outlet Obstruction

Kirandeep K Bains, MD, MS; Karna Baraboo, MD; Ilia Gur, MD; San Joaquin General Hospital

Gastric or duodenal peptic ulcer disease (PUD) affects about 8.4% of Americans and is commonly secondary to excessive NSAID use and H. pylori infection. Although most patients are asymptomatic, the most common symptom is epigastric pain and if left untreated can progress to upper gastrointestinal (GI) bleedings, perforation, and in rare cases gastric outlet obstruction (GOO). Treatment is guided by history and presence of alarm symptoms, such as advanced age (greater than 60), family history of upper GI malignancy, weight loss, early satiety, dysphagia, bleeding, iron deficiency anemia, and emesis, which warrant urgent endoscopic evaluation to assess the gastric and duodenal mucosa and obtain biopsies to rule out H pylori or malignancy. With the widespread introduction of omeprazole in 1989 and antibiotic treatment for H. pylori in 1994, the management of PUD has changed tremendously. Herein, we discuss a case of a 65-year-old man with a history of PUD complicated by posterior gastric ulcer perforation requiring graham patch repair four years ago and intra and extrahepatic biliary duct dilatation for seven years who presented with intractable epigastric abdominal pain, nausea, and vomiting, poor oral tolerance, despite being compliant with omeprazole and Pepcid. He had a history of a recent esophagogastroduodenoscopy where he was noted to have a large antral ulcer and pyloric stenosis for which he underwent balloon dilation but now he presented with signs of gastric outlet obstruction based on symptoms and imaging with concerns of possible pancreatic head malignancy. Intra-operatively, he was noted

to have severely adhered posterior wall of the stomach to the duodenum and pancreatic head which was inseparable therefore a diverting gastrojejunostomy was created. Furthermore, no mass was noted on palpation, rather the obstruction appeared all secondary to inflammatory changes from his PUD. Since the development of PPI and H pylori treatment, complicated cases of PUD are rare but it is important to recognize these rare, severe complications, such as the GOO presented here, and tackle them appropriately and with urgency to avoid further adverse outcomes.

P577

Robotic-Assisted Transcervical Mediastinoscopic Thoracic Esophagectomy (RACE): A Comparative Study with Robotic-Assisted Thoracoscopic Minimally Invasive Esophagectomy (RAMIE)

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Introduction: Trans-cervical mediastinoscopic esophagectomy for thoracic esophageal cancer is a non-thoracic approach, offering a lower invasiveness compared to conventional minimally invasive esophagectomy (MIE) via the thoracic cavity. This technique is particularly advantageous for patients with impaired pulmonary function, intrathoracic adhesions, or poor performance status, especially in elderly patients with esophageal cancer. However, transcervical esophagectomy presents challenges due to the limited workspace at neck and the risk of recurrent laryngeal nerve injury, leading to postoperative vocal cord paralysis. The use of a robotic system for transcervical mediastinoscopic esophagectomy, utilizing articulated instruments, is expected to enhance operative precision around the recurrent laryngeal nerve and potentially reduce nerve-related complications. In this study, we report the outcomes of robotic-assisted transcervical mediastinoscopic esophagectomy (RACE) and compare them with robotic-assisted minimally invasive esophagectomy (RAMIE), performed during the same period.
Methods and Procedures: At our institution, transcervical mediastinoscopic esophagectomy is performed on patients with previous thoracic diseases or other conditions that make the thoracic approach challenging. The standard approach for mediastinoscopic esophagectomy involves a bilateral cervical incision, starting from the right side. In the RACE procedure, the da Vinci system was used with the same bilateral cervical approach. We analyzed 40 consecutive RACE cases performed between 2023 and June 2024 at our institution. For comparison, RAMIE cases performed during the same period were also evaluated.
Results: The patient cohort had an average age of 75.0 years, with 35 males and 5 females. Clinical stages were distributed as follows: Stage I (17), Stage II (5), Stage III (14), and Stage IV (4). Prior treatments were noted in 52.7% of patients, and 87.5% had a history of systemic or pulmonary diseases. All RACE procedures were completed successfully with no intraoperative complications. Postoperative complications (Clavien-Dindo Grade $\geq$ 1) included recurrent laryngeal nerve palsy in 12.5% of patients and pneumonia in 5.0%. These complication rates were favorable when compared with the RAMIE cases performed during the same period.
Conclusions: Robotic-assisted transcervical mediastinoscopic esophagectomy (RACE) proved to be a feasible and relatively safe technique. The incidence of recurrent laryngeal nerve palsy and respiratory complications was acceptable, suggesting that RACE may be a viable option for minimally invasive esophagectomy, particularly in patients with contraindications for a thoracic approach. Further studies are warranted to confirm these findings and explore the broader application of this technique.

P578

Endoscopic Adjuncts: Unconventional Combinations for Management of Upper Gastrointestinal Perforation

Saumya Agrawal, MBBS; Kalyana Nandipati, MBBS; Creighton University School Of Medicine

Introduction: Upper gastrointestinal leaks and perforations are challenging, especially in immediate post-operative patients. Minimally invasive approaches, usually a combination of radiological and endoscopic interventions are preferred, if the patient is hemodynamically stable. A combination of different endoscopic adjuncts can particularly be very useful, even if unconventional, to achieve the best possible outcome in a patient. Here, we describe the combined use of biliary double pigtail catheter, endoscopic vacuum therapy and covered stent to manage a complicated case of gastric pouch perforation post paraesophageal hernia repair.
Case Presentation: 69 y/o female patient with history of Roux-en-Y gastric bypass, presented with a large paraesophageal hernia with the gastric pouch, entire alimentary limb, jejunojejunostomy and transverse colon in her chest. She underwent robotic PEH repair with mesh requiring extensive lysis of adhesions and mediastinal dissection. She was discharged but returned to ER on postoperative day 8 with shortness of breath and nausea, CT scan suggestive of a large mediastinal and abdominal fluid collection. Upper GI study confirmed a gastric leak. A differential of possible chyle leak was also ruled out with a lymphoscintigram. As the patient was hemodynamically stable, conservative approach was taken, starting with CT guided percutaneous drain placement. An endoscopy showed a small perforation of the cardia immediately proximal to the gastrojejunal (GJ) anastomosis. A biliary 7 Fr $\times$ 7 cm double pigtail catheter was deployed during EGD with one pigtail through the perforation and other through the alimentary limb for drainage, along with a nasojejunal tube for nutrition. Four weeks later, the pigtail catheter was replaced with an endoluminal vac. Subsequent EGD showed decrease in the size of perforation and the vac was again replaced. This vac was later exchanged for a covered stent extending from distal esophagus to proximal jejunum, to completely exclude the gastric pouch. A repeat evaluation four weeks post stent placement showed complete healing and the stent was removed. An upper GI contrast study also did not demonstrate any leak. Patient has been doing well since, tolerating oral diet and all drains removed.
Conclusion: A complicated case of gastric pouch perforation post hiatal hernia repair, highlights the importance of judicious use of endoscopic adjuncts for management of upper GI leaks. A systematic, methodical approach can pave the way for a successful non- operative management in similar selected patients.

P579

Fundoplication Versus Gastric Bypass for Management of GERD and Hiatal Hernias in Obese Patients: A Systematic Review

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Introduction: Severe obesity is associated with an increased prevalence of hiatal hernias (HH) and gastroesophageal reflux disease

(GERD). Both fundoplication (FP) and gastric bypass (GB) are utilized to manage these conditions in this patient population, but comparative outcomes are not well-established. This systematic review aims to compare surgical outcomes of FP versus GB for managing GERD and HH in obese adults.

Methods and Procedures: Following PRISMA guidelines, we systematically searched Scopus and PubMed for relevant studies published up to April 2024. Inclusion criteria encompassed adult obese patients (BMI $\geq$ 30) with HH or GERD undergoing their first FP or GB procedure. We excluded non-English articles, case reports, and studies with incomplete data. Data extraction and quality assessment were performed using Covidence and the ROBINS-I tool, respectively. Key outcomes assessed included postoperative reflux, surgical complications, recurrence of symptoms, and need for reoperation.

Results: Of 191 screened articles, a total of 5 studies met the inclusion criteria. Analysis revealed that both FP and GB effectively manage GERD. A three-arm study assessing postoperative outcomes in 150 patients found that single anastomosis gastric bypass with FP led to fewer complications compared to bypass without FP, which had a significantly higher complication rate ($p = 0.045$). Specifically, 26% of patients without FP experienced esophagitis compared to 14% with FP. Another study found similar overall complication rates between GB and FP but noted fewer symptomatic hernia recurrences in the GB group. A very large retrospective study indicated a significantly lower complication rate for GB compared to FP (7% vs 10%, $p < 0.05$). With respect to reflux scores and subjective symptom control, the study found no significant differences between FP and GB postoperatively, but GB resulted in greater weight loss.

Conclusions: Both FP and GB offer substantial benefits in managing GERD and HH in obese patients. FP shows a trend towards more symptom control but higher hernia recurrence among obese patients. GB provides effective reflux control along with significant weight loss, potentially reducing HH recurrence and improving management of comorbid conditions. This review demonstrates that GB is a safe and effective treatment for GERD and HH in obese patients and should be strongly considered in this patient population. Future research should focus on randomized controlled trials to better define the comparative efficacy of these interventions, standardize outcome measures, and evaluate patient-centered outcomes.

P580

The Effect of Diaphragm Relaxing Incisions on Recurrence and Complication Rate of Paraesophageal Hernias—One Academic Center's Experience and a Review of the Literature

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Introduction: There is strong evidence to suggest that diaphragm relaxing incisions correlate with lower recurrence rates of paraesophageal hernias. However, there is no standardized approach as to how and where to carry out the relaxing incisions. We hypothesize that laparoscopic diaphragm release using a novel technique during hiatal hernia repair, is safe, effective, and decreases incidence of recurrence.

Methods and Procedures: We performed both a literature review of current data and a single center retrospective review of laparoscopic diaphragm releases procedures performed during paraesophageal hernia repair. Diaphragm release was performed if the closure was under tension. We used surgeons' knots, and if they failed to anchor during suture closure of the hiatus, we considered that tension. Rather than employing the traditional technique of making a full-thickness incision through the diaphragm, this technique involves carrying out an incision only to the peritoneal lining of the abdomen and the central tendon of the diaphragm. Similar to an abdominal wall component separation, this approach facilitates the medial displacement of the muscle. Rather than the conventional synthetic mesh bridge, a biological mesh is then used as an on-lay to reinforce the diaphragm release.

Results: We identified 13 ($n = 13$) patients who underwent laparoscopic diaphragm release between 2023 and 2024. This included 8 females and 5 males, with a mean age of 67 years. The majority of hernias were type 3 and 4, with an average hiatal defect size of 6.8 cm. In 6 instances, redo hiatal hernia repair was being performed. Release was performed on the right side in 8 instances, left in 3, anterior in 1, and bilateral in 1. Two (2) recurrences were identified on follow-up based on imaging criteria. Both of these patients had extensive past surgical histories, with one including abdominal aortic aneurysm repair, gastrectomy, and prior hiatal hernia repair.

Conclusions: Our data demonstrates efficacy and low recurrence rates in right sided diaphragm release. It also demonstrated safety and efficacy in a small cohort of left, anterior, and bilateral diaphragm release. Future studies aim to continue to delineate best practice for diaphragm release during hiatal hernia repair in hopes of minimizing recurrence rates.

P581

Laparoscopic Redo Nissen Fundoplication for Failed Anti-reflux Surgery: A Case Report

Carla Campos; Gerardo Aguirre; Daniel Islas; Jorge Perez; Manuel García; Gerardo Garmendia; Mariana Treviño; Christus Muguerza Alta Especialidad

Gastroesophageal reflux disease (GERD) is one of the most common digestive disorders in the U.S., with an estimated prevalence of 18.1% to 27.8%. Laparoscopic anti-reflux surgery has remained the gold standard for the surgical management of GERD. However, long-term outcomes show that failure rates can be as high as 30%, and between 3 and 6% of patients require reoperation. Managing patients who do not respond to anti-reflux surgery is complex and not an easy task.

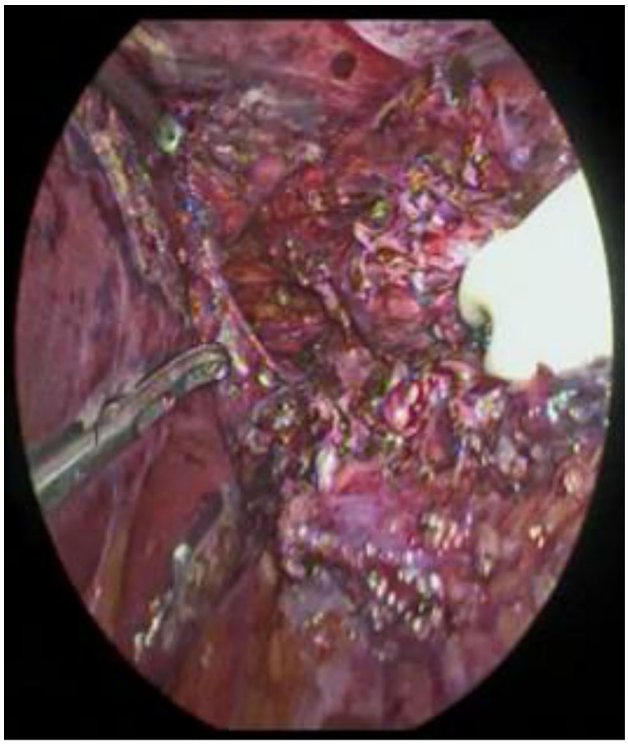
A 57-year-old male with a history of hiatal hernia treated with Nissen fundoplication one year ago. He started experiencing pathological gastroesophageal reflux 8 months ago, which did not improve with proton pump inhibitors. An esophagogastroduodenal series was performed, revealing peaks of esophageal reflux and a non-reducible hiatal hernia. An endoscopy showed the esophagogastric junction at 37 cm from the dental arch with pinching at 41 cm, as well as an open fundoplication with gastric folds extending into the thoracic cavity corresponding to a 4 cm Type 1 hiatal hernia.

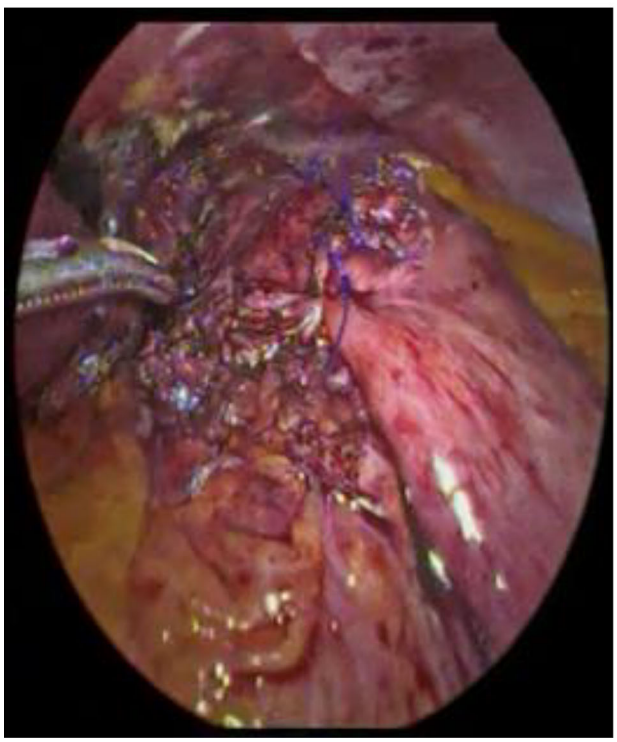
A laparoscopic redo Nissen fundoplication was decided upon. The procedure began by identifying the previous Nissen fundoplication. Intraoperative endoscopy was performed, revealing a loose fundoplication covering 210° and angled. The dissection began to completely takedown the fundoplication, confirmed with the aid of endoscopy. Subsequently, the hiatal dissection was performed to identify both crura, the esophagogastric junction was retracted to be at least 2 cm within the abdominal cavity, and plication was done. A new Nissen fundoplication was then performed, which was confirmed again with endoscopy.

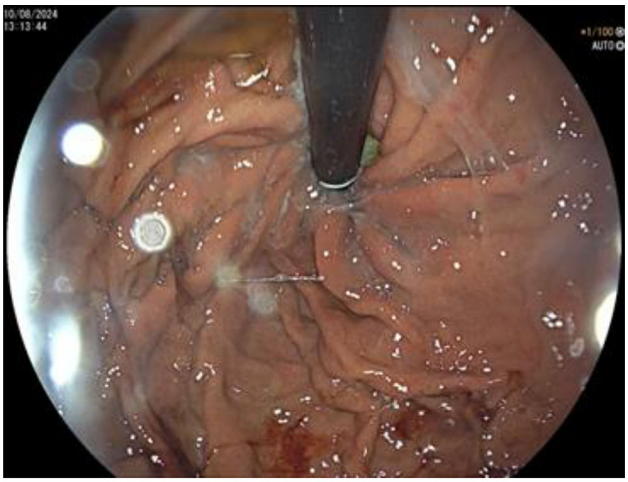
The patient had a good in-hospital recovery. He was discharged due to improvement and was followed up in outpatient consultations without any complications.

Different techniques have been proposed for revisional surgery; however, there is no consensus on which should be the preferred option. Some patients may benefit from reconstructing the failed or

mispositioned fundoplication, while others will require resection and takedown of the previous fundoplication.







P582

Establishing a Surgical Esophageal Function Testing Lab in an Underserved Area: Early Outcomes and Patient Benefits

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Background: Esophageal function testing (EFT) offers objective data crucial for diagnosing and planning treatment in patients with gastrointestinal symptoms suggestive of foregut disease. Typically, EFT is conducted at large tertiary centers, overseen by gastroenterologists. However, access to this specialized testing is often limited for patients in community settings, particularly those facing geographic or socioeconomic barriers. This study aimed to assess the initial outcomes of patients who underwent Bravo pH probe analysis and high-resolution esophageal motility (HREM) testing at a surgical center within a small community program.

Study Design: This retrospective review analyzed patients who underwent high-resolution esophageal motility (HREM) and/or Bravo pH probe testing for foregut symptoms at a community-based gastrointestinal (GI) surgery program between 2022 and 2024. Data on patient demographics, referring specialty, presenting symptoms, test results, and outcomes were gathered from the electronic medical record (EMR).

Results: Between 2022 and 2024, 59 patients underwent esophageal function testing: 57.6% had both and Bravo pH testing, 32.2% had only HREM, and 10.2% had only Bravo. Presenting symptoms were heartburn (71.1%), dysphagia (59.3%), nausea/vomiting (30.5%), regurgitation (25.4%), and atypical chest pain (11.8%).
The group consisted of 42 females (71.2%) and 17 males (28.8%), with an average age of 51.9 and a BMI of 30.8. Most patients (69.5%) were referred by primary care providers, with others referred by gastroenterologists (20.3%), general surgeons (6.8%), pulmonologists (1.7%), and otolaryngologists (1.7%). Acid-reducing medications were already in use by 81.3% of the patients.

Bravo pH testing showed pathological acid exposure (DeMeester score > 14.7) in 35.6% of patients. HREM results included normal esophagus (27%), hiatal hernia (18.2%), esophagogastric junction (EGJ) outflow obstruction (16.4%), and other motility disorders such as ineffective motility (9.1%), distal esophageal spasm (5.5%), and achalasia (3.6%).

Out of the 52 patients with documented follow-up, 30.7% underwent surgical or endoscopic intervention, which included laparoscopic Nissen fundoplication, laparoscopic paraesophageal hernia repair with partial fundoplication, endoscopic Botox injection, revision of jejunojejunostomy with small bowel resection, Heller myotomy with anterior fundoplication, revision of gastrojejunostomy anastomosis with vagotomy, and Toupet fundoplication.
Conclusion: Surgeons at community-based centers can establish comprehensive EFT programs that facilitate the management of patients locally without the barriers associated with referral to tertiary centers.

P583

Type 4 Paraesophageal Hernias are Associated with Higher Reoperation Rates Compared to Type 2 and 3

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Background: Paraesophageal hernias (PEH) have a wide range of presentations and categorizations, differences in hiatal anatomy, and variances in operative approaches. The most utilized classification scheme categorizes PEHs by what anatomic structure(s) have herniated through the diaphragmatic hiatus. This study was designed to evaluate the patient factors, presentations, operative strategies, and various outcomes of types 2–4 PEH repairs.
Methods: This was a retrospective cohort study of all patients who underwent a paraesophageal hernia repair at a single institution over a 10 year period (2010–2020). Patients were divided into 2 cohorts, those with types 2 and 3 PEHs and those with type 4 PEHs. Patient characteristics, presentations, operative approaches, rates of PEH recurrence, rates of reoperation for a recurrent PEH, postoperative dysphagia rates, and postoperative GERD rates were then compared between the two cohorts.
Results: There were 185 patients included in the study. There were no baseline patient characteristics that differed between groups. 127 (69%) were type 2 and 3 PEHs, 58 (31%) were type 4 PEHs. More type 4 PEHs were repaired in the urgent/emergent setting—24.1% vs 10% ($p = 0.04$). There was no difference in operative techniques, including use of fundoplication ($p = 0.3$), other than more hiatal mesh was used in type 4 PEHs—25% vs 11% ($p = 0.02$). More type 4 PEHs required a reoperation—16% vs 4.7% ($p = 0.02$) but the remainder of the post-operative outcomes studied were similar between groups (recurrences, dysphagia, GERD). To evaluate for any potential confounding factors, reoperation rates between elective and urgent/emergent repair of type 4 PEHs was not different ($p = 0.94$) and therefore the difference in reoperation rates between type 2/3 and type 4 was not due to the difference in acuity.
Conclusions: In this present study, type 4 PEHs can be safely repaired, but were associated with higher rates of reoperation despite having higher utilization of hiatal mesh, without any other difference in operative technique—and this result held true when the higher rates of urgent/emergent repairs were controlled for. Therefore, this should help surgeons more definitively discuss the risks and benefits of type 4 PEHs with this complex patient population.

P584

Are Coronal Height and the DeMeester Score Correlated to Surface Area of Hiatal Hernia Defect? A Prospective Analysis

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Objective: This study aims to assess if any association exists between esophageal hiatal defect surface area (HSA), pre-operative coronal height of hiatal hernia and pre-operative DeMeester score in individuals diagnosed with GERD and hiatal hernia.
Methods: This is an IRB approved single institution prospective cohort study that recruited patients from 2019 to February of 2024. Patients diagnosed with GERD, any type of hiatal hernia, and underwent laparoscopic hiatal hernia repair were included. Preoperative workup included pH-metry, maximal coronal height of the hiatal hernia based on radiologic or endoscopic workup, and the esophageal HSA. The HSA was measured through a method we developed that superimposes the esophageal hiatus defect to the area of a right-angle triangle: Area = (1/2) Base*Height. The height was defined as the left crus of the diaphragm. The base was defined as the distance perpendicular to the left crus and tangential to the medial edge of the esophagus. Descriptive statistics, Spearman correlation, and multivariate linear regression were performed to assess our primary aim.
Results: 211 patients were consented and followed over a 24-month period. No correlation was found between HSA and DeMeester score, or coronal height and DeMeester score. There was a significant correlation between coronal height and HSA ($p < 0.01$). Patients without a pH-metry were found to have a significantly larger coronal height ($8.0 \text{ cm} \pm 2.7 \text{ cm}$ vs 3.9 ± 1.9, p-value < 0.001) and HSA (5.9 ± 2.7 cm vs 4.1 ± 3.2 cm, p-value < 0.001) compared to those who had a pH-metry. Patients who had a pH-metry were more likely to have regurgitation, a higher pre-operative GERD-HQRL score, and a greater change in postoperative GERD-HRQL score.
Conclusions: No significant correlation was found between HSA, DeMeester score and coronal height. A larger HSA was associated with a worse GERD-HRQL. Our study did not measure the DeMeester score in patients with larger hiatal hernias, since the symptomatology of larger hiatal defects justified surgical intervention without further work up. Patients without a DeMeester score had significantly larger coronal heights and HSA compared to patients who had a DeMeester score. We are currently accruing data to measure DeMeester scores in patients with larger coronal heights to determine correlation.

P585

Endoscopic Stenting as Bridge to Surgery in Adult-Onset Hypertrophic Pyloric Stenosis

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Introduction: Adult onset hypertrophic pyloric stenosis is a rare disease without formal epidemiological studies, approximately 200 cases reported before 2006. The mainstay of treatment remains surgical with multiple techniques reported; however, limited discussion on treatment options exists when surgery is not feasible. We aim to discuss stenting as a suitable temporizing technique prior to surgical intervention.

Case Presentation: 78-year-old male with a history of exploratory laparotomy for a perforated ulcer presented with poor oral intake due to hypertrophic pyloric stenosis. Chronic epigastric pain, nausea, vomiting, and weight loss of 40 pounds over 4 months preceded the presentation. Notably, the patient had multiple similar previous emergency department visits. Computed tomography with oral contrast in May showed a markedly distended stomach, greater than noted on prior January and February exams, containing enteric contrast and fluid consistent with gastroparesis. Multiple esophagogastroduodenoscopies (EGD) showed negative biopsies, positive H.pylori previously treated with triple therapy and unsuccessful balloon dilations. A nasogastric tube was placed for decompression and total parenteral nutrition was initiated. Due to chronic malnutrition and likely atonic stomach, he was a poor surgical candidate and transferred to an advanced endoscopy facility for pyloric stent placement. He subsequently tolerated a regular diet and began quadruple therapy for concern of treatment-resistant H. Pylori. On follow up, he was tolerating diet, underwent a normal gastric emptying study, and is scheduled for repeat EGD with stent removal in 10 weeks. Definitive surgical planning currently underway.

Discussion: Adult hypertrophic pyloric stenosis is much rarer than its infantile counterpart, first described by Cruveilhier in 1835. Its etiology is not well understood but pathological examination of the pylorus shows similar pathology to the infantile hypertrophic pyloric stenosis. Symptoms typically present as a gastric outlet obstruction with endoscopy showing a thickened pylorus and benign biopsies. Treatments include balloon dilation, pyloroplasty, and gastrectomy with Billroth 2 reconstruction. Balloon dilation has a high failure rate and in cases of prolonged gastric outlet obstruction, there is concern that chronic stomach overdistension leads to gastroparesis. In addition, prolonged malnutrition breeds poor surgical candidates. Despite pyloric stenting's higher rate of dislodgement and re-occlusion, in such cases stenting can be a suitable alternative to optimize patients prior to definitive surgical treatment.

Conclusion: Adult hypertrophic pyloric stenosis is definitively treated with surgical interventions such as pyloroplasty or gastrectomy with reconstruction. In poor surgical candidates, pyloric stenting is a suitable short term option for patient optimization prior to surgical intervention.

P586

Laparoscopic Repair of a Strangulated Internal Hernia Through the Hepatogastric Ligament

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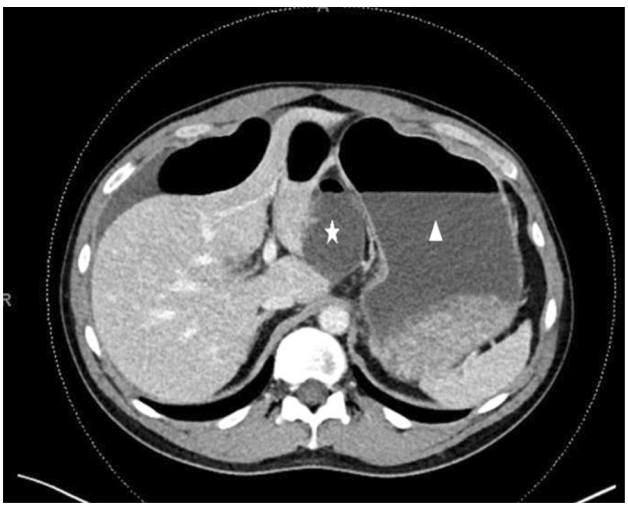
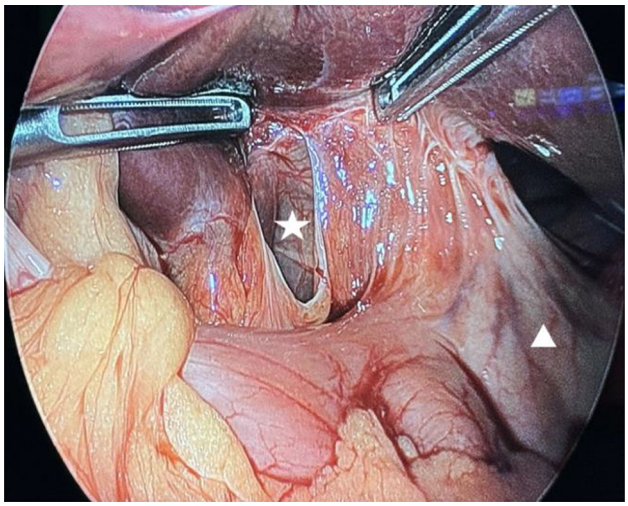
Introduction: Internal hernias are a rare cause of closed-loop small bowel obstructions, accounting for less than 0.1% of all cases. Of these, 5% to 8% of reported cases are secondary to a lesser sac hernia. A laparoscopic repair of a closed-loop small bowel obstruction secondary to internal herniation through a hepatogastric ligament defect has been rarely described in the literature. Here, we present a rare case of a laparoscopic reduction and repair of a hepatogastric ligament hernia in a young patient presenting with a closed loop small bowel obstruction.

Case Description: A 44-year-old, previously healthy gentlemen, presented to the emergency department with two days history of worsening epigastric pain, nausea, and non-bloody, non-bilious emesis. He was still passing gas and having bowel movements. The patient did not have a history of previous surgeries or abdominal trauma. On exam, he was vitally stable. His abdomen was soft, distended and had generalized tenderness. Laboratory tests were unremarkable except for an elevated white count of 14. An abdominal computed tomography (CT) was concerning for a closed loop small-bowel obstruction with presumed internal herniation through the foramen of Winslow (Fig. 1). The patient was taken to the operating room urgently for a diagnostic laparoscopy. During the surgery, we noted that there was a loop of small bowel that had herniated through a defect in the lesser omentum. Notably, the defect was found to be in the hepatogastric ligament and not through the foramen of Winslow (Fig. 2). The small bowel was released and it appeared viable. The defect was then laparoscopically closed with an interrupted suture to prevent any future episodes. The patient did well post operatively and was discharged home on the third postoperative day.

Conclusion: Given their rarity, lesser sac hernias through the hepatogastric ligament can be misdiagnosed, leading to delays in diagnosis and management. Differentiating a hernia through the lesser sac from one through the foramen of Winslow on CT scan can be challenging. A closed-loop obstruction through a lesser sac hernia should be considered in patients presenting with nonspecific symptoms of bowel obstruction. Laparoscopic reduction and repair may be an effective and timely intervention for patients with congenital defects through the lesser sac.





P587

Outcomes of Gastric Per-Oral Endoscopic Myotomy (GPOEM) with Medically Refractory Gastroparesis After Previous GPOEM: A Case Report

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Introduction: Gastroparesis is a complex, progressive chronic disease which may require procedural intervention when dietary changes and medications are ineffective or not tolerated. Gastric per-oral endoscopic myotomy (GPOEM) is an option for gastroparesis refractory to medical management, however, there are limited data regarding the safety and efficacy of GPOEM after previous GPOEM. Herein, we describe the clinical course and outcomes of patients who underwent repeat GPOEM for refractory gastroparesis.

Methods and Procedures: We retrospectively identified patients who underwent repeat GPOEM at our center from 2008 to 2024. Data including demographics, gastroparesis etiology, previous treatments, Gastroparesis Cardinal Symptom Index (GCSI), gastric emptying studies (GES), and outcomes were collected. Authorization of publication was obtained.

Results: Three patients with refractory gastroparesis were identified (Table 1).

Patient A had intra-pyloric botulinum toxin injections and dilations before and after the first GPOEM. GCSI subscores improved after the first GPOEM—nausea/vomiting (4.7 to 2.3), fullness/early satiety (5 to 4.3), and bloating (4.5 to 3), and after the second– to 2, 3.75, and 4, respectively. However, by two-year follow-up, scores worsened to 4, 5, and 4. Similarly, GES worsened after the second GPOEM and at last follow-up, and the patient required feeding tube placement.

Patient B had previous intrapyloric botulinum injections and was on chronic parenteral nutrition. GES improved after the first GPOEM, but worsened at the last follow-up. The patient briefly required enteral feeding tube after the first GPOEM and was back on chronic parenteral nutrition at last follow-up.

Patient C had no prior procedure for gastroparesis. GES was minimally affected by the first GPOEM. The patient reported subjective symptom improvement after both procedures.

All three patients survived to discharge without major complications.

Conclusion: This series demonstrates that while GPOEM may provide symptomatic relief and improved gastric emptying in patients with refractory gastroparesis, overall response may be variable. Gastroparesis remains a complex illness that may be progressive and refractory to re-intervention. Repeat GPOEM may be suitable for select patients but larger long-term series are necessary for further analysis.

Patient	Etiology	Comorbidities	Age at first GPOEM (years)	Time between GPOEM (years)	Gastric emptying study (GES) 4hr retention (%)			
					Before first GPOEM	After first GPOEM	After second GPOEM	Last follow-up
A	Gastric sarcoidosis	Colonic inertia, hypertension	57	1.38	–	4	14	26
B	Post-surgical (hiatal hernia repair)	Lupus, renal transplant, hypertension, asthma	69	1.66	88	53	92	–
C	Idiopathic	End stage disease, renal transplant	31	1.81	40	41	–	–

P588

Straight-Leg Raise Maneuver as Gerd Predictor Among Lung Transplant Candidates: A Single-Center Experience

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Introduction: The straight-leg raise (SLR) test, performed during high-resolution manometry (HRM), is used to assess esophagogastric junction (EGJ) function by forcing an increase in intra-abdominal pressure (IAP). The test aims to identify patients at risk of gastroesophageal reflux disease (GERD). We investigated the utility of the SLR in lung transplant (LT) candidates to identify those at risk of GERD.

Methods: After IRB approval, we conducted a single-center, retrospective, exploratory study of LT candidates over 18 years old who underwent esophageal functional testing (HRM and 24-h pH monitoring) between April and July 2024. Exclusion criteria included a history of foregut surgery, acid suppression therapy, hiatal hernia > 3 cm, or an incomplete SLR test. We evaluated the success of completing the SLR maneuver (defined as an IAP increase of at least 50% over the basal IAP) and its diagnostic performance. A positive SLR test was defined by an increase of ≥ 11 mmHg in peak pressure 5 cm above the lower esophageal sphincter (LES). GERD was diagnosed using a DeMeester score (DMS) ≥ 14.73.

Results: 37 LT candidates were included, most of them were male ($n = 24$; 64.9%). The median age was 64 years (IQR 53–67), and the median BMI was 27.0 kg/m^2 (IQR 23.1–28.9). The SLR maneuver was successfully completed in 29 cases (78.4%). Of these, 18 patients (62.1%) had pathological reflux per the DMS, but the SLR test identified only 8 GERD cases (44.4%), yielding a sensitivity of 44.4% (95%CI: 21.5–69.2), specificity of 36.4% (95%CI: 10.9–69.2), and overall accuracy of 41.4% (95%CI: 23.5–61.1). The magnitude of the SLR response was associated with a transient increase in upper esophageal sphincter pressure (rs = 0.374, $p = 0.045$), but this was not

related to pH test results. LES-crural diaphragm length (rs = 0.407, $p = 0.028$), LES pressure at rest (rs = − 0.530, $p = 0.003$), and EGJ-contractile integral (rs = − 0.387, $p = 0.038$) were the only LES manometric parameters correlated with an increased DMS. Of note, the Milan score was not correlated with the DMS (rs = 0.048, $p = 0.805$) nor was total acid exposure time (rs = 0.54, $p = 0.780$).
Conclusions: Our exploratory analysis suggests that although the SLR test is feasible in LT candidates, it is neither accurate nor predictive of GERD. Mechanical factors like extreme intrathoracic pressure changes and technique/operative confounders (e.g., head and neck positioning, respiratory cycle, phonation) may affect test performance. Further studies investigating the effect of these factors are needed to determine and refine the predictive value of this and other HRM metrics for pathological reflux among LT candidates.

P589

Review of Laparoscopic Surgery in a Resource-Limited Setting Through an Alternative Training Approach

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Background: Laparoscopic surgery is hardly available in resource-limited settings. However, the benefits of laparoscopic surgery are crucially needed in such settings, as the rate of complications and hospital stays is significantly lower using this technique. The common laparoscopic surgery training approaches are inanimate model skills training (box models and virtual reality simulators), animal laboratory, and operating room observation. These approaches are also rarely available in such settings to train surgical residents, and a different training technique is necessary to bridge this gap. Therefore, this study aims to review the first 14 months' laparoscopic surgical cases that were performed following an alternative training approach at MCM Comprehensive Specialized Hospital, Addis Ababa, Ethiopia.
Method: A retrospective cross-sectional study was conducted at MCM Comprehensive Specialized Hospital, Addis Ababa, Ethiopia. Medical records and operation theater registers of patients' for whom laparoscopic procedures were performed between April 2022 and June 2023 were retrieved. The procedures were performed by a surgeon and surgical residents who were trained in laparoscopic surgery using freely available structured training videos and a self-made simulation box using cheaper materials. Descriptive analysis was done using SPSS version 26.
Results: A total of 115 patients were included in the study. The male to female ratio was 1:38, with a mean age of 47 (SD + 15) years. Of the 115 patients, 93% had laparoscopic cholecystectomy done while the rest had diagnostic laparoscopy and laparoscopic appendectomy. The mean duration of the operation and hospital stay were 87 (SD + 37.6) minutes and 2.2 (SD + 0.72) days, respectively. The conversion rate to open surgery was 0.9%, which was performed for uncontrolled bleeding from the liver bed. The postoperative complication rate was 2/115 (1.7%), which were intraabdominal collection and superficial surgical site infection.
Conclusion: The hospital stay, conversion and complication rates were comparable to most similar studies. Laparoscopic surgery following affordable teaching methods using structured freely available training videos and a low-cost simple laparoscopic simulation box approach can be a good alternative to establish and train laparoscopic surgery at resource limited settings.
Keywords: laparoscopic surgery, laparoscopic simulation box, resource-limited setting

P590

A Retrospective Study of Outcomes in a Rural Pediatric Population Treated for Venous Insufficiency

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Introduction: Chronic venous disease (CVD) is a prevalent health condition that has been observed more among pediatric patients according to recent studies. The lack of venous insufficiency literature in pediatric populations created a knowledge gap regarding pediatric patients' natural history and outcomes of chronic venous insufficiency (CVI). This research aimed to review the management of pediatric patients with venous insufficiency, evaluate the outcome, and determine the efficacy, convenience, and safety of ablation procedures in an outpatient setting.
Methods and Procedures: A retrospective chart review of all patients seen at six locations from 2013 to 2024 was completed. Patients who were diagnosed with venous insufficiency, and those whose symptoms started before the age of 21 were included. Data included patient sex, body mass index (BMI), age at onset of symptoms, past medical history, smoking status, the presence of right and left leg symptoms, risk factor for deep vein thrombosis (DVT), risk factors for bleeding with anticoagulation, CEAP scores, pre and post-treatment ultrasound result, and complications post-treatment. Statistical analysis was done using QuickCalcs by GraphPad. An Analysis of Variance (ANOVA) was done to determine if there were statistically significant differences in the relationship between sex and BMI.
Results: There were a total of 34 patients, including ten males (29.5%) and twenty-four females (70%). The average age at onset of symptoms reported by the patient was 16.7 years ± 2.75 years, range 13–21 years (males = 15.7 ± 1.02 years, females = 16.25 ± 2.73 years). Most had CEAP scores above C2. Out of the 16 patients who met the criteria for treatment, 13 (81%) received treatment. RFA or EVLA was done for eight limbs, sclerotherapy for three limbs, and phlebectomy for one limb. No major complications were noted. Females were more likely to have disease in both legs than males ($P = 0.04$). Male patients were more likely to receive treatments regarding their diagnosis ($p < 0.05$). No relationship was identified between CEAP and vein size; sex and vein size; CEAP and reflux time; obesity and disease severity or vein size; age and disease severity, vein size, or reflux time.
Conclusion: Out-patient ablation procedures (RFA or EVLA) proved to be a safe and effective method for the treatment of venous insufficiency in pediatric patients. Female pediatric patients with venous insufficiency symptoms should have a careful evaluation of both extremities for venous disease. Further research with larger cohorts is warranted.

P591

Cost-Effectiveness of the Postoperative Recovery@Home Program in Reducing Catastrophic Health Expenditures in Rural Uganda

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Background: In rural Uganda, where healthcare access is limited and 29% of surgical patients suffer from catastrophic health expenditures (CHE) despite free care, postoperative complications can be financially devastating. With most of the rural population relying on subsistence farming or informal labor, the risk of CHE is particularly high after surgery. Postoperative complications, especially wound-related, pose a significant financial risk, driving families into poverty. The Recovery@Home program uses visiting nurses for home-based care, aiming to reduce CHE by ensuring follow-up and early intervention to minimize complications.
Methods: This retrospective analysis examines patients enrolled in the Recovery@Home program from January to May 2024 at Kyabirwa Surgical Center in rural eastern Uganda. Visiting nurses provide health monitoring, patient education, and remote physician consultations. Data on healthcare costs, wage losses, and 30-day complications (wound complications, readmissions, second surgeries, additional care) was collected via a mobile app. According to the Uganda Bureau of Statistics, the average household income for small-scale farmers and informal laborers (domestic work, street vending) is 500,000 UGX or less a month. Catastrophic health expenditure (CHE) was determined using the WHO threshold of 10% of household income, categorizing families spending over 50,000 UGX on healthcare as experiencing CHE. Logistic regression estimated the odds of encountering CHE.
Results: A total of 92 patients (66.2%) fully completed the program, 29 patients (20.9%) partially completed it, and 18 patients (12.9%) did not participate. Overall, 73.2% of participants were subsistence farmers or informal laborers. Patients with postoperative complications, especially wound complications, were > 4 times more likely to have CHE (OR = 4.21, CI [1.80–9.85], $p < 0.001$). However, patients who completed the Recovery@Home program were 84.1% less likely to encounter CHE compared to non-users (OR = 0.159, CI [0.043–0.582], $p = 0.005$), mainly due to significantly less wound complications (OR 0.093, CI [0.014, 0.628], $p = 0.015$) and overall complications (OR 0.035, CI [0.003, 0.364], $p = 0.005$). Additionally, the program significantly decreased wage losses per patient by 80.4% (OR = 0.196, CI: 0.05–0.73, $p = 0.029$).
Conclusion: The Recovery@Home program reduces the financial burden of postoperative care in rural Uganda by lowering complications, decreasing the risk of CHE and wage losses. Its success highlights its potential as a sustainable solution for improving care and financial protection in low-resource settings.

P592

Vertical Sleeve Gastrectomy with Ligamentum Teres Cardiopexy: A Systematic Review and Meta-analysis

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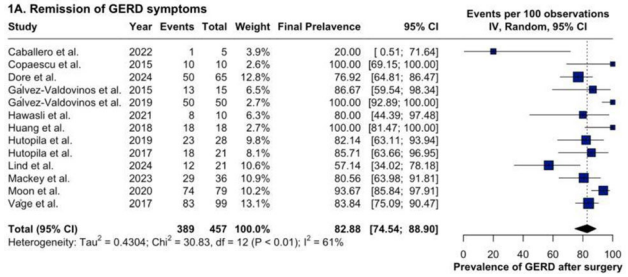
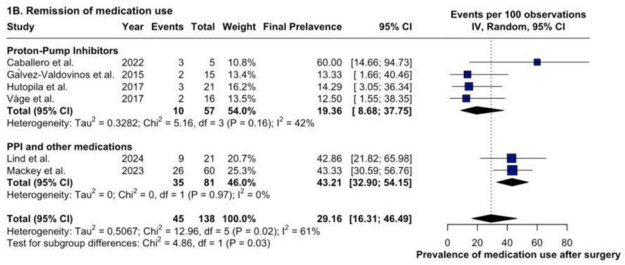
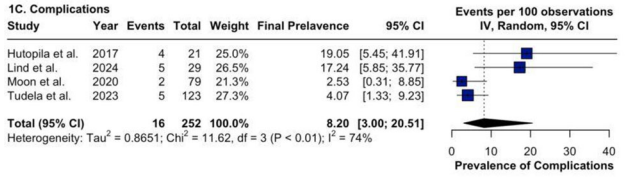
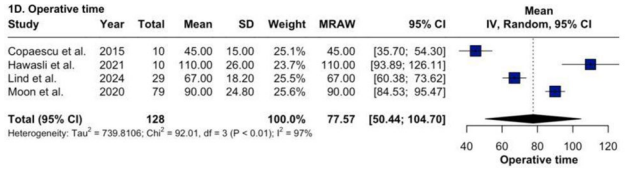
Background: Sleeve gastrectomy (SG) is one of the most commonly performed bariatric surgeries worldwide. However, recent meta-analyses have highlighted an increased risk of developing reflux symptoms, erosive esophagitis, and Barrett's esophagus following this procedure. To address reflux without the need for long-term medication or additional surgeries, some surgeons have proposed cardiopexy using the ligamentum teres. To assess the efficacy and safety of this technique in reducing reflux symptoms, we conducted a systematic review and meta-analysis to evaluate its impact on symptom remission and procedural safety.
Methods: We systematically searched PubMed, EMBASE, and Cochrane Central for studies assessing cardiopexy using the ligamentum teres in patients who underwent vertical gastrectomy (VG) up to September 2024. The primary outcomes included remission of gastroesophageal reflux disease (GERD) symptoms, discontinuation of medication, postoperative complications, and operative time. Both abstracts and observational studies were included. A random-effects model and subgroup analysis for medication remission were performed. Study weights were calculated using the inverse variance method, with statistical analyses conducted in R version 4.4.0.
Results: Thirteen studies with a total of 480 patients were included. Remission of GERD symptoms was observed in 82.88% (95% CI 74.54–88.90; $I^2 = 61\%$; Fig. 1A) of patients post-VG. Additionally, 29.16% (95% CI 16.31–46.49; $I^2 = 74\%$; Fig. 1B) of patients were able to discontinue medication after surgery. Specifically, proton pump inhibitor (PPI) discontinuation was achieved in 19.36% (95% CI 8.68–37.75; $I^2 = 42\%$; Fig. 1B), while both PPI and other medication discontinuation occurred in 43.21% (95% CI 32.90–54.15; $I^2 = 0\%$; Fig. 1B). Postoperative complications were reported in 8.20% (95% CI 3.00–20.51; $I^2 = 74\%$; Fig. 1C). The mean reported operative time was 77.57 min (95% CI 50.44–104.70; $I^2 = 97\%$; Fig. 1D).
Conclusion: Our meta-analysis suggests that ligamentum teres cardiopexy during VG reduces GERD symptoms and medication use after surgery. It also appears to be a safe procedure with a relatively short operative time.









P595

Establishing a Multi-specialty Minimal Access Surgery Hospital Program in a Developing Country

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Background: Major benefits accrue to patients undergoing minimal access surgery (MAS) involving various surgical specialties and interventionists. The scope of MAS comprises laparoscopy, thoracoscopy, arthroscopy, perivisceral and luminal endoscopies, interventional cardiology, and radiology. There is a significant disparity in the availability and uptake of these services in developing countries compared to high-index countries. We describe the frequency and limitations of minimal access surgery practice in a developing country.

Methods: This is a retrospective observational report of minimal access therapies on patients in a regional tertiary hospital of South-South Nigeria from January 2017. Data on frequency and limitations from a Hospital Grand Rounds presentation slides made on September 30th, 2024, by a coordinated multi-specialty team comprising General Surgery, Urology, Interventional Cardiology and Radiology, Cardiothoracic, Paediatric Surgery, and Gynaecology specialists were collated. Frequency distribution is analyzed in simple percentages.

Results: During the study period, 78(9.9%) laparoscopic surgeries, 75(9.5%) hysteroscopies, 157(20.0%) gastrointestinal endoscopies, 213(27.1%) endourology procedures, 227(28.9%) interventional cardiology, 34(4.3%) ultrasound-guided procedures and 2(0.3%) video-assisted thoracoscopies were recorded. The limitations identified were theatre space and equipment challenges, affordable consumables, uninterrupted power supply, and additional team training.

Conclusion: Despite major challenges, routine practice of MAS is feasible in resource-poor settings. Additional investment in requisite equipment procurements and maintenance, infrastructure, and training of dedicated professionals is desirable for an increased case volume.

Keywords: Minimal Access Surgery, Endo-laparoscopy, Limitations

P596

Who is Publishing? Authorship Trends in Global Surgery Literature Published in High-Impact Global Health Journals (2015–2024)

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Introduction: Global health research aims to tackle health inequities worldwide, and researchers from low- and middle-income countries (LMICs) are its major stakeholders. Despite this, authorship inequity has been a consistent feature of global health publications, with over-representation of authors from high-income countries (HICs) and overall under-representation of women as first authors in published literature.

The field of global surgery, which is concerned with the provision of surgical, anesthetic, and obstetric care worldwide, has recently gained prominence as an academic discipline within global health. The research and authorship dynamics in global surgery are evolving rapidly. This study aims to investigate authorship demographics in global surgery literature published in three high-impact global health journals as a first step towards identifying broader publication trends in the field.

Methods: BMJ Global Health, Annals of Global Health, and The Lancet Global Health were selected for analysis due to their impact factors exceeding 2 and their publication of over 85% of all global surgery articles featured in global health journals over the past decade. All author characteristics were obtained from publicly available data sources, including the author affiliations on PubMed and authors' public profiles on ResearchGate and LinkedIn.

Results: Since 2015, only 50 out of 7,689 total articles (0.65%) published in these three high-impact global health journals have been on global surgery topics. Of these 50 articles, 18 articles (36%) feature a female first author, 12 articles (24%) feature a female last author, and only 5 articles (10%) feature a first author from an LMIC. While there are single years that show relative increases (2017 and 2021), the overall trends of female authorship and LMIC authorship in the past decade have been stagnant.

Conclusions: Despite increasing awareness of authorship inequities that exist in global health research, there has been minimal demographic change in female and LMIC authorship in global surgery literature published in top global health journals over the past decade. Global surgery research seeks to promote equitable access to surgical care worldwide, yet disparities in authorship can lead to the exclusion of important local context and perspectives. This inequity may also impede underrepresented researchers' career advancement and limit access to funding. Further studies are needed to pinpoint gaps in authorship equity, allowing for the implementation of appropriate corrective measures.

Included Articles		50
Journal	BMJ Global Health *(IF=8.1)*	26
	Annals of Global Health *(IF=2.9)*	9
	The Lancet Global Health *(IF=19.9)*	15
Year of Issue	2015	9
	2016	5
	2017	4
	2018	5
	2019	3
	2020	5
	2021	6
	2022	4
	2023	7
	2024	2
Sex of First Author	Male	32
	Female	18
LMIC/HIC of First Author	HIC	45
	LMIC	5

Table 1. Demographic factors of included articles.

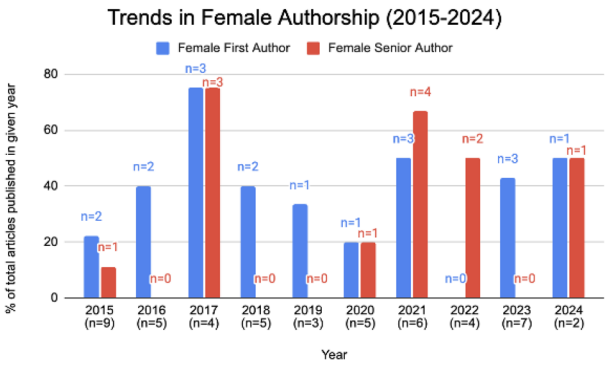

Figure 1. Female authorship trends in global surgery articles (2015-2024).

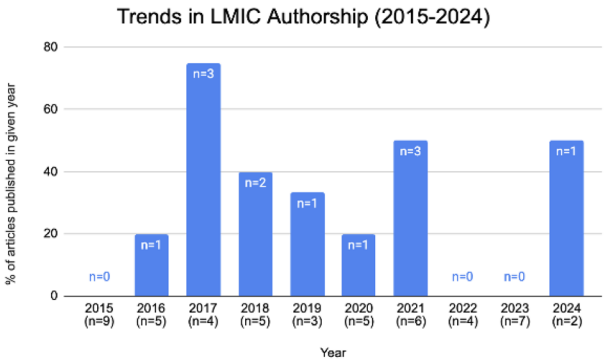

Figure 2. LMIC authorship trends in global surgery articles (2015-2024).

P598

Navigating the Challenge: Endovac Therapy as an Innovative Approach for Complex Duodenal Perforation

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Endo-luminal vacuum therapy has been described and utilized in patients undergoing corrective surgery after endoscopic complications or as endoscopic management of perforations. It has been presented in literature as adjuvant therapy in foregut perforations and leaks, namely esophageal perforation with reported success as high as 90%. Standard management of duodenal perforation is surgical intervention and endoluminal vacuum therapy has barely been described. Repair failure from persistent gastric or pancreatic secretions have been managed with surgical diversion, pyloric exclusion, or gastrojejunostomy tubes- all invasive and morbid interventions. Endoluminal therapy in the setting of refractory duodenal perforation after surgical intervention is an option and can be further explored as definitive management.

82 F with colonic adenocarcinoma s/p right hemicolectomy with primary anastomosis in 5/2022 presenting with duodenal perforation s/p jejunal serosal patch complicated by failure leak definitively treated with endoluminal vacuum therapy.

2 weeks s/p exploratory laparotomy and serosal patch, venting G-tube was placed due to persistent non healing ulcer, despite bowel rest and TPN. She clinically improved, and was discharged shortly afterwards. The patient returned to the ED with recurrence of the oral intolerance. She was found to have a persistent abdominal fluid collection around her duodenum, which IR was unable to drain as there was not an adequate window. The patient had limited surgical options given prior failure of her jejunal serosal patch, endovac therapy was utilized to manage possible duodenal patch leak, which was subsequently replaced two weeks later with J-tube extension and subsequent minimal output. Upon replacement, the diameter of the perforation was found to be decreased compared to previous.The J-tube was removed and a vac-tip sponge was placed through the G-tube to her ulcer. Her minimal output from her endovac continued, and six days later, an EGD was performed with evidence of shrunken ulceration. Sponge was replaced and remained in place for 2 more weeks. An Upper GI series demonstrated resolution of the perforation, and the patient was able to be transitioned to enteral feeds and subsequently had the endovac removed a week thereafter.

Endoluminal therapy proved to be an effective management for complex duodenal perforation refractory to conventional surgical management on our patient and the implications from description of cases in the literature are that it may serve as primary management for perforations or as adjunct to surgical procedure and potentially expedite healing, enteral feeding and optimization of nutrition.

P599

Virtual Reality Spatial Recognition Simulation in Laparoscopic Colorectal Resection: Initial Experience and Evaluation

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Advanced technologies such as Artificial Intelligence (AI) and Virtual Reality (VR) have recently gained attention as effective navigation tools in surgical procedures. VR holography offers potential for enhanced three-dimensional immersive visualization, improved preoperative planning, and superior surgical outcomes. We report our

initial experience with laparoscopic colectomy performed safely using VR simulation both preoperatively and intraoperatively.
Methods: We analyzed a series of colorectal cancer cases where VR holography was employed perioperatively at our institution. The mean patient age was 74.6 years, with a male-to-female ratio of 2:3. Tumor locations included ascending colon (n = 1), transverse colon (n = 1), sigmoid colon (n = 1), and rectum (n = 2). Surgical procedures comprised (extended) right hemicolectomy (n = 2), sigmoid colectomy (n = 1), and low anterior resection (n = 2).
Hologram creation: Contrast-enhanced CT data was processed using Ziostation (AMIN®?) for 3D analysis, converted to polygon data via STC output, and visualized as a hologram using HoloLens. This patient-specific 3D model enabled detailed preoperative planning and surgical rehearsal.
Results: Mean operative time was 205 min, with an average blood loss of 38 ml. No perioperative complications were observed.
The utilization of VR holography demonstrated the following advantages:

- Facilitated identification of vascular anomalies.
- Enhanced precise localization and dissection of lymph nodes.
- Functioned as real-time intraoperative guidance, aiding navigation through complex anatomical regions.
- Significantly improved team coordination by allowing shared visualization of surgical progress among assistants and staff via monitor display.

Conclusion: VR holography enabled accurate identification of vascular structures and lymph node locations in individual cases, facilitating precise surgical execution. This technology contributed to enhanced visualization and improved surgical planning in laparoscopic colorectal resection. Further innovations in VR technology are anticipated to augment the clinical utility of this approach, potentially leading to improved patient outcomes in minimally invasive colorectal surgery.

P600

Outcomes of Ultrasound- Guided Versus Laparoscopic Guided Lateral Transversus Abdominis Plane Block in Patients Undergoing Laparoscopic Sleeve Gastrectomy

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Introduction: Obesity is a major disease process in the United States with increasing prevalence and is associated with various comorbid conditions. Bariatric surgery, particularly laparoscopic sleeve gastrectomy (LSG), is an effective weight loss intervention, but presents challenges in postoperative pain management. This study compares the effectiveness of ultrasound-guided transversus abdominis plane (UTAP) blocks, laparoscopic-guided transversus abdominis plane (LTAP) blocks, and no regional anesthesia on overall opioid use and postoperative outcomes in in LSG patients.
Methods: This retrospective cohort study included 1,240 morbidly obese patients who underwent LSG at a single hospital from January 2019 to June 2023. Patients were categorized into three groups: UTAP, LTAP, and no TAP. Primary outcome was the total morphine milligram equivalents (MME) used within the first 24 h, 48 h, and overall hospital stay (median interquartile range). Secondary outcomes included total anesthesia time, postoperative pain scores, length of stay (LOS), 30-day readmission, and emergency room visit rates. Statistical analyses included chi-square tests, Fisher's exact test, independent t-tests, Mann–Whitney U tests, and multiple linear regression.
Results: The UTAP group had significantly lower median MME within the first 24 h (63 MME) compared to the LTAP group (98.8 MME, $p < 0.0001$) and throughout the hospital stay (93 MME vs. 120 MME, $p = 0.0004$). Both UTAP and LTAP groups had significantly lower total MME compared to the no TAP group ($p < 0.0001$ for both). Total anesthesia time was longer for UTAP (98.5 min) compared to LTAP (92.5 min, $p = 0.0472$). LOS was significantly longer in the UTAP group (1.59 days) compared to LTAP (1.18 days, $p = 0.0061$). There were no significant differences in pain scores at various time points or in 30-day readmission and emergency room visit rates between the UTAP and LTAP groups.
Conclusion: UTAP blocks demonstrated reduced opioid use compared to LTAP and no TAP, likely due to enhanced accuracy with ultrasound guidance. Further prospective studies are warranted to confirm these findings and refine pain management strategies for bariatric surgery patients.

P601

One-Step Laparoscopic-Endoscopic Management Using the Rendezvous Technique in 250 Patients with Cholecystocholedocholithiasis

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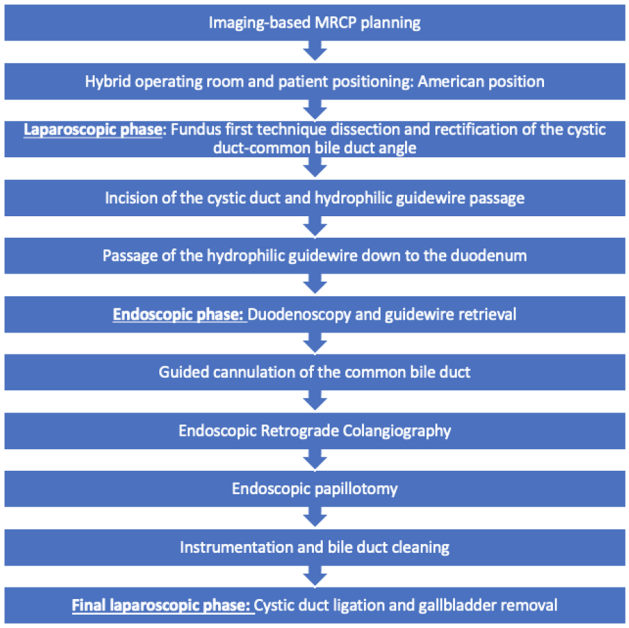
Introduction: The treatment of cholelithiasis with concomitant choledocholithiasis presents a clinical challenge, requiring a multidisciplinary approach that often involves sequential endoscopic retrograde cholangiopancreatography (ERCP) and cholecystectomy. Traditionally, these procedures are performed separately, leading to longer hospital stays, increased costs, and potential complications such as post-ERCP pancreatitis. Michel Gagner first described the intraoperative ERCP combined with laparoscopic cholecystectomy, known as the Rendezvous technique, offering a "one-step" solution to address both conditions simultaneously. The present study aims to evaluate the feasibility, safety, and outcomes of the Rendezvous technique in a Latin American setting.
Methods: This retrospective, observational study analyzed patients who underwent laparoscopic cholecystectomy combined with intraoperative ERCP (Rendezvous technique) at two academic medical institutions in Cúcuta, Colombia, between January 2014 and July 2023. Patient demographics, preoperative characteristics, intraoperative details, and postoperative outcomes were collected. All procedures followed our standardized Rendezvous technique surgical sequence with the steps described in Image 1.
Results: Over a period of nine years, 250 patients with concomitant cholelithiasis and choledocholithiasis underwent laparoscopic cholecystectomy with intraoperative ERCP using the standardized Rendezvous technique. The median patient age was 54 years (IQR: 28–74), with 73% (n = 183) of the patients being female. Most patients were classified as ASA II (n = 200, 80%), indicating mild systemic disease. The median operative time was 105 min (SD $\pm$ 15), with 3 cases (1.2%) converted to open surgery due to technical difficulties. Postoperative complications occurred in 7.2% (n = 18) of the patients, including 3 cases (1.2%) of moderate pancreatitis, 2 (0.8%) of bile fistula, and only 1 (0.4%) duodenal perforation, which was immediately managed surgically. Postoperative outcomes showed complete resolution of common bile duct stones in 93% (n = 233) of cases, with the remaining 17 patients (7%) requiring a second endoscopic procedure to fully clear the bile duct. The median

length of hospital stay was 1 day (IQR: 1–5). Thirty-day postoperative mortality was 0.8% (n = 2), due to non-surgical causes.
Conclusion: The results of this study confirm the viability of implementing the Rendezvous technique as a safe and effective one-step solution for managing cholecystocholedocholithiasis in a multidisciplinary setting. The approach offers high rates of stone clearance with acceptable morbidity and mortality, reinforcing its reproducibility in clinical practice. Additionally, the consistent use of a standardized surgical sequence is crucial to ensuring optimal outcomes and minimizing complications. Hybrid operating rooms, equipped for both endoscopic and laparoscopic procedures, represent an ideal environment for this technique, further enhancing its safety and efficiency.



P602

Comparison of Albumin and Crystalloid Fluids for the Management of Perioperative Volume Resuscitation in Esophagectomy

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Introduction: Fluid management is critical in preventing complications of esophagectomy. Traditionally colloid solutions have been used over crystalloids, despite lack of evidence. This strategy was disrupted when albumin was placed on national shortage in September 2022. The purpose of this retrospective study was to evaluate differences in outcomes between patients who received albumin or crystalloids during esophagectomy.
Methods and Procedures: This was a retrospective cohort investigating the management of patients undergoing esophagectomy at two hospitals between August 2020 and December 2023. Patients were included if they were 18 years or older, underwent their first esophagectomy, and received either albumin or crystalloids. The primary endpoint was the rate of anastomotic leak. Secondary endpoints included in-hospital mortality, length of stay (LOS), duration of mechanical ventilation, fluid volume, acute kidney injury, and vasopressor requirements.
Results: 95 patients were identified, with 49 receiving albumin and 46 receiving crystalloid alone. There was no difference in the rate of anastomotic leak between cohorts, with 6 patients in the albumin group and 9 in the crystalloids alone group experiencing a leak (12.2% vs 19.6%, P = 0.33). One patient died in each group during their hospital admission (P = 1), and there was no difference in LOS between albumin and crystalloid groups (9.4 vs 10.5 days, P = 0.30).
Conclusion: Volume resuscitation with albumin during esophagectomy did not reduce rates of anastomotic leak, in-hospital mortality, hospital LOS, or other complications compared to crystalloid fluids alone. These retrospective data are consistent with previous literature.

P603

Laparoscopic Transcystic Common Bile Duct Exploration for Choledocholithiasis: A Single Surgeon Experience

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Introduction: The purpose of this study was to compare various outcomes between laparoscopic transcystic common bile duct exploration and cholecystectomy (LTCBDE) versus endoscopic retrograde cholangiopancreatography followed by laparoscopic cholecystectomy (ERCP+LC) for the management of choledocholithiasis. We hypothesize that hospital length of stay is reduced with LTCBDE versus ERCP+LC.
Methods and Procedures: Using our hospital's electronic medical record data, we performed a retrospective cohort study of a single surgeon's outcomes using LTCBDE for the management of patients with clinical and/or radiographic evidence of choledocholithiasis. A comparison group was composed of patients who were managed with ERCP+LC. Our primary quantitative outcome was hospital length of stay. Other outcomes included stone clearance success rate based on completion cholangiogram, MRCP rate, post-procedure pancreatitis rate, and average procedure cost. Patient demographics, laboratory values, imaging characteristics, presence of gallstone pancreatitis and/or cholangitis were also collected for descriptive analysis. Propensity score matching was used to estimate the treatment effect given our lack of randomization.
Results: A total of 24 LTCBDE cases were identified in our study. Fourteen cases were included in the final analysis for comparison after propensity score matching. Length of stay was shorter in the LTCBDE group than in the comparison group (mean difference [MD]: − 1.5 days, p = 0.042 and MD: − 24.4 min, p = 0.05, respectively). Stone clearance success rate was 71.4% (10/14) in the LTCBDE group and 92.8% (13/14) in the ERCP+LC group. Preoperative MRCP was obtained in 7% (1/14) of patients in the LTCBDE group and 35% (5/14) of patients in the ERCP+LC group.
Conclusions: Our findings supported our hypothesis that management of choledocholithiasis with LTCBDE is associated with a shorter hospital length of stay compared to ERCP+LC at our institution. These findings suggest that this technique could minimize hospital resource usage and forgo the need for an additional procedure. Significant limitations to our study include limited sample size, lack of randomization, and single-surgeon data.

P605

Endoscopic Vacuum Therapy with an Improvised Affordable Device for the Management of Esophageal Leak after POEM

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Per-oral endoscopic myotomy (POEM) was developed less than two decades ago for the treatment of achalasia. Its minimally invasive approach and favorable short-term outcomes have led to the rapid adoption of the technique as the standard of care for achalasia and, in recent years, for other motility disorders of the GI tract. As with any new technique, there will be adverse events, and parallel to the evolution of these new treatments, several approaches for managing these adverse events should be discussed. We present a case of successful endoscopic management with EVT (endoscopic vacuum therapy) of an esophageal leak after a POEM procedure using an improvised endoscopic device. EVT was successful in managing the esophageal leak, leading to closure and resolution of symptoms. The patient experienced a favorable recovery without the need for further intervention. While further studies are needed to validate this approach, it offers a promising alternative to traditional management strategies. The use of an improvised device highlights the potential for cost-effective solutions in endoscopic interventions.

P606

Advanced Imaging Technology for Assessing Tissue Oxygen Saturation in Gastric Conduits During Thoracic Esophagectomy

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Introduction: Anastomotic leakage is a critical complication following thoracic esophagectomy. While indocyanine green (ICG) fluorescence imaging is the most commonly used technique for assessing tissue perfusion, it has notable limitations. These include challenges in evaluating congestion, subjectivity in interpreting staining intensity, and variability influenced by factors such as ICG injection and camera distance.

To address these limitations, we investigated tissue oxygen saturation (StO2) as a novel and objective method for assessing tissue perfusion. StO2 offers a quantitative, reproducible, and congestion-sensitive measure that can be performed easily and repeatedly. This study aimed to evaluate the effectiveness of this innovative imaging technology in assessing perfusion of the gastric conduit during thoracic esophagectomy.

Methods and Procedures: This prospective study included 68 consecutive patients with thoracic esophageal cancer who underwent minimally invasive esophagectomy (MIE) with gastric conduit reconstruction between July 2022 and April 2024. The gastric conduit was anastomosed in the cervical region. Intraoperative measurements of StO2 and hemoglobin index (HbI) were collected in real-time to assess conduit perfusion. StO2 and HbI values at the anastomotic site were compared with the incidence of postoperative anastomotic leakage.

Results: Two patients were excluded for oncological reasons based on intraoperative findings, leaving 66 patients in the final analysis. Four patients developed anastomotic leakage, all of whom had undergone robotic thoracic esophagectomy. StO2 values showed a gradual decrease toward the distal end of the conduit, with significantly lower values at the tip compared to the demarcation line ($P = 0.001$).

At the anastomotic site, the mean StO2 was significantly lower in the leakage group compared to the no-leakage group ($P = 0.002$). Similarly, the mean HbI was significantly higher in the leakage group ($P = 0.006$). Notably, despite normal ICG values in two of the four leakage cases, StO2 values were consistently low in all leakage cases, highlighting the sensitivity of this method in identifying compromised perfusion.

Conclusions: StO2 imaging technology proved to be a valuable tool in predicting the risk of anastomotic leakage and in selecting the optimal anastomotic site during thoracic esophagectomy. This novel, objective, and reproducible method addresses the shortcomings of ICG, providing more reliable insights into tissue perfusion and congestion, and has the potential to enhance surgical outcomes in esophageal cancer treatment.

P607

Our Experience of D-LECS for Duodenal Tumors Including Early Cancer

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Pancreaticoduodenectomy for duodenal intramucosal cancer and duodenal gastrointestinal stromal tumor (GIST) is considered to be a hyperinvasive treatment and can often be cured by local resection. However, endoscopic submucosal dissection (ESD) in the duodenum was reported to be associated with a higher risk of complications. Besides advancements in the ESD and laparoscopic techniques, laparoscopic and endoscopic cooperative surgery (LECS) has been developed. And a unique LECS technique for duodenal tumors (D-LECS) was developed to avoid perforation during and after ESD. In recent years, the reports of D-LECS for duodenal lesions has increased. This procedure was approved for use by the Japanese Ministry of Health, Labour and Welfare in 2020. And in 2021, treatment algorithm based on the duodenal cancer clinical practice guidelines were introduced.

At our hospital, D-LECS is performed for duodenal submucosal tumors and duodenal epithelial tumors that are difficult to safely resect and sew with an endoscope alone. We have experienced 12 cases of D-LECS so far. There were 8 cases of duodenal epithelial tumor (6 cases of cancer), 3 cases of duodenal GIST and a case of NET G1. Laparoscopic serosal muscular layer suture (D-LECS with ESD) in 4 cases, duodenal full-thickness resection (D-LECS with FTR) in 6 cases and laparoscopic lower duodenal serosal muscular layer resection in 2 cases were performed. None of them required a laparotomy transition and no complications were observed. And none of them has been recurred.

D-LECS requires advanced skills for both endoscopists and surgeons. However, it is thought that cooperation will enhance the safety and certainty of each other's procedures, enabling minimally invasive and safe surgery for patients.

P609

Initial Results of Totally Laparoscopic Mini-Partington Rochelle Combined with Intraoperative Pancreatoscopic-Guided Laser Lithotripsy for the Treatment of Chronic Pancreatitis

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Introduction: Chronic pancreatitis often requires surgical intervention when conservative treatments fail or neoplastic lesions are suspected. Recently, the combination of laparoscopic surgery and endoscopic-guided laser lithotripsy has shown promise in managing pancreatic ductal calculi.
Objectives: This study aimed to assess the safety, feasibility, and outcomes of mini laparoscopic longitudinal pancreaticojejunostomy (mini- Partington-Rochelle procedure) combined with endoscopic-guided laser lithotripsy in patients with chronic pancreatitis.
Methods: A prospective study was conducted on five patients with chronic pancreatitis who underwent the combined procedure between August 2023 and June 2024. Parameters such as operative time, blood loss, hospital stay, and postoperative outcomes were evaluated.
Results: The mean age of the patients was 38 years. Four patients had a history of alcohol and/or tobacco use, and two presented with pancreatic pseudocysts. The mean operative time was 165 min, with an average blood loss of 75 mL and a mean hospital stay of 9 days. No postoperative complications or reoperations were noted. All patients experienced significant pain relief and returned to normal activities.
Conclusion: The combined laparoscopic and endoscopic approach is a safe, feasible, and effective method for managing chronic pancreatitis. It offers potential advantages, including reduced residual stone rates and shortened pancreaticojejunostomy lengths. Further studies are recommended to confirm these findings.

P611

Is Teaching Genz Residents is Difficult?Is It High Time to Change Traditional Methods of Postgraduate Teaching to More Professional Skill Based Methods? Its TIME for "OFF PAPER, OFF DUTY HOUR TEACHING"

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The traditional method of teaching in any postgraduation course is to teach clinical signs on patients. Other methods which medical colleges uses are lectures seminars journal club case presentations sessions. More recently conference based teaching is also somewhat effective in postgraduation teaching. We came up with innovative methods to teach residents. During initial year of residency we teach purpose, aim, empathy, communication skills, interest, passion, new ways to change habits, dealing with procastination, leadership qualities, responsibility, growing your consciousness, inner health, stressfree residency and many more. The term we utilised for this teaching is "off paper off duty hour teaching".
Methods: Its not a stepwise approach. Its the optional thing in postgraduation teaching. But these methods help to retain residents interest in concerned subject. We teach All the above professional skills in off duty hour time. This teaching is may not be in hospital, ward, opd, operation theatre or consultant office. The common places to teach these things are canteens, cafeteria, in car on short or long drive, day picnics, day hikes and treks, dept outbound activities, small get togethers, birthday or anniversary celebration places.
Results: we started these extra measures from 2021 to all postgraduate students admitted to our institute. This is just a observational study. By doing these teachings residents became more interested, more confident, mire professional to the subject, more sincere, more efficient, more clear in thoughts. The most important change in residents by these teaching methods is they know what to do and what not to do.
Discussion: it is very unwise to say that a particular method is helpful in developing skills in residents or fellows. The combination of all available teaching methods can bring the desired results. Extracurricular teaching may help residents to develop interest and confidence to develope professionally in his/her subject.

P612

Early Robotic Liver Transplant Experience in the United States: A Case Series

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Introduction: Liver transplant remains the only definitive treatment for end stage liver disease. Although robotic surgery has been increasingly utilized in transplantation, robotic liver transplant remains a rare feat, limited by unique technical challenges. We report the first case series of robotic liver transplants in the U.S.
Methods and Procedures: All adults undergoing robotic-assisted liver-only transplant (RLT) were prospectively analyzed at a single high-volume transplant and robotics center. Total RLTs were defined as operations in which both the hepatectomy and implantation were performed robotically; hybrid operations, as robotic hepatectomies followed by open implantation via midline incision. All operations were led by the same surgeon and performed with an operating room team trained in robotic transplant/hepatopancreatobiliary operations.
Results: Six recipients underwent RLT, with a median age of 62.3 years [40.5, 68.2] and lab MELD score of 14.5 [9, 19]. All grafts were from deceased donors, five (83.3%) of which underwent machine perfusion.
Three patients (50%) underwent total robotic transplants and three, hybrid. One total RLT recipient underwent open conversion after reperfusion due to bleeding secondary to donor liver injury during procurement. Median operative time was 9.5 h; median warm ischemia time for total RLTs was 77 min.

Median follow up time was 286 days [1, 492]. Recipient median ICU stay was 5 days and length of stay, 10 days. All grafts continue to function well, with no instances of early allograft dysfunction or rejection. There have been no readmissions, retransplantations, or deaths.
Conclusion: Robotic liver transplantation is a safe operation, given appropriate candidate selection and clinical team training. With more experience, we anticipate that RLTs will become more prevalent nationally.

P614

Transthoracic Repeat Hepatectomy

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Introduction: Minimally invasive surgery (MIS) for liver resection has become widely accepted for repeat hepatectomy. However, in some cases, dense adhesions make the transabdominal approach extremely difficult. The liver is located beneath the diaphragm, and depending on the tumor's location, a transthoracic approach may be the simplest and most direct route. Here, we report a case of a patient who underwent repeat hepatectomy via a thoracoscopic approach due to the predicted difficulty of a transabdominal approach.
Case Presentation: The patient was a 78-year-old male with recurrent hepatocellular carcinoma (HCC) in segment 7 (S7) following laparoscopic right anterior sectionectomy for an S8 HCC. After the previous surgery, bile leakage occurred from the Glissonian pedicle of the anterior section, and bile leakage persisted in the abdominal cavity at the time of the current surgery. Given the anticipated challenges of a transabdominal approach, we planned for a transthoracic partial resection of S7. The patient was placed in the prone position, and the surgery was initiated under differential lung. After adhesiolysis in the thoracic cavity, intraoperative ultrasound (IOUS) was used to identify the location of the S7 tumor through the diaphragm. The diaphragm was incised, retracted with sutures, and the liver surface was exposed. A partial hepatectomy of S7 was performed. The operative time was 3 h and 25 min, with minimal blood loss, and the patient was discharged without complications on postoperative day 4.
Discussion: Repeat hepatectomy for tumors in segments 7 and 8 with dense adhesions typically requires right liver remobilization, increasing the complexity of the surgery. For tumors located beneath the diaphragm, a transthoracic approach may be the best option. However, there are risks, including bleeding due to the inability to perform the Pringle maneuver and the potential for diaphragmatic hernia following diaphragmatic incision. Considering tumor location and bleeding risk, thoracoscopic repeat hepatectomy can be a viable option.

P616

Congenital Abnormality of the Liver Masquerading as Liver Mass with Cholecystitis

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Introduction: Advances in Computerized Tomography (CT) and Magnetic Resonance Imaging (MRI) have increased incidental detection of hepatic lesions, requiring differentiating between benign and malignant masses. This case report presents a rare incidental hepatic mass found during an evaluation for suspected cholecystitis, highlighting the diagnostic challenges of atypical hepatic lesions.
Case Report: A 49-year-old woman with no significant past medical history presented to the emergency department with one day of sharp, intermittent epigastric pain radiating to the right upper quadrant (RUQ) and back. Physical examination showed RUQ tenderness. Vital signs, pregnancy test, and routine lab tests were normal except for an elevated lactate of 3.1 mmol/L. Initial imaging with an RUQ ultrasound revealed scattered hepatic calcifications, a normal common bile duct, and did not visualize the gallbladder. The CT showed hepatomegaly and a 5 × 2.2 cm hypodense mass with calcifications in the right liver lobe, distinct from the gallbladder, left hepatic calcifications, and subcentimeter hepatic densities (Fig. 1). Patient was admitted and treated for an assumptive diagnosis of acute cholecystitis. Further workup for an MRI revealed nonenhancing scarring/fibrosis in the right hepatic lobe but no focal mass. This revealed that the patient likely presented with gastritis and not acute cholecystitis. She was started on a liquid diet, and was resuscitated. Her symptoms gradually improved and was discharged soon after. The imaging findings were discussed in a multidisciplinary conference and was considered to be a congenital finding and unlikely the cause of her presentation.
Discussion: The case presented a diagnostic challenge due to the congenital hepatic mass's atypical features. Its hypodensity and calcifications did not align with typical imaging patterns of hepatic hemangiomas, which generally exhibit peripheral nodular enhancement and a centripetal "filling in" pattern. Hepatic adenomas and focal nodular hyperplasia were also less likely given the patient's profile. Hepatic adenomas often show peripheral enhancement on CT while focal nodular hyperplasia usually presents with a central scar but neither were observed in the hepatic mass in this case. The nonenhancing scarring and fibrosis seen on MRCP further complicated the diagnosis, as these are atypical for benign lesions. The peculiar imaging characteristics suggest the mass may be a congenital lesion or an atypical presentation of these common benign masses. Accurate diagnosis is crucial for determining the appropriate management and avoiding unnecessary interventions.

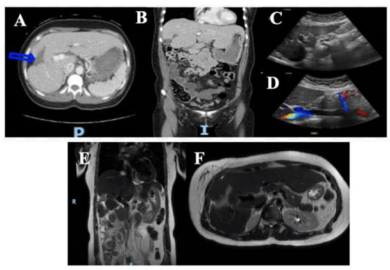

Figure 1. (A) Computed Tomography of Abdomen and Pelvis with IV Contrast displaying a blue arrow pointed to a hypodense process within the right liver measuring approximately 5x2.2 cm containing calcifications (B) Coronal view of CT Abdomen and Pelvis. Abdominal Ultrasound of Upper Quadrant displaying (C) Nonvisualized gallbladder (D) Normal caliber bile ducts. Common bile duct measures 3mm. MRI images (E and F) display nonenhancing scarring and fibrosis in the right hepatic lobe but no focal mass

P617

Laparoscopic Total Caudate Hepatectomy for Large Hepatic Tumor: A Video Case Report

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Background: Laparoscopic hepatectomy has emerged as a safe and effective alternative surgical approach for liver tumors in recent years. Compared to the traditional open approach, it offers several advantages, including reduced postoperative morbidity, less blood loss, and shorter hospital stays.1 However, laparoscopic resection of the caudate lobe remains a significant surgical challenge. The posterior location of the lobe complicates access, and the risk of bleeding is heightened due to the presence of several short hepatic veins that drain directly into the inferior vena cava (IVC), particularly when

managing larger tumors.2 Here, we present a case of laparoscopic caudate lobe resection for a large tumor located in segment 1 (S1).
Method: This is the case of a 51-year-old female with a 9.6 cm tumor located in the caudate lobe. Preoperative tri-phase liver computed tomography revealed heterogeneous mild enhancement with persistent enhancement rather than early washout. Preoperative biochemistry results were within normal limits, and the indocyanine green retention rate at 15 min post-injection was 12%. The patient was positioned in a modified lithotomy position. The surgical approach involved tracing the cystic plate to locate the left and right Glissonean pedicles. We performed intermittent hemi-Pringle maneuvers every 15 min while approaching the caudate lobe from the right, left, and cranial sides. The G1a and G1c pedicles were ligated whenever possible. The middle hepatic vein and the right posterior pedicle were identified as the upper and lateral borders of the resection, respectively. All short hepatic veins were carefully ligated, and the caudate lobe was meticulously dissected away from the IVC.
Result: The total operative time was 270 min, with an estimated blood loss of 1000 mL. No intraoperative blood transfusion was required. The patient was discharged on postoperative day 5 without complications. Pathology revealed a solitary fibrous tumor, composed of mildly to moderately atypical spindle cells.
Conclusion: Our experience demonstrates that laparoscopic total caudate hepatectomy is feasible and safe, with potential benefits of laparoscopic liver resection for selected patients.
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P618

Hepatic Portal Venous Gas in a Patient with Metastatic Pancreatic Adenocarcinoma on Chemotherapy: A Case Report

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Introduction: Hepatic portal venous gas (HPVG) is a radiologic sign suggesting severe abdominal pathology, most commonly bowel ischemia, and may require surgical intervention. We present a case of a patient with metastatic pancreatic cancer on chemotherapy found to have incidental HPVG on imaging.
Case: A 68-year-old male with metastatic pancreatic adenocarcinoma on gemcitabine and Abraxane due to progression on FOLFIRINOX therapy was admitted for shortness of breath. His history was notable for malignant biliary obstruction requiring endoscopic retrograde cholangiography status post biliary stent placement, venous thromboembolism on apixaban, current pneumonia on cefdinir, and methicillin sensitive Staphylococcus aureus bacteremia. He was hemodynamically stable on arrival, and physical examination revealed abdominal shifting dullness. Laboratory work showed leukocytosis to 18,000/μL with a left shift, hemoglobin of 8.6 g/dL, and alkaline phosphatase of 906 U/L. He was started on broad-spectrum antibiotics for pneumonia found on chest imaging. Due to abdominal distension and pain, a computed tomography (CT) of the abdomen and pelvis was obtained: findings included a small amount of gas in the lumen of the gallbladder, a stent in the distal common bile duct, a large amount of peripheral branching gas in the liver, locally invasive pancreatic adenocarcinoma with metastatic adenopathy greatest in the retroperitoneum, and a large amount of ascites (Fig. 1). No intraperitoneal gas or intestinal pneumatosis was identified. Interventional radiology was consulted for paracentesis and possible permanent peritoneal drainage for rapidly accumulating ascites. Paracentesis was performed with removal of 8.6 L of fluid, and he was discharged with an abdominal PleurX catheter placed a few days later. Antibiotic duration was extended for a total of 4 weeks, and he was discharged on oral doxycycline for 2 weeks.
Discussion: The diagnosis of HPVG is made through abdominal x-rays, ultrasound with or without color flow Doppler, or CT scans showing peripherally located gas in the liver due to centrifugal flow. Chemotherapy induced HPVG from irinotecan, cisplatin, and oxaliplatin has been previously reported. Although the mechanism is not fully understood, irinotecan causes mucosal damage that is amplified by oxaliplatin, compromising the gut wall leading to inflammation, ulceration, and permeability; gas then enters the portal circulation. In our case, prompt treatment was not necessary as it was an incidental finding, but HPVG should be recognized immediately in a hemodynamically unstable patient because surgical intervention may be necessary.

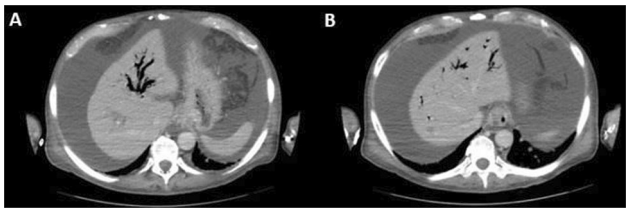

Fig. 1 **A** and **B** Axial cuts of CTAP showing HPVG in the liver peripherally

P619

Same Day Discharge in Minimally Invasive Minor Liver Resection: A Proposed Protocol

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Introduction: MIS techniques and implementation of ERAS protocols has led to successful implementation of same day discharge (SDD) programs amongst MIS colectomies and hysterectomies. Despite increasing uptake of MIS techniques in liver surgery, SDD remains a rare phenomenon. Same Day Discharge After Hepatectomy (SDD-Hep)is feasible but is only described in a single-institution case series. In this publication we describe our institution's SDD program for MIS minor liver resections.
Protocol: To be a candidate for SDD-Hep, patients must meet preoperative, intraoperative and postoperative criteria.
Preoperative criteria
Patients undergoing minor hepatectomy (bisegmentectomy, single segment resection, or multiple wedge resections) are offered SDD-Hep if they meet the following: Age < 80, live < 1 h from the hospital, no preoperative anemia, ECOG 0, and able to actively participate in a virtual care with remote automated monitoring(VRAS) program. Patients must also have a caregiver to drive them home and remain with them during their recovery.

Patients will be excluded if they have uncontrolled cardiac (CHF, arrhythmia)/respiratory comorbidities (sleep apnea, COPD), liver cirrhosis, chronic opioid use or contraindications to NSAIDs.
Intra-operative Criteria

Patients must undergo an uncomplicated foley catheter insertion/removal, with MIS minor liver resection, and the extraction site must be less than 8cm in length (Pfannenstiel preferred). All patients will receive either TAP blocks or rectus sheath blocks at the surgeon's discretion. The surgeon must be satisfied with hemostasis including a Valsalva maneuver, and trocar sites must be assessed for bleeding. Estimated blood loss must be < 400ml and total case length must be < 200 min. Patients must be the first case of the day, with a focus on an opioid and volume sparing anesthetic.

Post-operative Criteria

Post-operatively patients must have normal vital signs and stable hemoglobin at 3 h, pain well controlled with oral analgesia and able to void and ambulate. Patients will be assessed by a member of the surgery team prior to discharge, and must not have evidence of port site hematoma. Patients must be accompanied at discharge.

Post Discharge

Patients are followed by a Virtual Recovery program consisting of a nurse and a physician post-operatively for 5 days, with twice daily vital signs measurement, video interviews, and escalation protocols to the treating surgeon if needed.

Implementation: The primary outcome is proportion of enrolled patients who are discharged, with a target of 80%. Secondary outcomes include readmission and pain scores.

Conclusion: We describe our SDD protocol for patients undergoing minor hepatectomy.

P620

Optimizing the Management of Transplant Patient Inquiries Through Automated Answers: Development and Evaluation of a Safe, Personalized AI Chatbot

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Background: Nearly 50,000 organ transplants were performed in the U.S. in 2023, with transplant patients requiring continuous care and frequent consultations with healthcare providers. While many of these interactions occur in formal settings, others often occur informally via WhatsApp, phone calls, or email. At our institution, which manages over 500 solid-organ transplant patients, nurses often serve as the first line of contact, receiving multiple informal inquiries daily. AI-driven tools could help address patient questions, but commercially available large language models (LLMs) are not designed for clinical use and may produce inaccurate or harmful information, raising concerns about patient safety and confidentiality. This study aims to develop and evaluate an AI-based chatbot to safely manage patient inquiries and reduce the workload on nursing staff.

Methods: A prospective study was conducted to evaluate an AI-based chatbot for transplant patient queries. A set of 150 frequently asked patient questions was curated by the transplant institute and narrowed to 80 essential questions. Regarding the AI-tool, a JSON file served as the knowledge base, and Term-Frequency-Inverse Document Frequency (TF-IDF) was applied to identify key concepts. It was developed in Python and deployed using Azure OpenAI GPT-4.0 Turbo, with a focus on data security. Using a Stage-Gate approach, random subsets of questions were tested, with a multidisciplinary team (surgeon, nurse, and researchers) assessing the chatbot's responses. Content accuracy, safety and language appropriateness were assessed and weighed in a summary "Approval rate (%)". Each Stage-Gate (SG 1–3) introduced new challenges, including typos, biased questions, multiple queries in a single submission, and attempts to "bypass" the Chatbot's safety mechanisms. A 90% approval threshold was set to progress to the next stage, with lower-performing configurations ("creativity levels") excluded from subsequent stages.

Results: Five professionals participated in the evaluation. In the first SG, creativity levels 0.5 and 0.75 achieved approval rates of 96% and 92%, respectively. SG2 focused on these configurations, with level 0.75 maintaining a 92% approval rate and exclusively being assessed onwards. On SG3, a 94.79% approval was obtained when testing the ChatBot with even more complex questions, meeting predefined safety and accuracy benchmarks before patients testing.

Conclusions: Preliminary findings suggest that the AI-based chatbot can accurately and safely handle common transplant patient inquiries in a protected and confidential environment. Given its success in this controlled environment, future steps include testing with a selected group of patients under strict monitoring.

P621

Efficacy and Usefulness of Robotic Approach for Redo Hepatectomy

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Aim: In this presentation, we examined the safety and usefulness of robotic liver resection (RLR) in cases of repeat liver resection.

Methods: Our hospital introduced laparoscopic liver resection (LLR) in 2008, and has performed 784 minimally invasive liver resections (MILR) by May 2024. The LLR procedure has been standardized since 2019, and this study focused on cases from 2019 onwards. Among 299 cases of MILR (Minimally Invasive Liver Resection) from January 2019 to August 2024, the study included cases of repeated hepatectomy (limited to partial hepatectomy and lateral segmentectomy) without combined resection of other organs. Of these cases, 18 were RLR and 31 were LLR, and the safety and usefulness of RLR were examined by comparing the two groups. Factors compared included patient background, perioperative factors, and pathological margins.

Results: There were no significant differences in patient background between the two groups. Conversion to open surgery was observed in two cases in the LLR group but not in the RLR group. In terms of perioperative outcomes, the operative time was significantly longer in the RLR group than in the LRR group. Regarding other factors, the amount of bleeding and length of hospital stay tended to be suppressed in RLR group, but there was no statistically significant difference between the two groups. Surgical margins were positive in two cases in both groups.

Conclusion: The safety of RLR in repeat hepatectomy was comparable to that of LLR. In RLR, the port is usually placed more caudally than in LLR, and has less impact on abdominal wall adhesions in the upper abdomen. In addition, RLR is easy to remove adhesions due to its articular function, and the conversion rate is lower than that of conventional laparoscopy, with relatively little bleeding, making it a useful approach for repeat liver resections.

P622

Early Transjugular Intrahepatic Porto-Systemic Shunting Versus Endoscopic therapy for Variceal Bleeding in Cirrhotic Patients: A Systematic Review and Meta-analysis

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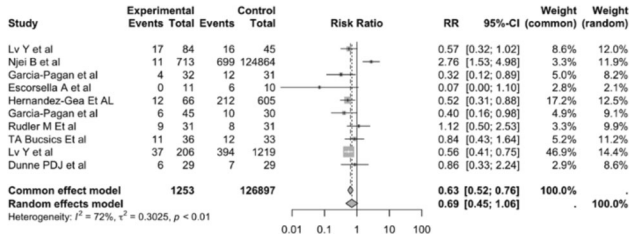


Introduction: Variceal haemorrhage has a high mortality rate even after treatment, making it a significant clinical problem.

Transjugular Intrahepatic portosystemic shunting (TIPS) is an image guided procedure performed in which a shunt is passed which connects the portal vein to the hepatic vein. The main indication of TIPS is in the management of varices resistant to both endoscopic and pharmacological interventions. The study aims to evaluate the effectiveness of early TIPS in comparison to standard treatment for gastroesophageal varices in patients with cirrhosis.

Methods and Procedures: This systematic review and meta-analysis followed PRISMA guidelines. A systematic search of literature was conducted in PubMed, EMBASE and Web of Science published before June 2024 for eligible studies.

The statistical analyses for the Meta-Analyses was carried out in the R-Studio Package. The pooled risk ratio was identified for the primary and secondary outcomes using the Mantel–Haenszel method for common effect model and Inverse variance method for random effects model.

Results: A Total of 10 articles were included in the analysis with a total of 146,140 participants.

The random effects model indicated a lower mortality in early TIPS management in comparison to the conventional procedure with a risk ratio of 00.6935 [95%CI;0.4536; 1.0609, $p < 0.01$].

The random effects model indicated a significant difference in events of rebleeding in the endoscopic therapy and TIPS. The risk of rebleeding in early TIPS was 0.22[95%CI;0.1677; 0.2740, $p < 0.01$] times the risk associated with endoscopic treatment.

The risk of transplantation was not significantly different in both groups. The common effects model showed the risk of transplantation at 1.3545 [95% CI;0.9497; 1.9318, $p = 0.34$]. The risk of developing encephalopathy showed similar outcomes in both the groups with the common effects model indicating a risk ratio of 1.1960 [95% CI; 1.0856; 1.3177 $p < 0.01$].

Conclusion: Early TIPS could be a recommended procedure for the management of variceal bleeding in cirrhotic patients. The events of re-bleeding in the conventional TIPS procedure and mortality were significantly lower, compared to endoscopic variceal management. This exhibits a significant improvement in rebleeding risk compared to standard therapy. Among the secondary outcomes, our findings suggest that risk of transplantation and for developing encephalopathy did not vary significantly among both the groups.

P623

Enterolithiasis; Unusual Meckel Diverticulum Presentation. A Case Report

H Melendez; B Bernard; A Lederman; Berkshire Medical Center

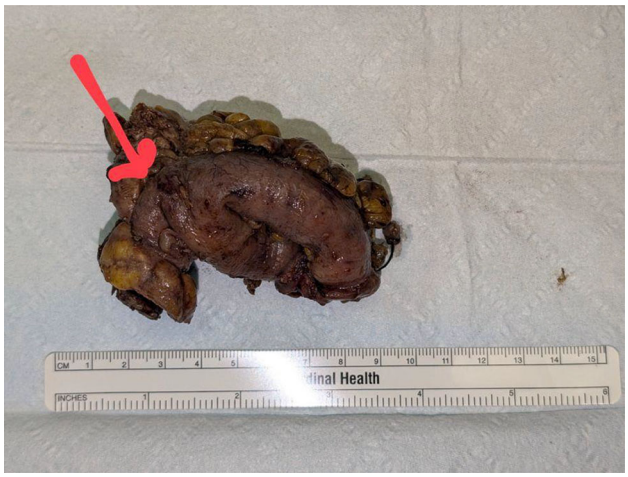
Introduction: Meckel's diverticulum is a congenital anomaly resulting from the incomplete obliteration of the vitelline duct during fetal development. The prevalence is approximately 2% in the general population. Although up to 95% of cases remain asymptomatic, complications such as bleeding, obstruction, perforation and enterolithiasis pose significant diagnostic and therapeutic challenges for clinicians. This report presents the case of a 67-year-old male with peritonitis due to a perforated Meckel's diverticulum associated to enterolithiasis, highlighting the clinical considerations and management strategy.

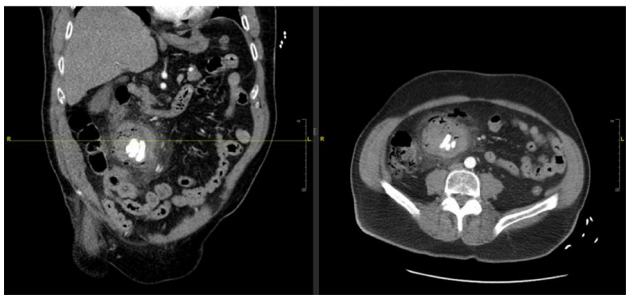
Case Presentation: A 67-year-old male with a history of hypertension, type 2 diabetes mellitus, and atrial fibrillation on direct oral anticoagulants presented with recurrent right lower quadrant abdominal pain, accompanied by fever, nausea, and dry heaving. Physical examination revealed peritonitis with guarding and increased pain in the right lower quadrant. An abdominal CT scan revealed a distended distal small bowel loop with surrounding stranding, free localized air, and a hyperdense structure in the lumen, suggestive of a foreign body. Prothrombin Complex Concentrate was given and patient was taken to the operating room. During exploratory laparoscopy, an abscessed, perforated Meckel's diverticulum was identified, associated with pigmented enteroliths. The patient underwent laparoscopic small bowel resection, abscess drainage, and thorough abdominal washout.

Outcome: Postoperatively, the patient had a favorable clinical course. The pathology report is negative for the presence of ectopic gastric mucosa within the diverticulum and for malignancy. Anticoagulation planned to be resumed 48 h after the intervention.

Discussion: The formation of enteroliths within Meckel's diverticulum is often attributed to a combination of factors, including prolonged stasis, a narrow diverticular neck, chronic inflammation, and the presence of ectopic gastric or pancreatic mucosa. The prevalence of ectopic mucosa is approximately 20–50% and it increases the risk for bleeding and perforation. In the absence of ectopic mucosa, the perforation in this case is presumed to be related to the enterocoliths. This condition is more prevalent in adult patients, where the clinical presentation can easily mimic other acute abdominal pathologies, complicating preoperative diagnosis. Despite the availability of diagnostic resources, many cases of perforated Meckel's diverticulum are only identified during surgical exploration. Therefore, a high index of suspicion is crucial.

Conclusion: Enterolithiasis associated with a perforated Meckel's diverticulum, while rare, constitutes a critical surgical emergency that necessitates prompt recognition and intervention. The ability to identify a clinical surgical abdomen is vital for effective management and improving prognoses in patients facing complications from Meckel's diverticulum.





P624

A Case of a Pelvic Epidermal Cyst Diagnosed by Preoperative Cytology and Completely Resected Laparoscopically Without Mini-laparotomy

Tadao Kubota, MD, FEBS; Okinawa Chubu Hosital

Patient: 40-year-old female

During routine examinations for other conditions, an asymptomatic pelvic mass with a maximum diameter of 10 cm was incidentally discovered. The initial hospital diagnosed the mass as a tailgut cyst. Due to the large size of the mass, it was determined that a certain degree of laparotomy would be necessary to avoid damaging the capsule during a laparoscopic approach. As a result, the patient hesitated to undergo surgery and continued with regular check-ups, during which several years passed.

Five years after the discovery, the patient relocated, and her care was transferred to our hospital. Based on our assessment, the size of the mass had gradually increased, albeit slowly, over the five years. We concluded that surgical removal would be preferable, regardless of the method. To balance certainty and safety, we proposed either a laparoscopic approach with a small laparotomy or a transperineal approach as options. However, the patient strongly desired a less invasive procedure. Therefore, we proposed performing a cytology test. If the mass was malignant, we would proceed with one of the previously suggested options. If benign, we proposed reducing the size of the mass by aspirating its contents laparoscopically, followed by removal through a small incision.

With the patient's consent, a cytology test was performed, and the pathology results only showed keratinized components. Therefore, it was determined that the mass was likely not the initially suspected tailgut cyst but rather an epidermal cyst.

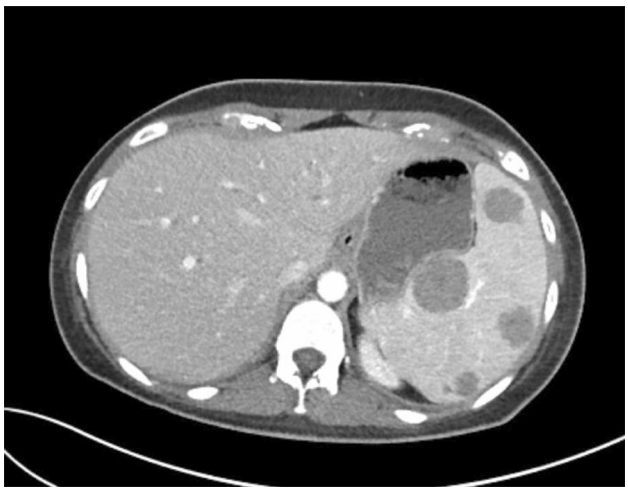
The surgery was performed laparoscopically. After dissecting around the mass, its contents were aspirated completely. The surrounding capsule was removed through the port site without the need for a laparotomy, and the procedure was completed successfully.

P625

Laparoscopic Splenectomy Demonstrating Metastatic Melanoma to the Spleen with an Unknown Primary in a Young Patient: A Case Report

Joseph Kuiper, MD; Dakota Pastore; Jason Barfuss, DO; Alexandra Haraczy, MD; Gregory Kunis, DO; John Pollock, MD; Erin Hart, DO; Arielle Brackett, MD; Jaime Giraldo, MD; Christiana Care

Metastatic melanoma to the spleen is a rare occurrence, particularly when the primary melanoma lesion is unknown with very few documented case reports. We report a case of isolated metastatic melanoma to the spleen in a 28-year-old female with a history of intravenous drug use (IVDU), rheumatoid arthritis, chronic hepatitis C, and tobacco use. The patient was admitted for cellulitis and right hip osteomyelitis secondary to endocarditis seeded by her known IVDU history. An abdominal CT scan obtained during her admission demonstrated multiple splenic lesions and VIR was consulted for drainage, which was deferred due to the large number and small size of the lesions. She was later discharged home but re-presented one week later with repeat CT scan demonstrating many enlarging splenic abscesses with splenomegaly despite prolonged antibiotic therapy. A laparoscopic splenectomy was performed, during which there was no intraabdominal spillage and the spleen was morcellated in a retrieval bag for removal. The patient recovered uneventfully after surgery and received her post-splenectomy vaccines prior to discharge. Pathology demonstrated a unique finding of metastatic malignant melanoma with no identifiable primary lesion identified on skin exam. She was subsequently initiated on immunotherapy in the outpatient setting. This case highlights the unique presentation of splenic metastases from an unknown primary melanoma in a young patient with multiple comorbidities. The successful laparoscopic approach in this patient underscores its feasibility and safety, even in complex situations. This case contributes to the limited literature on splenic metastasis from melanoma, particularly in younger populations with atypical risk factors. Further studies are needed to better understand the prognosis and optimal management of such cases.



P626

Extramedullary Plasmocytoma of the Small Intestine and Mesentery: A Rare Case Report

Eddy P Lincango[1]; Tishani Patel[1]; Mary McIntosh[1]; Michael Shockley[1]; Francisco San Miguel[2]; [1]University of Central Florida/Orlando Veterans Affairs Medical Center; [2]Orlando Veterans Affairs Medical Center

Introduction: Extramedullary plasmacytoma (EMP) is a rare plasma cell disorder that can occasionally involve the gastrointestinal tract, though involvement of the small intestine and mesentery is very uncommon. Diagnosis is challenging as patient presentation is variable with pain, obstruction, or bleeding, and imaging cannot differentiate between other malignancies. Diagnosis is not achieved until histopathological analysis of the resected mass. Treatment and prognosis depend on finding of primary EMP or secondary EMP in the setting of multiple myeloma.
Methods and Procedures: We report a case of a 71-year-old male presenting with iron-deficiency anemia and melena who was found to have a 15.5 cm EMP of the small bowel and mesentery.
Results: The mass with adjoining intestine and mesentery was surgically resected. His postoperative course was uneventful. Follow-up indicated primary EMP without metastasis or MULTIPLE myeloma.
CONCLUSIONS: EMP of the small intestine often presents with nonspecific symptoms as seen in this case with no findings on colonoscopy or EGD. Further workup may only reveal a mass of undetermined origin. If the mass is easily accessible, then surgery is a reasonable course of action and can be curative in cases of primary EMP. Close follow-up is recommended due to risk of progression to plasma cell myeloma.

P627

Hidden in Plain Sight: The Case of a Cord Liposarcoma Disguised as an Inguinal Hernia

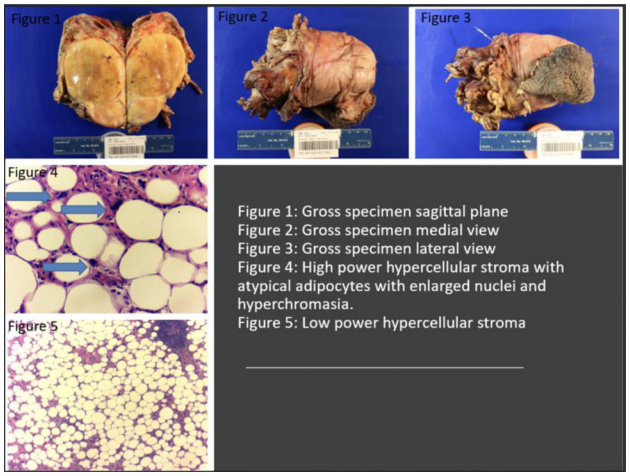
Tara Ranjbar, MD[1]; Yuli Breier, DO[1]; Kirill Antonov, MD[1]; Hilla Katz-Lichtenstein, MD[1]; Ricky Lovell, BS[2]; Adham Ahmed, BS[2]; Kiara Singer, DO[1]; Indraneil Mukherjee, MD[1]; [1]Northwell Health Staten Island University Hospital; [2]CUNY School of Medicine

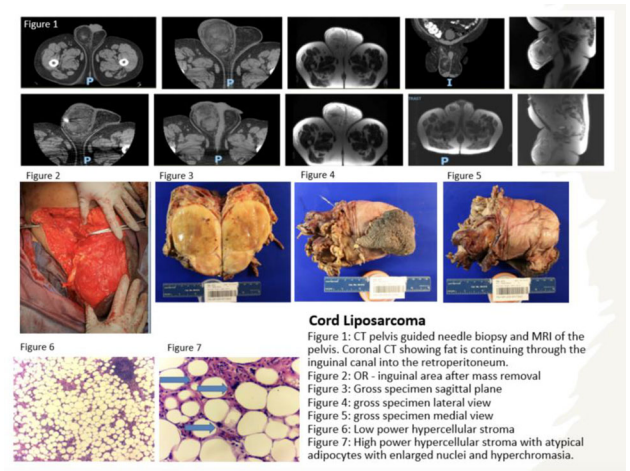
Cord liposarcoma is an exceedingly rare tumor of the spermatic cord, often mimicking common clinical conditions such as inguinal hernias, leading to diagnostic challenges. We present a case of cord liposarcoma initially misdiagnosed as an inguinal hernia, with the additional finding of a hernial sac containing the appendix and part of the cecum.

A 69-year-old male presented with a painless, progressively enlarging mass in the right inguinal region, with a history of intermittent discomfort and bulging, suggestive of a reducible hernia. Despite conservative measures, the mass grew, prompting further evaluation. Physical examination revealed a non-tender mass in the right inguinal canal, consistent with an inguinal hernia. CT scan revealed a well-circumscribed fatty lesion in the spermatic cord, raising suspicion of a lipoma. Further imaging with MRI suggested the possibility of liposarcoma.

The patient underwent surgical exploration and an orchidectomy. Intraoperatively, a mass in the spermatic cord, along with the appendix and a small portion of the cecum in the hernial sac, was found. The appendix was ligated, and the cecum returned to the abdomen. Histopathological analysis confirmed the diagnosis of liposarcoma. Subsequent staging studies, including CT and PET scans, showed no metastatic spread.

Cord liposarcoma is a rare soft tissue tumor, often challenging to diagnose due to its deceptive presentation. Common conditions can overshadow the underlying malignancy, leading to potential misdiagnosis and delayed treatment. Early recognition of liposarcoma is critical for optimal management and patient outcomes. This case underscores the importance of considering rare diagnoses when standard presentations take an unusual course. A multidisciplinary approach, involving surgery, radiology, and pathology, is key to accurate diagnosis and timely intervention.





P628

A Case of Sclerosing Mesenteritis

Gabrielle Dabrowski, MAT, MS[1]; Matthew Mesimer, MS[1]; Rachel Tran, MD[2]; Indraneil Mukherjee, MBBS, MD, FACS[2]; [1]Touro College of Osteopathic Medicine; [2]Zucker School of Medicine at Hofstra/Northwell at Staten Island University Hospital

Introduction: Sclerosing mesenteritis is an idiopathic disease related to chronic inflammation and previous abdominal trauma. Through this case, we present a 59 year old woman diagnosed with sclerosing mesenteritis by biopsy using exploratory laparoscopy after evaluation for non-specific abdominal pain. The patient denied any past surgical history and her medical history was negative for autoimmune conditions. She arrived to the emergency department after episodes of nausea and vomiting, accompanied by diffuse abdominal pain. Further laboratory workup revealed an inflammatory state along with suspicion for an upper gastrointestinal bleed. Additional tests were performed to narrow the differential which ruled out an upper gastrointestinal bleed and raised concern for a mass in the abdomen seen on CT. Ultimately, the patient required a biopsy of the identified mass through robotic assisted exploratory laparoscopy revealing fibrosis and lymphocytic infiltration, confirming the diagnosis of sclerosing mesenteritis.

Methods and Procedures: A CT Abdomen and Pelvis was indicated due to suspected upper gastrointestinal bleed, nonspecific abdominal pain resulting in blood-speckled emesis and low Hemoglobin of 7.5 and MCV of 70.2. Esophagogastroduodenoscopy and Colonoscopy were performed, followed by CT Guided needle biopsy indicated for further workup. Following all negative tests, laparoscopy with biopsy was indicated to determine the nature of the mass. During this procedure a peritoneal nodule was resected along with lymph nodes from the greater and lesser curvature of the stomach.

Results: Results of the CT Abdomen and Pelvis showed a $6.1 \times 5.5 \times 6.1$ cm mass with associated fat-stranding along with sub centimeter lymph nodes. Trace abdominopelvic ascites was also present. The esophagogastroduodenoscopy, colonoscopy and the CT guided needle biopsy resulted as negative for any signs of malignancy. Results from the laparoscopic biopsy of the mass and nearby lymph nodes was indicative of a lymphocytic predominance as well as high levels of IgG (2273 mg/dL) and CRP (89.6 mg/dL).

Conclusion(s): The patient discussed ultimately received the diagnosis of sclerosing mesenteritis, through a diagnosis of exclusion. Due to the combination of symptoms and negative workup for other disease processes, pathology results after biopsy confirmed the diagnosis. Sclerosing mesenteritis is a rare condition with few cases reported to date and although commonly presenting in patients with previous abdominal trauma or autoimmune conditions, further studies are required to improve diagnosis and treatment.

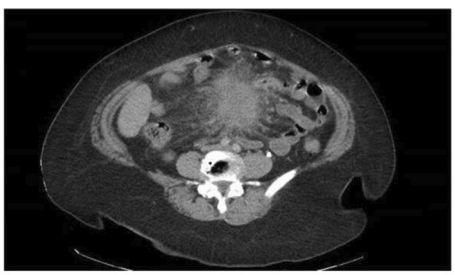


Figure 1: Axial image of abdominal CT showing a mass with stranding in the left mid-abdomen.

P632

Ozempic Associated Portal Venous Gas

Kyung Yoon, MD; Rachel Tran, MD; Tara Ranjbar, MD; Valentina LaraErazo, MD; Indraneil Mukherjee, MBBS; Galina Glinik, MD; Parth Patel, MD; Staten Island University Hospital

Introduction: Ozempic (semaglutide) is an injectable glucagon-like peptide-1 (GLP-1) receptor agonist used primarily in patients with type 2 diabetes to increase insulin secretion and suppress glucagon release. It is also commonly used for weight management in obese patients by delaying gastric emptying, slowing glucose absorption, and promoting a feeling of fullness and appetite suppression. However, Ozempic can cause common gastrointestinal side effects,

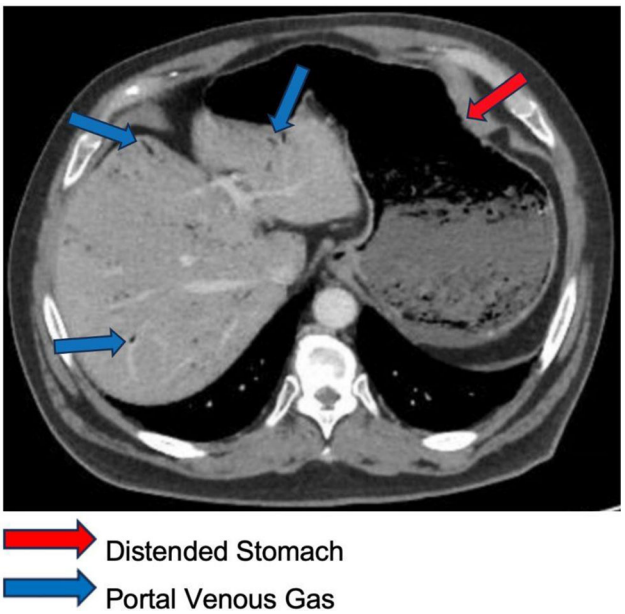
including nausea, vomiting, and diarrhea, which may complicate pre-existing gastrointestinal conditions.

Portal venous gas, the presence of gas within the portal venous system, is often associated with severe gastrointestinal pathology, such as bowel ischemia or necrosis. While there are no well-documented reports linking Ozempic directly to portal venous gas, any gastrointestinal distress or abdominal pain in patients taking Ozempic should be closely monitored.

Here, we present a case of gastric outlet obstruction with portal venous gas in a patient on Ozempic.

Methods: A 78-year-old male with PHMx of DM on ozempic presented to the ED with complaints of 3 weeks of diarrhea and nausea with development of emesis and abdominal discomfort. CT abdomen/pelvis was concerning for gastric outlet obstruction without any mechanical obstruction and portal venous gas. Surgery was consulted for potential gastric ischemia.

Abdominal exam was benign. Patient was managed conservatively: Ozempic was held and a nasogastric tube was inserted in the patient with return of 200cc gastric contents. GI was consulted for EGD to rule out gastric outlet obstruction, which showed erosive gastritis and ulcers.



Results: The patient's condition continued to improve with conservative management via bowel rest, intravenous fluids, and NG tube decompression of the stomach. Patient was discharged on 6/21/2024. No surgical intervention was required.

Conclusions: Ozempic's mechanism of action, which involves delayed gastric emptying, may in severe cases contribute to gastroparesis. Gastroparesis, characterized by inflammation and the potential for gastric ulcer formation, can create conditions that lead to portal venous gas—a serious and concerning clinical sign. Although portal venous gas is usually associated with more severe gastrointestinal pathologies, this case highlights the need for close monitoring of gastrointestinal symptoms in patients on Ozempic to promptly address any potential complications. In patients taking Ozempic who develop this complication, alternative treatment options should be considered for managing their underlying condition.

P633

Inverted Y and Five Triangles Systemization of New Anatomical Concept for Laparoscopic Inguinal Hernia Repair (TAPP)

Ayman Kamal, Assistant Professor, PhD; Surgery Department, Faculty of Medicine, Helwan University

Background: Laparoscopic inguinal repair is spreading recently for lesser incisions, speeder recovery and less postoperative limitations. The main difficulty is the greater surgical complexity associated with the need to follow a "new" anatomical systemization posterior inguinal wall, which requires specific training.

Methods: Standardization of anatomical identification and steps of dissection were applied in patients with inguinal hernia seeking TAPP. This included anatomical landmarks as fruchaud miopectineal orifice, inverted Y and the five triangles followed by the three dissection zones for a roomy space which was followed by giant mesh application.

Results: We operated 210 patients (304 hernias). 26 operations were carried out in recurrence hernias. All patients were discharged within 24 h. Postoperative hematoma was noted in 16 patients.

Conclusions: Anatomical concept systemization for TAPP is essential for improving quality of procedure and postoperative course.

P634

Closed Loop Obstruction Status Post Sacral Colpopexy

Naseem Sorurbakhsh, DO[1]; Asher E Lippe, DO[1]; Giovanna Mele, MD[1]; Fred Wolodiger, MD[2]; [1]HMH-Palisades Medical Center; [2]Englewood Health Medical Center

Introduction: Sacral colpopexy is the gold standard treatment for pelvic organ prolapse practiced by gynecologic surgeons. This procedure is typically performed laparoscopic, with robotic assistance gaining increasing popularity. It involves surgical fixation of the vaginal vault to the sacral promontory using a Y-shaped nonabsorbable mesh. Surgery has very high success rates with few complications; however, there are documented rare cases of mesh-related complications. In most cases, surgeons performing this procedure will close the peritoneum over the mesh, a process known as 'peritonealization'. In our current case, even with peritonealization, the Y-shaped mesh had eroded through and caused a closed loop small bowel obstruction.

Case Presentation: We present the case of a 43 year old female with no significant medical history and surgical history of robotic supracervical hysterectomy, bilateral salpingo-oophorectomy and sacral colpopexy with permanent Y-mesh for uterovaginal prolapse one year prior, who presented with a closed loop small bowel obstruction necessitating bowel resection.

She initially presented with abdominal pain for one day with over ten episodes of vomiting and pain localized to the right lower quadrant (RLQ) and suprapubic region. CT imaging revealed a closed loop bowel obstruction and the patient was promptly taken to the operating room several hours later for a diagnostic and exploratory laparotomy, excision of sacral mesh and resection of 50 cm of small bowel with a primary anastomosis. Upon entry into the abdomen, a segment of necrotic bowel was noted in the RLQ which prompted the haste conversion to open. It was noted that the mesh had acted as a bridge under which the small bowel and mesentery were trapped, resulting in a necrotic segment of small bowel. The mesh tape was divided and excised as a foreign body. The patient had an uneventful postoperative course and was discharged one week later.

Conclusion: This case highlights a rare but serious complication following sacral colpopexy, where despite peritonealization, the Y-shaped mesh used led to a closed-loop bowel obstruction resulting in bowel necrosis and bowel resection. While sacral colpopexy remains a highly effective and generally safe procedure, this case emphasizes the importance of considering potential mesh-related complications, even when recommended preventive measures, such as peritonealization, are performed. Surgeons should maintain a high index of suspicion for mesh-related complications in patients presenting with acute gastrointestinal symptoms following sacral colpopexy, as a timely diagnosis and intervention are critical for optimal outcomes.

P635

Is Hand-Assisted Laparoscopic Splenectomy the Better Choice? A Comparative Systematic Review and Meta-analysis

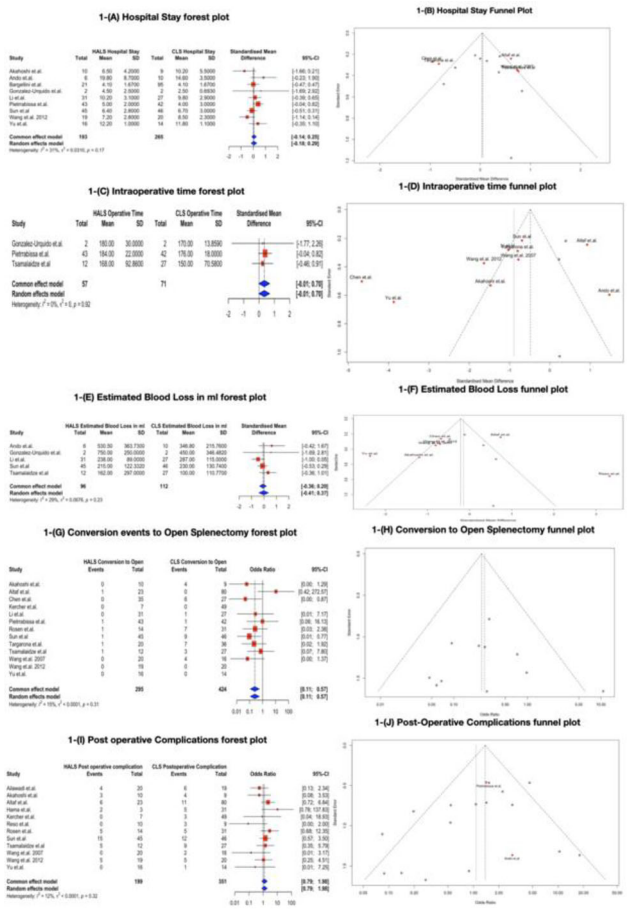
Purvil P Joshi[1]; Obinna Chike[2]; Pratik Chhatbhar, MBBS, PhD[3]; Obsa M Tera[2]; [1]Medical College Baroda, Vadodara, Gujarat, India; [2]American University of Antigua, Antigua; [3]Duke University, NC, USA

Introduction: As we know from several studies, the rapid advancements of Laparoscopic techniques led to increased safety and effectiveness among splenectomies. Both Conventional Laparoscopic Splenectomy (CLS) and Hand-Assisted Laparoscopic Splenectomy (HALS) have long been employed by surgeons for spleen resection. This systematic review and meta-analysis aims to evaluate the effectiveness of HALS compared to Conventional Laparoscopic Splenectomy (CLS).

Methods: We conducted a systematic review of relevant studies dating from January 2000 to April 2024 via PubMed, Google Scholar, and Cochrane Library. The comparison focused on assessing clinical outcomes with respect to CLS vs. HALS: postoperative complications, conversion to open splenectomy, intraoperative time, estimated blood loss, and hospital stay. Data extraction was performed by two independent reviewers. R software was used to calculate odds ratio and weighted mean differences with a 95% confidence interval. Newcastle–Ottawa scale was used for assessing the quality of the study. Funnel plots were drawn to check for any publication bias.

Results: Nineteen non-randomized controlled studies met the inclusion criteria, encompassing a total of 947 patients (HALS: 357 patients; CLS: 590 patients). The meta-analysis revealed no significant differences between the groups regarding intra-operative time, conversion events, hospital stay, post-operative complications, or estimated blood loss with $p > 0.05$ at 95%CI. Thus, the null hypothesis is not rejected. Relevant data are illustrated in Fig. 1-(A) through Fig. 1-(J) with Fig. 1-(A), (C), (E), (G) & (I) being Forest plots and Fig. 1-(B), (D), (F), (H) & (J) being funnel plots. This shows that there is no statistical difference between two procedures.

Conclusion: We found that HALS and CLS demonstrate similar clinical outcomes with regard to Hospital Stays, Intraoperative time, blood loss, Post-op Complications and Conversion events to Open.



P636

Complicated Interval Appendectomy for Perforated Appendicitis

Rachel Tran[1]; Laurel Gieseke, MD[2]; K Paige Mihalsky, MD[2]; Stas Lekhtman, DO[1]; Tara Ranjbar, MD[1]; Valentina Lara Erazo, MD[1]; Hilla Katz-Lichtenstein, MD[1]; Kyung Yoon, MD[1]; Indraneil Mukherjee, MD[1]; [1]Zucker School of Medicine at Hofstra/Northwell at Staten Island University Hospital; [2]University of Oklahoma Health Science Center

Introduction: Interval appendectomy is the preferred treatment for perforated appendicitis. In the interim, patients often receive IV antibiotics and, if abscesses are present, image-guided percutaneous drainage. Although associated with fewer postoperative challenges, interval appendectomy can be technically difficult. We present a case complicated by extensive intra-abdominal adhesions requiring partial cecectomy, omentectomy, multiple incisional hernia repairs, and abscess debridement.

Methods and Procedure: An 81-year-old woman presented with a right groin mass following a recent diagnosis of perforated acute appendicitis, complicated by an abscess that was initially drained percutaneously. She recovered well, and the drain was removed. However, she developed a painless lateral bulge in her right groin, noticeable when bending or exerting, in the area where the drain had been placed. CT imaging revealed a fluid collection in the groin near the prior drain site, extending into the abdominal cavity. Despite additional percutaneous drain placement, her symptoms persisted. She now presents for an interval appendectomy after multiple IR drain placements failed to resolve secondary abscesses, leading to the formation of a large 6.7 × 3.3 cm pericecal mucocele extending into the right inguinal canal, as seen on CT imaging.

The patient underwent diagnostic laparoscopy. Upon entry of the abdomen, phlegmonous muscle and dense intra-abdominal adhesions in the pelvis and right lower quadrant were seen. Dissection of adhesions revealed entrapment of both the small and large bowel to the abscess. The ileum was carefully dissected from the adhesions, however to free the transverse colon, partial omentectomy had to be performed. Additionally, the cecum was unable to be safely freed, requiring partial cecectomy via transection of the lateral wall. Appendectomy was performed using staples. Exploration of the abscess cavity revealed an incisional hernia at the site of the current pigtail drain with fat and omentum herniated inside. Tracking of the abscess cavity revealed extension into the right inguinal canal. ICG mode verified thorough debridement of the abscess cavity.

Results: The patient tolerated the procedure well and was able to discharge from the hospital the next day. Patient evaluated outpatient, with no complaints.

Conclusion: While interval appendectomy typically carries fewer postoperative risks, complications such as adhesions, abscesses, and complex anatomy can significantly increase the difficulty of the procedure. This case highlights the need for individualized surgical approaches and the potential requirement for advanced techniques to manage such complications.

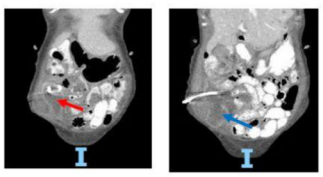


Figure 1: Right lower quadrant loculated fluid collection containing percutaneous pigtail catheter (red arrow) with additional loculated collection seen more laterally (blue arrow) in the subcutaneous tissues along the pigtail catheter tract

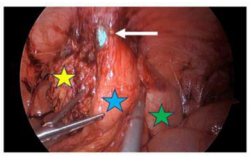


Figure 2: Omental (yellow star), ileal (blue star), cecal (green star), adhesion with pigtail in abscess (arrow)

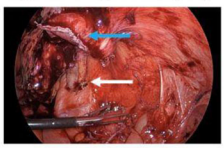


Figure 3: appendectomy (white arrow) and partial cecectomy (blue arrow)

P637

Unusual Ambulatory Presentation of Necrotizing Soft Tissue Infection

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Introduction: Necrotizing soft tissue infections (NSTIs) are severe, rapidly progressing conditions. This report presents an unusual case of NSTI in a patient who remained ambulatory and relatively well despite the infection.

Case Report: 56 year old female with a past medical history of diabetes mellitus, obesity, vertical banded gastroplasty over 20 years ago, incisional hernia status post polypropylene mesh overlay 6 years ago, and recent treatment for gastric ulcers. The patient walked into the outpatient surgical office with complaints of bleeding from the abdomen, reporting a one-week history of pain, swelling, and redness in the right underside of her pannus and one-day history of foul-smelling, spontaneously draining lesions with weakness. Upon entry, the surgical team noted a foul odor and promptly sent her to the emergency room which revealed an afebrile temperature, hemodynamic stability, leukocytosis, anemia, and hypokalemia. Physical examination was pertinent for right lower quadrant tenderness, necrotic skin changes, erythema, and seropurulent drainage. The patient was urgently taken to the Operating Room(OR) for debridement. On the way to the OR, patient underwent a CT scan that revealed a 9 × 5.9 × 7.1 cm collection with air and fluid in the right lower abdominal wall. In the OR necrotizing soft tissue was found in the skin and the fascia; the previous onlay mesh had likely eroded into a small bowel causing the infection. The patient needed a small bowel resection and complex closure of the interstitial ventral hernia repair. The time from the office visit to the post operative room was approximately 6 h. During the next 2 weeks, the patient required 5 more subsequent wound debridements, gradual closure of the external oblique, and vacuum-assisted closure(VAC) device exchanges. She was discharged on oral antibiotics and has fully recovered.

Discussion: Classic NSTI cases have rapid onset of severe pain, and systemic symptoms, while others may progress insidiously with vague, non-specific symptoms. This variation may relate to the causative organism: Type I infections are usually polymicrobial and seen in patients with multiple comorbidities, Type II infections are monomicrobial and often caused by Group A Streptococcus, and Type III is rare linked to specific geographic locations like Vibrio vulnificus. While the patient's comorbidities/risk factors align with Type 1, the culture positive for E. raffinosus is atypical for polymicrobial infections. Increased awareness of varied presentations of NSTIs is crucial for effective intervention.

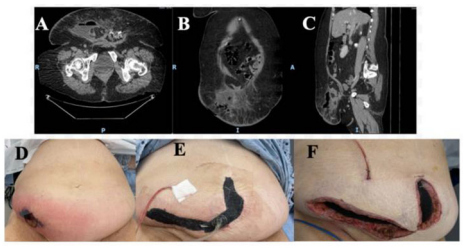

Figure 1. CT Abdomen and Pelvis shows (A) new 9 x 5.9 x 7.1 cm rim-enhancing fluid collection in the right lower ventral abdominal wall with an air-fluid level, compatible with an abscess; overlying skin thickening, soft tissue defect and inflammation (B) Coronal View (C)Sagittal View. (D) Pre-operative image of skin changes prior to initial debridement (E)Post-operative image of initial debridement with wound vacuum assisted closure (VAC) device in place (F) Post-operative image after the third debridement

P638

First Case of Acute Cholecystitis Due to Veillonella spp and Report of a Series of Infections Due to the Elusive Anaerobe at a Rural Hospital

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Introduction: The Gram-negative anaerobic cocci Veillonella spp are part of the human intestinal flora and rarely implicated in diseases. Its yield within the microbiome significantly increases with physical activity. Veilonella yield is increased in athletes due to high lactic acid levels and may even improve performance during endurance training.
Patients and Methods: Following an index case of Veillonella cholecystitis, which has not been reported previously, our institutional database was searched for all infections caused by the pathogen during a 4-year period.
Results: All seven identified Veillonella spp infections occurred in men; their median age was 61.2 (range 38.5 to 81.8) years. Rates of DM were 57% and of hypertension 86% and 43% of patients were active smokers, which was higher than in infections caused by other anaerobes. There was one positive blood culture all other isolates were from drained abscesses, wounds and tissue samples (appendicitis 2, cholecystitis 1, trunk abscess 1 and lower extremity abscess 2). Microscopy of six specimens revealed WBC and Gram-positive cocci in all cases, Gram-negative rods in 17% and Gram-positive rods in 33%. In two cases (including the bacteremia) Veillonella was a single isolate, spectrum of pathogens isolated in addition to Veillonella in 5 mixed infections included Staphylococcus aureus (1), enterococci (1), E.coli (2) and Bacteroides spp (3). All infections were successfully managed with surgical intervention and antibiotics such as Betalactams, Clindamycin and metronidazole.
Conclusion: We report the 1st case of Veillonella spp cholecystitis. The organism should be added to the ever expanding spectrum of anaerobic pathogens involved in surgical infections. In contrast to the reported colonization preference within the microbiome of athletes, in our series middle aged and elderly men with multiple co-morbidities were mainly affected.

P639

Mediastinal Epithelioid Hemangioendothelioma with Osseous Metaplasia - A Case Report on an Ultra-Rare Sarcoma

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Background: Epithelioid hemangioendothelioma (EHE) is a malignant vascular tumor that was first described in 1972 and not named until 1982. Literature currently includes 248 cases total with a 4:1 female preponderance and median age of 36 at diagnosis. The majority of the tumors were found in the liver, followed by cases in the lung, soft tissue, and then bone; most patients presented with multiple tumors and multiple involved organs. Only 12 cases of mediastinal instances were found and often thought to arise from the superior vena cava or brachiocephalic vein. Clinically this condition ranges in behavior from benign hemangioma to high-grade angiosarcoma. Median survival is 4.6 years with a range from 6 months to 24 years; the majority of mortality occurs from respiratory failure due to tumor burden in the lungs.
Case Presentation: A 68 year-old female presented with an anterior mediastinal mass found incidentally during a CT scan done as work-up for pacemaker placement. The mass was noted to be $6.1 \times 4.1 \times 5.0$ cm of irregular lobulated fat/soft tissue mass with interspersed calcifications. Imaging differential included thymoma, thymic carcinoma, thymic rebound, metastasis, thymolipoma, or germ cell tumor. CT-guided biopsy demonstrated extramedullary hematopoiesis. Surgery involved en bloc resection of the left phrenic and left vagus nerve due to frank involvement and partial invasion of the innominate vein was noted but dissection robotically was still feasible. Resection margins were negative with one negative lymph node. Her postoperative course was significant for elevation of the left hemidiaphragm and persistent hoarseness without any shortness of breath. She is scheduled for a vocal cord injection with ENT. Her pathology has undergone expert review and is awaiting second expert review prior to determining any adjuvant treatment and surveillance.
Discussion: EHE occurs in less than one in one million and therefore very little is known about the disease. Because the course may be incredibly indolent or aggressive, treatment is difficult to decide but typically involves surgery and potentially chemotherapy and/or radiation. The majority of mediastinal patients were asymptomatic and incidentally discovered, with diagnosis not occurring until post-operative pathology, such as in the case above. Often during surgery, the tumor is seen to be invading a vessel, but postoperative insight signifies the tumor may have developed from the vessel. While rare, keeping this on the differential may benefit patients with otherwise little known disease.

P640

Early Experience in Seeking Insurance Coverage for Endoscopic Sleeve Gastroplasty and Transoral Outlet Reduction

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Objective: Endoscopic Sleeve Gastroplasty (ESG) and Transoral Outlet Reduction (TORe) are incisionless endosurgical procedures to address weight loss in patients with BMI between 30 and 50 mg/k^2. A manufacturer managed patient access support program (PASP) is available for patients seeking insurance coverage at Boston Scientific (manufacturer of the Apollo ESG^{TM} and Revise^{TM} Systems) approved centers.
Methods: A database of requests for prior authorization (PA) is maintained by a third-party vendor and is updated daily. This study is a descriptive analysis of outcomes associated with our experience supporting patients in the insurance approval process for ESG and TORe.
Results: Between January 1 and August 30, 2024, there were 309 closed cases in our program. Of these, 48 patients did not have bariatric benefits and could not seek coverage. Eighty patients had bariatric benefits, but their insurer would not allow prior authorization for endobariatric procedures.
Of those who moved forward to prior authorization (n = 53), 30 (57%) were denied and 23 (43%) were approved at the PA stage. Eleven (n = 37%) of those who were denied chose not to appeal. Nineteen (63%) patients who were denied at PA went to first appeal and 5 (26%) were successful in getting the denial overturned.

A small cohort (n = 6) of patients requested external review (IRO) after exhausting the insurer's available internal options. During IRO, an independent expert with relevant clinical experience reviews the medical records. If approved, IRO is binding for the insurance company. Currently, 50% of IRO cases have been overturned and the patients were able to receive the procedure.

Conclusions: Prior authorization is challenging for patients seeking weight loss treatment, including those seeking medications (GLP-1s) and bariatric surgery. Unfortunately, many patients do not have access to bariatric benefits at all. ESG and TORe are incisionless, endosurgical procedures that facilitate weight loss in patients with obesity. Despite prior authorization burdens, patients have found success in getting case-by-case coverage, where coverage exists. With ample literature on safety and effectiveness and our success in securing case-by-case approvals, we believe ESG and TORe will be included as a covered benefit for more patients in the future.

P641

Knotted Nasogastric Tube - Knot Your Usual Surgical Knot: A Case Report

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Nasogastric tubes are routinely used in a variety of clinical settings including diagnostic and therapeutic purposes. As common as it is used in daily practice, it comes with its own complications, including knotting of the tube.

This is a case of a 59 year old female who was admitted to the hospital for small bowel obstruction. The patient received an NG tube to decompress stomach contents. During its removal however it was found to be knotted. The tube had to be eventually removed with a nasal endoscopy under General Anesthesia.

The knotting of an NG tube is a rare complication. Clinicians should be aware of this complication, measures to avoid it and methods of removing knotted NG tubes.

P642

Reporting Quality of Systematic Reviews Evaluating Surgical Interventions According to the PRISMA 2020 Checklist: A Methodological Survey

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Background: Research plays a crucial role in guiding clinical practice and decision-making. Systematic reviews (SRs) and meta-analyses (MAs) hold an invaluable position in the hierarchy of evidence. The PRISMA 2020 checklist serves as a guideline for reporting SRs and MAs. However, adherence to these guidelines in studies pertaining to surgical interventions has not been studied. The aim of this methodological survey is to evaluate the compliance with methodological reporting in surgical SRs and MAs as per the PRISMA checklist.
Methods: MEDLINE and EMBASE were searched for SRs and MAs evaluating surgical interventions, published from the beginning of 2022 to the end of 2023. Overall PRISMA statement checklist completeness was the primary outcome. Our secondary outcome was the association between PRISMA reporting completeness and journal endorsement of PRISMA, a priori registration of the study, a priori publication of a protocol, number of included studies, type of publication, and journal impact factor, using Poisson regression for assessment of these associations.
Results: 57 studies met the inclusion criteria, out of 658 captured citations. The studies predominantly addressed bariatric surgery ($n = 34$), general surgery ($n = 9$), breast surgery ($n = 6$), and colorectal surgery ($n = 4$). The mean number of PRISMA items reported was 31.42 (SD 5.45) out of a total of 42 items (74.8%). Adjusted analysis showed that studies with a published protocol were significantly more likely to report a higher number of PRISMA items (incidence rate ratio [IRR] 1.17, 95% confidence interval [CI] 1.02–1.33, $p = 0.023$). Open access publications were associated with reporting fewer PRISMA items (IRR 0.89, 95% CI 0.82–0.97, $p = 0.009$).
Conclusion: Adherence to the PRISMA 2020 checklist for SRs and MAs evaluating surgical interventions is moderate, with a mean of 75% of items being adequately reported. Publishing a protocol before conducting the study may enhance reporting completeness, indicating a possible avenue for future improvement in adherence. Future research should explore additional strategies to improve reporting standards in surgical research. This study aligns with broader efforts to enhance transparency, replicability, and integrity in research in surgery.

P643

Air Bubble in Right Thoracic Cavity of a Septuagenarian: A Rare Case of Morgagni Hernia with Mesentero-Axial Gastric Volvulus

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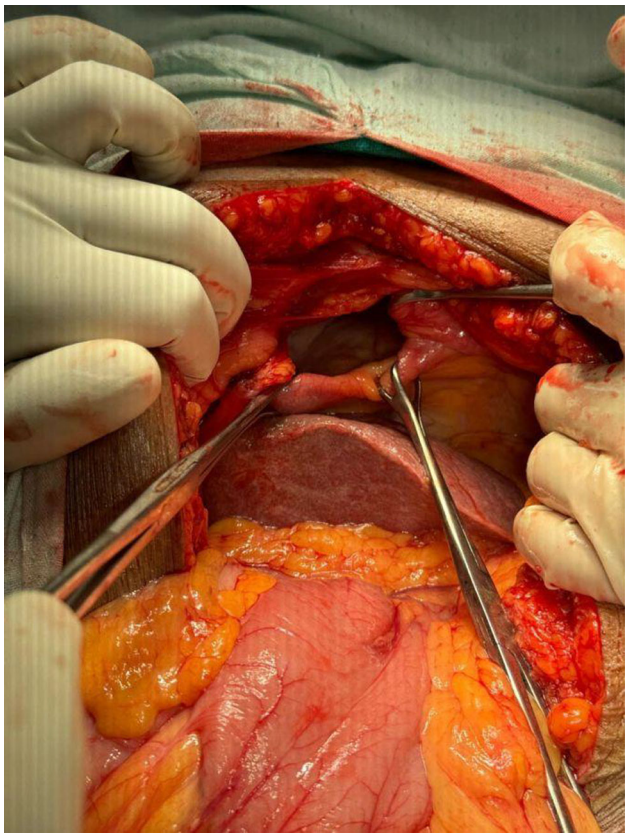
Keywords: Morgagni hernia, Gastric Volvulus, Laparotomy
Introduction: Morgagni hernia (MH) is the rarest form of congenital diaphragmatic hernia (CDH), comprising of only 2% to 5% of cases. It is characterised by its anteromedial location. MH is usually asymptomatic and infrequently shows presentation in adulthood. Gastric volvulus is when the stomach rotates 180 degrees or more, causing closed loop obstruction. Mesentero-axial gastric volvulus (MAGV) is an uncommon subtype of gastric volvulus (GV) that can present as a surgical emergency due to life-threatening complications. Morgagni Hernia complicated with mesentero-axial gastric volvulus presenting with features of an acute abdomen is an even rarer entity. Our aim is to highlight that Morgagni Hernia with gastric volvulus as a complication, although rare, should be a suspected diagnosis in an elderly patient presenting with symptoms of an acute abdomen.
Case Report: A 70 year old male presented to the Emergency Department with complaints of intractable vomiting and abdominal pain since 3 days associated with progressive distension of abdomen and inability to pass flatus and faeces and complaint of dyspnoea since 3 days. He had similar history in past and was hospitalized wherein he was managed conservatively and discharged. On clinical examination, abdomen was soft, distended, diffusely tender on deep palpation, no guarding or rigidity was noted. Nasogastric decompression was done. Routine Chest and Abdominal X-rays and Ultrasonography showed an abnormal air filled loop in right thoracic cavity. On advanced imaging (gastrograffin dye study and Contrast CT of Abdomen and Chest) the diagnosis of Morgagni's Diaphragmatic Hernia with Mesentero-axial Gastric Volvulus was ascertained. He underwent Emergency Exploratory Laparotomy. The per op findings corroborated with the radiological diagnosis. After reduction of hernial contents the volvulus was relieved subsequently and primary repair of diaphragmatic defect was contemplated. The gentleman had an uneventful recovery in the post operative period and was discharged within a fortnight.

Chest X-ray showing air fluid level in right thoracic cavity



Intra op image of the defect in diaphragm

Conclusion: A symptomatic Morgagni hernia in adults can present with a spectrum of symptoms ranging from non- specific nausea, vomiting, indigestion to more serious obstructive features requiring surgical management. Gastric volvulus is a rare complication of Morgagni Hernia but should be considered as a differential diagnosis so that quick identification and due intervention can be achieved.

P644

Active Screening Strategy for Exocrine Pancreatic Insufficiency in Acute Necrotizing Pancreatitis

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Introduction: Exocrine pancreatic insufficiency (EPI) management in moderately severe and severe acute necrotizing pancreatitis is unclear.

Methods: Sixty-two consecutive patients with acute necrotizing pancreatitis undergoing drainage procedures for local complications from 2019 to 2024 were included in the study. Patients with chronic pancreatitis, pancreatic adenocarcinoma and preexisting malabsorption syndromes were excluded from the study. Severity was classified based on revised Atlanta classification. Screening for EPI was done at resumption of non-clear liquid diet and at discharge using EMR template. Pancreatic exocrine replacement therapy (PERT) was initiated for clinical/biochemical diagnosis of EPI. Clinico-pathological variables and nutritional parameters (subjective global assessment form and serum albumin) were recorded at discharge and 3- and 6-month follow-up.

Results: Twenty-five (40.3%) patients had severe pancreatitis and 37 (59.7%) patients had moderately severe pancreatitis based on Atlanta classification. Median Bedside severity index (BISAP) score at admission for this entire cohort was 4 (IQR 3,5). Etiology of pancreatitis was gallstones in 38 (61.3%), alcohol induced in 19 (30.6%) and other causes in 5 (8.1%) patients. All patients had local complications of either walled off necrosis (n = 50, 80.6%) or acute necrotic collection (n = 12, 19.4%) requiring drainage procedures. The primary drainage procedure performed was endoscopic in 32 (51.6%) patients, interventional radiology percutaneous drainage in 26 (41.9%) patients and surgical in 4 (6.5%) including 9 (14.5%) patients who underwent multi-gate drainage strategy. EPI was diagnosed in 36 (58.1%) patients, and they were all started on PERT. Presence of EPI was not significantly different between patients who underwent internal vs external drainage (16 vs 20, p = 0.153), based on etiology of pancreatitis (gallstone, n = 20 vs alcohol, n = 13, p = 0.255), severity of pancreatitis (moderately severe, n = 22 vs severe, n = 14, p = 0.788) or presence of associated new/ worsening endocrine insufficiency (10 vs 5, p = 0.296). Compliance with PERT therapy was good at 82% and primary reason for noncompliance was cost of therapy (n = 5) and intolerance (n = 4). PERT was discontinued at 3-month follow-up for resolution of EPI in 16 (44.4%) and at 6 months only 3 (8.3%) patients required long term PERT.

Conclusion: We found that early EPI in acute necrotizing pancreatitis in common but transient and often undiagnosed. An EMR based active screening strategy and intervention is important in optimization of these nutritionally fragile patients. A prospective clinical trial is currently underway to study role of early PERT in severe acute pancreatitis.

P645

Adopting a Robotic Approach to Adrenalectomy: 5 Year Experience at a Single High-Volume Center

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Background: Robotic adrenalectomy offers the advantages of the robotic platform and is as safe and effective as a laparoscopic approach. Hesitation to adopt a robotic approach includes concern over learning curve and increased operative time. Augusta University created a multidisciplinary, comprehensive Adrenal Center in 2019. From 2019 to 2024, a total of 108 adrenalectomies were performed with 91.6% performed via a transperitoneal robotic approach and 8.4% open. Volume increased yearly with 31 adrenalectomies performed in 2023. We hypothesized over this period operative time would decrease demonstrating proficiency and operating room efficiency would improve. Secondarily we sought to identify factors such as BMI, age, comorbidities, functional status, or tumor size affecting operative time.
Methods: Retrospective chart review of robotic adrenalectomies by a single surgeon at a teaching hospital with resident physician involvement from 2019 to 2024. Adrenalectomies combined with a second procedure were excluded. The total number selected for final analysis was 93. Primary outcomes were operative time and operative prep time defined as the time from patient entering the room till surgery start. Variables of interest for the secondary outcome included functional status of tumor, tumor size and patient age, BMI, and ASA classification. Multivariate regression used to analyze variables.
Results: Mean operative length was 167 min and median of 153 min. Operative time significantly decreased over the study period ($p = 0.01$). Pheochromocytomas and tumor size > 4 cm (mean 6.25 cm) did not result in increased operative time. Neither age over 65 nor BMI > 30 was significant. Operative prep time was also noted to significantly decrease over the period ($p = 0.00$). Mean operative prep time was 54.1 min with median of 50 min. Pheochromocytoma was associated with longer operative prep time ($p = 0.010$) likely a result of placement of central access or invasive monitoring. ASA 4 classification was associated with a statistically significant increase in operative time ($p = 0.02$) but not operative prep time ($p = 0.26$). There was a single conversion to a hand assisted laparoscopic approach due to a nonrecoverable fault on the robot.
Discussion: There is a learning curve associated with adoption of robotic adrenalectomy but over time both surgeon and operating room efficiency improves. Furthermore, implementation in a hospital where residents will rotate through a service is feasible. An advantage to the robotic approach is better ergonomics in patients with higher BMI and larger tumor sizes without significantly increasing operative time which were previously associated with prolonging operative time in laparoscopic adrenalectomy.

P646

Wandering Spleen, Is it a myth

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Background: Wandering spleen is a rare condition resulting from the elongation or maldevelopment of the spleen's ligaments. It mainly affects children. Among adults, it is most commonly found in females of active reproductive age. It may present as an asymptomatic mass in the abdomen, or it may present with intermittent abdominal discomfort because of torsion and spontaneous detorsion of the spleen. We present the case of a 35-year-old female who presented by left hypochondrial pain and vomiting. The suspected diagnosis was confirmed by CT. Laparoscopic exploration showed an infarcted spleen, and laparoscopic splenectomy was performed.
Case Report: A 35 yr old female patient presented by diffuse abdominal pain, mainly left hypochondrium, U/S showed displaced spleen lower than normal site and CT confirmed the diagnosis. Laparoscopic exploration showed partly infarcted spleen and long pedicle. Laparoscopic splenectomy was done and the postoperative follow up was uneventful. Histopathological examination showed infarctions.
Discussion: The clinical presentation of wandering spleen is variable; it is either asymptomatic or noted incidentally during physical and radiographic examination or presents as acute abdominal abdomen due to torsion with subsequent infarction. The most common presentation is a mass with non-specific abdominal symptoms or intermittent abdominal discomfort due to congestion resulting from torsion and spontaneous detorsion.
Splenic torsion may be acute or chronic. Acute torsion may mimic peritonitis, acute appendicitis, twisted ovarian cysts, or bowel obstruction. Chronic torsion may present as an abdominal mass, which may be located in any quadrant.

Multiple imaging modalities can be used to diagnose this condition. USG findings of a solid mobile mass, absence of the spleen from its normal location, and Doppler USG of the splenic vessels can be used to evaluate flow. A CT scan remains the investigation of choice and can demonstrate the organ's circulation and the viability of splenic parenchyma.

Splenectomy is indicated for infracted spleen and sometimes for huge splenomegaly precluding splenopexy. For all other cases, splenopexy is the treatment of choice.

P647

Inguinal Sarcoma: A Rare yet Aggressive Tumor

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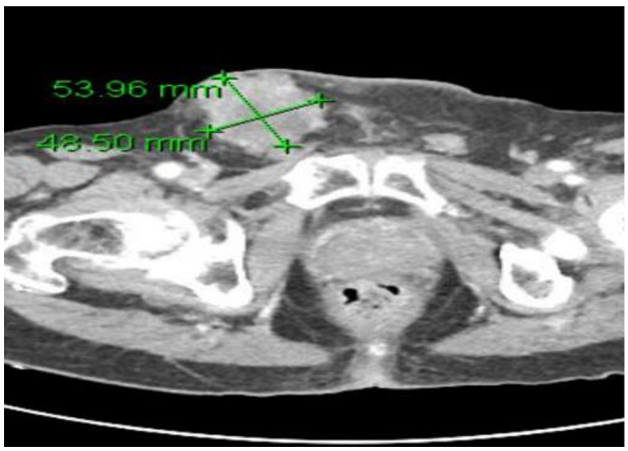
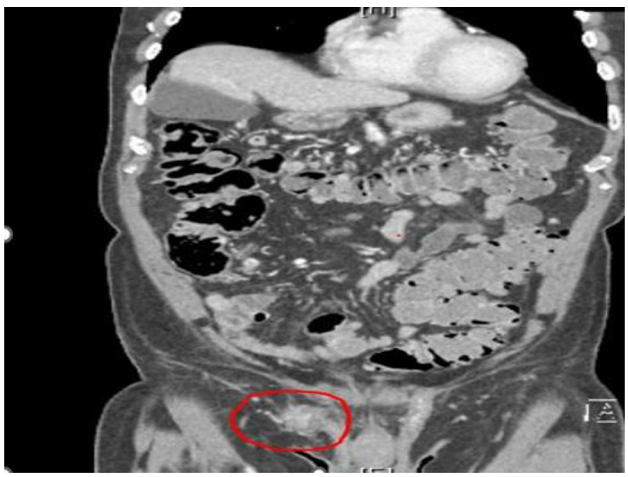
Introduction: Sarcomas of the inguinal region are rare and pose significant challenges due to their proximity to critical neurovascular structures. Effective management requires meticulous preoperative planning and a multidisciplinary approach. This case report describes the surgical management of a high-grade myogenic pleomorphic sarcoma in an elderly patient, emphasizing the importance of collaboration among surgical specialties and postoperative care.
Methods: An 85-year-old male with a past medical history of invasive well-differentiated squamous cell carcinoma of the anus (treated with chemoradiation) presented with a progressively enlarging mass in the right inguinal region. A fine needle aspiration (FNA) biopsy performed at an outside institution confirmed a diagnosis of high-grade sarcoma. Imaging revealed a 5.4 cm hypervascular mass abutting the spermatic cord. The surgical team anticipated potential positive margins and neurovascular injury. Given the involvement of the spermatic cord, the urology team was consulted, and a collaborative surgical plan was established. The patient underwent radical excision of the right inguinal sarcoma and orchiectomy, in collaboration with urology.
Results: Intraoperatively, a 6 cm mass was successfully excised with a margin of 5 cm. The patient's postoperative course was uneventful, and he was discharged with a Jackson-Pratt drain in place. Pathology confirmed the diagnosis of high-grade leiomyosarcoma with focally positive inferior margins. The case was reviewed by the tumor board,

and adjuvant radiation therapy was recommended to address the positive margins and reduce the risk of recurrence.

Conclusion: This case highlights the complexities of managing inguinal sarcomas and the critical role of a multidisciplinary team in ensuring optimal surgical outcomes. The involvement of multiple specialties was essential in achieving safe excision, and adjuvant therapy was necessary due to the challenges in obtaining clear surgical margins.





P648

Case Report: Bilateral Femoral Hernia Presentation in Transgender Female

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Introduction: Femoral hernia is a relatively rare type of groin hernia, more commonly occurring in individuals assigned female at birth, with a female-to-male ratio of approximately 10:1. The occurrence of femoral hernias in transgender patients, particularly those who identify as female but were assigned male at birth, presents unique clinical considerations due to the interplay between anatomical predispositions and gender-affirming care. This case report explores the bilateral presentation of femoral hernias in a transgender female patient, highlighting the clinical challenges and anatomical nuances associated with this condition.

Case Presentation: We present a case of a 62-year-old transgender female (assigned male at birth) with a complex history of bilateral femoral hernia. Initially, in 2019, the patient presented with a small fat containing left femoral hernia with no evidence of obstruction. The patient elected not to proceed with surgery and subsequently was lost to follow-up. In 2022, the patient returned with a non-reducible left groin bulge inferior to the inguinal ligament, diagnosed as an incarcerated femoral hernia, necessitating urgent surgical intervention. The patient underwent a successful primary left femoral hernia repair with small bowel resection.

In early 2023, the patient again presented with a new groin mass now on the right side. Physical examination revealed a right palpable mass inferior to the inguinal ligament, and imaging confirmed a right femoral hernia. A primary repair of the right femoral hernia was performed without complications, and the patient tolerated the procedure well.

C: This case illustrates the interesting occurrence of femoral hernias in an individual assigned male at birth, given the female-to-male ratio of 10:1. It also demonstrates an unusual presentation of an incarcerated left femoral hernia, which is less common due to the anatomical position of the sigmoid colon that produces a tamponading effect, reducing the risk of left-sided femoral hernias. Additionally, bilateral presentation in this transgender female patient underscores the need for heightened clinical awareness and tailored management strategies that consider both the patient's gender identity and anatomical predispositions. The role of female hormone administration may be involved in this unique situation.

P651

Vascular Emergency Surgery- Simulated Exercises for Limb Salvage (VESSELS): A Preliminary Study of a Military General Surgery Resident Education Curriculum

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Objective: Military surgeons face the challenge of delivering high-quality care in resource-constrained environments, necessitating a broad surgical skill set. However, general surgery residency often falls short of preparing military residents for the complexities they may encounter on the battlefield with the increasing use of minimally invasive and endovascular techniques. In particular, vascular injuries are five times more prevalent in modern combat than in previous wars. It is crucial to equip surgical residents with the knowledge and open technical skills to manage vascular injuries and to fill the gap in residency training. One approach is through simulation courses implemented longitudinally throughout the residency. This preliminary study aims to evaluate the effectiveness of the VESSELS supplemental curriculum.

Methods: Walter Reed National Military Medical Center General Surgery residents, including trainees from PGY-1, 2, 3, and 5, were given a didactic and technical skills curriculum on managing traumatic vascular emergencies, including the performance of vascular anastomoses and shunt placement. After a case-based group discussion, residents were separated into small groups consisting of a chief resident, a junior resident, and an intern under the guidance of

vascular and trauma surgeons. They completed pre- and post-knowledge and attitudes assessments to evaluate the impact of the curriculum.

Results: Ten residents completed knowledge assessments, six of which had increased knowledge assessment scores by an average of 13% (range 8–24%). Of the thirteen residents who completed the post-assessment attitudes questionnaire, nine agreed or strongly agreed that the curriculum increased their confidence in their ability to work in vascular surgery. Overall, junior residents had lower confidence levels than senior residents. However, there was an increase in confidence levels in knowledge and technical abilities among the residents who participated.

Conclusion: Longitudinal simulation-based curricula may be beneficial in teaching military residents the technical skills and decision-making needed in the deployed, austere setting and improve confidence to approach these patients. Moving forward, we plan to increase participation among residents, quantify improvement from the curriculum, and enhance the hands-on experience of the curriculum. Ideally, this curriculum can be expanded to other MTFs and include curriculum pertinent to other combat-related injuries.

P653

Development of an Augmented-Reality Interface for Virtual Monitor Display During Robotic Surgery: A Feasibility Study

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Introduction: Robotic-assisted surgery enhances precision through three-dimensional (3D) visualization and instrument control, significantly benefiting the surgeon. However, the same visualization advantages are not extended to non-surgeon personnel in the operating room, whose views are often compromised by glare or obstructed by equipment. This study aims to address this gap by developing an effective Augmented Reality (AR) interface using an Apple Vision Pro (AVP) headset, integrated with the Da Vinci Surgical Robot. The AR interface is designed to project virtual monitors into the user's field of view, potentially improving visibility for non-surgeon personnel.

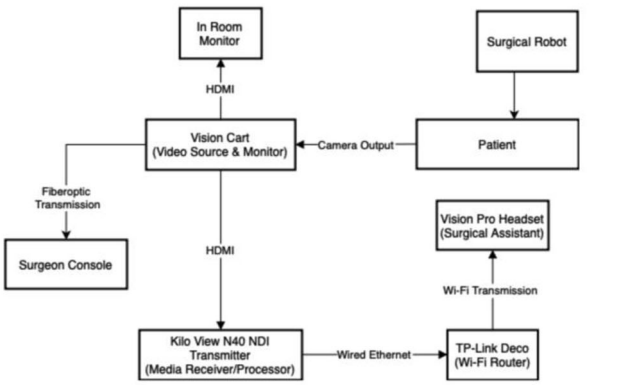
Methods: We defined an effective AR interface as a system that is mobile, convenient, and offers comparable endoscopic camera image quality and video lag relative to existing options. The system used a Network Device Interface (NDI) to transmit a virtual monitor to an Apple Vision Pro headset. The Intuitive Vision Cart outputs video signal via HDMI to a Kilo View N40 NDI transmitter, which encodes video and sends the feed over wired Ethernet to a Wi-Fi router. The router wirelessly transmits the signal to the Vision Pro headset, allowing non-surgeon personnel to view images on a virtual monitor (Fig. 1).

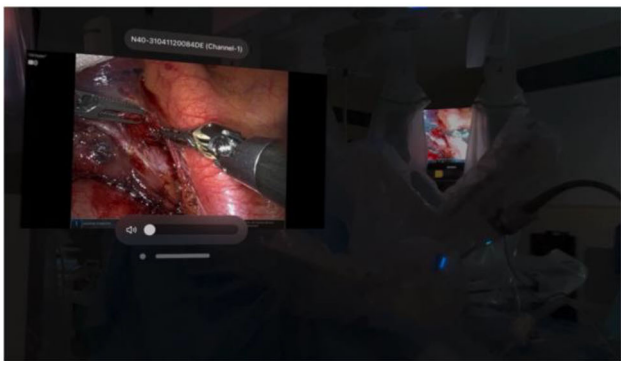
Qualitative testing was performed by surveying volunteers' opinions about the system's feasibility. Quantitative testing using a programmed reaction time test on a personal laptop was performed using 4 conditions: direct vision, in-room monitor, surgeon console, and AVP headset. Reaction times were analyzed using a linear mixed-effects model, accounting for repeated measures and the fixed effect of vision condition. Repeated pairwise comparisons were performed and analyzed using Tukey's post-hoc adjustment.

Results: Seven subjects tested the system, with qualitative feedback indicating satisfactory mobility, comfort, and image quality. Five volunteers performed reaction time testing, revealing a significant reaction delay in all video image systems compared to direct vision. The average reaction time for the conditions is as follows: direct vision: 0.303 s, surgeon console: 0.320 s ($p = 0.77$), in-room monitor: 0.469 s ($p < 0.0001$), and AVP headset: 0.514 s ($p < 0.0001$).

Conclusion: Augmented Reality monitors may offer similar or improved visualization to endoscopic images for non-surgeon personnel during robotic assisted surgery. Further study is necessary to demonstrate safety and efficacy profiles and to develop more efficient surgical workflows and better support for non-surgical personnel in robotic-assisted procedures.

Figure 1: Technical Schematic of Vision Pro Headset Integration with the Da Vinci Surgical Robot and Representative Picture of Intraoperative Virtual Monitor





P654

Revolutionizing Obesity Treatment in Colombia Efficacy of the Ingestible Intragastric Balloon in Patients with Severe Obesity (BMI ? 40)

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Introduction: Morbid obesity is a disease that affects 53% of the adult population in Colombia. We know that cultural patterns, sedentary lifestyles, and fast food contribute to this condition. It has been demonstrated that changes in eating habits, emotional management, and physical activity can help reduce and maintain weight, but effective weight loss is often achieved with procedures. Although surgery is the most effective for patients with type III or IV obesity, there are patients who do not wish to undergo invasive methods and prefer endoluminal techniques.

Methods and Procedures: Since 2020, the Allurion Balloon, an ingestible balloon, has been available in Colombia. In four years of

using this device, I have implanted 40 balloons without related complications and with weight losses of up to 33% of body weight in 16 weeks. Two patients, a 21-year-old female and a 26-year-old male, with BMIs of 43 and 53 respectively, decided to undergo the Allurion Balloon procedure. The patients consulted with a nutritionist, behavioral psychologist, and sports physician. Before the procedure, an upper endoscopy was performed to evaluate the presence of hiatal hernia, gastric surgery, ulcer, or masses that would contraindicate the procedure. The procedure was done in the X-ray room with the patient awake, taking approximately 10 min.

Results: Prior to balloon implantation, the patients lost 8 kg. During the 16-week treatment period, they started physical activity on the third day after the procedure. Four follow-up appointments were conducted before the balloon was expelled rectally, resulting in a weight loss of 33 kg for the female patient and 42 kg for the male patient, reducing their BMIs to 27 and 30, respectively, at the time of balloon expulsion. At 18 months of follow-up for patient 1 and 10 months for patient 2, no weight regain was observed.

Conclusion: We know that surgery is the most effective method for managing morbid obesity. However, despite its results, some patients are reluctant to undergo such a definitive method. This is why the Allurion Balloon is a strategy to make noticeable habit changes and significantly aid in weight loss. The estimated weight loss with the gastric balloon is up to 16%, but with these patients, we achieved up to 40% weight loss and resolution of comorbidities.

Table 1 Complications associated with the M Close device

Complications	Total patients = 118 (%)
Early complications	
Trocar site pain	4 (3.39%)
Pain Visual Analogue Scale	
1–3	3 (75%)
4–6	1(25%)
7–9	0 (0%)
10	0 (0%)
Infection	0 (0%)
Seroma	0 (0%)
Hematoma	0 (0%)
Bleeding	0 (0%)
Late complications	
Chronic pain	0 (0%)
Hernia	0 (0%)
Neuralgia	0 (0%)

P655

Prospective Study of Efficacy of Trocar Port-Site Closure Using M-Close Device in Laparoscopic Sleeve Gastrectomy

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Introduction: Complications associated with closing the surgical port site in bariatric procedures present a challenge for surgeons. Different techniques have been reported in the literature to mitigate these complications, including suture retrieval devices, skin tapes, adhesive dressings, and more advanced and recent devices such as M-Close. However, few studies have evaluated their effectiveness in both the short and long term. The objective of this study is to assess the effectiveness of the M-Close device in our patient population.

Methods and Procedures: A prospective and descriptive study was conducted at Endohospital (Piedras Negras, Mexico). Patients were followed for 18 months post-surgery to assess complications. Descriptive statistics were performed. The results were expressed using mean, standard deviation, prevalence, and percentages.

Results: A total of 118 patients were evaluated, with 70.34% being female. The average age was 42.35 ± 11.94 years. The average BMI was 38.58 ± 5.29. The 45.76% of participants had a history of at least one prior surgery, with 77.87% having undergone at least one abdominal surgery. The most common procedures were umbilical hernia repair and cholecystectomy The 40.68% were taking medication, with lisinopril being the most prevalent, followed by escitalopram and sertraline. The main allergy reported by patients is to penicillin. The 44.07% of the patients were active smokers. The only complication observed was pain at the surgical port site (3.39%), with most cases being mild pain. No other postoperative complications were reported (Table 1).

Conclusions: The results of this study suggest that the M-Close device is highly safe and effective, with a very low rate of early complications. No long-term complications were observed.

P656

Turning Down the Heat: Active Electrode Monitoring and the Fight Against Stray Energy Injury

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Introduction: Effective hemostasis is a critical component of laparoscopic surgery that relies on precise energy application to control bleeding. This process carries a risk of stray energy, where electrical energy transfers from an active electrode to nearby instruments or tissues without direct contact, causing unintended thermal injury to patients. Active electrode monitoring (AEM), consisting of a conductive metal shield around a laparoscopic instrument, is an emerging technology designed to minimize this energy transfer during surgery. Few studies have thoroughly assessed its effectiveness in preventing stray energy injury. This study aims to compare the incidence and severity of stray energy transfer with and without AEM in a benchtop model.

Methods: A benchtop model was constructed utilizing porcine intestine, a Maryland Grasper, an electrosurgical generator (FT-10, Covidien, Boulder, CO), and a variable instrument (standard L-hook or shielded, active electrode monitoring L-hook). The instruments were held by a single surgeon with the grasper in contact with intestinal tissue and the variable instrument positioned 4 cm away without making contact. The instrument was activated in open air fashion (no contact with tissue or the other instrument) at 30W in spray coagulation mode for 4 s. A thermal camera measured the change in tissue temperature from baseline (°C). Statistical significance set at $p < 0.05$.

Results: The standard laparoscopic L-hook reached an average maximum temperature of 54.93 ± 10.54 °C (range 33.4 to 69.9 °C) with an average temperature rise of 35.5 ± 10.52 °C. The shielded L-hook reached an average maximum temperature of 25.78 ± 2.44 °C (range 22.5 to 29.5 °C) with an average temperature rise of 6.21 ± 2.37 °C. The standard L-Hook increased tissue temperatures

significantly more than the shielded/AEM L-Hook, 35.5 vs. 6.21, $p < 0.001$.
Conclusion: Active electrode monitoring (AEM) instruments result in significantly less stray energy transfer during laparoscopy than non-AEM instruments. Tissue temperatures increased 6× more (6 vs. 36 °C) with standard laparoscopic instruments. Surgeons should consider utilizing AEM instruments to reduce the risk of stray energy burns to patients during minimally invasive surgery.

P657

Evaluation of Single Incision Intragastric Surgery for the Gastric Gastrointestinal Stromal Tumors with Intra-luminal Growth Pattern

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Aim: Laparoscopic endoscopy cooperative surgery (LECS) is widely accepted for the gastrointestinal stromal tumor (GIST) with intra-luminal growth pattern. Although we experienced difficult cases of LECS, according to the location and growth pattern of the gastric GIST. Therefore we introduced intragastric surgery (IS) for the gastric GIST. To clarify the efficacy and safety of IS for gastric GIST with intra-luminal growth pattern, we compared surgical outcomes between the IS group and LECS group retrospectively.
Methods: The patients with gastric GIST less than 5 cm, which exist upper body of stomach to EG junction was extracted. 7 patients underwent single incision IS for April 2021 to April 2024. On the contrary, 6 patients underwent LECS for April 2018 to April 2021. We compared surgical outcomes of these two groups.
Results: The surgical time was significantly short in the IS group ($p = 0.038$). Postoperative hospital stay is also short in the IS group ($p = 0.024$). However, there're no significant differences in postoperative complication and blood loss.Cosmetic results showed excellent in the IS group.
Conclusion: Single incision IS for the gastric GIST with intra-luminal growth pattern may be one of the useful therapeutic option and minimally invasive procedure.

P658

A Novel Retractor-Assisted Rectal ESD Method that Utilizes a Transanal Platform and Decreases Both En Bloc Polypectomy Times by 45% and Muscle Injuries

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Introduction: ESD is the gold standard polypectomy method, allowing en bloc removal and assessment of lateral and deep margins. Retraction is obtained with gravity and dissection cap pressure applied to the mucosal edge or submucosa. This challenge accounts, in large part, for the low ESD adoption rate. This study presents a novel ESD retraction method for rectal polyps that uses a TAMIS transanal platform, endoscopic grasper, and a curved-tip overtube. Preliminary ex vivo bovine large bowel data is presented.
Methods: Bovine large bowel with intact sphincter was used. Four 2 cm round lesions were tattooed onto the mucosa with a hot wire 15–30 cm from the anus. Two lesions were removed using standard ESD technique (needle knife and dissection cap) and two were needle-knife resected with the novel grasper-assisted method; an endoscopic grasper through a plastic curved-tip overtube inserted via the GelPOINT Path device faceplate (Applied Medical, CA). The faceplate was attached to the device's "anal sleeve", previously inserted across the sphincter. After outlining with spot burns, the lift was established and a circumferential mucosal incision made with a needle knife. Next, an endoscopic grasper is passed through the overtube and used to grasp the distal cut edge of the resection target. The inner curved shape of the overtube deflects the grasper tip into the lumen, facilitating contact with the mucosal edge. Once grasped, the overtube is torqued so that the polyp flap is retracted toward the lumen, placing distal submucosal attachments on stretch and facilitating detachment. Case length and number of deep wall injuries were noted.
Results: A total 11 ESD resections were done (5 standard ESD [SESD], 6 Grasper-Assisted [GA]). The mean case length for the SESD cases was 37.13 min whereas for the GA cases it was 20.53 min ($p = 0.003$). There were no perforations in either group but there were significantly more deep muscle partial thickness injuries in the SESD group (mean number of injuries 4.8) vs the GA cases (mean 0.3/case, $p = 0.007$). The resected pelts of the grasper group had fewer rents and incomplete margins (SESD, 1.6/pelt vs Grasper-assisted, 0.2/pelt, $p = 0.03$).
Conclusions: This novel grasper and overtube retraction in conjunction with a transanal gel device provides reliable retraction that exposes distal submucosal attachments and greatly shortens resection times while also improving the quality of the polypectomy and avoidance of deep wall muscle injuries. For distal lesions this retraction strategy holds great promise and warrants further investigation.

P659

Efficacy of Low-Pressure Pneumoperitoneum for Laparoscopic Appendectomy in the Pediatric Population

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Introduction: The objective of this study is to evaluate the feasibility of low versus standard pressure pneumoperitoneum in pediatric laparoscopic appendectomy. Trials on low pressure laparoscopy have yielded evidence of decreased duration of hospital stay, postoperative pain and analgesic consumption, and more. These trials predominately pertain to the adult population with minimal studies evaluating efficacy in the pediatric population.
Methods and Procedures: Patients ranging from > 1 to < 15 yo undergoing a laparoscopic appendectomy were randomly assigned to either low pressure (LP: 8 mmHg) or standard pressure (SP: 15 mmHg) in a single-blinded, rolling enrollment fashion. The primary endpoint was the ability to remain at low pressure. Secondary endpoints were operative duration, complications, and postoperative pain using pain scores and additional analgesic use. Pain scores ranging from 0 to 10 were obtained through standard of care from staff who were blinded. Statistical analysis was performed using an unpaired t-test with statistical significance $p < 0.05$.
Results: 20 patients have been enrolled in this study. There were no significant differences in patient demographics. Operative times were consistent between the groups ($p = 0.972$). There was a notable difference in post operative pain scores in favor of the low-pressure group (3.22 vs 1.1; $p = 0.021$). In 4 instances, an increase to standard pressure was required for safe port placement. Additionally, there were 2 patients that required conversion from low to standard pressure for entirety of case for poor visualization, yielding an 83.3% success rate.

Conclusions: Low pressure pneumoperitoneum is a safe option available for pediatric laparoscopic appendectomy. Our preliminary data demonstrated no significant differences in operative times with benefits in post operative pain scores consistent with other trials.

Table 1 Demographics and outcomes of standard pressure (SP) versus low pressure (LP) laparoscopy in pediatric appendectomy

	SP(15 mmHg)	LP(8 mmHg)	*p*-value
Age(y)	11.9	9.39	0.157
Weight(kg)	54	40	0.171
Resident level	3.44	3.30	0.817
Perforated appendicitis	1	3	
Operative time(min)	43.9	43.5	0.972
Post-Op Pain Score(0–10)	3.22	1.10	0.021
Additional opioid analgesic	2	2	
Conversion to SP (ports only)		4	
Operative complications	0	0	
Wound infection	0	1	

P660

Editorial on GERD Screening and Its Role in Bariatric Patients

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Introduction: Gastroesophageal reflux disease (GERD) is a condition in which gastric contents empty into the esophagus and can damage the esophageal epithelium, increasing the risk of developing Barrett's esophagus and esophageal adenocarcinoma. Our objective is to provide a comprehensive review of the existing literature surrounding current GERD screening guidelines among bariatric patients, as well as explain why EsoGuard is an effective screening tool for GERD and should become the gold standard.
Methods: We did a thorough literature search on PUBMED and Google Scholar to include articles on GERD screening that have been available to date.
Results: We have noticed that EsoGuard better fits the criteria for a screening tool according to the AMA Journal of Ethics, which defines an effective screening tool as easily accessible, affordable, safe, reproducible, and consistently demonstrates high sensitivity and specificity. Esoguard has a sensitivity of 87.5% and a specificity of 81.2% in detecting Barrett's esophagus and can be increased to 94.4% for long-segment Barrett's esophagus and 90.3% for Non-dysplastic Barrett's according to gene methylation (VIM, CCNA1) studies. Many bariatric surgeons are calling into question the need for an EGD prior to bariatric surgery. This can be supported by data in one meta-analysis examining 31 retrospective observational studies that found that only 3.9% of pre-op EGDs resulted in a change to the future bariatric surgery. EsoGuard may have a role in replacing future pre-op EGDs as a more practical screening tool in bariatric patients.
Conclusion: It is clear that there is no true universal screening tool for GERD that is affordable and practical. Despite its efficacy, EGDs are costly in both money and time. Emerging technologies like EsoGuard are a promising alternative for clinicians and patients. More research is needed on the efficacy of EsoGuard, but it could provide an effective and less invasive option for measuring esophageal function and health.

P661

New Technologies that Came to Stay - A Case Report in a Third World Hospital

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With the advent of low-dose CT, pulmonary nodules are being detected earlier and therefore the demand for surgical management with curative intent is increasing rapidly. On the other hand, the possibility of the surgeon to objectively identify the parenchymal planes, ensure a sealed and more precise transection of the structures by cancelling hand tremor and eliminating the manual force, as well as shorten the surgical time and reduce postoperative complications such as air leak and bleeding will guarantee a favorable recovery in the patient.

We present a case of lobectomy through the implementation of innovative technologies such as the use of indocyanine green (ICG) with immunofluorescence and powered staplers, which we know have been on the market for some time but are not widely available in our environment.

A 49-year-old female with a history of Hodgkin's lymphoma and right ovarian cystadenoma, who during follow-up was detected a pulmonary node of 13 mm and SUV max of 3.7 in the posterior basal segment of the right lower lobe, with pathological report of adenocarcinoma, cT1bN0M0. She is scheduled for right lower lobectomy and lymphadenectomy by VATS. The inferior pulmonary vein and the basilar arterial were delimited with Thoracic LigaSure electrocoagulation, with subsequent section with Signia powered stapler (gold reload). Upon completion of the vascular aspect, 0.15 mg/kg of ICG was injected intravenously; and the infrared mode was activated in the optics, objectifying after a few seconds the diffusion of the marker over the entire parenchymal surface except in the resected lobe. We also verify with the contrast and overlay modes, obtaining the same interlobar plane. The lower lobe bronchus is identified and also sectioned with Signia (buttressed purple reload). The correct resection is checked with pulmonary insufflation of the remaining lobes. And finally, the complementary lymphadenectomy was performed. The postoperative was favorable with removal of pleural drainage on day 3 and has not presented early complications.
Conclusions: The use of ICG with immunofluorescence and powered staplers represent safe and effective tools in minimally invasive anatomical pulmonary resections.

P662

Maximizing the Potential of EHR Data: Forging New Paths to Predict Postoperative Complications

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Background: Electronic health record (EHR) data presents an unparalleled opportunity to enhance healthcare delivery, including the optimization of postoperative patient outcomes. While EHR systems have been widely adopted, they remain largely underutilized for advanced clinical decision-making. This project aims to demonstrate how EHR data, when harnessed effectively, can serve as a critical tool for predicting and mitigating the impact of postoperative complications in gastrointestinal surgery through machine learning (ML) approaches. Through a comprehensive literature review and initial development of ML models utilizing EHR data, we outline key steps and best practices for leveraging artificial intelligence (AI) and EHRs to optimize postoperative management.

Methods: A literature review was conducted by examining databases including PubMed, Web of Science, OVID Embase, Google Scholar, and Cochrane library databases. Searches were performed with the initial keywords: electronic health record/EHR, postoperative complications, gastrointestinal surgery, machine learning/ML, artificial intelligence/AI. Publications that were retrieved underwent further assessment to ensure other relevant publications were identified and included. The best practices for creating ML models outlined in the papers reviewed were abstracted and defined to allow for the development of predictive models within healthcare data.

Results: While there has been growing research into integrating ML/AI with EHR data for improving gastrointestinal surgery outcomes, significant gaps remain. EHRs are still underutilized as a powerful resource. Our findings highlight seven critical steps for leveraging EHR data in ML model development (Table 1): (1) Defining the research question; (2) Data acquisition; (3) Data preparation; (4) Defining cohorts/labels; (5) Defining features (variables) of interest; (6) Model training, testing, and parameter tuning; and (7) Model validation and deployment.

Conclusion: Despite the clear advantages of using EHR data for predictive modelling, the current healthcare landscape has yet to fully embrace this resource for machine learning applications. By illustrating best practices for leveraging EHR data—from cohort identification to feature selection and model construction—this research emphasizes that EHRs are not just passive records but are an active, underexploited resource. Unlocking the full potential of EHRs can lead to a revolution in precision medicine, particularly in the domain of postoperative care, enabling the prediction, prevention, and early detection of complications.

Table 1 - Critical steps identified for leveraging EHR data in ML model development

Step	Description
Defining the Research Question	Clearly articulate the clinical or research question to guide data use and model development.
Data Acquisition	EHR data varies in quality, scope, cost, and usability (with a need for preprocessing). Ideally, EHR data that contains both structured and unstructured de-identified health data and allows you to address the research question must be obtained and utilized.
Data preparation	EHR data is often complex and may require significant transformation before use. When integrating data from multiple sources, harmonization is necessary. Addressing missing data and correcting errors are essential steps in preparing the dataset for analysis.
Defining cohorts/labels	This can be done using various methods, including using medical nomenclature only (ICD codes, CPT codes, etc.), employing a sequence of medical codes that account for clinical workflows, or utilizing text mining and natural language processing (NLP) methods to determine the patient's surgical procedure (cohort) and outcome (label).
Defining features (variables) of interest	Begin by identifying potential features from the literature. Use statistical tools like feature importance plots, partial dependence plots (PDP), and Friedman's H-statistic to evaluate the relationship between predictor variables and outcomes. Various feature selection methods can help prioritize the most relevant variables.
Model training, testing, and parameter tuning	The ML problem should be clearly defined to guide model selection. The model should be trained on a subset of data and then validated on an independent test set. Considerations such as model interpretability, fairness, overfitting, and real-world applicability are vital. Parameter tuning is necessary to optimize model performance.
Model validation and deployment	Once the model is fine-tuned, it must be validated through techniques such as data splitting, testing on external datasets, or prospective deployment. Model deployment in clinical settings requires thorough evaluation to ensure it functions effectively in real-world conditions.

P663

A Single-Institution Study of Esocheck/Esoguard in Detecting Barrett's Esophagus Among Patients Undergoing Hiatal Hernia Repair

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Introduction: Chronic GERD is associated with an increase in the risk of developing Barrett's esophagus (BE), which is the precursor for esophageal adenocarcinoma. The current gold standard in screening and diagnosing BE is endoscopic biopsy utilizing the Seattle protocol; however, it has shortcomings as general anesthesia is required, under-sampling routinely occurs, and prevalence of screening is low. EsoCheck is a non-endoscopic, swallowable balloon-based device used to capture esophageal DNA samples for methylation analysis through EsoGuard. The primary objective was to assess EsoGuard to screen for and detect BE compared with the current gold standard in patients undergoing hiatal hernia repair, a population with a high prevalence of chronic GERD.

Methods: We recruited patients undergoing hiatal hernia repair at Tampa General Hospital. Patients were ≥ 18 years of age with no history of esophageal malignancy or esophageal surgery. Patient data was collected from Epic and includes patient demographics, medical history, procedure details, and the results of specimen analysis. On presentation to the operating room and prior to hiatal hernia repair all study participants completed esophageal sampling using EsoCheck, followed by endoscopic biopsies using the Seattle protocol.
Results: Twenty-five patients were enrolled from August 2023-September 2024. Patients were mostly female (n = 18, 72.0%) and white (n = 21, 84.0%). Average BMI was 28.96. Average age at procedure was 58.20 years. All patients had a history of chronic GERD. Toupet fundoplication was the most common repair procedure performed (n = 23, 92.0%). BE was found in 6 (24.0%) patients with the Seattle protocol. EsoGuard showed sensitivity of 83.3% (95% CI 36.5–99.1) and specificity of 63.2% (95% CI 38.6–82.8) in detecting BE. Positive predictive value was 41.7% (95% CI 16.5–71.4) and negative predictive value was 92.3% (95% CI 62.1–99.6). Of the 7 patients with false positives on EsoGuard, pathology demonstrated mucosa with chronic inflammatory changes in 6 patients.
Conclusions: Our study shows the strong potential for EsoGuard as a non-invasive screening tool for BE, with excellent sensitivity and negative predictive value in a population undergoing hiatal hernia repair. While EsoGuard has value in ruling out BE, the lower specificity shows that positive results should be corroborated with the current gold standard of endoscopic biopsies following the Seattle protocol.

P664

A Simple and Safe Method for Laparoscopic Proximal Gastrectomy Using the Oblique Anastomosis Plus Single Flap Valvuloplasty (OSF) Technique

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Objective: Reflux esophagitis and anastomotic complications caused by esophagogastrostomy after proximal gastrectomy remains a surgical problem. The purpose of this study was to investigate the feasibility of oblique overlap anastomosis plus single flap valvuloplasty (OSF) for reconstruction after laparoscopic proximal gastrectomy.
Methods: The C-shaped seromuscular flap (2.5 × 3.5 cm), which was 2 cm from the top of the remnant gastric, was extracorporeally created on the anterior wall of the remnant stomach. The stomach was opened approximately 1cm above the lower edge of the mucosal flap.Four supporting stitches were sutured around the hole and the right wall of the esophageal stump was incised with a support suture to prevent the linear stapler from entering the submucosa. Liner stapler was inclined to the left side of the esophagus at an angle of about 30 degrees to the longitudinal axis of the esophagus for oblique anastomosis between the dorsal side of the esophagus and the anterior stomach and then esophagogastrostomy was performed with the length of anastomosis was 4 cm. Entry hole was suture with 3 stitches and then the linear stapler was used for closing the entry hole. Finally, the seromuscular flap was closed using barbed sutures.
Results: There were 7 males and 4 females. The average age was (69.9 ± 7.8) years, the BMI was (21.7 ± 7.2) kg/m^2 and the mean tumor size was 2.1 ± 0.6 cm. The median operative time was 275 (270–428) minutes, the time for OSF reconstruction was 112 (80–140) minutes, and the blood loss was 50 (20–400) ml. The pathological stage was 0–I in 7 cases (63.6%) and II–III in 4 cases (36.4%). The patients were fed on the 4th day (4–7 days) and discharged from hospital on the 7th day (6–9 days) after surgery. No patient had gastroesophageal reflux symptoms of grade B and above, and no patient took anti-reflux medicine.
Conclusions: The Oblique anastomosis plus Single Flap valvuloplasty (OSF) technique is a safe and feasible treatment for Siewert type II esophagogastric junction adenocarcinoma.

P666

Novel use of Temporary Mechanical Circulatory Support for Combined Bariatric Surgery & Cholecystectomy

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Case Report: A 54-year-old male with heart failure with reduced ejection fraction (HFrEF) secondary to ischemic cardiomyopathy (ICM) and a BMI of 43 required a decrease in BMI for heart transplant eligibility. When all weight loss efforts failed, he was recommended to undergo elective bariatric surgery and cholecystectomy. The patient was considered high risk due to ICM with severely reduced left ventricle dysfunction at ACC stage C and NHYA class III. The patient's preoperative hemodynamics failed to improve with Milrinone support, hypothesized to be due to worsening ischemia caused by existing CAD resulting in failure to meet the increased oxygen demand with inotropy. An Impella 5.5® (Danvers, Massachusetts, USA) device was placed via an axillary approach for hemodynamic support. Bariatric surgery was successful with Impella 5.5® in place, and the device was removed four days POD with subsequent hospital discharge eight days POD.
Facts of Case:

Proposed surgery	Laparoscopic sleeve gastrectomy
	Laparoscopic cholecystectomy
Surgical risk factors	Severely reduced LV dysfunction
	Ischemic cardiomyopathy with LVEF of 24%. LVEDD 7.2 cm
	ACC/AHA Stage C NYHA Class III
Baseline hemodynamics	RA: 3, PA: 70/27/44, PCWP: 22
	SVO2: 65%, FICK CO: 5.4 L/min
	CI: 2.06 L/min/m^2
Pre-	impella hemodynamics on inotropic support
RA: 21, PA: 48/36/41, PCWP: not remeasured	
SVO2: -, FICK CO: 4.5 L/min	
CI: 1.7 L/min/m^2	
Pre-surgical therapy	Impella 5.5®
	Swan-Ganz hemodynamic catheter
Complications	Hypertension requiring nicardipine infusion
	Hyperkalemia

Discussion: The elective use of temporary mechanical circulatory support devices (MCS) is a promising innovative approach for providing hemodynamic support for patients undergoing non-cardiac surgical procedures. The listed case serves as the first documented example of successful use of temporary MCS in elective, outpatient, combined laparoscopic sleeve gastrectomy and laparoscopic cholecystectomy.

P668

Percutaneous Transhepatic Cholangioscopy with Biliary Stent Placement Under Direct Visualization for Malignant Hilar Biliary Obstruction When ERCP Fails: A Cohort Study

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Background: Biliary drainage in advanced Malignant hilar obstruction (MHBO) remains a challenge. Endoscopic retrograde cholangiography (ERCP) and percutaneous transhepatic drainage (PTCD) are the main drainage strategies recommended by guidelines for the treatment of malignant hilar obstruction. However, 10% of cases fail due to nipple inaccessibility or inability to intubate, and the clinical success rate of biliary drainage varies widely in reported studies, from 42 to 81%. Percutaneous transhepatic cholangioscopy (PTCS) enabled the procedure to be performed within the biliary tree due to the ability to directly visualize the biliary system during interventions. As a novel alternative, we describe the feasibility of PTCS with biliary stent placement to facilitate internal biliary drainage under direct visualization for malignant biliary obstruction when ERCP fails in this study.
Methods: Patients with MHBO after ERCP failure who were treated with PTCS and placed with self-expanding metal stents at West China Hospital of Sichuan University from November 2023 to July 2024 were enrolled. All patients underwent the following surgical procedures: First, a fistula from extrahepatic to intrahepatic bile duct was established using one-step PTCS. The target bile duct was punctured with 18G-PTC needle under intraoperative ultrasound guidance, and the puncture path was immediately gradually expanded from 8-Fr to 18-Fr with a fascial dilator until the 18-Fr surgical sheath was placed into the target hepatic duct. Secondly, a choledochoscope was placed to explore the obstruction site, and intraoperative radiography was performed to evaluate the obstruction. Subsequently, 18G-PTC needle was used to puncture the obstructed bile duct under direct choledochoscope and intraoperative ultrasound guidance. The obstructed bile duct was then dilated with a balloon. Finally, a self-expanding metal stent was placed at the obstruction site through a fistula. After biliary stent placement, cholangiography was performed again to evaluate the effect of intrabiliary drainage through the established fistula.
Results: A total of 15 patients were included, Stenosis was Type II for 8, III for 5, and Type IV for 2 patients. Technical and clinical success was 100% and86.7%, respectively. Morbidity was 20% (3 patients), including 2 with bacterial infection of unspecified site managed conservatively and 1 with cholangitis. None of the patients died. Chemotherapy could be administered in 75% (9) patients in cases of clinical success.
Conclusion: PTCS with biliary stent placement under direct visualization may be a feasible alternative approach to achieve internal biliary drainage when ERCP is fails.

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Hysterectomy by Vaginal Natural Orifice Transluminal Endoscopic Surgery (vNOTES) vs Total Laparoscopic Hysterectomy for Benign Indications: Preliminary Data from a Retrospective Cohort Study

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Introduction: Hysterectomies performed laparoscopically have greatly increased within the last few decades and exceed the number of vaginal hysterectomies. In fact, the laparoscopic approach affords the benefit of less postoperative discomfort, shorter hospital stay, and quicker recovery. The emerging of NOTES (Natural orifice transluminal endoscopic surgery) for gynecologic surgeries began in 2012 when Ahn et al. first demonstrated its feasibility and safety. Subsequently, many authors have published their experiences with vNOTES in a series of gynecologic procedures.
Problem Statement: The aim of this study is to compare the vNOTES hysterectomy with the total laparoscopic hysterectomy (TLH) in terms of surgical complications, operative time, length of hospital stay, estimated blood loos and conversion rate.
Methods: Retrospective cohort study.
The women undergoing hysterectomy for benign diseases by vNOTES and TLH from January 2023 to August 2024 at BronxCare hospital were retrospectively analyzed.
Results: From January 2023 to August 2024, we analyzed 23 women underwent vNOTES and 25 women underwent TLH.
There were no statistically significant differences in age, BMI, smoking, parity, and preoperative hemoglobin level between the two groups. However, the patients in the TLH group had a significant number of previous abdominal surgery vs the patients in the vNOTES group (17 patients in the vNOTES vs 22 patients in TLH group, $p < 0.05$) (Table 1).

Moreover, no statistically significant differences were found in terms of postoperative complications, conversions rate, blood transfusion and hospital stay. However, from the preliminary analysis, the mean operative times was 191.3 ($\pm$ 39.2) in the vNOTES group and 248 ($\pm$ 62.3) in the laparoscopic hysterectomy group ($p < 0.05$). Nonetheless, the indications for surgery in the two groups were mainly different, as shows in Table 2. Also, even if the mean estimated blood loss (EBL) in the 2 groups were comparable (110 $\pm$ 71.5 in the vNOTES vs 194 $\pm$ 232.4 In the TLH group. $P = 0.010$), a statistically significant difference was found in the level of the HGB drop post-operative (1.2 $\pm$ 0.6 in the vNOTES group vs 1.7 $\pm$ 0.9 in the TLH group). (Table 2).
Conclusions: Our preliminary data showed that the early operative outcomes of vNOTES hysterectomy were comparable to those of the TLH group. Additionally, vNOTES had significantly lower values for operation time and change in hemoglobin on postoperative day 1. There were no significant differences in intra- and postoperative complications. Randomized controlled trials are needed to evaluate whether vaginally assisted NOTES hysterectomy is superior to the standard laparoscopic hysterectomy.

P671

Aiming for Zero Anastomotic Leaks: A Hyperspectral Laparoscope Enables Quantitative Intraoperative Visualisation of Bowel Oxygenation During Surgery

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Introduction: Anastomotic leakage (AL) is a common and devastating complication of bowel anastomoses, with great impact on morbidity, mortality, local cancer recurrence, and patient quality of life. While the causes are multifactorial, adequate blood supply is one key component to avoid AL. Intraoperative quantitative visualisation of oxygenation can influence surgical assessment and decision-making. Current methods rely on fluorescent dyes, generally without continuous or quantitative oxygenation assessment. A precise tool that does not rely on dyes for perfusion assessment is needed. Our goal was to demonstrate the efficacy of a label-free continuous, real-time visualisation and quantification of superficial tissue oxygenation (StO_2) in minimally invasive surgery (MIS).

Methods and Procedures: A compact hand-held hyperspectral imaging (HSI) system (HYPERSNAP^{TM} Surgical System, Hypervision Surgical Ltd.) was used in an in vivo porcine model ($n = 3$). The minimally invasive HSI system simultaneously provides conventional high resolution colour images and continuous quantitative widefield StO_2 maps in real time. To demonstrate accuracy, paired measurements of StO_2 were acquired using an FDA-cleared oxygenation probe and the HSI system. Agreement was assessed using Bland–Altman analysis. Ischaemic and borderline ischemic regions were created by temporarily occluding vessels supplying pre-identified bowel regions. To demonstrate repeatability, multiple measurements were made for the same tissue location (test–retest) and a predefined range of working distances.

Results: Quantitative measurements of StO_2 made with the HSI system corresponded to those made with the oxygenation probe. They accurately revealed changes consistent with healthy, transition and ischemic zones of the small and large bowel. Measurements were repeatable on test re-test ($SD \leq 1.5$, chi^2 test of variance $p < 0.001$) and at working distances 2–9 cm ($SD \leq 2.8$, chi^2 test $p < 0.03$). The HSI system revealed post-occlusive reactive hyperaemia (i.e., an increased StO_2 of previously hypo-perfused regions) when compared to the regions not previously subject to clamping ($StO2 = 86 \pm 3$ versus 72 ± 4, $p = 0.0003$). The HSI system also highlighted oxygenation changes due to tension-related compression of the vascular supply to the distal colon; these changes were easier to see than on the conventional colour image.

Conclusion: HSI has the potential to reduce anastomotic complications by providing label-free quantitative tissue oxygenation assessment in real time, highlighting changes during surgery. The study demonstrates successful preclinical in vivovalidation of the accuracy, precision, and efficacy, laying the foundation for first-in-human trials.

P673

A Novel Technique for a Rapunzel Syndrome

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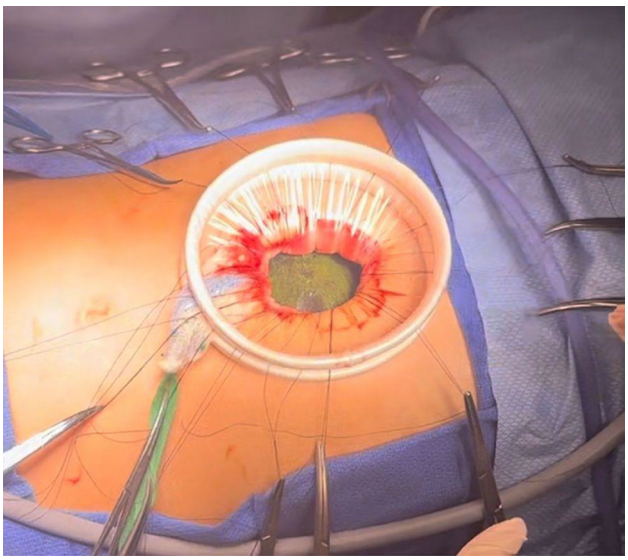
Rapunzel syndrome was first described in 1968 and is characterized by the prolongation of a gastric bezoar into the duodenum and/or jejunum. This can result in intestinal obstructions and perforations. The standard approach to removal is through a sizable midline laparotomy and gastrotomy with exposure of intragastric contents to the abdominal cavity. We herein describe the removal of a large bezoar through a mini laparotomy and gastrotomy using two Alexis Wound Retractors.

A 3 year old female was brought to the emergency department by her mother with a one month history of lethargy, nausea, vomiting, and five pound weight loss. Blood work was remarkable for a leukocytosis of 11.4 and anion gap of 16. A computed tomography scan of the abdomen and pelvis showed a distended stomach. The patient underwent a fluoroscopy study which showed a large gastric bezoar with delayed emptying of contrast from the stomach into the duodenum. The patient failed conservative management with nasogastric tube and bowel regimen. The decision was made to proceed with surgical intervention.

We used an upper midline mini laparotomy incision to gain access to the abdominal cavity through which we placed an Alexis Wound Retractor (Applied Medical, Rancho Santa Margarita, CA, USA). The stomach was identified and traction sutures were placed for better control. A temporary, secure gastrotomy was performed and a second Alexis Wound Retractor was placed within the lumen of the stomach. The bezoar was gently removed in continuity. There was significant extension into the small bowel. The gastrotomy was then closed using a linear stapler, followed by a layered closure of the fascia and skin.



A small mini laparotomy incision and two Alexis Wound Retractors were used to remove a large and extensive bezoar. The clinical course was favorable. This method is safe and effective for the removal of large gastric bezoars. No other special equipment is required. This method allows for a secure and direct intragastric access, providing an excellent exposure for the removal of any size bezoar.

P674

Cyber Route 66 Wet-Lab: Telerobotic Surgical Procedures Between CA and IL Brings the Future of Surgical Practice Closer to the Present

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Introduction: Telerobotics promises enormous advancements in the field of surgery by providing remote surgeon expertise to save more lives and eliminate the need to travel for both the patient and the surgeon. However, the speed of wireless transmission (optimal lag - time < 100ms), cybersecurity, technology affordability, and acceptance remain challenges to successfully implementing remote telerobotic surgery. We evaluated two novel telerobotic surgery-enabling platforms that may help overcome these barriers.

Methods and Procedures: The Sovato Platform (Connectivity System/Orchestration App) and Virtual Incision's MIRA (mini-single arm robotic surgical platform) were integrated to perform remote telesurgery between CA and IL (Fig. 1). The procedures included cholecystectomy, colectomy, gastric mobilization/gastrostomy/primary closure, and nephrectomy. Experienced robotic surgeons were seated at the console stationed in Santa Barbara, CA, and the MIRA robot was deployed in the animals in an OR, with two surgeons at the bedside in Chicago, IL. Network performance of latency time and bandwidth usage for all procedures and reliability of audio/visual communication were collected and analyzed. Questionnaires to evaluate surgeon perception of the telerobotic process were completed for each procedure.

Results: Four console surgeons with 2 bedside assistants successfully completed 20 separate procedures (5 each/surgeon; 4/pig) without loss of robot instrument control or audio/visual communication for a total of 32,000 (one way) tele-surgical miles in 2 days. Network performance had an exceptional average latency of 58 ms and peak latency of 65 ms with 0% packet loss over 2000 miles. The robot intraoperative view to the surgeon's console utilized 17.21 Mbps, from the surgeon's console movement control to the robot (0.2999 Mbps) and bi-directional audio and video (3.3 Mbps). Compared to conventional robotic surgery, the surgeons perceived no difference in 82% of the procedures, easier (6%), slightly easier (6%), and more difficult (6%) with no procedure significantly more difficult.

Conclusion: We report for the first time a lag time of less than 100ms during successful remote telerobotic operations with little to no surgeon-perceived difference between telesurgery and traditional robotic procedures within the U.S. Seamless wireless network integration of two cutting-edge surgical technologies, Sovato Platforms and Virtual Incision's MIRA is a significant step in bringing remote telesurgery closer to real-time surgical practice.

Fig. 1 Cyber Route 66 Remote Tele-Surgery Wetlab. Surgeons seated at the console in Santa Barbara, CA controlling the robot for consecutive abdominal procedures in a pig in Chicago, IL

P675

EnteroPlug: A Novel Journey to Complex Enteric Fistula Control in a Tertiary Ecuadorian hospital

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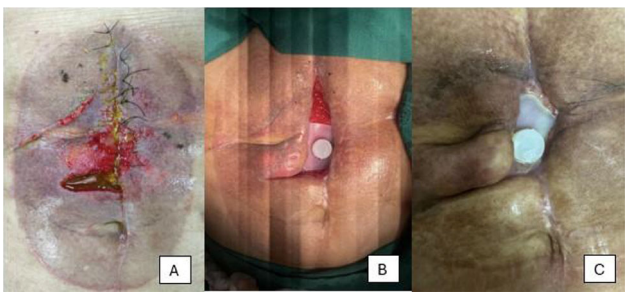
Introduction: For the management of enterocutaneous and enteroatmospheric fistulae, the application of a minimally invasive silicone device to occlude the fistula tract hasn't been proven over the years. The aim of this study: describe the short-term outcomes of adult patients with enteric fistulae (enterocutaneous and enteroatmospheric) treated with EnteroPlug, a three-piece silicone novel device, from November 2023-to-April 2024 at Alfredo Paulson's Hospital in Ecuador.

Methods and Procedures: Observational, prospective, and analytical study, included patients with complex enterocutaneous and enteroatmospheric fistulae. Data was obtained from electronic medical records and analyzed using SPSS 27.0. Schein's classification was used for fistulae. Management: surgical cleaning and the use of a silicone device to occlude the fistula tract. Main outcomes—fistula characteristics and output, hospital stay, type of nutrition, weight at 15, 30 and90 days, %of total weight gain, blood albumin and transferrin.

Results: Nine patients were included: 44.44% female, 55.56% male; age: 61.33 years (53–71 years), total hospital stay: 57.56 days (26–83 days), hospital stay after EnteroPlug: 8.56 days (7–11 days). Fistulae: all were type IV(A), with high output (922.22 ml in 24 h [600–1500 ml]); mean diameter: 3.06 cm (2–5 cm); 66.67% postoperative, 33.33% posttraumatic.

Before EnteroPlug, all patients received total parenteral nutrition; afterwards, all were fed enterally and fistula output ceased completely(B) (100%, $n = 9$); % of total weight gain: 15.14% (7.35–25.86%). After EnteroPlug, average significant increase of: albumin: 1.48 g/dL ($t = 23.88$; $p < 0.001$); weight: 3.67 kg at 15 days, 5.2 kg at 30 days, and 8.78 kg at 90 days ($t = 2.43$, $p = 0.041$; $t = 3.72$, $p = 0.006$; $t = 7.61$, $p < 0.001$; respectively); and BMI: 3.07kg/m^2 ($t = 7.62$; $p < 0.001$). Fistula diameter ($t = -5.48$; $p < 0.001$), and CRP level [by an average of 192.10 mg/dl ($t = 3.26$; $p = 0.011$)] were significantly reduced(C). Transferrin at 90 days: 86.67 µg/dL (170–227 µg/dL). Patients with diabetes ($t = 2.98$; $p = 0.020$) and chronic kidney disease ($t = 2.153$; $p = 0.068$) gained significantly less weight.



All patients achieved partial closure and were discharged without complications.

Conclusion(s): EnteroPlug is a novel silicone three-piece, easy-to-place, minimally-invasive device, allowing weight gain, restart of enteral feeding, and BMI and albumin increase in patients with enteric fistulae, thus, improving patient's clinical condition and enabling temporary closure of the fistula, to later opt for secondary intention healing or surgical resection.

P676

Magnetic Compression Anastomoses; An Emerging Technology for Gastrointestinal Surgery

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Introduction: Magnetic compression anastomoses (MCA) are a developing approach to gastrointestinal anastomoses creation. The technology employs use of intraluminal magnets that once in place, impose force within the lumen leading to development of a fistula over the course of days to weeks. Early studies suggest that MCA has comparable outcomes to traditional techniques such as surgical sutures and staples. With this emerging option for surgical approaches, there must be further investigation regarding the appropriate situations where MCA will be most efficacious.
Methods: A comprehensive literature review was performed in PubMed for articles published in English pertaining to MCA use in human patients. 47 articles resulted and were reduced to 44 with 3 articles removed due to irrelevance.
Results: Recent literature regarding MCA's utilization has some concentration within the bariatric subspecialty, but also extends into the colorectal world regarding stenotic disease. There is also literature regarding small bowel, gastric outlet and biliopancreatic obstructions, as well as diverting ostomy reversal and esophageal atresia in pediatric surgery. The techniques most commonly employed are endoscopic, laparoscopic, or radiologic placement via dual magnet ring systems. Most bariatric anastomoses are created via a side to side technique, while stricturing disease therapies use an end to end technique. Overall, there are few reported complications in the case studies reviewed, with stenosis and restenosis being among those most frequently discussed. Anastomotic leaks and perforations have been rare. Efficacy is also highlighted in the articles reviewed. Efficacy has been measured in a multitude of ways including procedure length of time, recovery length of time, anastomosis patency, stricture recurrence, diet tolerance, weight loss, or improvement of metabolic conditions. Statistical power has been a consistent limiting factor thus far. Expert opinion has discussed utility for patients with general anesthesia intolerance, recurrent disease processes, or those with hostile surgical abdomens.
Conclusion: MCAs are an emerging technology in the world of gastrointestinal surgery. It seems unlikely for them to fully replace stapling or hand sewn techniques, however they will likely continue to be more commonly utilized and tested in a multitude of areas within the gastrointestinal surgical world with their niche becoming more apparent as studies continue and gain statistical power.

P677

Outpatient Treatment of Portal Vein Thrombosis

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INTRODUCTION: Portal vein thrombosis is an infrequent, but potentially lethal complication of sleeve gastrectomy. Venous thromboembolism (VTE) may be the most common cause of postoperative mortality following bariatric surgery. Portal vein thrombosis (PVT) was seen in seven patients following sleeve gastrectomy. Commonly, patients with PVT are admitted to the hospital and given intravenous anti-thrombotic therapy and gradually converted to oral agents for discharge.
Methods and Procedures: PVT must be recognized early to limit potentially lethal gastrointestinal complications due to thrombosis of mesenteric vessels. The diagnosis can be clinically difficult due to often vague symptoms and a heightened awareness on the part of the surgeon is imperative. CT scan is the diagnostic tool of choice and once confirmed anti-thrombotic therapy is begun in the stable patient.
Results: From a single surgeon 4127 sleeve gastrectomies done during the last 14 years we found 7 cases of PVT and the last 2 cases were successfully treated entirely as outpatients with oral anti-thrombotic therapy. Interestingly, all 7 of our cases were African American females and all with body mass indexes in the 40s with an average of 43.7. Ages ranged from 30 to 54 with an average age of 39. The last two in our experience were treated entirely as outpatients with oral anticoagulant therapy.
Conclusion: The incidence of portal vein thrombosis after sleeve gastrectomy is most likely secondary to the disruption of native blood flow including ligation of the short gastric vessels. Care must be taken to preserve collateral flow such as that through the epiploic vessels. PVT must be recognized early to be treated successfully. Traditionally, patients with this dreaded diagnosis are hospitalized and anticoagulated prior to discharge. Fast acting oral anticoagulant agents that do not require monitored blood levels can be used to therapeutically treat stable patients without hospitalization. These case reports may shed light on a treatment option for portal vein thrombosis in a stable patient.

P678

Esophageal Stents: How High Can You Go? A Traumatic Injury Treated with High Esophageal Stent Placement

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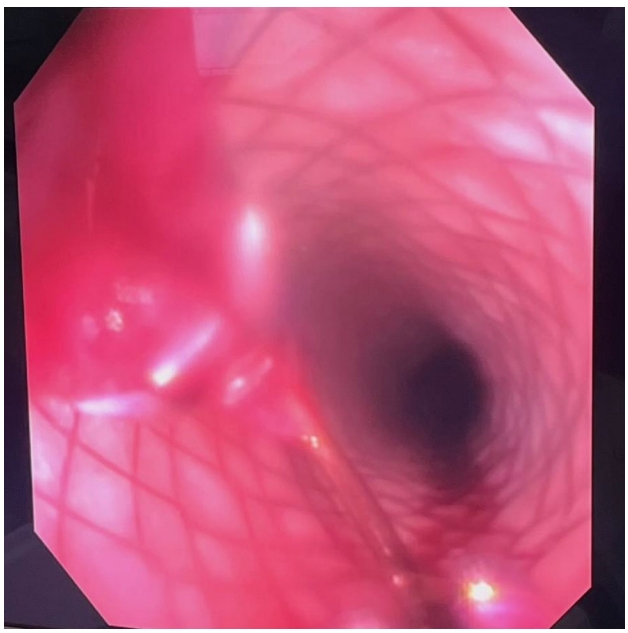
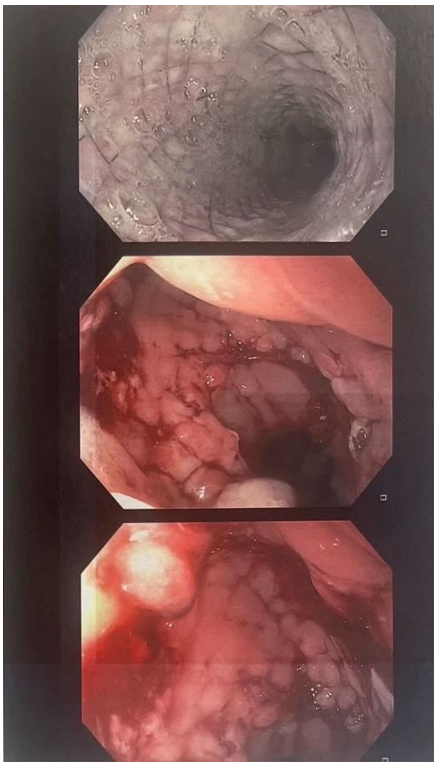
Esophageal injuries secondary to trauma are exceedingly rare and associated with high morbidity and mortality. Due to the paucity of cases that are treated, there has been slow evolution of treatment for these patients and some variability in both implementation and outcomes. Treatment guidelines vary additionally on anatomic location of the injury and size of injury, and can be approached in non-operative, minimally invasive, or surgically managed approaches. For cervical esophageal injuries, patients are taken to the operative room for definitive management if unstable or undergo endoscopy evaluation if stable and suspicion is low. In the past several years, there has been increased interest in endoscopic stent placement as a treatment in select trauma patients. Esophageal exclusion with stents has been a successful treatment for esophageal perforation for other causes, such as iatrogenic or spontaneous (i.e. Boerhaave syndrome) but has not been routinely implemented in a major way in the trauma literature.

In this case report, a 20-year-old male presented with a devastating gunshot wound to the neck, resulting in injuries to his trachea and esophagus. The patient was initially treated with operative management by the trauma team and was assisted by otolaryngology for prevertebral flap placement and drainage. Due to the extent of the esophageal injury, full coverage was not obtained, and the patient was additionally unsuccessfully treated with vacuum tipped nasogastric tube therapy. The patient developed mediastinitis and progressively became worse. On hospital day 8, a multidisciplinary team of general surgery and gastroenterology performed an upper endoscopy noting a 2 cm diameter full thickness defect in the esophagus at the 12:00 and 6:00 positions, 3–4 cm from the cricopharyngeal bar and an enteral stent was placed with full coverage and secured into placed with Endostich prolene sutures. After treated minimally invasively for mediastinitis and abscesses, the patient had the stent removed on hospital day 40 noting appropriately healed mucosa circumferentially. The patient was started on a diet after no apparent leakage on imaging.

Optimal treatment of traumatic esophageal injuries depends on location and nature of the underlying pathology. In appropriate circumstances, endoscopy can be used not only for diagnostic purposes as it is widely used now but also therapeutically as well. As the expansion of endoscopic modalities increases and proficiency in the field broadens, further research will be needed to determine esophageal stent placement's role in the trauma algorithm.





P679

Managing Anastomotic Leaks: A Promising and Novel Technique

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Introduction: Intestinal perforations and anastomotic leaks present significant challenges during surgery, often necessitating bowel resection with associated morbidity and prolonged recovery. The use of biologic patches represents a promising alternative for managing select cases of intestinal perforations, offering a novel solution for achieving primary closure and promoting healing.

Case: We present a 73-year-old male with a complex surgical history including short bowel syndrome and several high output enterocutaneous fistulae secondary to multiple exploratory laparotomies and bowel resections. He was managed with TPN and output reducing medications, including teduglutide. While he responded well to conservative measures, however his fistulae never fully closed, and he remained unable to tolerate significant oral intake. Seven months later he was taken for elective exploratory laparotomy for planned take-down of enterocutaneous fistulae. The abdomen was found to be frozen, necessitating extensive adhesiolysis. Two small bowel resections were performed with primary stapled anastomoses, and the common enterotomy was closed in two layers.

Unfortunately, on postoperative day 1, the patient's drain became bilious, and a CT scan with oral contrast revealed a leak with extensive extravasation. He was immediately taken back to the operating room for repeat laparotomy, where an 8mm defect was found at the proximal jejunal anastomotic staple line. Due to the proximal location of the breakdown, the patient's limited bowel length and the extensive adhesions, the decision was made to close the defect with a slowly absorbable 4-0 barbed suture and reinforce it with a bovine pericardial patch, which was secured to the serosa with 4-0 PDS suture. An NGT methylene blue leak test was negative. Postoperatively, the patient recovered well. His diet was gradually advanced and his chronic wounds healed.

Discussion: In this case, the application of a biologic patch proved successful in achieving durable closure of a small bowel anastomotic leak, avoiding the need for further bowel resection or potential ostomy creation in a patient with foreshortened bowel and a frozen abdomen. The current literature on the use of biomaterials for anastomotic leak is extremely limited, with the majority focusing on animal models. The few studies that have been done in humans have reported positive results with fibrin sealants, collagen patches (including bovine pericardium) and omentoplasty, however nearly all of these are studied in the context of preventing anastomotic leaks and not treating them. Further studies are warranted to evaluate the long-term outcomes and cost-effectiveness of this innovative approach in intestinal perforation repair.

P680

Breaking the Circuit: Active Electrode Monitoring as a Shield Against Stray Energy Transfer

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Introduction: Laparoscopic surgery commonly uses monopolar radiofrequency energy for precise hemostasis. Stray energy can be transferred via antenna and capacitive coupling to nearby instruments or the patient, causing delayed and undetected injury. Active Electrode Monitoring (AEM) is an emerging technology designed to reduce this risk by shielding laparoscopic instruments. The purpose of our study was to compare the occurrence and severity of stray energy transfer with and without AEM.

Methods: A benchtop model was constructed utilizing porcine intestine, a laparoscopic L-hook, Maryland grasper, and an electrosurgical generator (FT-10, Covidien, Boulder, CO). Energy settings were 30 Watts spray coagulation mode. The instrument tips were held by a single surgeon and placed 4 cm apart. A 4-s open-air activation was performed with the energized L-hook, excluding tissue and the other instrument. All energy delivered to the tissue occurred through capacitive coupling via the Maryland grasper whose tip contacted the tissue. The current delivered and returned were measured with an oscilloscope with monitors placed on the active cable between the generator and the L-hook, and the return cable between the electrosurgical generator and the return pad. The difference between the delivered and returned current was compared between a shielded L-hook (Device Name, Encision, Boulder CO) and an unshielded L-hook. Statistical significance was set at $p < 0.05$.

Results: The unshielded L-hook showed a near-complete return of current in all trials, with an average active cable current of 0.30 ± 0.0070 mA and an average return current of 0.35 ± 0.046 mA. The average current drop-off was -0.044 ± 0.059 mA, with a range from -0.18 to 0.10 mA. The shielded L-Hook exhibited a greater reduction in current, 0.56 ± 0.035 mA (range 0.48–0.61 mA), with an average active cable current of 0.73 ± 0.0070 mA and an average return current of 0.18 ± 0.036 mA. The current drop-off was significantly greater than the unshielded L-Hook 0.56 vs -0.044, $p < 0.001$.

Conclusion: This benchtop study shows that the shielded L-hook significantly reduces stray energy transfer by capacitive and antenna coupling. An average current drop-off of 76% was achieved with AEM technology while the unshielded instrument demonstrated a slight increase in current to the return electrode on average ($-$ 18%). These findings suggest that incorporating shielded instruments like AEM mitigates the risk of stray energy injuries and enhances patient safety, underscoring its clinical value in improving surgical outcomes.

P682

Pancreatitis Panniculitis and Polyarthritis Syndrome: A Rare Misdiagnosed Case of Septic Arthritis Successfully Managed with Corticosteroids

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Background: Pancreatitis Panniculitis and Polyarthritis (PPP) syndrome is a rare triad of pancreatitis, subcutaneous fat necrosis (panniculitis), and polyarthritis, caused by the extravasation of pancreatic enzymes into the bloodstream. This can result in fat necrosis within various tissues, including bone and joints, leading to painful, swollen joints and skin lesions. Given its rarity, PPP syndrome is often misdiagnosed, and there is no established management protocol. We present a case of PPP syndrome that was initially misdiagnosed and treated as septic arthritis, highlighting the importance of recognizing this uncommon entity.

Case Presentation: A 35-year-old Indian male presented to the emergency department with diffuse joint pain, redness, and swelling for more than 20 days. His medical history was significant for chronic pancreatitis, anaemia, pleural effusion, portal vein thrombosis, tuberculosis, and alcohol consumption. He had no recent trauma, travel history, or contact with infectious diseases, including COVID-19. The patient was febrile, tachycardic, and normotensive, with diffuse swelling and tenderness in multiple joints, including the

knees, ankles, elbows, and wrists. Laboratory findings showed leukocytosis, elevated inflammatory markers, and elevated amylase levels.

Initial diagnostic imaging, including X-rays, showed no joint abnormalities, and arthrocentesis yielded purulent fluid that tested negative for microorganisms but revealed lipid crystals. This ruled out septic arthritis and raised suspicion for a pancreatic origin. A CT scan of the abdomen confirmed the diagnosis of chronic pancreatitis, with multiple calcifications in the pancreas and portal vein thrombosis. A joint biopsy was performed, and histopathology revealed extensive fat necrosis and the characteristic "ghost cells" of PPP syndrome.

The patient was started on a course of prednisolone, which led to significant clinical improvement, and he was discharged after 29 days of hospitalisation. He was placed on a tapering regimen of steroids over six weeks.

Conclusion: PPP syndrome is a rare but important differential diagnosis in patients with recurrent joint effusion, especially in the setting of chronic pancreatitis. Timely recognition and appropriate management can prevent unnecessary surgeries and reduce morbidity. Though there is no established treatment protocol, corticosteroids may offer a promising treatment option for managing extra-pancreatic manifestations. Further research is needed to establish guidelines for the diagnosis and management of PPP syndrome.

P684

Laparoscopic External Pancreatic Stenting Following External Pancreaticoduodenectomy: Early Experiences and Outcomes

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Background: Post-operative pancreatic fistula (POPF) is one of the most important post-operative complications following pancreaticoduodenectomy. External pancreatic stenting is one of the strategies that has been used to reduce this risk in the open setting. External pancreatic stenting has not yet been described laparoscopically.

Methods: Between 2020 and 2023, patients who underwent laparoscopic pancreaticoduodenectomy with placement of an external pancreatic stent for any indication were retrospectively analyzed.

Results: We present a case series of 34 patients who underwent laparoscopic external pancreatic stenting at our institution. 25/34 patients had functioning pancreatic stents, 6/34 had non-functioning stents, and 3/34 had unknown stent output. The average stent output over the first 3 postoperative days was 149 cc/day. 5 clinically relevant POPF were observed in the 25 patients with functioning stents (20%), whereas 3 clinically relevant POPF were observed in the 6 with nonfunctioning stents (50%). Patients with functioning pancreatic stents had a lowered observed POPF rate when compared to expected (20% observed vs 37% expected) using the updated alterative fistula risk score whereas patients with non-functioning stents had a higher observed than expected POPF rate (50% observed vs 40% expected). Patients with functioning stents had fewer severe in-hospital complications (Clavien Dindo IV or V) related to POPF (1 vs 2), and shorter median length of stay (8 days vs 18.5 days).

Conclusion: Laparoscopic external pancreatic stent placement is feasible and, in this series, appears to be associated with better post-operative outcomes.

P685

Open vs Laparoscopic vs Robotic Pancreaticoduodenectomy: Systematic Review of the Literature and Network Meta-Analysis of Randomized Controlled Trials

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Introduction: Various publications have compared outcomes between open, laparoscopic and robotic pancreaticoduodenectomies (OPD, LPD, RPD), although the number of randomized controlled trials (RCTs) is limited. Our aim was to perform a network meta-analysis of RCTs comparing the outcomes of OPD, LPD and RPD.

Methods: We performed a systematic literature search of PubMed/MedLine, Cochrane Library, ClinicalTrials.gov and Google Scholar, to identify RCTs. The systematic review was conducted using the reporting items for systematic reviews and network meta-analyses guidelines (PRISMA-NMA). For statistical analysis R software (version 4.3.2) was used, employing the gemtc and netmeta-packages for Bayesian and frequentist models, respectively. Results were synthesized as odds ratios (OR) or mean differences (MD) with 95% credible intervals (CI), and heterogeneity was evaluated using the I^2 statistic. Risk of bias was assessed using the National Institutes of Health (NIH) Quality Assessment Tool for controlled intervention studies.

Results: Seven RCTs including a total of 1247 patients with mean age 62.6 years were included for analysis. Age, BMI, and disease stage were similar for all groups.

OPD was associated with a small but statistically significant higher 90-day mortality than LPD, with a 0.32% increase (95% CI: [0.20–0.45%], $p < 0.05$).

Post-pancreatectomy hemorrhage was less frequent after ODP and RDP compared to LDP (ODP vs LDP − 0.66%; RDP vs LDP − 1.42%; $p < 0.05$). Operating time was significantly longer for LPD and RPD compared to OPD (LPD vs OPD + 72.6 min; $p = 0.0018$, RPD vs OPD + 67.1 min; $p = 0.1238$). No significant differences in length of hospital stay (MD = 1.94 days in favor of LPD) and in the incidence of complications of Clavien-Dindo grade 3 or higher were found (OPD vs LPD; OD = 0.7982 (95% CI: 0.5667–1.1243, $p = 0.1972$), RPD vs LPD; OD = 0.5473 (95% CI: 0.2512–1.1926, $p = 0.1293$), OPD vs RPD; OR of 1.1653 (95% CI: 0.8392–1.6181, $p = 0.3609$).

Conclusions: Our network meta-analysis of RCTs suggests that OPD was associated with higher mortality compared to LPD and RPD. LPD and RPD were associated with longer operative times, no significant difference in complications and failed to exhibit statistically significant reduction in hospital stay, while LPD demonstrated higher rates of PPH. The heterogeneity across studies highlights the need for further well-designed, multicenter RCTs, especially comparing LPD to RPD, to better elucidate the relative benefits and risks of these surgical approaches in pancreaticoduodenectomy.

P686

Comparative Safety of En Bloc vs. Separate Resection of Splenic Vessels in Laparoscopic Distal Pancreatectomy

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Background: Two primary techniques exist for performing laparoscopic distal pancreatectomy (LDP): en bloc resection and separate resection. While the separate technique remains the most widely adopted, there has been a notable shift towards the en bloc approach in recent years. This study aims to evaluate the efficacy and safety of en bloc resection by comparing both techniques.
Methods: A retrospective analysis of patients who underwent LDP between January 2008 and December 2023 was performed. Patients were grouped into those who had en bloc resection versus separate ligation of splenic vessels and pancreatic tissue. Surgical outcomes and post-operative results were compared using the Mann–Whitney *U* test for continuous variables and Fisher's exact test for categorical variables.
Results: A total of 436 patients were analyzed after excluding 24 spleen-sparing cases. The "En bloc resection" group ($n = 262$) was compared to the "separate vessel resection" group ($n = 174$), which included subtotal ($n = 142$) and distal pancreatectomies ($n = 32$). En bloc resection had a shorter median operative time (112 vs. 207 min, $P < 0.001$), less blood loss (50 vs. 100 mL, $P < 0.001$), and lower transfusion rates (3.1% vs. 9.0%, $P = 0.008$). Postoperatively, the en bloc group had shorter hospital stay (3 vs. 4 days, $P < 0.001$) and lower major morbidity (7.25% vs. 16.37%, $P < 0.001$).
Conclusion: While not always feasible, concurrent division of the splenic blood vessels and pancreatic tissue during LDP is a safe approach and should be preferred when possible.

Table 1 Comparison of en bloc and separate resection methods

Variable	En bloc resection	Separate resection	*P*-value
N (Total)	262	171	
Male (%)	27.86 (73)	74.85 (128)	0.237
Age (years)	64.55 (54.4–72.9)	67.4 (59.45–74.05)	0.0289
BMI (kg/m^2)	28.3 (24.8–32.6)	25.9 (22.95–29.8)	< 0.001
OP time (min)	112.0 (85.0–150.0)	207.0 (157.0–267.0)	< 0.001
EBL (mL)	50.0 (25.0–100.0)	100.0 (50.0–200.0)	< 0.001
Hospital stay (days)	3.0 (2.0–4.0)	4.0 (3.0–5.0)	< 0.001
PPH (%)	2.67 (7)	4.09 (7)	0.598
POPF (%)	8.40 (22)	12.28 (21)	0.193
Major morbidity (%)	7.25 (19)	16.37 (28)	< 0.001

P687

A Case of Intraductal Tubulopapillary Neoplasm: A Five-Year Journey from Initial Presentation to Surgical Intervention

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Introduction: Intraductal tubulopapillary neoplasm (ITPN) is a rare, non-mucinous pancreatic tumor, comprising less than 1% of exocrine pancreatic neoplasms. ITPN poses diagnostic challenges due to its rarity and overlapping features with other pancreatic tumors such as intraductal papillary mucinous neoplasm (IPMN) and pancreatic ductal adenocarcinoma (PDAC). The natural history of ITPN is not well-defined due to limited case reports. This case report describes the prolonged natural history of a patient with ITPN who initially presented in 2018 and ultimately underwent surgical resection in 2023, highlighting the slow progression of the disease over five years.
Methods and Resources: A 53-year-old female initially presented in 2018 with symptoms of nausea, vomiting, epigastric pain, and weight loss. Triple-phase CT revealed an enhancing mass in the pancreatic head, measuring 8.5 × 4.7 × 4.8 cm, with associated ductal dilation. Endoscopic ultrasound (EUS) with fine needle aspiration (FNA) was inconclusive, showing inflammatory debris but no malignancy. The patient's symptoms improved with conservative management, and she deferred further treatment.
In 2023, the patient re-presented with similar but more severe symptoms, including significant weight loss and diabetic ketoacidosis. Imaging revealed substantial enlargement of the pancreatic mass, now measuring 15 cm, along with retroperitoneal and peripancreatic lymphadenopathy and gastric outlet obstruction. The multidisciplinary team recommended a pylorus-preserving pancreaticoduodenectomy, given the worsening clinical picture and potential malignancy.
Results: The patient underwent successful pylorus-preserving pancreaticoduodenectomy in 2023. Histopathology revealed a well-circumscribed 14.1 cm intraductal tubulopapillary neoplasm confined to the pancreas, without evidence of invasive carcinoma or distant metastasis. Thirteen lymph nodes were sampled, all demonstrating nonnecrotizing granulomatous inflammation without malignancy. Immunohistochemical staining was positive for CK7, Cam 5.2, focal CD10, alpha-1 antitrypsin, and MUC1, with a Ki-67 proliferative index of 29.2%. The patient's postoperative recovery was uncomplicated, and one year after surgery, she remains disease-free.
Conclusion: This case illustrates the long natural history of ITPN, with slow progression over five years from initial presentation to surgical intervention. The prolonged course of this disease emphasizes the need for clinicians to consider ITPN in patients with indolent pancreatic masses. Despite initial uncertainty regarding malignancy, the patient's favorable outcome following complete surgical resection underscores the importance of timely intervention. Further studies are needed to better characterize the natural history of ITPN and to refine diagnostic techniques that allow for earlier and more accurate identification of this rare neoplasm.

P688

Age and Surgical Outcomes in Robotic Distal Pancreatectomy: Does Age Really Matter?

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Background: Robotic distal pancreatectomy(DP) is emerging as the technique of choice in minimally invasive DP. However, the impact of age on postoperative outcomes remains insufficiently defined. We aim to evaluate the postoperative outcomes of Robotic DP in the different age groups.
Methods: All patients who underwent primary robotic DP at our institution between 2008 and 2023 were identified, and their medical records were reviewed. Patients were divided into groups based on age by decades of life: 39 years or less, 40–49, 50–59, 60–69, 70–79, and 80 and above. Comorbidities in all age groups were identified and postoperative complications were compared between age groups.
Results: A total of 227 patients were identified, 129(56%) were female. There were 31(4.9%) patients age less than 39 years, 26(4.1%) between 40–49, 43(6.8%) between 50–59, 59(9.3%) between 60–69, 54(8.5%) between 70–79, and 14(2.2%) 80 and above. Mean age was 59 years of age. Overall, patients aged 80 and older had a higher prevalence of cardiac comorbidities (CHF 28% vs.5%, $p < 0.001$; Cardiac Valve Disease 42% vs.2.3%, $p < 0.001$). In Contrast, patients aged < 39 years had a higher prevalence of drug abuse (16% Vs.2%, $p < 0.001$) and history of pancreatitis (45% vs. 14%, $p < 0.001$). Patients aged 80 years and older had a higher rate of postoperative pulmonary embolism (7% vs. 0.9%, $p = 0.49$) and chest pain without myocardial infarction (7% vs. 0.4%, $p = 0.01$) as compared to other age groups. Additionally, patients aged 70–79 had higher rates of postoperative fever (2% vs. 1%, $p = 0.04$) and pancreatic fistula (14% vs. 6%, $p = 0.05$). Interestingly, patients in their 50s had longer operative time(OT) (mean 275 min vs. 246 min, $p = 0.015$) and the highest rate of pancreatic leak (34% vs. 19%, $p = 0.024$) although no significant increase in estimated blood loss (EBL) (mean 276.74 vs. 368.86, $p = 0.13$), length of stay (LOS) (5.35 d vs. 5.64 d, $p = 0.15$), reoperation(2% vs. 2%, $p = 0.75$) or 90-day readmission rate (44% vs 32%, $p = 1.51$) was observed as a result, when compared to the other age groups.
Conclusion: Despite age and higher prevalence of preoperative comorbidities, patients aged 70 and above have overall similar short-term outcomes with no statistically significant increase in OT, EBL, reoperation, LOS, 90-day readmission, or 30-day mortality suggesting age alone should not be a reason to forego robotic DP in otherwise acceptable risk patients. Further studies are required to understand the rationale behind it better.

P689

Health Care Engagement and Age of Diagnosis of Pancreatic Ductal Adenocarcinoma

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Introduction: Pancreatic ductal adenocarcinoma (PDAC) generally affects older adults, with a median age of onset of 70 years. While medical factors have been linked to earlier-onset PDAC, including alcohol use, tobacco use, and family history of pancreatic cancer, little is known about social and demographic factors that may also influence age of diagnosis (AOD). In this study, we sought to investigate the effect of healthcare engagement on AOD, using having a primary care physician (PCP) as a proxy. We hypothesize that lower engagement is associated with earlier PDAC AOD.
Methods and Procedures: We conducted a retrospective review of patients diagnosed with PDAC between 2000 and 2022 at our public safety-net hospital, collecting data from the electronic medical record regarding their cancer and social demographics (sex, race/ethnicity, insurance). We recorded each patient's AOD and divided patients into subgroups based on PCP status at the time of cancer diagnosis. Bivariate analyses were conducted using Wilcoxon rank-sum or Kruskal–Wallis to compare median AOD by social demographics and PCP status. A linear regression examined the relationship between AOD and PCP status, controlling for sex, race/ethnicity, and insurance.
Results: 410 patients were included in the study (median age 66; 48% male; 36% Black and 52% non-Hispanic white). 8% of patients were uninsured, 24% private, 26% Medicaid, and 41% Medicare. Males were significantly younger at diagnosis than females (median 63 vs. 67 years; $p = 0.003$). Medicare patients' AOD (73 years) was significantly older than those with private (60 years), Medicaid (59 years), or no insurance (59 years; $p < 0.001$). No significant differences in AOD were observed by race/ethnicity. Patients with a PCP (median 66 years [IQR 59–73.5]) were significantly older at diagnosis than their counterparts without a PCP (62.5 years [54–69]; $p = 0.001$). Patients without a PCP were on average 2.95 (95% CI – 5.09 to – 0.81) years younger at time of PDAC diagnosis than those with a PCP, even controlling for differences in sex, race/ethnicity, and insurance ($p = 0.007$).
Conclusions: Patients without PCPs are diagnosed with PDAC at younger ages than their counterparts with PCPs, even when accounting for other demographic differences. The presence or absence of a PCP at the time of diagnosis may serve as a proxy for overall healthcare access and engagement, suggesting that patients without stable access to care may present with PDAC earlier. These findings present an opportunity for further exploration and study regarding the social factors influencing the onset of PDAC.

P692

A Rare Case of Littoral Cell Angioma of a Splenule Within the Pancreatic Tail

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Littoral cell Angioma (LCA) is a rare, potentially malignant tumor which originates from the red pulp sinuses of the spleen. While typically benign, the rate of malignant transformation is unclear, and malignancy cannot be determined until final pathology. Because it arises from the vasculature of splenic tissue, LCA has the potential to affect accessory spleens (splenules), which may exist in multiple locations within the abdomen, most commonly the splenic hilum. Few cases in the literature have reported LCA of splenules, and mainly describe splenules within the hilum. We present a unique case of a patient with LCA affecting both the spleen and an intrapancreatic splenule within the pancreatic tail. In this case the patient was found to have numerous non-specific splenic masses noted incidentally on computed tomography (CT) of the chest during a work-up for dyspnea.. Magnetic resonance imaging (MRI) revealed numerous splenic lesions as well as a lesion of the pancreatic tail concerning for LCA,

which was confirmed via percutaneous splenic biopsy and a EUS guided biopsy of the pancreas (Figs. 1, 2). As no guidelines exist for management of LCA, the options of surveillance and surgical resection were presented, and the patient elected to proceed with resection via laparoscopic distal pancreatectomy and splenectomy. The patient tolerated the procedure well and was discharged on post-operative day two. Final pathology confirmed the diagnosis and ruled out malignant transformation. The patient has no evidence of persistent or recurrent disease on surveillance imaging 2 years post-operatively and has had no post-operative complications. There have only been four reported cases of LCA in an accessory spleen, and there are no official guidelines for treatment or surveillance of LCA. The options of surveillance and resection should be discussed thoroughly with patients presenting with LCA to help guide a patient-centered management approach. This case describes the effective, minimally-invasive management of LCA which should be considered as a treatment option when presented with this rare diagnosis.

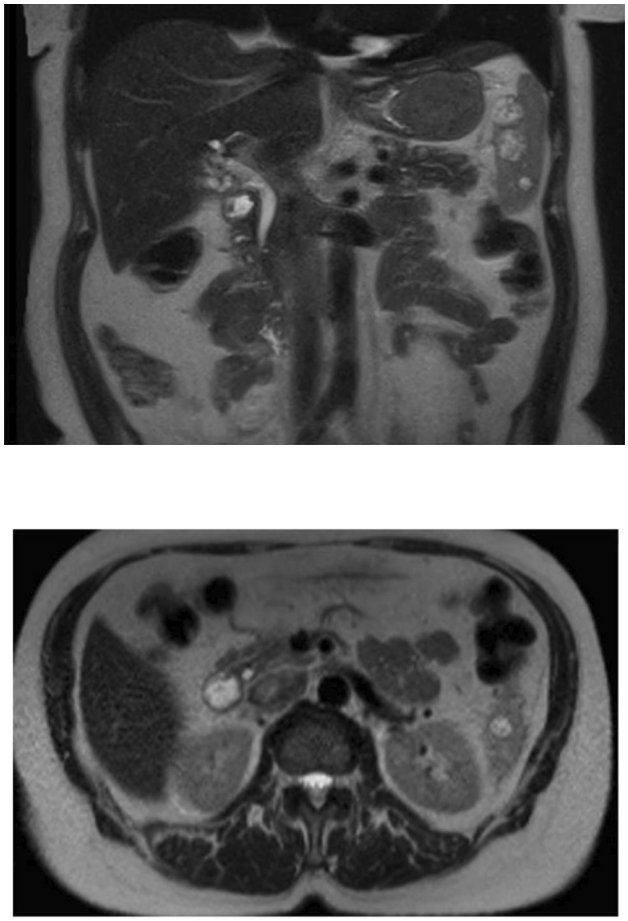

Figure 2. Magnetic resonance imaging (MRI) showing T2 hyperintense/T1 hypointense heterogeneously/progressively enhancing lesion centered in the inferior aspect of the pancreatic tail measuring approximately 1.7x1.2x1.0cm.

P693

Effect of BMI on Operative Time in Patients Undergoing Distal Pancreatectomy With or Without Splenectomy

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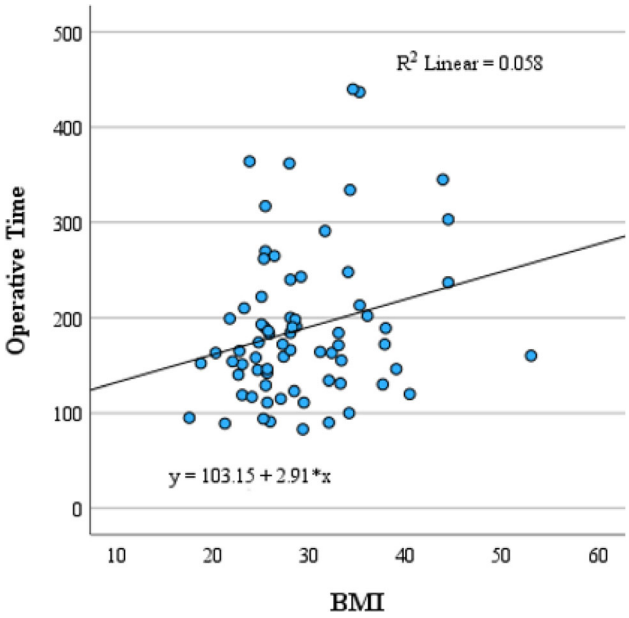
Introduction: The impact of preoperative body mass index (BMI) on surgical outcomes is well-documented across various abdominal surgeries. However, its effect on operative time in distal pancreatectomy (DP) with or without splenectomy remains understudied. This study hypothesizes that increased BMI is associated with prolonged operative time in patients undergoing DP with or without splenectomy, regardless of surgical approach.

Methods and Procedures: We conducted a single-institution, two-surgeon, retrospective review of 72 patients who underwent DP, with or without splenectomy, at Advent Health Orlando between October 2019 and April 2024. Inclusion criteria encompassed all patients undergoing DP for any indication within the specified time frame. Surgical approaches included laparoscopic, laparoscopic hand-assisted, laparoscopic converted to open, robotic, robotic planned conversion to open, robotic unplanned conversion to open, and open techniques. Data collected included preoperative variables (age, sex, ethnicity, prior abdominal surgery, ASA class, and BMI) and intraoperative parameters (operative time, splenectomy status, intraoperative blood loss, tumor size, tumor location, and rate of conversion to open, post-op ICU admission). The primary outcome measure was the correlation between BMI and operative time, assessed using Pearson correlation coefficient linear regression. A p-value of < 0.05 was considered statistically significant.



The mean BMI of the cohort was 29.18 (range: 17.5 to 53.0), with 34.7% (25/72) classified as obese (BMI $\geq$ 30). The Pearson correlation coefficient for BMI and operative time was 0.242, showing a significant linear relationship between BMI and operative time (p = 0.041). These findings suggest that BMI is modestly associated with operative time in patients undergoing DP. When looked at as a categorical variable rather than a continuous variable, BMI groups (Normal $<$ 25, Overweight: 25–30, Obesity: $>$ 30) no significant association was found (p = 0.20). Additionally, the rate of conversion to open procedures, intraoperative blood loss, and splenectomy rates

were not significantly affected by BMI. A significant mean difference of BMI between ICU readmission groups (Yes: 46.7 ± 8.9; No: 28.6 ± 5.9; $p = 0.005$) was found when looking at BMI as a continuous but not categorical variable ($p = 0.17$).
Conclusion(s): In this single-institution retrospective review, increased BMI was found to be significantly associated with longer operative times in distal pancreatectomy. This finding highlights the potential need for tailored preoperative planning and resource allocation for patients with higher BMI undergoing DP. Furthermore, while looking at BMI as a continuous variable may be useful in predicting surgical outcomes, grouping BMI as a categorical variable may be less useful.

P694

Early Experiences of Lap-Assisted Whipples Pancreaticoduodenectomy

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Introduction: Laparoscopic/Minimal Invasive surgeries have suggested to enhance postoperative recovery when compared to their Open counterparts, However, there are concerns about the extensive learning curve due to the complex nature which could increase the risk of complications. (1) Laparoscopic assisted pancreaticoduodenectomy (LAPD), a hybrid procedure combining laparoscopic resection and reconstruction under a small incision, may serve as an alternative on the road to matured application of TLPD.
Material and method: Data is collected retrospectively through electronically maintained patient database. Data collected including demographic profile, imaging characteristic, FNAC proven pancreatic or Cholangiocarcinoma requiring Whipple's procedure. Patient underwent diagnostic laparoscopy and by laparoscopy pancreaticoduodenectomy and cholecystectomy done. After complete dissection, upper midline incision given from xiphisternum to supraumbilical port and specimen delivered. Now for anastomosis part, pancreatojejunostomy and dunking pancreaticogastrostomy done as surgeons preferences. The data was analysed and outcomes assessed.
Results: There were 34 patients diagnosed with Periampullary masses and it was 1.5 times more common in females as compared to males. Mean age of presentation was 58 years. Histopathology revealed – Ampullary Variety – 16, CA head of pancreas- 8, Distal CBD Cholangio CA - 2, SPEN -2, Gastrinoma of the head of pancreas- 1 IPMN - 2, The average hospital stay was 16 days. developed – 7 patients had Burst abdomen, 5 developed surgical Site infection, 2 - chyle leak, 3 had Haemorrhage and 4 developed anastomotic leak, 6 developed Pancreatic Fistula. 4 underwent re-exploration for bleeding.
There were 2 mortalities within 1st 30 days of operation.
Conclusion: The potential advantages of LAPD include more precise mobilization and dissection compared with OPD, and more precise reconstruction and haemostasis compared with TLPD, which will possibly lead to a more favourable postoperative recovery.
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P695

Outcomes of Abdominal Drainage Versus No Abdominal Drainage After Distal Pancreatectomy: A Single Institution Review

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Background: Pancreatic resection with prophylactic drain placement is common practice for lesions of the pancreas but can be associated with high morbidity and complication rates. Recently, mounting evidence suggests no difference exists in outcomes of morbidity or complication whether or not a drain is left after pancreatic resection, specifically distal pancreatectomy (DP).
Methods: This is a single institution, single surgeon retrospective review of cases of minimally invasive distal pancreatectomy between October 2019 and April 2024 at AdventHealth Orlando. Drain placement versus no drain placement after DP was analyzed for differences in outcome variables. The primary outcome of the investigation was pancreatic fistula or other complications graded by need for post-operative Interventional Radiology (IR) drainage, Endoscopic drainage, or reoperation. Secondary outcomes included hospital length of stay (LOS), readmission rates, Intensive Care Unit (ICU) admission, mortality with 30 days, in-hospital mortality, surgical site infections (SSI), deep infection, post-operative pancreatic fistula (POPF), and exocrine pancreatic insufficiency.
Results: A total of 38 patients met our inclusion criteria between October 2019 and April 2024, 25 female (65.8%) and 13 male (34.2%) patients. This included 26 (68.4%) and 12 (31.6%) in drain and no drain groups, respectively. The average age of our cohort was 59.3 years. There is no statistical difference in pre-operative parameters of age, sex, ethnicity, prior abdominal surgery, ASA class, and BMI between the two groups. There is no statistically significant difference between IR/Endoscopic drainage, reoperation, hospital LOS (days), readmission, ICU admission, mortality within 30 days, in-hospital mortality, SSI or wound infection, deep infection, and POPF between the 2 groups.
Conclusion: No statistically significant difference in pre-operative patient characteristics or post-operative outcomes between drain versus no drain after DP was found. Continued investigation with a randomized, prospective trial or larger meta-analysis could strengthen these findings.

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Validation of the Six-Minute Walking Test as a Measure of Postoperative Recovery After Pancreatic Surgery

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Introduction: Recovery after surgery is a multidimensional, dynamic process, in which physical function represents a key domain. The six-minute walking test (6MWT) is a low cost, multifactorial and valid measure to evaluate functional capacity. The aim of the present study was to contribute evidence for the construct validity of 6MWT as a measure of postoperative recovery after pancreatic surgery.
Methods: The study involved patients enrolled in a prospective observational trial between 2020 and 2022. Construct validity was assessed by testing the hypotheses that at 30 days after surgery the distance walked in 6 minutes (6MWD) is greater: (1) in younger

versus older patients; (2) in patients with higher preoperative physical status versus lower; (3) in patients undergoing distal versus proximal pancreatectomy and (4) laparoscopic versus open resection; (5) in patients with a shorter versus higher length of hospital stay, (6) in patients without postoperative complications versus with complications including (7) respiratory and (8) cardiovascular complications, (9) pancreatic fistula and (10) postoperative hemorrhage; (11) in patients without delayed gastric emptying (DGE) versus with DGE; (12) in patients without percutaneous drainage versus with; (13) and in patients not reoperated within 30 days versus reoperated; and that (14) 6MWD at 4 weeks after surgery positively correlates with Duke Activity Status Index (DASI) questionnaire scores. The COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) checklist was used to guide the formulation of hypotheses and reporting of results. Between-group difference in 6MWD at 30 postoperative days was assessed using linear regression adjusted for preoperative 6MWD.

Results: 151 patients who completed the 6MWT before surgery and 30 days after surgery were included in the analysis (median age 67 years, female sex 50%, proximal pancreatectomy 62%, distal pancreatectomy 38%, laparoscopic approach 24%, median 6MWD 512 meters). As shown in Table 1, data supported 12 of 14 (86%) hypotheses tested for construct validity (except for age and postoperative pancreatic fistula known-group comparison) showing between-group mean differences in 6MWD greater than the minimal important difference of 19 meters. There was a moderate positive correlation between 6MWD and DASI (r = 0.52) at 30 days after surgery.

Conclusion: This study contributes evidence for the construct validity of the 6MWT as a measure of postoperative recovery after pancreatic resection. Results from this study support the use of the 6MWT as an outcome measure in studies evaluating interventions aimed to improve recovery after pancreatectomy.

TABLE 1. Hypotheses tested for known-groups construct validity of the 6MWT as an outcome of postoperative recovery after pancreatic resection

Comparison	Number of patients	Mean difference (meters)	95% CI	p-value	Hypothesis confirmed
Younger (<75 years old) vs older patients (≥ 75 years old)	122 vs 19	0.57*	-23.42 to 23.54	.998	No
Higher physical status (ASA I-II) vs lower physical status (ASA III+)	90 vs 61	40.97*	21.96 to 59.98	.033	**Yes**
Distal vs proximal pancreatectomy	57 vs 94	49.28*	30.92 to 67.63	.008	**Yes**
Laparoscopic vs open surgery	36 vs 115	62.96*	42.50 to 83.42	.002	**Yes**
Shorter (<10 days) vs higher (≥ 10 days) length of hospital stay	73 vs 78	100.46*	84.15 to 116.77	<.001	**Yes**
No severe vs severe postoperative complications	116 vs 32	106.90*	86.52 to 127.28	<.001	**Yes**
No postoperative respiratory complications vs yes	130 vs 19	94.56*	68.67 to 120.45	<.001	**Yes**
No postoperative cardiovascular complications vs yes	136 vs 13	67.08*	34.31 to 99.85	.036	**Yes**
No postoperative pancreatic fistula vs POPF	83 vs 66	2.32*	-16.12 to 20.76	.900	No
No postoperative hemorhage vs PPH	137 vs 12	90.79*	58.41 to 123.16	.006	**Yes**
No delayed gastric emptying vs DGE	122 vs 27	121.24*	100.06 vs 142.42	<.001	**Yes**
No percutaneous drainage vs drainage	132 vs 17	90.97*	63.62 to 118.33	.001	**Yes**
Not reoperated within 30 days vs reoperated	138 vs 10	131.81*	97.41 to 166.22	<.001	**Yes**

* Should be interpreted as mean difference (meters) between groups 30 days after surgery; regression analysis was adjusted for preoperative 6-minute walked distance

P698

Changes in Clinical Features and Surgical Outcome of Gallbladder Cancer in Korea Over 30 Years: A Korea Tumor Registry System-Biliary Pancreas (KOTUS-BP) Database Analysis

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Background: The aim of this study was to investigate the changes of clinical features and surgical outcomes of gallbladder cancer (GBC) in Korea during last 30 years using a Korea Tumor Registry System-BiliaryPancreas (KOTUS-BP) database.

Method: In total, 4179 patients who underwent surgery for primary GBC between 1991 and 2022 were obtained. Patients were divided into 3 time periods: period I (1991 to 1999, n = 235), period II (2000 to2009, n = 1416), period III (2010 to 2021, n = 2528).

Results: The mean age of the patients increased from 60 years in period I to 67 years in period III.

As the period increases, laparoscopic operation (12.4%, 28.5%, 40.1%, $p < 0.001$), extended cholecystectomy (38.2%, 51.1%, 60.1%, $p < 0.001$) and curative resection (68.14%, 85.2%, 88.8%, $p < 0.001$) were performed more frequently. More patients experienced less advanced T stage (T1&2, 52.4%, 71.8%, 78.5%, $p < 0.001$) and N0 stage (26.3%, 39.6%, 47.4%, $p < 0.001$). After a median follow-up period of 42 (range 3–268) months, the 5-year overall survival (39.4%, 56.1%, 67.2% $p = 0.019$) and median disease free survival (months) (15, 63, 88, $p < 0.001$) improved. Recurrence occurred less frequently (42.0%, 35.0%, 23.3%, $p < 0.001$). Systemic recurrence was more common than loco-regional recurrence in all periods. More patients underwent adjuvant treatment (8.3%, 22.1%, 26.8%, $p = 0.017$). In multivariate analysis, poor prognostic factors were higher T stage, presence of lymph node metastasis, and no adjuvant treatment.

Conclusion: Over the past 30 years, the survival rate of GBC has increased remarkably as the number of patients who can undergo curative resection due to early diagnosis of GBC and the number of patients receiving adjuvant therapy have increased.

P699

Banti's Syndrome: A Rare Chronic Pancreatitis Complication

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Splenic vein thrombosis is a rare complication of chronic pancreatitis. It can lead to a portal hypertension of the splenic territory with splenomegaly, pancytopenia (hypersplenism), and esophageal varices. This syndrome was first discovered by Guido Banti in 1882 and is known as Banti's syndrome or idiopathic portal hypertension. Esophageal varices represent the main clinical presentation of this syndrome. The absence of cirrhosis is a notable finding in these cases. We present a clinical case of a 46-year-old man from Brazil with a long history of alcohol consumption. The patient presented with asthenia, dizziness, and episodic large-volume hematemesis on hospital admission. Endoscopy revealed medium-sized varices in the gastric fundus, with red spots and signs of recent bleeding (IGV-1). A CT scan showed an unremarkable liver, splenomegaly, cysts in the tail of the pancreas; and prominence of venous vessels in the periesophageal region, greater and lesser curvature of the stomach. Laboratory tests revealed severe anemia, negative results for malaria and schistosomiasis, and normal liver function tests. All other causes

of hypersplenism were ruled out, and idiopathic splenomegaly and portal hypertension of the splenic region and the diagnosis of Banti's syndrome was made. The patient underwent a laparoscopic azygos-portal disconnection. A splenectomy was not performed because of the presence of numerous pseudocysts in the pancreatic tail. Splenic artery ligation and an antireflux procedure (Dor technique) were performed. The patient presented an uneventful recovery, and he was discharged on the third day after the procedure.

P701

A Prospective Study on Perioperative Factors Influencing the Outcome OF Pancreatic Resection Surgeries in a Tertiary Care Centre in Eastern India

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Introduction: Pancreatic adenocarcinoma is one of the most common cancers with bad prognosis, and has a dismal 5-year survival rate of 2–9% and frequent presentation at an advanced stage. Despite numerous advancements in surgical techniques and post-operative management, pancreaticoduodenectomy has a high rate of complications (30–60%). The primary causes of protracted recovery and the frequent need for additional procedures are surgical complications, including postoperative pancreatic fistula (POPF), delayed gastric emptying (DGE), and infections. With the increasing availability of interventions for such conditions, there is a need to determine predictors to identify the complications early to lessen the morbidity and mortality arising from such procedure.
Aims and Objective: To determine the perioperative risk factors influencing the outcome of pancreatic surgery in a tertiary care setup (AIIMS Patna) in India.
Primary objective: To assess the demographic characteristics, and peri-operative factors influencing the outcome of pancreatic surgeries in a tertiary care setup in India within one month of surgery according to Clavein–Dindo classification.
Methodology:
Study Design: It is longitudinal study where all patients undergoing surgical treatment for resectable pancreatic tumours and patients undergoing resection procedures for benign diseases of the pancreas admitted under surgical disciplines of AIIMS Patna was be included in the study. Age, presence of co-morbidity, duration of illness, previous history of ERCP/PTBD, CEA value, blood loss in surgery, and presence of sarcopenia based on CECT findings were recorded for analysis.
Results: The study included 60 patients with mean age of 51.48 years and 65% patients were male and 35% of patients were females. Most frequent complication overall was a biochemical Pancreatic jejunal anastomotic leak (POPF in18.3%). The second most common complication was Delayed Gastric Emptying Grade B (5 patients) followed by SSI in 3 patients. An overall complication rate noted in our study was 46.7%, of which the mortality rate was 11.7%.
Conclusion: POPF, DGE, and surgical site infections are some of the most common complications post pancreatic resection surgery. Drain amylase on POD 3 can be a useful marker for suspecting POPF. Higher intra-operative blood loss, and raised values of serum amylase on POD 3,5 increase the chance of developing POPF. Serum Amylase on POD 3 can be a novel marker for detecting and for predicting the severity of POPF. Measurement of psoas muscle on CECT as a marker of sarcopenia is reliable, but we could not reciprocate the same in our population.

P702

A Matched Case–Controlled Analysis of Pathologic Response to Neoadjuvant Ablative Radiotherapy for Pancreatic Cancer

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Introduction: Ablative neoadjuvant radiotherapy (RT) delivered with a magnetic resonance imaging-guided linear accelerator (MR-LINAC) is emerging as an option for treating patients with borderline resectable pancreatic ductal adenocarcinoma (PDAC) compared to standard low dose neoadjuvant radiation therapy. This study evaluated the pathological response to ablative RT and chemotherapy before surgery compared to neoadjuvant chemotherapy alone.
Methods: We conducted a single institution retrospective analysis of patients who received neoadjuvant chemotherapy and ablative RT followed by pancreatic resection from December 2019 to February 2024. These patients were matched in a 1:2 fashion with patients who underwent neoadjuvant chemotherapy alone according to age, gender, Charlson Comorbidity Index and tumor size. The pathologic response to treatment was evaluated using the CAP score in resected surgical specimens.
Results: We evaluated a total of 57 patients, 19 who had neoadjuvant chemotherapy followed by ablative RT and 38 patients who underwent neoadjuvant chemotherapy alone. No statistically significant difference was observed in the number of neoadjuvant chemotherapy cycles between the groups (10.4 vs 7.7, $p = 0.49$). All patients who received neoadjuvant RT had borderline resectable tumors versus 44.7% of the matched cohort ($p < 0.005$), with the rest of the matched cohort being resectable. Neoadjuvant RT patients were also more likely to undergo pancreatoduodenectomy (84.2% vs 47.3, $p = 0.02$) instead of distal pancreatectomy (15.8% vs 52.7%, $p = 0.02$). There were no differences in type of chemotherapy given ($p = 0.28$), number of cycles given ($p = 0.49$), CA 19-9 levels before surgery, or other demographic information. All patients received 5 fractions of RT with overall dose of 40 Gray in 8 patients and 50 Gray in 11 patients, with no difference in tumor response between the groups ($p = 0.11$). Those who received ablative RT had better pathologic response to therapy than those who had neoadjuvant chemotherapy alone (CAP grade 0: 5.2% vs 0%; grade 1: 26.3% vs 13.1%; grade 2: 68.4% vs 52.6%; grade 3: 0% vs 34.2%). The mean number of lymph nodes involved by tumor was 0.5 in the ablative radiation cohort compared to 1.3 ($p = 0.04$).
Conclusion: Neoadjuvant chemotherapy and ablative 5-fraction RT resulted in more favorable pathologic outcomes compared to neoadjuvant chemotherapy alone. Future studies should evaluate whether these differences in pathologic outcomes translate into meaningful differences in local recurrence rates and overall survival. Additionally, patients receiving neoadjuvant chemotherapy followed by ablative radiation showed a significantly lower rate of positive lymph nodes.

P704

When Will We Have a Value Model in Surgery?

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Introduction: Beginning in 2023, a tiered approach to reimbursement for ventral hernia repairs (VHR) based strictly on defect size was adopted by the American Medical Association. To assess the impact of this change on reimbursement, value-based outcomes were collected one year before and one year after this modification.
Methods: An iterative clinical quality improvement process was employed to measure and improve value-based outcomes. Ventral hernia repair patients were identified through a physician practice clinical administrative database. Procedural information, clinical outcomes and financial data were collected. Datasets were merged to allow for analysis of the impact of the new codes on hospital profit margin. A data cleaning process was implemented to address data gaps, conflicts, errors and anomalies.
Results: 219 patients (104 female and 105 male) underwent VHR from 1/2022 to 12/2023. Patient demographics and surgical approach are presented in Table 1. Comparisons between financial outcomes, length of stay (LOS), wound complications and other outcomes were collected for patients with VHR performed in 2022 versus 2023. When comparing the two years of different reimbursement strategies, the LOS was less in 2023 (two vs three days). Although variable costs were also less in 2023, the cost decrease was insufficient to maintain a positive net margin. A comparison of financial and clinical outcomes is presented in Table 2.
Conclusions: The changes in VHR reimbursement in 2023 resulted in a significant revenue decline despite improvement in LOS, decreased cost of care and similar rates of complications. After being profitable for the ventral hernia repair in 2022, the hospital experienced a negative net margin in 2023 resulting in a total decline in profit of $81,427. The change in reimbursement codes for VHR did not reward improvement of value-based outcomes.

Year	Total Patients	Gender (F/M)	Age (Range)	BMI (Range)	Open (%)	Laparoscopic (%)	Robotic (%)
2022	94	53/41	56.0 (24 – 84)	31.69 (29.00 – 49.17)	47 (50.0%)	30 (31.9%)	7 (7.4%)
2023	125	61/64	55.8 (27 – 78)	31.00 (17.97 – 48.49)	81 (64.8%)	30 (24.0%)	12 (9.6%)

Table 1 Comparison of patient demographics and surgical approach

Year	Length of stay, days (Range)	Total Wound Complications (%)	Symptomatic Seroma (%)	Rehospitalization (%)	ED Visit w/in 30 days (%)	Average Variable Cost Per Patient	Average Reimbursement Per Patient	Hospital Total Profit/Loss
2022	3 (0 – 30)	15 (16.0%)	9 (9.6%)	6 (6.4%)	8 (8.5%)	$9997	$14830	+$86,552
2023	2 (0 – 29)	22 (17.6%)	6 (4.8%)	4 (3.2%)	7 (5.6%)	$8524	$11887	- ($14675)

Table 2 Comparison of financial and other outcomes

P705

Exploring the Critical View of Safety in Laparoscopic Cholecystectomy: Insights from a Prospective Study with Need for Early Adoption and Propagation of Safety Culture

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Background: Laparoscopic cholecystectomy is the gold standard for gall stones, with the critical view of safety (CVS) being a key component. Achieving CVS is essential to reduce the risk of bile duct injuries, which currently occur in 0.4–1.8% of cases, down from 1 to 2.2% before the CVS era.
Method: This prospective observational study evaluated the achievement of CVS and complication rates during laparoscopic cholecystectomy across different surgical hierarchies. We included patients aged 18–60, with their procedures recorded and reviewed by experienced surgeons. Outcomes measured were attainment of CVS, time taken to achieve it, and complication rates among residents and consultants, with case difficulty graded using Nassar's criteria.
Result: 225 cases were included Grade I (n = 160), Grade II (n = 33), Grade III (n = 18), and Grade IV (n = 14). 40% of total Grade III cases (n = 18) did not achieve the CVS, and CVS was not defined in Grade IV in 62% (n = 14). In these, bailout procedures like subtotal cholecystectomy (n = 5), conversion to open cholecystectomy (n = 4), retrograde approach (n = 5) were done. Consultants (n = 124) were able to achieve CVS in 92.6% of all cases; Grade I = 100%, II = 100%, III = 56%, IV = 40% whereas for registrars (n = 101) it was 74% among all cases, in Grade I = 91%, II = 72%, III = 42%, in Grade IV CVS was not achieved. The average time to achieve CVS varied with Nassar's grading: consultants, Grade I:12 min (5–18 min), II:18 min (15–30 min) and III:27 min (25–30 min) whereas Registrars took longer, with Grade I:15 min (10–22 min), II:22 min (20–28 min) and III around 45 min. The complications according to Clavien Dindo classification were Grade I = 30, II = 14, III = 4, IV = 3 (bowel injury, BDI), Grade V = 0. There were no complications among the consultants however there were three cases of BDI (two cystic duct stump leaks & one requiring hepaticojejunostomy after few months)
Discussion: A critical view of safety (CVS) in laparoscopic cholecystectomy is essential for minimizing bile duct injuries. This technique enhances visualization of cystic structures and significantly reducing injury rates from 0.5-0.8% to under 0.3% with widespread adoption. Our study reveals that achieving CVS takes about 24 min for consultants and 38 min for registrars, with BDI rates of 0% and 2.97%, respectively. Emphasizing CVS during residency is crucial for reducing complications. Making CVS a global standard practice can further mitigate risks and enhance the success of laparoscopic cholecystectomy.

P706

Readability Assessment of Online Patient Education Material on Barrett's Esophagus Across the United States

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Health inequality due to low health literacy has been well reported in the literature. Because of this, many organizations have created guidelines and recommendations to help overcome this widespread issue. The recommended reading level for patient education material provided by the American Medical Association (AMA) is no greater than the 6th grade level. Multiple studies have been done showing the average reading level for patient education material to be greater than this recommendation.

In this study, 54 medical centers were identified to have online education materials available for patients related to Barrett's esophagus. The description of Barrett's Esophagus on these websites was analyzed using multiple readability calculators including the Flesch Kincaid Grade Level, the Gunning Fog Score, the Coleman Liau Index, and the Simple Measure of Gobbledygook index. These results were compared to a grade level value of 6.9 based on the recommendation by the AMA. Using a one sample *t*-test with a *p*-value of 0.001, all four calculators were considered statistically significant. Of the 54 websites, only 2 websites had a reading level less than or equal to 6.9. However, this was not consistent across all 4 calculators. This study highlights the significant disparity in online patient education materials and the need for improvements with current patient education.

P708

Same-day discharge following laparoscopic cholecystectomy and inguinal hernioplasty: Challenges in tertiary care institute of North India

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Introduction: Same-day discharge defines a situation when a patient is admitted for some listed planned surgical procedure and discharged home on the same calendar day. This study aimed to evaluate the feasibility of same-day discharge of patients after laparoscopic cholecystectomy and laparoscopic inguinal hernioplasty in a tertiary care institute of North India.

Methods: A prospective observational study was conducted from June 2020 to May 2021 in the Department of general surgery. This study included all cholelithiasis and inguinal hernia patients who had no previous medical or surgical complication, with ASA grade 1 or 2 and whose travelling time from home was less than 60 min. The Patients who had a drug history of anticoagulant drugs, chemotherapy for various causes and immunocompromised, psychiatric, and pregnant patients were excluded from this study. Postoperative complications and feasibility of discharge were monitored with the MPADSS scoring system.

Results: Eighty-five patients were counselled for same-day discharge before laparoscopic surgery, out of them 21 (24.7%) patients were enrolled. Only 6 (29%) patients were discharged successfully after surgery. Remaining 15 (71%) patients were unable to discharge due to intraoperative bleeding 2 (9.5%), 1 (4.8%) bile leak from the liver bed, pain 4 (19%), lack of confidence regarding postoperative care 6 (28.5%) and social factors 2 (9.5%). Among all, 29% of patients were satisfied and agreed to advise others, 19% of patients were satisfied but preferred inpatient care and 52% of patients were dissatisfied.

Conclusion: In India, due to an overburden on health care centre's, it is necessary to incorporate same-day discharge after laparoscopic cholecystectomy and hernioplasty. Postoperative home care, however, may be challenging for patients in North India due to fears of postoperative complications. The patients are more compliant with overnight hospital stays and are discharged the next morning. The success of this system is likely to depend on a variety of factors, including social factors, complicated surgeries, the infrastructure of hospitality, counselling and the experience of surgeons.

P709

Are Community Screening Endoscopists Appropriately Referring Complex Polyps for Advanced Endoscopic Resections?

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Introductions: The aim of this study is to assess whether community screening endoscopists are utilizing existing complex polypectomy pathways. Endoscopic mucosal resection (EMR) techniques have been proven to be safe and effective for managing complex polyps. Recent literature highlight that it can be difficult for endoscopists to identify which polyps may benefit from attempted endoscopic excision and referral to an advanced polypectomy center. With the increasing availability of these new endoscopic resection techniques there is a need to review practices to assess where efforts for education should focus.

Methods: A total of 196 patients were found to have a poly $p > 2$ cm on review of FIT+ patients during a recent one-year period of our province wide screening colonoscopy database. Pathology results were unavailable for several health zones, leaving 78 patients. 13 of these were excluded for malignancy, one was lost to follow up, and one was miscoded. In total, 63 patients were included, 8 of which had a surgical resection, and the rest had an EMR. Surgical resection included any laparoscopic colonic resection as well as transanal minimally invasive surgery (TAMIS). Electronic charts were reviewed for these patients including endoscopy reports, operative reports, clinic notes, and a pathology review.

Results: Of the 8 patients who underwent surgical resection for a large colonic polyp, 5 had a laparoscopic right hemicolectomy, 2 had TAMIS, and 1 had a laparoscopic anterior resection. 5 polyps were unresectable due to size, 1 failed to lift with submucosal injection, and 2 were unable to be removed due to location/angle of the scope. All polyps were biopsied as adenomas but 2 came back as early cancer on surgical pathology. 6 endoscopists referred for second opinion prior to surgical resection while 2 did not. We employed the criteria from recent 2023 national guidelines on polyp classification and management to review these cases and determined only one patient out of the 8 may have benefited from a referral to an advanced endoscopist.

Conclusions: Quality reviews of referral patterns in colonoscopy screening databases are an effective strategy to assess educational needs of the endoscopists and to target quality care initiatives. Based on this review, community endoscopists in the zones where pathology was readily available are appropriately utilizing the advanced polypectomy pathways. Efforts to improve pathology availability are needed to assess whether best practice have been adopted in all the zones and to improve continuing medical education efforts.

P713

Dedicated Robotic Bedside Assistants Can Dramatically Enhance Operating Room Efficiency and Cost-Effectiveness

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Background: Though robotic surgery has been demonstrated to be a safe and effective technique, concerns regarding its cost-effectiveness and possible longer operative times persist. Dedicated robotic bedside assistants are highly trained individuals that may mitigate some of these concerns. In this study, we sought to investigate how a dedicated robotic registered nurse first assistant (RNFA) could enhance operating room efficiency while controlling the costs of robotic surgery.
Methods: This is a descriptive analysis of the development of a robotic bedside assistant program at our institution from 2017 to 2023. All robotic cases during this study period were analyzed. Outcome metrics included case volumes, % of cases supported by an RNFA, first-case on-time (FCOT) start accuracy, turn-over times (TOT), average number of robotic cases performed per day per room, and errors in supply charge documentation.
Results: Yearly robotic volumes during the study period increased from 534 cases in 2017 to 2434 cases in 2023, nearly five-fold growth. The number of dedicated robotic RNFAs increased from 1 in 2018, which was the pilot year, to 11 in 2023. The percentage of cases covered by an RNFA increased from 14.7% in 2018 to 98.1% in 2023. The average number of robotic cases performed per operating room increased from 1.6 to 4.1 cases per day. TOT decreased from 74.1 to 33.5 min. FCOT start accuracy improved from 37 to 93%. The proportion of cases with an error in the supply charge documentation decreased from 64.2 to 12.8%.
Conclusions: A dedicated RNFA as the robotic bedside assistant may have significant impacts on the efficiency of robotic surgical procedures. Operating room availability is at a premium at most institutions. A dedicated robotic bedside assistant program may help to improve OR utilization without the need for additional rooms. While building an RNFA team requires initial investment, we have found a significant return on investment through this program. In addition to improved provider and patient satisfaction, these programs may also provide a financial benefit in reducing documentation errors and increasing OR productivity.

Robotic Case Outcome Metrics and the Implementation of the Robotic RNFA

Year	2017	2018	2019	2020	2021	2022	2023
# Robotic-dedicated RNFAs	0	1	4	7	7	9	11
Robotic case volume	534	966	1397	1518	1836	2113	2434
% Cases covered by a robotic RNFA	0	14.7	56.4	87.8	85	97.8	98.1
% FCOT (First case on time start)	37	73	88	93	91	93	93
Turn-over time (min)	74.1	67.8	45.2	37.9	33.1	34.4	33.5
Avg # robotic cases/ robotic operating room/day	1.6	1.9	2.4	2.7	3.3	3.7	4.1
% Cases with errors in supply charge documentation	64.2	62.1	44	30.1	17	15.1	12.8

P714

Implementation of Patient and Family Driven Exercise Regimen for Post Operative Acute Care General Surgery Patients: A Quality Improvement Effort

Joshua Appel; Ashlie Nadler, MD, MSc; University of Toronto

Introduction: Patients admitted to the acute care surgery service often present with complex medical conditions and advanced age. As a result, patients undergoing emergency surgery frequently experience significant deconditioning postoperatively. Many patients require additional support to facilitate their recovery including rehabilitation or transitional care. The importance of early mobility and exercise in this context is well described. However, the aftermath of the COVID-19 pandemic has led overworked physiotherapists often hindering them from adequately treating these patients. Consequently, we conducted a "root cause analysis" (Fig. 1) and identified a possible solution, involving a patient- and family-directed exercise program, adjusting for ECOG status. We have initiated a pilot project specifically targeting patients > 65 who have undergone an emergency general surgery operation at our institution. Our goal is to reduce the percentage of patients that may require additional support from rehabilitation institutions following their surgery conducted under the ACS service. This process in interim. The aim of this abstract reflects our process measures.
Methods and Procedures: Our quality improvement team began by creating a "process map" (Fig. 2) to pinpoint areas amenable to enhancement in postoperative patient care. We then conducted a root cause analysis by way of an Ishikawa diagram and a cause-idea map (Fig. 3) to identify our "change idea". We then educated our multidisciplinary team and implemented the pilot project at our institution, continually refining its execution through multiple plan-do-study-act (PDSA) cycles (Fig. 4).
Results: A total of 33 patients were enrolled in the pilot project. Following the completion of several PDSA cycles and subsequent data collection, we analyzed our process, balancing and outcome measures respectively. With regard to process measures, we were able to increase patient participation from 50 to 75% (see Fig. 5). Out of the patients that participated, we increased the average number of exercises conducted per day from 50 to 90% (Fig. 6). We did observe falls related to the pilot project in 6% of patients (2/33 or ~ 10 per 1000 inpatient days extrapolated) over this 8-week period.
Conclusion: While our process measures show promising results, we look forward to reviewing our outcome measures in early 2025. We hypothesize that the expedited return of patients to their homes instead of requiring additional care facilities, if embraced by numerous institutions across Canada, could potentially mitigate a multitude of the adverse consequences caused by the aftermath of the COVID-19 pandemic.

Figure 1. Ishikawa Diagram and Root Cause Analysis

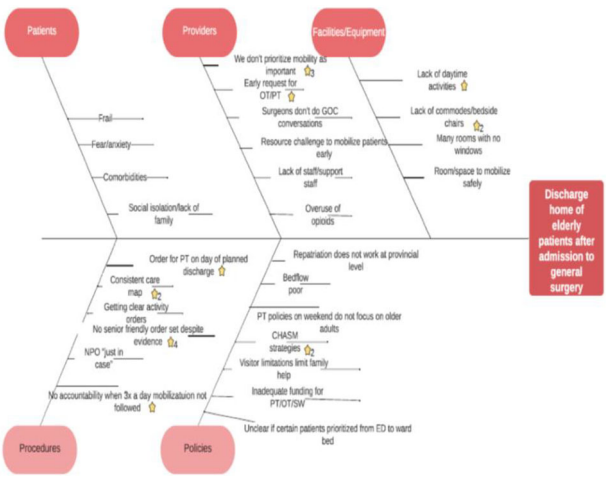


Figure 2. Process Map – Course in Hospital for a Patient Requiring Admission

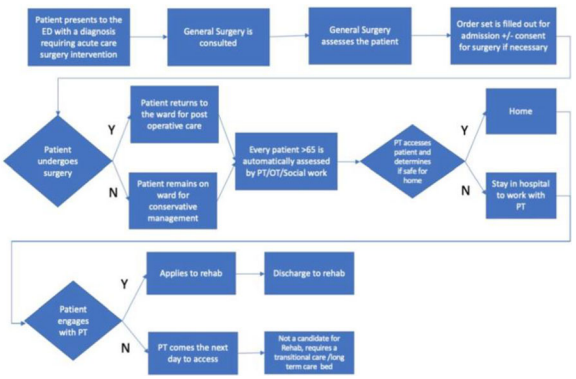


Figure 3. Cause-Idea Map Extrapolated from Ishikawa Diagram

Root cause identified	Actionable? Yes/No	If actionable, corresponding change ideas	Impact? Hi or Lo	Effort? Hi or Lo	Priority? Hi Me Lo
Patients have fear/anxiety of going home	Yes	Reassurance	Lo	Hi	Lo
Patients are too comorbid and have prolonged hospital stays as a result of post operative complications	No	-	-	-	-
Patients have lack of family at home/social isolation	Yes	Personal support workers, home alterations	Hi	Hi	Lo
Providers don't prioritize mobility as important	Yes	Education	Hi	Lo	Lo
Provider: Early request for PT	Yes	Earlier identification of high priorty patients	Hi	Lo	Hi
Provider: Lack of staff (PT/OT/Social work)	Yes	Hire more members of MDT	Hi	Hi	Hi
Providers overuse opioids	Yes	Education around opioid reduction	Hi	Hi	Hi
Facilities/equipement: Lack of daytime activities	Yes	Patient lead exercises	Hi	Hi	Hi
Facilities/equipement: Lack of bedside chairs	Yes	Obtain more equipement	Lo	Hi	Lo
Facilities/equipement: many rooms with no windows lead to delirium	Yes	More windows in patient rooms	Hi	Hi	Lo
Facilities/equipement: no room/space for patients to mobilize safely	Yes	Dedicated mobility area for patients	Lo	Hi	Lo
Procedures/providers: Order PT to clear patient for home on the planned day of d/c	Yes	Order PT earlier	Hi	Lo	Lo
Procedures: patients do no receive clear activity orders	Yes	Clearly tell patients their activity status/restrictions	Hi	Lo	Hi
Procedure: No senior friendly admission order set	Yes	Creat senior friendly order set	Hi	Hi	Hi
Procedure: Patient kept NPO just in case of procedure	No	-			
Procedure: No accountability for lack of mobilization	Yes	Incentivize patient mobilization	Hi	Lo/Hi	Hi
Policies: Issues with Bedflow (waiting for rehab bed)	Yes	Create more rehab beds	Hi	Hi	Lo
Policies: Poor adoption of CHASM strategies	Yes	Creat policy to adopt CHASM strageties into practice	Hi	Hi	Hi
Policies: Visitor limitations limit family help	Yes	Extend visitation hours	Lo	Lo	Lo
Policies: inadequeate funding for additional PT/OT/SWs	Yes	Allocate more funding	Hi	Hi	Lo

Figure 4. Plan, Do, Study Act (PDSA) Exercise Performed Over An 8-week Period

PDSA Cycle	New Patients Enrolled	Planned test of change	Result (study)
1	1	FIRST PDSA PILOT	Patients engaged/good compliance, however occasionally forgetful of project, misplaced project information pamphlet on POD3 Bracelet fell off during transfer in OR
2	2	Apply bracelet on POD1	Bracelet stayed on Similar results to PDSA 1 otherwise In addition, poor participation if patient was alone Half of patients misplaced project information pamphlet during post operative stay
3	5	Residents reorient patient to the project on POD1 and posted pilot project information on an easy to see location	0/5 patients misplaced the information 3/5 patients stated they performed exercises, despite being unobserved
4	5	To address lack of observations by nurses and poor enrolment, patient must do FIRST set of exercises witnessed by nurse Then either family members/nurses/PSW for duration of exercises, patient can do exercises independently but cannot remove tab on their own Nurse/PSW/family member allowed to remove tab ONLY	Decreased "time wasted" by nurses as observed action was by PSW's/family members Concerns of bracelet color was similar to falls risk color
5	5	Repeat Cycle	Similar to Cycle #3
6	5	Change falls risk bracelet color	Successful. Bands accidentally shredded with hospital band cant collect data Unsure whose band belongs to who when removed
7	5	When band is placed, attach MRN sticker to band Resident rounding removes band on EDD	More work for residents, but ensures accurate data will be collected for each patient
8	5	Plan to implement on additional acute care surgery ward	Poor patient compliance and participation possible due to less time spent educating house staff. Project enthusiasm on this ward was poor

PSW (personal support worker)

Figure 5. Run Chart to Assess Patient Enrollment and Participation

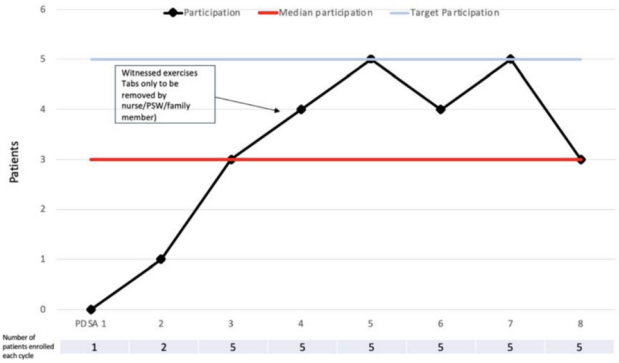
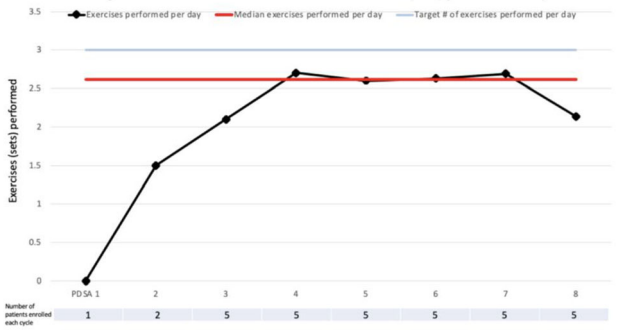


Figure 6. Run Chart to Assess Number of Exercises (Sets) Performed Daily



P715

Trauma Activation in a Non-trauma Tertiary Care Center: An Observational Study

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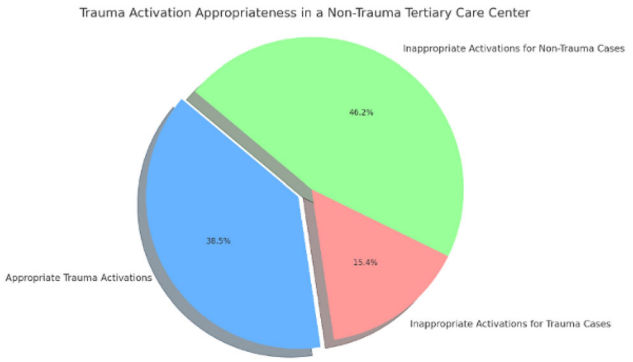
Introduction: Non-trauma tertiary care centers may occasionally receive patients with traumatic injuries requiring immediate intervention, despite not being specifically designated for trauma cases. At such centers, a trauma activation occurs when a provider contacts the general surgery trauma phone for urgent assistance. This study evaluates trauma activations at a non-trauma tertiary care center in Orlando, Florida, between May and August 2024. We hypothesized that the lack of trauma-specific protocols leads to a high rate of inappropriate activations, highlighting the need for standardized guidelines to improve patient care and resource utilization.

Methods and Procedures: This retrospective analysis examined trauma activation logs from May to August 2024 at a non-trauma tertiary care center. Activations were categorized as "trauma" or "non-trauma." Appropriate activations were defined as those involving traumatic injuries requiring immediate evaluation or surgical intervention. Inappropriate activations included cases where a trauma response was triggered without meeting criteria for activation (e.g., non-traumatic conditions or minor injuries). Descriptive statistics were used to calculate percentages of appropriate and inappropriate activations, and a pie chart was generated to visualize these findings.

Results:



Of 13 trauma activations analyzed, 7 (53.8%) involved trauma cases, while 6 (46.2%) were non-trauma cases. Among the trauma activations, 5 (38.5%) were deemed appropriate, involving serious injuries such as gunshot wounds and motor vehicle collisions with significant trauma. However, 2 (15.4%) were inappropriate, involving minor trauma, such as a ground-level fall with minimal injury and a superficial gunshot wound. All non-trauma activations (46.2%) were classified as inappropriate, including cases like gynecological complications, non-traumatic pneumothorax, and surgical consults for hernia or diverticulitis.

Conclusions: The study highlights that non-trauma tertiary care centers still encounter trauma cases requiring immediate attention. However, a significant portion of trauma activations (61.6%) were inappropriate, either due to non-trauma cases or minor trauma that did not warrant full activation. This underscores the need for clearer, standardized trauma activation protocols to ensure efficient use of resources, improve patient care, and minimize unnecessary trauma team involvement. Implementing such guidelines could help optimize responses at non-trauma centers.

P716

Securing Success: Strategies for Preventing Early Gastrostomy Tube Dislodgement

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Introduction: One of the most serious and prevalent complications associated with the placement of gastrostomy (G) tubes is early G-tube dislodgement, occurring at a rate of 10–30%. It is generally defined as displacement within 7–14 days post-procedure. The resulting sepsis and risk of mortality often necessitate emergent exploratory laparotomy. Despite the availability of devices targeted toward reducing dislodgements, these methods can be costly and time-consuming with variable outcomes. Our objective is to assess the efficacy of a novel G-tube securement protocol designed to decrease the in-hospital rate of early post-operative G-tube dislodgement.

Methods and Procedures: This is a pilot, single-center prospective quality improvement study performed from September 2023 to December 2023. A pre-study power analysis calculation determined a target sample size of approximately 50 patients based published dislodgement rates, as cited above. A G-tube securement protocol was developed based on extensive literature review, including (a) at least 3 interrupted 3-0 Silk sutures securing the bumper to the skin with an additional silk suture tied around the tube at the distal end of the bumper, (b) a CathGrip device anchoring the tube to the abdominal wall, and (c) placement of an abdominal binder. Inclusion criteria were G-tubes placed by general surgery, age 18 years or older, and no intraoperative complications from the initial G-tube placement. Open, laparoscopic, and percutaneous endoscopic gastrostomy (PEG) approaches were included. The data was compared to a historic control to evaluate for G-tube dislodgement and return to the operating room within the first 30 days postoperatively. Standard descriptive statistics were used for patient demographic information and statistical significance analysis.

Results: Fifty patients were enrolled in our study after applying our exclusion criteria, with no recorded subject dropouts during the 1-month follow-up. The indications for G-tube placement were fairly uniform, primarily including feeding access and gastric decompression. At the 30-day follow-up, 2 patients (4%) experienced unintentional early G-tube dislodgement ($P < 0.005$). Both cases necessitated exploratory laparotomy for G-tube replacement. Diagnostic assessments relied on physical exam findings, as no contrast studies were conducted. Notably, there were no G-tube placement-related mortalities within the 30-day timeframe.

Conclusion: In comparison to historical data, the adoption of a standardized protocol for securing a G-tube post-placement significantly diminishes the incidence of in-hospital early dislodgement of G-tubes and contributes to an overall reduction in patient morbidity.

P718

Outcomes of a Reinforced Tissue Matrix Used in Ventral Hernia Repair

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Introduction: Various FDA-cleared synthetic and biologic hernia mesh options exist for ventral hernia repair. A group of multi-layer reinforced tissue matrix products was designed to combine the benefits of a biologic scaffold with the durability of synthetic reinforcement. This group of reinforced tissue matrix options (OviTex®) may have a better clinical value proposition than other synthetic or biologic-only hernia mesh options.

Methods and Procedures: A clinical quality improvement (CQI) project is a way to analyze outcomes using real-world clinical data. In this CQI project, one clinical site evaluated this reinforced tissue matrix for ventral hernia repair over five years (2017–2021). Recognizing that quality follow-up data is necessary to provide feedback for learning how to improve outcomes, a combination of manual and technological solutions was used to obtain clinical and follow-up data. Clinical data were obtained from the electronic medical record through GenAI data acquisition software tools and manual extraction. Follow-up data were obtained through a HIPAA-compliant patient-facing, text application, as well as manual phone calls and emails.

Results: 287 patients underwent ventral hernia repair at a single hernia center. There were eight recurrent hernias requiring repair (2.8%). Outcomes of repairs that included onlay placement were compared with patients who had OviTex placed in other locations, typically retrorectus or preperitoneal, to assess the impact of plane of placement. There were 16 patients with non-mesh repairs with two recurrences (12.5%) who were excluded from this analysis. 73 patients had onlay placement with one recurrence that required repair (1.4%), and there were four wound complications (5.5%), including one major complication requiring device removal. Other planes of placement were used in 198 patients, with five recurrences requiring reoperation (3.0%). Additional details and follow-up are shown in Table 1.

Conclusions: A multi-layer reinforced tissue matrix is being evaluated in a CQI project. The results suggest that this reinforced tissue matrix has a low recurrence rate and a reasonable complication profile, including only one infection requiring removal. There were no other device-related complications. Implementing onlay mesh placement as a possible clinical quality improvement led to lower recurrence and similar wound complication rates, although the one device removal was in the onlay group. A combination of automated and manual data collection was employed for clinical and patient follow-up, with a high success rate for follow-up.

Mesh placement	Total Patients	Mesh size (cm2)	Wound complications (%)	Total Recurrence (%)	Mean Follow-up (months)	Follow-up Range (months)
Non-Onlay OviTex	198	245.8 (18 – 1600)	11 (5.6%)	6 (2.5%)	25.7	1 – 87
Onlay OviTex	73	362.1 (32 – 750)	4 (5.5%)	1 (1.4%)	21.8	1 – 55
Total	271	277.9 (18 – 1600)	15 (5.5%)	6 (2.2%)	24.9	1 – 87

Table 1 Results of ventral hernia repair with OviTex® reinforced tissue matrix

P719

Combatting Postcode Lottery: Do Regional Outreach Clinics Improve Access to Elective General Surgical Care for Rural Populations?

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Intro: Inequitable access to healthcare is a well-documented issue in Aotearoa New Zealand (NZ), particularly affecting rural and Maori populations. In response, the recent centralization of nearly 20 district health boards into Te Whatu Ora—Health NZ was intended to address geographic and ethnic disparities in healthcare delivery. General surgery, often provided regionally, is crucial in this context as rural populations face numerous barriers to accessing timely elective surgical care. In Hawke's Bay, rural outreach clinics in Waipukurau and Wairoa were established to address these barriers and improve access to general surgical services. However, recent health service restructuring raises concerns about the continuation of these clinics. This study aimed to assess the impact of rural outreach general surgical clinics on access to elective surgery by ethnicity and rurality.
Methods: A retrospective cohort study of patients undergoing elective general surgical procedures in the Hawke's Bay region from August 2015 to December 2023 was conducted. The study focused on cholecystectomy, hernia repairs, and haemorrhoidectomy, excluding patients with cancer or those with delayed surgeries due to other health issues. The primary outcome of interest was the time from referral to surgery, stratified by ethnicity and rurality.
Results: Results indicated that rural and Maori patients waited significantly longer for elective surgery compared to their urban and non-Maori counterparts. Rural patients experienced a median wait time of 96 days compared to 83 days for urban patients ($p = 0.006$), while Maori patients waited longer than non-Maori patients ($p = 0.04$). The outreach clinics facilitated quicker first specialist assessments for rural and Maori patients, but these patients still experienced prolonged wait times for surgery after being waitlisted.
Conclusion: This study highlights ongoing disparities in access to elective surgery, particularly for rural and Maori populations, and underscores the importance of maintaining and expanding rural outreach clinics. Although the small sample size limits broader conclusions, the data suggest that these clinics play a vital role in addressing healthcare inequities. Future research, particularly qualitative studies, is needed to capture patient experiences and explore how further investment in rural outreach can enhance equity in surgical care delivery.

P720

PRESTON Score: A Predicative Scoring System to Predict Oncological Outcomes for Locally Advanced Rectal Cancer Cases

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Introduction: Locally advanced rectal cancer (LARC) is associated with high recurrence rates and poor survival outcomes. Preoperative inflammation markers have been shown to correlate with survival in various cancers, including LARC. Identifying patients with a higher risk of recurrence based on these markers could guide treatment and surveillance strategies. This study aimed to develop a scoring system based on pre-treatment inflammatory markers to predict survival outcomes in LARC patients. This system may help in tailoring postoperative surveillance and evaluating the need for aggressive neoadjuvant treatment.
Procedure: We retrospectively analyzed LARC patients to assess the correlation between pretreatment inflammatory markers and survival outcomes. Four pre-treatment indicators were selected based on their known association with inflammation and cancer prognosis: neutrophil-to-lymphocyte ratio (N:L), platelet count, albumin levels, and ferritin levels. A scoring system was developed where each patient received 1 point for having the following indicators: N:L ratio > 3.5, platelet count $> 440 \times 10^9$/L, albumin < 35 g/L, and ferritin < 20 μg/L. A total score ranging from 0 to 4 was calculated for each patient. Patients were then stratified into different risk categories, and their survival outcomes were analyzed using Kaplan–Meier survival analysis and Cox proportional hazards models.
Results: There was a total of 70 cases, M:F ratio of 1:1 and median age was 60.1 years. Patients with higher scores on the pretreatment inflammatory markers showed a significant correlation with worse survival outcomes. Specifically, patients with a score of 2 (8.2%; $n = 5$) or higher demonstrated a markedly increased risk of recurrence and decreased overall survival compared to those with a score of 0 or 1.
Conclusion: Our scoring system based on pretreatment inflammatory markers (N:L ratio, platelet count, albumin, and ferritin) effectively identifies LARC patients with a higher risk of poor survival outcomes. This scoring system was found to be an independent predictor of survival, even when controlling for other clinical factors. Patients with higher scores may benefit from more aggressive neoadjuvant treatment and closer postoperative surveillance. Further research could explore how different chemotherapy regimens affect survival outcomes in patients with varying scores, particularly comparing long-course versus short-course treatment and optimizing treatment strategies further.

P721

Practice Patterns for Venous Thromboembolism (VTE) Prophylaxis in Hospitalized Surgical Patients Who Developed VTE, a Retrospective Evaluation

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Introduction: In hospitalized surgical patients who developed venous thromboembolism (VTE), prophylaxis patterns were evaluated for appropriate weight-based dosing and interruptions in treatment. In combination with Caprini Score, this information will be used to implement new VTE prophylaxis protocols within the Department of Surgery.
Methods and Procedures: Chart review was performed on 34 surgical patients who developed perioperative VTE, evaluating inpatient prophylaxis practices at a single academic institution. The type of chemo prophylaxis, whether the dose was appropriately weight-based, as well as interruptions in treatment prior to developing VTE were collected. Each patient's Caprini Score was calculated based on perioperative demographics to determine risk of VTE occurrence.
Results: 34 surgical patients who developed VTE during hospital admission from January 2023 to August 2024 were included for review. One patient experienced a VTE at the site of surgical vessel repair and was excluded, five patients developed VTE prior to surgical intervention and were admitted to a medical service so were excluded, leaving 28 patients for evaluation. The average age was 52.3 years, 19 (67.9%) patients were male, and the average BMI was 31.4 kg/m^2. Eighteen (64.3%) patients experienced interruptions in prophylaxis prior to the VTE event. A large majority of those patients ($n = 17$, 94.4%) missed three or more doses prior to the VTE event. Ten (35.7%) patients had inadequate dosing based on their BMI. A Caprini Score was also calculated for each patient, with an average value of 7.1. Of the 26 patients considered "high risk" or "very high risk" for VTE with a Caprini Score > 5, 61.5% ($n = 16$) experienced at least one interruption in prophylaxis therapy, 11.5% ($n = 3$) had inappropriately dosed prophylaxis therapy, and 17.9% ($n = 5$) experienced both interruption and an inadequate dose of prophylaxis.
Conclusions: This evaluation identifies modifiable practice patterns related to VTE prophylaxis that can potentially reduce the occurrence of VTE in the highest risk surgical patients. A missed dose was frequently identified in these patients and is likely a contributing factor to developing VTE. The Caprini Score is easily calculated and helps identify patients at greatest risk of developing a VTE, and may prompt surgeons and other care providers to standardize their approach to VTE prophylaxis in hospitalized surgical patients.

P722

Admission to Medicine or Surgery Service for Cholecystitis: A Retrospective Cohort Review

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Introduction: For many conditions, specialized care improves the quality, effectiveness, and efficiency of treatment. We hypothesize that patients with cholecystitis admitted to a surgical service have better outcomes. We aim to determine whether the admitting service influences length of stay (LOS) and complications.
Methods: This retrospective cohort study evaluated patients at a tertiary care center from 2020 to 2023 with an ICD-10 code of K80 for cholelithiasis and/or cholecystitis. Patients undergoing elective cholecystectomies were excluded. The electronic medical record was queried for demographics, comorbidities, LOS, and 30-day readmission. Univariate and multivariate analysis was performed between the two groups.
Results: We evaluated 2529 patients during the study period. The patients admitted to the surgical service (43%) had a shorter LOS (6.7 days vs. 8.6 $p < 0.001$). Surgical patients had a lower readmission rate at 30 days (16.0 vs. 20.3%, $p = 0.006$) with an incident risk of readmission of 0.79 (95% CI 0.67–0.94, $p = 0.007$) compared to medicine-admitted patients.
Conclusion: Patients with cholecystectomy can be safely treated ON MOST SERVICES in a large academic medical center. However, surgical services provide more expedited management and lower rehospitalization rates.

P723

Pediatric Surgery Stapler Malfunction - A MAUDE Analysis

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Introduction: With advancements in medical technology, the use of surgical devices in pediatric surgery has increased, necessitating that these tools be safe for children. However, there is a paucity of research on mechanical malfunctions in clinical settings specific to pediatric surgery. This study aims to elucidate the frequency and types of surgical stapler malfunctions reported to the Food and Drug Administration (FDA).
Methods: We conducted a retrospective review of the Manufacturer and User Facility Device Experience (MAUDE) database for reports involving surgical staplers. Reports from 2018 to 2023 were extracted and analyzed for data on adverse effects and malfunctions. Reports involving patients aged 18 years or younger were included. Duplicates were removed by matching the patient's age, incident date, and incident narrative.
Results: Out of 441 reports, 37 (8.39%) pediatric reports were identified. After removing duplicates, 31 reports were analyzed. Of these, 25 (80.6%) reports pertained to the JUSTRIGHT 5MM STAPLER. No deaths were reported. Ten out of 31 incidents (32.3%) did not result in patient harm, and four reports (12.9%) lacked sufficient information regarding patient conditions. Serious injuries included four bleeding incidents, three organ perforations, two lacerations, two obstructions, and one pneumothorax. All reported malfunctions were device-related, with the most common issues being failure to form staples ($n = 6$) and firing problems ($n = 6$), followed by failure to fire and physical resistance/sticking ($n = 3$ each). Eleven incidents occurred during thoracic procedures, nine during laparoscopic appendectomies, and seven reports did not specify the procedures.
Conclusions: Despite rigorous safety mechanisms, malfunctions still occur in pediatric surgeries. Due to the voluntary nature of the MAUDE reporting system, there is likely to be underreporting. Also, wide disparities and many missing values were observed in the reports. These suggest that mandatory reporting and better standardization may benefit the medical community. Further study is warranted to understand device malfunctions and their effects on patients.

P724

Incidence, Risk Factors, and Outcomes of Pseudomembranous Colitis in Hospitalized Patients: A Three-Year Retrospective Study in Yemen

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Background: Pseudomembranous colitis (PMC) is a severe form of colonic inflammation, most commonly caused by Clostridium difficile infection (CDI) following antibiotic therapy. Globally, CDI has been linked to prolonged antibiotic use, with mortality rates ranging from 6 to 30% in severe cases. Pediatric patients, although less frequently affected, may experience severe complications. Studies suggest that delayed diagnosis, inappropriate initial treatment, and prolonged hospital stays exacerbate the severity of PMC. This study aims to assess the incidence, risk factors, and outcomes of PMC among hospitalized patients in Yemen, where healthcare-associated infections such as CDI are underreported and frequently misdiagnosed.
Methods: This three-year retrospective cohort study analyzed the records of 1,360 patients hospitalized for over 7 days and treated with antibiotics. The cohort included 470 pediatric patients initially misdiagnosed with cholera. We examined the development of PMC, focusing on treatment outcomes and complications. Logistic regression was used to identify risk factors for severe PMC and mortality.
Results: Among the 1360 patients, 51.5% (700) developed severe PMC requiring IV vancomycin and metronidazole, while 13.9% (190) experienced less severe cases responding to oral treatment. Of the pediatric patients, 34.6% (470) developed diarrhea, initially misdiagnosed as cholera but later confirmed to be PMC, with 20.2% (95) requiring prolonged treatment due to fatal systemic complications. Overall mortality was 3.3% (45/1360), significantly higher in severe PMC cases (6.4%, 45/700) due to septic shock ($p < 0.05$). The findings align with global reports showing high mortality in delayed treatment and severe cases of PMC.
Conclusions: Severe pseudomembranous colitis poses a significant challenge in hospitalized patients, particularly in resource-limited settings and poor healthcare systems like Yemen. Prolonged antibiotic use, misdiagnosis, and delayed treatment contributed to the severity of the condition. Mortality was especially high due to catastrophic systemic complications and misdiagnoses, emphasizing the need for better diagnostic protocols, extreme hygiene enforcement, and timely interventions to mitigate the impact of PMC.

P725

Evaluation of a Patient Engagement Application for Bariatric, Colorectal, and Gynecologic Oncology Surgery Within a Tertiary Care Centre to Reduce Healthcare Utilization

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Introduction: The emergence of mobile patient engagement technology has introduced a valuable tool to the realm of surgical care. Research suggests these programs not only bolster safety but also improve patient satisfaction, promote faster recovery, and reduce the necessity for follow-up visits. This trend is evident across various specialties such as breast, orthopedic, and gynecologic oncology procedures. However, the effect of these tools on non-surgical healthcare utilization, such as emergency department visits, readmission rate, and office contact is unknown.
Methods: Select patients scheduled for bariatric, colorectal, and gynecologic oncology surgeries were recruited to use a perioperative online guide (Seamless MD) over a one year period. This guide was used to personalize care based on the patient's surgery and offered specific personalized recommendations for their recovery. The guide also offered an opportunity to collect subjective and patient-reported data. Data was collected on four key domains: patient experience (including satisfaction), patient outcomes (like wound pain and opioid use), provider experience, and healthcare system metrics (e.g., emergency department use, 30-day readmissions).
Results: Throughout the enrollment period, 267 patients joined the program. Of those, 170 patients completed it. According to preliminary findings, 88% of participants reported feeling more prepared for surgery after completing the program, while 91% felt more confident managing their recovery at home. Additionally, 83% of patients were able to avoid making additional clinic phone calls, and 23% avoided a presentation to the emergency department.
Conclusion: These early findings suggest that an online perioperative patient guide could serve as a valuable tool in enhancing patient outcomes and potentially lowering healthcare costs. Data collection in the form of matched cohort study is ongoing.

P726

Impact of a Metabolic and Bariatric Surgery Program on Health and Dietary Habits: A Patient-Reported Outcomes Study

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Introduction: This study assessed changes in patients' self-reported health, dietary habits, and physical activity following the enrollment in a metabolic and bariatric surgery program (MBSP). Our MBSP includes a multidisciplinary team consisting of a metabolic and bariatric surgeon, nutritionist, nurse practitioners, psychologist, and ongoing administrative support individualized for each patient at an academic, accredited bariatric center of excellence.
Methods: A survey was distributed to patients after completion of the MBSP at least three months after their surgery during 2023–2024 (Fig. 1). Demographic data were collected, and responses were rated and analyzed using chi-square for statistical significance (Fig. 2).
Results: 46 patients completed the surveys (71.7% female, 28.3% male). Ethnic representation included 47.8% White, 19.6% African American, 26.1% Other/Not Listed, 2.2% Asian, 2.2% Native Hawaiian/Pacific Islander, and 2.2% Multiracial. The age distribution was 58.7% between 30–49 years old, 32.6% over 50 years old, and 8.7% 20–29 years old. Pre-MBSP, 60.9% of patients rated their overall health as "poor" or "very poor," and post-MBSP, 89.1% rated as "good" or "excellent" ($p < 0.0001$). Pre-MBSP, 58.5% considered their dietary habits "very unhealthy" or "unhealthy," and post-MBSP, 97.8% considered their dietary habits "healthy" or "very healthy." Pre-MBSP, 65% considered home-cooked/fresh food as the healthiest diet among five options listed, but after MBSP, 60% selected diets high in lean meat, high in fish, low fat, low carbs, vitamins, proteins, and minerals ($p = 0.0007$). 67.4% of patients indicated they "neither agreed or disagreed," "disagreed," or "strongly disagreed" with the statement, "I am knowledgeable of healthy eating habits" before initiating surgical consultation treatment, but afterwards, 93.4% indicated they "agreed" or "strongly agreed" with the statement ($p < 0.0001$). Pre-MBSP, when asked "How often do you aim to eat healthy everyday?," most stated they

aimed to eat healthy occasionally (69.6%), and post-MBSP, most stated they aimed to eat healthy "very often" (73.9%) ($p < 0.0001$). Initially, in terms of physical activity engagement, the majority of patients described themselves as sedentary (52.2%), and after, the highest frequency response was reported with engagement 2–3 times/week (56.5%) ($p < 0.0001$). 80.4% of respondents had received dietary counseling prior to their first consultation, with most patients deeming the MBSP "very useful" or "extremely useful" (84.8%).

Conclusion: The MBSP led to improvements in patient's self-reported health ratings, dietary habits, understanding of healthy eating, and physical activity levels, highlighting the intervention's effectiveness in enhancing overall physical well-being. Further research with larger sample sizes and longer follow-ups is warranted to validate these findings.

Patient Perception of Healthy Eating Behaviors Bariatric Surgery Questionnaire

Please read each question and select from the multiple-choice options, the answer that best rates your dietary health and physical activity BEFORE and AFTER Bariatric Surgery.

In general, how would rate your health?

	Very poor	Poor	Average	Good	Excellent
BEFORE Bariatric Surgery	○	○	○	○	○
AFTER Bariatric Surgery	○	○	○	○	○

How do you consider your dietary habits ...

	Very unhealthy	Unhealthy	Neither healthy nor unhealthy	Healthy	Very healthy
BEFORE Bariatric Surgery	○	○	○	○	○
AFTER Bariatric Surgery	○	○	○	○	○

What do you consider the healthiest diet among these options?

	Home cooked, fresh foods/ingredients	Organic	High in whole grain foods and high in dietary fiber	High in vegetables and fruits	Includes lean meat, high in fish, low fat, low carbs, vitamins, protein, and minerals
BEFORE Bariatric Surgery	○	○	○	○	○
AFTER Bariatric Surgery	○	○	○	○	○

I am knowledgeable of healthy eating habits ...

	Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree
BEFORE Bariatric Surgery	○	○	○	○	○
AFTER Bariatric Surgery	○	○	○	○	○

Do you aim to eat healthy everyday?

	Yes, very often	Yes, often	Occasionally	No, never	Do not know
BEFORE Bariatric Surgery	○	○	○	○	○
AFTER Bariatric Surgery	○	○	○	○	○

How would you rate your engagement in physical activity?

	Sedentary/No physical activity	Once a week	2-3 times week	5 day a week
BEFORE Bariatric Surgery	○	○	○	○
AFTER Bariatric Surgery	○	○	○	○

Have you ever received dietary counseling from a registered dietician or other healthcare professional BEFORE your first bariatric surgery consultation?
○ Yes, I did receive counseling before bariatric surgery
○ No, I did not receive counseling before bariatric surgery

How useful was the dietary counseling you received in direct preparation for bariatric surgery?
○ Extremely useful
○ Very useful
○ Somewhat useful
○ Slightly useful
○ Not at all useful

Question #1: In general, how would you rate your health?

Response n (%)	Before MBSP	After MBSP	p-value
Very Poor	6 (13.0%)	1 (2.17%)	p<0.0001
Poor	22 (47.8%)	0 (0%)	
Average	13 (28.3%)	4 (8.7%)	
Good	5 (10.9%)	30 (65.2%)	
Excellent	0 (0%)	11 (23.9%)	

Question #2: How would you consider your dietary habits?

Response n (%)	Before MBSP	After MBSP	p-value
Very Unhealthy	13 (13.8%)	0 (0%)	p<0.0001
Unhealthy	21 (44.7%)	0 (0%)	
Neither Healthy or Unhealthy	9 (28.7%)	1 (2.2%)	
Healthy	3 (12.8%)	30 (65.2%)	
Very Healthy	0 (0%)	15 (32.6%)	

Question #3: What do you consider the healthiest diet among these options?

Response n (%)	Before MBSP	After MBSP	p-value
Home cooked/fresh food	30 (65.2%)	16 (34.8%)	p=0.0007
Organic	0 (0%)	0 (0%)	
High in whole grains, dietary fiber	5 (10.9%)	1 (2.2%)	
High in vegetables and fruits	2 (4.4%)	1 (2.2%)	
Includes lean meat, high in fish, low fat, low carbs, vitamins, protein, and minerals	9 (19.6%)	28 (60.9%)	

Question #4: Please select how much you agree or disagree with the following statement: I am knowledgeable of healthy eating habits.

Response n (%)	Before MBSP	After MBSP	p-value
Strongly disagree	2 (4.4%)	0 (0%)	p<0.0001
Disagree	11 (23.9%)	0 (0%)	
Neither agree nor disagree	18 (39.1%)	3 (6.5%)	
Agree	13 (28.3%)	20 (43.5%)	
Strongly agree	2 (4.4%)	23 (50%)	

Question #5: How often do you aim to eat healthy every day?

Response n (%)	Before MBSP	After MBSP	p-value
Do not know	0 (0%)	0 (0%)	p<0.0001
Never	5 (10.9%)	0 (0%)	
Occasionally	32 (69.6%)	0 (0%)	
Often	7 (15.2%)	12 (26.1%)	
Very often	2 (4.4%)	34 (73.9%)	

Question #6: How would you rate your engagement in physical activity?

Response n (%)	Before MBSP	After MBSP	p-value
Sedentary/No physical activity	24 (52.2%)	2 (4.4%)	p<0.0001
Once a week	14 (30.4%)	2 (4.4%)	
2-3 times a week	7 (15.2%)	26 (56.5%)	
5 days a week	1 (2.2%)	16 (34.8%)	

Question #7: Have you ever received dietary counseling from a registered dietician or other healthcare professional BEFORE your first bariatric surgery consultation?

Response	n (%)
No	9 (19.6%)
Yes	37 (80.4%)

Question #8: How useful was the dietary counseling you received in direct preparation for bariatric surgery?

Response	n (%)
Not at all useful	0 (0%)
Slightly useful	2 (4.4%)
Somewhat useful	5 (10.9%)
Very useful	22 (47.8%)
Extremely useful	17 (37%)

P727

Wireless Proctoring by TELEPRO System: From Beside to International

Satoru Takayama; Oogaki Tokushukai

With the advent of laparoscopic and robotic surgery, it has become possible to instruct without scrabbing the surgical field. In fact, it is common to instruct while looking at the monitor without scrabbing but writing on the monitor is a complicated process. With the Telepro System (TENMA co., Ltd, Japan), however, it is possible to write with a pen on a pad or touch-sensitive laptop in proctor's hand, enabling teaching. The Telepro System allows the user to sit beside the surgeon and write on the monitor to provide sensitive guidance by pen. And because the latency of this system is extremely low, the instructor is wireless and can move freely, even via WiFi latency. This means that teaching can be done remotely. In fact, we have used this system for teaching not only beside of surgeon, but also between hospitals in different parts of the country and even overseas. Specifically, we received instruction in Robotic surgery from Malaysia and Australia to Japan. The instructions are written into laptop monitor in Malaysia or Australia that transmits the da Vinci Surgeon's Console with instruction voice by awareness delay. This international tele proctoring system was used four times, three in Kuala Lumpur, to Tokyo, Shizuoka, and Nagoya, Japan and once in Sydney to Shizuoka, Japan. and the proctoring was given without delay, as if the instructor were just behind the operator. This was possible because latency was low even between foreign countries by video compression technology, and the latency was 0.05 average which is almost imperceptible. We usually use this system as the beside instruction system during operation and use domestic instruction system within Japan. Because as an instruction by arrow

using pen on monitor enable more precise teaching than only voice. We experienced the possibility of teaching regardless of the distance, and it turned out that in the future it will be easy to teach even across national borders, and we will be able to receive instruction as if there were a surgeon behind us without long distance invitation of proctor surgeon.

P728

Racial Inequities in Robotic Bariatric Surgery: An MBSAQIP Analysis

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Introduction: The proportion of bariatric surgeries completed robotically is continuing to increase. Access to robotic surgical technology remains a limited resource. In this context, we seek to determine if patient race influences the likelihood of undergoing bariatric surgery with a robotic surgical platform.
Methods: We queried the 2021 and 2022 Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database to identify White, African American, Asian, Hispanic, Native Hawaiian/Pacific Islander, and American Indian/Native Alaskan patients who underwent bariatric surgery. Comparisons of baseline clinical characteristics of our study cohorts were performed using the Wilcoxon rank sum test, Pearson's Chi-squared test, and Fisher's exact test where appropriate. A multivariable logistic regression analysis was used to assess the likelihood of racial minorities undergoing robotic bariatric surgery (versus the conventional laparoscopic approach) in comparison to white patients. Any baseline demographic or clinical characteristics related to each outcome that were significant based on univariate analysis were adjusted for in the multivariable regression model.
Results: We identified 386,557 patients that had bariatric surgery between 2021 and 2022. Of these, 227,967 were White (59.0%), 83,097 were Black (21.5%), 70,335 were Hispanic (18.2%), 2393 were Asian (0.6%), 1900 were American Indian/Native Alaskan (0.5%) and 865 were Native Hawaiian or other Pacific Islander (0.2%). When compared to White patients, Black patients were more likely to have their procedures performed robotically (OR 1.09 [1.07–1.12], $p < 0.001$). Asian patients were less likely to have robotic surgery than Whites; however, this difference did not reach statistical significance (OR 0.91 [0.83–1.01], $p = 0.066$). Hispanic (OR 0.95 [0.93–0.97], $p < 0.001$), Native Hawaiian/Pacific Islander (OR 0.62 [.52–0.73], $p < 0.001$), and American Indian/Native Alaskan (OR 0.68 [0.60–0.76], $p < 0.001$) all had significantly lower likelihoods of undergoing robotic bariatric surgery.
Conclusion: African American patients are slightly more likely than White patients to undergo bariatric surgery with robotic assistance. Hispanics, Native Hawaiian/Pacific islanders, and American Indian/Native Alaskans are less likely to have their procedures completed robotically than White patients. There are significant racial inequities in access to robotic technologies in bariatric surgery.

P729

Surgical Management of Symptomatic Cholelithiasis in the Setting of Complete Situs Inversus

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Background: Situs inversus totalis (SIT) is a rare congenital abnormality affecting approximately 1 in 10,000 people resulting in a mirror transposition of the thoracic and abdominal organs. In addition to the laterality disturbances, situs inversus totalis is associated with several other abnormalities including bronchiectasis, sinusitis, and deficient tracheobronchial cilia, known as Kartagener's syndrome. SIT leads to a delay in the diagnosis of abdominal pathologies including acute cholecystitis and cholelithiasis, as patients typically present with atypical, left, hypochondrial pain. In addition to diagnostic uncertainty, SIT also results in potential technical challenges.
Case Presentation: The patient is a 53-year-old female with a 4-year history of cholelithiasis with several episodes of biliary colic in the setting of complete situs inversus presented to the outpatient general surgery clinic for evaluation of left upper quadrant abdominal pain associated with fatty foods desiring surgical intervention. MRCP performed at the current presentation showed moderate gallbladder distention, cholelithiasis, and extrahepatic common bile duct dilation without evidence of acute cholecystitis or other source of obstruction. Decision was made to proceed with robot-assisted laparoscopic cholecystectomy. Eight millimeter robotic trocars were placed in a curvilinear manner with two on the left side, one, mid-abdomen, and one on the right side of the abdomen. The gallbladder was found to be extremely distended making it difficult to retract cephalad. Thus, the decision was made to decompress it. There was also a large stone found at the gallbladder neck. All other aspects of the procedure proceeded in a routine fashion.
Discussion: The first successful laparoscopic cholecystectomy in a patient with situs inversus was performed in 1991 by Campos and Sipes, with subsequent reports describing a technically challenging procedure. Reports made mention of the use of an assistant for retraction, the use of a mirror image placement of ports and instruments, as well as various positionings of the surgeon to help alleviate some degree of the challenge of this procedure. Additionally, surgeon handedness has been found to make a difference. The contralateral disposition of the abdominal viscera, resulting in mirror image anatomy, poses a major technical challenge for the right-handed surgeon, who would now need to perform major steps of the procedure with his non-dominant hand. However, there is one school of thought that the use of robotic assistance can effectively alleviate this difference and thus may be preferred over laparoscopic cholecystectomy in the case of complete situs inversus.

P730

Hernia Heptathalon

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Presentation: The patient is a 72-year-old female who presents with chronic bilateral lower abdominal pain. She has a history of chronic pain with daily narcotic use and is a 50-pack year smoker. There is no history of previous hernia repairs. On exam, she has a reducible left inguinal hernia. CT imaging demonstrated bilateral inguinal hernias, a right Spigelian hernia, as well as an anterior diaphragmatic hernia

containing transverse colon. After cessation of tobacco use for six weeks, a minimally invasive-robotic assisted surgical repair of her inguinal and diaphragmatic hernias was offered.
Operative Approach: Three 8 mm robotic trocars were placed across the abdomen. Five separate hernia defects were noted in the lower abdomen: a Pantaloon hernia and incarcerated obturator hernia on the left, and Spigelian, incarcerated obturator and femoral hernias on the right. Bilateral TAPP inguinal hernia repairs were performed with placement of a mid-weight mesh. The Spigelian defect, containing pre-peritoneal fat, was approximated with barbed suture. The robot was rotated 180 degrees for repair of the diaphragmatic hernia. The transverse colon was reduced from the mediastinum and the falciform ligament divided. The hernia sac was reduced and divided. The final defect measured 9 cm × 5 cm and was repaired using multiple interrupted horizontal mattress permanent sutures without undue tension. An underlay coated permanent mesh was placed.
Post-Operative Course: The patient was admitted overnight and had an uneventful postoperative course. She continued to do well post-operatively, with resolution of her chronic lower abdominal pain.
Discussion: Obturator and femoral hernias are rare, with a prevalence of 1–4% and less than 1%, respectively. Both are typically found in elderly patients, more commonly in women. Anterior (Morgagni) diaphragmatic hernias are particularly rare, constituting 1–3% of all congenital diaphragmatic hernias. Morgagni hernias may go undiagnosed until adulthood if symptomatic. Unlike inguinal hernias, which require repair once symptomatic, operative repair of femoral, obturator, and diaphragmatic hernias are recommended when identified. The simultaneous presence of an inguinal, obturator, femoral, Spigelian and diaphragmatic hernia with subsequent repair in the same patient has not been reported in the literature. Here we reported a unique case in which six separate hernias are repaired concurrently via robotic approach. Although a rare case, the Xi robotic system proved advantageous, allowing surgical repair deep within the pelvis to high on the diaphragm without moving ports, the patient, or the robot.

P731

Comparative Analysis of Laparoscopic and Robotic Appendectomy: A Multi-Hospital Retrospective Cohort Study

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Introduction: Appendectomies are one of the most commonly performed procedures by general surgeons in the United States and the laparoscopic approach has been the standard for decades. However, adoption of robotic assistance for the treatment of diseases of the appendix continues to grow. Despite this growth, clinical outcomes regarding laparoscopic versus robotic appendectomy remain unclear.
Methods: We conducted a multi-hospital retrospective cohort study of patients who underwent appendectomy between August 1, 2021 and February 29, 2024. We compared preoperative clinical characteristics, intra-operative surgical details, and post-operative outcomes between laparoscopic and robotic groups. The post-operative outcomes analyzed included conversion to open, need for extended resection, 30-day return to the operating room, need for blood transfusion, 30-day readmission, abscess requiring drain, and death. Statistical analysis included chi-square tests, Student *t*-tests, and multivariable logistic regression.
Results: A total of 1431 patients (1079 laparoscopic, 352 robotic) were included for analysis. The robotic group was found to have a higher proportion of Caucasian patients, more American Society of Anesthesiologist (ASA) class 2 patients, and a higher proportion of non-elective cases. We also found that more robotic appendectomies were completed at community hospital sites rather than larger academic medical centers. Robotic surgery was associated with significantly lower rates of conversion to open ($p < 0.001$). Additionally, robotics was associated with significantly lower rates of unexpected extended resections ($p = 0.015$). We also saw trends towards statistical significance for reduced need for blood transfusion and abscess requiring IR drain in the robotic group. To account for preoperative differences between the two groups, a multivariable logistic regression analysis was performed, and the robotic group was associated with a 66% decreased risk of any complication (OR = 0.34, 95% CI [0.17, 0.68]).
Conclusion: Robotic appendectomy demonstrates favorable clinical outcomes compared to the traditional laparoscopic approach. These findings support the advantages of a robotic-assisted approach to appendectomy.

P733

24/7 Robotic Access in Emergency General Surgery: A Unique Platform for Perforated Peptic Ulcer Disease

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Introduction: The management of peptic ulcer disease has transitioned from a surgical to predominantly medical approach thanks to the introduction of proton pump inhibitors. Operative intervention is reserved for complicated ulcer disease such as perforation, hemorrhage, and obstruction. This collective case study examines the advantage of robotic assisted approach to complex perforated peptic ulcer disease in the acute care setting.
Methods: Two patients were admitted to a 321-bed community hospital with perforated peptic ulcer disease. Each underwent omental patch repair with the da Vinci Xi robotic surgical system during non-weekday hours by two surgeons. The first patient was an 85-year-old male with longstanding history of Aspirin use. He was found to have pneumoperitoneum in the upper abdomen with peri-splenic ascites on cross-sectional imaging. He underwent robotic-assisted omental patch repair during weekend hours. The second patient was a 55-year-old female with multiple comorbidities including daily tobacco and alcohol use. CT imaging revealed a large amount of pneumoperitoneum and pelvic ascites. She was taken for robotic-assisted omental patch repair at 02:00 AM on a weeknight. Here we emphasize two patient presentations that highlight our institution's 24-h access to robotic-assisted approach to emergency general surgery.
Conclusion: The use of robotic surgery has increased over time and the application of robotic-assisted acute care surgery is an emerging discussion in recent literature. While surgical robotic systems are seen across multiple clinical specialties, skepticism remains regarding robotic-assisted procedures in emergency general surgery. However, several studies have shown increasing popularity with robotic surgery with a favorable decrease in conversion rates to open surgery when compared to laparoscopic surgery. With these cases, we exemplify the advantages and versatility of the robotic platform. The advancement of robotic technology is often cited as more facile and user-friendly, which has opened new opportunities for its application in the emergency setting. The dexterity afforded by the robot assisted our efforts, specifically related to suturing of the omental patch, to maintain a minimally invasive surgery for both patients. Our use of robotic assisted surgery during non-weekday hours epitomizes the opportunities to improve patient care and compete in a rapidly-evolving field. With advancements in minimally invasive practices, it is crucial to

provide our patients with access to high-quality care regardless of the time of day. Our cases demonstrate the ability to support a 24/7 robotic program and adds evidence to the ongoing support of using robotic systems in emergency general surgery.

P734

Magnetic-Assisted Single-Surgeon Robotic Laparoscopic Surgeries Using Mars

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Introduction: Magnetic-Assisted Robotic Surgery (MARS) is a novel platform designed to enhance the benefits of minimally invasive surgery for patients while improving surgeon control and visualization. Previous studies have shown promising results in various laparoscopic surgeries, such as cholecystectomy, bariatric, and renal procedures. One of the key features of MARS is its ability to allow the surgeon full control of the instruments, eliminating the need for an assistant. There is a global shortage of high-quality surgical assistance, which leads to disparities in access to safe, effective, and timely surgical care. This study aims to evaluate the feasibility and efficacy of MARS when used by a single surgeon during reduced-port laparoscopic surgery.
Methods: A retrospective, single-center study was conducted using electronic medical records from 59 patients who underwent reduced-port laparoscopic surgery assisted by MARS between February 2024 and August 2024. All procedures were performed by a single surgeon. Data on surgical time, 30-day postoperative complications, hospital readmission rates, and deviations from hospital protocol were analyzed. Statistical analyses were performed using Python, version 3.11.5. Continuous data were expressed as the mean and standard deviation for normally distributed data, or as the median and range for non-normally distributed data. Categorical variables were reported as frequencies and percentages.
Results: Fifty-nine patients were included in the analysis, consisting of 51 laparoscopic cholecystectomies, 1 laparoscopic cholecystectomy with inguinal hernia repair, and 7 laparoscopic gynecologic procedures. The cohort included 53 females and 6 males, with a mean age of 46.6 years (SD = 13.5). In all cases, at least one fewer port/incision was used. The median operative time was 50.0 min (range: 27.0–120.0 min). For cholecystectomy, the median time was 47 min (range: 17–95 min). No 30-day postoperative complications, hospital readmissions, or deviations from hospital protocol were reported in any of the surgeries.
Conclusion: This study demonstrates that the MARS system is feasible, safe, and effective when used by a single surgeon in reduced-port robotic laparoscopic procedures. These findings confirm previous results on the efficacy, safety, and feasibility of MARS in robotic laparoscopic procedures, while also providing new insights into its use in inguinal hernia repair and laparoscopic gynecologic procedures. Additionally, it offers a viable solution aimed at addressing the shortage of high quality surgical assistants, thereby increasing surgical volumes.

P735

Factors Influencing Robotic-Assisted Surgery Total Cost

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Introduction: Higher cost is one common concern of robotic-assisted surgery (RAS). This study aims to investigate potential factors that have an impact on the total cost (the sum of direct and indirect costs) of RAS.
Methods: We extracted 1526 RAS cases, including 499 Cholecystectomy (RCH), 138 Colectomy (RCO) and 889 Inguinal Hernia (RIH), from hospital records with 6 variables – total cost (TC), surgery time length (STL), length of stay (LOS), patient type (PT), case complexity assessed by DRG, and payor (PY). Pearson correlations and boosted tree predictive model with dependent resampling was applied to assess the predictor total effect.
Results: Majority RCO were inpatient cases (136/138, 98.5%), followed by RCH (103/499, 20.6%) and RIH (12/889, 1.3%). The average TC of outpatient RAS was $23,230.7 (SEM 991.3) and the mean TC of inpatient RAS was $21,882 (SEM 2698.5). Overall, STL had no correlation with TC ($r = -0.05$, $p = 0.070$) but LOS significantly correlated with TC ($r = 0.65$, $p < 0.0001$). The predicting modeling showed LOS had the strongest predictor total effect for TC in all 3 procedures: RCH – LOS 0.90 followed by DRG 0.41; RCO – LOS 0.64 followed by PY 0.33; RIH – LOS 0.89 followed by PY 0.24.
Conclusions: Our findings suggest that LOS and case complexity assessed by DRG are two potential factors influencing the TC of RCH; while in RCO and RIH, LOS and PY may have a considerable impact on TC. Future study is needed for further validate these findings.

P736

A Case of Epiphrenic Esophageal Diverticulum and Concurrent Mid-Esophageal Diverticulum

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Esophageal diverticulum are very uncommon lesions which are classified based on their locations, pathology, being pulsion or traction and morphology being a true or false diverticulum. Symptoms usually present as dysphagia, regurgitation, heartburn, halitosis and vomiting and patients are usually symptomatic 15–20% of the time. These symptoms are similar to many gastrointestinal disorders therefore making the diagnosis difficult. Contrast studies remain the investigation of choice and the estimated incidence of EPD is about 1:500,000 per year. Diagnostic evaluation consists of a barium swallow, esophagogastroduodenoscopy (EGD) and manometry. This report presents a patient who was diagnosed with both diverticulum, was symptomatic and underwent operative repair.

Case: 82 year old female, past medical history of esophageal reflux and a hiatal hernia, presented with a three week complaint of dysphagia. Esophagram revealed a large hiatal hernia, mid esophageal & epiphrenic diverticulum. She underwent robotic assisted esophageal diverticulectomy, epiphrenic diverticulopexy, Heller myotomy, hiatal hernia repair and Dor Fundoplication. Esophagram revealed no leak. Discharged symptom free.

These rare entities are very uncommon. Reviewing the literature, there does not appear to be any documented reports of a patient with both types of diverticulum, this patients occurrence is extremely unique. Upon reviewing the patients history, there was no obvious etiology as to why she developed either of the diverticulum outside of her long history of reflux, but she notably had chronic use of tobacco which raises further questions, has there been an increase in esophageal diverticulum secondary to tobacco use? This question may allow opportunities for further study.

P737

Robotic Assisted Laparoscopic Enterolithotomy for Gallstone Ileus

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This case report describes an elderly female with multiple comorbidities and delayed presentation of mechanical small bowel obstruction. This was suspected to be caused by gallstone ileus after visualization of pneumobilia and radiopaque object within the abdomen on cross sectional imaging. A robotic assisted laparoscopic enterolithotomy was carried out successfully, utilizing three 8 mm robotic port sites and one 5 mm laparoscopic port for suction/irrigation to control any enteric spillage during enterotomy and two layer repair. The patient was discharged on day 4 after tolerating a soft diet with full return of bowel function, without complications and with limited pain due to the minimally invasive approach and short operative time that the robotic range of motion allowed for when running the bowel proximal from the ileocecal valve to the level of the obturating stone which was in the proximal ileum. This technique describes an ideal approach to the minimally invasive management of gallstone ileus.

P738

Florence-Lapchole: Automated Surgical Scene Inference and Segmentation with Natural Language-Guided Online Interface

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Introduction: Studies have shown the feasibility of using laparoscopic surgical videos, e.g., laparoscopic cholecystectomy (LapChole), for objective skill assessment and tool-tissue interaction inference. Recently, attention-based deep learning models such as Florence-2 (Microsoft) and SAM2 (Meta) for fast object detection and tracking have been introduced. Their temporal and geometrical attention architecture has led to superior accuracy in detection and tracking compared to existing models. However, their performance on surgical video inference has not been tested. A favourable use case of such models can be accurate annotation and segmentation of laparoscopic surgical videos, e.g., LapChole, towards training AI models based on semi-automatic annotations. Especially in gastrointestinal surgery, the variety of tissues and instruments has made manual annotation of videos cumbersome, subjected to variability, and time-consuming. In this study, we developed a novel online deep-learning-based platform for automatic segmentation and annotation of laparoscopic videos and studied its performance.

Methods and Procedures: We employed a large language model based on GPT-4 (OpenAI, CA, USA), fine-tuned to process expert's text prompts such as "identify and trace the grasper" in a surgical context. These prompts were passed to the Florence2-LapChole vision model, our fine-tuned Florence-2 model, to perform tissue and tool identification, i.e., abdominal wall, liver, fat, grasper, blood, liver ligament, connective tissue, cystic duct, gallbladder, gastrointestinal tract, hook. SAM2 was used to initiate the object detection, allowing users to confirm accuracy and refine the initially selected points of interest via manual/verbal frame exploration. The online platform subsequently uses Florence2 for object detection and SAM2 for temporal tracking across the entire video.

Fig. 1 Three auto-generated masks on a representative LapChole video

Results: Figure 1 depicts a snapshot of the online platform with three auto-generated masks. The completion time of auto-segmentation for a series of 60-s videos was evaluated. The platform's object tracking accuracy was studied by comparing the produced masks with the manual segmentations available on the Roboflow dataset for the same videos. The average computational time for 60s videos was 113.2-s. Also, user interaction time with the platform for the same video annotations was 259.3-s. Florence2-LapChole, the model responsible for object detection, achieved an accuracy of 82% using the Intersection Over Union (IoU) metric.

Conclusion: The proposed AI platform reduced the annotation time of LapChole videos from hours to minutes. Its ability to handle complex object movements and occlusions enhances surgical video analysis, producing annotations crucial for advancing surgical techniques and future AI developments.

P739

Comparison in Intraoperative Energy Devices LigaSure, Harmonic Scalpel and Robotic Scissors and Its Correlation to Developing Ileus Post Operatively in Colorectal Elective Surgery

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Introduction: Postoperative ileus is a common complication following abdominal surgeries and often associated with delayed recovery and subsequent increased healthcare costs. Various surgical tools, such as the Robotic Scissors, Harmonic Scalpel, and LigaSure, are widely used to minimize tissue trauma and enhance procedural efficiency. However, the potential impact of these instruments on postoperative outcomes, including the incidence of ileus, remains a topic of interest.

This study aims to investigate whether there is a statistically significant difference in the rates of ileus among patients undergoing surgery with these three tools.

Procedure: Retrospective data collection from 2017 to 2023 of all cancer resections which has taken place in our Hospital Trust onto a database. Subjects were divided into three energy device groups with multiple variables recorded including demographics, pre operative. We excluded all open cases, conversion to open cases and cases where multiple devices were used. We performed chi-square test compare the observed frequencies of ileus cases to see if there are any statistical differences between groups.

Results: A total of 611 different cancer colon resection cases were reviewed. The median age of the patients was 71 (22–92) years; M:F 1:0.7. The study was divided into three groups Robotic Scissors, LigaSure and Harmonic. In the Robotic Scissors group, out of 101 total cases, 8 patients developed ileus, resulting in an ileus rate of 7.9%. For the Harmonic Scalpel group, there were 407 total cases, with 50 patients experiencing ileus, corresponding to an ileus rate of 12.3%. Lastly, in the LigaSure group, 103 total cases were recorded, with 10 patients developing ileus, leading to an ileus rate of 9.7%.

Based on the statistical analysis conducted using a chi-square test for independence, there is no significant difference in the rates of ileus among patients who underwent surgery with the Robotic Scissors, Harmonic Scalpel, or LigaSure. The p-value of 0.706 indicates that the observed differences in ileus incidence are not statistically significant at the conventional threshold of 0.05.

Conclusion: We conclude that the differences in ileus rates between these surgical tools are likely due to random chance, and there is no evidence to suggest that one tool is associated with a higher or lower rate of ileus compared to the others in this dataset.

P740

Robotic Pancreaticoduodenectomy is Associated with Reduced Morbidity Compared with Conventional Laparoscopic Pancreaticoduodenectomy: A Systematic Review AND Meta-analysis

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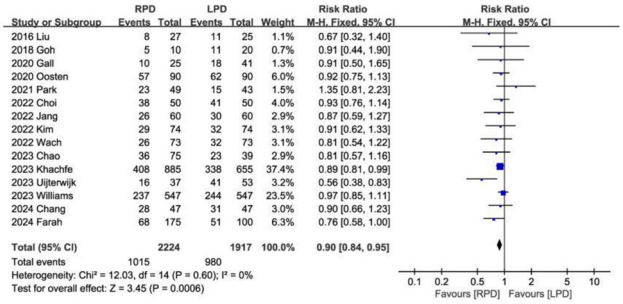

Objective: Minimally invasive Pancreatoduodenectomy is increasingly utilized. The flexibility of the robotic system in resection and reconstruction provides potential benefits in pancreaticoduodenectomy. Increasingly, robotic pancreaticoduodenectomy (RPD) has been reported with favourable outcomes. However, whether RPD is superior to laparoscopic pancreaticoduodenectomy (LPD) remains controversial. The study aims to assess the available literature and compare the perioperative outcomes of RPD and LPD.

Methods: The Embase, Web of Science, PubMed, Cochrane Library, and Scopus databases were searched for articles published up to August 20, 2024. Risk ratios (RRs) and mean differences (MDs) with 95% confidence intervals (CIs) were calculated. The I^2 statistic was used to assess the degree of heterogeneity. A random-effects model was used if $I^2 > 50\%$; otherwise, a fixed-effects model was employed.

Results: 32 studies were included, with a total of 16227 patients (RPD group: 6718 patients; LPD group: 9509 patients). Compared with LPD, RPD has lower overall morbidity (RR 0.90, 95% CI 0.84, 0.95; Heterogeneity: $I^2 = 0\%$, $P = 0.60$), conversion (RR 0.44, 95% CI 0.35, 0.56; Heterogeneity: $I^2 = 60\%$, $P = 0.0003$) and blood transfusion rates (RR 0.53, 95% CI 0.45, 0.62; Heterogeneity: $I^2 = 21\%$, $P = 0.23$), shorter length of stay (MD, − 0.50 days; 95% CI, − 0.87, − 0.13, $P = 0.008$), and higher number of harvested lymph nodes (MD, 1.93; 95% CI, 0.86, 2.99, $P = 0.0004$; $I^2 = 85\%$). There were no significant differences observed in 90-day mortality (RR, 0.93), major complications (RR, 1.03), operative time (MD, − 1.71 min), blood loss (MD, − 26.19 mL), reoperation (RR, 0.97), bile leak (RR, 0.87), postoperative pancreatic fistula (RR, 1.01), delayed gastric emptying (RR, 1.09), and R0 resection (RR, 0.98) between the groups. In addition, according to the funnel plots and Egger tests, and no significant publication bias was observed.

Conclusions: Robotic-assisted surgery for PD is safe and feasible. Compared to LPD, it offers better short-term outcomes, such as reduced postoperative morbidity, blood transfusion, conversion, length of hospital stay, and increased number of lymph node dissection. Further randomized controlled trials to verify the potential advantages of RPD over LPD are warranted. In addition, these results may help pancreatic surgeons in their choice of surgical approaches.

P742

Rare Case Report—Minimally Invasive Repair of Bilateral Morgagni Hernia Complicated by Diaphragmatic Rupture Secondary to Loss of Abdominal Domain

Cecilia Lee, DO; Kevin Jamil, MD; Corewell Health

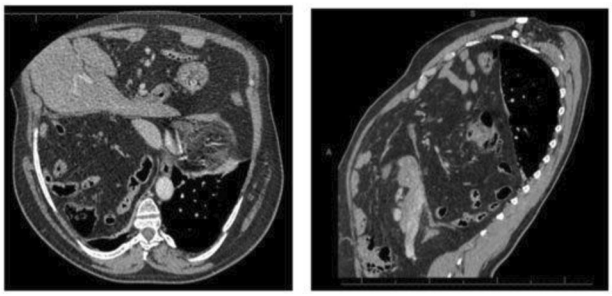

Figure 1 & 2 Computed tomography (CT) revealed a diaphragm hernia involving the liver, mesenteric fat, and small and large bowel loops in the right hemithorax.

Figure 3 Chest X-ray at POD 0

Figure 4 Chest X-ray at POD 4

Bilateral Morgagni hernias are rare congenital diaphragmatic defects caused by the failure of fusion of the seventh costochondral arch with the pars sternalis. Chronic diaphragmatic hernias require challenging complex closure due to loss of the abdominal domain (also referred to as loss of domain (LOD)). Loss of domain involves the visceral content in the hernia sac being greater than the capacity of the abdominal cavity, which compromises tension-free hernia repair and poses an increased risk of compartment syndrome, fascial dehiscence, respiratory compromise, or poor bowel function.

This case describes a 50-year-old male who underwent repair via a laparoscopic approach combined with right VATS and a Gore-Tex patch for a large bilateral Morgagni hernia; the patient then experienced complete diaphragm avulsion secondary to loss of domain and increased intraabdominal pressure and underwent reconstruction via right thoracotomy with Gore-Tex mesh. This case report discusses the challenges faced with loss of domain with chronic diaphragm hernias, parallel challenges faced in both diaphragm and abdominal hernia repairs, and the goals for techniques such as preoperative pneumoperitoneum and injection of Botulinum toxin into the lateral abdominal wall to be incorporated for preoperative optimization for large complex diaphragm hernia repairs, which both significantly lengthened the abdominal wall muscle and increased cavity compliance.

P744

Feasibility of An Artificial Intelligence-Powered Digital Surgical Assistant to Improve Efficiency of Motion in Surgery

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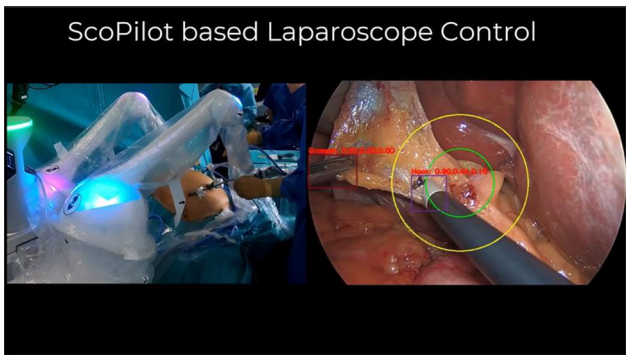
Background: Efficiency of motion in surgery refers to movements and actions to achieve surgical tasks with minimal unnecessary motion. It emphasizes precision that reduces time, improves accuracy, and enhances overall workflow during procedures. Efficiency of motion is a critical factor in assessing surgical performance, with direct implications for quality, safety, and outcomes in robotic-assisted surgery. It is commonly assessed using the validated Global Evaluative Assessment of Robotic Skills (GEARS) scale, which collectively uses efficiency of motion, task completion, precision, instrument control, and overall workflow to assess performance. In current surgical systems, performance is greatly affected by human factors. An artificial intelligence (AI)-powered system could have great value for reducing human error and improving efficiency of motion. Our goal was to assess the feasibility of a novel bedside digital surgical assistant with AI-powered computer vision to improve efficiency of motion during minimally invasive surgery (MIS)..
Method: A prospective multicenter observational study was performed using the Maestro system (Moon Surgical, Paris, FR) for MIS cases. Maestro's AI-powered ScoPilot feature optimizes surgeon control and manipulation of camera position simply by moving a selected instrument. Scopilot was used in all cases. Video analysis was performed using the GEARS scale to assess performance, with attention to efficiency of motion (measured on a 1–5 Likert scale). Data were analyzed using frequency statistics.
Results: Video analysis of 20 procedures involving 3 surgeons was performed. The procedures performed were cholecystectomy (n = 16, 80%), inguinal (n = 2, 10%) and Gastric Sleeves (n = 2, 10%). Using ScoPilot, efficiency of motion was a perfect 5/5 in all procedures reviewed. There was optimal visualization of the instruments on screen, smooth, appropriate, and accurate instrument movements, and ideal instrument control.
Conclusion: The Maestro System's AI-powered ScoPilot helped optimize efficiency of motion in MIS, across a range of procedures, surgeons, and centers. The ScoPilot software demonstrated feasibility for improving surgical performance in MIS. These results highlight the promise of the platform and support further study to optimize quality, outcomes, and safety.



P746

Robotic SP General Surgery Experience in Single Center Institution

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Background: Single-port robotic surgery marks a significant advancement in minimally invasive techniques, offering notable advantages over traditional multi-port single site robotic and laparoscopic single-port approaches. The da Vinci SP robotic surgical system was specifically developed to address the challenges of single-incision laparoscopic surgery. In this study, we aim to share our initial experience with robotic single-port surgeries using the da Vinci® SP system across a range of general surgical procedures.
Methods: A retrospective series of robotic single-port (SP) transabdominal procedures was analyzed, including Trans abdominal preperitoneal inguinal hernia repair, cholecystectomy, appendectomy, sleeve gastrectomy, Nissen fundoplication, gastric resection, Iliopsoas lipoma resection, ventral hernia repair, liver cyst resection, and hiatal hernia repair, all performed using the Da Vinci SP robotic platform. The primary endpoints were safety and feasibility, defined by the need for conversion and the incidence of perioperative complications. The study period extended from July 2019 to August 2024.
Results: During the period of the study, 445 patients underwent robotic single port surgery. The majority of the cases represent single port robotic cholecystectomies ($n = 282$), followed by the inguinal hernia repair ($n = 146$). All the procedures took place in the main OR of UI Health ($n = 396$) as well as the Specialty Care Building Outpatient Facility located in the same institution ($n = 49$). The complications rate represented 3.7% ($n = 16$) majority of them are Clavien Dindo classification I (Superficial SSI).
A total of 4 cases presented incisional hernia after the index surgery (0.91%), noted in up to 487 days (mean) follow up.
Conclusion: Robotic single port platform is a safe and feasible approach with good future potentials for most general surgery procedures and more evidence is needed.

P747

Pioneering Augmented Laparoscopy in Bariatric Surgery: A Multicenter Evaluation Using the Maestro System

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Background: Bariatric surgery presents unique challenges due to the complexity of the anatomy, requiring precise visualization and tissue manipulation. The Maestro™ System, a novel digital assistant for laparoscopy, comprises a cart and two robotic arms that assist the surgeon by providing dynamic scope control and tissue exposure with haptic feedback. This system maintains the surgeon's presence at the patient's bedside, ensuring full control over all instruments within the operative field. This study evaluates the feasibility, safety, and impact of the Maestro System in bariatric procedures.
Methods: This retrospective analysis reviewed a multicenter, prospectively gathered series of 161 bariatric procedures, including 84 sleeve gastrectomies and 77 Roux-en-Y gastric bypasses, conducted at four surgical centers in the USA (Jacksonville, FL) and France (Nice, Marseille, Besancon). The patients had a mean age of 42 years and a mean BMI of 41.1 kg/m^2. All procedures were performed by senior surgeons trained on the system. Key metrics such as operative time, intraoperative complications, and outcomes were collected to assess OR performance.
Results: Out of 161 bariatric procedures, 157 (96.8%) were successfully completed using the Maestro System. No device-related adverse events were reported. Three cases (97%) were converted to standard laparoscopy due to arm conflicts or technical difficulties, such as hostile abdomen. One patient (.6%) required conversion to open surgery for a hemostatic splenectomy. There was no mortality, and low morbidity. The mean operative time was 44 min for sleeve gastrectomy and 54 min for Roux-en-Y gastric bypass. The average robotic setup time was 5 min. The system provided stable visualization and reliable tissue retraction, significantly reducing the assistant's workload and enhancing overall OR efficiency by reallocating tasks to more valuable ones and decreased variability across procedures.
The analysis of intraoperative and postoperative data demonstrated the feasibility and safety of the Maestro System in bariatric procedures. These findings provided valuable insights into the system's impact on patient recovery and overall surgical performance.
Conclusion: This multicenter study demonstrated that the Maestro System is a feasible and safe device for bariatrics. The system's ability to enhance surgical precision and streamline workflow efficiency across multiple centers suggests it has the potential to become a standard in every OR. Further randomized controlled trials are needed to confirm these findings and explore how it could fit into routine practice, potentially enabling more efficient surgical schedules and reducing procedural variability.

P748

First Multicenter Study of Maestro-Assisted Laparoscopic Cholecystectomy: Feasibility and Safety in 100 Cases

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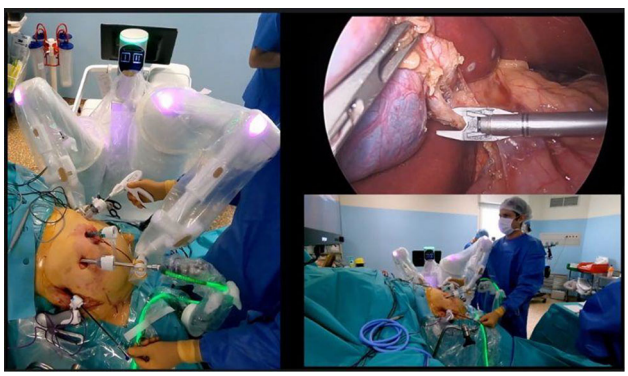
Background: Traditional surgical robots often struggle to adapt to routine procedures, failing to meet demands for both efficiency and cost-effectiveness. The Maestro™ system by Moon Surgical is an innovative digital robotic assistant equipped with two arms for dynamic scope control and tissue handling, offering haptic feedback to improve surgeon performance. This study aimed to assess the feasibility and safety of the Maestro platform in performing laparoscopic cholecystectomy (LC).
Methods: This retrospective analysis examined a prospectively gathered multicenter series of 100 patients undergoing elective Maestro-assisted laparoscopic cholecystectomy (MLC). The study spanned four surgical centers in the USA (Jacksonville, FL) and France (Nice, Marseille, Besançon), with procedures performed by senior surgeons trained on the Maestro system. Key metrics collected included patient demographics, operative duration, robotic setup time, and outcomes. Safety was evaluated based on intraoperative/postoperative complications and the need for conversion.
Results: The study included 100 patients (mean age: 58 years ± 18, mean BMI: 27 kg/m^2 ± 6, mean ASA: 2). The average operating time was 45 min (± 23), with a mean robotic setup time of 5 min (± 2). Maestro provided steady scope control and adequate tissue retraction, enabling clear visualization of the critical view of safety (CVS) and safe dissection. No device-related adverse events were noted. One cystic artery bleed (350cc) occurred and was successfully managed using the system. No bile duct injuries occurred. No open conversions were required; however, 3 procedures were converted to standard LC. Ten cases were performed as solo surgeries. Postoperative outcomes were favorable for 96% of patients, with a mean hospital stay of 1.2 days. Two patients (2%) were readmitted. Minor

complications included superficial surgical site infections ($n = 2$, Clavien I) and one diarrheal syndrome (Clavien I). One infected hematoma (Clavien 3A) required drainage. One late common bile duct stricture occurred six months post-op and required hepaticojejunostomy.

Conclusion: This study demonstrates the feasibility and safety of the Maestro robotic platform in routine LC. The system enhanced operative precision and steady retraction, offering a new concept for augmented laparoscopy. Further randomized studies are necessary to evaluate long-term outcomes and cost-effectiveness.

2 Pictures: Maestro setup - External View + IO view



P749

Feasibility Learning Curve (CuSum analysis) of Robot-Assisted Minimally Invasive Esophagectomy (RAMIE)

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Introduction: The aim of the study is to investigate the feasibility learning curve of implementing robotic-assisted minimally invasive esophagectomy (RAMIE) at a tertiary referral center.

Methods: Retrospective observational study of patients over 18 years old between June 2019 and June 2024 of consecutive esophageal cancer patients who underwent RAMIE. The primary outcome was operative time. Secondary outcomes included estimated blood loss, conversion rate, lymph node yield, positive proximal margin and in-hospital mortality rate. Cumulative sum (CUSUM) analyses were performed to identify trends for the operating time and intraoperative blood loss. The CUSUM formula generated a positive, neutral, or negative value for a case when subtracted from the mean of the particular outcome. The occurrence of a learning effect was defined as a decreasing CUSUM curve. The patients were compared based on whether they underwent surgery before the plateau occurred and those who underwent surgery after the plateau in the CUSUM analysis. Categorical variables were depicted as counts (with percentage) and compared utilizing chi square or Fisher's exact tests. Continuous variables were shown as means (with standard deviation) or medians (IQR) and computed by either Student's *t*-test or Mann–Whitney *U* test, depending on the distribution of data.

Results: 71 RAMIE procedures during the study period. The CUSUM curve for the operating time is shown in Fig. 1. The operative time curve showed a plateau after 24 cases. No significant differences were found between the groups intraoperative blood loss, conversion rates, lymph node yield 24.0 (± SD 6.8) vs 27.2 (± SD 12.4) $P = 0.239$, or positive proximal margins. The complication rates were higher in the second group ($P < 0.001$) but no difference in 30 days/in-hospital mortality 4.3% vs 4.2%, $P = 0.986$.

Conclusions: The result of this study suggests that the feasibility learning curve of RAMIE is short and safe without compromising oncological outcomes or perioperative mortality.

Figure 1

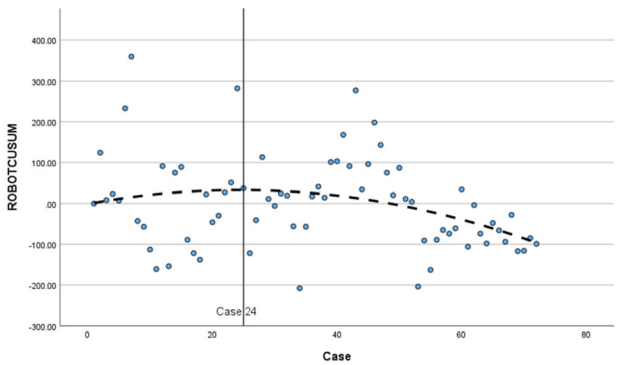

Figure 1. CUSUM analysis curve depicting operative times, with plateau after 24 cases

Table 1

Intraoperative and postoperative outcomes of the initial cases series of 71 patients

	Total cohort (case 1–71)	Before plateau (case 1–24)	After plateau (case 25–71)	P-value
RAMIE time, median minutes [IQR]	280 [187–351]	291 [195–361]	270 [187–317]	0.433
Blood loss, median milliliters [IQR]	25 [15–100]	37.5 [10–95]	20 [20–100]	0.631
Conversion to open, number (%)	2 (2.8)	1 (4.2)	1 (2.1)	1.000
Lymph node yield, [mean (± SD)]	1.22 [2.2]	1.83 [2.9]	0.89 [1.7]	0.093
Margins, positive number (%)	5 (7.0)	3 (12.5)	2 (4.3)	0.655
Postoperative complications, number (%)				
No complication	38 (54.3)	8 (33.3)	30 (63.8)	**> 0.001**
I	1 (1.4)	0 (0.0)	1 (2.1)	
II	11 (15.7)	5 (20.8)	6 (12.8)	
IIIa	8 (11.4)	3 (12.5)	5 (10.6)	
IIIb	4 (5.7)	2 (8.3)	2 (4.3)	
IVa	4 (5.7)	3 (12.5)	1 (2.1)	
V	4 (5.7)	2 (8.3)	2 (4.2)	
In-hospital Mortality, number (%)	3 (4.2)	1 (4.2)	2 (4.3)	0.564

IQR, interquartile range; RAMIE, robot-assisted minimally invasive esophagectomy.

P750

Bleeding After Robotic Bilateral Inguinal Hernia Repair in a Patient on Coumadin

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Introduction: Inguinal hernias are the most common hernia type managed by general surgeons, and now robot-assisted techniques are gaining popularity due to their precision and reduced recovery times. However, complications such as postoperative bleeding can occur, leading to extended hospital stays, readmissions, and even reoperations. Bleeding complications occur in approximately 0.9% of cases, and anticoagulants like warfarin are a known independent risk factor.
Case Presentation: We report a case of a 68-year-old male with a history of a mechanical heart valve on Coumadin, who underwent robotic bilateral inguinal hernia repair with mesh. Warfarin was restarted on postoperative day (POD) 1 with Lovenox bridging. On POD 3, the patient presented with worsening abdominal pain, distention, shortness of breath, and orthostatic symptoms. Examination revealed tachycardia, hypotension, and abdominal distention.
The patient was urgently taken to the operating room. Access to the preperitoneal cavity was achieved by making a small extension of the periumbilical incision, revealing a 2-L hematoma, which was evacuated. A wound protector was used, and pneumoperitoneum was achieved with a 12 mm trocar. Additional 5 mm trocars were placed in the left and right upper quadrants. Inspection showed blood clots in the preperitoneal space, with active bleeding from a vessel at the lateral edge of the left side mesh controlled with hook cautery. Minor raw surface bleeding on the right side was also controlled with cautery, Vistaseal, and Surgicel powder. Peritoneal flaps were resecured, and the patient's heparin drip started on POD 3 was bridged to Coumadin by POD 5. The patient was discharged home without further incidents.
Conclusion: Robotic inguinal hernia repair, while minimally invasive, carries a risk of significant bleeding, especially in patients on anticoagulation therapy. This case highlights the critical need for careful management of anticoagulation during robotic hernia repair to reduce bleeding risk. Warfarin is an independent risk factor for postoperative bleeding, underscoring the importance of vigilant monitoring and prompt surgical intervention for complications.

P754

Comparative Outcomes of Robotic vs. Laparoscopic Cholecystectomy: A Retrospective Analysis

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Introduction: The robotic approach to cholecystectomy (RC) has gained popularity in recent years due to its potential for enhanced precision, improved visualization, and increased surgeon dexterity. However, concerns persist regarding its cost-effectiveness, operative time, and potential for complications when compared to the traditional laparoscopic technique (LC). While many studies have evaluated the safety and efficacy of both approaches, the data remains inconclusive. This retrospective review aims to contribute to the growing body of evidence by comparing outcomes of robotic and laparoscopic cholecystectomies performed at a large academic safety net hospital.
Methods and Procedures: A retrospective analysis of 150 patients who underwent either a RC ($n = 48$) or LC ($n = 102$) was performed. Surgical outcomes were assessed by analyzing factors such as complication rates, open conversion rates, operative times, estimated blood loss, and length of stay. Demographic factors and emergent status of the case, and resident involvement were collected.
Results: Analysis of the RC and LC groups found that there was no significant difference in age ($P = 0.507$), BMI ($P = 0.906$), ASA classification ($P = 0.253$), or resident involvement ($P = 0.506$) between the two groups. Most RC are elective surgery ($P = 0.049$). When comparing the short-term outcomes there was no significant difference in rates of post-operative complications ($P = 0.164$) or open conversions ($P = 0.329$). There was no conversion to open in RC. There was also no significant difference in the length of stay ($P = 0.162$). Additionally, the RC had significantly lower OR times ($P < 0.00001$) and times from open incision to closing ($P < .00001$), as well as less estimated blood loss ($P = 0.00016$) compared to the LC group. To assess whether the higher rates of elective procedures in the RC groups were a confounding variable for surgical times, a separate analysis of elective and emergent procedures was done. RC had significantly shorter OR ($P \leq .0.005$) and surgical ($P < 0.005$) times in both elective and emergent procedures.
Conclusions: This retrospective data at a teaching hospital with a low socioeconomic population proves that RC is non-inferior and has direct outcomes. Even though there was no statistical difference in post-op complication rates or open conversions, in this small sample size, RC had no conversion rate. Additionally, RC had both shorter procedure and OR times compared to LC regardless of resident involvement or emergent status, suggesting there may be an advantage to RC.

P755

Retrospective Analysis of Surgical Outcomes and Costs Comparing Robotic vs Laparoscopic Cholecystectomy for Urgent/Emergent Patients in a Busy Community Setting

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Objective of the Study: Cholecystectomy, commonly performed in the United States with over 700,000 cases annually, incurs significant healthcare costs of approximately $6.5 billion USD. Despite advancements in robotic surgery since its FDA approval in 2000, its cost-effectiveness compared to traditional laparoscopic cholecystectomy (LC) in non-academic settings remains uncertain. This study compares the cost-effectiveness, safety, and feasibility of robotic-assisted cholecystectomy (RC) versus LC for urgent/emergent cases in a non-academic community hospital.
Methods and Procedures: This retrospective cohort study included 132 patients who underwent LC ($n = 110$) or RC ($n = 22$) from January 2019 to January 2022. Inclusion criteria were patients over 18 years with acute cholecystitis or acute cholangitis who had surgery within 24 h of emergency department arrival. Data were collected from electronic medical records, focusing on cost-effectiveness, complications, and readmissions as primary outcomes, with secondary outcomes including operative time, estimated blood loss, hospital length of stay, imaging studies, and discharge pain management. Statistical analyses included Chi-square, Fisher's exact tests, Wilcoxon rank-sum test, and generalized linear modeling.
Results: Of the 131 patients, demographic characteristics were similar between LC and RC groups. RC had a significantly longer operative time (76 min vs. 38.5 min, $p = 0.001$) and higher costs, with

direct and indirect costs significantly greater than LC ($p = 0.001$ and $p = 0.05$, respectively). No significant differences were observed in postoperative outcomes, including hospital length of stay, pain management, and readmission rates.

Conclusion: RC is as safe and feasible as LC for urgent/emergent cases, though it incurs higher costs and longer operative times. Decisions regarding surgical technique should consider the facility's capabilities and surgeon's expertise. Further research in diverse hospital settings is necessary to evaluate the broader applicability and economic impact of RC.

P756

Use of Force Feedback is Associated with Decreased Force During Robotic Surgery

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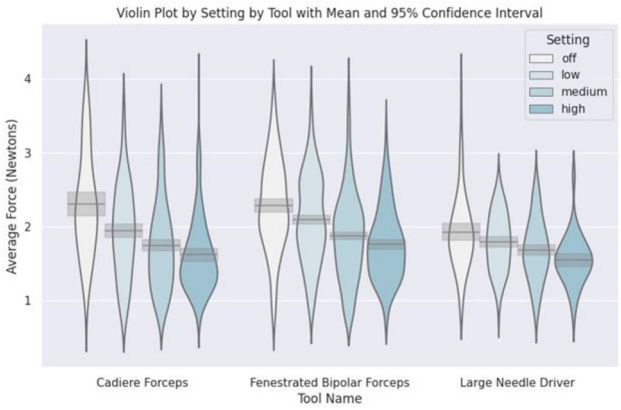
Introduction: The objective of this study was to determine whether the use of Force Feedback instruments is associated with changes in force applied at the tips of instruments during robotic surgery. One of the described limitations of robotic surgery is the inability for the surgeon to feel force exerted in the operative field. The da Vinci 5 Surgical System was launched in 2024 with new technology that provides Force Feedback. Force Feedback instruments incorporate sensors that measure push and pull forces at instrument tips and convey these forces to hand controllers on the robotics console.

Methods and Procedures: This study included data from all robotic surgery procedures across surgical specialties performed on the da Vinci 5 surgical system using at least one Force Feedback instrument from system launch on March 29, 2024 to September 15, 2024. One-way analysis of variance (ANOVA) and post-hoc Tukey's HSD tests were performed to compare average forces overall, by instrument type, and by Force Feedback setting (i.e., off, low, medium, and high). This study analyzed de-identified data from the da Vinci surgical system and was determined exempt by the WCG Institutional Review Board.

Results: During the study period, 1110 procedures meeting eligibility criteria were done by 261 unique surgeons. In 791 cases (71.3%), only one Force Feedback instrument was used; two were used in 280 cases (25.2%), three in 35 cases (3.2%), and four in 4 cases (0.4%). The ANOVA test revealed statistically significant differences in average force across settings (F-statistic = 66.3, $p < 0.001$). Post-hoc Tukey's HSD tests further identified statistically significant differences between all pairwise comparisons of force settings (off vs. low, off vs. medium, off vs. high, low vs. medium, low vs. high, and medium vs. high, all $p < 0.001$). Average force was 2.21 Newtons with Force Feedback set off, 2.02 Newtons on low, 1.83 Newtons on medium, and 1.67 Newtons on high, with higher forces seen for use of Cadiere forceps and fenestrated bipolar forceps versus the large needle driver (Fig. 1).

Conclusions: During early experience with Force Feedback instruments, the average force decreased with increasing force setting, with the greatest forces being measured when Force Feedback was off. Greater differences in force across settings were observed for retraction instruments, which may receive less visual attention from the operating surgeon. Use of Force Feedback may support gentler surgery. Future research will examine whether decreased force translates to improved outcomes.



P758

Advancing Ventral Hernia Repair: A Systematic Review of Minimally Invasive Techniques

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Introduction: Ventral hernia (VH) repair remains a common yet complex surgical procedure, with over 600,000 operations performed annually in the U.S. Minimally invasive surgical approaches, such as robotic and laparoscopic techniques, have gained prominence in the last decade, offering promising alternatives to open surgery. This study systematically reviews randomized controlled trials (RCTs) focused on these minimally invasive techniques to establish best practices and assess their efficacy in ventral hernia management.

Methods: A comprehensive search of EMBASE, PubMed, Cochrane, and ClinicalTrials.gov for RCTs on VH management published between 2015 and 2024. Trials comparing robotic and laparoscopic surgery were of primary interest. Outcomes were evaluated based on recurrence rates, surgical site infections (SSI), operative times, and postoperative complications. The quality of evidence was graded using the GRADE framework.

Results: 84 RCTs were identified. Both robotic and laparoscopic ventral hernia repairs provide advantages over traditional open methods. Three RCTs directly compared robotic intraperitoneal onlay mesh (IPOM) with laparoscopic IPOM. While both techniques were effective, robotic IPOM was associated with lower hernia recurrence rates in some studies, with recurrence rates of 4% for robotic versus 13% for laparoscopic (RR 0.3, 95% CI: 0.06–1.39; $P = 0.12$). However, this came at the cost of longer operative times ($P = 0.04$). In contrast, other studies, such as the PROVE-IT trial, reported higher recurrence rates for robotic IPOM (24%) compared to laparoscopic repair (6%, $P = 0.04$). Importantly, there were no significant differences in surgical site infection (SSI) rates between the two

approaches. Additionally, the trials highlighted the benefits of minimally invasive techniques, including laparoscopic fascial defect closure, which reduced postoperative seroma formation ($P < 0.01$) and recurrence rates (7% vs. 19%, $P = 0.047$) compared to traditional methods. Mesh placement in the sublay position further decreased wound-related complications, with significantly fewer instances of wound infection ($P = 0.04$) and seroma formation (OR 2.85, 95% CI: 1.74–4.67, $P < 0.001$). These outcomes underscore the clinical benefits of adopting minimally invasive approaches in VH management. **Conclusion:** The growing body of evidence highlights the benefits of minimally invasive surgery, particularly robotic and laparoscopic techniques, in VH repair. These techniques reduce postoperative pain, hospital stay, and complication rates while maintaining or improving hernia recurrence outcomes. Both robotic and laparoscopic approaches offer unique advantages, but further research is required to optimize these methods and standardize their application in clinical practice. The adoption of these advanced surgical techniques has the potential to significantly enhance patient recovery and reduce the long-term burden of VH.

P759

The Dreaded 'Callbladder': Should the Robotic Platform Be Made Available For Use At All Times?

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While the utilization of robotic minimally invasive surgery (MIS) by acute care surgeons continues to grow, its use in the non-elective setting has remained underdeveloped despite increases in robotic training for surgeons and surgical trainees. Laparoscopic cholecystectomy remains the most common MIS procedure performed in the acute care setting at our institution. With our adoption of the robotic platform, the number of robotic cholecystectomy (RC) cases have increased. This growth, however, seems to be isolated to the elective setting. In this study, we aimed to evaluate existing barriers that may result in the limited use of robotic MIS, particularly of robotic cholecystectomy, in the non-elective or acute care setting.

In 2022, three acute care surgeons adopted the robotic platform into their elective and non-elective practices at a level 1 trauma center. A retrospective analysis was then performed for all non-elective cholecystectomy cases in 2022 and 2023.

Throughout the study period, cholecystectomy remained the most commonly performed MIS case in the non-elective setting (47.7%) with a total of 130 performed laparoscopically versus 15 robotically. Conversion to open cholecystectomy occurred in 3.8% of laparoscopic cases (5) compared to 0% of robotic cases. Total operating room (OR) time was similar between laparoscopic (75.6 min) and robotic (70 min) cases. Pre-operative and post-operative length of stay (LOS) was additionally similar between cohorts (Fig. 1). Over 20% of laparoscopic cholecystectomy cases (27) were performed outside of regular OR hours, whereas only 6.7% of robotic cholecystectomy cases (1) occurred during those same hours.

The use of the robotic platform for cholecystectomy in the non-elective, acute care setting does not appear to prolong hospital LOS or operating times and may improve the ability to complete the procedure in a minimally invasive fashion. A lack of availability and access to the robotic platform, specifically outside of standard OR times, is likely the most significant barrier to its utilization. With the acquisition of a second robotic system and increasing administrative support for its use by the acute care surgery team, this warrants further investigation of robotic utilization in the non-elective setting.

P761

Robotic Precision: Novel Approach to Splenic Vein Aneurysm Management

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Introduction: Splenic vein aneurysm (SVA) is an extremely rare finding. First reported by Lowenthal et al. in 1953, very few cases have been reported in the medical literature. Little is known about the pathogenesis of an SVA, but many believe this to be associated with portal hypertension or a congenital defect of the splanchnic vasculature. As with arterial aneurysms, sequelae of SVA (particularly those over 3 cm) include rupture, thrombosis, or obstruction of adjacent structures. Given the rarity, no clear practice guidelines exist. Excision is the most commonly performed treatment, however other approaches have been infrequently described, including observation with serial imaging, plication, and endovascular stenting. No robotic-assisted intervention has been documented to date.
Case Report: Our case involves a 22-year-old, recently postpartum female who presented to the emergency department with worsening left upper quadrant abdominal pain. Computed tomography angiography (CTA) of the abdomen revealed a 2.7 cm × 4.5 cm splenic vein aneurysm. She was referred to vascular surgery, and was monitored with serial imaging. CTA at the 3-month interval showed the aneurysm to be stable in size, but intimately associated with the tail of the pancreas. Given her ongoing symptoms and the close proximity of the aneurysm to the pancreas, she was referred to hepatopancreatobiliary (HPB) surgery for further evaluation. She ultimately underwent a robotic-assisted splenectomy with high ligation of the splenic vein. She was discharged on POD 2 and has since been seen in the outpatient setting. She is doing remarkably well.
Discussion: Robotic splenectomy was a safe and effective treatment for this patient with a rare case of large splenic vein aneurysm. Although visceral aneurysms have traditionally been managed by vascular surgeons, modern surgical advancements and subspecialization allow for a multidisciplinary approach. Robotic surgery is not currently widely utilized in the field of vascular surgery but may be an important tool moving forward as demonstrated by this presentation. We hope that this case will contribute to the larger body of literature that may one day aid in developing consensus guidelines on management and prognosis of a rare disease process.

P762

Ensuring the Safety of Robotic-Assisted Right Hemicolectomy in Patients with a History of Abdominal Aortic Aneurysms: Expanding Indications Through Port Placement Modifications.

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Introduction: Robotic-assisted surgery carries the risk of organ and vascular injury due to the lack of tactile feedback from the robotic arms. This risk is particularly heightened in patients with a history of abdominal aortic aneurysms (AAA) or iliac artery aneurysms, often leading to exclusion from robotic surgery. However, we hypothesize that careful modification of port placement can allow for safe robotic-assisted surgery even in these high-risk cases.
Methods and Procedures: We performed robotic-assisted right hemicolectomy on two patients with a history of AAA. Case 1

involved an 84-year-old male who had previously undergone EVAR for AAA, left common iliac artery aneurysm, and left internal iliac artery aneurysm. He was diagnosed with cecal cancer (cT2N0M0, cStage I) and underwent robotic-assisted ileocecal resection. Although residual aneurysms were present (AAA 67mm, left common iliac artery 29mm, left internal iliac artery 18mm), he was discharged without complications on postoperative day 9. Case 2 involved a 66-year-old male with an untreated AAA (23mm), who was diagnosed with ascending colon cancer (cT2N0M0, cStage I) and underwent robotic-assisted right hemicolectomy. He was discharged on postoperative day 8. To avoid contact with the AAA, the camera port (#2) was placed at the umbilicus, and port #4 was positioned on the left side of the epigastrium (Fig. 1). In both cases, standard port placements carried the risks of aneurysm contact, so camera and arm ports were repositioned to avoid these areas.

Results: By modifying port placement, we successfully avoided contact with the aneurysms and completed the surgeries without complications in both cases. Both patients recovered well and were discharged within 9 and 8 days, respectively, following an uneventful postoperative course.

Conclusion(s): Careful modification of port placement can mitigate the risk of vascular injury during robotic-assisted surgery in patients with a history of abdominal aortic aneurysms. This approach highlights the potential to expand the indications for robotic surgery in high-risk patients, including those previously considered unsuitable due to vascular conditions.

P763

Implementation of Robotic Technology in Trauma and Acute Care Surgeons Practices: Experience from a Level I Trauma Center

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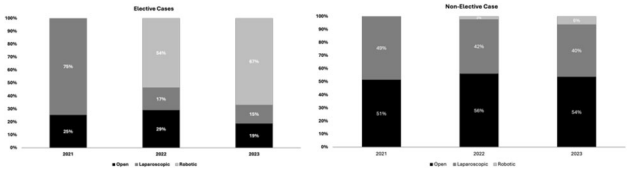
Background: Robotic minimally invasive surgery (MIS) applications continue to expand across all surgical fields and training. Furthermore, its use is expected to become more ubiquitous with more newly graduating surgeons undergoing formal robotic training in their residencies. However, the adoption of such technology falls behind in urgent and emergent settings. In this study, we described our experience in adopting robotic MIS in the practices of trauma and acute care surgeons (TACS) in elective and non-elective cases.

Methods: At a level I trauma center, three TACS adopted robotic MIS in their elective and non-elective practices in a staged manner; pre-implementation (2021), implementation (2022), and post-implementation (2023). Pearson's $\chi 2$ test was used to compare proportions between categorical variables.

Results: In 2021, the group performed 485 abdominal cases, of which 265 (55%) were MIS with no robotic cases. In 2022, a total of 547 abdominal cases were performed, and 290 (53%) were MIS; 107 (37%) robotic, and 183 (63%) laparoscopic. In 2023, 512 cases were performed, of which 302 (59%) were MIS; 144 (48%) were robotic and 158 (52%) laparoscopic. Stratifying by elective vs. non-elective, the adoption of the robotic technology was much more pronounced in the elective setting ($p < 0.0001$; Fig. 1); nonetheless, the increase in non-elective robotic cases was significant in the post-implementation year (p 0.01).

Conclusion: TACS efficiently integrated robotic technology into their practices, mainly in the elective setting, as the transition in non-elective surgery was lagging. Further studies are needed to elucidate and potentially address the limitations of robotic surgery in the non-elective setting.



P764

Comparing Robotic Versus Open Surgical Approaches for Incarcerated Diaphragmatic Hernia Repair

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Introduction: Incarcerated diaphragmatic hernias are a rare complication after traumatic injuries. This is a case comparison between two patients presenting to our institution with incarcerated diaphragmatic hernias within four days of each other. Both patients were treated with different surgical approaches. This case report will serve as a comparison of the outcomes of each of these patients. Both patients remained hospitalized for approximately 1 day and discharged in stable condition. Both were males from South American countries and had traumatic injuries to the diaphragm that had been missed on trauma workup in their native countries.

Procedures: The first case was a 23-year-old male who presented to the hospital with two weeks of worsening abdominal and chest pain. He had been a victim of stabbing to the left chest 3 years prior and had not undergone operative exploration in his home country. He was taken to the operating room where via three 8mm trocar sites a robotic left diaphragmatic hernia repair was performed. The patient's splenic flexure and omentum were incarcerated through the diaphragmatic hernia. No resection was indicated at that time as the large bowel appeared to be viable and checked with ICG. The diaphragmatic defect was repaired with ethibond suture. He was discharged on postoperative day 1. The second case was a 40-year-old male who presented to the hospital with one week of worsening abdominal pain. He had been struck with a large piece of glass to the left chest approximately 15 years prior to presentation. This was not treated at that time in his home country. He was taken to the operating room for an open left diaphragmatic hernia repair via a left subcostal incision. He was also found to have a portion of large bowel and omentum incarcerated via his diaphragmatic hernia. The defect in the diaphragm was closed with 0 PDS suture. The patient's pain was controlled postoperatively and he was discharged on postoperative day 1.

Results: Both patients were taken to the operating room within four days of presentation and discharged on postoperative day one.

Conclusion: Approaching incarcerated diaphragmatic hernias either robotically or with an open approach demonstrated almost equivalent length of stay and pain control. Based on surgeon preference each patient was treated within the surgeon's comfort level. Both patients had good outcomes with equivalent length of stay time and pain control.

P765

A Novel Table-Mounted Minimally Invasive Surgical Platform: A Non-inferiority Study of the Revolve Surgical System v1.0

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Background: The Revolve Surgical System v1.0(RSSv1) is a novel table-mounted minimally invasive surgery platform that combines functionalities of standard laparoscopic and robotic surgical systems (Fig. 1). The RSSv1 gives surgeons: (1)the ability of joint-braked retraction/countertraction ability, (2)robot-assisted 2-degrees of freedom at the tool tip (jaw-and-roll), and (3)an innovative customizable handle design. This study aims to compare the performance of the RSSv1 against manual laparoscopic instruments(MLI), and evaluate the user-satisfaction with the RSSv1's on workload and ergonomics.

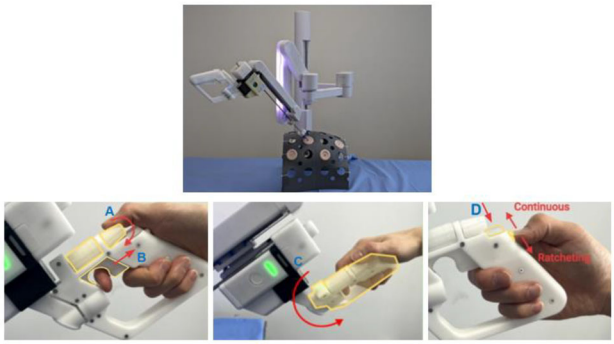

Figure 1: (Top) RSSv1, (Bottom) Handle Design: [A] roll via knob, [B] jaw actuation trigger, [C] roll via wrist, [D] ratchet release and mode enabling button.

Methods: A non-inferiority single center study was conducted with 20 participants (medical students, General Surgery residents, and staff General surgeons) recruited from Western University. Participants were provided a short instructional video on the RSSv1 prior to testing. Using a laparoscopic box trainer, each participant performed three standardized Fundamentals of Laparoscopic Surgery (FLS) tasks (PEG transfer, endoloop, intracorporeal knot suturing) using both the RSSv1 and MLI. Participants were randomized to begin testing on either RSSv1 or MLI. On each platform, all FLS tasks were performed 4 times with the final trial's data used in the statistical analysis. Performance was evaluated using FLS outcome measures. Wilcoxon Signed-Rank Test was used to compare RSSv1 and MLI. $p < 0.05$ was considered statistically significant. Workload and ergonomics were evaluated using the National Aeronautics and Space Administration Task Load Index (NASA-TLX) questionnaire and a post-test questionnaire.

Results: Performance between RSSv1 and MLI was only statistically different in the completion times for peg transfer and intracorporeal knot suturing, where participants performed faster using MLI (Table 1). No variance in the other FLS task quality metrics between the two groups was observed. Average NASA-TLX scores showed that the RSSv1 was considered less physically demanding however required higher cognitive load. Most participants found RSSv1 comfortable and intuitive, moreover the braking system was found to be useful as both a self-retractor and laparoscopic camera-holder.

Table 1: Comparison of completion time between RSS and MLI

Completion Time (seconds; median [IQR])	RSS	MLI	p-value
Peg Transfer	87 [79, 108]	76 [53, 105]	**0.012**
Endoloop	22 [15, 31]	18 [15, 26]	0.161
Intracorporeal Knot Suturing	100 [84, 142]	83 [56, 104]	**0.003**

Conclusion: Our study found the RSSv1 was non-inferior to MLI in all FLS performance metrics except completion time. Participant completion times with the RSSv1 may have been impacted by minimal training time. The RSSv1 offers ergonomic benefits over the MLI and providers surgeons greater independence with its joint-braking functionality. Future works assessing RSSv1 learning curves and impact on OR workflow will shed light on its translatability.

P766

Cutting Through Climate Change: A Scoping Review of the Effets of Climate Change on General Surgery

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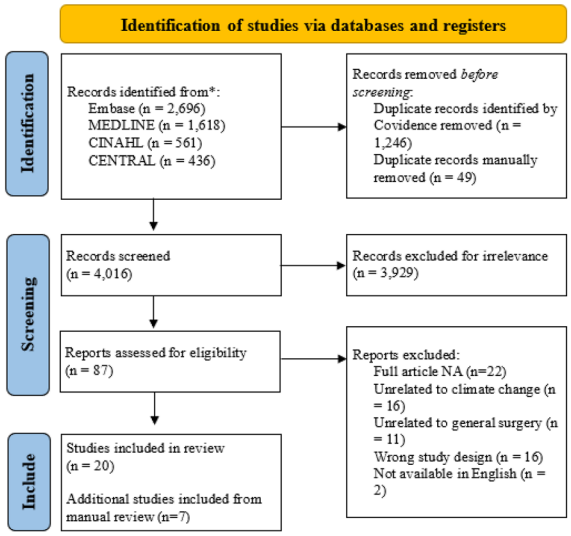
Introduction: It is well known that the delivery of healthcare is a major driver of climate change. While climate change is generally considered to adversely impact human health, its specific effects on surgical diseases remain poorly understood. This is the first scoping review to elucidate the impact of climate change on general surgery.
Methods: A comprehensive search was performed utilizing Medline, Embase, Cochrane, and CINAHL, supplemented by manual searches. Broad terms for climate change in the context of general surgery and its subspecialities were applied. Potential climate change-related effects were defined as daily or seasonal temperature anomalies and extreme weather events (e.g., hurricanes, floods, wildfire). Full-text articles were reviewed for relevance to both general surgery and climate change.
Results: Of 4016 studies, 20 met inclusion criteria and 7 were added from manual searches (Fig. 1). Three broad themes were identified: access to surgical care, shifts in surgical disease burden, and post-operative outcomes. Five studies described decreased access to care following extreme weather events, including one which found breast cancer mortality increased from baseline rates after Hurricane Katrina. Eleven studies highlighted shifts in surgical disease patterns. Temperature anomalies were found to be correlated with higher rates of traumatic injuries, skin and soft tissue infections, and complicated appendicitis. Extreme weather events were associated with a higher surgical trauma case volume. Five articles found that temperature anomalies were associated with higher rates of postoperative surgical site infections. Four articles focused on outcomes after extreme weather events, including one which found that wildfire smoke exposure was associated with worse overall survival after lung resection.
Conclusion: Climate change and extreme weather events may limit access to surgical care, increase the burden of trauma care and emergency general surgery, and worsen postoperative outcomes. Further research in this area is needed to inform and prepare general surgeons for the possible impacts of climate change on their patients and practices.

Figure 1. PRISMA Flow diagram of study selection



Modified From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

P767

Reducing Unnecessary Blood Tests for Elective Colorectal Inpatients

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Background: Routine daily blood tests are frequently performed postoperatively, often without a clear clinical indication, serving more as a surveillance tool than a necessity. Studies show that between 12 and 44% of these tests are not clinically justified (McAlister et al., 2020, p. 377). Reducing unnecessary blood tests can improve patient experience and quality of care, minimize material use, and reduce environmental impact. This is increasingly important as the National Health Service (NHS) aims to reduce its carbon footprint and achieve carbon neutrality by 2030 (NHS, 2020). Unnecessary blood tests not only place an avoidable burden on healthcare resources but also contribute to a higher carbon footprint due to the materials, transportation, and energy consumption involved in laboratory processes.
Procedure: To address this issue, a protocol was introduced to prevent unnecessary blood testing in patients following elective colorectal surgery. Standardizing this aspect of care ensures that clinical judgement and established protocols dictate when blood tests are truly needed. Research has shown that reducing unnecessary blood tests does not adversely affect patient outcomes when done in a controlled and safe manner, guided by clinical judgement and established protocols (Fisher et al., 2021). The protocol's implementation was guided by Kotter's 8-stage change management framework, which focuses on building urgency, forming guiding coalitions, and embedding change into an organization's culture (Kotter, 2014). This approach provided a structured method to effectively integrate the protocol across the clinical setting.
Results: The new protocol was implemented for elective colorectal inpatients, and data was gathered over four months. This data was compared to retrospective figures and revealed a significant decrease in the number of unnecessary blood tests performed. On average, each patient had 3 C-reactive protein (CRP) tests, 3 full blood counts (FBC), 3 urea and electrolyte (U&E) tests, and 2 liver function tests (LFT) during their hospital stay. The median length of stay for these patients was 5 days. The reduction in unnecessary tests occurred in a safe and controlled manner, with no negative clinical impact observed.
Conclusion: The successful implementation of this protocol using Kotter's change model led to a reduction in unnecessary blood tests in elective colorectal surgery patients. The changes were carried out safely and effectively, with no additional risk to patient care. The cost of postoperative blood tests was reduced to £7.96 per patient, representing a cost saving of £4.89 per patient per stay.

P844

Surgical Approach for a Giant Anterior Diaphragmatic Hernia in SLE patient Using Clamshell Thoracotomy - A Case Report

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Bilateral transverse thoracosternotomy, commonly referred to as "clamshell thoracotomy," was originally introduced for open-heart surgeries to provide broad and safe exposure through bilateral incisions. Although median sternotomy became the preferred approach for open-heart procedures in the early 1960s, up to 50% of emergency thoracotomies in busy trauma centers continue to use the clamshell technique. There have been reports of hernial repairs using thoracotomy approaches, although they remain rare. We present the case of a 55-year-old woman with a recurrent giant hiatal hernia. Her medical history includes systemic lupus erythematosus (SLE), von Willebrand disease, and sleep apnea-hypopnea syndrome (SAHOS). She had undergone two previous hiatal hernia repairs within the past year, initially via a Nissen fundoplication, followed by a gastropexy and hiatoplasty, both through abdominal approaches. Following the second surgery, the patient developed retrosternal pain and regurgitation. A CT scan revealed a giant anterior hiatal hernia, with a hernial sac measuring 10.1 cm in the thoracic cavity and a defect measuring 2.7 × 6.7 cm. Due to the extent of the tear, which involved the lower aspect of the heart and both cardiophrenic angles, a clamshell thoracotomy was chosen as the surgical approach.

The procedure involved a transverse incision at the level of the 5th intercostal space, extending from the right midclavicular line across the sternum to the left midclavicular line, followed by a transverse sternotomy. The intercostal muscles were detached from the upper edge of the 6th costal arch, and a mechanical retractor was used to provide exposure. Diaphragmatic hernia repair was performed using two meshes. The first mesh was placed under the diaphragm in contact with the peritoneum, and the second mesh was positioned over the diaphragm. Both meshes were secured using "diaphragm-mesh-diaphragm" sutures with non-absorbable material. The procedure concluded with diaphragm plication and hiatoplasty to close the diaphragmatic defect.

The postoperative course was favorable. The patient's pleural drains were removed, she resumed a normal diet, and no early complications were observed.

Conclusions: Acquired anterior giant diaphragmatic hernias, as seen in this patient, may develop following complex hiatal surgeries due to increased tension and insufficient diaphragmatic relaxation incisions, leading to the formation of a giant anterior hernia.

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