

INTERVENTIONAL ENDOSCOPY

S1066 International Award

High 1-Year Survival Rate of Unresectable Pancreatic Cancer Size Smaller Than 4 cm in Diameter Treated With Concurrent EUS-RFA: An Average Treatment Effect on the Treated Weighted Survival Analysis

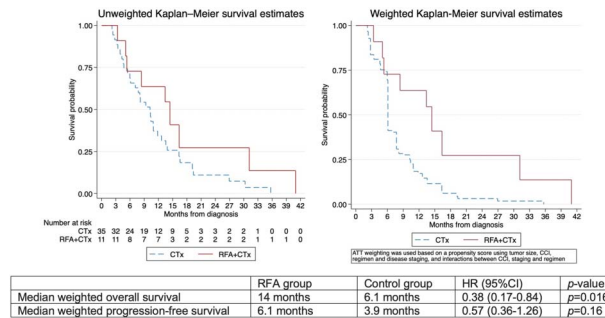
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**Introduction:** Treatment of small primary pancreatic ductal adenocarcinoma (PDAC), unresectable due to of blood vessel involvement or distant metastasis, relies on systemic therapy only. We hypothesized that concurrent EUS-guided radiofrequency ablation (EUS-RFA) might control the primary tumor and improve patients' outcomes.

**Methods:** A prospective series of unresectable PDAC patients with primary tumor size ≤4 cm who underwent EUS-RFA using a 19-gauge RFA needle (STARmed Koyang, Korea) from Jan 2017 – Jan 2022 were compared with matched historical controls. A propensity score was calculated using tumor size, staging, age adjusted Charlson Comorbidity Index (CCI), Chemotherapy regimen received, and interactions between CCI regimen and staging. This was used to reweight observations so covariate distribution in the chemotherapy only group equalled that of the RFA group (Average Treatment effect on the Treated weights). We used the VIVA combo RF system with an energy of 50 Watts and impedance of 100 Ohms. Chemotherapy was given if the patients were deemed tolerable by oncologists. The patients were followed for at least 12 months to see the survival rates.

**Results:** 46 patients comprised of 11 patients in EUS-RFA group and 35 patients in control group were included in the analysis. The mean (SD) age was 63 (13.5) years in the RFA group and 68 (8.1) years in control group. Characteristics of patients, along with the standard mean differences before and after weighting are show in Table. Median weighted survival was 14 months in the RFA group versus 6.1 months in the controls. The adjusted survival probability at 6 and 12 months was 73% and 64% in the EUS-RFA group, versus 69% and 17% in the controls. The hazard ratio (HR) for death was 0.38 (95%CI 0.17 to 0.84); p=0.016 in the RFA group versus the controls. Median weighted time to progression was 6.1 in the RFA group versus 3.9 months in the controls. The adjusted progression-free survival at 6 and 12 months in the EUS-RFA group were 55% and 36%, versus 28% and 4% in the controls; the HR for progression was 0.57 (95%CI 0.36 – 1.26); p = 0.16 in the RFA group versus controls. The adverse events were only mild abdominal pain which were observed in 8.3% of total RFA operations.

**Conclusion:** In patients PDAC with primary lesions ≤4 cm that cannot be cured by surgery, EUS-RFA combined with chemotherapy resulted in improved survival and progression free survival with minimal adverse events.



[1066] Figure 1. Treatment outcomes compared RFA group with control group

Table 1. Baseline characteristics of the enrolled patients \*Data are mean (SD) or n(%) as appropriate. Percentages are rounded to 1 decimal place and may not equal 100%

Characteristic	Raw (unweighted)		After weighting			
	Prospective cases (n=11)	Historical controls (n=35)	Prospective cases (n=11)	Historical controls (n=35)	Standardized mean difference	p-value
Mean age (years)	63 (13.5)	68 (8.1)				
Female sex, n(%)	9 (81.8)	22 (62.9)				
Mean CCI score	2.91 (2.4)	2.89 (1.3)	2.91	2.94	-0.055	0.98
Tumor diameter (cm)	3.25 (0.51)	3.10 (0.58)	3.25	3.25	0.008	0.90
Regimen, n(%)						
None	3 (27.3)	6 (17.1)	27.3	26.3	0.022	0.96
First-line	3 (27.3)	16 (45.7)	27.3	27.0	0.005	0.99
Second-line	5 (45.5)	13 (37.1)	45.5	46.7	-0.025	0.96
Staging						
Stage III	6 (54.6)	24 (68.6)	54.5	56.6	0.021	0.97
Stage IV	5 (45.5)	11 (31.4)	45.5	43.4	-0.021	0.97

S1067

Endoscopic Sleeve Gastroplasty vs Intra-gastric Balloon: A Large, Database Analysis of Early Safety and Efficacy

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**Introduction:** Intra-gastric balloon (IGB) placement and endoscopic sleeve gastroplasty (ESG) are the two most common endoscopic bariatric therapies currently performed in the United States. Procedural selection is often based primarily on patient preference. There is a lack of comparative data to help guide patient discussions regarding these interventions. This study is the largest study to date to directly compare short-term safety and efficacy of IGB to ESG using a large international bariatric database.

**Methods:** All patients undergoing ESG and IGB across 800 hospitals in the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database from 2016-2020 were included. All patients undergoing IGB were propensity matched to patients undergoing ESG. We compared occurrences of serious adverse events (SAE), readmissions, re-interventions, and emergency room (ER) visits within 30-days after procedure. Secondary outcomes included procedure time, length of stay (LOS), and total body weight loss (TBWL) measured at 30 days. (Table)

**Results:** A total of 1,996 patients underwent IGB and 6,054 patients underwent ESG. All IGB patients were propensity matched to 1,996 ESG patients, with no differences in baseline characteristics. ESG and IGB had similarly low rates of SAE ( $p > 0.05$ ). ESG had more readmissions within 30 days ( $p < 0.05$ ). IGB had more outpatient treatments for dehydration and re-interventions within 30 days ( $p < 0.05$ ), with 3.7% of patients reporting early balloon removal less than 30 days after implantation. ESG had greater %TBWL at 30 days ( $p < 0.05$ ).

**Conclusion:** ESG and IGB are both safe procedures with comparably low rates of SAE. ESG is perhaps better tolerated than IGB.

**Table 1.** † Most common reason for readmission after both procedures was nausea, vomiting, and fluid/electrolyte or nutritional depletion. § Most common type of intervention after IGB was early IGB removal. The most common intervention after ESG was therapeutic endoscopy with stent placement or dilatation

Comparing Short Term (30d) Procedural Outcomes of Endoscopic Sleeve Gastroplasty and Intra-gastric Balloon Placement			
	ESG (n=1998)	IGB (n=1998)	p
Mean BMI (SD)	36.36 (6.19)	36.17 (6.16)	0.316
Mean Change from Pre-Op to Post-Op BMI (SD)	-1.51 (2.41)	-0.95 (2.83)	< 0.001
Mean % Total Body Weight Loss (%TBWL) (SD)	3.8% (7.9%)	2.3% (6.6%)	< 0.001
Mean Number of Days from Procedure to Discharge (SD)	0.65 (1.76)	0.04 (0.33)	< 0.001
Mean Procedure Length, minutes (SD)	64.97 (45.39)	16.51 (17.12)	< 0.001
Serious Adverse Event, n (%)	17 (0.9)	5 (0.3)	0.055
Reoperation, n (%)	22 (1.1)	12 (0.6)	0.121
Readmission, n (%) †	56 (2.8)	29 (1.5)	0.004
Re-Intervention, n (%) §	35 (1.8)	90 (4.5)	< 0.001
Received Treatment for Dehydration Outpatient, n (%)	46 (2.3)	89 (4.5)	< 0.001
Emergency Department Visit Not Resulting in Admission, n (%)	66 (3.3)	69 (3.5)	0.861

S1068

#### Safety and Feasibility of Same-Day Discharge After Endoscopic Submucosal Dissection: A Western Multicenter Prospective Cohort Study

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**Introduction:** Patients undergoing endoscopic submucosal dissection (ESD) in Asia are traditionally admitted for routine post-procedural observation. Data on the feasibility of same-day discharge (SDD) following ESD remains scarce. We aimed to evaluate the safety and feasibility of SDD after ESD and to identify factors associated with admission.

**Methods:** Retrospective post-hoc analysis of multicenter prospective cohort study of adults who underwent ESD at 10 participating centers from 2016 to 2021. The primary endpoint was safety and feasibility of SDD after ESD and to identify factors associated with admission. Endoscopists with < 50 cases were defined as low-volume ESD endoscopists. Lesions with Paris 0-Ic or III were considered to have a depressed morphology component.

**Results:** 831 patients (57% male, median age 67 [IQR 57-74]) underwent esophageal (n=240), gastric (n=126), and colorectal (n=465) ESD, of which 588 (71%) underwent SDD and 243 (29%) were admitted. 13 (2%) in the SDD group had delayed bleeding, 9 requiring repeat endoscopy and 2 needing blood transfusion. Four patients (1%) had delayed perforation, of which only one required surgery. Out of the 243 admissions, 223 (92%) were discharged within 24 hours after routine post-procedural observation. Nineteen patients (8%) were admitted for the management of adverse events: 3 for bleeding and 16 for intraprocedural perforation. All these complications were managed endoscopically, and none required surgery. Mean hospital length of stay was  $1.3 \pm 0.8$  days. Interestingly, on multivariate analysis, lesion size  $\geq 45$  mm inversely correlated with admission (OR: 0.5; 95% CI: 0.3-0.8;  $P=0.001$ ). All of the following factors were independently associated with a higher likelihood of admission: ESD in esophagus/stomach vs colorectal (OR: 1.7; 95% CI: 1.1-2.6;  $P=0.011$ ), low endoscopist volume (OR: 2.1; 95% CI: 1.3-3.3;  $P=0.001$ ), invasive cancer histology at baseline (OR: 1.9; 95% CI: 1.2-3.1;  $P=0.010$ ), adverse events (OR: 2.7; 95% CI: 1.5-4.8;  $P=0.001$ ), and procedure time  $>75$  minutes (OR: 13.5; 95% CI 8.5-21.3;  $P < 0.001$ ). (Table)

**Conclusion:** SDD is feasible and safe, with less than 3% of patients developing delayed adverse events following SDD. Factors including ESD location, lesion size, baseline histology, endoscopist volume, and procedural time appear to correlate with need for admission. Additional studies are needed to identify predictors for SDD after ESD.

**Table 1.** Baseline characteristics of patients hospitalized and discharged following endoscopic submucosal dissection for esophageal lesions

Baseline characteristic	All (831)	Admitted (243)	Discharged (588)	P-value
Age (median, IQR)	67 (57 – 74)	68 (59 – 73)	66 (57 – 74)	0.185
Male sex	477 (57%)	138 (57%)	339 (58%)	0.823
ASA class				0.005
I	82 (10%)	12 (5%)	70 (12%)	
II	374 (45%)	103 (42%)	271 (46%)	
III	355 (43%)	112 (46%)	243 (41%)	
IV	20 (2%)	16 (7%)	4 (1%)	
Upper GI Location				0.009
Esophagus	240 (29%)	83 (35%)	157 (27%)	
Distal esophagus/GEJ	161 (19%)	62 (26%)	99 (17%)	
Esophageal body	79 (10%)	21 (9%)	58 (10%)	
Stomach	126 (15%)	41 (17%)	85 (14%)	
Colorectal	465 (56%)	119 (49%)	346 (59%)	
Endoscopist volume < 50	176 (21%)	80 (33%)	96 (16%)	< 0.0001
Prior intervention at ESD site	197 (24%)	35 (14%)	162 (28%)	< 0.0001
No fibrosis	467 (56%)	158 (65%)	309 (53%)	0.0001
Submucosal fibrosis	362 (44%)	85 (35%)	279 (47%)	
Mild	110 (13%)	14 (6%)	96 (16%)	
Moderate	92 (11%)	16 (7%)	78 (13%)	
Severe	160 (19%)	55 (23%)	105 (18%)	
Lesion size, mm (median, IQR)	44 (32 – 60)	41 (30 – 60)	45 (33 – 59)	< 0.0001
Depressed morphology	111 (13%)	48 (20%)	63 (11%)	0.0004
Non-depressed morphology	720 (87%)	195 (80%)	525 (89%)	
Flat	375 (45%)	75 (31%)	300 (50%)	
Elevated	208 (25%)	81 (33%)	127 (21%)	
Mixed	90 (11%)	29 (12%)	61 (10%)	
Other (i.e. submucosal)	47 (6%)	10 (4%)	37 (6%)	

Table 1. (continued)

Baseline characteristic	All (831)	Admitted (243)	Discharged (588)	P-value	
Invasive cancer	140 (17%)	63 (26%)	77 (13%)	< 0.0001	
Non-invasive	691 (83%)	180 (74%)	511 (87%)		
Intramucosal cancer	122 (15%)	40 (16%)	82 (14%)		
High grade dysplasia	175 (21%)	39 (16%)	136 (23%)		
Low grade dysplasia	214 (26%)	46 (19%)	168 (29%)		
Sessile serrated adenoma	31 (4%)	16 (7%)	15 (3%)		
Hyperplastic polyp	15 (2%)	5 (2%)	10 (2%)		
Non-dysplastic lesion	40 (5%)	9 (4%)	31 (5%)		
Carcinoid tumor	15 (2%)	3 (1%)	12 (2%)		
Other	79 (10%)	22 (9%)	57 (10%)		
Adverse events					< 0.0001
Bleeding	15 (2%)	3 (1%)	12 (2%)		
Perforation	20 (2%)	16 (7%)	4 (1%)		
Infection	0 (0%)	0 (0%)	0 (0%)		
Stricture	27 (3%)	13 (5%)	14 (2%)		
Sedation-related	0 (0%)	0 (0%)	0 (0%)		
Total procedure time, min (median, IQR)	76 (56 – 120)	136 (91 – 198)	69 (51 – 89)	< 0.0001	
En bloc resection rate	790 (94%)	219 (86%)	571 (96%)	< 0.0001	
R0 resection rate	713 (85%)	180 (73%)	533 (89%)	< 0.0001	
Curative resection rate	679 (81%)	172 (70%)	507 (85%)	< 0.0001	

IQR=Interquartile range. ASA=American Society of Anesthesiologists. GEJ=Gastroesophageal junction. HGD=High grade dysplasia. LGD=Low grade dysplasia.

S1069

#### Endoscopic vs Surgical Procedures for Gastroesophageal Reflux Disease - A Network Meta-Analysis

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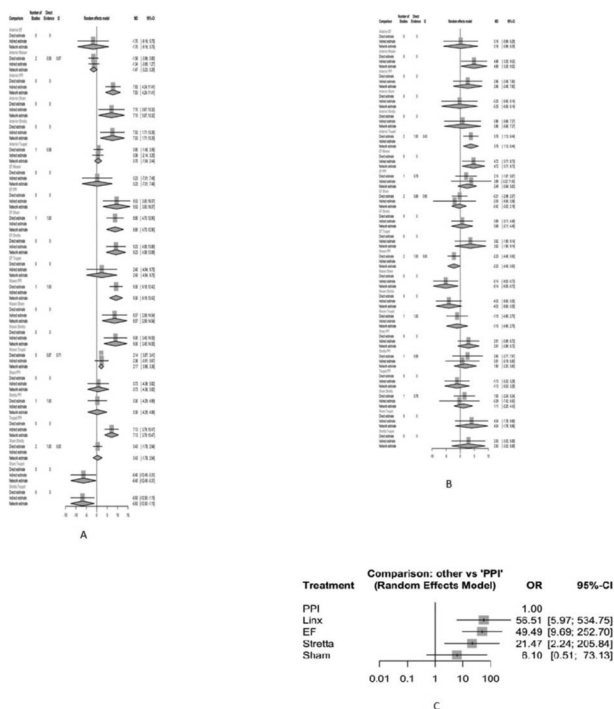
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**Introduction:** Various surgical fundoplication (SF) procedures have been the mainstay therapy for medication refractory GERD. Over the last couple of decades, interventional endoscopic procedures such as radiofrequency energy delivery with Stretta, endoscopic fundoplication (EF) procedures with EsophyX and GERDx systems, and laparoscopic magnetic sphincter augmentation (Linx), have emerged as alternative options. Objective of our study was to compare the efficacy of these various procedures.

**Methods:** A comprehensive search of the available electronic databases was conducted, and only RCTs with our procedures of interest were included in our network meta-analysis using random-effects analysis. Outcomes of interest were lower esophageal sphincter pressure (LESP), esophagitis, cessation of use of proton pump inhibitors (PPIs), and percentage of time with a pH less than 4 on a 24-hour esophageal pH monitoring (% time pH < 4) at a follow-up of one year or less.

**Results:** Thirty-one studies with a total of 4,371 patients were included in the analysis. EF and SF were associated with significantly higher LESP compared to PPI. There was no significant difference between EF and Nissen [Mean Difference (MD): 0.23, 95%CI: -7.01-7.48], anterior (MD: 1.76, 95% CI: -5.75-9.16) or Toupet (MD: 2.4, 95%CI: -4.94-9.75) funduplications. In contrast, Stretta was inferior to Nissen (MD: -9.00, 95%CI: -14.55 - -3.45), Toupet (MD: -6.83, 95%CI: -12.50 - -1.55) and anterior (MD: -7.5, 95%CI: -13.35 - -1.71). Regarding % time pH < 4, EF was significantly better than Nissen (MD: 4.72, 95%CI: 0.71-8.73), but not significantly different from either Toupet (MD: 3.62, 95%CI: -1.90-9.14) or anterior (MD: -0.16, 95%CI: -6.29-5.96) funduplications, and none of the procedures were significantly different from the PPI group. Cessation of PPI usage was significantly higher for endoscopic and surgical (only Linx) procedures compared to PPI group, but none of the procedures had significant differences when compared to each other. Endoscopic and surgical procedures (only SF) did not differ significantly from each other or from the PPI group in terms of presence of esophagitis at follow-up. (Figure)

**Conclusion:** Efficacy of EF seemed comparable to SF in the short-term. Stretta was found to be inferior to all procedures in terms of LESP. Further studies focusing on head to head trials between EF and SF, and long term outcomes of EF are required to understand the place of EF in the treatment hierarchy.



[1069] **Figure 1.** A. Direct, indirect and network estimates of post-intervention lower esophageal sphincter pressures; B. Direct, indirect and network estimates of percentage of time with an esophageal pH less than 4; C. Forest plot of cessation of PPI usage at follow-up comparing various interventions to PPI alone

S1070 Presidential Poster Award

**Outcomes and Trends of Endoscopic Retrograde Cholangio-Pancreatography in Bariatric Surgery Patients - A National Inpatient Sample (NIS) Study**

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**Introduction:** Bariatric surgery (BS) is a widely used modality of treatment in patients with morbid obesity. The lifetime risk of these patients needing Endoscopic Retrograde Cholangio-Pancreatography (ERCP) has increased. ERCP in this population is time-consuming and technically challenging due to altered anatomy. Despite several techniques, there are complications associated with each type of ERCP. Our aim was to assess trends and outcomes of ERCP in BS patients.

**Methods:** We utilized the Nationwide Inpatient Sample (NIS) database from 2007 to 2018. We identified adult hospitalized patients who underwent ERCP using CPT procedure codes. These were divided based on the presence of bariatric surgery (BS) status and nonbariatric surgery (NBS). All procedures were captured using previously validated CPT codes, comorbidities were captured using previously validated ICD 9 and 10 codes. Univariate and multivariate logistic regression for categorical variables and linear regression for continuous variables was carried out to identify independent associations at p < 0.05. Statistical Analysis was performed using R studio.

**Results:** Total 2,178,983 patients had ERCP between 2007 and 2018, from which 36,713 (1.7%) were performed in BS patients. Among the patients who received ERCP, 68% were females, 72% were Caucasians (Table). Rates of ERCP in BS patients increased from 1,593 (4.3%) in 2007 to 5075 (14%) in 2018 (p < 0.01). Total charges associated with BS was \$76,902 vs \$55,252 (p < 0.001). ERCP for Cholelithiasis (2.1% vs 1.4%) was more common in BS patients. On univariate analysis, bleeding, intra-abdominal infections, bile duct perforation, and inpatient mortality were statistically significant amongst BS patients as compared to NBS patients. On multivariate analysis, BS patients had higher risk of death (aOR: 1.38, 1.18-1.63) and bleeding complications (aOR: 1.73, 1.44-2.07) as compared to NBS patients. While acute pancreatitis was significantly higher in NBS patients as compared to BS patients. Acute cholangitis was comparable in BS and NBS patients (Table 2).

**Conclusion:** The utilization of ERCP has been increasing over the last decade. The BS group had younger females and had higher utilization of health care resources. BS group despite being younger had a higher mortality rate and had more bleeding complications as compared to NBS. ERCP should be performed with caution in patients with BS to avoid mortality and worse inpatient outcomes.

**Table 1. Demographics, indications of bariatric and nonbariatric surgery patients**

	Non Bariatric Surgery Group (n = 2,142,270)	Bariatric Surgery Group (n= 36,713)	p-value
AGE	62 (46, 76)	57 (44, 67)	< 0.001
AGE GROUP			< 0.001
18-27	116,840 (5.5%)	425 (1.2%)	
28-37	343,200 (16%)	2,262 (6.2%)	
38-47	391,922 (18%)	5,754 (16%)	
48-57	387,558 (18%)	8,811 (24%)	
58-67	313,532 (15%)	8,042 (22%)	
68-77	216,827 (10%)	6,094 (17%)	
78-87	197,928 (9.2%)	4,015 (11%)	
88 and above	174,463 (8.1%)	1,311 (3.6%)	
GENDER			< 0.001



Table 1. (continued)

	Non Bariatric Surgery Group (n = 2,142,270)	Bariatric Surgery Group (n= 36,713)	p-value
Male	879,110 (41%)	11,618 (32%)	
Female	1,262,064 (59%)	25,080 (68%)	
Unknown	1,097 (< 0.1%)	15 (< 0.1%)	
RACE			< 0.001
White	1,326,854 (68%)	24,424 (72%)	
African American	178,702 (9.1%)	3,558 (10%)	
Hispanic	305,630 (16%)	4,081 (12%)	
Asian/Pacific Islander	72,335 (3.7%)	852 (2.5%)	
Native American	13,664 (0.7%)	153 (0.4%)	
Other	66,140 (3.4%)	1,016 (3.0%)	
Unknown	178,946 (8.4%)	2,628 (7.2%)	
LENGTH OF STAY (Days)	4.0 (3.0, 7.0)	6.0 (3.0, 12.0)	< 0.001
YEAR			< 0.001
2007	157,405 (7.3%)	1,593 (4.3%)	
2008	172,320 (8.0%)	1,829 (5.0%)	
2009	170,895 (8.0%)	2,135 (5.8%)	
2010	176,302 (8.2%)	2,661 (7.2%)	
2011	179,012 (8.4%)	2,440 (6.6%)	
2012	168,425 (7.9%)	2,500 (6.8%)	
2013	167,540 (7.8%)	2,540 (6.9%)	
2014	168,515 (7.9%)	3,145 (8.6%)	
2015	174,610 (8.2%)	3,440 (9.4%)	
2016	200,030 (9.3%)	4,595 (13%)	
2017	201,935 (9.4%)	4,760 (13%)	
2018	205,280 (9.6%)	5,075 (14%)	
OBESITY	309,544 (14%)	11,259 (31%)	< 0.001
TOTAL CHARGES (\$)	\$55,252 (34,801, 87,258)	\$76,902 (46,432, 139,565)	< 0.001
INDICATIONS FOR ERCP			
Acute Pancreatitis	14,015 (0.7%)	255 (0.7%)	0.7
Acute Cholangitis	124,546 (5.8%)	1,498 (4.1%)	< 0.001
Cholelithiasis	30,785 (1.4%)	765 (2.1%)	< 0.001
Pancreatic Cancer	25,946 (1.2%)	460 (1.3%)	0.7
Hilar Cholangiocarcinoma	20,022 (0.9%)	278 (0.8%)	0.12

Table 2: Multivariate Logistic Regression of ERCP Complications and Inpatient Mortality

	Adjusted Odds Ratio	95% CI	p-value
Inpatient Mortality	1.75	1.49-2.07	< 0.01
Acute Pancreatitis	0.36	0.15-0.86	0.02
Acute Cholangitis	1	0.92-1.11	0.84
Bleeding	2.05	1.71-2.45	< 0.01
Cholecystitis	1.18	0.79-1.77	0.42
Intraabdominal Infections	4.12	3.33-5.11	< 0.01
Bile Duct Perforation	3.77	3.07-4.63	< 0.01

## S1071 Residential Poster Award

## Assessment of Pathogenic Enteric Flora Contaminating Novel Duodenoscopes With Disposable Tips

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**Introduction:** The FDA has advised that endoscopy units use duodenoscopes with disposable components to minimize the risk of duodenoscope-associated infections. Data are emerging on the effectiveness of disposable tips in preventing contamination of the duodenoscope with high-risk organisms. We hypothesize that disposable tips will not eliminate high-risk bacterial contamination.

**Methods:** We conducted a prospective observational study from October 2021 to March 2022 to speciate and quantify the bacterial contamination rate of 46 Pentax Medical ED34-i10T2 duodenoscopes with disposable tips. After disposal of the tip, the duodenoscope was cultured after one manual wash (MW) and one cycle of high-level disinfection (HLD) in an automated endoscope re-processor, and then again after two MW and an additional cycle of HLD. Each duodenoscope was sampled in 4 locations after the first MW-HLD cycle and the second: 1) elevator tab, 2) instrument channel distal opening, 3) composite duodenoscope tip, 4) instrument channel (Figure). Bacterial pathogenicity was classified by the FDA as high-concern (any CFU) and low/moderate-concern organisms (>100 CFU). *Clostridium difficile* and *Enterococcus faecalis* were classified as high-concern organisms. We compared contamination rates to historical data from the FDA surveillance study of Pentax reusable duodenoscopes that demonstrated contamination rates of 6.0% high-concern organisms and 8.2% low/moderate-concern organisms.

**Results:** 46 Duodenoscopes were sampled resulting in 368 sample events. After one MW-HLD cycle, 8 of 46 duodenoscopes remained contaminated with any organism. After the full HLD, 5 of 46 duodenoscopes remained contaminated with any organism. Low/moderate concern organisms were isolated in 2.7% of samples (95% CI 0.9%, 6.2%). High concern organisms were isolated in 0% of samples (95% CI 0%, 2.0%). (Table)

**Conclusion:** Compared to historical FDA data from reusable Pentax duodenoscopes, the rate of low/moderate-concern organism contamination of duodenoscopes with disposable tips was lower, and the confidence interval excluded the historical rate. The rate and confidence interval limits for high-concern organism contamination in our study were also lower than FDA data<sup>1</sup>. Our results suggest that disposable tips decrease but do not eliminate duodenoscope bacterial contamination. <sup>1</sup> 522 postmarket surveillance studies database: pilot phase (phase 1) of the Sampling and Culturing Study for Pentax. [accessdata.fda.gov](https://accessdata.fda.gov). 2020.



[1071] **Figure 1.** Each duodenoscope was sampled in 4 locations: 1) elevator tab, 2) instrument channel distal opening, 3) composite duodenoscope tip, 4) instrument channel. Samples 1-3 were collected with flocked swabs. Swabs were plated on routine medias for relevant enteric pathogens. The 4th was collected by flushing 25mL of neutralizing buffer through the elevator channel, then scrubbing the channel with a brush, followed by another 25mL flush. The 50mL eluent was vacuum filtered through a 0.22-micron filter and plated on TSA. Antibiotic resistance was assessed via PCR. CFU and proportion of contaminated scopes were compared between MW-HLD cycles.

**Table 1. Descriptive Table comparing sample rates to historical FDA reported rates of contamination**

Outcome	Historical Rate	Summarized Rate across all Sites (95% CI)
Raw sample total low-concern organism >100 CFU presence	8.2%	2.7% (0.9%, 6.2%)
Raw sample total high-concern organism ( <i>Enterococcus</i> and <i>C difficile</i> ) >1 CFU presence	6.0%	0% (0%, 2.0%)

**S1072 Outstanding Research Award in the Interventional Endoscopy Category (Trainee)  
Presidential Poster Award**

**Safety of Endoscopic Pancreatic Necrosectomy Compared With Radiologic or Surgical Necrosectomy: A Nationwide Inpatient Analysis**

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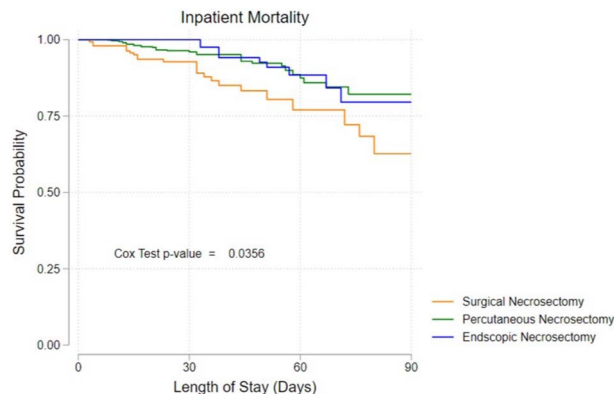
**Introduction:** Pancreatic necrosis is an independent predictor of morbidity and mortality among patients with acute pancreatitis. Patients with pancreatic necrosis often undergo direct endoscopic necrosectomy, surgical and interventional radiology approaches exist. We compared the safety and outcomes of 3 techniques including endoscopic necrosectomy, fluoroscopy-guided necrosectomy by an interventional radiologist (IR-necrosectomy), and open necrosectomy performed by a surgeon (surgical necrosectomy).

**Methods:** Using the Nationwide Readmissions Database, we identified hospitalised patients who underwent pancreatic necrosectomy from 2016 to 2019. They were identified using the International Classification of Diseases, 10th Revision, Procedure Coding System. Categorical variables were described using proportions and compared with Chi-Squared Test. Continuous variables were presented as means and compared using the adjusted Wald test. Adjusted odds ratios for adverse events associated with each technique were calculated using multivariable logistic regression analysis. Adjusted hazard ratios were calculated to compare mortality rates.

**Results:** Of the 2,281 patients meeting the selection criteria, the method of pancreatic necrosectomy was as follows: endoscopy, 672 (52.1 ± 1.00 years); IR, 1,338 (53.2 ± 0.56 years); and open surgery, 271 (52.0 ± 1.36 years). The rate of mortality was lowest for endoscopy (hazard ratio (HR) 0.27; 95% CI 0.08-0.90; P = 0.033) followed by IR (HR 0.44; 95% CI, 0.20-0.98; P = 0.045), compared to surgery. Endoscopy was associated with less post procedure bleeding compared to IR and surgical necrosectomy, respectively (n=74 vs n=195 vs n=102; P< 0.001); as well as lower rates of post procedure end organ damage including

renal failure (n=134, vs n=449, vs n= 133; P< 0.001) and respiratory failure (n=0, vs n=18, vs n= 13; P=0.002). Endoscopy was associated with average shorter lengths of stay and total hospital costs when compared with IR and surgery, respectively (20.1 vs 25.8 vs 38.3 days; P < 0.001) and (\$57K vs \$76K vs \$123K; P< 0.001).

**Conclusion:** Endoscopic necrosectomy is associated with significantly lower risk of inpatient mortality, adverse events, length of stay, and cost when compared to IR and surgical approaches.



[1072] **Figure 1.** Kaplan-Meier survival curve comparing endoscopic, radiologic, and surgical pancreatic necrosectomy

S1073 Presidential Poster Award

**Endoscopic Sleeve Gastroplasty in Class III Obesity (BMI>40): A Propensity-Matched, Retrospective Comparison of Short-Term Safety and Efficacy vs Bariatric Surgery**

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University of Virginia, Charlottesville, VA.

**Introduction:** Less than 1% of eligible patients undergo bariatric surgery, mainly due to apprehensions over adverse events. Endoscopic sleeve gastroplasty (ESG) may increase adoption of bariatric procedures while limiting potential procedural morbidity. Although there are no guidelines that specify applicability, ESG is still predominantly offered to patients with class I (BMI 30-35 kg/m<sup>2</sup>) and class II obesity (BMI 35-40 kg/m<sup>2</sup>). There is a lack of data evaluating ESG amongst its surgical bariatric alternatives in patients with class III obesity (BMI > 40 kg/m<sup>2</sup>). This is the largest study yet to assess short term (30d) safety and efficacy of ESG in patients with class III obesity and compare its performance to sleeve gastrectomy (SG) and Roux-en-Y bypass (RNYB).

**Methods:** We retrospectively evaluated over 500,000 patients undergoing ESG, SG, and RNYB across 800 hospitals from the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database from 2016-2020. ESG patients were grouped by obesity class (Class III and Class I-II) and propensity matched to compare outcomes between groups. ESG patients with class III obesity were also propensity matched separately to SG and RNYB patients with class III obesity to compare outcomes. Outcomes measured at 30d included adverse events (AE), readmissions, reoperations, reinterventions, total body weight loss (TBWL), emergency room (ER) visits, and outpatient treatments for dehydration.

**Results:** In patients who underwent ESG, there was no difference in AE, readmissions, reoperations, or reinterventions between Class III and Class I-II obesity cohorts (p >0.05). ESG led to greater mean % TBWL at 30d in Class III obesity versus Class I-II obesity (p < 0.05). For class III obese patients, ESG had similar AE to SG (p >0.05) and far less than RNYB (p < 0.05). ESG led to nearly identical mean %TBWL as SG and RNYB at 30d (p < 0.05). ESG patients had similar rates of readmissions and reoperations (p >0.05) compared to SG, but more reinterventions (p < 0.05). SG had more outpatient treatments for dehydration (p < 0.05) and ER visits (p < 0.05) than ESG. Compared to RNYB, ESG had fewer readmissions, reoperations, outpatient treatments for dehydration, and ER visits (p < 0.05).

**Conclusion:** ESG is safe in class III obesity, with no difference in AE between obesity classes. The safety of ESG in class III obesity mirrored SG and exceeded RNYB, with comparable efficacy. Clinicians should consider expanding access to ESG regardless of BMI.

**Table 1. Short-Term Safety and Efficacy of Endoscopic Sleeve Gastroplasty in Class III Obesity versus Bariatric Surgery**

	ESG in Class III Obesity (n= 2,626)	ESG in Class I-II Obesity (n= 2,626)	P	SG in Class III Obesity (n= 5,252)	P	RNYB in Class III Obesity (n= 5,252)	P
Mean BMI (SD)	47.79 (7.23)	35.38 (2.73)	< 0.001	48.31 (7.44)	0.003	47.85 (6.84)	0.707
Mean Change from Pre-Op to Post-Op BMI (SD)	-2.44 (3.42)	-1.30 (1.84)	< 0.001	-2.65 (2.29)	0.002	-2.58 (2.47)	0.057
Mean % Total Body Weight Loss at 30d (SD)	5.0 (6.0)	3.2 (7.3)	< 0.001	5.4 (3.8)	< 0.001	5.3 (4.4)	0.003
Mean Number of Days from Procedure to Discharge (SD)	1.01 (1.65)	0.73 (2.23)	< 0.001	1.52 (1.33)	< 0.001	1.94 (1.84)	< 0.001
Mean Procedure Length, minutes (SD)	68.94 (49.15)	60.49 (44.48)	< 0.001	78.99 (40.17)	< 0.001	134.97 (65.25)	< 0.001
Major Adverse Event, n (%)	36 (1.4)	37 (1.4)	1	76 (1.4)	0.866	172 (3.3)	< 0.001
Anastomotic Leak, n (%)	0 (0.0)	0 (0.0)	1	1 (0.2)	0.808	2 (0.3)	0.718
Pneumonia, n (%)	2 (0.1)	7 (0.3)	0.182	9 (0.2)	0.784	24 (0.5)	0.01
Intra-operative or Post-operative Blood Transfusion, n (%)	11 (0.4)	15 (0.6)	0.555	25 (0.5)	0.859	68 (1.3)	< 0.001
Mean Number of Blood Products Transfused (SD)	0.11 (0.87)	0.10 (0.56)	0.965	0.10 (0.56)	0.835	0.25 (1.05)	0.017
Vein Thrombosis requiring therapy, n (%)	0 (0.0)	2 (0.1)	0.479	12 (0.2)	0.032	10 (0.2)	0.057
Sepsis, n (%)	6 (0.2)	6 (0.2)	1	7 (0.1)	0.492	13 (0.2)	1
Unplanned Admission to ICU, n (%)	12 (0.5)	9 (0.3)	0.662	29 (0.6)	0.698	58 (1.1)	0.006
Bowel Obstruction, n (%)	1 (0.3)	0 (0.0)	1	2 (0.0)	0.883	6 (0.9)	0.383
Reoperation within 30 days, n (%)	32 (1.2)	33 (1.3)	1	53 (1.0)	0.464	138 (2.6)	< 0.001
Readmission within 30 days, n (%)	101 (3.8)	92 (3.5)	0.557	179 (3.4)	0.355	334 (6.4)	< 0.001
Reintervention within 30 days, n (%)	68 (2.6)	62 (2.4)	0.657	53 (1.0)	< 0.001	125 (2.4)	0.624
Received Treatment for Dehydration Outpatient, n (%)	75 (2.9)	54 (2.1)	0.075	206 (3.9)	0.019	269 (5.1)	< 0.001
Emergency Department Visit Not Resulting in Admission, n (%)	148 (5.6)	108 (4.1)	0.012	364 (6.9)	0.032	522 (9.9)	< 0.001

S1074 Presidential Poster Award

**Concomitant Transoral Incisionless Fundoplication Outcomes and Efficacy for Gastroesophageal Reflux Disease: A Retrospective Analysis**

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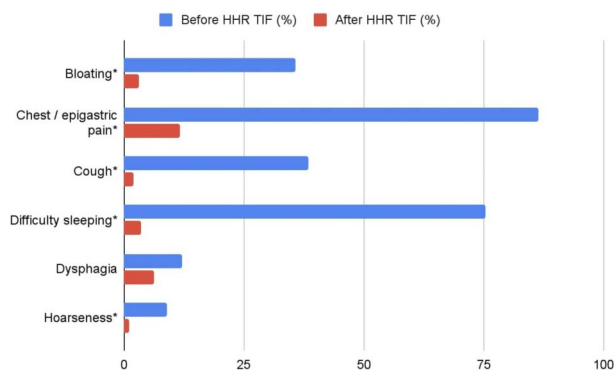
<sup>1</sup>Universidade Federal de Minas Gerais, Boston, Minas Gerais, Brazil; <sup>2</sup>Marmara University School of Medicine, Los Angeles, CA; <sup>3</sup>University of California, Irvine, Irvine, CA; <sup>4</sup>Universidade Federal do Mato Grosso do Sul, Union City, NJ; <sup>5</sup>OC Surgical, Orange County, CA.

**Introduction:** Gastroesophageal reflux disease (GERD) affects up to 27.8% of the American population and costs USD 10 billion to the US healthcare yearly. Proton pump inhibitors (PPIs) remain the gold standard treatment despite long-term complications and being refractory in up to 40% of patients since it does not address the anatomical defects that might be present. Alternatives such as hiatal hernia repair with concomitant transoral incisionless fundoplication (cTIF) have been used to manage patients with larger hernias (>2 cm) or esophagitis grade B-D, but there is scarce literature about its efficacy. Therefore, we aim to assess the outcomes and efficacy of cTIF.

**Methods:** Retrospective data were collected from patients who underwent hybrid TIF in two centers from May 2012 to March 2021. Categorical variables were described as frequencies. Statistical analysis was performed using chi-square or fisher's exact tests to assess the relationships between different variables. Results with a p-value < 0.05 were considered statistically significant.

**Results:** Of 334 patients, 133 were male (39.82%) and 201 female (60.18%). Mean age was 54 (± 14.7). Mean BMI was 28.4 (± 5.3), mean size of hiatal hernia was 3.7cm (± 1.25) and mean DeMeester score was 38.9 (± 35.2). 52 patients (16.35%) had recurrence of at least one symptom after cTIF. Patients showed significant improvement in difficulty sleeping, chest or epigastric pain, cough, hoarseness, and bloating (p< 0.000). Dysphagia was not improved (p=0.061). 282 patients were on daily proton pump inhibitors (PPI) before the procedure, with a mean use time of 5.6 years (± 5.3). We found a significant PPI use reduction, from 92.45% to 44.75% of patients (p< 0.000). No adverse events were reported. 8 patients (2.39%) had recurring GERD with a positive DeMeester score and underwent a second cTIF.

**Conclusion:** GERD is associated with decreased quality of life, especially for patients with refractory and severe symptoms. Hybrid TIF presents as a solid alternative for patients with GERD with hiatal hernia, with most patients showing significant improvements in symptoms. This is the largest cohort of patients who underwent cTIF performed by the same surgeon to the best of our knowledge. Further studies should aim to establish the long-term outcomes of the procedure.



[1074] **Figure 1.** Percentage of patients that had GERD-related symptoms before and after undergoing cTIF (HHR TIF). The most common symptoms before the procedure were chest or epigastric pain, difficulty sleeping, and cough. Almost half of the patients with positive dysphagia symptoms had symptom relief (p=0.061). Symptoms marked with an asterisk were found statistically significant (p < 0.000).

S1075 Presidential Poster Award

**Early (<4 Weeks) vs Standard (≥ 4 Weeks) Endoscopic Drainage of Pancreatic Walled-Off Fluid Collections: A Systematic Review and Meta-Analysis**

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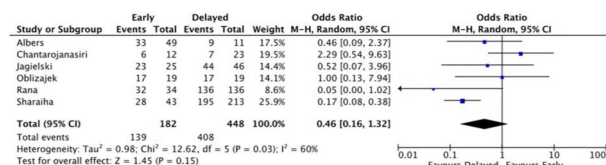
<sup>1</sup>University of Utah, Salt Lake City, UT; <sup>2</sup>Michigan State University at Hurley Medical Center, Flint, MI; <sup>3</sup>Loyola University Medical Center, Chicago, IL; <sup>4</sup>Elmhurst Hospital, Elmhurst, NY; <sup>5</sup>University of Foggia, Foggia, Puglia, Italy; <sup>6</sup>S. Elia-Raimondi Hospital, Caltanissetta, Sicilia, Italy; <sup>7</sup>Centura Health-Porter Adventist Hospital, Salt Lake City, UT; <sup>8</sup>University of Cincinnati, Cincinnati, OH.

**Introduction:** Previous studies have demonstrated that the ideal time for drainage of walled off pancreatic fluid collections is 4-6 weeks after its development. However, some pancreatic collections, including pancreatic walled-off necrosis (WON), require earlier drainage. Nevertheless, the optimal timing of the first intervention is unclear, and consensus data are sparse. The aim of this study was to evaluate clinical outcomes and safety of endoscopic ultrasound (EUS) - guided drainage of pancreatic fluid collections < than 4 weeks after its development compared to ≥4 weeks after its development.

**Methods:** Search strategies were developed for PubMed, EMBASE, and Cochrane Library databases from inception through June 2022 in accordance with PRISMA and MOOSE guidelines. Outcomes of interest included technical success defined as successful endoscopic placement of LAMS, clinical success defined as reduction in cystic collection size, and procedure-related adverse events. A random effects model was used for analysis and results were expressed as odds ratio (OR) along with 95% confidence interval (CI).

**Results:** A total of 6 studies (630 patients) were included in our final analysis where 182 patients (28.9%) were enrolled in the early drainage cohort and 448 (71.1%) patients in the standard drainage cohort. Age ranges were similar between groups. Alcohol was the main driver of acute pancreatitis. Infection was the most common indication for pancreatic drainage (42.6%). The mean fluid collection size was 143.4 ± 18.8 mm for the early cohort vs 128 ± 19.7 mm for the standard cohort. Most fluid collections were located in the body of the pancreas (86.7%). Overall, technical success favored standard drainage over early drainage (OR 0.01; 95% CI 0.00 – 0.15; P=0.001). Clinical success also favored standard drainage over early drainage (OR 0.46; 95% CI 0.16 – 1.32; P=0.03). With regards to adverse events, there was no statistically significant difference in overall adverse events (OR 0.76; 95% CI 0.42 – 1.39; P=0.56) or mortality (OR 1.14; 95% CI 0.29 – 4.48; P=0.23). Hospital stay was longer for patients undergoing early drainage compared to standard drainage (23.7 vs 16.0 days, respectively). (Figure)

**Conclusion:** Compared to early drainage (< 4 weeks), endoscopic drainage of pancreatic fluid collections is significantly more efficacious when performed at least 4 weeks after development, with a shorter hospital length of stay. Therefore, pancreatic fluid collections should ideally be drained 4 weeks after development.



[1075] **Figure 1.** Forrest plot showing pooled rates of clinical success.

## S1076 Presidential Poster Award

**Anesthesia Care Provider Sedation (ACPS) Is Superior to Conscious Sedation (CS) for Successful Diagnostic Tissue Acquisition in Endoscopic Ultrasound Fine Needle Aspiration and/or Biopsy (EUS FNA/B)**

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**Introduction:** EUS-FNA/B is frequently used for diagnosis of suspicious intestinal, subepithelial, and extraintestinal lesions. Our study aimed to evaluate the role of sedation in the diagnostic yield of EUS-FNA/B of suspicious lesions in the mediastinum, abdomen and pelvis. Given frequent use and experience of CS with diagnostic EUS at our institution, we hypothesized that the diagnostic yield of EUS-FNA/B would be equivalent for both sedation groups.

**Methods:** A retrospective, single-center, cohort study was conducted including patients aged >18 years old who received EUS-FNA/B at our institution from 9/2018 – 5/2021 for further evaluation of suspicious lesions. Relevant baseline variables were collected for both groups. The primary endpoint was EUS diagnostic yield of neoplastic lesions. Successful cytologic diagnosis was defined by positive or suspicious results. Unsuccessful cytological results were defined by unsatisfactory, indeterminate, or false negative results. Secondary endpoint was adverse events (AEs). AEs were recorded for EUS only (EUS/ERCP patients were excluded from AE tally due to possible confounding). Baseline statistical comparison was done using the Chi-square test and Wilcoxon two sample tests. Univariate and multivariate logistic regression analysis was conducted to further evaluate primary and secondary outcomes. All statistical analyses were performed utilizing SAS Software (version 9.4; SAS Institute Inc. Cary, NC, USA).

**Results:** 369 patients met initial inclusion criteria. 67 cases with confirmed or suspected benign lesions were eliminated from analysis. Successful FNA/B was present in 146/196 (74.5%) of patients in the ACPS group and 66/106 (62.3%) in the CS group, ( $p = 0.0274$ ). Upon multivariate logistic regression controlling for lesion size, location, needle size, number of passes, and presence of ROSE, the difference in diagnostic yield between the CS and GA groups remained statistically significant (adjusted odds ratio [95% CI]: 0.558 [0.315 - 0.987],  $P = 0.0451$ ) (Table). Adverse events (AEs) occurred more frequently in the ACPS group. This difference was sustained on multivariate analysis controlling for BMI, age, and ASA class.

**Conclusion:** ACPS is associated with improved diagnostic yield when performing EUS-FNA/B for suspicious lesions in the mediastinum, abdomen, and pelvis. AEs occur more frequently in ACPS albeit most AEs are mild and associated with general anesthesia.

**Table 1. Descriptive Analysis of demographics, Univariate/Multivariate logistic regression analysis, and Adverse Events**

Demographics	Type of sedation				P value
	Anesthesia		Conscious Sedation		
	N(number of patients)	%	N	%	
Gender					0.07
Male	110	47.21	51	37.5	
Female	123	52.79	85	62.5	
ASA Class					< 0.001
1	5	2.15	8	5.88	
2	45	19.31	63	46.32	
3	169	72.53	65	47.79	
4	14	6.01	.	.	
Location					0.001
Thoracic	1	0.43	1	0.74	
Abdominal (non-pancreas)	26	11.16	22	16.18	
Pelvic	3	1.29	2	1.47	
pancreas ampulla/uncinate/head	130	55.79	42	30.88	
neck/body/tail pancreas	50	21.46	46	33.82	
SEL	22	9.44	22	16.18	
Cytologic Result					0.007
Unsatisfactory specimen	14	6.01	22	16.18	
Negative for malignancy	43	18.45	33	24.26	
Atypical/Indeterminate	30	12.88	15	11.03	
Suspicious for malignancy	10	4.29	3	2.21	
Positive for malignancy	136	58.37	63	46.32	
FNB					< 0.001
N	140	60.09	115	84.56	
Y	93	39.91	21	15.44	
Univariate and Multivariate logistic regression analysis					
Univariate logistic regression (Crude effect)	Unit	OR	95% Confidence Limits		p-Value
Type of sedation (CS vs Anesthesia)	<b>1</b>	<b>0.565</b>	<b>0.34</b>	<b>0.938</b>	<b>0.0274</b>
Adjusted Effect	Unit	OR	95% Confidence Limits		p-Value
Type of sedation CS vs Anesthesia	1	0.558	0.315	0.987	0.0451
Location Others vs (pancreas ampulla/uncinate/head)	1	0.46	0.2	1.063	0.0691
Number of needle passed	1	1.473	1.191	1.822	0.0004
<b>Categories of Adverse Events</b>			<b>Type of Sedation</b>		
			<b>CS</b>	<b>Anesthesia</b>	
	<b>Severity</b>			<b>GA</b>	<b>MAC</b>
	Mild		3	14	2
	Moderate		1	5	0

Table 1. (continued)

Demographics	Type of sedation				P value
	Anesthesia		Conscious Sedation		
	N(number of patients)	%	N	%	
Severe			0	3	0
Fatal			0	0	0
Total			4	22	2

\*\*Total of 28 adverse events.

## S1077 Presidential Poster Award

## Novel Through the Scope Steerable Grasper Reduces Dissection Time and Technical Demand in Endoscopic Submucosal Dissection in Novice Endoscopists Compared to Clip and Line Traction Method: An Ex Vivo Randomized Study

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<sup>1</sup>Thomas Jefferson University Hospital, Philadelphia, PA; <sup>2</sup>Thomas Jefferson University, Philadelphia, PA.

**Introduction:** Lack of effective devices to aid in tissue traction to facilitate endoscopic submucosal dissection (ESD) leads to prolonged dissection time. Clip and line (CL) method is commonly used to provide traction and improve visualization of the submucosa. A novel through the scope dynamic steerable grasping arm (SGA) has recently been available. We aim to prospectively study the efficacy of this new device with novice endoscopists in an ex vivo setting.

**Methods:** This is a prospective single center randomized trial. In an ex-vivo porcine stomach model, two 25mm circular lesions were marked. Submucosal injection using a lifting agent and circumferential incision was performed. Novice endoscopists with no prior experience of ESD and with one to three years of experience of performing endoscopies were randomized to either SGA (study group) or CL method (control group) first. Each endoscopist performed ESD with both methods. Primary outcome was total dissection time in minutes. Adverse events of muscle injury, perforation, mucosal injury or tissue fragmentation were noted. Participants were asked to choose their preferred traction method for future ESDs. Subsequently, NASA task load index was used to grade subjective mental and physical work load.

**Results:** Ten subjects participated in the study and five were randomized to SGA method first. The mean dissection time was significantly shorter when using SGA compared to clip and line method (5.07 ± 2.19 mins vs 20.07 ± 8.45 mins, P < 0.001) irrespective of order of randomization. Four instances of muscle injury and one perforation were noted with CL and none with SGA. NASA task load index scores across the domains of mental demand (7.9 ± 3.1 vs 15 ± 4, P < 0.001), physical demand (6.4 ± 2.5 vs 12.9 ± 5.6, P = 0.009), temporal demand (5.6 ± 3.3 vs 13.8 ± 4.3, P < 0.001), performance (3.9 ± 3.2 vs 9.2 ± 5.0, P = 0.02), effort (8.4 ± 3.5 vs 16.3 ± 2.8, P < 0.001) and frustration (3.9 ± 2.3 vs 14.3 ± 5.1, P < 0.001) were significantly lower with SGA compared to CL. All participants preferred SGA over CL method.

**Conclusion:** With novice endoscopists performing ESD, SGA leads to faster dissection time compared to CL for traction with a reduced mental and physical work load. There was a trend towards reduced adverse events with SGA. SGA is a promising tool to improve efficiency and learning curve of ESD (Table).

Table 1. Dissection times between two methods across the two randomized groups

Randomization	Number of subjects	Dissection time in minutes using SGA (mean +/- SD)	Dissection time in minutes using CL (mean +/- SD)	P value
SGA first	5	5.32 + 2.21	22.6 + 11.42	0.017
CL first	5	4.82 + 2.41	17.5 + 3.70	0.002
Total	10	5.07 + 2.19	20.07 + 8.45	< 0.001

SGA: Steerable grasping arm; CL: Clip and line.

S1078 Outstanding Research Award in the Interventional Endoscopy Category  
Presidential Poster Award

## Are Advanced Endoscopy Fellows in the United States Achieving Adequate ESD Experience?

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**Introduction:** In 2012, the American Society for Gastrointestinal Endoscopy (ASGE) established the official Advanced Endoscopy Fellowship (AEF) program match, supervised by the ASGE training committee, to serve as a platform connecting applicants and programs. Historically, advanced endoscopy fellowships offered endoluminal endoscopic procedures, including endoscopic retrograde cholangiopancreatography, endoscopic ultrasound, and endoscopic mucosal resection. To become designated as proficient, trainees needed to meet a minimum procedural volume. More recently, third space endoscopy procedures have evolved including endoscopic submucosal dissection (ESD) and peroral endoscopic myotomy (POEM). Multiple studies support that ESD proficiency requires a trainee perform a minimum of 50 gastric/esophageal as well as 50 colorectal dissections, for a total of at least 100 ESD procedures. We conducted a mirror study to reflect the present status of ESD training among the ASGE match programs.

**Methods:** 2023 ASGE AEF programs were reviewed from publicly available information posted on the ASGE website.

**Results:** Of the 78 AEF programs, 70 offer ESD training. The total number of ESD procedures per institution was 41.8 ± 37 per year. Of these, the reported volume involving fellows' hands-on experience was 17.8 ± 24.6 procedures per year. The average number of physicians performing ESD was 1.4 ± 0.7 per institution. Twenty-two of 70 programs perform >50 ESD procedures annually, with a median of 83.2 ± 36.5 procedures per year. In these 22 programs, the fellows' hands on experience was 33.3 ± 34.5 procedures annually.

**Conclusion:** ESD is an emerging endoscopic procedure for early GI tract malignancies. To be able to perform the procedure independently and safely, more than 100 supervised ESD procedures are required to achieve proficiency. Relative to other parts of the world, ESD in the United States is still an evolving procedural realm demanding close proctorship. Based on the current ASGE AEF data presented, a better understanding of the training process for ESD and third space endoscopy is necessary, with the potential development of standardized training requirements.

## S1079

## Endoscopic Sleeve Gastropasty Performed by Gastroenterologists vs Bariatric Surgeons: Are There Differences in Short-Term Outcomes?

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**Introduction:** Endoscopic sleeve gastropasty (ESG) is an emerging bariatric intervention designed to imitate surgical sleeve gastrectomy (SG), with demonstrated safety and efficacy in early clinical studies. Both gastroenterologists and bariatric surgeons currently perform ESG, but there is a lack of data evaluating the impact of proceduralist specialization on short-term outcomes following ESG. Prior studies analyzing SG have suggested that variations in training background and specialty impact clinical outcomes of the procedure. This study aims to assess whether proceduralist specialization impacts short-term (30d) safety after ESG.

**Methods:** All patients who underwent ESG from 2016-2020 across 800 different hospitals in the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database were stratified into two cohorts depending on the specialty of the physician performing the procedure. These cohorts were then propensity matched using baseline patient characteristics. We primarily compared adverse events (AE), readmissions, re-operations, and re-interventions within 30 days after procedure. Secondary outcomes included procedure time, length of stay (LOS), total body weight loss (TBWL), and emergency room (ER) visits within 30d.



**Results:** Following propensity matching, there were no differences in baseline characteristics between patients who underwent ESG with a gastroenterologist or bariatric surgeon. There was no difference in AE in ESG performed by either specialty ( $p > 0.05$ ). ESG performed by bariatric surgeons led to a higher rate of reoperations within 30 days ( $p = 0.025$ ). ESG performed by gastroenterologists led to more ER visits but did not lead to a higher rate of readmissions or reinterventions. LOS was shorter in ESG performed by gastroenterologists, whereas procedure time was longer.

**Conclusion:** ESG is safely performed by both gastroenterologists and bariatric surgeons. Patients who underwent ESG with a gastroenterologist visited the ER more often, while bariatric surgeons were more likely to re-operate on patients within 30d—perhaps highlighting variations in technique or postprocedural management. Both specialties should continue collaborating to expand access while standardizing procedural technique and competency requirements (Table).

**Table 1. Comparing Short-Term (30d) Procedural Outcomes after Endoscopic Sleeve Gastroplasty performed by Gastroenterologists versus Bariatric Surgeons**

	Gastroenterologist (n=1234)	Metabolic and Bariatric Surgeon (n=1234)	p
Mean BMI (SD)	38.61 (7.78)	38.46 (7.78)	0.648
Mean Change from Pre-Op to Post-Op BMI (SD)	-1.69 (3.61)	-1.51 (2.21)	0.228
Mean % Total Body Weight Loss (TBWL) (SD)	4.0% (10.1%)	3.6% (6.0%)	0.310
Mean Number of Days from Procedure to Discharge (SD)	0.44 (2.00)	0.74 (1.54)	< 0.001
Major Adverse Event, n (%)	15 (1.2)	17 (1.4)	0.859
Reoperation, n (%)	10 (0.8)	24 (1.9)	0.025
Readmission, n (%)	60 (4.9)	51 (4.1)	0.437
Intervention, n (%)	42 (3.4)	44 (3.6)	0.913
Mean Procedure Length, minutes (SD)	66.59 (41.69)	55.26 (43.13)	< 0.001
Emergency Department Visit Not Resulting in Admission, n (%)	80 (6.5)	45 (3.6)	0.002

S1080

#### Utilization of Endoscopic Retrograde Cholangiopancreatography (ERCP) in a Nationwide Cohort of Patients Admitted With Acute Biliary Pancreatitis With Cholangitis

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**Introduction:** Acute pancreatitis (AP) is the most common gastrointestinal cause of hospital admissions in the United States, with biliary pancreatitis being the most common cause of acute pancreatitis. Acute Cholangitis is a bacterial infection of the biliary system and is most commonly caused by a complete or partial obstruction of the biliary tree by gall stones. One of the most important prognostic factors for acute cholangitis is the timing of biliary drainage. ACG guidelines for acute pancreatitis recommend that patients with AP and concurrent acute cholangitis should undergo ERCP within 24 h of admission. We aimed to estimate the impact of ERCP on hospitalization outcomes in this patient population.

**Methods:** We collected data from the Healthcare Cost and Utilization Project- (HCUP) Nationwide Readmission Database- 2018. Patients admitted with acute biliary pancreatitis with concurrent cholangitis were identified and discharge weights were applied. Median and IQR were used to describe Continuous variables, and proportions were used with categorical variables. Comparison between groups was performed by Mann Whitney test for continuous variables and the Chi-Square test for Categorical variables.

**Results:** We identified 3,981 index hospitalizations with acute biliary pancreatitis with cholangitis, 71.4% of whom received ERCP. Patient received ERCP had significantly lower mortality (3.3% vs. 7.1%,  $P < 0.001$ ) compared to those who didn't but performing ERCP was associated with increased length of stays (6; IQR: 4-9 vs. 5; IQR: 3-8  $P < 0.001$ ) and higher total costs of hospitalization (\$68,904; IQR: \$44,876-\$109,459 vs. \$50,667; IQR: \$28,694-\$101,917,  $P < 0.001$ ). Only 65.2% of ERCPs were performed within 24 hours of admission. Those who received ERCP within 24 hours had decreased LOS (5; IQR: 3-8 vs. 7; IQR: 5-11,  $P < 0.001$ ), lower hospitalization costs (\$63,263; IQR: \$41,180-\$102,942 vs. \$76,958; IQR: \$48,808-\$128,660,  $P < 0.001$ ) and lower 90-day readmission rates (15.1% vs. 19.9%,  $P = 0.006$ ) compared to those who received ERCP after 24 hours of admission. (Table)

**Conclusion:** Performing ERCP was associated with lower inpatient mortality in patients admitted with acute biliary pancreatitis with cholangitis and performing the ERCP within 24 hours of admission was associated with decreased length of stays, hospitalization costs, and 90-day readmission rates. Our study supports ACG guidelines and urges clinicians to adhere to the recommendations to improve outcomes.

**Table 1. Demographic and clinical characteristics of patients with biliary pancreatitis with cholangitis**

	ERCP performed		P-value
	No N= 1,137	Yes N= 2,844	
Median Age (IQR)	71 (59- 81)	72 (61-81)	0.452
Sex (%)			
Male	544 (47.8)	1,453 (51.1)	0.064
Female	593 (52.2)	1391 (48.9)	
Hypertension (%)	471 (41.4)	1,357 (47.7)	< 0.001
Diabetes mellitus (%)	356 (31.3)	927 (32.6)	0.433
Dyslipidemia (%)	466 (41)	1,311 (46.1)	0.004
Obesity (%)	270 (23.7)	640 (22.5)	0.399
COPD (%)	134 (11.8)	288 (10.1)	0.124
Acute kidney failure (%)	342 (30.1)	865 (30.4)	0.835
CKD (%)	188 (16.5)	546 (19.2)	0.051
Heart failure (%)	225 (19.8)	424 (14.9)	< 0.001
Cirrhosis (%)	33 (2.9)	115 (4)	0.086
ICU admission (%)	20 (1.8)	36 (1.3)	0.232
Bed size of the hospital (%)			
Small	195 (17.2)	319 (11.2)	< 0.001
Medium	357 (31.4)	764 (26.9)	
Large	585 (51.5)	1,761 (61.9)	



Table 1. (continued)

	ERCP performed		P-value
	No N= 1,137	Yes N= 2,844	
Insurance (%)			
Medicare	711 (62.5)	1901 (66.8)	0.002
Medicaid	91 (8)	243 (8.5)	
Private insurance	267 (23.5)	558 (19.6)	
Self-pay	30 (2.6)	85 (3)	
Other	8 (0.7)	4 (0.1)	
No charge	30 (2.6)	54 (1.9)	
90-day readmission (%)	155 (18.7)	359 (16.9)	0.261

S1081

#### Evaluation of Abbreviated HLD Protocols for Duodenoscopes With Disposable Tips

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**Introduction:** Recent observational studies suggest that duodenoscopes with disposable tips have lower rates of bacterial contamination compared to fully reusable duodenoscopes. However, it is unclear if the reprocessing of duodenoscopes with disposable tips can be abbreviated without compromising disinfection efficacy. We evaluated rates of duodenoscope bacterial growth after abbreviated disinfection protocols.

**Methods:** We conducted a two-phase prospective observational study utilizing an abbreviated protocol for the disinfection of Pentax Medical ED34-i10T2 duodenoscopes with disposable tips. Phase 1 (P1), conducted from October 2021 to March 2022, used an abbreviated protocol of one manual wash (MW) prior to one cycle of high-level disinfection (HLD). Phase 2 (P2) was conducted from April to May 2022 and samples were obtained after two MWs and one HLD. Each duodenoscope was sampled in 4 locations per Figure. Samples were plated on routine medias for enteric pathogens including *Clostridium difficile* and *Enterococcus* spp. Antibiotic resistance was assessed via PCR for Vancomycin-resistant *Enterococcus* (VRE). One-sided Fisher's exact test was done to identify differences in bacterial growth at each sample site in both phases. Contamination was defined by >100 CFU raw growth and >1 CFU *C. difficile* and VRE.

**Results:** P1: 46 duodenoscopes were sampled resulting in 184 sample events. 8 of 46 duodenoscopes had raw growth. 4 grew VRE. None grew *C. difficile*. P2: 25 duodenoscopes were sampled resulting in 100 sample events. 2 of 25 duodenoscopes had raw growth. 4 grew VRE. None grew *C. difficile*. P1 vs P2: There were no significant differences in total bacterial or VRE presence for all sample sites. For sites 2 and 3 in phase 2, the 95% confidence interval for the rate of contamination after two MW was 0.1% to 20.4%. This was higher than the CI limits for the rate of contamination in phase 1 (site 2 95% CI 0%, 7.7%; site 3 95% CI 0.1%, 11.5%). (Figure)

**Conclusion:** In our study, one MW did not grow significantly more bacteria compared with two MW prior to HLD. This suggests that two MW may not be superior to one MW in achieving HLD in duodenoscopes with disposable tips. Duodenoscopes with disposable tips have lower bacterial contamination rates compared to prior FDA data<sup>1</sup> on fully reusable duodenoscopes. Our data provide impetus for larger studies of abbreviated HLD protocols. (Table).<sup>1</sup> 522 postmarket surveillance studies database: pilot phase (phase 1) of the Sampling and Culturing Study for Pentax. accessdata.fda.gov. 2020.



[1081] **Figure 1.** Sample locations: 1) The elevator tab, 2) instrument channel distal opening, 3) composite duodenoscope tip, and 4) the instrument channel. Samples 1-3 were collected with flocked swabs. The 4th was collected by flushing 25 mL of neutralizing buffer through the instrument channel, then scrubbing the channel with a brush, followed by another 25mL flush. The 50mL eluent was vacuum filtered through a 0.22-micron filter and plated on TSA. Duodenoscope serial numbers were recorded and one duodenoscope grew VRE in Phase 1 and Phase 2.

**Table 1.** Comparison of Contamination Rates by Sample Site in Phase 1 versus Phase 2

		Phase 1	Phase 2	P1 vs. P2
		(N=46) 95% CI	(N=25) 95% CI	p-value
Raw Sample Presence (>100 CFU)				
	Site 1	0 (0%) (0%, 7.7%)	0 (0%) (0%, 13.7%)	–
	Site 2	0 (0%) (0%, 7.7%)	1 (4.0%) (0.1%, 20.4%)	0.35
	Site 3	1 (2.2%) (0.1%, 11.5%)	1 (4.0%) (0.1%, 20.4%)	0.58
	Site 4	7 (15.2%) (6.3%, 28.9%)	0 (0%) (0%, 13.7%)	1.00
Raw Sample Enterococcus Presence (>1 CFU)				
	Site 1	2 (4.3%) (0.5%, 14.8%)	1 (4.0%) (0.1%, 20.4%)	0.734
	Site 2	2 (4.3%) (0.5%, 14.8%)	2 (8.0%) (1.0%, 26.0%)	0.441
	Site 3	2 (4.3%) (0.5%, 14.8%)	2 (8.0%) (1.0%, 26.0%)	0.441
	Site 4	0 (0%) (0%, 7.7%)	0 (0%) (0%, 13.7%)	–
Raw Sample C. difficile Presence (>1 CFU)				
	Site 1	0 (0%) (0%, 7.7%)	0 (0%) (0%, 13.7%)	–
	Site 2	0 (0%) (0%, 7.7%)	0 (0%) (0%, 13.7%)	–
	Site 3	0 (0%) (0%, 7.7%)	0 (0%) (0%, 13.7%)	–
	Site 4	0 (0%) (0%, 7.7%)	0 (0%) (0%, 13.7%)	–

S1082

**Endoscopic Ultrasound-Guided Superior Hypogastric Plexus Neurolysis: An Update on a Unique Technique for the Management of Pelvic Pain***Kamran Ayub, MD, MRCP<sup>1</sup>, Navkiran Randhawa, DO<sup>2</sup>, Ahamed Khalyfa, DO<sup>2</sup>.*<sup>1</sup>Silver Cross Hospital, New Lenox, IL; <sup>2</sup>Franciscan Health, Olympia Fields, IL.

**Introduction:** The superior hypogastric plexus is a paired structure located anterior to the sacral promontory, in close proximity to the bifurcation of common iliac vessels. It mediates painful visceral stimuli from most of the pelvic structures. Superior hypogastric plexus neurolysis (SHPN) is a well-recognized treatment for pelvic pain resulting from cancer of sigmoid colon, rectum, prostate, bladder, cervix, and uterus. It is also used to manage pain resulting from benign conditions such as endometriosis, pelvic inflammatory disease, and radiation colitis. The conventional approach used by pain experts is difficult and requires CT guidance. The purpose of this study was to test the hypothesis that endoscopic ultrasound (EUS)-guided SHPN is technically feasible.

**Methods:** Patients with severe pelvic pain due to cancer were eligible for the study. Consecutive patients with pelvic pain secondary to cancer were offered to participate in the study. Pain was graded before and after the procedure and weekly thereafter, by using a visual analog scale graded from 1 to 10. A linear scope was introduced into the rectum and advanced until iliac vessels were identified. In 10 patients, the sacral promontory was identified with fluoroscopy. A 22-gauge needle was passed in the space posterior to the rectum and 10 mL of bupivacaine injected, followed by 10 mL absolute alcohol. In one patient, internal iliac vessels were identified by using EUS and the injections were given anterior to the periosteum; fluoroscopy was not used.

**Results:** SHPN was performed in 11 patients with pelvic pain due to cancer. The procedure was completed successfully in all patients. The mean pain score was 9 before the procedure and 3 after (Table). No complications were encountered. The mean procedure time was 20 minutes.

**Conclusion:** Our study reveals that EUS-guided SHPN is technically feasible. The iliac vessels are well seen by this approach, thus making hemorrhage an unlikely complication.

**Table 1.** Patient's Clinical profile and Pre-Visual analogue scale and Post-Visual analogue scale scores

Number	Diagnosis	Pre-VAS	Post-VAS	Duration of Relief (weeks)
1	Rectal Cancer	10	3	6
2	Rectal Cancer	9	2	14
3	Rectal Cancer	8	3	12
4	Prostate Cancer	9	4	6
5	Rectal Cancer	10	2	12
6	Cervix Cancer	9	3	16
7	Sigmoid Cancer	9	5	8

Table 1. (continued)

Number	Diagnosis	Pre-VAS	Post-VAS	Duration of Relief (weeks)
8	Uterine Cancer	8	3	10
9	Rectal Cancer	9	4	24
10	Rectal Cancer	10	2	18
11	Anal Cancer*	10	3	16

\*Superior Hypogastric and Ganglion Impar Neurolysis.  
VAS = Visual analogue scale.

S1083

#### Outcomes of Endoscopic Ultrasound-Guided Fine Needle Biopsy Using a Novel Hydrostatic Stylet Technique

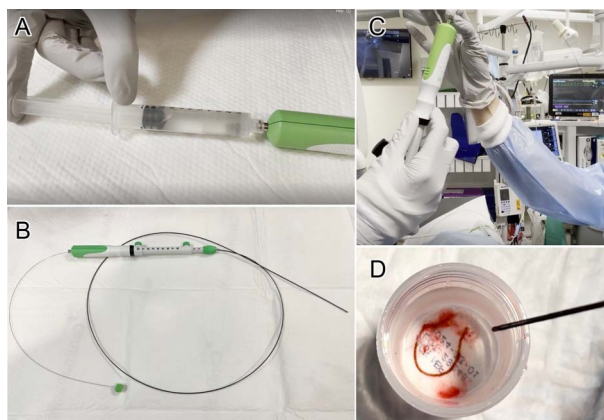
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**Introduction:** Endoscopic ultrasound-guided fine needle biopsy (EUS-FNB) is frequently used to obtain core samples for the diagnostic evaluation of solid lesions. The optimal technique for tissue acquisition using core biopsy needles remains uncertain. Here we report the outcomes of a novel hydrostatic stylet (HS) technique for core biopsy acquisition and evaluate its diagnostic yield, efficacy, and safety compared to conventional stylet slow-pull (SP).

**Methods:** The steps of the HS technique are detailed in Figure. We performed a retrospective analysis of patients who underwent EUS-FNB with core biopsy of solid lesions via HS or SP between January 2020 and April 2022. Exclusion criteria included cystic lesions, non-lesional liver biopsies, and specimens sent for cytological analysis only. Patient and lesion characteristics, the number of passes, sample adequacy, and adverse events were compared between HS and SP techniques.

**Results:** A total of 272 patients were included with 138 in the HS group and 134 in the SP group (Table). The anatomic distribution and size of lesions were similar in both groups with the head of the pancreas and lymph nodes being the two most common locations. The most utilized needle size was 22-gauge in both techniques. Compared to the SP approach, the HS technique demonstrated a significantly lower mean number of passes (1.2 vs 3.5,  $P < 0.001$ ), higher sample adequacy (97.8% vs 83.6%,  $P < 0.001$ ), and higher sensitivity (97.1% vs 89.7%). Rates and severity of adverse events in the HS group were comparable to the SP group (1.5% vs 2.2%,  $P = 0.63$ ) and existing literature.

**Conclusion:** The novel HS technique demonstrated significantly improved biopsy sample adequacy and diagnostic yield while requiring fewer passes to obtain higher diagnostic success compared to a conventional EUS-FNB approach. Further prospective evaluation is needed to confirm these pilot findings and optimize EUS-FNB technique.



[1083] **Figure 1.** EUS-FNB Hydrostatic Stylet Technique Stepwise Progression A. The stylet is removed from the core needle, and the channel is flushed with sterile water. B. The stylet is partially reinserted, leaving 30 cm hanging out, in order to reduce friction within the articulating portion of the endoscope and to preserve a hydrostatic column of fluid between the stylet and needle tip. C. The assistant braces their arm against a fixed object and holds the stylet motionless relative to the patient while the needle is advanced over it into the target tissue, letting go as the needle is withdrawn. D. The sample is expressed directly into formalin by advancing the stylet and residual water column within the needle so producing a visible tissue core with minimal specimen fragmentation or blood contamination.

Table 1. Demographic, Lesion, and Procedural Characteristics for 272 Patients Undergoing EUS-FNB via Hydrostatic Stylet (HS) or Stylet Slow-pull (SP) Techniques

Characteristics	HS (n=138)	SP (n=134)	P-value
Male gender, n (%)	80 (58.0)	58 (48.3)	0.015
Age, mean $\pm$ SD, years	64.9 $\pm$ 13.5	66.2 $\pm$ 15.5	0.48
Lesion location, n (%)			
Pancreas head	32 (23.2)	40 (29.9)	
Lymph node	28 (20.3)	18 (13.4)	
Liver mass	23 (16.7)	12 (8.9)	
Stomach	11 (8.0)	18 (13.4)	
Pancreas body	10 (7.3)	17 (12.7)	
Pancreas tail	9 (6.5)	11 (8.2)	
Biliary duct	7 (5.0)	4 (3.0)	
Pancreas neck	7 (5.0)	4 (3.0)	
Pancreas uncinate process	5 (3.6)	4 (3.0)	
Duodenum	4 (2.9)	2 (1.5)	

**Table 1. (continued)**

Characteristics	HS (n=138)	SP (n=134)	P-value
Left adrenal gland	2 (1.5)	2 (1.5)	
Esophagus	0 (0)	2 (1.5)	
Lesion size, mean ± SD, mm			
Major diameter	22.5 ± 12.1	23.5 ± 10.9	0.55
Minor diameter	16.8 ± 8.9	19.4 ± 10.7	0.07
Number of passes, mean ± SD	1.2 ± 0.5	3.5 ± 1.4	< 0.001
Size of needle used, n (%)			0.03
19-gauge	17 (12.3)	6 (4.5)	
22-gauge	116 (84.1)	126 (94.0)	
25-gauge	5 (3.6)	2 (1.5)	
FNB puncture site, n (%)			0.22
Gastric wall	63 (45.7)	73 (54.5)	
Duodenal wall	73 (52.9)	58 (43.3)	
Jejunal wall	1 (0.7)	0 (0)	
Esophageal wall	1 (0.7)	0 (0)	
Adverse events, n (%)	2 (1.5)	3 (2.2)	0.63
Sample diagnostic, n (%)	135 (97.8)	112 (83.6)	< 0.001
Sensitivity, % (95% CI)	97.1 (91.7-99.4)	89.7 (81.9-94.9)	
Specificity, % (95% CI)	100 (89.1-100)	100 (78.2-100)	

S1084

#### Endoscopic Ultrasound-Guided vs Percutaneous Drainage for the Management of Post-Operative Pancreatic Fluid Collections After Distal Pancreatectomy

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**Introduction:** Post-operative pancreatic fluid collections (POPFs) remain a significant source of morbidity after distal pancreatectomy. Drainage can be performed using percutaneous or endoscopic approaches, but comparative data are limited. This study compared endoscopic ultrasound-guided drainage (EUSD) with percutaneous drainage (PTD) in the management of symptomatic POPFs after distal pancreatectomy. The primary aim is to compare rates of clinical success, defined as symptomatic improvement and radiographic resolution without requiring an alternate drainage modality. Secondary outcomes included technical success, total number of interventions, time to resolution, rates of adverse events (AEs), and POPF recurrence.

**Methods:** Adults who underwent distal pancreatectomy from January 2012 to August 2021 and developed symptomatic POPF were identified retrospectively from a single academic center electronic medical record and a prospectively maintained pancreatic surgery database. Demographic data, procedural data, and clinical outcomes were abstracted. Quantitative variables were described with median and interquartile ranges and compared using a two-tailed t-test. In addition, categorical data were reported as frequencies and compared using Chi-squared or Fisher exact tests.

**Results:** Of 1046 patients that underwent distal pancreatectomy, 217 met study inclusion criteria (median age 60 years, 51.2% female) of whom 106 underwent EUSD and 111 PTD. There were no significant differences in baseline characteristics including age, gender, pathology, and POPF size (Table). PTD was generally performed earlier after surgery (10 vs. 27 days;  $p < 0.001$ ) and more commonly in the inpatient setting (82.9% vs. 49.1%;  $p \leq 0.001$ ). EUSD was associated with a significantly higher rate of clinical success (92.5% vs. 76.6%;  $p = 0.001$ ), fewer median number of interventions (2 vs. 4;  $p \leq 0.001$ ), and lower rate of POPF recurrence (7.6% vs. 20.7%;  $p = 0.007$ ). Drain dwell time was shorter for patients who underwent PTD (37 vs. 46 days;  $p = 0.013$ ). AEs were more frequent after EUSD but did not reach a level of statistical significance (10.4% vs. 6.3%;  $p = 0.28$ ); with approximately 1/3 of EUSD AEs due to stent migration.

**Conclusion:** In patients with POPFs after distal pancreatectomy, EUSD was associated with higher rates of clinical success, fewer interventions, and lower rates of recurrence. EUSD should be considered for management of POPFs in centers with technical expertise.

**Table 1. Baseline characteristics and clinical outcomes of patients who developed post-operative pancreatic fluid collections after distal pancreatectomy**

Baseline Characteristics	EUSD N = 106	PTD N = 111	P value
Age, years, median (IQR)	60 (48-68)	60 (55-68.5)	0.09
Female, no. (%)	52(49.1)	59 (53.1)	0.54
Laparoscopic surgery, no. (%)	56 (52.8)	34(30.6)	<b>0.002</b>
Pancreatic pathology, no. (%)			
Ductal adenocarcinoma	43 (31.1)	40 (29.7)	
Neuroendocrine tumor	32 (30.2)	33 (29.7)	
Intraductal papillary mucinous neoplasm	12 (11.3)	8 (7.2)	
Other*	19 (17.9)	30 (27.0)	
Inpatient, no. (%)	52 (49.1)	92(82.9)	< <b>0.001</b>
Presence of solid necrosis, no. (%)	48 (45.3)	11 (9.9)	< <b>0.001</b>
Infected POPF, no. (%)	42 (39.6)	30 (27.0)	0.06
Maximum diameter in cm, Median (IQR)	7.4 (5.2-10.0)	6.7 (5.1-10.0)	0.45
Time to drainage from surgery, days, median (IQR)	27.0 (13.5-46.5)	10.0 (7.00-18.3)	< <b>0.001</b>
Clinical Outcomes			
Clinical success, no. (%)	98 (92.5)	85 (76.6)	0.001
Technical success, no. (%)	106(100)	111(100)	

Table 1. (continued)

Baseline Characteristics	EUSD N = 106	PTD N = 111	P value
Procedure related adverse events, no. (%)	11(10.4)	7 (6.3)	0.28
Number of interventions, median (IQR)	2 (2-4)	4 (2-6)	< 0.001
Time to drain removal, days, median, (IQR)	45.5 (31.5-73.0)	37.0 (24.0-61.0)	0.013
Recurrence, no. (%)	8 (7.6)	23 (20.7)	0.007

Footnotes: EUSD: EUS-guided drainage; PTD: Percutaneous drainage; POPFC: Post-operative pancreatic fluid collection  
 \*Other pathologies: serous cystadenoma (EUSD n=2; PTD n=3), sarcoma (EUSD n=3; PTD n=6), chronic pancreatitis (EUSD n=3; PTD n=5), insulinoma (EUSD n=1; PTD n=5), other metastatic disease (EUSD n=10; PTD n=11).

S1085

#### Impact of Location on Radiation Exposure During ERCP: A Multi-Institutional Analysis at Tertiary Academic Centers

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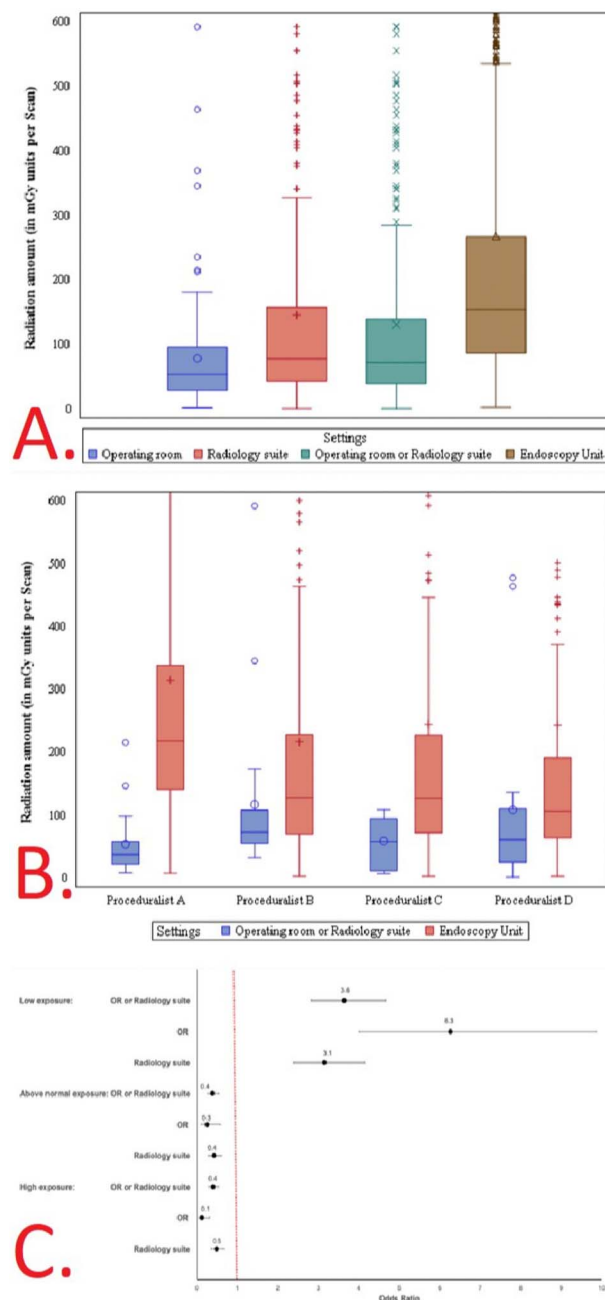
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**Introduction:** Radiation exposure is a hazard associated with performing ERCPs. ERCPs at our institution are performed in the operating room (OR), radiology suite, or endoscopy unit depending on a number of factors. At our institution, the fluoroscopy device is controlled by the endoscopist in the endoscopy unit and by a radiology technician (tech) in the radiology suite and OR. Our study examines the differences in radiation exposure between ERCPs performed in different locations.

**Methods:** A retrospective cohort analysis was performed on adult ERCPs performed between 2015 to 2021, using the records of two tertiary academic centers. Cases with incomplete or undocumented fluoroscopy radiation exposure were excluded. Radiation dose (in mGy) was compared between the endoscopy unit and other settings (radiology suite, OR, and radiology suite and OR combined). Chi-square, Fisher exact test, and Student's t-tests were performed for descriptive analysis to report demographics and other health-related measurements. The multivariable regression models were adjusted for age at the time of the ERCP, race, gender, ethnicity, Charlson Comorbidity Index score (CCI), year of ERCP, and endoscopist. Multivariable logistic regression was adjusted for the same variables, with exception of the endoscopist. (Figure)

**Results:** Of 2211 ERCPs, 78.7% were performed in the endoscopy unit. The individuals in the OR and radiology suite had more comorbidities compared with those in the endoscopy suite (mean CCI=4.2 vs 3.6, p-value=0.0101). The average radiation dose was higher in the endoscopy unit setting (268.5) compared with the OR (78.7), radiology suite (145.8), and OR and radiology suite (131.1), adjusted p-value= 0.0044, 0.0488, 0.0021, respectively. 75% of cases were done by four endoscopists, who on average had less radiation dosage in the OR or radiology suite (54.2, 116.9, 58.9, 108.8), compared with the endoscopy unit (314.9, 216.9, 244.7, 243.5), with p-value= < 0.0001, 0.0157, < 0.0001, 0.0247, respectively. Individuals had an almost 4-fold chance to have a low radiation exposure (< 75 mGy) when the exam was done in the OR or radiology suite compared to the endoscopy unit, OR 95% CI 3.6 [2.8-4.7]. (Table)

**Conclusion:** Radiation exposure was higher in the endoscopy unit when compared to the radiology suite or OR and this was confirmed on subgroup analysis limited to high-volume endoscopists. Findings from this study suggest utilization of radiology techs should be considered to mitigate radiation exposure.



[1085] **Figure 1.** (A) Radiation amount during an ERCP in the endoscopy unit compared to the operating room or radiology unit from 2015 to 2021. (B) Radiation amount during an ERCP, by proceduralist, in the endoscopy unit compared with the operating room or radiology unit from 2015 to 2021. (C) Radiation amount exposure categories during an ERCP, in the endoscopy unit compared with the operating room or radiology unit from 2015 to 2021.

**Table 1. Baseline characteristics of patients that had an ERCP in the endoscopy unit compared with the operating room or radiology unit from 2015 to 2021**

Patient Characteristics	Endoscopy Suite (n=1741, 78.7%)	OR (n=102, 4.6%)	P-value	Radiology Unit (n=368, 16.6)	P-value	OR or Radiology Unit (n=470, 21.3%)	P-value
Male gender, no. (%)	777 (44.6)	46 (45.1)	0.9263	143 (38.9)	<b>0.0425</b>	189 (40.2)	0.0867
White or Caucasian race, no. (%)	1277 (75.2)	73 (73.0)	0.2229	294 (80.6)	0.0908	367 (78.9)	0.1921
Hispanic or Latino	239 (14.2)	24 (24.0)	<b>0.0070</b>	46 (12.5)	0.4121	70 (15.0)	0.6538
Age at admission, mean (SD)	63.3 (18.6)	62.7 (18.5)	0.7551	66.2 (180.0)	<b>0.0053</b>	65.5 (18.1)	<b>0.0227</b>
Less than 50 years old	371 (21.3)	21 (20.6)	0.8626	64 (17.4)	0.0914	85 (18.1)	0.1252
50-65 years old	459 (26.4)	26 (25.5)	0.8455	73 (19.8)	<b>0.0088</b>	99 (21.1)	<b>0.0189</b>
65-75 years old	382 (21.9)	27 (26.5)	0.2847	92 (25.0)	0.2016	119 (25.3)	0.1206

Table 1. (continued)

Patient Characteristics	Endoscopy Suite (n=1741, 78.7%)	OR (n=102, 4.6%)	P-value	Radiology Unit (n=368, 16.6)	P-value	OR or Radiology Unit (n=470, 21.3%)	P-value
75-85 years old	311 (17.9)	14 (13.7)	0.2865	78 (21.2)	0.1343	92 (19.6)	0.3938
More than 85 years old	218 (12.5)	14 (13.7)	0.7216	61 (16.6)	<b>0.0370</b>	75 (16.0)	0.0512
Hospital			<b>&lt; 0.0001</b>		<b>&lt; 0.0001</b>		<b>&lt; 0.0001</b>
#1	1741 (100.0)	84 (82.4)		0 (0.0)		84 (17.9)	
#2	0 (0.0)	18 (17.7)		368 (100.0)		386 (82.1)	
Proceduralist, no (%)			<b>&lt; 0.0001</b>		<b>&lt; 0.0001</b>		<b>&lt; 0.0001</b>
A	607 (34.9)	16 (15.7)		3 (0.8)		19 (4.0)	
B	288 (16.5)	19 (18.6)		1 (0.3)		20 (4.3)	
C	316 (18.2)	8 (7.8)		3 (0.8)		11 (2.3)	
D	272 (15.6)	11 (10.8)		5 (1.4)		16 (3.4)	
E	35 (2.0)	12 (11.8)		149 (40.5)		161 (34.3)	
F	113 (6.5)	10 (9.8)		63 (17.1)		73 (15.5)	
Others <sup>a</sup>	110 (6.2)	26 (25.5)		144 (39.1)		170 (36.2)	
Number of ERCPs	1.5 (1.1)	1.3 (0.8)	0.0800	1.4 (0.9)	0.3716	1.4 (0.9)	0.1505
CCI, mean (SD)	3.6 (3.5)	4.4 (3.6)	<b>0.0439</b>	4.1 (4.5)	<b>0.0387</b>	4.2 (4.4)	<b>0.0101</b>
CCI≥2, no. (%)	1034 (59.4)	68 (66.7)	0.1452	229 (62.2)	0.3130	297 (63.2)	0.1353

Abbreviations: CCI – Charlson comorbidity index; ERCP – Endoscopic retrograde cholangiopancreatography; OR – Operating room; SD – standard deviation. Note: a – All other proceduralists with less than 5% of the overall exams done.

S1086

Endoscopic Ultrasound (EUS) Guided Therapies for Primary and Secondary Prophylaxis in Gastric Varices – An Updated Systematic Review and Meta-Analysis

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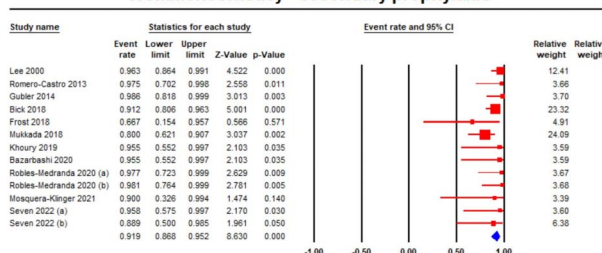
**Introduction:** Gastric varices (GV) account for about 20% of all variceal bleeds and are associated with more risk of uncontrolled bleeding, higher transfusion requirements, and higher rates of rebleeding and death when compared to esophageal varices. While endoscopic glue injection therapy has been traditionally used for secondary prophylaxis in GV, data regarding treatment options for primary prophylaxis continues to emerge. Recently, endoscopic ultrasound (EUS) guided therapies have been employed in GV bleeding. We conducted a systematic review and meta-analysis exploring the safety and efficacy of EUS-guided treatments for primary and secondary prophylaxis of GV.

**Methods:** We conducted a comprehensive search of major databases from inception to June 2022, to identify studies of interest. Our primary goals were to estimate the pooled rates of treatment efficacy, GV obliteration, GV recurrence, and re-bleeding with EUS guided therapy in primary and secondary prophylaxis. Random-effects model was used for our meta-analysis and heterogeneity was assessed using the I2 statistics.

**Results:** 604 patients (18 studies) were included. EUS guided therapies for primary GV prophylaxis were performed in 162 patients, whereas secondary prophylaxis for active and recent bleeding from GV was performed in 442 patients. In primary prophylaxis, pooled rate of GV obliteration was 90.2% (CI 81.1–95.2; I2 0). With combination EUS-glue and coil therapy, the rate was 95.4% (CI 86.7–98.5; I2 0). Pooled rate of post therapy GV bleeding was 4.9% (CI 1.8–12.4; I2 0). In secondary prophylaxis, pooled rate of treatment efficacy was 91.9% (CI 86.8–95.2; I2 12). With EUS-glue, EUS-coil and combination EUS-glue and coil, the rates were 92% (CI 80.7–96.9; I2 60), 95.5% (CI 83.6–98.9; I2 0) and 88.8% (CI 79.8–94.1; I2 16), respectively. Pooled rate of GV obliteration was 84% (CI 71.5–91.2; I2 74). With EUS-glue, EUS-coil and combination EUS-glue and coil, the rates were 84.6% (CI 75.9–90.6; I2 31), 92.3% (CI 81.1–97.1; I2 0) and 84.5% (CI 50.8–96.7; I2 75), respectively. Pooled rates of GV re-bleeding and recurrence were 18.1% (CI 13.1–24.3; I2 16) and 20.6% (CI 9.3–39.5; I2 66), respectively. Mean number of sessions to achieve GV obliteration was 1.4 (range 1-5). Overall pooled rate of adverse events was 11.9% with systemic embolization occurring in 14 patients.

**Conclusion:** Our analysis shows that EUS-guided therapy for gastric varices is technically feasible and clinically successful in both primary and secondary prophylaxis in GV.

Treatment efficacy - secondary prophylaxis



[1086] Figure 1. Treatment Efficacy – secondary prophylaxis.

Table 1.

STUDY	DESIGN	Type of prophylaxis	TOTAL N	EUS MODALITY USED (COIL/GLUE/ COMBINATION)	VOLUME/NO. OF COILS	VOLUME/ NO. OF COILS	GV TYPE	NO. OF SESSIONS	M/ F	AGE
Lee 2000	Prospective, single center, July 1996 to October 1998, China	Secondary	54	EUS-glue	Median 3 doses of CYA (1-8)	NA	GOV1 20, GOV2 18, IGV1 16	2.2 ± 1.7	34/ 20	61 ± 14



Table 1. (continued)

STUDY	DESIGN	Type of prophylaxis	TOTAL N	EUS MODALITY USED (COIL/GLUE/COMBINATION)	VOLUME/NO. OF COILS	VOLUME/NO. OF COILS	GV TYPE	NO. OF SESSIONS	M/ F	AGE
Romero-Castro 2013	Retrospective, multi-center, February 2008 to May 2012, Spain and Germany	Primary/Secondary (7/23)	30 - 19 (CYA); 11 (Coil)	EUS-glue/EUS-Coil	1 mL/session (mean 1.5±0.1 mL, range 1-3 mL)/ Mean of 5.8±1.2 coils (range 2-13)	1.5 ± 0.1 / 5.8 ± 1.2	IGV1 15, GOV2 14, GOV1 1	1.4±0.1 (range 1-3)	22/ 8	60.6 ± 8.7
Gubler 2014	Retrospective, single center, 2006 to 2013, Switzerland	Primary	4/40	EUS-glue	1.9 ml (range 1-10)	3.7 ± 2.6 (vol)	IGV1	2.7 ± 1.8	25/ 15	65 (14-79)
		Secondary	36/40							
Bick 2018	Retrospective, single center, January 2013 and November 2017, USA	Primary	7	EUS-glue (62), glue+coil (2)	2 ml ± 0.8/2 coils	2 ± 0.8/2 ± 1	IGV1:30, GOV1: 2, GOV2: 32	1.2 ± 0.2	33/ 31	58.0 ± 12.5
		Secondary	57							
Frost 2018	Retrospective, single center, October 2013 and January 2017, Ireland	Primary	5	EUS-thrombin	600 - 5000 IU of thrombin	NA	GOV2: 4, IGV1: 4	NR	3/0	61.8 ± 10
		Secondary	3	EUS-thrombin	4250-10,000 IU of thrombin			NR	4/1	61.8 ± 10
Mukkada 2018	Retrospective, single center, October 2013 - December 2016, India	Secondary	30	EUS glue or coil	2ml (1-10)/1-6 coils [1 (7n), 2 (13n), 3 (5n), 4 (3n), 5 (1n), 6 (1n)]	3.75 ± 2.6 / 2.3 ± 1.5	GOV1: 12, GOV2: 8, IGV1: 10	"Multiple"	NR	57.5 ± 12.7
Khoury 2019	Case series, single center, March 2015 and March 2018, Israel	Secondary	10	EUS-glue+coil	1-2ml/2-8 coils	1.5 ± 0.3 / 1.8 ± 1.5	GOV1: 2, GOV2: 5, IGV1: 3	1-4	7/3	46.7 ± 19.3
Lobo 2019	Randomized controlled trial, single center, November 2014 to December 2016, Brazil	Primary + Secondary (6/10)	16	EUS-glue+coil	1.40±0.74 ml/1-3 coils (11/2/2)	1.4 ± 0.74 / 1.4 ± 0.5	GOV2 13, IGV1 3	1 session - 6/16, 2 sessions - 4/15	8/8	49.3 ± 14.8
Bazarbashi 2020	Retrospective, case series, single center, October 2017 and November 2018, USA	Secondary	10	EUS-coil/ gelatin sponge	2.5 ± 0.7 ml absorbable sponge/ 8 ± 2.9 coils	2.5 ± 0.7 / 8 ± 2.9	GOV2: 3, IGV1: 7	NR	4/6	64 ± 11.5
Irisawa 2020	Prospective, single center, case series, Japan	Primary	8	EUS guided coil with sclerotherapy	7.8 mL±6.7/5.6±2.9 coils	7.8 ± 6.7 / 5.6 ± 2.9	IGV1	1.9 ± 1.0	6/2	69 ± 9
Kozeil 2020	Retrospective, single center, Poland	Primary	6	EUS-glue+coil	2ml (1-9)/1.7 (1-3) coils	3.5 ± 2.3 / 1.85 ± 0.6	GOV2 8, IGV1 6, IGV2 2	5	9/7	51 (29-75)
		Secondary	10							
Robles-Medranda 2020 (a)	Randomized controlled trial, single center, March 2016 - October 2018, Ecuador,	Primary	4/30	EUS coil	3 (1 - 7) coils	3.5 ± 1.7	GOV2 12, IGV 1 18	NR	19/ 11	61.6 (12.3)
		Secondary	21/30							
Robles-Medranda 2020 (b)	Randomized controlled trial, single center, March 2016 - October 2018, Ecuador,	Primary	3/30	EUS-glue+coil	1.8 ml (1.2-2.4)/2 (1 - 3) coils	1.8 ± 0.4 / 2 ± 0.6	GOV2 19, IGV1 11	NR	16/ 14	61.8 (7.8)
		Secondary	26/30							
Kouanda 2021	Retrospective, single center, June 2009 and December 2019, USA	Primary	80	EUS-glue+coil	2 ml (0.5 - 5)/1.5 (1-3) coils	2.4 ± 1.3 / 1.75 ± 0.6	IGV1 69, GOV2 8, GOV1 3	1.3 ± 0.5	55/ 25	60.5 ± 10.4
Mosquera-Klinger 2021	Retrospective, single center, case series, June 2014 - June 2018, Colombia	Secondary	4	EUS guided hydro coils	2 coils	2 ± 0.5	NR	NR	3/1	37 ± 12
Seven 2022 (a)	Retrospective, single center, January 1, 2011, and January 31, 2021, Turkey	Primary	8	EUS-coil	5 (3-9)	5.5 ± 1.7	-	NR	-	55.9 ± 12.9
		Secondary	11				GOV2 8, IGV1 3	NR	7/4	
Seven 2022 (b)	Retrospective, single center, January 1, 2011, and January 31, 2021, Turkey	Secondary	9	EUS-glue+coil	5 (3-9)	5.5 ± 1.7	GOV2 7, IGV1 2	NR	5/4	52.1 ± 13.4
Alali 2022	Retrospective, case series, single center, October 2017 to October 2021, Kuwait	Primary + Secondary (5/10)	15	EUS-glue+coil	1.5ml (0.74)/1.5 (1.4) coils	1.5 ± 0.74 / 1.5 ± 1.4	GOV2 12, IGV1 3	1.25 ± 0.38	12/ 3	58 (12)
Bazarbashi 2022 (a)	Retrospective case series, single center, 2018 - 2021, USA	Primary + Secondary (11/68)	79	EUS coils/coil/gelatin sponge	2.5 ml ± 2.05/4.29 ± 3.27 coils	2.5 ± 2.0 / 4.29 ± 3.27	IGV1 49, IGV2 4, GOV1 7, GOV2 19	NR	44/ 35	60.3 ± 13
Samanta 2022 (a)	Randomized controlled trial, multi center, India - Italy	Primary + Secondary (8/44)	52	EUS-glue+coil	2ml (1-3)/2 (1 - 3) coils	2 ± 0.6 / 2 ± 0.6	NR	1 +/- 0.25	32/ 20	48.59 ± 13

S1087

**Cost-Effectiveness of Endoscopic Stricturectomy versus Resection Surgery for Crohn's Disease Strictures**

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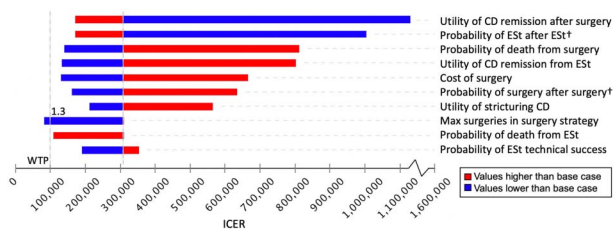
<sup>1</sup>Duke University Medical Center, Durham, NC; <sup>2</sup>Columbia University Medical Center, New York, NY; <sup>3</sup>NYU Langone Health, New York, NY; <sup>4</sup>Columbia University Irving Medical Center, New York, NY.

**Introduction:** Strictures in Crohn's disease (CD) increase the likelihood of requiring surgery, which is costly and invasive. In the last two decades, endoscopic therapies including endoscopic balloon dilation (EBD) and endoscopic stricturectomy (ES) have emerged as effective and less invasive therapies for CD strictures.<sup>1</sup> ES in particular is advantageous for longer, fibrotic strictures, or strictures adjacent to anatomic structures requiring precision, and has shown a high rate of surgery-free survival.<sup>2-4</sup> We therefore assessed the cost-effectiveness of ES as compared to surgical resection for CD strictures.

**Methods:** A microsimulation state-transition model compared ES to surgical resection for patients with primary or anastomotic CD strictures. Our primary outcome was quality-adjusted life years (QALYs) over ten years, and strategies were compared at a willingness to pay (WTP) of \$100,000/QALY from a societal perspective. Costs (2022 \$US) and ICERs were calculated. Deterministic 1-way and probabilistic analyses assessed model uncertainty.

**Results:** The surgery strategy cost more than 2.5 times the endoscopic stricturectomy strategy, but resulted in nine higher QALYs per 100 persons (Table). Overall, surgery had an ICER of \$308,787/QALY, making ES more cost-effective. The median number of endoscopic stricturectomies was 4 in the ES strategy and 0 in the surgery strategy; the median number of surgeries was 0 and 2 respectively. One-way sensitivity analyses showed that quality of life after ES as compared to that after surgery, probabilities of requiring repeated interventions, and surgical mortality and cost were the most influential parameters in our model (Figure). Probabilistic sensitivity analyses favored ES in 65.5% of iterations.

**Conclusion:** Endoscopic stricturectomy is cost-effective for managing primary or anastomotic Crohn's disease strictures. Post-intervention quality of life and probabilities of requiring repeated interventions exert most influence on cost-effectiveness; the decision between ES and surgery should be made considering patients' risk and quality of life preferences. 1. Lee KE et al. Dig Dis Sci. 2022 Mar 15.2. Lan N et al. Gastrointest Endosc. 2019 Aug;90:259-268.3. Zhang LJ et al. Gastroenterol Rep (Oxf). 2019 Oct;8:143-150. 4. Lan N et al. Inflamm Bowel Dis. 2018 Mar;24:897-907.



[1087] **Figure 1.** Tornado diagram showing main drivers (variables and sensitivity ranges) of the incremental cost-effectiveness ratio (ICER). †Multiplicative factor by which probability Tables are multiplied. Abbreviations: CD (Crohn's disease), ES (Endoscopic stricturectomy), ICER (Incremental cost-effectiveness ratio), Max (Maximum), WTP (Willingness to pay)

**Table 1. Base Case Cost-Effectiveness Analysis Results**

	Cost (\$)	Incremental Cost (\$)	Effectiveness (QALY)	Incremental Effectiveness (QALY)	ICER (\$/QALY)
Endoscopic Stricturectomy	16,748		6.28		
Resection Surgery	45,135	28,388	6.37	9 QALYs per 100 persons	308,787

Abbreviations: QALY (Quality-adjusted life year), ICER (Incremental cost-effectiveness ratio).

S1088

**Comparison of Safety of Lumen Apposing Metal Stents With or Without Coaxial Plastic Stent Placement for the Management of Pancreatic Fluid Collections**

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**Introduction:** Lumen opposing metal stents (LAMS) allow for safe and effective endoscopic drainage of pancreatic fluid collections (PFCs). LAMS, however, have been associated with bleeding within the cavity and pseudoaneurysm formation. Placement of a coaxial double pigtail plastic stent (DPPS) may theoretically reduce this risk and that of symptomatic stent occlusion. The aim of this study is to compare the safety of LAMS alone versus LAMS with coaxial DPPS placement (LAMS/DPPS) for the management of PFCs.

**Methods:** Patients who underwent LAMS placement for management of a PFC between Sep 2019 and Feb 2022 were retrospectively identified from a tertiary care center procedural data base. Cases were categorized as LAMS or LAMS/DPPS. Demographics, clinical characteristics, and outcomes were compared between the two cohorts. The primary outcome was the rate and type of adverse events between the groups. Secondary outcomes included clinical success rates and time to clinical success.

**Results:** 185 unique patients were identified; 83 (44.9%) with LAMS drainage alone and 102 (55.1%) LAMS/DPPS. There were no significant differences in age, sex, PFC etiology, PFC type, size, or paracolic extension (Table). DPPS with 7Fr or 10Fr diameters were utilized with a median length of 4.0 cm (IQR 4.0-7.0). There were no significant differences in rates of clinical success, need for early necrosectomy, number of endoscopies, or number of necrosectomies. However, stent dwell time was significantly longer in the LAMS only group (69 vs. 35 days, p=0.017). Overall, AE rates were the same in the two cohorts (15.7%, vs. 15.7%, p=0.825). Bleeding occurred in 2 (2.4%) and 9 (8.8%) cases in the LAMS and LAMS/DPPS groups, respectively (p=0.067), with 4 confirmed cases of pseudoaneurysm bleeding (1 LAMS and 3 LAMS/DPPS, p=0.220). There were no differences in the rate of clinically significant stent occlusion (2.4% LAMS vs. 2.9% LAMS/DPPS, p=0.825) or migration (3.6% LAMS vs. 1.0% LAMS/DPPS, p=0.220). Incidental DPPS migration was noted in 12 (11.8%) cases, but all patients were asymptomatic.

**Conclusion:** The safety profile of LAMS was similar to LAMS/DPPS in this cohort. The incidence of bleeding and occlusion was low overall and not significantly impacted by the presence of a DPPS. Randomized studies are needed to further elucidate the role of coaxial DPPS in drainage of PFCs.

**Table 1. Baseline clinical characteristics and outcomes of patients who underwent placement of either lumen opposing metal stent (LAMS) alone or LAMS with coaxial double pigtail plastic stent (LAMS/DPPS) placement**

BASELINE CHARACTERISTICS	LAMS N = 83	LAMS/DPPS N=102	P Value
Age, y, median (IQR)	55.0 (45.5 – 65.0)	56.5 (42.8 – 65.0)	0.760
Female	22 (26.5)	41 (40.2)	0.051
Collection Type			0.550
Walled-off necrosis	64 (77.1)	80 (78.4)	
Pseudocyst	21 (25.3)	22 (21.6)	
Maximum diameter of dominant collection, cm, median (IQR)	12.0 (7.9 – 18.4)	11.0 (7.8 – 15.0)	0.098
Multiple collections	30 (36.6)	51 (50.0)	0.068

Table 1. (continued)

BASELINE CHARACTERISTICS	LAMS N = 83	LAMS/DPPS N=102	P Value
Paracolic extension	32 (38.6)	34 (33.3)	0.461
OUTCOMES			
LAMS dwell time, d, median (IQR)	69.0 (31.0 – 131.0)	35.0 (21.0 – 65.5)	<b>0.017</b>
Clinical success	63 (75.9)	71 (69.6)	0.341
Total therapeutic endoscopies, no., median (IQR)	2 (1 – 3)	3 (2 – 4)	0.216
Total necrosectomies, no., median (IQR)	1 (0 – 2)	1 (0 – 2)	0.976
Unplanned early necrosectomy	12 (14.6)	16 (15.7)	0.843
Incidental stent migration			0.883
LAMS	1 (1.2)	1 (0.9)	
DPPS	N/A	12 (11.8)	
Adverse Events	13 (15.7)	16 (15.7)	0.996
LAMS Occlusion	2	3	0.825
LAMS Migration	3	1	0.220
Bleeding	2	9	0.067
Infection	6	4	0.322

Data reported as no. (%) unless indicated.

S1089

### Minimal Clinically Important Differences in Overall and Individual Gastroparesis Symptoms After G-POEM: Impact of Clinical Factors and Prior Treatments

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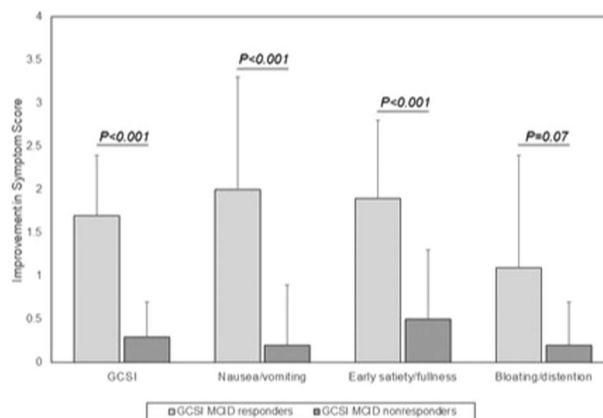
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**Introduction:** Gastric peroral endoscopic myotomy (G-POEM) reduces symptoms in gastroparesis to varying degrees. Studies using Gastroparesis Cardinal Symptom Index (GCSI) surveys set cutoffs for minimal clinically important differences (MCID) that reflect significant longitudinal improvement over time. Few studies have assessed MCIDs of individual gastroparesis symptoms after G-POEM or impact of clinical factors on MCID responses. We compared MCIDs to G-POEM for overall and individual symptoms relating to gastric emptying, pain and opioid use, conditions associated with gastroparesis, and prior therapy.

**Methods:** 22 refractory gastroparesis patients completed GCSI surveys (0=no symptoms, 5=very severe) before and 85±64 days after G-POEM from 2017-21. MCIDs  $\geq 1$  after G-POEM were deemed significant for overall GCSI and individual nausea/vomiting (NV), early satiety/fullness (ES), and bloating/distention (BL) scores.

**Results:** 11/22 patients (50%) met MCID cutoffs for significant GCSI decrease after G-POEM. Individual symptom decreases meeting MCID cutoffs were seen in 12 patients for NV and ES (54%) and 9 for BL (41%). NV and ES reductions were greater in those meeting GCSI MCID cutoffs; BL reductions trended higher (Figure). Gastric emptying normalized in 8/20 patients (40%) which was not different in MCID responders vs. nonresponders for GCSI (44 vs. 36%,  $P=1.0$ ), NV (30 vs. 50%,  $P=0.65$ ), ES (40 vs. 40%,  $P=1.0$ ), or BL (56 vs. 27%,  $P=0.46$ ). Pain as a major symptom was noted by 2/10 responders (20%) vs. 4/11 nonresponders (36%) ( $P=0.64$ ). Opioids were used by 3/11 responders and 3/11 nonresponders (27%,  $P=1.0$ ). Higher basal symptoms, associated IBS and fibromyalgia, and therapies (opioids, metoclopramide, botulinum toxin) impacted responses (Table).

**Conclusion:** Important overall symptom responses to G-POEM using MCIDs were reported by half of gastroparesis patients. Individual symptoms of nausea/vomiting and early satiety showed meaningful decreases more often than bloating. MCID responses did not relate to gastric emptying or pain as a major symptom, but opioid use weakly predicted reduced early satiety/fullness. Increased basal gastroparesis symptoms and IBS related to greater response; fibromyalgia weakly predicted lower response. Metoclopramide use predicted response while higher numbers of botulinum toxin injections weakly related to lesser response raising concerns about pyloric scarring. These findings may be considered in selecting patients for G-POEM.



[1089] **Figure 1.** Individual symptom reductions in nausea/vomiting and early satiety/fullness in patients showing MCID responses in overall GCSI to G-POEM were greater than nonresponders. Bloating/distention improvements trended greater.

Table 1.

Symptom Score Measuring MCID Response	Associated with Improved Response		Associated with Poorer Response	
	Factor	P Value	Factor	P Value
Overall GCSI score	Higher basal individual postprandial fullness score Prior metoclopramide use	0.04 0.08	Higher number of botulinum toxin injections	0.08
Nausea/vomiting GCSI subscore	Higher basal NV GCSI subscore Higher basal individual nausea score Higher basal individual vomiting score	0.03 0.02 0.03	Diabetic gastroparesis etiology Fibromyalgia	0.09 0.09
Early satiety/fullness GCSI subscore	Higher basal NV GCSI subscore Higher basal ES GCSI subscore Higher basal individual postprandial fullness score Prior metoclopramide use	0.03 0.01 0.001 0.01	Fibromyalgia Prior opioid use	0.06 0.06
Bloating/distention GCSI subscore	IBS	0.04		

S1090

#### Factors Associated With Severe Submucosal Fibrosis in the Treatment of Barrett's Esophagus

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**Introduction:** Severe submucosal fibrosis (SSF) is established to increase complications with endoscopic submucosal dissection (ESD) throughout the GI tract. This is often attributed to prior treatment with endoscopic mucosal resection (EMR). However, there is little information regarding which forms of treatment increases the risk of SSF in Barrett's esophagus therapy. We performed a retrospective cohort study to determine the risk factors for SSF.

**Methods:** We identified consecutive patients from the Barrett's Esophagus unit who underwent ESD by a single experienced endoscopist (KKW) who graded the submucosal fibrosis. Submucosal fibrosis can only be reliably identified on ESD to adequately examine the collagen fibers. All resections were performed using a scissor type device. Submucosal fibrosis was evaluated as F0 (no fibrosis), F1 (moderate fibrosis with individual strands), and F2 (SSF) with solid sheets of fibrosis) by international standards. All patients had prior therapy identified and categorized as EMR, thermal treatments including RFA in combination with multipolar coagulation and APC, as well as cryotherapy either balloon or spray.

**Results:** A total of 205 patients were identified with a mean age of 69±0.7 years with 156 males and a Barrett's segment length of 4.4±0.3 cm. Diaphragmatic hernia length was 2±0.2 centimeters. 119 patients had either F0 (n=57, 28%) or F1 (n=55, 27%), while F2 fibrosis was found in 93 (45%) patients. The patients in each group were similar in terms of age, length of Barrett's esophagus, and histology (Table). On univariate analysis, SSF was significantly associated with female gender (p< 0.03), thermal ablation (p< 0.04), and larger hiatal hernia (p< 0.005). Cryotherapy was not associated with SSF. EMR was performed in over half the patients with SSF but was also performed in 41% of those without (p< 0.08). On multivariate analysis, thermal ablation was significantly associated with SSF and hiatal hernia size remained significant but gender was not significant.

**Conclusion:** SSF can dramatically decrease the ability for endoscopic resection. Thermal ablation and size of hiatal hernia are associated with SSF. Careful inspection and resection prior to beginning ablation should decrease the need to perform ESD after ablation. The association with hernia highlights the need for acid control.

Table 1. Assessment of Factors Producing Severe Submucosal Fibrosis

Patients (n,%)	None or Mild Fibrosis	Severe Fibrosis	< p
	112 (54%)	93 (45%)	
Age (yrs)	69.5±0.9	68.4±1.0	0.46
Male gender (n,%)	92 (82%)	64 (69%)	0.03
Length of BE (cm)	4.5±0.4	4.2±0.4	0.57
Length of DH (cm)	1.6±0.2	2.5±0.2	0.005
LGD or ND (n,%)	50 (45%)	35 (38%)	0.31
HGD or ACA (n,%)	62 (55%)	58 (62%)	
Thermal Ablation (RFA) (n,%)	24 (21%)	32 (34%)	0.04
Cryotherapy	17 (15%)	21 (23%)	0.17
EMR	43 (38%)	47 (51%)	0.08

S1091

#### Endoscopic Outcomes of Post-Operative Bile Leaks

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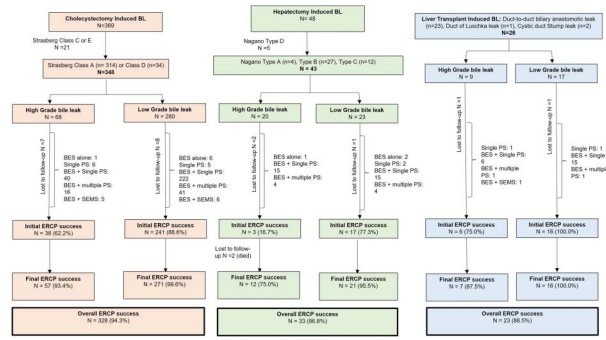
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**Introduction:** Endoscopic retrograde cholangiopancreatography (ERCP) is a treatment option for post-operative bile leaks (PBL). In this study, we aimed to evaluate the ERCP outcomes for PBL at our tertiary institution.

**Methods:** We created a retrospective database of patients with PBL who underwent ERCP between July 2011 to January 2021. We reviewed the fluoroscopic images and reports of each ERCP and defined a high-grade PBL as visualization of contrast extravasation from the bile duct defect before contrast filling the intrahepatic biliary branches. Initial ERCP success was defined as resolution of PBL seen on the 2nd ERCP cholangiogram. Final ERCP success was defined as resolution of PBL after one or more interventional ERCP sessions. We used Strasberg classification for post cholecystectomy bile leaks (C-BL), Nagano classification for post hepatectomy bile leaks (H-BL) and we distinguished bile leaks from orthotopic liver transplants (OLT-BL) as duct-to-duct biliary anastomotic leak or other locations. (Figure)

**Results:** Out of 443 cases - 369 (83.3%) were C-BL, 48 (10.8%) were H-BL, and 26 (5.9%) were OLT-BL. Baseline characteristics are summarized in Table. Median time from surgery to ERCP was 6 days; 84% had ERCP performed at least 3 days after the inciting surgery. The initial ERCP interventions and ERCP outcomes are shown in detail in Image 1. The median time from initial ERCP to the 2nd ERCP was 5 weeks. The overall ERCP success rate was better for C-BL (94.3%) vs H-BL (86.8%) and OLT-BL (88.5%), (P=0.0004). Across the different groups, high-grade PBL was associated with a higher likelihood of persistent PBL needing multiple ERCP therapy sessions (P < 0.0001). Overall ERCP-related adverse events occurred in 19 (4.3%) patients - 17 post-ERCP pancreatitis, 1 perforation and 1 post-ERCP bleed. 7 had severe post-ERCP pancreatitis that required escalation of care. None of these cases resulted in in-hospital mortality.

**Conclusion:** For initial ERCP treatment of PBL, our endoscopists generally preferred combination therapy with BES and plastic stenting. Regardless of the surgery and location of leak, high-grade PBL were more likely to require multiple ERCP sessions to resolve, suggesting that a high-grade PBL may warrant more aggressive ERCP therapy from the start. In our cohort, it appears that low-grade OLT-BL were most likely to resolve after 1 ERCP intervention and high-grade H-BL were the most likely to need repeated ERCP therapies. However, our study was limited by an overwhelming proportion of C-BL.



[1091] **Figure 1.** Outcomes of initial ERCP interventions. Abbreviations: BL : Bile leak. BES: Biliary endoscopic sphincterotomy. PS: Plastic Stent. SEMS: Self-expandable metallic stent.

**Table 1. Baseline Characteristics of Patient Cohort**

Variables	Cholecystectomy induced Bile leaks (N=369)	Hepatectomy induced Bile Leaks (N=48)	Liver Transplant induced Bile Leaks (N=26)
Median Age (years) [IQR]	56.0 [41.0, 68.0]	57.5 [51.0, 65.0]	51.5 [39.0, 58.0]
Female Gender (%)	220 (60%)	27 (56%)	10 (38%)
Median BMI [IQR]	31.0 [26.0, 35.0]	26.0 [ 22.5, 32.0]	27.0 [ 25.0, 29.0]
Diabetic on medical management (%)	67 (18%)	5 (10%)	7 (27%)
Active tobacco use (%)	144 (39%)	24 (51%)	8 (32%)
On immunosuppressants (%)	16 (4.3%)	10 (20.8%)	26 (100.0%)
Altered anatomy from prior surgery (%)	12 (3%)	4 (8%)	25 (96%)
Surgery performed for malignancy (%)	4 (1%)	37 (77%)	3 (12%)
Jaundice present at initial ERCP (%)	137 (40%)	18 (38%)	21 (81%)
Documented biloma before initial ERCP (%)	131 (39%)	32 (68%)	7 (28%)
Percutaneous abdominal drain in-situ at initial ERCP (%)	228 (62%)	34 (71%)	6 (23%)
Biliary stones found at initial ERCP (%)	71 (19%)	3 (6%)	1 (4%)
Biliary stricture found at initial ERCP (%)	25 (7%)	11 (23%)	16 (62%)

S1092

**Outcomes of Endoscopic Ultrasound-Guided Gallbladder Drainage in Malignant Biliary Obstruction: A Meta-Analysis**

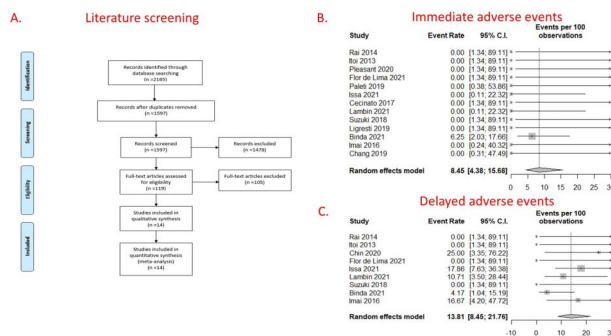
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**Introduction:** Endoscopic ultrasound-guided gallbladder (EUS-GBD) drainage has been described as an alternative palliative treatment for malignant biliary obstruction (MBO). We aim to assess the outcomes of EUS-GBD for MBO.

**Methods:** We conducted a comprehensive literature review of MEDLINE, EMBASE, Cochrane, and Scopus databases for studies published in the English language that addressed outcomes of EUS-GBD for MBO through December 2021. Technical success was defined as successful stent deployment. Clinical success was defined as the resolution of the indication to proceed with EUS-GBD which includes improvement of jaundice or significant improvement of bilirubin. Reintervention was defined as the need for reintervention after achieving clinical success. Immediate adverse events (AE) were defined as complications that occurred intra-procedural till the first 24 hours after the procedure. Delayed AE were defined as complications that occurred after the first 24 hours of doing the EUS-GBD drainage. Pooled estimates were calculated following the restricted maximum likelihood method using random effects model. We assessed heterogeneity using the I<sup>2</sup> statistic.

**Results:** After excluding duplicates, 1597 articles were screened with 14 unique articles included in the meta-analysis (Fig 1A). A total of 143 patients were included. All studies had reported the technical success. The pooled technical success was 91.66% [95% confidence interval (CI) 83.13 - 96.08%]. Thirteen articles (139 patients) reported the clinical success and immediate AE. The pooled clinical success rate was 82.32% (95% CI 74.90-87.89%). The pooled immediate AE rates were 8.45% (95% CI 4.38-15.68) (Fig 1B). 9 articles (124 patients) reported delayed AE. The delayed AE reported were food impaction in the stent (n=3), stent migration &/or dysfunction (n=3), bleeding (n=2), cholangitis (n=1), peritonitis (n=1), and unknown AE (n=3). The pooled delayed AE rates were 13.81% (95% CI 8.45-21.76%) (Fig 1C). Nine articles (82 patients) reported intervention rates. The pooled reintervention rates after achieving clinical success were 15.71% (95% CI 9.20-25.51%). I<sup>2</sup>=0 for all meta-analyses.

**Conclusion:** This is the first meta-analysis to evaluate outcomes of EUS-GBD drainage in MBO. We report a high technical and clinical success come up with a relatively low reintervention and AE rates. There was no heterogeneity in our data. EUS-GBD drainage is a feasible palliative option in MBO in experienced centers.



[1092] Figure 1. Forest plots depicting immediate and delayed adverse events

S1093

**Assessment of Physical and Mental Health Before and After Protocolized Endoscopic Necrosectomy for Walled-Off Pancreatic Necrosis in a Prospective Multi-Center Trial**

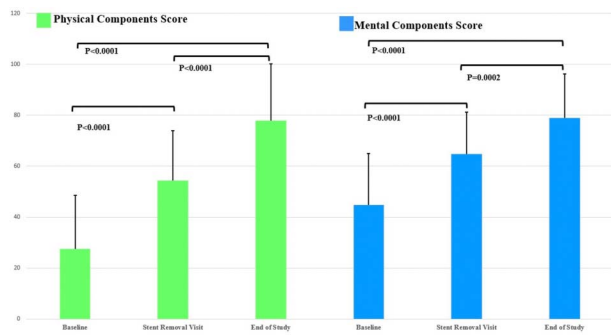
*Ambreen Anil Merchant*, MD<sup>1</sup>, *Barham Abu Dayyeh*, MD, MPH<sup>2</sup>, *Vinay Chandrasekhara*, MD<sup>2</sup>, *Raj J. Shah*, MD<sup>3</sup>, *Jeffrey J. Easler*, MD<sup>4</sup>, *Andrew C. Storm*, MD<sup>2</sup>, *Mark D. Topazian*, MD<sup>2</sup>, *Michael J. Levy*, MD<sup>2</sup>, *John A. Martin*, MD<sup>2</sup>, *Bret T. Petersen*, MD<sup>2</sup>, *Naoki Takahashi*, MD<sup>2</sup>, *Steven A. Edmundowicz*, MD<sup>3</sup>, *Mihir S. Wagh*, MD, FACC<sup>5</sup>, *Sachin Wani*, MD<sup>5</sup>, *John DeWitt*, MD<sup>6</sup>, *Mark A. Gromski*, MD<sup>7</sup>, *Mohammad Al-Haddad*, MD, MSc<sup>7</sup>, *Stuart Sherman*, MD<sup>7</sup>, *Joy Peetermans*, PhD<sup>8</sup>, *Ornela Gjata*, MS<sup>9</sup>, *Margaret Gourlay*, MD, MPH<sup>8</sup>, *Edmund McMullen*<sup>10</sup>, *Field F. Willingham*, MD, MPH<sup>11</sup>.  
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**Introduction:** A regulatory FDA IDE prospective multi-center clinical trial (G170261-NCT03525808) was performed to evaluate rigorous protocolized management of walled off necrosis (WON) ≥ 6 cm in size with > 30% necrotic material using endoscopic ultrasound (EUS) guided lumen apposing metal stent (LAMS) placement with/without endoscopic necrosectomy. Few studies have examined changes in health related quality of life (HRQOL) before and after endoscopic management for WON. The SF-12 is a validated measure of HRQOL containing 12 items which yield a Mental Components Score (MCS) and a Physical Components Score (PCS). Higher scores correspond to a greater perceived quality of life.

**Methods:** The pre-specified target sample of 40 consecutive eligible patients was enrolled by multiple centers from September 2018 to March 2020. Patients with radiographic WON resolution (as demonstrated by size ≤ 3 cm on CT or MRI) and/or 60 days LAMS indwell time had stent removal followed by an end of study visit 6 months later. SF-12 quality of life questionnaires were completed by patients at baseline, stent removal and at the end of study visit.

**Results:** Mean SF-12 Physical Components Score (PCS) was 27.5±21.1 at baseline, 54.4±19.5 at the time of LAMS removal, and 77.9±22.3 at end of study. Mean SF-12 Mental Components Score (MCS) was 44.9±20.1 at baseline, 64.7±16.5 at the time of LAMS removal, and 79.0±17.2 at end of study. The mean improvement in PCS score from baseline to LAMS removal was 26.0±24.8 (p< 0.0001), with the mean improvement in score from baseline to end of the study being 49.1±29.6 (p< 0.0001). The mean improvement in MCS was 19.6±20.1 from baseline to LAMS removal (p< 0.0001) and 32.0±22.3 from baseline to the end of study (p< 0.0001). The mean improvement from the time of stent removal to the end of study was 25.2±18.0 (PCS, p< 0.0001) and 15.5±18.5 (MCS, p=0.0002) (Figure).

**Conclusion:** These data suggest that patients undergoing protocolized endoscopic necrosectomy for walled-off pancreatic necrosis experience significant improvement in both physical and mental HRQOL. Improvement in the physical score domain appeared to be greater than for the mental score domain. HRQOL indicators continued to improve over a mean follow-up of 180 days.



[1093] Figure 1. SF-12 Physical and Mental Components Score.

S1094

**Diagnostic Accuracy of Endoscopic Ultrasound (EUS)-Guided Fine Needle Biopsy (FNB) by Macroscopic On-Site Evaluation (MOSE): A Systematic Review and Meta-Analysis**

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**Introduction:** Assessment of endoscopic ultrasound (EUS) guided fine needle tissue adequacy by macroscopic on-site evaluation (MOSE) is gathering attention. Studies report good diagnostic parameters with MOSE; however, the overall data is limited and it is unknown if MOSE is as good as rapid on-site evaluation (ROSE). We conducted this systematic review and meta-analysis to report on the pooled diagnostic parameters of EUS-guided tissue acquisition by MOSE using fine needle biopsy (FNB).

**Methods:** Major databases like Medline, Embase, Scopus were searched by experienced medical librarian (Dec 2021), and studies that reported on the diagnostic assessment of EUS-guided tissue acquisition by MOSE were selected. Pooled diagnostic accuracy, sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated by standard meta-analysis methods following the random-effects model. Heterogeneity was assessed by I<sup>2</sup> statistics.

**Results:** 14 studies were included in the final analysis. 1508 lesions were biopsied in 1489 patients undergoing EUS-guided tissue acquisition. MOSE definition included a visible core of tissue with opacity, 'worm-like' features of adequate size and length (>4mm). Majority of the lesions biopsied were solid pancreatic masses (692 lesions, 45.8%), followed by lymph nodes (n=334, 22.1%), submucosal tumors (n=183, 12.1%), and other extra-pancreatic lesions (n=299, 19.8%). The pooled accuracy of biopsy specimen in yielding a pathological diagnosis by MOSE was 91.3% (95% CI 88.6-93.3, I<sup>2</sup>=66%), pooled sensitivity was 91.5% (88.6-93.6, I<sup>2</sup>=66%), pooled specificity was 98.9% (96.6-99.7, I<sup>2</sup>=80%), pooled PPV was 98.8% (97.4-99.5, I<sup>2</sup>=33%), and pooled NPV was 55.5% (46.9-63.9, I<sup>2</sup>=95%). The pooled rate of



good specimen quality by MOSE as assessed by the endoscopist was 84.9% (60.1-95.4, I<sup>2</sup>=91%). The pooled rate of diagnostic yield was 93% (87.7-96.1, I<sup>2</sup>=73%). Adverse events were minimal (2.5%, 1.5-3.9, I<sup>2</sup>=21%). Subgroup analysis by needle type is summarized in Figure.

**Conclusion:** Based on a meta-analysis of 14 studies, EUS-guided tissue acquisition with MOSE demonstrated excellent pooled diagnostic accuracy, sensitivity, specificity and PPV. Criteria of MOSE must include a visible core of tissue with opacity, 'worm-like' features of adequate size and length (>4mm). In centers with access to ROSE, future well-controlled studies are warranted to establish the outcomes of MOSE in comparison to ROSE, especially with the newer generation EUS specific biopsy needles.

	Pooled rates (95% confidence interval, I <sup>2</sup> %)		
	Any needle	ForkTip and/or Franseen needles	Other needles
Accuracy	91.3% (88.6-93.3, 66%)	90.6% (87.3-93.1, 46%)	92.7% (86.1-96.3, 81%)
Sensitivity	91.5% (88.6-93.6, 66%)	91.5% (88-94, 47%)	91.8% (85-95.7, 80%)
Specificity	98.9% (96.6-99.7, 80%)	98.2% (90.6-99.7, 81%)	98.5% (83.5-99.9, 83%)
PPV	98.8% (97.4-99.5, 33%)	98.7% (96.6-99.5, 0%)	98.7% (93.6-99.7, 55%)
NPV	55.5% (46.9-63.9, 95%)	63.1 (40.8-80.9, 93%)	66.7% (35.3-88.1, 97%)
Diagnostic yield	93% (87.7-96.1, 73%)	94.7% (88.4-97.7, 60%)	NA
Specimen quality (by endoscopist assessment)			
- Good	84.9% (60.1-95.4, 91%) (4 cohorts)	NA	NA
- Poor	10.9% (3.6-28.8, 87%) (4 cohorts)	NA	NA
Adverse events	2.5% (1.5-3.9, 21%)	3.3% (1.9-5.5, 7%)	1% (0.3-2.8, 0%)

[1094] **Figure 1.** Other needles: (ProCore, Boston Expect, Echotip Ultra), PPV: positive predictive value, NPV: negative predictive value, NA: not applicable.

S1095

**Full Thickness vs Circular Peroral Myotomy in the Treatment of Esophageal Achalasia: A Systematic Review and Meta-Analysis**

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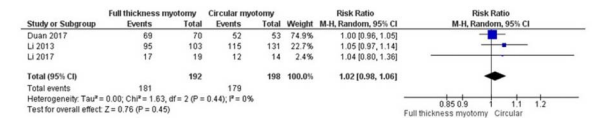
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**Introduction:** Peroral endoscopic myotomy (POEM) is an effective procedure that is used to treat esophageal achalasia. Early studies recommended a circular myotomy where the circular muscle layer is cut with preservation of the longitudinal layer. Recent studies have investigated full thickness myotomy as a possible alternative to treat severe cases.

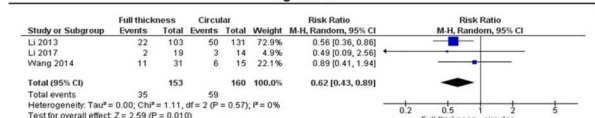
**Methods:** We conducted a systematic review and meta-analysis on the studies that compared full thickness and circular POEM in treating achalasia patients. We performed a comprehensive search in the databases of PubMed/MEDLINE, Embase, and the Cochrane Central Register of Controlled Trials from inception through April 20th, 2022. We considered randomized controlled trials, cohort studies, case-control studies, and case series. We excluded abstracts, animal studies, case reports, reviews, editorials, and letters to editors. From each study, we collected the number of patients who underwent full thickness and circular POEM. The primary outcome was clinical success. The secondary outcomes were the occurrence of subcutaneous emphysema, operation time, and post-procedure reflux symptoms. The random-effects model was used to calculate the risk ratios (RR), mean differences (MD), and confidence intervals (CI). A p value < 0.05 was considered statistically significant. Heterogeneity was assessed using the Higgins I<sup>2</sup> index.

**Results:** Six randomized controlled trials involving 774 patients were included in the meta-analysis. The rate of clinical success was not statistically different between full thickness and circular POEM (RR 1.02, 95% CI 0.98-1.06, p = 0.45, I<sup>2</sup> = 0%) (Figure 1a). The rate of subcutaneous emphysema was significantly lower in the full thickness group (RR 0.62, 95% CI 0.43-0.89, p = 0.01, I<sup>2</sup> = 0%) and the operation time was also lower in the same group (MD -10.60 mins, 95% CI -19.60- -2.13, p = 0.01, I<sup>2</sup> = 76%) (Figure 1b and 1c). The rate of post-procedure reflux symptoms was not statistically different between the two groups (RR 1.10, 95% CI 0.60-2.02, p = 0.75, I<sup>2</sup> = 22%).

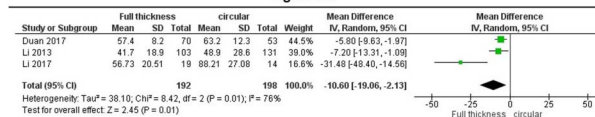
**Conclusion:** Our meta-analysis demonstrated that clinical success was not statistically different between full thickness and circular PEOM. However, subcutaneous emphysema and operation time were both significantly lower in the full thickness myotomy group. There was no difference between the two groups in the rate of post-procedure reflux symptoms. Further randomized controlled trials are needed to confirm our findings.



**Figure 1 a**



**Figure 1 b**



**Figure 1 c**

[1095] **Figure 1.** a) The rate of clinical success b) The rate of subcutaneous emphysema c) The operation time.



S1096

### Early Safety and Efficacy of Endoscopic Sleeve Gastroplasty vs Sleeve Gastrectomy: A Propensity-Matched, Database Analysis of 6,000 Patients

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**Introduction:** Endoscopic sleeve gastroplasty (ESG) is a promising bariatric intervention designed to emulate sleeve gastrectomy (SG), the most commonly performed bariatric operation. Comparative studies are limited and there is a lack of large-scale population-based data. Additionally, no studies have examined the impact of race on outcomes after ESG. This is the largest study yet to compare short-term safety and efficacy of ESG to SG, and the first to evaluate the impact of race on short-term outcomes after ESG.

**Methods:** We analyzed 600,000 patients who underwent ESG or SG from 2016-2020 across over 800 hospitals in the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database. Patients who underwent ESG were propensity matched to SG patients. We primarily compared occurrences of adverse events (AE), readmissions, reoperations, and reinterventions within 30-days. Secondary outcomes measured at 30 days included total body weight loss (TBWL), outpatient treatments for dehydration, and emergency room (ER) visits. Multivariate regression evaluated the impact of patient characteristics, including race, on AE.

**Results:** 6,054 patients underwent ESG and 597,463 underwent SG. Propensity matching in a 1:5 ratio compared all ESG cases to 30,270 SG cases. ESG had shorter procedural time (62.9 min vs 72.4,  $p < .05$ ) and length of stay (0.87 days vs 1.45,  $p < 0.05$ ). AE were low after both procedures (SG: 1.1% vs ESG: 1.4%,  $p > 0.05$ ). However, patients undergoing ESG had more readmissions (3.8% vs 2.6%), reoperations (1.4% vs 0.8%), and reinterventions (2.8% vs 0.7%) within 30 days ( $p < 0.05$ ). SG cohort had more outpatient treatments for dehydration (3.3% vs 2.4%,  $p < 0.05$ ) and ER visits not resulting in admission (5.9% vs 4.9%,  $p < 0.05$ ). SG also resulted in greater mean %TBWL compared to ESG (5.4% vs 4.0%,  $p < 0.05$ ). The greatest odds of increasing AE after both ESG and SG were attributed to the presence of renal insufficiency (ESG: OR 10.0, SG: OR 1.95) and therapeutic anticoagulation (ESG: OR 3.73, SG: OR 1.80). Race was not significantly associated with AE after ESG, while black race was associated with higher risk of AE after SG (OR 1.23, 95% CI: 1.13-1.35). (Table)

**Conclusion:** ESG demonstrates comparable safety to SG with shorter procedure time and LOS. Clinicians may have been more inclined to readmit and intervene in ESG patients as compared to SG patients with similar complaints. Race did not impact short-term AE after ESG. Further prospective comparative studies are needed.

**Table 1. Comparison of Short-Term Outcomes (30 Days) after Endoscopic Sleeve Gastroplasty versus Sleeve Gastrectomy**

	Endoscopic Sleeve Gastroplasty (n = 6,053)	Sleeve Gastrectomy (n=30,270)	P-value
Mean Pre-Procedure BMI (kg/m <sup>2</sup> ) (SD)	40.5 (8.6)	42.8 (6.2)	< 0.001
Mean Change in BMI After Procedure (kg/m <sup>2</sup> ) (SD)	-1.8 (2.9)	-2.4 (1.8)	< 0.001
Mean % Total Body Weight Loss (% TBWL) (SD)	4.0 (6.7)	5.4 (4.3)	< 0.001
Major Adverse Event, n (%)	86 (1.4)	340 (1.1)	0.058
Reoperation, n (%) †	86 (1.4)	238 (0.8)	< 0.001
Readmission, n (%) ‡	231 (3.8)	794 (2.6)	< 0.001
Re-Intervention, n (%) §	171 (2.8)	209 (0.7)	< 0.001
Mean Number of Days from Procedure to Discharge (SD)	0.87 (2.18)	1.44 (0.97)	< 0.001
Mean Procedure Length, minutes (SD)	62.90 (46.99)	71.69 (37.14)	< 0.001
Received Treatment for Dehydration Outpatient, n (%)	147 (2.4)	993 (3.3)	0.001
Emergency Department Visit Not Resulting in Admission, n (%)	294 (4.9)	1786 (5.9)	0.002

†Abdominal re-exploration was the most commonly performed re-operation after both ESG and SG. The most common reason for re-operation after ESG included obstruction or gastrointestinal perforation, whereas gastrointestinal bleeding and staple line leak were the most common reasons after SG.  
‡Most common etiologies for readmission after ESG and SG were nausea, vomiting, fluid/electrolyte disturbance, and abdominal pain.  
§Most common re-intervention after ESG and SG was therapeutic endoscopy, with stent placement or dilatation representing the most common endoscopic interventions.

S1097

### Clinical Outcomes of Double Balloon Enteroscopy: An 8-Year Tertiary Center Experience

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**Introduction:** The objectives of this study are to examine clinical characteristics of patients undergoing antegrade and retrograde double balloon enteroscopy (DBE) and to assess factors predicting 6-month readmission

**Methods:** We conducted a retrospective cohort study of patients (n=1162) who underwent DBE at an academic tertiary care center between November to December 2020. Baseline patient data as well as DBE related variables were collected. Outcome variables included readmission rates, diagnostic and therapeutic yield. Measures of central tendency and frequency distributions were used for univariate analysis. Chi-square and student 2 sample t-test were performed to compare patient characteristics. Logistic regression was used for outcome variable analysis.

**Results:** Of the 1162 DBE procedures, 50.95% were male (n= 592) with a mean age of 61.29 (15.33, SD). The most common indications for procedure being GI bleed (61%) and abnormal video capsule endoscopy findings (30%). The cohort's rate of positive diagnostic yield was 65% and 57% for therapeutic yield. The mean procedural time was 39.80 (21.31, SD) minutes, and 77% of DBE patients received antegrade procedures. Compared to retrograde procedures, a higher proportion of DBE patients with antegrade procedures had positive diagnostic yield (66% vs. 62%,  $p=.254$ ) (Table). Readmission rates at 30 days and 6 months were 11% and 18% respectively. Antegrade procedures were more likely to be inpatient (37% vs 29%,  $p=0.018$ ) and associated with shorter procedure time ( $38.67 \pm 204.5$  vs  $43.7 \pm 23.7$  minutes,  $p=0.0008$ ) and higher therapeutic yield (60% vs 46%,  $p=0.00$ ) ( Figure). Univariate analysis depicted inpatient status, total procedure minutes, and anticoagulation use to be associated with 6-month readmission (all  $P < 0.05$ ). After controlling for each variable through multivariable analysis, inpatient status [OR:3.56, 95% CI (2.59-4.89),  $p=0.00$ ] and total procedure minutes [OR:1.01, 95% CI (1.00-1.01),  $p=0.03$ ] remained significant predictors of 6-month readmission

**Conclusion:** DBE procedures has high efficacy for both diagnostic and therapeutic yield while evaluating GI bleed, abdominal pain, iron deficiency anemia, as well as performing ERCP in patients with altered upper GI anatomy. Patients undergoing antegrade DBE are associated with shorter procedure time and higher therapeutic yield compared to patients undergoing retrograde DBE. DBE patients who are inpatients and higher procedural times are more likely to be readmitted in 6 months.

6-month readmission	Univariate Analysis		Multivariate Analysis	
	OR [95% CI]	P value	OR [95% CI]	P value
Female	0.93 [0.69-1.26]	0.649	-	-
Age	0.99 [0.98-1.00]	0.158	0.99 [0.98-1.00]	0.253
Retro	0.85 [0.59-1.23]	0.383	-	-
Diagnostic Findings	0.76 [0.57-1.02]	0.072	0.79 [0.57-1.10]	0.160
BMI<25	1.09 [0.80-1.50]	0.572	-	-
Inpatient	<b>3.91 [2.87-5.33]</b>	<b>0.000</b>	<b>3.56 [2.59-4.89]</b>	<b>0.000</b>
Procedure minutes	<b>1.01 [1.01-1.02]</b>	<b>0.000</b>	<b>1.01 [1.00-1.01]</b>	<b>0.026</b>
Antiplatelet	0.84 [0.60-1.19]	0.335	-	-
Anticoagulation	<b>1.74 [1.17-2.59]</b>	<b>0.006</b>	1.29 [0.84-1.99]	0.243

[1097] **Figure 1.** Univariate and Multivariable Logistic Regression Analysis predicting 6-month readmission rate

**Table 1.** Patient characteristics and outcome variables stratified based on procedure type (anterograde vs retrograde)

Variable		Anterograde (n=900)	Retrograde(n=262)	P-Value
Sex	Male	459 (51%)	133 (51%)	.95
	Female	441 (49%)	129 (49%)	
Age, Range:	35-93, Mean (SD)	61.17 (15.30)	61.69 (15.49)	.629
Patient Type	Outpatient	571 (63%)	187 (71%)	.018
	Inpatient	329 (37%)	75 (29%)	
BMI	Less than 25	304 (34%)	77 (29%)	.183
	25 or more	596 (66%)	185 (71%)	
Altered Anatomy	No	695 (77%)	234 (89%)	.000
	Yes	205 (23%)	28 (11%)	
Anticoagulation	No	780 (87%)	230 (88%)	.636
	Yes	120 (13%)	32 (12%)	
ESRD	No	858 (95%)	247 (94%)	.485
	Yes	42 (5%)	15 (6%)	
Anesthesia Type	General	809 (90%)	97 (37%)	.000
	Mac	91 (10%)	165 (63%)	
Total procedural time	Mean (SD)	38.67 (20.45)	43.70 (23.70)	.0008
Therapeutic Yield	No	361 (40%)	141 (54%)	.000
	Yes	539 (60%)	121 (46%)	
Positive Finding	No	305 (34%)	99 (38%)	.244
	Yes	595 (66%)	163 (62%)	
Readmission 30-day	No	791 (88%)	238 (91%)	.187
	Yes	109 (12%)	24 (9%)	
Readmission 6 Month	No	731 (81%)	219 (84%)	.383
	Yes	169 (19%)	43 (16%)	

S1098

**Learning Curve of Transoral Incisionless Fundoplication: A Proficiency Study**

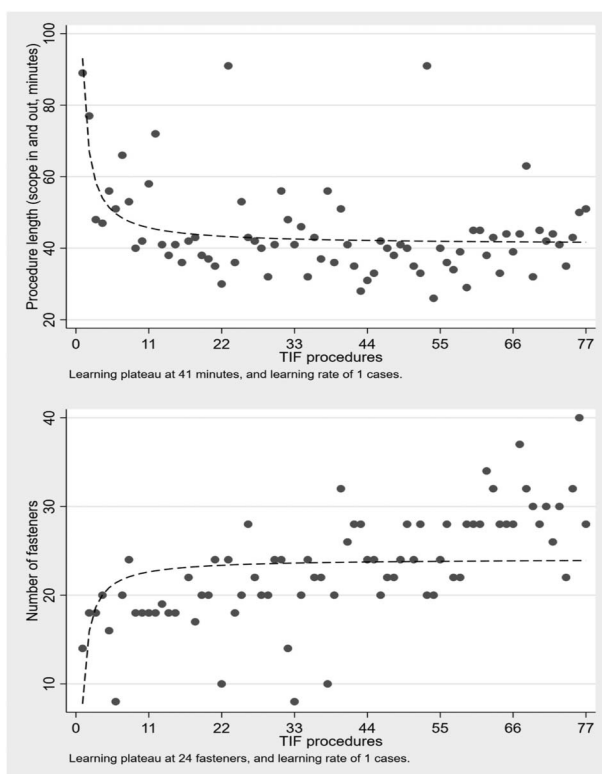
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**Introduction:** Transoral incisionless fundoplication (TIF) is a minimally invasive endoscopic procedure for treatment of gastroesophageal reflux disease. Performing TIF requires unique training to achieve proficiency. This study aims to evaluate the learning curve of performing TIF in relation to patient and procedure-specific characteristics.

**Methods:** This is a retrospective study of consecutive TIF procedures performed by a single experienced gastroenterologist to assess the procedure learning curve. Historical and procedural characteristics were recorded, and the learning curve was estimated by cumulative sum of means (CUSUM) analysis. Proficiency was defined as reliably achieving a procedure length less than 45 minutes.

**Results:** 77 consecutive TIF procedures (68 patients) were included. The average age of patients was  $52.35 \pm 15.74$  years (32.4% male). The estimated learning plateaus for procedure time and number of fasteners were 41 minutes and 24 fasteners, respectively. Twelve procedures were required to reliably achieve a procedure length of 45 minutes or less. There was no significant correlation between the length of the TIF procedure and number of fasteners ( $p=0.091$ ) or Hill classification (I vs II/III) ( $p=0.483$ ). There was no relationship between the Hill classification (I vs. II/III) and number of fasteners ( $p=0.475$ ). We observed a significant increase in average number of fasteners used over time from  $18.5 \pm 2.28$  during the first quartile of procedures to  $29.82 \pm 4.61$  in the last quartile ( $p=0.01$ ). There was no relationship between procedure length, ASA score, number of fasteners, and hospital length of stay.

**Conclusion:** Proficiency in performing TIF in less than 45 minutes can be achieved after independently performing 12 procedures.



[1098] Figure 1. Non-linear regression curves for proficiency of procedure duration and number of fasteners

**Table 1. Baseline patient characteristics and procedural outcomes**

Patient summary characteristics:	
Gender (Female)	67.6% (n=46)
Age [mean ± SD]	52.35 ± 15.74
Race	
White	79.41% (n=54)
Non-Hispanic	67.65% (n=46)
BMI [mean ± SD]	27.7 ± 5.1
ASA Score	
II	69.1% (n=47)
III	29.4% (n=20)
IV	1.5% (n=1)
Prior history of Barrett's ablation	4.4% (n=3)
Prior esophageal surgical intervention	
Nissen Fundoplication	8.8% (n=6)
POEM- Nissen Fundoplication	1.5% (n=1)
POEM	2.9% (n=2)
Indication for TIF	
GERD	83.82% (n=57)
Chronic cough +/- GERD	16.17% (n=11)
Hernia HILL grade (if available):	
1	25% (n=14)
2	62.5% (n=35)
3	8.9% (n=5)
4	3.6% (n=1)
Longitudinal length of hernia ≥ 2cm (available value; n=56)	26.78% (n=15)
PH impedance or Bravo test (uninterpretable; n=1, not performed due to presence of BE/esophagitis=5)	
Acid	82.26% (n=51)
Non-acid	17.74% (n=11)
Procedure characteristics:	

**Table 1. (continued)**

Total TIF procedures	(n=77)
Median procedure length(minutes) [min, max]	41 [26,91]
Number of fasteners [mean ± SD]	23.1 ± 6.2
Number of fasteners original TIF per Quartiles [mean ± SD]	
First	18.5 ± 2.28
Second	21.53 ± 3.12
Third	24.71 ± 3.53
Forth	29.82 ± 4.61
Median Hospital LOS (days) [min, max]	1 [0,10]

S1099

#### Safety and Efficacy of the Utilization of Prone Position in ERCP With Those of the Left Lateral Decubitus Position: A Systematic Review

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**Introduction:** The prone position and the left lateral position are the most common positions to perform ERCP. The prone position is the most frequently used because it provides better visualization and easier cannulation of the pancreatic and CBD. Besides, the risk of aspiration and the incidence of complications is relatively decreased in this position. We aim to compare the safety and efficacy of the utilization of the prone positions in ERCP with those of the left lateral decubitus position.

**Methods:** We searched Web of science, Cochrane Central, PubMed, and SCOPUS for relevant clinical trials and excluded observational studies. Quality appraisal was evaluated according to GRADE and we assessed the risk of bias using Cochrane's risk of bias tool. We included the following outcomes: Biliary cannulation success, Pancreatic duct Cannulation time, Overall adverse events, Pancreatitis, Bleeding, Cardiopulmonary event, Procedure time, and Ampullary localization time. We performed the analysis of homogeneous data under the fixed-effects model, while analysis of heterogeneous data was analyzed under the random-effects model.

**Results:** We included a total of five studies. The pooled analysis showed that the prone position was associated with higher success rate of biliary cannulation success and faster localization of the ampulla (RR=1.08 [1.03, 1.14], (P = 0.001) and (MD=-0.52 [-1.01, -0.02], (P = 0.04), respectively. There is no significant difference between both groups regarding the pancreatic duct Cannulation time (MD=-0.49 [-1.06, 0.08], (P = 0.09), Overall adverse events (RR= 0.79 [0.59, 1.06], (P = 0.12), Pancreatitis (RR= 1.36 [0.61, 3.06], (P = 0.45), Bleeding (RR=1.02 [0.34, 3.01], (P = 0.98), Cardiopulmonary event (RR=1.06 [0.35, 3.23], (P = 0.92), and Procedure time (MD=-1.08 [-3.79, 1.62], (P = 0.43).

**Conclusion:** Our study concludes that the left lateral position was associated with a higher rate of successful common bile duct cannulation than the prone position in ERCP.

S1100

#### Comparison of EGD to EGD With EUS in Evaluation of Sub-Epithelial Lesions of the Upper GI Tract

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**Introduction:** Subepithelial lesions of the upper GI tract are commonly observed during esophagogastroduodenoscopy (EGD). While mostly benign, definitive diagnosis of these lesions can determine further management. Currently sub-epithelial lesions are initially evaluated with EGD, EUS (endoscopic ultrasound), and tissue biopsy. In this study, we compared the diagnostic yield of subepithelial lesions with EGD alone to EGD with EUS.

**Methods:** 94 cases of subepithelial lesions performed at an academic tertiary referral medical center containing both EGD and EUS reports with images were examined retrospectively. Two expert gastroenterologists (defined as greater than ten years experience performing EGD and EUS) reviewed each case separately and recorded a diagnostic impression based upon EGD alone followed by an impression of EGD with EUS. Tissue pathology was recorded for all cases when available. For cases without definitive tissue pathology, expert consensus on post-review discussion was considered the final diagnosis.

**Results:** Expert impressions of subepithelial lesions on EGD alone and EGD with EUS were 71.3% and 85.1% accurate respectively. A 13.8% increase in diagnostic accuracy was observed with the addition of EUS (p=0.001). There were 60 cases with definitive tissue pathology available. In these cases, EGD alone and EGD with EUS impressions were 67.5% and 78.3% accurate respectively in comparison to final pathology. A 10.8% increase in diagnostic accuracy was observed with addition of EUS (p=0.059). Expert agreement occurred in 78.7% of EGD alone impressions and 88.3% of EGD with EUS impressions.

**Conclusion:** Additional evaluation of subepithelial lesions with EUS characterization demonstrated an increase in diagnostic accuracy compared to EGD alone. These results illustrate the utility of EUS in diagnosis of these potentially malignant lesions. Future studies should continue to evaluate the diagnostic benefit from both EUS and various biopsy techniques to further develop guideline-driven approaches in evaluation of subepithelial lesions.

S1101

#### Safety and Efficacy of LAMS versus FCSEMS in Endoscopic Ultrasound-Guided Gallbladder Drainage in Acute Cholecystitis: A Meta-Analysis

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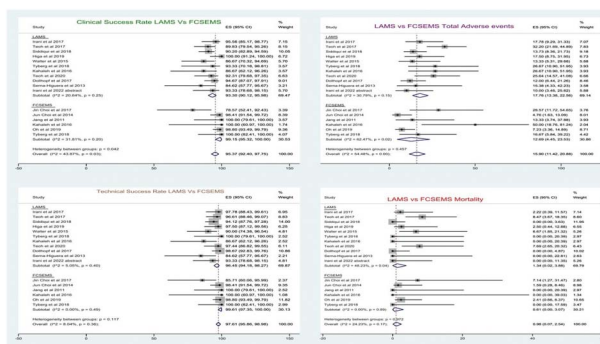
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**Introduction:** EUS-guided gallbladder drainage (EUS-GBD) is well established as a safe alternative to percutaneous cholecystostomy (PT-GBD) for acute cholecystitis. However, there have been no studies to date comparing the safety and efficacy of the different types of stents for EUS-GBD. Therefore, we conducted a systematic review and meta-analysis to compare the safety and efficacy of lumen-apposing metal stent (LAMS) to Fully covered self-expandable metal stent (FCSEMS) for EUS-GBD.

**Methods:** A comprehensive literature search was conducted from electronic databases, including PubMed, Embase, and Scopus, from inception until 6/2022. A single-arm meta-analysis was performed using a random-effects approach using restricted maximum likelihood (REML) method comparing proportional data. In addition, subgroup analysis was performed based on the type of stent and comparing the outcomes. All the statistical analysis was conducted using Stata16.

**Results:** Pooled data from 463 LAMS and 199 FCSEMS across 11 and 6 studies respectively were included in the final analysis (Table). There was no significant difference in the technical success rate between FCSEMS vs LAMS (97.61% vs 96.45%, I<sup>2</sup> = 8.04%, p= 0.36) However, when compared to LAMS, FCSEMS had a 6% higher clinical success rate (99.2 % versus 93.3%, I<sup>2</sup> = 43.87%, p = 0.03) FCSEMS had significantly lower adverse rate of 12.7% when compared to 17.7% LAMS, a difference of 5% (I<sup>2</sup> = 54.5%, P = 0.0000). There was no significant difference in recurrent cholecystitis rates between the groups (FCSEMS= 1% vs 1.7%, I<sup>2</sup>= 3.7%, p =0.41). Although there was a lower mortality seen while using FCSEMS compared to LAMS, it was not statistically significant (I<sup>2</sup> = 24.2%, p = 0.17) (Figure).

**Conclusion:** Strengths and limitations: To the best of our knowledge, our study is the first meta-analysis to compare the safety and efficacy of LAMS versus FCSEMS for EUS-GBD. Patient factors such as comorbidities, health conditions while undergoing the procedure, etc., could not be compared between the groups. There was inadequate data to classify adverse events as severe or mild-moderate. Moderate heterogeneity was noted. Discussion: FCSEMS had a higher clinical success rate and fewer adverse events than LAMS for EUS-GBD. There was no difference in technical success, recurrent cholecystitis, or mortality among the two groups. RCTs and observational studies comparing LAMS vs. FCSEMS head-to-head are required to further our understanding in this regard.



[1101] **Figure 1.** Forest plots comparing the outcomes of LAMS versus FCSEMS in Endoscopic ultrasound-guided gallbladder drainage in acute cholecystitis.

**Table 1. LAMS versus FCSEMS for Endoscopic ultrasound-guided gallbladder drainage in acute cholecystitis**

	FCSEMS	LAMS
No. of patients (n)	199	463
Technical success rate (%)	99.6	94.4
Clinical success rate (%)	99.2	93.3
Total adverse events (n)	21	84
Bleeding (n)	0	19
Perforation (n)	2	4
Mortality (n)	4	12

S1102 WITHDRAWN

S1103

**A Study of ERCP Perforations Over 12 Years From the National Endoscopic Database: Effect of Procedural Volumes, Duration and Complexity**

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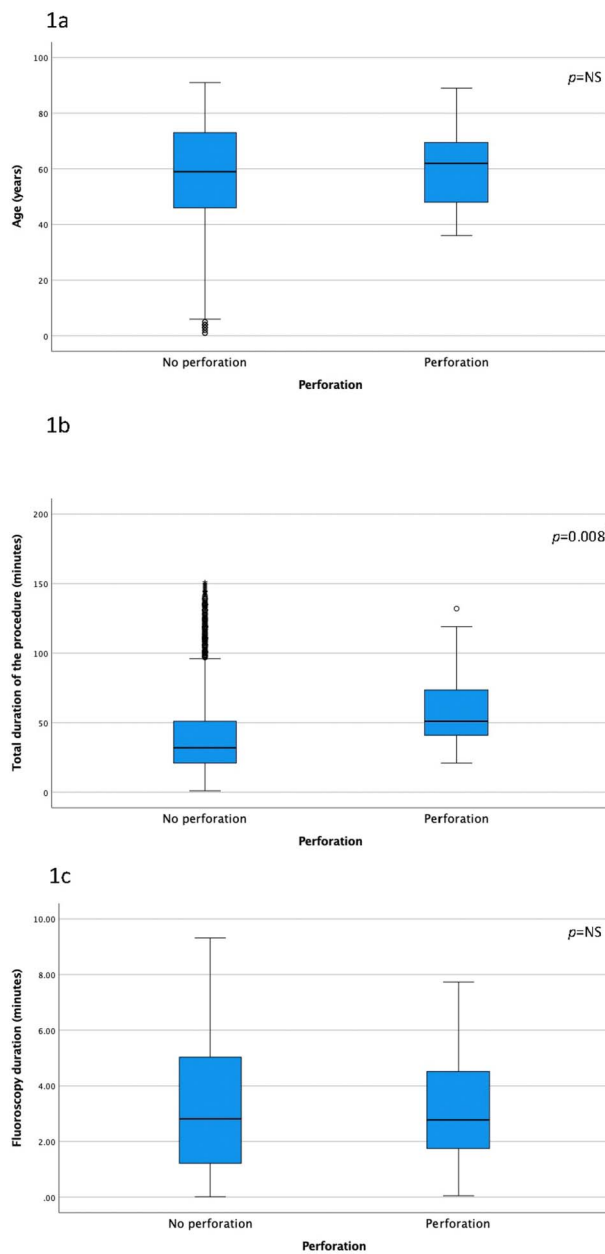
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**Introduction:** Perforation during ERCP is rare (< 1%) but potentially fatal event (up to 20% mortality). Given its rarity, most data is through study of case series from large centers or analysis of large databases. Although a meta-analysis has shown fewer adverse events as a composite (bleeding, pancreatitis, perforation) during ERCP performed at high volume centers, there is very little real-world data on endoscopist and center procedural volumes, ERCP duration, and complexity on the occurrence of perforation.

**Methods:** Patients from Clinical Outcome Research Initiative National Endoscopic Database CORI-NED (2000-2012) who underwent ERCP were stratified based on the endoscopist's volume (quartiles), center's volume (quartiles), total procedure duration and complexity grade of the ERCP based on procedure details. Effects of these variables on the perforations that occurred were studied. Continuous variables were compared between perforations (P) and no perforations (NP) using the unpaired t-test with statistical significance set at p< 0.05 (2-tailed).

**Results:** A total of 14,153 ERCPs were performed by 258 endoscopists with 20 reported perforations (0.14%) among 16 endoscopists. Mean patient age in years (±SD) 61.6± 14.8 vs 58.1± 18.8 (P vs NP, p=NS, Figure a). Cannulation rate was 100% and 91.5% for P and NP respectively. 13/20 (65%) of endoscopists were high volume performers in the 4<sup>th</sup> quartile and 11/20 (55%) of perforations occurred in centers with the highest volumes (4<sup>th</sup> quartile). Total procedure duration in minutes was 40.33 ± 23.5 vs 60.1 ± 29.9 (P vs NP, p=0.008, highly significant, Figure b). Fluoroscopy duration in minutes was 3.3 ± 2.3 vs 3.3 ± 2.6 (P vs NP p=NS, Fig 1c). 50% of the procedures were complex and greater than grade 1 difficulty (Table). 3/20 (15%) patients had prior biliary surgery. 13/20 (65%) had sphincteromies performed with stent insertion. Peritonitis occurred in only 1/20 (0.5%), (Table).

**Conclusion:** Overall adverse events as a composite during ERCP are known to occur at a lower rate with higher volume endoscopists and centers. However, perforations studied from the national database have shown prolonged and more complex procedures performed by high volume endoscopists at high volume centers contributing to perforations. This is likely a result of high-risk procedures undertaken in patients with complex pathology at tertiary and quaternary centers.



[1103] **Figure 1.** (a) Age (years) box plot comparing no perforation group versus perforation group (b) Total ERCP duration (minutes) box plot comparing no perforation group versus perforation group 1. Fluoroscopy duration (minutes) box plot comparing no perforation group versus perforation group

**Table 1. Endoscopist & center volume quartiles, indications & complexity of ERCP procedures that resulted in perforations**

Physician	Physician volume quartile	Center volume quartile	Indication	ERCP difficulty grade	Dilation of strictures	Sphincterotomy performed	Stent placement	Sphincterotomy Device	Peritonitis	Prior biliary Surgery
1	4	4	LHD tumor biopsy	3	No	No	No	NA	No	No
2	4	4	Pancreatic tumor	3	No	Yes	Yes	*	No	Yes
2	4	4	CBD stone	3	Yes	Yes	Yes	Cotton Cannulotome	No	No
2	4	4	CBD stricture	3	Yes	Yes	Yes	Cotton Cannulotome	No	No
3	3	3	RHD tumor biopsy	3	No	Yes	Yes	Cotton Cannulotome	No	No
4	3	2	CBD stone	1	No	Yes	Yes	Cotton Cannulotome	No	No
5	4	4	CBD stone	1	No	Yes	Yes	Papillotome	Yes	No
6	4	3	Stent placement	1	No	Yes	Yes	Autotome	No	No

Table 1. (continued)

Physician	Physician volume quartile	Center volume quartile	Indication	ERCP difficulty grade	Dilation of strictures	Sphincterotomy performed	Stent placement	Sphincterotomy Device	Peritonitis	Prior biliary Surgery
7	4	3	CBD stone	1	No	No	No	*	No	No
8	3	4	CBD stone	1	No	No	No	*	No	No
9	4	3	Pancreatic tumor	3	No	Yes	Yes	Cotton Cannulotome	No	No
10	3	3	Sphincter of Oddi dysfunction	3	No	Yes	Yes	*	No	No
11	4	4	CBD stone	2	No	Yes	Yes	Cannulating Sphincterotome	No	Yes
11	4	4	Stent replacement	1	No	No	No	NA	No	No
11	4	4	Pancreatic pseudocyst drainage	4	No	Yes	Yes	Needle Knife Precut	No	Yes
12	4	4	CBD stone	1	No	Yes	Yes	*	No	No
13	4	4	CBD stone	1	No	No	No	NA	No	No
14	3	3	Stent placement	1	No	Yes	Yes	Cotton Cannulotome	No	No
15	3	3	CBD stone	1	No	No	No	NA	No	No
16	3	3	CBD stone	3	No	No	No	NA	No	Yes

\*unavailable.

S1104

## Endoscopic Papillectomy of Ampullary Lesions: Predictors of Recurrence and Adverse Events

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**Introduction:** Endoscopic papillectomy (EP) is an effective endoscopic modality for managing ampullary adenomas, early ampullary carcinoma, and piecemeal resection of large laterally spreading lesions. EP has comparable efficacy and a better safety profile compared to a pancreaticoduodenectomy (Whipple surgery) or transduodenal ampullectomy (TA). However, there is a need to identify risk factors for recurrence and adverse events after EP. Thus, this study aims to evaluate predictors for recurrence and adverse events in patients who underwent EP for ampullary lesions.

**Methods:** This study is a retrospective analysis of all consecutive patients who underwent endoscopic snare papillectomy for an ampullary lesion between January 2006 and December 2021. We assessed multiple patient and procedure-related variables to identify risk factors related to post-EP adverse events and ampullary lesion recurrence using both univariate and multivariate analysis.

**Results:** A total of 51 patients undergoing EP for ampullary lesions were included in the final analysis. There were 11 patients with familial adenomatous polyposis (FAP) while 40 had sporadic lesions (Table). Recurrence was seen in 17 patients (37.0%) among those who followed up after technical success; five FAP (55.5%) and twelve sporadic (32.4%) patients had a recurrence. Adverse events included intraprocedural bleeding in 17 patients (33.3%), delayed bleeding requiring endoscopic evaluation in 7 patients (13.7%), post-ERCP pancreatitis (PEP) in 7 patients (13.7%), papillary stenosis in two patients (3.9%), and perforation in one (2%). Three patients (5.9%) had concomitant delayed bleeding and post-ERCP pancreatitis. Nine patients (19.6%) had intraprocedural bleeding requiring endoscopic clip placement of whom one later presented for delayed bleed. Age, method of resection, lesion size, and intraductal extensions were not associated with recurrence. Complete histologic (R0) resection was the only factor associated with no recurrence following EP (OR=5.4, 95% CI: 1.4-20.8, P-value=0.014). Post-ERCP pancreatitis was associated with delayed bleeding (OR=7.5, 95% CI: 1.2-46.1, P-value=0.03). The median follow-up was 228 (40-795) days for those who followed up (46 patients).

**Conclusion:** In patients who underwent EP for ampullary lesions, R0 resection was associated with reduced risk of recurrence. In addition, delayed bleeding after EP is associated with an increased risk of developing PEP.

Table 1. Baseline characteristics of patients who underwent endoscopic papillectomy

Characteristics	(n=51)
Age, years (median (IQR))	65 (56-76)
Gender (male)	29 (56.8%)
Symptoms attributable to the ampullary lesion prior to EP	
Abdominal pain or dyspepsia	8 (15.7%)
Obstructive jaundice	7 (13.7%)
Pancreatitis	4 (7.8%)
None	32 (62.7%)
Histology obtained prior to EP	40 (78.4%)
Endoscopic ultrasound prior to EP	37 (72.5%)
Lesion size, mm (median (IQR))	15 (10.8-20)
Median duration of the procedure in minutes (median (IQR))	79 (57.8-101.3)
Method of resection	
En-bloc snare resection	30 (58.8%)
En-bloc snare resection + APC	8 (7.8%)
Piecemeal snare resection	6 (11.8%)
Piecemeal snare resection + APC	7 (13.7%)
Intraductal extension	8 (15.7%)
Duodenal diverticulum	4 (7.8%)
Altered post-surgical anatomy	3 (5.9%)
Pancreas divisum	3 (5.9%)



**Table 1. (continued)**

Characteristics	(n=51)
Biliary sphincterotomy	40 (78.4%)
Pancreatic sphincterotomy	11 (21.6%)
Submucosal lifting prior to EP	7 (13.7%)
Pancreatic stent after EP	46 (90.2%)
Biliary stent after EP	45 (88.2%)
Final diagnosis	
Tubular adenoma	25 (49.0%)
Tubulovillous adenoma	14 (27.5%)
Tubular adenoma with high grade dysplasia	5 (9.8%)
Adenocarcinoma	2 (3.9%)
Neuroendocrine tumors	1 (2.0%)
Other (non-neoplastic)	4 (7.8%)
Concordant histology before and after EP	32 (62.7%)
Complete histological (R0) resection	23 (45.1%)
Number of procedures to achieve technical success	
One	44 (86.3%)
Two	5 (9.8%)
Three	2 (3.9%)
Antiplatelets or anticoagulation therapy prior to EP	14 (27.5%)
Overnight admission after EP	24 (47.1%)
ED visit within 30 days of index EP	7 (13.7%)
Hospital readmission within 30 days of index EP	6 (11.8%)

APC: Argon plasma coagulation; ED: Emergency department; EP: Endoscopic papillectomy; IQR: Interquartile range.

S1105

#### Practice Patterns of Endoscopists Performing Endoscopic Gallbladder Drainage

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**Introduction:** Over the last decade, techniques of endoscopic gallbladder drainage (EGBD) have been employed for temporary or definitive gallbladder drainage in patients with acute cholecystitis who are not surgical candidates. Despite growing interest and clinical use of EGBD, little is known about technical aspects of practice patterns of EGBD. Our aim was to survey endoscopists to evaluate the practice patterns and technical considerations regarding endoscopic gallbladder drainage.

**Methods:** An 18-item survey was designed to evaluate the practice patterns of advanced endoscopists with regards to endoscopic gallbladder drainage. The survey was structured into the following domains: i) Experience and practice setting of endoscopists, ii) Preference and volumes of endoscopic drainage, iii) Practice patterns with respect to technical aspects of endoscopic gallbladder drainage. The survey was distributed to all members of the American Society for Gastrointestinal Endoscopy (ASGE). Each response was included in the final analysis. Descriptive statistics were calculated using frequencies and percentages.

**Results:** Responses were received from 217 endoscopists. Of these, 178 perform EUS-GBD and 178 perform ETGBD. The number of years since graduation of advanced endoscopy fellowship was: 0-5 years (39.6%), 6-10 years (16.5%), 11-15 years (10.4%) and more than 15 years (33.5%). The majority of respondents (75.4%) practice in a tertiary care setting. The preferred approach for endoscopic gallbladder drainage was EUS-guided gallbladder drainage (EUS-GBD) in 58.8%, ERCP-guided transpapillary gallbladder drainage (ETGBD) 30.2%, and no preference in 11%. For EUS-GBD, 48% had no preference in anatomic site, 35.5% preferred transduodenal and 16.5% transgastric approaches. For EUS-GBD, 69.2% preferred placing lumen apposing metal stent (LAMS) without a guidewire. In terms of LAMS removal after EUS-GBD, 49.3% leave the LAMS indefinitely and 48.3% schedule routine removal of LAMS. For ETGBD via ERCP, the majority of respondents prefer 7 French (73.3%) and double pigtail (85.4%) stents. The most common follow-up plans after ETGBD were: never/as needed (36.7%) and every 3 months (29.5%). Further characteristics are summarized in Table.

**Conclusion:** Despite growing interest in endoscopic gallbladder drainage, significant heterogeneity in practice patterns exists. Further study is needed to better understand these differences for further standardization of procedural techniques.

**Table 1.**

Preferred Approach for Endoscopic Drainage in Acute Cholecystitis	
Endoscopic ultrasound-guided gallbladder drainage	107 (58.8%)
ERCP-guided transpapillary gallbladder stenting	55 (30.2%)
Other	20 (11%)
Preferred enteral access point for EUS GB drainage	
Transgastric	25 (16.5%)
Transduodenal	54 (35.5%)
No preference	73 (48.0%)
Preferred Stent Type (EUS-GBD)	
Lumen apposing metal stent	141 (100%)
Plastic stent	0
Use of guidewire (EUS-GBD)	
Placed over a guidewire	43 (30.1%)
Placed without a guidewire	99 (69.2%)
Other	1 (0.7%)
Use of plastic stents within LAMS (EUS-GBD)	
Yes	82 (57.3%)
No	59 (41.3%)

Table 1. (continued)

Preferred Approach for Endoscopic Drainage in Acute Cholecystitis	
Other	2 (1.4%)
Preference regarding placement of number of plastic stents within LAMS (EUS-GBD)	
One	74 (75.5%)
Two	23 (23.5%)
Three	0 (0%)
More than Three	1 (1.0%)
Case-by-case basis	0 (0%)
Removal of LAMS after EUS GB drainage	
Leave indefinitely	67 (49.3%)
Schedule routine removal	69 (48.3%)
EUS-guided gallbladder drainage on patients who are currently on anticoagulation	
Yes	30 (21.0%)
No	113 (79.0%)
Transpapillary gallbladder drainage (ETGBD)	
Preferred Stent Diameter	
7 French	85 (73.3%)
10 French	21 (18.1%)
Varies	0 (0%)
Other	10 (8.6%)
Preferred Stent Type	
Single pigtail	7 (5.7%)
Double pigtail	105 (85.4%)
Straight stent	3 (2.4%)
No preference	8 (6.5%)
Number of stents typically placed	
A single stent	119 (82.6%)
Multiple stents	21 (14.6%)
Varies case to case	0 (0%)
Other	4 (2.8%)
Follow up after stent placement	
Every 3 months	41 (29.5%)
Every 6 months	14 (10.1%)
Never	51 (36.7%)
Other	33 (23.7%)

## S1106

## Analysis of Reported Adverse Events Related to Over the Scope Clips: A MAUDE Database Analysis

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**Introduction:** Over-the-scope clips (OTSC) have been increasingly used in the management of bleeding, perforations, fistulae, and anastomotic leaks in the gastrointestinal tract. However, since their Food and Drug Administration (FDA) approval in 2010, data on the adverse events of OTSC systems has been lacking. Our study aims to report and analyze adverse events and device failures associated with OTSC systems using the FDA's Manufacturer and User Facility Device Experience (MAUDE) database.

**Methods:** We analyzed the post-marketing surveillance data from the FDA MAUDE database of the two OTSC systems available in the United States: The Padlock clip system and the Ovesco OTSC from April 2017 through May 2022.

**Results:** Thirty-six medical device reporting claims were found from May 2017 through May 2022. Adverse events were classified as device-related problems and patient-related adverse events. Thirty-six device-related problems were reported, along with sixteen device-related adverse events (Table). Most device-related problems were reported in the Padlock defect closure system (n=23), followed by the Padlock pro clip system (n=8) and Ovesco OTSC clip system (n=5). The most common device-related problem was related to the failure of deployment of OTSC (n=14), followed by material protrusion or extrusion (n=6). The most common patient adverse events were perforation (n=4), bleeding (n=3), esophageal laceration (n=3) and luminal stenosis (n=2). Three out of four perforations were in the Padlock pro select closure system. All four patients required surgical management of the perforation. No deaths related to the use of OTSC were reported.

**Conclusion:** Using the data from a publicly available database, the overall adverse events from OTSC systems remain low. Failure of OTSC deployment and perforation were the most common device-related problem and patient-related adverse events, respectively. The identification of common adverse events has the potential to optimize device design and patient outcomes. It is important for endoscopists to be mindful of these potential adverse events when using over-the-scope clips.

**Table 1. Device-related problems and adverse events**

Device-related problems	Number
Failure of OTSC deployment	14
Other	8
Separation problems	3
Detachment of the device	2
Protrusion or extrusion of over the scope clip system	6
Defective device component	2
Failure of positioning of the device	1
Total	36
Patient related- adverse events	Number
Gastro-gastric fistula	1
Perforation	4
Local trauma	1
Pain	1
Bleeding	3
Pyloric stenosis	1
Colonic stenosis	1
Esophageal laceration	3
Ulcer	1
Total	16

S1107

#### Duodenal Endoscopic Submucosal Dissection in the United States: A Single Center Case Series

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**Introduction:** Endoscopic Submucosal Dissection (ESD) is a well-established effective endoscopic technique which facilitates en bloc removal of gastrointestinal epithelial lesions. Duodenal ESD is a relatively novel and rare procedure in the United States (US). Here we report a single-center case series of duodenal ESD in the US.

**Methods:** Patients who received ESD at Memorial Sloan Kettering Cancer Center from June 2018 to May 2022 were reviewed (n=477) and a total of 29 patients who had duodenal ESD were included in this study. Gender, age, American Society of Anesthesiology (ASA) score, type of sedation, type of solution for submucosal lifting agents, procedure time, location of the lesion, en bloc resection rate, R0 (complete) resection rate, presence of scar, adverse events, final pathology, and the length of hospital stay were reviewed.

**Results:** A total of 29 patients had duodenal ESD (6.0%). 13 were female (44.8%), 16 were male (55.2%) and the median age was 68 (range 40 – 79). 25 cases (86.2%) had adenoma, 3 cases (10.3%) had neuroendocrine tumor and 1 had no tumor in the final pathology report. 23 were performed under general anesthesia (79.3%) and 6 with propofol sedation (20.7%). 10 patients (34.5%) were classified ASA II and 19 patients (65.5%) were ASA III. The location of lesions was 2nd part (15/29, 51.7%), followed by 3rd part (10/29, 34.5%), 1st part and bulb (3/29, 10.3%). En bloc resection was achieved in 14 cases (48.3%) and 3 had post-endoscopic mucosal resection (EMR)/ polypectomy scars (3/14, 21.4%). R0 resection rate was 44.8% (13 cases). Of 15 of piecemeal resections (51.7%), 4 had post-EMR/ polypectomy scars (4/15, 26.7%). En bloc and piecemeal resection rate were not affected by the presence of scars (p=0.35). ORISE was used in 16 cases (55.2%) and Eleview was used in 13 cases (44.8%) as the lifting solution and en bloc resection rate was 50% (8/16) with ORISE cases and 46.2% (6/13) in Eleview cases. Mean procedure time was 119 minutes (range 24 -240). As a complication, no perforations were noted. 1 patient developed post-ESD pancreatitis after the removal of large adenoma involving ampulla. The median length of hospital stay was 2 days (range 0 - 20). (Table)

**Conclusion:** This study demonstrated that the duodenal ESD is safe and feasible in the US. The current task is to increase more skilled endoscopists for ESD procedures. Further studies with a larger population are necessary to investigate safety and efficacy in the US.

**Table 1. The Data of Duodenal Endoscopic Submucosal Dissection (ESD), Single-Center Case Series Rate of en bloc or piecemeal resection were not affected by the presence of scars (p=0.35)**

		n	%		%
Duodenal ESD cases	total	29			
Gender	Female	13	44.8		
	Male	16	55.2		
Age	Median age	68			
Sedation type	General anesthesia	23	79.3		
	Propofol sedation	6	20.7		
ASA score	ASA II	10	34.5		
	ASA III	19	65.5		
Location of the lesions	1st part, bulb	3	10.3		
	2nd part	15	51.7		
	2nd and 3rd part	1	3.4		
	3rd part	10	34.5		
				En bloc (n)	%
Lifting solution	Eleview	13	44.8	6	46.2
	ORISE	16	55.2	8	50
				Scar positive (n)	%
Post-EMR/polypectomy scars					
Resection type	En bloc	14	48.3	3	21.4
	Piecemeal	15	51.7	4	26.7

Table 1. (continued)

		n	%
Procedure time	Mean time	119min	
	Median time	110min	
Adverse events after ESD	Post-ESD pancreatitis	1	3.4
Final pathology	Adenoma	25	86.2
	NET	3	10.3
	No tumor	1	3.4
RO resection		13	44.8
Maximum size of resected area	Mean of maximum size	28.2mm	
Length of hospital stay	Mean length	2.48days	
	Median length	2days	

ESD: Endoscopic submucosal dissection ASA: American Society of Anesthesiology EMR: Endoscopic mucosal resection NET: Neuroendocrine tumor

## S1108

## Endoscopic Papillectomy for Familial Adenomatous Polyposis Syndrome vs Sporadic Lesions: Distinct Clinical Manifestations and Therapeutic Options

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**Introduction:** Patients with familial adenomatous polyposis (FAP) syndrome have a high risk of developing ampullary and periampullary adenomas and subsequently adenocarcinoma. Duodenal adenocarcinoma is the second leading cause of death in patients with FAP. Endoscopic papillectomy (EP) is the primary modality for managing ampullary lesions. This study aims to compare baseline characteristics and outcomes of EP between patients with FAP vs. sporadic ampullary lesions.

**Methods:** This study is a retrospective analysis of all consecutive patients who underwent endoscopic snare papillectomy for an ampullary lesion between January 2006 and December 2021. We compared baseline characteristics, clinical presentation, procedure-related variables, recurrence, and post-EP adverse events in patients with FAP vs. sporadic ampullary lesions.

**Results:** Fifty-one patients undergoing EP for ampullary lesions were included in the final analysis. There were eleven patients with FAP and forty patients with sporadic ampullary lesions. In FAP vs. sporadic ampullary lesions, patients were younger [35 vs. 70 years,  $P < 0.001$ ], were less likely to present with symptoms prior to EP [18.2 vs. 62.5%,  $P=0.02$ ], less likely to have biopsies prior to EP [54.5 vs. 85%,  $P=0.04$ ], and less likely to get an endoscopic ultrasound prior to EP [36.4 vs. 82.5%,  $P=0.005$ ]. FAP patients were also less likely to be on antiplatelet or anticoagulation therapy [0 vs. 35%,  $P=0.02$ ]. In FAP vs. sporadic ampullary lesions, the lesion size was smaller in FAP: 10 mm [IQR: 6-15 mm] vs. 15 mm [12-21 mm,  $P=0.03$ ]. The en-bloc resection rate was higher in FAP vs. sporadic ampullary lesions [100 vs. 67.5%,  $P=0.01$ ]. However, the rate of complete histological (R0) resection (45.5 vs. 45%,  $P=1.00$ ) was similar. Although the recurrence rate was higher in FAP vs. sporadic ampullary lesions [55.6 vs. 32.4%,  $P=0.2$ ], this was not statistically significant. Also, the rates of adverse events were similar between the two groups. (Table)

**Conclusion:** Patients with FAP and ampullary lesions requiring EP present earlier in life, are less likely to present with symptoms, have smaller lesions, and are more likely to have en-bloc resection than sporadic lesions. Although not statistically significant, rates of recurrence were higher in FAP thus prompt surveillance of these patients is necessary. EP is safe and effective in removing ampullary lesions irrespective of the type of lesion.

Table 1. Endoscopic papillectomy in patients with FAP v sporadic ampullary lesions

	FAP (n=11)	Sporadic (n=40)	P-value
Male gender	4 (3.4%)	25 (62.5%)	0.12
Age, years (median (IQR))	35 (30-63)	70 (61-76.75)	< 0.0001
Age > 75 years	0 (0%)	14 (35.0%)	0.02
Symptoms prior to EP	2 (18.2%)	25 (62.5%)	< 0.0001
Histology obtained prior to EP	6 (54.5%)	34 (85.0%)	0.04
Endoscopic ultrasound prior to EP	4 (36.4%)	33 (82.5%)	0.005
Antiplatelet/Anticoagulation use	0 (0%)	14 (35.0%)	0.02
Iron deficiency anemia	4 (36.4%)	11 (27.5%)	0.71
Extended procedure (>90 mins)	1 (9.1%)	13 (37.1%)	0.39
Lesion size in mm (median (IQR))	10 (6-15)	15 (12-21)	0.03
Lesion size ≥ 20 mm	1 (9.1%)	16 (41.0%)	0.23
Intraductal invasion	1 (9.1%)	7 (17.5%)	0.67
En bloc resection	11 (100%)	27 (67.5%)	0.01
Complete histological (R0) resection	5 (45.5%)	18 (45.0%)	1.00
Final Pathology			
Adenoma	10 (90.9%)	29 (72.5%)	
Adenoma w/high grade dysplasia	0 (0%)	5 (12.5%)	
Adenocarcinoma or NET	0 (0%)	3 (7.5%)	
Other (benign)	1 (9.1%)	3 (7.5%)	0.4
More than one EP to achieve technical success	0 (0%)	7 (17.5%)	0.32
Recurrence after technical success	5 (55.6%)	12 (32.4%)	0.2
Delayed bleeding requiring intervention	2 (18.2%)	5 (12.5%)	0.64
Post-ERCP Pancreatitis (PEP)	3 (27.3%)	4 (10.0%)	0.16
Papillary Stenosis	0 (0%)	2 (5.0%)	1.00

EP: Endoscopic papillectomy; FAP: Familial adenomatous polyposis; IQR: Interquartile range.

S1109

**General vs Monitored Anesthesia Time: Is One Preferred for EUS-Guided Portal Pressure Gradient Measurements and Liver Biopsies?**

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**Introduction:** EUS-guided portal pressure gradient (PPG) measurement and EUS guided liver biopsies are well tolerated procedures under anesthesia, but it is unclear which anesthesia modality, monitored anesthesia care (MAC) or general anesthesia (GA), is superior for performing these cases. We aimed to describe our centers' experiences and approach to EUS-guided PPG and liver biopsy from an anesthesia perspective and compared the two anesthesia modalities in terms of procedure duration, efficacy, and safety.

**Methods:** This was a retrospective review of all consecutive patients who underwent EUS-guided PPG measurement and/or liver biopsies at a single tertiary center between June 2021 and May 2022. All procedures were done with an anesthesiologist attending and/or a resident/nurse. After initial experience with GA, our center largely switched to MAC for these cases. In the last 40 cases, 82% were done with MAC. Demographic data, scope time, anesthesia time, technical success rate, and adverse events post procedure for each patient were noted. Statistical analysis was performed using student t-testing.

**Results:** We have a total of 73 patients who underwent EUS guided PPG measurement and/or liver biopsy, with 30 (54%) having undergone only PPG measurement. The mean age was 51, with 56 (77%) patients being female and mean BMI as 37. The clinical indication for most patients 60 (82%) in undergoing the EUS procedure was for evaluation of underlying NAFLD/NASH. No differences in basic demographics was found between the MAC and GA cohorts. The mean scope time for MAC vs GA was  $38.2 \pm 14.2$  and  $47.3 \pm 14.5$  minutes respectively for patients who underwent both EUS-PPG and liver biopsy. The timing of endoscopy was comparable between the two modalities ( $p=0.013$ ). The mean anesthesia time for MAC vs GA was  $57.1 \pm 14.9$  and  $81.6 \pm 14.9$  minutes respectively, with MAC being shorter by 25 minutes ( $p < 0.001$ ). Similar comparisons were made for patients who underwent EUS-PPG alone. Technical success was 100% for all cases, and there was only one reported adverse event of a patient who reported transient shortness of breath post-extubation from GA who underwent EUS-PPG alone. This was resolved within a few hours with close monitoring. (Table)

**Conclusion:** Our results show that MAC was superior in terms of anesthesia time as compared to GA. Both anesthesia modalities demonstrated excellent and comparable safety and efficacy.

Table 1. Procedure and Anesthesia time for EUS guided PPG measurement and Liver Biopsy			
Table a	EUS guided PPG measurement (with liver biopsy)		
	Mean	Mac(n=20)	GA (N=23)
	Procedure time (mins)	$38.2 \pm 14.2$	$47.3 \pm 14.5$
	Anesthesia time (mins)	$57.1 \pm 14.9$	$81.6 \pm 14.9$
Table b	EUS guided PPG measurement (without liver biopsy)		
	Mean	MAC (N=13)	GA (N=17)
	Procedure time (mins)	$37.7 \pm 14.5$	$46.9 \pm 14.5$
	Anesthesia time (mins)	$58.1 \pm 15.5$	$81.9 \pm 15.5$
Table c	Mean intubation time with GA (n=23) (with liver biopsy)		
		$66.3 \pm 14.6$	
	Mean intubation time in minutes with GA (n= 17) ( without liver biopsy)		
		$66 \pm 15.3$	

S1110

**Colorectal Endoscopic Submucosal Dissection in the West: A Systematic Review and Meta-Analysis**

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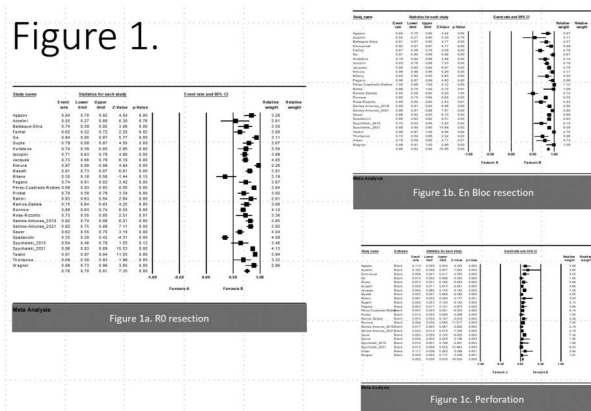
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**Introduction:** The advantages of endoscopic submucosal dissection (ESD) over endoscopic mucosal resection for large sessile and laterally spreading colorectal neoplasms are well established, most notably, high R0 and en bloc resection rates, and potential cure of intramucosal neoplasms. Increased frequency of adverse events, technical challenges, and lack of adequate training in ESD limit its widespread adoption in the western world.

**Methods:** A comprehensive literature search was performed in electronic databases in May 2021 for published manuscripts and abstracts of studies performed in non-Asian countries (Europe, Americas, or Australia) that evaluated the effectiveness of ESD for colorectal neoplasms. Pooled (weighted) rates of en bloc and R0 resection rates, perforation, and lower gastrointestinal bleeding were obtained using random-effects model. The study is registered in PROSPERO (CRD42021247492).

**Results:** Thirty-two studies (30 retrospective and two prospective) comprising 3,295 patients met the inclusion criteria (Table). 96.7% (2,817/2913) of polyps were  $\geq 2$  cm. Twenty-five studies were conducted in European countries, three in the United States, one in Brazil and three studies were multinational. Pooled en bloc resection rate (27 studies) was 86% (95% CI 0.82-0.90%) and R0 resection rate (28 studies) was 76% (95% CI 0.70-0.81) (Figures 1a-c). Procedure-related perforation rate was (24 studies) was 5.2% (95% CI 0.04-0.07) and clinically significant bleeding (23 studies) was observed in 4.6% (95% CI 0.036-0.058). Surgery for invasive cancer (21 studies) was performed in 4.3% (95% CI 0.029-0.064) of patients. There was a high degree of heterogeneity for en bloc resection (I<sup>2</sup> 85%), R0 resection (I<sup>2</sup> 91%), perforation (I<sup>2</sup> 59%), and surgery for invasive cancer (I<sup>2</sup> 67%), and low heterogeneity was observed for bleeding (I<sup>2</sup> 24%).

**Conclusion:** En bloc and R0 resection rates of ESD for large colorectal polyps are acceptable in Western countries. Both these rates have improved compared to previous reports from non-Asian countries.(1) Bowel perforation and clinically significant bleeding are still observed in 5-10% of ESD procedures. Ongoing efforts to train therapeutic endoscopists will probably improve the safety and effectiveness of colorectal ESD in the West.



[1110] **Figure 1.** Forest Plots Illustrating R0 and En Bloc Resection Rates, and Procedure-related Perforation in Colorectal ESD.

**Table 1. Characteristics of Included Studies**

First author	Year of publication	Study design	Country	N	Mean age	Mean tumor size (cm)	Mean procedure time (min)
Agapov	2014	Retrospective	Russia	44	64	3.5	120
Azzolini	2011	Retrospective	Italy	11	56	5.9	132
Baldaque-Silva	2019	Prospective	Portugal, Sweden	43	NA	3.8	130
Emmanuel	2018	Retrospective	UK	52	72	5.5	NA
Farhat	2011	Retrospective	France	85	65	NA	NA
Ge	2019	Retrospective	USA	77	64	4.8	105
Gupta	2022	Retrospective	USA	78	65	3.0	107
Hurlstone	2007	Retrospective	UK	42	68	NA	48
Iacopini	2017	Retrospective	Italy	140	67	3.0	76
Jacques	2019	Retrospective	France	192	67	5.4	103
Kimura	2021	Retrospective	Brazil	71	66	6.8	176
Maselli	2019	Retrospective	Italy	136	68	4.0	85
Milano	2018	Retrospective	USA, Italy	23	66	2.6	120
Nugent	2021	Retrospective	USA	91	65	3.2	NA
Pagano	2019	Retrospective	Italy	57	69	2.9	NA
Pérez-Cuadrado-Robles	2018	Retrospective	Belgium	171	67	4.0	116
Probst	2012	Retrospective	Germany	76	64	4.5	176
Rahmi	2014	Prospective	France	24	67	3.5	110
Ramos-Zabala	2020	Retrospective	Spain	80	65	3.1	155
Ronnow	2018	Retrospective	Sweden	301	72	4.0	98
Rosa-Rizzotto	2016	Retrospective	Italy	48	63	NA	99
Santos-Antunes	2018	Retrospective	Portugal	114	64	3.9	119
Santos-Antunes	2021	Retrospective	Portugal	147	64	4.4	90
Sauer	2016	Retrospective	Germany	178	70	4.1	127
Soune	2010	Retrospective	France	26	NA	4.9	65
Spadaccini	2022	Retrospective	Europe, USA, Australia	207	67	4.2	NA
Spychalski	2015	Retrospective	Poland	33	67	3.8	95
Spychalski	2021	Retrospective	Poland	601	65	4.4	83
Taskin	2020	Retrospective	Turkey	279	64	4.2	NA
Thorlacius	2013	Retrospective	Sweden	29	74	NA	NA

N number of procedures, NA data not available.

**REFERENCE**

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S1111

**Post-ERCP Pancreatitis: Does Diet Matter?**

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**Introduction:** Post-ERCP pancreatitis (PEP) is one of the most feared and most common complications of an ERCP, with an incidence of approximately 9.7%. While several risk factors for PEP have been established, the relationship between post-procedure diet and PEP is not well understood. We sought to evaluate whether a regular diet immediately post-ERCP was associated with an increase in PEP.

**Methods:** This was a retrospective study during which consecutive patients at two academic medical centers who underwent ERCP in 2021 were evaluated. Inclusion criteria were a) patients  $\geq$  18 years old; b) inpatient status prior to ERCP; c) no prior history of ERCP; d) no prior history of pancreatitis; e) no prior history of Sphincter of Oddi dysfunction. Data collected from these patients included patient demographics, ERCP procedure details, pre- and post- ERCP diet orders, and post- procedure complications. Association with PEP was evaluated using  $\chi^2$  and Fisher's exact tests.

**Results:** 100 consecutive patients met inclusion criteria and were included in this study. Overall, 74 patients (74%) received a modified post-ERCP diet, and 26 (26%) of patients received a regular post-ERCP diet. There was no significant difference in the incidence of PEP between these two groups (7/74 (9.4%) vs 0/26 (0%),  $p = 0.185$ ). Cannulation type was found to be significantly associated with the development of PEP (standard cannulation, 2/72 (2.7%) vs other cannulation (double wire, needle knife, sphincteroplasty- assisted), 5/25 (20%),  $p=0.011$ ). No other factors were found to have a significant association with the development of PEP (Table).

**Conclusion:** In this cohort of 100 patients, post-ERCP diet choice was not found to be associated with the development of PEP. In fact, the only factor that was associated with PEP was a non-standard cannulation during ERCP, which is a well-established risk factor. The lack of association of post ERCP diet with PEP is an important finding because it is a common practice for endoscopists to recommend a modified consistency diet post ERCP to reduce the risk of PEP despite the lack of supporting evidence for this recommendation. Immediate advancement to a regular diet has significant benefits including aiding in patient recovery, reducing hospital length of stay, and improving patient satisfaction. Larger scale studies to corroborate this data in a prospective fashion are indicated.

**Table 1. Factors Associated with the Development of Post-ERCP Pancreatitis**

	Post-ERCP Pancreatitis		p-value
	Yes	No	
Main Exposure: Post-ERCP Diet, n (%)			0.1852
Modified	7 (9.46)	67 (90.54)	
Regular	0	26 (100.00)	
Demographic Characteristics			
Sex, n (%):			1.0000
Male	4 (7.27)	51 (92.73)	
Female	3 (6.67)	42 (3.33)	
Age in Years:			0.5122
Mean (SD)	58.29 (21.69)	63.46 (18.46)	
Comorbidities			
History of Pancreatitis, n (%)			1.0000
Yes	0 (0.00)	10 (100.00)	
No	7 (7.78)	83 (92.22)	
History of Cholelithiasis, n (%)			0.3411
Yes	0 (0.00)	19 (100.00)	
No	7 (8.64)	74 (91.36)	
ERCP Characteristics			
Indication, n (%)			0.8308
Benign Bile Duct Pathology	6 (8.45)	65 (91.55)	
Malignancy	1 (6.25)	15 (93.75)	
Benign Pancreas Duct Pathology	0 (0.00)	13 (100.00)	
Cannulation Type (N = 97*), n (%)			<b>0.0116</b>
Standard	2 (2.78)	70 (97.22)	
Other	5 (20.00)	20 (80.00)	
Sphincterotomy, n (%)			0.1856
Yes	4 (5.06)	75 (94.94)	
No	3 (14.29)	18 (85.71)	
Biliary Stent, n (%)			0.1139
Yes	6 (11.54)	46 (88.46)	
No	1 (2.08)	47 (97.92)	
Pancreatic Stent, n (%)			0.3108
Yes	2 (12.50)	14 (87.50)	
No	5 (5.95)	79 (94.05)	
Complexity Grade, n (%)			1.0000
Grade 3	1 (7.69)	12 (92.31)	
Grade 1-2	6 (6.90)	81 (93.10)	
Post-Procedure Fluid (mL, N = 81*), n (%)			0.9525
Mean (SD)	870.00 (710.28)	904.45 (778.64)	
Rectal Indomethacin Given, n (%)			0.1037
Yes	7 (9.86)	64 (90.14)	
No	0 (0.00)	29 (100.00)	
*N listed due to missing data for some patients at these data points			



S1112

**Endoscopic Management of Esophageal Perforations and Leaks: A Multi-Center Study**

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**Introduction:** Endoscopic advancements in stenting and tissue plication have proven to be viable alternatives to surgical management of esophageal perforations and are increasingly being used in clinical practice. We aim to assess the efficacy and outcome of different endoscopic treatment modalities in patients with esophageal perforations.

**Methods:** We performed a retrospective analysis of patients with esophageal perforations from an endoscopic database since 2007. Patients with esophageal fistula, stricture, or stenosis were excluded. Patients were categorized into four treatment groups: primary closure (endoscopic suturing), primary bypass (stenting), combination (suturing defect and stenting), and conservative therapy (NPO, trans-nasal feeding tubes). Baseline demographics, patient characteristics, and treatment modality outcomes were collected. Predictors of success were identified using logistic regression.

**Results:** 95 patients (mean age 64 ± 15, 67% male) with esophageal perforations were included. The most common etiology was iatrogenic after dilatations or endoscopic myotomy (40%). 64% of perforations were in the distal esophagus. Regardless of strategy employed, 49% of patients had successful endoscopic repair of perforation. Only 7 patients required subsequent operative intervention. The combination approach achieved the greatest clinical success (66%), defined as no need for surgical intervention, when compared to the other modalities (primary bypass 35%, closure 57%, and conservative 25%, p=0.05). Patients with concomitant systemic inflammatory response syndrome had greater clinical success if they were treated with combination approach compared to primary bypass approach (18% vs. 64%, p=0.01). If the perforation was greater than or equal to 20mm, combination therapy had greater clinical success compared to primary bypass approach (0% vs. 50%, p=0.04). Early stent migration was associated with greater need for rescue surgery (p=0.02). (Table)

**Conclusion:** Esophageal perforations can be managed effectively with endoscopic therapy. Larger, prospective trials are needed to clarify ideal individualized endoscopic strategies. Patients with systemic inflammatory response and/or perforation ≥ 20 mm are managed most effectively with combination therapy.

**Table 1. Demographics, Presentation and Outcomes by Treatment Group**

Variables (%)	All (n=95)	Primary bypass (n=43)	Primary closure (n=12)	Combination (n=29)	Conservative (n=11)	p-value
	Demographics					
	All	Primary bypass (n=43)	Primary closure (n=12)	Combination (n=29)	Conservative (n=11)	
Age (± SD)	63 ± 14	66 ± 13	61 ± 13	61 ± 15	64 ± 15	0.23
Sex (Male)	64(67)	16(70)	10 (83)	19(65)	7(63)	0.61
History of EC	14 (16)	6(26)	1(8.3)	3(10)	2(18)	0.31
History of Radiotherapy	15 (19)	6(26)	0(0)	4(14)	2(18)	0.245
Diabetes	14(15)	2(9)	7 (43)	3(10)	2(18)	0.686
Hypertension	48(51)	12(52)	7(58)	13(45)	5(46)	0.927
Sleep apnea	16(17)	5(22)	2(17)	5(17)	0(0)	0.45
<b>Site of Perforation</b>						
Proximal		4(9.3)	0	2(6.9)	6(54.5)	
Middle		7(6.3)	3(25.0)	7(24.1)	0	
Distal		29 (67.4)	8(66.7)	20(69.0)	5(45.5)	
<b>Etiology of perforation</b>						
Spontaneous		7(16.3)	1(8.3)	0	2 (18.2)	
Iatrogenic		22(51.2)	9(75.0)	21(72.4)	7(63.6)	
Food impaction		2(4.7)	1(8.3)	2(6.9)	1(9.1)	
Anastomotic leak						
Esophageal cancer		4(9.3)	0	3(10.3)	0	
Boerhaave syndrome		2(4.7)	0	0	0	
		6(14.0)	1(8.3)	1(3.4)	1(9.1)	
<b>Symptoms at time of diagnosis</b>						
Dysphagia		10(23.3)	1(8.3)	4(13.8)	4(36.4)	
Chest pain		11(25.6)	4(33.3)	4(13.8)	1(9.1)	
Abdominal pain		1(2.3)	0	1(3.4)	1(9.1)	
Fever						
Other		4(9.3)	1(8.3)	5(17.2)	0	
		10(23.3)	2(16.7)	8(27.6)	2(18.2)	
<b>Outcomes by Treatment Group</b>						
Pittsburgh Perforation Severity Score (n=47)	3.17 ± 2.1	3.59 ± 2.2	2.5 ± 2.0	2.72 ± 1.8	3.45 ± 2.25	0.225
Operative intervention required	7(5.7)	2(4.7)	1(8.3)	3(10.3)	1(9.1)	0.95
Mortality	9(7.4)	4(9.3)	0	3(10.3)	2(18.2)	0.652
SIRS	44(36.1)	19(44.2)	4(33.3)	16 (55.2)	5(45.5)	0.635
Stent migration	11	10(23.3)	0	2(6.9)	0	0.182
LOS* (days)	16 ± 15	19 ± 15	11 ± 10	18 ± 19	7.9 ± 7.0	0.123
LOF* (months)	4.6 ± 4.1	4.25 ± 1.5	6 ± 8.8	3.5 ± 2.1	9.3 ± 6.4	0.07

\*LOS – Length Of Stay In The Hospital; LOF - Time From Diagnosis To Last-Follow Up; SIRS - Systemic Inflammatory Response Syndrome)

S1113

**Single Session Combined Laparoscopic Hernia Repair With Transoral Incisionless Fundoplication: A Systematic Review and Meta-Analysis**

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**Introduction:** Transoral incisionless fundoplication (TIF) is a promising anti-reflux surgery that can be performed in patients with hiatal hernia  $\leq 2$  cm. Recently, single session combined laparoscopic hernia repair followed by TIF (cTIF) has been used for patients with gastroesophageal reflux disease (GERD) with hiatal hernia length  $> 2$ cm. We conducted this systematic review and meta-analysis to assess outcomes of single session combined laparoscopic hernia repair with transoral incisionless fundoplication.

**Methods:** We conducted a comprehensive search of Ovid Cochrane, Ovid Embase, Ovid Medline, Scopus, and Web of Science (inception to March 2022) to identify studies reporting on laparoscopic hiatal hernia repair followed by transoral incisionless fundoplication. Case reports, review articles, editorials, studies with less than 10 patients were excluded. Studies reporting on either only TIF or TIF after failure of anti-reflux surgery were also excluded. Outcomes assessed were mean difference in GERD-HRQL (gastroesophageal reflux disease-health related quality of life) and RSI (reflux severity index) questionnaire pre-procedure and post-procedure. Follow up duration was six months for the study. Standardized mean difference was calculated for outcomes in the study.

**Results:** Out of 64 studies, 4 studies were finally included based on the inclusion criteria. Total 262 patients with mean age  $55.27 \pm 3.58$  years; 117/256 (45.7%) males were included in the study. Mean BMI of patient population was  $29.48 \pm 1.03$  kg/m<sup>2</sup>. Mean difference for GERD-HRQL score was 2.72 (4 studies; 95% CI 0.83 - 4.6),  $p = 0.005$ ,  $I^2$  96% while for RSI was 1.31 (4 studies; 95% CI 1.06 - 1.57),  $p < 0.001$ ,  $I^2$  0.

**Conclusion:** This is the first study to assess pooled mean difference of efficacy indicators of cTIF. Analysis showed significant reduction in GERD-HRQL score after cTIF procedure. RSI score was also found to be significantly reduced post cTIF procedure. Combined TIF is an effective procedure for patients with GERD and hiatal hernia  $> 2$ cm.

S1114

#### Protein-Calorie Malnutrition Is Associated With Worse Outcomes in Patients Admitted With Acute Cholangitis Undergoing Endoscopic Retrograde Cholangiopancreatography

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**Introduction:** Acute cholangitis, often caused by biliary obstruction, can lead to sepsis and death due to multiorgan failure. Endoscopic retrograde cholangiopancreatography (ERCP) is the recommended first line therapeutic modality in the management of acute cholangitis. ERCP can be associated with complications such as pancreatitis, perforation, and bleeding. Protein-calorie malnutrition (PCM) is associated with poor clinical outcomes in hospitalized patients. The aim of this study is to elucidate the relationship between PCM and patients undergoing ERCP for acute cholangitis.

**Methods:** Data were extracted from the National Inpatient Sample (NIS) database in the period between 2016 to 2019. Using the International Classification of Diseases, 10th revision, and Clinical Modification (ICD-10-CM) codes to obtain baseline demographic and clinical data, in-hospital mortality, hospital charges, and hospital length of stay (LOS). Statistical analysis was completed using t-test and Chi-squared analyses. Multivariate analysis for the mortality odds ratio (OR) was calculated after adjusting for potential confounders.

**Results:** A total of 123,285 patients with ascending cholangitis underwent ERCP, and 11,135 (9%) of these patients had PCM. The mean age of the PCM group was 68.15 years which was not significantly different from the non-PCM group ( $p$ -value 0.86). Most patients in the PCM group were males (56%) and whites (62.6%). More patients in the PCM group were alcoholics, had diabetes mellitus, congestive heart failure (CHF), and cirrhosis compared to the non-PCM group. After controlling for potential confounders, PCM was associated with higher in-hospital mortality (OR 3.4, CI 2.85-4.04;  $p < 0.01$ ). Moreover, patients with PCM had higher total hospital charges (\$175,726 vs. \$82,824;  $P < 0.01$ ), and a longer LOS (12.7 vs 6.1 days;  $P < 0.01$ ). In addition to malnutrition, age  $> 65$  years, non-white race, cirrhosis, and CHF were independently associated with higher in-hospital mortality (Table).

**Conclusion:** PCM is a strong predictor of poor clinical outcomes in patients with acute cholangitis admitted for ERCP. Systemic comorbidities such as cirrhosis and CHF are often associated with diminished nutritional states which may explain the higher prevalence of in-hospital mortality in the study group. Nutritional status is a modifiable risk factor and should be optimized to improve clinical outcomes in hospitalized patients with cholangitis.

**Table 1. Univariate and multivariate analysis of factors affecting in-hospital mortality in patients with acute cholangitis undergoing ERCP**

Variable	Univariate		Multivariate	
	OR (CI 95%)	P-value	OR (CI 95%)	P-value
Protein-calorie malnutrition	3.66 (3.08-4.34)	$< 0.01$	3.4 (2.85-4.04)	$< 0.01$
Age $> 65$	1.47 (1.25-1.73)	$< 0.01$	1.38 (1.16-1.64)	$< 0.01$
Female	1.06 (0.91-1.22)	0.41	1.06 (0.91-1.23)	0.436
Non-White	1.24 (1.06-1.44)	$< 0.01$	1.25 (1.07-1.46)	$< 0.01$
Alcoholism	1.4 (1.03-1.9)	0.02	1.32 (0.94-1.84)	0.1
Cirrhosis	2.18 (1.68-2.82)	$< 0.01$	1.89 (1.82-2.6)	$< 0.01$
Congestive heart failure	2.38 (2.02-2.82)	$< 0.01$	2.17 (1.42-2.52)	$< 0.01$
Smoking	0.57 (0.48-0.68)	$< 0.01$	0.6 (0.5-0.71)	$< 0.01$

S1115

#### Frailty Scores Do Not Affect ERCP Outcomes for Biliary Stone Disease: A Nationwide Inpatient Assessment

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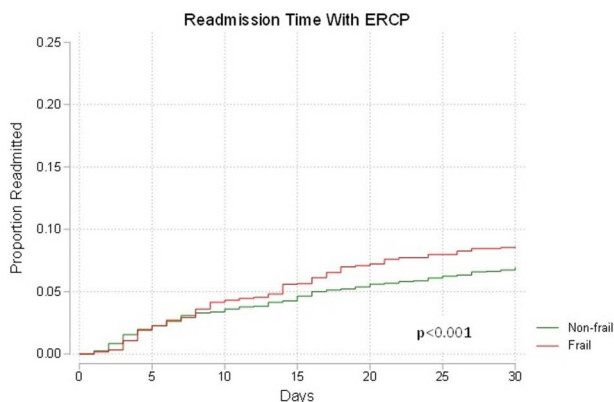
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**Introduction:** Pancreaticobiliary diseases are common in the elderly. To this end, frailty represents a state of vulnerability which should be considered when assessing the risks and benefits of therapeutic endoscopic procedures. Aim: To determine the rate of readmissions and clinical outcomes using the validated Hospital Frailty Risk Score in patients undergoing endoscopic retrograde cholangiopancreatography (ERCP).

**Methods:** Using the National Readmissions Database, we identified patients with an admission diagnosis of cholangitis with obstructive stone or cholecystitis with obstructive stone from January-November 2016 to 2019. Patients were determined to be of low frailty risk with a score of  $< 5$ , while patients of medium to high frailty risk had a score of  $> 5$ .

**Results:** During the study period, 27,365 patients who underwent ERCP were identified. Mean age of index admissions was 59.15 years and 54.75% were female. From the total cohort, 6,572 (24%) of patients underwent therapeutic ERCP on initial admission; of these patients, 31.6% ( $n=2,064$ ) were regarded as frail (risk score  $> 5$ ). Following ERCP, frail patients did not have a statistically significant readmission rate (8.42% vs. 6.94%, respectively;  $p = 0.196$ ). The performance of ERCP did not affect readmission rates (OR 1.14, CI: 0.94-1.38,  $p = 0.085$ ). Frail patients were likely to have longer lengths of stay, higher total cost, procedural related complications, and higher risk of mortality. Despite this, ERCP was not a significant contributor of mortality risk (HR 0.56, CI 0.31-1.03,  $p = 0.063$ ). (Figure)

**Conclusion:** ERCP is not a risk factor for readmission among frail patients. However, frail patients are at higher risk for procedure-related complications, healthcare utilization, and mortality. (Table)



[1115] Figure 1. Cox regression curve showing the effect of frailty on readmission following ERCP for biliary stone disease.

**Table 1. Study baseline characteristics of patients admitted with a primary diagnosis of acute cholecystitis with obstructing stone or acute cholangitis with obstructing stone**

Variables	Non-frail		Frail		Total		N	P-value
	%	CI	%	CI	%	CI		
<b>ERCP</b>								
No ERCP	78.84	[77.87-79.78]	66.37	[64.50-68.18]	75.98	[75.04-76.91]	20,793	0.000
ERCP	21.16	[20.22-22.13]	33.63	[31.82-35.50]	24.02	[23.09-24.96]	6,572	
<b>Age</b>								
< 75 years	82.99	[82.24-83.71]	51.00	[49.12-52.88]	75.66	[74.88-76.42]	20,705	0.000
> 75 years	17.01	[16.29-17.76]	49.00	[47.12-50.88]	24.34	[23.58-25.12]	6,660	
<b>Sex</b>								
Male	43.92	[42.96-44.90]	49.70	[47.90-51.51]	45.25	[44.39-46.11]	12,382	0.000
Female	56.08	[55.10-57.04]	50.30	[48.49-52.10]	54.75	[53.89-55.61]	14,983	
<b>Mortality</b>								
Did not die	99.86	[99.74-99.93]	97.71	[97.08-98.21]	99.37	[99.21-99.50]	27,180	0.000
Died	0.14	[0.07-0.26]	2.29	[1.79-2.92]	0.63	[0.50-0.79]	173	
<b>Calendar year</b>								
2016	26.24	[24.75-27.79]	23.50	[21.72-25.37]	25.61	[24.24-27.03]	7,009	0.001
2017	24.54	[23.24-25.88]	23.06	[21.35-24.88]	24.20	[23.02-25.42]	6,623	
2018	24.23	[22.93-25.59]	25.08	[23.36-26.88]	24.43	[23.23-25.66]	6,685	
2019	24.99	[23.66-26.37]	28.36	[26.48-30.32]	25.76	[24.51-27.05]	7,049	
<b>Insurance</b>								
Medicare	37.50	[36.50-38.51]	76.21	[74.52-77.81]	46.45	[45.51-47.40]	12,284	0.000
Medicaid	18.19	[17.32-19.09]	7.95	[7.00-9.01]	15.82	[15.09-16.58]	4,184	
Private insurance	37.56	[36.56-38.58]	14.14	[12.90-15.47]	32.14	[31.28-33.02]	8,501	
Self-pay	6.75	[6.23-7.30]	1.71	[1.29-2.26]	5.58	[5.16-6.03]	1,476	
<b>Median household income</b>								
0-25th percentile	26.73	[25.55-27.94]	26.96	[25.23-28.75]	26.78	[25.70-27.89]	7,226	0.425
26th to 50th percentile	27.11	[26.08-28.17]	25.80	[24.09-27.58]	26.81	[25.87-27.78]	7,235	
51st to 75th percentile	25.65	[24.67-26.66]	26.88	[25.21-28.62]	25.93	[25.02-26.86]	6,997	
76th to 100th percentile	20.50	[19.43-21.61]	20.37	[18.80-22.03]	20.47	[19.47-21.51]	5,524	
<b>Hospital bed size</b>								
Small	18.80	[17.68-19.97]	18.31	[16.73-20.01]	18.69	[17.64-19.78]	5,114	0.018
Medium	30.53	[29.14-31.97]	28.07	[26.23-29.98]	29.97	[28.69-31.28]	8,201	
Large	50.67	[49.07-52.26]	53.62	[51.52-55.71]	51.34	[49.88-52.81]	14,050	
<b>Hospital urban-rural designation</b>								
Metropolitan areas with at least 1 million residents	58.39	[56.71-60.04]	57.77	[55.52-59.99]	58.24	[56.67-59.81]	15,939	0.000
Metropolitan areas with less than 1 million residents	33.77	[32.20-35.37]	36.53	[34.36-38.75]	34.40	[32.91-35.93]	9,414	
Metropolitan areas	6.01	[5.33-6.77]	4.68	[3.90-5.60]	5.70	[5.11-6.36]	1,561	
Not metropolitan or micropolitan (non-urban residual)	1.84	[1.49-2.27]	1.02	[0.68-1.53]	1.65	[1.35-2.01]	452	
<b>Hospital teaching status</b>								
Metropolitan non-teaching	26.85	[25.56-28.17]	24.29	[22.63-26.04]	26.26	[25.08-27.48]	7,187	0.000
Metropolitan teaching	65.31	[63.85-66.74]	70.00	[68.12-71.82]	66.38	[65.06-67.69]	18,166	
Non-metropolitan hospital	7.84	[7.07-8.69]	5.70	[4.84-6.71]	7.35	[6.69-8.08]	2,013	

Table 1. (continued)

Variables	Non-frail		Frail		Total		N	P-value
	%	CI	%	CI	%	CI		
Patient Location: Urban-Rural Code								
Central metro areas of >=1 million population	29.86	[28.20-31.59]	26.11	[24.21-28.10]	29.01	[27.47-30.59]	7,915	0.007
Fringe metro areas of >=1 million population	26.34	[24.90-27.85]	28.01	[25.99-30.11]	26.73	[25.34-28.16]	7,292	
Metro areas of 250,000-999,999 population	20.92	[19.64-22.27]	21.46	[19.72-23.31]	21.05	[19.83-22.32]	5,742	
Metro areas of 50,000-249,999 population	8.72	[7.91-9.61]	9.46	[8.34-10.71]	8.89	[8.13-9.71]	2,426	
Micropolitan counties	8.21	[7.48-9.00]	8.19	[7.08-9.47]	8.21	[7.53-8.93]	2,239	
Not metropolitan or micropolitan counties	5.94	[5.35-6.59]	6.77	[5.82-7.86]	6.13	[5.58-6.73]	1,672	
Day of Admission								
Admitted Monday-Friday	72.95	[72.12-73.78]	74.52	[72.86-76.12]	73.31	[72.58-74.04]	20,063	0.100
Admitted Saturday-Sunday	27.05	[26.22-27.88]	25.48	[23.88-27.14]	26.69	[25.96-27.42]	7,303	

S1116

### Transoral Incisionless Fundoplication Is a Safe and Effective Therapeutic Option for Refractory GERD: A 3-Year Retrospective Experience at a Quaternary Center

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**Introduction:** Refractory GERD is seen in up to 40% of patients who experience persistent symptoms despite optimal therapy with acid-suppressing agents, including proton pump inhibitors (PPI) and H2 blockers (H2B). Such individuals may be candidates for invasive interventions. Transoral incisionless fundoplication (TIF) is a minimally invasive intervention, which can be performed alone or in conjunction with laparoscopic hiatal hernia repair (HHR). Our study aimed to evaluate the technical and clinical success of TIF performed at a quaternary center in the management of refractory GERD.

**Methods:** This is an IRB approved retrospective chart review of patients who underwent TIF alone or TIF with HHR (TIF+HHR) for refractory GERD from 2018 to 2021. Technical success was defined as completed procedures without major complications. Clinical success was measured by reduction in PPI and/or H2B use as well as symptom resolution quantified by the GERD HQL Questionnaire.

**Results:** A total of 58 patients with a mean age of 55.7 years were included of whom 62.7% were female. 19.0% underwent TIF only, while 81.0% underwent TIF+HHR. Hill grade I, II, III, and IV was respectively present in 9.3%, 32.6%, 44.2%, and 9.3% of patients who underwent TIF alone or TIF with HHR (TIF+HHR) for refractory GERD from 2018 to 2021. Technical success was defined as completed procedures without major complications. Clinical success was measured by reduction in PPI use of whom 76.2% stopped completely and 9.6% reduced dosing by  $\geq 50\%$ . Similar results were seen in those with H2B use with 85.7% of patients stopping completely. Preop mean HQL score was 29.59 which decreased significantly to 6.56 and 3.27 at 6 and 12 months, respectively. At 12 months, 81.8% reported satisfaction with their condition, whereas 9.1% were neutral and 9.1% were dissatisfied. Complications occurred in 4 patients, including self-resolving oozing and superficial mucosal tears not requiring intervention.

**Conclusion:** Our study confirms that TIF is a viable treatment option in the management of refractory GERD. Similar to prior studies, we experienced high technical success rates with no major complications as well as clinical success with a majority of patients being able to reduce or stop PPI and/or H2B completely. In those who were unable to be titrated off acid suppression, postop evaluation suggested alternative diagnoses such as esophageal hypersensitivity or functional dyspepsia.

S1117

### Is Transduodenal Approach Better Than the Transgastric for EUS-GBD? - A Meta-Analysis

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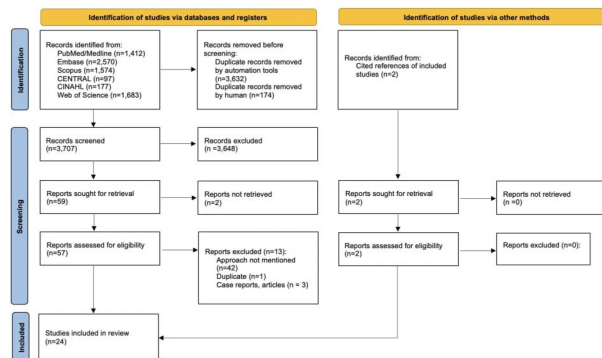
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**Introduction:** Endoscopic ultrasound-guided gallbladder drainage is achieved by creating cholecysto-enteric stoma, via either transduodenal (TD)/transjugal (TJ) or transgastric (TG) approach. In TD/TJ approach, retroperitoneal duodenum is immobile thus, provides a stable access point for the gallbladder (GB) neck. The inflamed GB can adhere to wall of duodenum/jejunum lending further stability. Other advantages are decreased risk of stent migration (due to reduced peristalsis) and stent occlusion (due to lower chances of food reflux) compared to TG approach. Hence, TD/TJ approach can be expected to have lesser adverse events (AE) compared to TG approach. We aimed to compare the AE, technical success, and clinical success of two approaches.

**Methods:** Study was registered in PROSPERO and comprehensive literature search was done on PubMed, Embase, Scopus, CENTRAL, CINAHL, and Web of Science. In total, 3707 studies were screened and 24 met the inclusion criteria (Figure). Summary statistics from each study (both 1 arm and 2 arm studies) were extracted for clinical outcomes of AE, clinical success, and technical success. Random effects model was used for analysis using the software Comprehensive Meta-Analysis.

**Results:** Analysis was done by 2 methods (Table). Method 1: Including studies with patients in both arms. TG vs. TD/TJ: Pooled OR (95% CI), p-value: AE (6 studies): 1.58 (0.46-5.45), p=0.47; Clinical success (3 studies): 0.30 (0.06-1.48), p=0.14; and Technical success (3 studies): 0.30 (0.05-1.89), p=0.20. Method 2: Including all studies (15 TD/TJ & 9 TG). TG vs. TD/TJ: AE (Studies: 9 vs 15): 27.5% (17.1%-41.1%) vs. 15.2% (9.5%-23.6%), p=0.07; Clinical success (Studies: 6 vs 13): 83.3% (71.0%-91.0%) vs. 91.7% (82.4%-96.3%), p=0.16; and Technical success (Studies: 9 vs 15): 91.3% (83.6%-95.6%) vs. 95.3% (90.7%-97.7%), p=0.22.

**Conclusion:** Our meta-analysis showed no significant difference in clinical and technical success between the TD/TJ and TG approach. The rate of AE was similar when comparing two-arm studies only; however, the difference was almost statistically significant when all studies were included, the rate being higher in TG approach. Limitations include data sparsity and heterogeneity of studies analyzed. Sufficiently powered RCTs are needed to verify the above results. While approach to transluminal GB drainage depends on endoscopist preference and patient's anatomy (proximity of GB to lumen), it would be useful to know which approach has a favorable AE profile when both are feasible.



[1117] Figure 1. PRISMA flow diagram

**Table 1. Results of comparison of technical success, clinical success, and rate of adverse events between the transgastric and transduodenal/transjejunal approach**

METHOD 1- Including studies with patients in both arms				
	N of studies	Pooled odds ratio (TG vs. TD/TJ)	95% CI	p-value
Adverse events	6	1.58	0.46-5.45	0.47
Clinical success	3	0.30	0.06-1.48	0.14
Technical success	3	0.30	0.05-1.89	0.20
METHOD 2- : Including all the studies				
	N of Studies (TG vs TD/TJ)	AE(%)	95% CI	p-value
Adverse events	9 vs 15	27.5% vs 15.2%	17.1%-41.1%) vs (9.5%-23.6%)	0.07
Clinical success	6 vs 13	83.3% vs 91.7%	(71.0%-91.0%) vs (82.4%-96.3%)	0.16
Technical success	9 vs 15	91.3% vs 95.6%	83.6%-95.6%) vs 90.7%-97.7%)	0.22

S1118

**Safety and Efficacy of the Novel EndoRotor Device for the Treatment of Walled-Off Pancreatic Necrosis (WOPN): A Systematic Review and Meta-Analysis**

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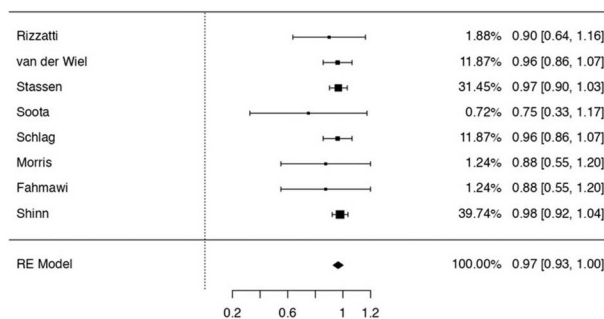
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**Introduction:** Debridement of infected walled-off pancreatic necrosis (WOPN) is indicated to treat and prevent sepsis-related multi-organ failure. The lack of dedicated and effective accessories for WOPN debridement results in the need for time-consuming repetitive procedures. The aim of this study was to evaluate the efficacy and safety of the EndoRotor® powered endoscopic debridement system to remove solid debris under direct endoscopic visualization.

**Methods:** Search strategies were developed for PubMed, EMBASE, and Cochrane Library databases from inception through June 2022, in accordance with PRISMA and MOOSE guidelines. Outcomes of interest included technical success defined as successful use of device for debridement, clinical success defined as complete debridement and cyst resolution, and procedure-related adverse events. A random effects model was used for analysis and results were expressed as Odds ratio (OR) along with 95% confidence interval (CI).

**Results:** A total of 8 studies (n = 91 patients) were included. The most common etiology of WOPN was biliary (30%). Mean WOPN size was 154.6 ± 34.0 mm, while mean procedure time was 71.4 minutes. LAMS were used to create a cystgastrostomy for 73.6% of cases with the remaining cases relying upon a placement of plastic stents (24.2%) and self-expanding metal stents (SEMS) (2.2%). The mean number of necrosectomy sessions required was 2.2 (range 1 to 7). The pooled rate of clinical success was 97% (95% CI 93-100%, I2 = 0%) with a pooled technical success rate of 97% (93-100%, I2 54%). The pooled procedure-related adverse event rate was 7% (2-12%, I2 = 0%), which included procedure-associated bleeding, pneumoperitoneum, peritonitis, pleural effusion, and dislodgement of LAMS. Overall publication bias was considered low. (Figure)

**Conclusion:** Our study illustrates that the novel EndoRotor device appears to be safe and effective for treating pancreatic necrosis. Patients undergoing endoscopic necrosectomy with the EndoRotor appear to require less debridement sessions when compared with studies using conventional instruments.



[1118] Figure 1. Forrest plot of pooled rates of clinical success.

S1119

**Safety and Efficacy of Pediatric Endosonography: A Multi-Center Retrospective Cohort Study**

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**Introduction:** Endoscopic ultrasound (EUS) is widely used in the adult population for a wide range of diagnostic and therapeutic purposes. In the pediatric population, the use of EUS has been historically diagnostic, however, EUS-guided therapy is increasing. In this retrospective study, we aim to describe the safety and efficacy profiles of EUS in pediatric patients across a spectrum of EUS procedures.

**Methods:** This is a retrospective multi-center cohort study of pediatric patients who underwent EUS procedures for diagnostic or therapeutic purposes between January 2011 and March 2022. Data including demographics, procedural details, and adverse events (AE) were collected. Outcomes were diagnostic success, defined as successful diagnosis using only EUS without any additional diagnostic tools, and therapeutic success, defined as using only EUS without additional therapeutic interventions.

**Results:** 61 pediatric patients between the age of 0 to 18 years underwent 77 EUS procedures, of which 35 were females (56.5%). The mean age at the procedure was 16.2 ± 4.2 years and the median weight was 70.2 kg (IQR 49.7-91.2). The indications for EUS were gastrointestinal lumen evaluation ± fine needle biopsy/aspiration (FNB/A), pancreaticobiliary tree evaluation ± FNB/A, surveillance for tumor syndrome, suspected lymph node (LN), or gastrointestinal (GI) mass, celiac plexus block and cyst gastrostomy creation (Table). The median procedure time was 35 minutes (IQR 18 - 49). The diagnostic success rate was 98.7% and the therapeutic success rate was 100%. The complication rate was 2.6% which included 2 cases of pancreatitis after fine-needle aspiration of the pancreas. No case had any anesthesia-related complications.

**Conclusion:** In this multicenter retrospective cohort study, the use of EUS in pediatrics has shown to be safe and effective in a wide range of diagnostic and therapeutic intents.

**Table 1. Baseline characteristics, procedural and clinical outcomes of pediatric patient EUS procedures**

	<b>N=77 (%)</b>
Females	35 (56.5)
Weight (n=66)	70.2 [49.7 – 91.2]
Age at procedure (years)	16.2 ± 4.2
<b>Indication</b>	
Diagnostic	
GI lumen Evaluation	9 (11.7)
GI lumen Evaluation with FNB/A	5 (6.5)
Pancreaticobiliary tree evaluation	37 (48.1)
Pancreaticobiliary tree evaluation with FNB/A	6 (7.8)
Surveillance for tumor syndrome	7 (9.1)
Suspected LN or mass	8 (10.4)
Therapeutic	
Celiac Plexus Block	1 (1.3)
Cystgastrostomy	4 (5.2)
<b>Anesthesia Type</b>	
Monitored Anesthesia Care (MAC)	48 (62.3)
General Anesthesia	29 (37.7)
Mean procedure Time in minutes (N= 59)	35.0 [18.0 - 49.0]
Diagnostic Success	76 (98.7)
Therapeutic Success (n=5)	5 (100)
EUS related complications	2 (2.6)
Anesthesia complications	0 (0)

EUS = endoscopic ultrasound, FNB/A = fine needle aspiration/biopsy, LN = lymph node.  
 Continuous variables presented as mean ± SD or median (IQR).  
 Categorical variables presented as n (%).

S1120

**Pre-Procedure Desmopressin and Bleeding Risk After Endoscopic Retrograde Cholangiopancreatography and Endoscopic Biliary Sphincterotomy**

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**Introduction:** Intravenous Desmopressin (DDAVP) is sometimes given to uremic patients before endoscopic retrograde cholangiopancreatography (ERCP) with sphincterotomy to reduce the risk post-sphincterotomy bleeding. However, this is based on extrapolation from previous studies that evaluated the use of desmopressin prior to surgery or renal biopsy to decrease the risk of bleeding and transfusion requirements. The aim of this study was to identify the impact of desmopressin on post-sphincterotomy bleeding rates after ERCP.

**Methods:** We performed a single-center retrospective study of patients who underwent an ERCP with sphincterotomy at our institution between January 2011 and January 2021. Primary outcomes were the rate of post sphincterotomy bleeding (PSB). Descriptive statistics and univariable analysis were performed.

**Results:** 2500 patients underwent ERCP with sphincterotomy during the study period, 99 (4.0%) of which received DDAVP. Post-sphincterotomy bleeding occurred in 31 patients (1.24%). Patients who experienced PSB had higher BUN ( $p < .001$ ), were more likely to be on hemodialysis ( $p = .04$ ) and were more likely to receive DDAVP ( $p < .001$ ). (Table)

**Conclusion:** Post-sphincterotomy bleeding was more likely to occur in patients who received desmopressin. This suggests that desmopressin does not reduce PSB and therefore should not be used for this purpose. Uremia and renal failure are associated with PSB, but desmopressin does not reduce this risk.

**Table 1. Patient characteristics comparing patients who had post-sphincterotomy bleed and those who did not**

Variables	PSB N=31	No PSB N=2469	P-value
Age	58.6±24.0	54.4±20.9	.17
<b>Gender</b>			
Female	16 (51.6)	1,405 (56.9)	.55
<b>Pre-op Labs</b>			
BUN	22.0±17.4	13.2±10.3	< .001
Cr	1.47±1.4	0.90±0.71	.037
INR	1.2±0.3	1.1±0.2	.26
Platelets	213.0±118.5	240.0±108.8	.12
<b>Anti-platelets</b>			
Aspirin	8 (25.8)	541 (21.9)	.60
Clopidogrel	1 (3.2)	32 (1.3)	.35
DAPT	1 (3.2)	17 (.69)	.09
<b>Anticoagulation</b>			
Any	1 (3.2)	109 (4.4)	.75
Enoxaparin	0 (0)	25 (1.0)	.50

Table 1. (continued)

Variables	PSB N=31	No PSB N=2469	P-value
Warfarin	1 (3.2)	35 (1.4)	.40
Rivaroxaban	0 (0)	29 (1.2)	.54
Apixaban	0 (0)	39 (1.6)	.48
Edoxaban	0 (0)	1 (.04)	
Dabigatran	0 (0)	5 (0.2)	.80
DVT Prophylaxis			
Subcutaneous Heparin	4 (12.9)	291 (11.8)	.85
Enoxaparin	0 (0)	50 (2.0)	.42
ESRD	3 (9.7)	80 (3.2)	.04
DDAVP	6 (19.4)	93 (3.8)	< .001

Values are reported as n (%) or mean±SD.

S1121

#### Outcomes in Hospitalized Patients With Coagulopathy (COAG) Presenting With Nonvariceal Upper Gastrointestinal Bleed (NVUGIB) - 4-Year NIS Study (2016 -2019)

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**Introduction:** Coagulopathy is a major public health issue worldwide resulting in mortality and morbidity. (1) Primary coagulation disorders include defect in platelets or blood vessels. (2) Secondary coagulation disorders involve qualitative or quantitative defects in clotting factors or their inhibitors. (3) Acquired coagulation disorder is mainly associated with chronic diseases like liver disease, vitamin K deficiency, disseminated intravascular coagulation (DIC), and anticoagulant therapy [4] Limited data is available to determine the impact of coagulopathy on non-variceal upper gastrointestinal bleed.

**Methods:** Using National Inpatient Sample databases from 2016 to 2019(5), we identified patients presenting with Non variceal gastrointestinal bleed (NVUGIB), the population were then divided based on the presence and absence of coagulopathy using appropriate ICD-10-CM/PCS codes. STATA 17.0 software (6) was used for the analysis. Pearson's Chi-Square test was used to analyze categorical variable, whereas the student t-test was used to analyze continuous variables. Univariate and multivariate logistic regression was used to adjust for potential confounders. Primary outcome was in hospital mortality due to NVUGIB in patients with coagulopathy vs without coagulopathy.

**Results:** Amongst total of 1,515,460 patients admitted with non-variceal upper gastrointestinal bleed, 120,060 (7.92%) patients had coagulopathy disorder. Male gender and white ethnicity were predominant in both populations. There were 7,408(6.17%) and 27,017(1.94%) mortality in patients with and without coagulopathy respectively. The difference is statistically significant with OR:1.7, 95% CI: 1.63-1.93, and p < 0.001. Additionally, complications such as hypovolemic shock, pressor support, acute respiratory failure were higher in patients with coagulopathy. Odds of using IR intervention were higher and EGD were lower in patients with coagulopathy as shown in Table. Mean length of stay 5.72 (5.64-5.80) vs 4.14 (4.12-4.16) [Days: p-value < 0.001] and hospitalization charges (mean US\$: 20143 vs. 12390) were also higher in patients with coagulopathy.

**Conclusion:** Patients with coagulopathy presenting with NVUGIB were younger, had higher resource utilization, and were associated with higher in-patient mortality and complications. Coagulopathy, whether congenital or acquired, is a risk factor for adverse hospital outcome for patients admitted with NVUGIB.

Table 1. In Patient Outcomes

Variables	Odds ratio	95% CI	P value
In-patient mortality	1.7	1.63-1.93	< 0.001
ALL EGD	.7666	0.74-0.79	< 0.001
EGD with intervention	.9674	0.92-1.00	0.111
IR intervention	1.26	3.7-9.8	0.007
Acute Respiratory Failure	2.06	1.91-2.23	< 0.001
Hypovolemic Shock	1.96	1.82-2.12	< 0.001
Requiring pressor Support	1.88	1.60-2.22	< 0.001
Blood Products Transfusion	1.34	1.29 – 1.39	< 0.001

S1122

#### Impact of Biliary Stents on Diagnostic Yield of Endoscopic Ultrasound-Guided Tissue Acquisition of Solid Pancreatic Head Lesions: A Systematic Review and Meta-Analysis

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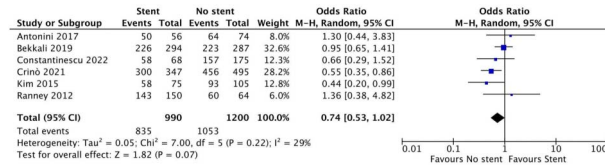
**Introduction:** There is scarce evidence on the impact of biliary stents on endoscopic ultrasound (EUS) fine-needle biopsy (FNB) or fine-needle aspiration (FNA) of pancreatic head masses. Aim of this meta-analysis was to compare the diagnostic performance of EUS-guided tissue sampling in patients with or without biliary stents.

**Methods:** We searched PubMed/Medline and Embase databases through March 2022 and identified 7 studies (2458 patients). Primary outcome was diagnostic accuracy. Secondary outcomes were sample adequacy, diagnostic sensitivity, specificity, and number of needle passes. We performed pairwise meta-analysis through a random effects model and expressed results as odds ratio (OR) or mean difference along with 95% confidence interval (CI).

**Results:** Pooled accuracy was 85.4% (95% CI 78.8%-91.9%) and 88.1% (83.3%-92.9%) in patients with and without stent, respectively with no significant difference between the two approaches (OR 0.74, 95% CI 0.53-1.02; p=0.07). No difference in patients with plastic stent was observed (OR 0.89, 0.51-1.54; p=0.67) whereas a significant difference was observed in patients with metal stent (OR 0.54, 0.17-0.97; p=0.05). Diagnostic accuracy with EUS-FNB was significantly lower in patients with biliary stents (OR 0.64, 0.43-0.95; p=0.03) whereas no difference was observed with FNA. No difference in terms of sample adequacy was observed between the two groups (OR 1.06, 0.67-1.67; p=0.81). Diagnostic sensitivity was significantly lower in patients with biliary stent (OR 0.59, 0.44-0.80; p< 0.001) and the number of needle passes was not significantly different between the two groups (mean difference -0.09, -0.30 to 0.11; p=0.38).

**Conclusion:** The presence of a metal stent negatively impacts on diagnostic yield of EUS tissue sampling for pancreatic head lesions, whereas no difference seems to be observed with plastic stents. Therefore, in jaundiced patients, EUS tissue sampling should precede ERCP, especially when metal stents are used.





[1122] Figure 1. Forest plot of diagnostic accuracy analysis

S1123

**Do Patients With ICDs or Pacemakers Develop Device Malfunction After ERCP?**

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**Introduction:** Sphincterotomy in endoscopic retrograde cholangiopancreatography (ERCP) involves the use of electrocautery to access the biliary tree. There is a theoretical risk of electromagnetic interference (EMI) in patients with implantable cardioverter-defibrillators (ICD) or pacemakers (PM) who undergo electrosurgery. Studies found the EMI risk to be minimal, yet they utilized small sample sizes. Our goal is to assess potential risk of EMI in patients with ICDs or PMs undergoing ERCP.

**Methods:** The National Inpatient Sample (NIS) was used to identify hospitalized patients with ICDs/PMs and gallstones, stratified based on whether they received ERCP, from 2001 to 2013 via International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9 CM) codes. Primary outcomes consisted of mortality, length of stay, and hospitalization charges. Secondary outcomes included complications of AICD/PM malfunction (ICD discharge and syncope), different arrhythmias, cardiac arrest, and various degrees of heart block. Chi-squared tests and independent t-tests were performed to assess categorical and continuous data, respectively. Multiple logistic regression was used to control for confounders.

**Results:** The non-ERCP group had 40,630 individuals while the ERCP group had 6,250. Both non-ERCP & ERCP groups were mostly male (59.51% versus 57.14%) and Caucasian (79.08% versus 82.49%). Members of the ERCP group were older (78.22 ± 11.129 years versus 75.45 ± 12.203 years; adjusted p < 0.05). Mortality was higher in the non-ERCP group (2.71% versus 2.06%; adjusted p < 0.05). LOS (7.28 ± 5.774 days versus 5.54 ± 5.102 days; p < 0.05) and total charges (\$55,305.18 ± 55,500.141 versus \$36,701.06 ± 46,133.869; p < 0.05) were higher in the ERCP group. The non-ERCP group had higher rates of syncope (1.28% versus 0.69%; adjusted p < 0.05), unspecified cardiac dysrhythmia (0.89% versus 0.54%; adjusted p < 0.05) and left bundle branch block (LBBB; 1.43% versus 1.04%; p < 0.05). Differences in rates of other arrhythmias and heart block were statistically insignificant.

**Conclusion:** This study found that ICD/PM patients with gallstones who underwent ERCP had mostly equal rates of arrhythmias and heart block as the non-ERCP group, however the latter had higher rates of syncope and mortality. This could be due to the medical optimization patients undergo prior to ERCP. These patients are closely observed and managed with frequent follow-ups. Further prospective studies are needed to elucidate the potential for EMI in those undergoing ERCP. (Table)

**Table 1. Demographics, Primary and Secondary Outcomes in Patients Undergoing ERCP with Known Gallstones With and Without an ICD/PM**

	Non-ERCP group		ERCP group		OR	CI	p-value	AOR	ACI	Adjusted p-value	
	Percentage	n	Percentage	n							
Mortality	2.71	1,101	2.06	129	0.757	0.629-0.91	< 0.05	0.734	0.606-0.89	< 0.05	
Complete AV block	0.70	283	0.77	48	1.103	0.812-1.5	0.53	0.983	0.703-1.374	0.918	
1 <sup>st</sup> degree AV block	0.46	187	0.35	22	0.764	0.491-1.189	0.232	0.866	0.554-1.352	0.526	
<b>Other 2<sup>nd</sup> degree AV block</b>	0.14	57	0.24	15	1.712	0.969-3.026	0.061	1.663	0.921-3.001	0.092	
Left BBB	1.43	582	1.04	65	0.723	0.559-0.936	< 0.05	0.715	0.546-0.935	< 0.05	
Right BBB	0.88	357	0.93	58	1.057	0.8-1.396	0.698	0.877	0.71-1.083	0.224	
Syncope	1.28	520	0.69	43	0.534	0.391-0.73	< 0.05	0.543	0.394-0.748	< 0.05	
ICD discharge	0.06	23	0.03	2	0.565	0.133-2.398	0.433	0.813	0.188-3.521	0.782	
Paroxysmal V Tach	3.62	1,471	2.86	179	0.785	0.671-0.919	< 0.05	0.858	0.727-1.012	0.069	
VFib/VFlutter	0.28	114	0.3	19	1.084	0.666-1.763	0.746	1.059	0.624-1.797	0.832	
Cardiac arrest	0.44	179	0.37	23	0.835	0.54-1.29	0.415	0.925	0.591-1.449	0.735	
Cardiac dysrhythmia, unspecified	0.89	362	0.54	34	0.608	0.428-0.866	< 0.05	0.668	0.461-0.969	< 0.05	
AFib/AFlutter	37.76	15,341	40.03	2,502	1.1	1.042-1.162	< 0.05	1.037	0.978-1.1	0.219	
Premature Beats	0.63	258	0.528	33	0.831	0.578-1.195	0.316	0.926	0.639-1.344	0.687	
Sex at birth											
	Female	40.49	16,448	42.86	2,679	1.103	1.045-1.164	< 0.05	1.102	1.04-1.167	< 0.05
	Male	59.51	24,179	57.14	3,571						
Race							< 0.05				
	Caucasian	79.08	28,024	82.49	4,554						
	Black	8.69	3,080	4.64	256						
	Hispanic	7.68	2,722	8.2	453						
	Asian or Pacific Islander	2.09	742	2.46	136						
	Native American	0.39	138	0.33	18						
	Other	2.07	733	1.88	104						

	Non-ERCP group			ERCP group			Mean difference	CI	p-value
	Mean	SD	SE Mean	Mean	SD	SE Mean			
Age at admission (years)	75.45	12.203	0.061	78.22	11.129	0.141	-1.763 ± 0.164	-2.085 to -1.442	< 0.05
LOS (days)	5.54	5.102	0.025	7.28	5.774	0.073	-1.737 ± 0.071	-1.875 to -1.599	< 0.05
Total charges (USD)	36,701.06	46,133.869	230.58	55,305.18	55,500.141	707.539	-18,604.115 ± 650.266	-19,878.646 to -20,062.883	< 0.05

ERCP: endoscopic retrograde cholangiopancreatography; n: sample size; OR: odds ratio; CI: 95% confidence interval; AOR: adjusted odds ratio; ACI: adjusted confidence interval; AV: atrioventricular; BBB: bundle branch block; V Tach: ventricular tachycardia; VFib: ventricular fibrillation; VFlutter: ventricular flutter; AFib: atrial fibrillation; AFlutter: atrial flutter; AV: atrioventricular; SD: standard deviation; SE: standard error; USD: US dollars; LOS: length of stay.

S1124

### Optimal Submucosal Injection for Submucosal Dissection: A Single-Center Experience

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**Introduction:** A submucosal injection is an essential technique for endoscopic submucosal dissection (ESD) to lift the lesion. Not only does this facilitate en-bloc resection, but it also provides sufficient submucosa for proper pathologic evaluation of margin and lymphovascular invasion. Several injection agents for ESD have been developed, including ORISE Gel (Boston Scientific, MA, USA) and Eleview (Aries Pharmaceutical, CA, USA), however, few studies have examined the clinical outcomes of each lifting agent. Here we compared the clinical outcomes of ORISE Gel and Eleview used during the ESD of colorectal lesions.

**Methods:** A total of 90 patients who underwent ESD were included in this retrospective cohort study. 2mm Dual-J Knife (Olympus) or 1.5mm ProKnife (Boston Scientific) were used for resection. Patients were divided into a comparison group: ORISE group (n=36) vs Eleview group (n=54). The primary outcome was the amount of each agent used to achieve adequate submucosal lifting. Secondary outcomes were en-bloc resection rate, R0 resection rates, ESD time, length of hospital stay, and adverse events. R0 resection was defined as an en-bloc resection with microscopically negative margins. The two groups were compared using the Independent t-tests and chi-square tests.

**Results:** The ORISE group had a significantly lower amount of agent used (30 mL vs 65.5 mL,  $p < 0.001$ ) and shorter procedure time (90.0 min vs 120.0 min,  $p = 0.05$ ) when compared with the Eleview group, while there was no difference in en-bloc resection rate (77.8% vs 70.4%,  $p = 0.48$ ), R0 resection rate (61.1% vs 59.3%,  $p = 0.83$ ) hospital length of stay ( $1.03 \pm 0.70$  vs  $1.39 \pm 2.41$ ,  $p = 0.39$ ), or adverse events (16.7% vs 11.1%,  $p = 0.53$ ). (Table)

**Conclusion:** The use of ORISE for colorectal ESD was significantly associated with a lower amount of gel used for submucosal lifting and shorter procedure time while there were no differences in the en-bloc resection or R0 resection rates, hospital length of stays, and adverse events compared to Eleview. Further study is warranted to investigate the clinical outcomes of different lifting agents used for ESD.

**Table 1. Baseline Characteristics and Outcomes of Colorectal Endoscopic Submucosal Dissection LGD=low-grade dysplasia, HGD=high-grade dysplasia**

		Eleview (n=54)		Orise (n=36)		
Baseline characteristics	Age, y, median (IQR)	58 (54.5-66.5)		64 (56.3-73.0)		
	Sex, men/women, n	31/23		18/18		
	Lesion size, mm, median (IQR)	31 (22.3-44.8)		29.5 (20.0-34.0)		
ASA class, n (%)	I	2	3.7	0	0	
	II	24	44.4	9	25.0	
	III	26	48.1	27	75.0	
	IV	2	3.7	0	0.0	
	Lesion site, n (%)					
	Ileocecal valve	5	9.3	2	5.6	
	Cecum	15	27.8	9	25.0	
	Ascending colon	11	20.4	6	16.7	
	Hepatic flexure	2	3.7	0	0.0	
	Transverse colon	9	16.7	11	30.6	
	Splenic flexure	1	1.9	0	0.0	
	Descending colon	3	5.6	2	5.6	
	Sigmoid colon	8	14.8	6	16.7	
Anesthesia, n (%)	Propofol	23	42.6	24	66.7	
	General anesthesia	31	57.4	12	33.3	
Histology, n (%)	Nondysplastic colon mucosa	25	46.3	14	38.9	
	Adenoma with LDG	0	0.0	5	13.9	
	Adenoma with HGD	16	29.6	9	25.0	
	pT1a	2	3.7	3	8.3	
	pT1b	7	13.0	2	5.6	
	Sessile serrated polyp	1	1.9	3	8.3	
	Sessile serrated polyp with dysplasia	3	5.6	0	0.0	
					p-value	
Outcomes	Amount of injection, mL, median (IQR)	65.5 (40.0-100.0)		30 (20.0-48.0)		< 0.001
	Procedure time, min, median (IQR)	120 (90.0-168.75)		90 (73.75-142.5)		0.05
	En bloc resection, n (%)	38	70.4	28	77.8	0.48
	R0 resection, n (%)	32	59.3	22	61.1	0.83
	Hospital length of stay, d, mean $\pm$ SD	1.39	2.406	1.03	0.7	0.39
	Adverse event, n (%)	6	11.1	6	16.7	0.53
	Type of adverse event					
	Delayed bleeding	5	9.3	2	3.7	
	Perforation	1	1.9	0	0	
	Infection	0	0	1	1.9	
	Hypotension	0	0	2	3.7	
	Arrhythmia	0	0	1	1.9	

S1125

### Utility and Role of Endoscopic Ultrasound for Suspected Early Esophageal Cancer

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**Introduction:** Accurate clinical staging of esophageal cancer is vital in selecting appropriate treatment options. Endoscopic ultrasound (EUS) has been determined to be an accurate imaging modality for esophageal cancer staging, differentiating superficial lesions from deep lesions. Despite being accurate, utilization of EUS in apparent early-stage cancer remains controversial. The current study aims to assess the utility of EUS for early-stage esophageal cancer and whether endoscopic features of esophageal malignancy can help direct the optimal management of the cancer.

**Methods:** This was a retrospective study of patients who underwent pre-resection EUS after a diagnosis of esophageal cancer at a tertiary medical center. 50 patients met inclusion criteria for this study. Patient clinical data, initial EGD/biopsy, EUS, and final resection pathology reports were extracted from chart review and statistical analysis was performed to determine the accuracy of EUS and associations of endoscopic findings with deeper invasion.

**Results:** EUS T stage was concordant with histological T stage in 74% of patients (37/50). In determining sub-mucosal involvement (T1a vs T1b), EUS had a specificity of 85% and sensitivity of 53.8%. EUS had an overall accuracy of 72.7% in identifying sub-mucosal invasion in T1 cancers. Prominent lymph nodes on EUS and tumor size  $> 2$  cm on visual inspection were significantly associated with deeper invasion of cancer on histology with p-values  $< 0.01$ . Barrett's morphology was significantly associated with superficial cancers with a p-value  $< 0.01$ . EUS affected management from EMR/ESD to esophagectomy in 9.4% of patient with Barrett's morphology and 6.7% of patients with tumor size  $< 2$ cm. In patients without any endoscopic findings suggestive of deep invasion, EUS identified deeper cancer and changed management in  $< 7\%$  of cases.

**Conclusion:** For assessing deeper invasion (T2, T3 and T4), EUS has been substantiated as a significantly effective tool. In staging T1b lesions, EUS was reasonably specific in ruling out sub-mucosal invasion; however, it had relatively poor sensitivity in identifying sub-mucosal invasion. Additionally, data validated endoscopic features suggesting superficial cancers including a tumor size < 2cm and the presence of Barrett's morphology. In patients with these findings suggesting superficial cancer, EUS rarely identified a deep cancer that warranted a change in management.

S1126

#### Rate of Upper Gastrointestinal Motility Disorders Post Lung Transplantation

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**Introduction:** Microaspiration of gastric contents is considered a risk factor for the development of bronchiolitis obliterans syndrome, the main cause of graft failure, late morbidity, and mortality following lung transplantation. Gastrointestinal motility disorders can lead to increased microaspiration events and are common post lung transplant, however their influence on allograft function has not fully been evaluated. Our aim was to assess the frequency of gastrointestinal motility disorders following lung transplantation as it relates to allograft rejection.

**Methods:** We conducted a retrospective chart review of patients who underwent lung transplantation within our institution between 1/1/2019 - 12/31/2021. Clinicodemographic, radiographic, endoscopic, manometric, pH testing, pulmonary function testing, and outcome data post-transplant was obtained.

**Results:** 75 patients underwent lung transplantation during the study period. 11 patients had evidence of allograft rejection. 2 of the 9 deaths throughout the study period were due to rejection. 50.0% of patients had delayed gastric emptying studies (GES). 57.1% had elevated pH testing. Of those with esophageal manometry (EMAN), 37.1% had abnormal findings. pH elevation, as measured by DeMeester scoring, was high in 71.4% of patients with allograft rejection (n=7) compared to 53.6% of those without rejection (n=28, p < 0.672). Mean DeMeester scores for those with and without rejection were 50.4 and 29.5, respectively. Comparable rates were observed for delayed GES in addition to abnormal findings on EMAN for both patients with and without rejection. High rates of gastroparesis were identified with 66.7% for those with rejection (n=6) vs 46.4% for those without (n=28, p < 0.6562). The median 4-hour GES was 12.0. In those with delayed GES, the median was 20.0 for rejection vs 4.8 for those without. High resolution manometry noted abnormalities in 42.9% of patients with rejection (n=7) compared to 35.7% without (n=28, p=1). (Table)

**Conclusion:** High rates of gastrointestinal motility disorders are seen post-transplant with delayed gastric emptying (50.0%), increased acid-exposure time (57.1%), and abnormal manometry (37.1%). However, there was not a statistically significant difference in pH testing, manometric, nor gastric emptying testing between patients who had allograft rejection (acute and chronic) vs normal graft function. Secondary to the rarity of allograft rejection, larger, likely multicenter studies evaluating this association may be warranted.

**Table 1. Patient characteristics, acid exposure time, gastric emptying, and esophageal manometry findings categorized by presence or absence of lung allograft rejection**

	Patients With Allograft Rejection (N=11)	Patients Without Allograft Rejection (N=64)
Mean Age (years)	60	57
Sex (%male)	63.6	65.6
Deaths	3	6
Patients with Abnormal pH Testing	5/7 (71.4%)	15/28 (53.6%)
Mean DeMeester Score (SD)	50.4 (95.2)	29.5 (50.4)
Patients with Delayed Gastric Emptying Studies	4/6 (66.7%)	13/28 (46.4%)
Median Gastric Emptying at 4-hours time (%)	20.0	4.8
Patients with Abnormal Esophageal Manometry Findings	3/7 (42.9%)	10/28 (35.7%)

S1127

#### EUS-Guided Gastroenterostomy vs. Enteral Stenting for Palliation of Benign and Malignant Gastric Outlet Obstruction

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**Introduction:** Gastric outlet obstruction (GOO) can occur due to benign or malignant etiologies. Enteral stenting (ES) using self-expanding metal stents has been around for decades and remains a widely used technique in the palliation of GOO. With the advancement of interventional endoscopic ultrasound (EUS) techniques and the advent of lumen-apposing metal stents, EUS-guided gastroenterostomy (EUS-GE) has been adopted as a novel technique for treating symptomatic GOO in benign and malignant etiologies. We conducted a retrospective study to evaluate the outcomes of technical and clinical success and safety in patients with GOO undergoing EUS-GE versus ES.

**Methods:** Patients who underwent EUS-GE or ES for GOO between September 2015 and December 2021 were included in the study. Primary outcomes included technical success defined as successful deployment of the stent and clinical success defined as relief of symptoms and tolerance of oral intake. Secondary outcomes were timing of unplanned re-intervention based on etiology and serious adverse events.

**Results:** A total of 107 procedures among 103 patients met inclusion criteria, 63 (58.9%) underwent ES, and 44 (41.2%) underwent EUS-GE (Table). A higher percentage of malignant etiologies were in the enteral stenting group versus the EUS-GE group (88.9% vs 59.1%, p = 0.0003). Technical success among EUS-GE and ES patients was 100%. Clinical success was achieved by 90.5% of EUS-GE patients compared to 97.7% of ES patients, which was similar in both groups (p = 0.24). There was no significant difference in serious adverse events between EUS-GE and ES patients (3.2% vs 6.8%, p = 0.4). Thirteen ES patients required unplanned re-intervention compared to four EUS-GE patients (20.6% vs 9.1%) but the cumulative incidence functions were not significantly different (p = 0.11). The median time for re-intervention in EUS-GE patients was 154 (50,425) days and 94 (43,112) days for ES patients. EUS-GE was associated with a significantly reduced need for unplanned re-intervention in an adjusted model for etiology (benign or malignant) (HR: 0.264; 95% CI: 0.086, 0.813; p = 0.02).

**Conclusion:** Technical success, clinical success, and rate of serious adverse events did not significantly differ among EUS-GE and ES patients. However, the rate of unplanned re-intervention was significantly lower in the EUS-GE group when adjusted for the etiology of GOO, thus EUS-GE can be considered as a first line therapy for these patients.

**Table 1. Summary of Patient Characteristics and Clinical Outcomes**

Procedures N = 107 Patients N = 103	Enteral Stenting N = 63	EUS-GE N = 44	P-value
Age			0.19
Mean (SD)	69.5 (13.2)	65.9 (14.8)	
Range	38, 95	34, 91	
Sex, n (%)			0.64
Male	33 (52.4%)	21 (47.7%)	
Female	30 (47.6%)	23 (52.3%)	
Etiology, n (%)			0.0003
Benign	7 (11.1%)	18 (40.9%)	
Malignant	56 (88.9%)	26 (59.1%)	

Table 1. (continued)

Procedures N = 107 Patients N = 103	Enteral Stenting N = 63	EUS-GE N = 44	P-value
Technical success, n (%)			N/A
Yes	63 (100.0%)	44 (100.0%)	
Clinical success, n (%)			0.24
Yes	57 (90.5%)	42 (97.7%)	
Missing/Unknown	0	1	
Serious Adverse event, n (%)			0.4
Yes	2 (3.2%)	3 (6.8%)	
Unplanned reintervention, n (%)			0.11
Yes	13 (20.6%)	4 (9.1%)	

S1128

### Establishing New Third Space Program: Importance of a Pre-Procedure Checklist

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**Introduction:** Third space endoscopy refers to techniques for accessing the submucosa, i.e., “the third space,” with subsequent submucosal tunneling to perform various minimally-invasive diagnostic and therapeutic interventions. There is limited availability of these techniques in tertiary US medical centers due to the extensive training and technical challenges of these procedures. We share our experience establishing a new third space endoscopy program in our hospital and highlight the importance of using pre-procedure checklists.

**Methods:** This quality improvement study was designed to train personnel in a new submucosal endoscopy program. Our PI is an established submucosal endoscopist who recently relocated to develop the third space procedures program at our institution. All staff underwent training consisting of a lecture and a review of tools and equipment used in the procedure before scheduling patients. The study has two phases: pre-intervention (phase 1) and post-intervention phase (phase 2). The intervention included posting a pre-procedure checklist in December 2021 in each endoscopy suite. We reviewed each case to determine the need to correct the equipment set-up before the procedure in both phases.

**Results:** In phase 1, from July to November 2021, 20 patients underwent third space procedures, including Z-POEM, POEM, and G-POEM. The CO<sub>2</sub> was not set up in 10 patients (50%); it was changed from air to CO<sub>2</sub> as a final check of the PI. An endoscopic cap was not placed in 8 patients (40%). The decompression kit was not checked each time. When the PI checked, it was not in place twice, once in September and another time in November 2021. All other items listed in the pre-checklist were set up correctly. In phase 2, from December 2021 to June 2022, 38 patients underwent third space procedures, including Z-POEM, POEM, G-POEM, and ESD. All items in the pre-checklist were set up correctly and in place for use. However, the decompression kit was missing in one instance in April 2022. (Table)

**Conclusion:** CO<sub>2</sub> was the most often forgotten item in procedure set-up, followed by the endoscopic caps. We found that posting a pre-procedure list in the endoscopic room is an essential and reliable intervention to improve workflow and procedural safety. It is also crucial for the endoscopist to check for the decompression kit monthly due to its infrequent use and easy misplacement.

Table 1. Pre-Submucosal Endoscopic Procedure Checklist

1	Carbon Dioxide insufflators
2	Antibiotics (IV Zosyn 4.5g or Levofloxacin 500mg)
3	Endoclips
4	Transparent Endoscope Distal Caps
5	Endosurgical Hybrid Knives
6	Power machine POEM settings
7	Needle Decompression Kits
8	Alcohol swaps

S1129

### Achalasia Patients Admitted After Per-Oral Endoscopic Myotomy (POEM) versus Heller's Myotomy: An American Experience

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**Introduction:** Achalasia is a rare neurodegenerative motility disorder of the esophagus characterized by ineffective lower esophageal sphincter relaxation and peristalsis leading to dysphagia. Heller's Myotomy (HM) is the gold standard surgical procedure used to treat achalasia. However, Per-Oral Endoscopic Myotomy (POEM), a rapidly emerging minimally-invasive endoscopic technique, has gained immense popularity for management of achalasia in recent years. In this study, we aimed to compare the differences for achalasia patients who were admitted to the hospital after POEM or HM in the United States (US).

**Methods:** The National Inpatient Sample was utilized to identify all adult (≥18 years) achalasia patients who were admitted to the hospital after POEM or HM in the US from 2016–2019. Hospitalization characteristics and clinical outcomes were compared between the two subgroups. P-values ≤0.05 were considered statistically significant.

**Results:** Between 2016–2019, there were 1,885 and 11,150 achalasia patients who were admitted to the hospital after POEM and HM, respectively. Most of these hospitalizations were primarily at large urban teaching hospitals (Table). The mean age for POEM-related hospitalizations was 57.6 years compared to 56.7 years for the HM cohort, without a statistical difference (p=0.13). For achalasia patients hospitalized after POEM, the 65–79 age group had the highest proportion (31.8%) of patients, while the 50–64 age group had the highest proportion (31.3%) of patients for the HM cohort. We noted a significant White predominance in both subgroups (Table). Furthermore, a higher proportion of achalasia patients with Charlson Comorbidity Index (CCI) ≥1 were admitted after POEM (43.8 vs 40%, p=0.002) compared to HM. We did not find a statistical difference for the mean length of stay (3.7 vs 3.4 days, p=0.35) and mean total healthcare charge (\$66,151 vs \$65,468, p=0.07) between achalasia patients who were admitted after POEM or HM (Table). Moreover, there was no inpatient mortality for both subgroups.

**Conclusion:** Studies have demonstrated that POEM and HM to be efficacious and safe for management of achalasia. In this study, there was no inpatient mortality for achalasia patients admitted to the hospital after POEM or HM. Furthermore, there was no statistical difference in the mean LOS between the two subgroups. These findings reflect an excellent safety profile of both procedures and similar recovery times. However, POEM is relatively less invasive than HM.

**Table 1. Comparative analysis of achalasia patients that were admitted to the hospital after Per-Oral Endoscopic Myotomy (POEM) or Heller's Myotomy in the United States from 2016–2019**

Variable	Achalasia Patients Admitted After Per-Oral Endoscopic Myotomy	Achalasia Patients Admitted After Heller's Myotomy	P-value
Total Hospitalizations	1,885	11,150	
Mean Age (years)	57.6	56.7	p=0.395
Age Groups (years)			p=0.136
18 - 34	285 (15.1%)	1,365 (12.2%)	
34 - 49	305 (16.2%)	2,175 (19.5%)	
50 - 64	540 (28.6%)	3,485 (31.3%)	
65 - 79	600 (31.8%)	3,440 (30.9%)	
≥ 80	155 (8.2%)	685 (6.1%)	
Gender			p=0.663
Male	935 (49.6%)	5,395 (48.4%)	
Female	950 (50.4%)	5,755 (51.6%)	
Race			p=0.825
White	1,245 (68.4%)	7,260 (68.2%)	
Black	270 (14.8%)	1,540 (14.5%)	
Hispanic	175 (9.6%)	1,170 (11%)	
Asian	50 (2.8%)	275 (2.6%)	
Other	80 (4.4%)	345 (3.2%)	
Charlson Comorbidity Index (CCI)			p=0.002
CCI = 0	1,060 (56.2%)	6,690 (60.0%)	
CCI ≥ 1	825 (43.8%)	4,460 (40.0%)	
Hospital Region			p< 0.001
Northeast	635 (33.7%)	1,995 (17.9%)	
Midwest	405 (21.5%)	2,280 (20.5%)	
South	610 (32.4%)	4,405 (39.5%)	
West	235 (12.5%)	2,470 (22.2%)	
Hospital Bed-Size			p< 0.001
Small	45 (2.4%)	1,085 (9.7%)	
Medium	215 (11.4%)	2,250 (20.2%)	
Large	1,625 (86.2%)	7,815 (70.1%)	
Hospital Location			p< 0.001
Rural	10 (0.5%)	180 (1.6%)	
Urban Non-teaching	60 (3.2%)	1,100 (9.9%)	
Urban Teaching	1,815 (96.3%)	9,870 (88.5%)	
Mean Length of Stay (days)	3.7	3.4	p=0.356
Mean Total Hospital Charge (\$)	66,151 (4,857)	65,468 (1,514)	p=0.775

S1130

**Safety and Efficacy of Endoscopic Ultrasound-Guided Gallbladder Drainage Performed by Early Career Advanced Endoscopists: A Multicenter Experience**

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**Introduction:** Endoscopic ultrasound-guided gallbladder drainage (EGBD) using lumen-apposing metal stents (LAMS) has increasingly become an option for patients with acute cholecystitis or symptomatic cholelithiasis who are not surgical candidates. Recent studies have shown EGBD to be safe and effective. However, these data come from experienced advanced endoscopists. There is currently no data regarding the safety and effectiveness of EGBD in the hands of early career advanced endoscopists. We aimed to evaluate the safety and effectiveness of EGBD performed by early career advanced endoscopists.

**Methods:** This was a multicenter, retrospective analysis of all patients who underwent EGBD, performed by 7 early career advanced endoscopists. Early career advanced endoscopist was defined as within two years of graduating advanced endoscopy fellowship. Patient and procedural characteristics were recorded. Primary outcomes were technical and clinical success. Technical success was defined as the ability to place the stent within the gallbladder. Clinical success was defined as improvement or resolution of gallbladder related symptoms within 5 days of the procedure. Other outcomes included adverse events and procedure related mortality.

**Results:** A total of 21 patients underwent EGBD. All advanced endoscopists were within 18 months of completion of an American Society for Gastrointestinal Endoscopy (ASGE) accredited advanced endoscopy fellowship. The indication was acute cholecystitis in 18 cases (86%) and symptomatic cholelithiasis in 3 cases (14%). 48% were female, 81% were inpatients and the mean age was 75 years. The mean platelets and INR were 247 K/cmm and was 1.2, respectively. Eight patients were on anticoagulation. The EGBD was performed with the transgastric approach in 15 cases (71%) and transduodenal approach in 6 cases (29%). Clinical and technical success were achieved in all cases. One patient developed post-procedural pain within 30 days and one patient required overnight admission overnight. No patients developed recurrent cholecystitis, bleeding, perforation, stent migration or death within 30 days. Ten patients (48%) had the LAMS removed and the average time to LAMS removal was 41 days. The median duration of follow-up was 75 days. (Table)

**Conclusion:** Our findings suggest that endoscopic ultrasound-guided gallbladder drainage is safe and effective in the hands of formally trained early career advanced endoscopists.

**Table 1. Patient and Procedural Characteristics**

	N = 21 patients
Indication	
Acute Cholecystitis	18 (86%)
Symptomatic Cholelithiasis	3 (14%)
Patient characteristics	
Female	10 (48%)
Age	75 years (SD 12)
Inpatient	17 (81%)
Chronic kidney disease	3 (14%)
Diabetes mellitus	11 (52%)
Cirrhosis	1 (5%)
Platelet count (K/cmm)	247 (SD 64)
INR	1.2 (SD 0.22)
Anticoagulation use	8 (38%)
Apixaban	7 (33%)
Enoxaparin	1 (5%)
Procedure characteristics	
Site of Lumen Apposing Metal Stent placement	
Stomach	15 (71%)
Duodenum	6 (29%)
Size of Lumen Apposing Metal Stent	
10 mm x 10 mm	14 (67%)
15 mm x 10 mm	7 (33%)
Outcomes	
Technical success	21 (100%)
Clinical success	21 (100%)
Stent removed	10 (48%; average 41 days)
Recurrent Cholecystitis	0
Length of follow-up (days, median)	75
Adverse events	
Any adverse event	2 (10%)
Need for admission following procedure	1 (5%)
Post-procedural pain within 30-days	1 (5%)
Death within 30-days	0

S1131

**Looking at the "Holiday Effect" on Post-ERCP Complications: A National Inpatient Sample Database Study**

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**Introduction:** The "weekend effect" and "July effect" were studies that looked at the outcome of endoscopic retrograde cholangiopancreatography (ERCP) procedures in relation to a specific time. Admissions on the weekends have been shown to lead to delays in patients with gallstone pancreatitis, while patients admitted in July had higher rates of post-procedural sepsis. Here, we evaluate the effects of the "holiday effect" during the month of December on post-ERCP complication rates.

**Methods:** The National Inpatient Sample database was used to identify hospitalized patients over 18 years old who had an ERCP procedure between 2007 - 2017 using ICD9 and ICD10 codes. Patients were divided into two groups: those who were admitted in December and those who were admitted in other months. Primary outcome was overall mortality. Secondary outcomes were post-ERCP pancreatitis, cholangitis, cholecystitis, infection, hemorrhage, perforation. Patients were matched by age, race, gender, and by the Elixhauser comorbidity index. Multivariate analyses were performed to assess outcomes and independent t-tests were used to compare mortality trends by year.

**Results:** Of the 294,853 patients who had an ERCP between 2007 and 2017, 142,206 patients were admitted in December for the procedure. There was an increase in overall mortality (OR 1.1, p=0.002) for patients who had an ERCP done during December compared to other months. The annual trends comparing mortality rates of patients after ERCP complications were significant (p< 0.001). The data was significant for post-ERCP cholecystitis in December (OR 1.8, p< 0.001) but not for post-ERCP pancreatitis, cholangitis, infection, hemorrhage, and perforation. (Table)

**Conclusion:** December is one of the busiest months due to the holidays. During this time, hospitals may be inadequately staffed and employees may have irregular hours or additional stressors, leading to a higher overall post-ERCP mortality rate. Patients may also choose not to have procedures done during this time, coming in only for emergent and urgent issues requiring ERCP. Looking at the trends from 2007 to 2017, there was an overall decrease in post-ERCP mortality, which can be attributed to improvement in endoscopic techniques and staff holiday schedules. Patients also had an increase in post-ERCP cholecystitis, which may be influenced by poor dietary choices. Endoscopists should be aware of this "holiday effect" when performing ERCPs in December.

**Table 1. Clinical Outcomes of the "Holiday Effect" After Endoscopic Retrograde Cholangiopancreatography (ERCP)**

	P-Value	Odds Ratio (95% CI)
Post-ERCP Pancreatitis	0.060	1.1 (1.0-1.3)
Post-ERCP Cholangitis	0.335	0.9 (0.8-1.1)
Post-ERCP Cholecystitis	< 0.001	1.8 (1.3-2.6)
Post-ERCP Infection	0.315	1.1 (0.9-1.2)
Post-ERCP Hemorrhage	0.083	1.3 (1.0-1.7)

**Table 1. (continued)**

	P-Value	Odds Ratio (95% CI)
Post-ERCP Perforation	0.745	1.0 (0.8-1.3)
Overall Mortality	<b>0.002</b>	1.1 (1.0-1.2)

CI = Confidence Interval.

S1132

**Real World Outcomes of Transoral Incisionless Fundoplication at a Tertiary Academic Center**

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**Introduction:** Transoral incisionless fundoplication (TIF) is a minimally invasive procedure for treatment of gastroesophageal reflux disease (GERD). Although studies have reported long-term durability and resolution of symptoms, the procedure carries a wide range of adverse events from mild to life-threatening. This study aims to evaluate the short-term outcomes of consecutive TIF procedures in a tertiary academic center.

**Methods:** This is a retrospective study of patients who underwent TIF procedure by a single experienced gastroenterologist at a tertiary center in the United States from January 2018 to December 2021. Clinical success was defined as the ability to create a  $\geq 270^\circ$  partial wrap with estimated longitudinal length of  $\geq 2$ cm. Short-term outcomes including patient symptoms or procedure related adverse events immediately to two months post-op were collected retrospectively.

**Results:** Overall, 68 patients underwent 77 consecutive TIF procedures. The average age of patients was  $52.35 \pm 15.74$  years (67.6% female). Technical success was achieved in 100% of the patients. 10.3% of the patients had a history of prior anti-reflux surgery. Chronic GERD was the main indication for TIF procedure. The majority of patients underwent TIF for Hill grade II and III flap valves, present in 62.5% and 25%, respectively. 50.6% of patients had post-procedure symptoms up to 2 months post-procedure including abdominal pain (28%), nausea/vomiting (14.3%), chest pain (10.4%), dysphagia/odynophagia (6.5%). There was a positive correlation between number of fasteners used and immediate abdominal pain ( $p=0.003$ ), sore throat ( $p=0.024$ ), and nausea/vomiting ( $p=0.046$ ). Two patients developed major adverse events: one developed pneumoperitoneum and the second aspiration pneumonia complicated by flash pulmonary edema. Of the 29 patients with follow-up EGDs, 62.1% had an intact wrap (Hill I). There was no significant difference in the average number of fasteners in those with intact or loose wrap on follow up EGD ( $21.67 \pm 5.1$  vs.  $22.8 \pm 5.2$ ,  $p=0.57$ ). 9 patients (13.2%) underwent redo TIF and 2 (2.9%) proceeded with surgical fundoplication for persistent symptoms. (Table)

**Conclusion:** Outcomes of TIF performed on a heterogeneous population in a tertiary academic center are comparable to outcomes reported from original randomized trials of TIF. Immediate adverse effects are common after TIF, but typically improve on long-term follow-up.

**Table 1. Baseline patient characteristics and short-term post-TIF outcomes**

Patient summary characteristics:	
Gender (Female)	67.6% (n=46)
Age [mean $\pm$ SD]	52.35 $\pm$ 15.74
Race	
White	79.41% (n=54)
Non-Hispanic	67.65% (n=46)
BMI [mean $\pm$ SD]	27.7 $\pm$ 5.1
ASA Score	
II	69.1% (n=47)
III	29.4% (n=20)
IV	1.5% (n=1)
Prior history of Barrett's ablation	4.4% (n=3)
Prior esophageal surgical intervention	
Nissen Fundoplication	8.8% (n=6)
POEM- Nissen Fundoplication	1.5% (n=1)
POEM	2.9% (n=2)
Indication for TIF	
GERD	83.82% (n=57)
Chronic cough +/- GERD	16.17% (n=11)
Hernia HILL grade (if available):	
1	25% (n=14)
2	62.5% (n=35)
3	8.9% (n=5)
4	3.6% (n=1)
PH impedance or Bravo test (uninterpretable (n=1); not performed due to presence of BE/esophagitis (n=5))	
Acid	82.26% (n=51)
Non-acid	17.74% (n=11)
Procedure characteristics:	
Number of fasteners [mean $\pm$ SD]	23.1 $\pm$ 6.2
Median Hospital LOS (days) [min, max]	1 [0,10]
Immediate outcomes post procedure-2 months(%):	
Immediate adverse events	50.6% (n=39)



Table 1. (continued)

Immediate abdominal pain	28.6% (n=22)
Immediate chest pain	10.4% (n=8)
Immediate dysphagia/odynophagia	6.5% (n=5)
Immediate sore throat	7.8% (n=6)
Immediate Nausea/vomiting	14.3% (n=11)
Follow-up Procedural outcomes (%):	
Post-TIF EGD performed	42.6% (n=29)
Time interval between TIF and Follow up EGD	269.8 ± 205.1 Days
Esophagitis on post-TIF EGD	10.3% (n=3)
Intact wrap on post-TIF EGD	62.1% (n=18)
>95% SAP on follow up PH testing (out of 18)	50% (n=9)
Post-TIF surgical fundoplication (n)	2.9% (n=2)
Repeat TIF patient characteristics:	
Repeat TIF required (n)	13.2% (n=9)
Female Gender (%)	66.7% (n=6)
BMI at initial TIF [mean ± SD]	29.4 ± 3.7
Age at initial TIF (median) [min,max]	53 [25,65]
ASA score at initial TIF (median) [min,max]	2 [2,3]
Number of fasteners (median) [min, max]	
Initial TIF	20 [14,34]
Re-Do TIF	22 [8,28]
Procedure length (median) [min, max]	
Initial TIF	47 [36,89]
Re-Do TIF	45 [29,56]

S1133

#### Achalasia Patients Admitted After Per-Oral Endoscopic Myotomy (POEM): A Snapshot of the United States Population

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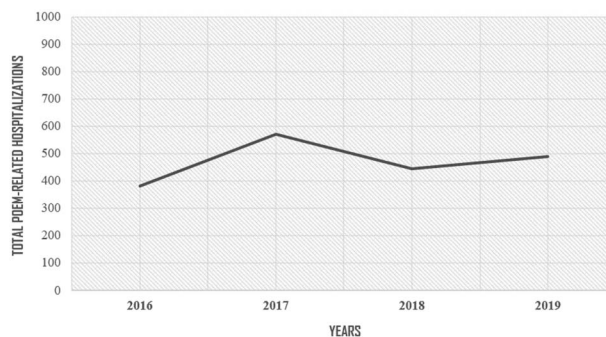
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**Introduction:** Achalasia is a neurodegenerative motility disorder of the esophagus characterized by ineffective lower esophageal sphincter (LES) relaxation and peristalsis leading to progressive dysphagia. Per-Oral Endoscopic Myotomy (POEM) is a rapidly emerging minimally invasive procedure for management of achalasia. In this study, we aimed to investigate hospitalization characteristics and outcomes for achalasia patients who were hospitalized after POEM in the United States (US).

**Methods:** The National Inpatient Sample was utilized for 2016–2019 to identify all adult (≥18 years) achalasia patients in the US who were admitted after POEM. Patients' demographic characteristics, outcomes, and complications were highlighted. P-values ≤0.05 were considered statistically significant.

**Results:** In the US, 1,885 achalasia patients were admitted to the hospital after POEM between 2016–2019. There was an increase in the total number of admissions after POEM from 380 in 2016 to 490 in 2019 (Figure). The mean age for these admissions increased from 54.2 years in 2016 to 59.3 years in 2019. Most hospitalizations were for the 65–79 age group (31.8%), females (50.4%), and Whites (68.4%), mainly at large (86.2%) urban teaching (96.3%) hospitals (Table). The Northeast (33.7%) and South (32.4%) hospital regions had the highest number of POEM-related hospitalizations. Furthermore, a majority of the study population was eventually discharged home (88.3%). There was no inpatient mortality. The mean length of stay (LOS) decreased from 4 days in 2016 to 3.2 days in 2019, while the mean total healthcare charge (THC) increased from \$52,057 in 2016 to \$65,109 in 2019. Esophageal perforation was the most common complication noted for 1.3% of all patients, while post-procedure pneumonia was only observed in 0.8% of the study cohort (Table).

**Conclusion:** Same-day discharges after POEM are safe and feasible. However, some patients may be hospitalized post-procedure. In this study, we noted an increase in the number of achalasia patients who were hospitalized after POEM between 2016 to 2019, mainly at large urban teaching centers. Furthermore, there was no POEM-related mortality and rates of complications were extremely low, reflecting an excellent safety profile of this advanced procedure. We noted a decrease in the mean LOS for these hospitalizations which may be attributed to improvements in the management strategies as familiarity with the procedure increased.



[1133] Figure 1. Trends for Achalasia patients who were admitted to the hospital after Per-Oral Endoscopic Myotomy (POEM) in the United States from 2016 to 2019.

**Table 1.** Trends and outcomes for patients with achalasia who were admitted after Per-Oral Endoscopic Myotomy (POEM) in the United States from 2016 to 2019

Epidemiological Variable	YEARS				
	2016	2017	2018	2019	2016-2019 (Overall)
Total Number of Per-Oral Endoscopic Myotomy	380	570	445	490	1,885
Mean Age (years) ± Standard Error	54.2 ± 1.4	56.8 ± 1.5	59.6 ± 1.9	59.3 ± 2.0	57.6 ± 0.9
Age Group Distribution (years)					
18 – 34	80 (21.1%)	105 (18.4%)	40 (9.0%)	60 (12.2%)	285 (15.1%)
35 – 49	75 (19.7%)	80 (14.0%)	75 (16.9%)	75 (15.3%)	305 (16.2%)
50 – 64	115 (30.3%)	155 (27.2%)	155 (34.8%)	115 (23.5%)	540 (28.7%)
65 – 79	90 (23.7%)	195 (34.2%)	115 (25.8%)	200 (40.8%)	600 (31.8%)
≥ 80	20 (5.3%)	35 (6.1%)	60 (13.5%)	40 (8.2%)	155 (8.2%)
Gender					
Male	185 (48.7%)	270 (47.4%)	220 (49.4%)	260 (53.1%)	935 (49.6%)
Female	195 (51.3%)	300 (52.6%)	225 (50.6%)	230 (46.9%)	950 (50.4%)
Race					
White	275 (76.4%)	380 (69.7%)	270 (62.1%)	320 (66.7%)	1,245 (68.4%)
Black	45 (12.5%)	90 (16.5%)	75 (17.2%)	60 (12.5%)	270 (14.8%)
Hispanic	30 (8.3%)	45 (8.3%)	50 (11.5%)	50 (10.4%)	175 (9.6%)
Asian	< 11 (1.4%)	0 (0.00%)	15 (3.5%)	30 (6.3%)	50 (2.8%)
Others	< 11 (1.4%)	30 (5.5%)	25 (5.8%)	20 (4.2%)	80 (4.4%)
Charlson Comorbidity Index (CCI)					
CCI = 0	230 (60.5%)	350 (61.4%)	220 (49.4%)	260 (53.1%)	1,060 (56.2%)
CCI = 1	55 (14.5%)	130 (22.8%)	120 (27.0%)	150 (30.6%)	455 (24.1%)
CCI = 2	50 (13.2%)	40 (7.0%)	50 (11.2%)	40 (8.2%)	180 (9.6%)
CCI ≥ 3	45 (11.8%)	50 (8.8%)	55 (12.4%)	40 (8.2%)	190 (10.1%)
Hospital Region					
Northeast	135 (35.5%)	205 (36.0%)	120 (27.0%)	175 (35.7%)	635 (33.7%)
Midwest	125 (32.9%)	135 (23.7%)	85 (19.1%)	60 (12.2%)	405 (21.5%)
South	80 (21.1%)	165 (29.0%)	170 (38.2%)	195 (39.8%)	610 (32.4%)
West	40 (10.5%)	65 (11.4%)	70 (15.7%)	60 (12.2%)	235 (12.5%)
Hospital Bed Size					
Small	< 11 (1.3%)	0 (0.0%)	15 (3.4%)	25 (5.1%)	45 (2.4%)
Medium	25 (6.6%)	95 (16.7%)	45 (10.1%)	50 (10.2%)	215 (11.4%)
Large	350 (92.1%)	475 (83.3%)	385 (86.5%)	415 (84.7%)	1,625 (86.2%)
Hospital Location & Teaching Status					
Rural	< 11 (1.3%)	< 11 (0.9%)	0 (0.0%)	0 (0.0%)	< 11 (0.5%)
Urban Non-teaching	15 (4.0%)	25 (4.4%)	< 11 (1.1%)	15 (3.1%)	60 (3.2%)
Urban Teaching	360 (94.7%)	540 (94.7%)	440 (98.9%)	475 (96.9%)	1,815 (96.3%)
Discharge Home	340 (89.5%)	495 (86.8%)	390 (87.6%)	440 (89.8%)	1,665 (88.3%)
Inpatient Mortality	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Length of Stay	4.0	3.7	3.9	3.2	3.7
Total Healthcare Charge (\$)	52,057	75,240	67,520	65,109	66,151
Complications					
Major Post-Procedural Hemorrhage	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Esophageal Perforation	< 11 (1.3%)	< 11 (0.9%)	< 11 (1.1%)	< 11 (2.0%)	25 (1.3%)
Post-Procedure Sepsis	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Post-Procedure Pneumonia	< 11 (1.3%)	0 (0.0%)	< 11 (1.1%)	< 11 (1.0%)	15 (0.8%)

S1134

**Submucosal Lift During Underwater Endoscopic Mucosal Resection Preserves the Benefits of Underwater Technique**James S. Love, MD<sup>1</sup>, Gabriel Marrero-Rivera, MD<sup>2</sup>, Alexander Pan, MD<sup>1</sup>, Kirbylee Nelson, MD<sup>3</sup>, Brian Boulay, MD<sup>1</sup>.<sup>1</sup>University of Illinois at Chicago, Chicago, IL; <sup>2</sup>University of Pittsburgh, Pittsburgh, PA; <sup>3</sup>Northwestern Memorial Hospital, Chicago, IL.

**Introduction:** Conventional injection-assisted endoscopic mucosal resection (EMR) is a widely accepted method for removal of laterally-spreading non-pedunculated polyps ≥10mm. Underwater EMR (uEMR) is an emerging technique which may result in higher en bloc resection and lower adenoma recurrence. uEMR typically does not include submucosal injection for lifting the lesion which may contribute to its limited adoption among practitioners of EMR. In this study, we aim to determine the safety and efficacy of underwater EMR with lift (uEMR-L) for large polyp resection.

**Methods:** uEMR-L was performed at a single center by an expert endoscopist over a 3 year period. A pediatric colonoscope with a transparent cap was advanced to the lesion and inspected with air insufflation and then with the lumen filled with sterile water. Intentionally limited submucosal injection was performed using a saline-based solution with methylene blue and dilute epinephrine. The lesion was then resected using a snare in en bloc or piecemeal fashion at the discretion of the endoscopist. Supplementary techniques were used as needed for completion of resection. Surveillance examination was planned in 6 months following uEMR-L. Data regarding patient age, sex, submucosal injection volume, procedural complications, and polyp size, morphology, histology, and recurrence was collected and included in our analysis.

**Results:** Between December 2017 and December 2020, 66 lesions were treated with uEMR-L in 51 patients. The mean size was 27.4 mm (range 15-60mm). The median submucosal injection volume was 7 ml (range 2-30ml, mean 9.2ml, SD 7.1). Complete resection was performed in 62/66 (94%) of the lesions. Of the incomplete resections, 2 were invasive adenocarcinoma, one extended into the appendiceal orifice, and one had extensive submucosal fibrosis. Ten of the lesions were removed en bloc, with mean size of 19.1 mm. Of the 62 lesions in which polypectomy was completed, 50 underwent surveillance examination a median of 200 days later. Only 2/50 polypectomy sites had residual polyp tissue which was resected endoscopically. One patient experienced delayed bleeding requiring admission. No other complications of bleeding, perforation, or unplanned admission were seen. (Table)

**Conclusion:** uEMR-L is a safe and effective technique for endoscopic mucosal resection of large nonmalignant colon polyps. This specific technique may preserve the benefits of underwater resection and serve as an entry point for endoscopists without previous experience in underwater EMR.

**Table 1. Demographic and polypectomy data of patients treated with uEMR-L between December 2017 and December 2020**

Patient demographics (N=51)		
Sex	N	Percentage (%)
Male	51	100
Female	0	0
Age	Mean (years)	Std. Dev.
	69.0	6.3
Lesion Characteristics (N=66)		
Size	Avg (mm)	Range (mm)
	27.4	15-60
Injection Volume	Median (ml)	Range (ml)
	7	2-30
Appearance	N	Percentage (%)
Granular	52	78.8
Sessile	14	98.5
Resection	N	Percentage (%)
Complete	62	94
Complete, En Bloc	10	16
Incomplete	4	6
Complications	N	Percentage
Delayed Bleeding	1	2
Surveillance (N=50/62)		
Recurrence	N	Percentage (%)
Residual Polyp Tissue	2	4.0%

S1135

#### Post POEM Procedure Metabolic Changes: A Single Center Retrospective Analysis

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**Introduction:** In the last decade, peroral endoscopic myotomy (POEM) has emerged as an effective endoscopic treatment for motility disease, specifically esophageal achalasia. The purpose of our study was to investigate 6-months and 1-year postoperative weight change in patients who underwent a POEM procedure.

**Methods:** We performed an IRB approved single center retrospective study. We evaluated patients diagnosed with achalasia who underwent a POEM procedure between 1/1/2017 and 12/30/2021. We extrapolated pre-procedural and post-procedural weight and albumin levels after 6 months and 1 year. All statistical analysis was completed with STATA.

**Results:** In six months, 68 patient post-POEM procedure weight increased 2.1%, which is statistically significant (p-value = 0.04). Female patients did not have a significant weight change, but male patients had a 5.0% increase (p = 0.006). For weight change at six months, patients less than 40 years old had a 5.7% increase (p=0.03), and patients between 60-79 had a 2.4% increase (p=0.02). At one year, there was a 2.9% increase (p< 0.001) for all patients. Female patients did not have a significant change (p=0.17), but male patients had a 4.5% increase in weight (p< 0.001). Stratified by age, all groups had a statistically significant increase in weight except for patients >80 years old (p=0.29). Patients less than 40 years old had a 5.8% increase (p=0.005), 40- to 59-year-old patients had a 3.4% increase (p=0.006), and 60-79-year-old patients had a 2.9% increase (p=0.002). Weight at one year stratified by comorbidity (Obesity, Hyperlipidemia, Coronary Artery Disease, Diabetes Mellitus, and chronic kidney disease) showed no statistically significant change for any disease. In 6 months and 1 year, the mean albumin level increased after POEM procedure (Pre procedure mean 3.69, six months mean 3.90, and 1-year mean 4.12); which was statistically significant (P = 0.001)

**Conclusion:** There was a statistically significant increase in both 6-month and 1-year postoperative weight and Albumin levels among all patients who underwent a POEM procedure. Male patients were significantly more likely to have an increase in postoperative weight than females. There was also a statistically significant increase in weight among patients age < 40, 40-59, and 60-79 1-year postoperatively. When stratified by comorbidities, there was no significant change in weight 1-year postoperatively. Further studies are indicated to better assess the consequences or benefits of postoperative weight gain. (Table)

**Table 1. Change in Weight in Six Months and One Year after POEM Procedure**

Demographic at 6 months	Total Patients	Weight at POEM (kg)	Weight at 6 months (kg)	Demographic at 1 year	Total Patients	Weight at POEM (kg)	Weight at 1 year (kg)
Total	68	74.8	76.4	Total	111	80.2	82.6
Female	38	69.4	69.2	Female	54	73.0	73.6
Male	30	81.7	85.8	Male	57	87.1	91.0
Age < 40	7	68.6	72.5	Age < 40	11	83.6	88.5
Age 40-59	22	84.7	87.5	Age 40-59	31	86.7	89.6
Age 60-79	30	71.7	73.4	Age 60-79	55	79.7	82.0
Age ≥ 80	9	66.1	63.6	Age ≥ 80	14	65.4	64.5

S1136

### Endoscopic Ultrasound Guided Biliary Drainage and Percutaneous Transhepatic Biliary Drainage Provide Successful Salvage Biliary Drainage in Biliary Obstruction From Pancreatic Cancer: A Single Center Experience

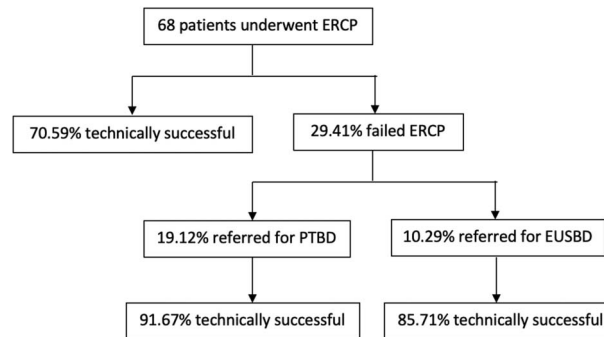
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**Introduction:** Biliary obstruction is common in patients with pancreatic cancer. Approximately 70% of patients present with an obstruction. Endoscopic retrograde cholangiopancreatography (ERCP) is the primary modality for biliary decompression. Alternative nonsurgical methods include endoscopic ultrasound guided biliary drainage (EUSBD) via choledochoduodenostomy and percutaneous transhepatic biliary drainage (PTBD). Our study's objective is to review the rates of technical and clinical success of EUSBD and PTBD for malignant biliary obstruction after unsuccessful ERCP.

**Methods:** A retrospective study was performed from 2017-2021, including patients with biliary obstruction from pancreatic head mass who underwent ERCP, EUSBD, or PTBD. Technical success was defined by successful biliary decompression with either ERCP, EUSBD, or percutaneous approach. Clinical success was defined as a 25% reduction in total bilirubin 7 days post procedure.

**Results:** 309 patients were initially reviewed; 26 patients excluded from the ERCP group, 24 patients in EUSBD group, and 151 patients from the PTBD group for lack of pancreatic head mass or absence of pre/post-procedural labs. 108 patients were included in the final data collection, and the demographics were comparable for 68 patients in ERCP group, 28 patients in EUSBD group, and 12 patients for PTBD. The mean pre-procedure total bilirubin 10.6 ERCP, 11.4 EUSBD, and 12.1 PTBD. In 29% of ERCP procedures, a biliary stent was not able to be placed due to luminal obstruction or failed biliary cannulation. Of the unsuccessful ERCPs, 19% were referred to PTBD, and 10% underwent EUSBD. Technical success was achieved in 92% and 86% for PTBD and EUSBD, respectively ( $p=0.61$ ). In the EUSBD group, 11% of procedures had failed stent placement and were referred for PTBD. Clinical success was achieved in 85% of ERCP, 83% of EUSBD, and 91% of PTBD ( $p=0.73$ ) (Figure).

**Conclusion:** While ERCP is the initial treatment modality for biliary obstruction from pancreatic cancer, it can be challenging with a malignant luminal obstruction. Our study shows similar rates of technical and clinical success among the EUSBD and PTBD groups after unsuccessful ERCP. Our findings support the use of EUSBD over PTBD after unsuccessful ERCP since EUSBD can be performed in the same setting without need for another procedure. Further studies with more patients are needed to validate these findings, determine the tolerability of the two procedures to allow for a more personalized approach, and stratify predictors of technical and clinical success. (Table)



[1136] **Figure 1.** Flow chart demonstrating technical success of ERCP and subsequent EUSBD and PTBD procedures.

**Table 1. Demographic data for ERCP, EUSBD, and PTBD groups**

	ERCP n = 68	EUSBD n = 28	PTBD n = 12
Average age (years)	68	70	71
Males	56%	46%	42%
Caucasian	72%	68%	75%
African American	24%	32%	25%
History of Smoking	47%	50%	50%
CBD Diameter (mm)	12.8	15.4	11.6

S1137

### Analysis of Off-Label Usage of Lumen Apposing Metal Stents in the GI Tract: A Single Center Experience

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**Introduction:** Lumen apposing metal stents (LAMS) have revolutionized our approach to pancreatic fluid collections (PFCs). In addition to tremendous success in safely and effectively managing PFCs, LAMS have been utilized in other interventions including EUS-guided gallbladder drainage (EUS-GBD), EUS-directed transgastric ERCP (EDGE), EUS-guided transgastric intervention (EDGEI), EUS-guided gastrojejunostomy (EUS-GJ), EUS-guided choledochoduodenostomy (EUS-CD), EUS-guided drainage of post-operative collection (EUS-PO) and stricture dilation (SD). There is limited research on the use of LAMS for these off-label indications. We present our experience using LAMS in the management of conditions other than pancreatic fluid collections.

**Methods:** All patients who underwent LAMS placement between March 2015-October 2021 were added to a prospectively maintained database. Collected data including patients' demographics, procedure details, clinical outcomes, and adverse events was retrospectively reviewed. All patients who underwent LAMS placement for PFCs were excluded from the analysis. Descriptive statistics were used to summarize our findings.

**Results:** A total of 191 patients underwent LAMS placement during the study period. Of these, 65 patients had indications outside of drainage of PFCs. This included EUS-GBD (25), EDGE (6), EDGEI (2), EUS-GJ (11), EUS-CD (4), SD (6), EUS-PO (9), and miscellaneous (2) (Table). The average age was 65.7 years (SD 8.6) and 24 were female (36.9%). Technical success was achieved in 63 patients (96.9%). The diameter of LAMS used included 8mm (n=2), 10mm (n=23), 15mm (n=17), and 20mm (n=21). The average procedure time was 39.4 minutes (SD 5.3) and the average duration of LAMS placement was 36.2 days (SD 8.5). Clinical success was achieved in 57/63 patients (90.5%); however, this was much lower for patients who underwent LAMS placement for stricture dilatation (50%). LAMS was left indefinitely in 24 patients (38.1%). Adverse events occurred in six patients (9.2%).

**Conclusion:** LAMS provide an effective and safe modality for securing endoscopic access and allowing interventions outside of PFCs. However, the efficacy of LAMS for managing gastrointestinal strictures remains in question.

**Table 1. Summary of usage of LAMS in the GI Tract**

	EUS-GBD (n=25)	EDGE (n=6)	EDGI (n=2)	EUS-GJ (n=11)	EUS-CD (n=4)	SD (n=6)	EUS-PO (n=9)	Miscellaneous (n=2)
Age, mean, SD	73.64, 12.0	65.8, 8.1	61.0, 9.9	64.5, 13.0	65.3, 17.0	55.2, 11.75	52.0, 18.5	71, 66
Female gender, n, %	6, 24%	5, 83.3%	1, 50%	2, 18%	3, 75%	5, 83%	2, 22.2%	0, 0%
Indications, n %	Calculus Cholecystitis, 15, 60% Malignant cholecystitis, 5, 20% Acalculous cholecystitis, 2, 8% Malignant biliary obstruction, 3, 12%	Choledocholithiasis (n=4, 66.7%)  Benign papillary stenosis (n=2, 33.3%)	Pancreatic mass (n=1, 50%)  Pancreatic cyst (n=1, 50%)	Malignant GOO, 11, 100%	Distal malignant biliary obstruction, 4 100%	Anastomotic stricture, 4 (67%)  Pyloric stricture, 2 (33%)	Post-operative fluid collections, 9, 100%	Liver abscess, 2, 100%
Technical success, n, %	23, 92.0%	6, 100%	2, 100%	11, 100%	4, 100%	6, 100%	9, 100%	2, 100%
Clinical success, n, %	21/23, 91.3%	6, 100%	2, 100%	11, 100%	4, 100%	3, 50%	8, 88.9%	2, 100%
Procedure duration (min), mean, SD	39.5, 21.7	38.7, 20.0	52, 17.0	66, 31.6	24.5, 13.3	18.7, 3.8	27.3, 9.1	28, 7.1
Duration of LAMS placement, mean, SD	47.9, 27.0	30.3, 11.6	28, 0	N/A	N/A	68.5, 26.7	47.3, 28.2	39, 5
Adverse events, n, %	4, 18%	0, 0%	1, 50%	0, 0%	0, 0%	1, 16.7%	0, 0%	0, 0%
Length of follow-up (days), mean, SD	47.3, 27.9	208.2, 179.1	240, 144.2	46.50, (28.3, 82.8)	143, 119.9	292, 171.2	565.8, 465.1	43.5, 53.0

S1138

**Malnutrition and Post-ERCP Complications: Nationwide Inpatient Sample Database Analysis**

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**Introduction:** Complications can arise from endoscopic retrograde cholangiopancreatography (ERCP). Few studies have studied the relationship between malnutrition and post-ERCP complications. One study identified malnutrition as a risk factor for post-ERCP cholangitis. Another study found malnourished patients had increased post-ERCP inpatient mortality and higher risks for sepsis, hemorrhage, and intestinal perforation. We seek to elucidate the relationship between malnutrition and post-ERCP complications.

**Methods:** The National Inpatient Sample database was used to identify hospitalized patients over 18 years old who had an ERCP procedure between 2007 - 2017 using ICD-9 and ICD-10 codes. Patients were divided into two groups, those with and without malnutrition. Primary outcomes were length of stay, payor status, and total charges. Secondary outcomes were rates of post-ERCP pancreatitis, cholangitis, cholecystitis, infection, hemorrhage, perforation, and overall mortality. Patients were matched by age, race, sex, and Elixhauser comorbidity index. Chi-squared tests compared categorical data, independent t-tests compared continuous data, and multivariate analyses assessed primary outcomes.

**Results:** Of 282,526 patients who met inclusion criteria, 141,285 had malnutrition. For both groups, the mean ages were 67 years old with 49% males, 69.7% White and 11.6% Black. The Elixhauser Comorbidity Index was 19.8 in the malnutrition group and 15.0 in the control group. Primary outcomes were significant for length of stay (13.9 days vs 7.9 days,  $p < 0.001$ ), payor status ( $p < 0.001$ ) with more patients in the malnutrition group having Medicare or Medicaid, and higher total charges (\$139,346 vs \$80,136,  $p < 0.001$ ). Secondary outcomes were significant ( $p < 0.001$ ) for the odds ratio of post-ERCP pancreatitis (OR 2.3), perforation (OR 2.4), cholangitis (OR 1.8), cholecystitis (OR 3.6), infection (OR 3.3), hemorrhage (OR 3.8), and mortality (OR 2.0).

**Conclusion:** Malnutrition can be characterized as increased catabolic state versus decreased anabolic state. Catabolism, which involves the body expending energy, can occur in response to an acute stressor. Decreased anabolism can occur due to food insecurity or feeding issues. Malnutrition increases morbidity and mortality for patients undergoing procedures. Our data shows malnourished patients have increased risks for multiple post-ERCP complications. Patients' nutritional statuses should be assessed and optimized prior to ERCP.

S1139

**Endoscopic Resection Technique Outcomes for Non-Lifting Colorectal Lesions: A Systematic Review**

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**Introduction:** Endoscopic mucosal resection (EMR) is dependent on submucosal injectate expansion to allow for effective and safe tissue capture. Non-lifting polypoid tissue can render colorectal neoplasia recalcitrant to EMR. A number of alternative resection modalities and auxiliary techniques targeting non-lifting polypoid tissue have been described. We therefore sought to perform a systematic comparative analysis of existing techniques for non-lifting colorectal neoplasia.

**Methods:** Two authors (BZ, HJK) independently searched MEDLINE and EMBASE (Inception to April 2022) for citations evaluating endoscopic resection technique outcomes for non-lifting colorectal neoplasia. Eligible outcomes included technical success (removal of all visible polypoid tissue), R0 resection, intra-procedural perforation (IPP), clinically significant post-endoscopic resection bleeding (CSPEB), delayed perforation and recurrence. Categorical variables were expressed as frequency (%), with ranges estimated for the outcomes of interest, stratified by their respective techniques.

**Results:** 2395 citations were identified in our search strategy, of which 18 citations provided endoscopic resection technique outcomes for non-lifting colorectal neoplasia (7 endoscopic full-thickness resection (EFTR), 3 endoscopic submucosal dissection (ESD), 3 hybrid resection techniques (2 hybrid EFTR and 1 dissection-enabled scaffold-assisted resection), 2 avulsion techniques, 2 cap-assisted EMR (C-EMR), and 1 ablative technique). Technical success ranged from 79-100% (EFTR: 80-100%, ESD: 79-91%, hybrid technique: 98-100%, avulsion: 100%, C-EMR: 97%, ablation: 96%). R0 for applicable modalities ranged from 54-100% (EFTR: 57-100%, ESD: 54-63%). IPP ranged from 0-9% (EFTR: 0-4%, ESD: 0-9%, hybrid technique: 0-2%, avulsion: 0-3%, C-EMR: 0-9%, ablation: 0%). CSPEB ranged from 0-29% (EFTR: 0-29%, ESD: 0%, hybrid technique: 0-4%, avulsion: 5-6%, C-EMR: 9%, ablation: 4%). Delayed perforation was between 0-14% (EFTR: 0-14%, ESD: 0-9%, hybrid technique: 0%, avulsion: 0%, C-EMR: 0%, ablation: 0%). Recurrence ranged from 0-43% (EFTR: 0-43%, ESD: 0-4%, hybrid technique: 0-17%, avulsion: 15-17%, C-EMR: 19%, ablation: 26%).

**Conclusion:** Endoscopic resection techniques are effective for non-lifting colorectal lesions. Given the frequency of technical success comparative analyses between existing techniques focusing on the frequency of low-risk T1 colorectal cancer histopathology post-resection and adverse outcomes are needed. (Table)

**Table 1. Outcomes and complications of different auxiliary techniques for non-lifting colorectal neoplasia**

Modality	Number of Studies	Number of Lesions	Technical Success	R0	Intra-procedure Perforation	CSPEB <sup>1</sup>	Delayed Perforation	Recurrence
EFTR <sup>2</sup>	7	106	80-100%	57-100%	0-4%	0-29%	0-14%	0-43%
ESD <sup>3</sup>	3	46	79-91%	54-63%	0-9%	0%	0-9%	0-4%
Hybrid technique <sup>4</sup>	3	84	98-100%	N/A	0-2%	0-4%	0%	0-17%

Table 1. (continued)

Modality	Number of Studies	Number of Lesions	Technical Success	RO	Intra-procedure Perforation	CSPEB <sup>1</sup>	Delayed Perforation	Recurrence
Avulsion	2	121	100%	N/A	0-3%	5-6%	0%	15-17%
Cap-assisted EMR <sup>5</sup>	2	82	97%	N/A	0-9%	9%	0%	19%
Ablation	1	26	96%	N/A	0%	4%	0%	26%

<sup>1</sup>Clinically significant post-endoscopic resection bleeding.  
<sup>2</sup>Endoscopic full-thickness resection.  
<sup>3</sup>Endoscopic submucosal dissection.  
<sup>4</sup>Includes hybrid EFTR and Dissection enabled scaffold-assisted resection.  
<sup>5</sup>Includes cap-assisted EMR alone and cap-assisted EMR ± cold avulsion ± ablation.

S1140

### Gender and ERCP Complications: A Nationwide Inpatient Sample Database Analysis

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**Introduction:** Endoscopic retrograde cholangiopancreatography (ERCP) can involve a variety of complications including pancreatitis, hemorrhage, and cholangitis. Some studies have identified female gender as a risk factor for post-ERCP pancreatitis, cholangitis, and overall complications, however other studies have shown contradictory results. Given these discrepancies, we evaluated gender as a risk factor for post-ERCP complications using the National Inpatient Sample database.

**Methods:** The National Inpatient Sample (NIS) database was used to identify hospitalized patients over 18 years old who had an ERCP procedure between 2007 - 2017 using ICD-9 and ICD-10 codes. Patients were divided into two groups: males (726,352 [40.1%]) or females (1,084,048 [59.9%]), as defined by NIS as "indicator of sex". Patients were matched by age, race, and by Elixhauser comorbidity index. Primary outcomes were rates of post-ERCP pancreatitis, cholangitis, cholecystitis, infection, hemorrhage, and perforation. Chi-squared tests were used to compare categorical data and multivariate analyses were performed to assess primary outcomes.

**Results:** There were 1,810,400 patients hospitalized from 2007-2017 who underwent an ERCP procedure, of which 1,084,048 (59.9%) were female and 726,352 (40.1%) were male. Primary outcomes were significant for increased odds ratio of post-ERCP pancreatitis (OR 1.2,  $p < 0.001$ ) and decreased odds ratio of post-ERCP cholangitis (OR 0.7,  $p < 0.001$ ), cholecystitis (OR 0.4,  $p < 0.001$ ), infection (OR 0.7,  $p < 0.001$ ), and hemorrhage (OR 0.6,  $p < 0.001$ ) in females compared to males. No significant difference was found between men and women for post-ERCP perforation.

**Conclusion:** Although there are differences in the effects of gender on post-ERCP complications in the literature, the mechanisms causing these effects are not known. Women are known to have higher risks for biliary stones and sphincter of Oddi dysfunction which can further increase the odds of post-ERCP pancreatitis. We postulate that the decreased rates of cholangitis, cholecystitis, infection, and hemorrhage in women compared to men could be from an anatomical variation in the biliary tree that is gender specific. Therefore, endoscopists should further explore and consider this possibility when performing ERCPs.

Table 1. Clinical Outcomes in Females and Males who underwent ERCP

	p value	Odds Ratio	Confidence Interval
Post-ERCP Pancreatitis	< 0.001	1.2	1.1-1.3
Post-ERCP Cholangitis	< 0.001	0.7	0.7-0.8
Post-ERCP Cholecystitis	< 0.001	0.4	0.4-0.5
Post-ERCP Infection	< 0.001	0.7	0.7-0.7
Post-ERCP Hemorrhage	< 0.001	0.6	0.5-0.7
Post-ERCP Perforation	0.304	1.1	1.0-1.2

S1141

### Outcomes of Post-Hepatectomy Bile Leaks With Endoscopic Therapy

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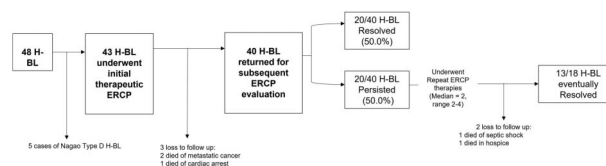
<sup>1</sup>Indiana University School of Medicine, Indianapolis, IN; <sup>2</sup>Indiana University, Indianapolis, IN.

**Introduction:** Post-hepatectomy bile leak (H-BL) can occur in up to 30% of cases and lead to higher post-operative morbidity. Endoscopic retrograde cholangiopancreatography (ERCP) is considered a good treatment option although current literature is limited to small cohort studies.

**Methods:** We created a retrospective database of H-BL cases referred for ERCP between 2011 to 2021. Data collected included endoscopic reports, fluoroscopic imaging, patient demographics, type of H-BL and ERCP outcomes. A high-grade bile leak (HGBL) was defined as visualization of contrast extravasation from the bile duct before filling of intrahepatic biliary branches with contrast. Initial ERCP failure was defined as persistence of H-BL seen on the 2<sup>nd</sup> ERCP evaluation.

**Results:** In total, 48 cases of H-BL (30 for malignancy, 9 for liver abscess, 1 for large liver cyst) were referred for ERCP. None of them had hepaticojejunostomy. After excluding cases with transected bile ducts, 43 cases underwent initial therapeutic ERCP - 20/43 were HGBL involving the left or right hepatic duct (9/20), main extrahepatic duct (9/20) or peripheral intrahepatic ducts (2/20); in contrast, 23/40 low-grade leaks were mainly from peripheral intrahepatic ducts (16/23). 40 patients were able to return for their 2<sup>nd</sup> ERCP evaluation. Of these, 38 patients had received biliary endoscopic sphincterotomy (BES) with one or multiple plastic stents and 2 received only plastic biliary stents. 50% of H-BL resolved after initial ERCP and the rest underwent repeat ERCP interventions with eventual resolution of H-BL in 33/38 (86.8%) of cases. Univariate logistic regression analysis identified that high grade leak and presence of biloma were associated with significantly higher odds for H-BL persistence after initial ERCP (Table). On multivariate analysis, presence of a high-grade leak (OR 11.02, CI 1.58 - 76.78,  $p = 0.015$ ) remained significant for persistent H-BL after initial ERCP therapy. Adverse events occurred in 3/40 (7.5%) cases after initial ERCP - 1 case of pancreatitis and 2 cases of cholangitis.

**Conclusion:** Our study suggests that ERCP remains an effective treatment for H-BL, although 50% of our cohort needed more than one ERCP. 15/20 of initial ERCP failures had underlying malignancy, which may have negatively affected healing (OR for initial ERCP 2.72 [0.57 - 12.91]), although this was not statistically significant. Patients with HGBL should undergo more persistent endoscopic therapy such as a longer stent indwell time. (Figure)



[1141] Figure 1. Flowchart of the Study. H-BL: Post hepatectomy bile leaks



**Table 1. Univariate analysis of clinical factors for persistent H-BL after initial ERCP treatment (N=40)**

Variables	Initial ERCP failure	OR (95% CI)	P value
Patient Characteristics			
Female	6/20 (30.0%)	0.25 (0.06 – 1.01)	0.051
Age 55 years old or more	9/20 (45.0%)	0.52 (0.13 – 2.02)	0.344
Median BMI (IQR)	26.0 (25.0, 32.0)	1.03 (0.94 – 1.13)	0.563
On diabetic treatment	4/17 (23.5%)	5.54 (0.55 – 55.49)	0.145
Malignancy as underlying diagnosis for hepatic resection	15/20	2.72 (0.57 – 12.91)	0.207
Location and timing of ERCP Procedure			
ERCP performed > 3 days	17/20 (85.0%)	0.88 (0.11 – 7.06)	0.906
Bile leak characteristics			
Nagano Type A*	1/20 (5.0%)	0.33 (0.03 – 3.55)	0.363
Nagano Type B	14/20 (70.0%)	0.85 (0.21 – 3.39)	0.813
Nagano Type C	5/20 (25.0%)	2.22 (0.44 – 11.18)	0.333
<b>High-grade bile leak</b>	15/20 (75.0%)	12.80 (2.55 – 64.37)	<b>0.002</b>
<b>Concomitant biloma present</b>	17/20 (85.0%)	7.33 (1.53 – 35.11)	<b>0.013</b>
Percutaneous abdominal drain present	16/20 (80.0%)	1.50 (0.34 – 6.59)	0.591
Presence of biliary stones	3/20 (15.0%)	0.53 (0.04 – 6.44)	0.619
Presence of biliary stricture	5/20 (25.0%)	1.56 (0.34 – 7.13)	0.565
ERCP interventions			
Biliary sphincterotomy performed	20/20 (100.0%)	200326 (0.00 – 5E274)	0.969
Biliary sphincterotomy alone	0	0.00 (0.00 – 43E213)	0.962
Bridging biliary stents	9/20 (45.0%)	2.36 (0.48 – 11.73)	0.293
Multiple biliary plastic stents	3/20 (15.0%)	0.47 (0.09 – 2.42)	0.367

S1142

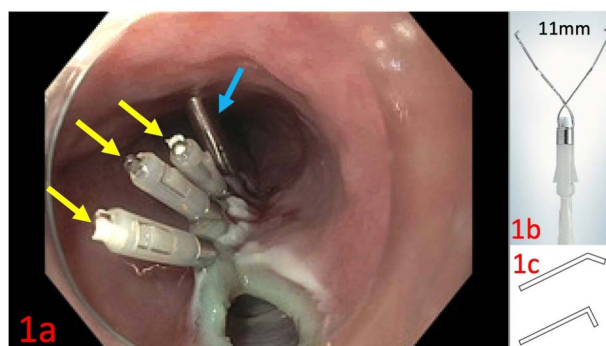
**Use of Reloadable Clips During Per-Oral Endoscopic Myotomy (POEM) Is Safe, Effective, and Cost-Effective**Krishna Patel, DO<sup>1</sup>, Val Mollo<sup>2</sup>, Amar S. Naik, MD<sup>1</sup>, Nikhil Shastri, MD<sup>1</sup>.<sup>1</sup>Loyola University Medical Center, Maywood, IL; <sup>2</sup>Loyola University Stritch School of Medicine, Maywood, IL.

**Introduction:** Endoscopic clip closure is routinely used in Per-Oral Endoscopic Myotomy (POEM). Clip use can be costly and our large volume tertiary center has seen a rise in clip utilization overall. POEM is a safe and effective procedure for achalasia patients (pts) when the endoscopist is properly trained. Continued POEM evolution will lead to improved outcomes and increased cost-effectiveness. We investigated the performance and cost effectiveness of implementing the newly available (in USA) Reloadable Clips (RC) in addition to Standard, Single-use clips (SC) during tunnel closure in POEM.

**Methods:** A retrospective cohort study of consecutive pts undergoing POEM for achalasia (before/after introduction of RC) was undertaken. Pt demographics, disease/treatment characteristics were recorded. POEM was performed by a single-trained Advanced Interventional Endoscopist with standardized protocol. All pts were admitted to observation with barium esophagram within 12 hours of POEM. Treatment efficacy was measured by immediate technical success, absence of leak on esophagram, and symptom evaluation at follow-up. Treatment related adverse events recorded were dysphagia, bleeding requiring transfusion, leak on esophagram, ED visit, and emergency operation. Procedural details of incision length, anterior/posterior approach, type of incision, myotomy length, and number and type of clips (RC vs SC - (Figure) used for zipper closure technique were noted. Cost of clips used per case was calculated. Statistical analysis with Fisher's exact and two-tailed unpaired T test was performed.

**Results:** 24 achalasia pts (Table) were evaluated. 14/24 (58%) patients were in Group 1 (RC + SC) and 10/24 (42%) were in Group 2 (SC only). 24/24 patients had immediate technical success and no early treatment related adverse events. Mean total number of clips/case in Group 1 (6.4 + 1) and Group 2 (5.7 + 1.2) did not differ (p = 0.15). Mean myotomy length in Group 1 vs Group 2 was (8.7cm vs 7.3cm, p = 0.08). Cost for RC was \$100.50 for 1st clip, \$39.50 for 2nd clip, and \$39.50 for each subsequent clip. The cost for each SC was \$150. Mean total clip cost per case in Group 1 was \$454 compared to \$855 for Group 2 (p < 0.001).

**Conclusion:** Use of RC in POEM was safe, technically successful, and highly cost effective. RC can be used alongside SC for zipper closure technique. Further prospective studies evaluating their use in EMR/ESD may lead to similar cost savings.



[1142] **Figure 1.** Examples of Reloadable (RC) and Standard, Single-use Clips (SC) Caption: Zipper closure technique (Figure a); Reloadable Clip (RC) (yellow arrows, Figure a); Standard, Single-use Clip (SC) (blue arrow, Figure a); opening width of RC (Figure b), 135-degree jaw of RC (top of Figure c).



**Table 1. Comparison of Utilization of Reloadable and Standard Clips versus Standard Clips Only in Patients with Achalasia Undergoing POEM Caption**

	Reloadable and Standard, Single-use Clips (RC + SC) Group 1 (n = 14)	Standard, Single-use Clips (SC) Only Group 2 (n = 10)	p value
Achalasia Type			
1	4/14 (29%)	2/10 (20%)	p = 1*
2	7/14 (50%)	7/10 (70%)	p = 0.42*
3	3/14 (21%)	1/10 (10%)	p = 0.61*
Mean Incision Length			
2 - 2.5 cm	11/14 (79%)	9/10 (90%)	p = 0.61*
3.5 cm	3/14 (21%)	1/10 (10%)	p = 0.61*
Location of Incision			
Anterior	3/14 (21%)	3/10 (30%)	p = 0.66*
Posterior	11/14 (79%)	7/10 (70%)	p = 0.67*
Type of Incision			
Circular	9/14 (64%)	8/10 (80%)	p = 0.65*
Full Thickness	5/14 (36%)	2/10 (20%)	p = 0.65*
Mean Myotomy Length (cm)	8.7 + 2.3	7.3 + 1.2	p = 0.08 <sup>^</sup>
Mean Number of Clips/Case			
Total	6.4 + 1	5.7 + 1.2	p = 0.15 <sup>^</sup>
Reloadable Clips	3 + 2.7	0	
Standard, Single-Use Clips	1.3 + 0.5	5.7 + 1.2	
Mean Total Clip Cost (\$)	454	855	p = 0.0001 <sup>^</sup>
Early Treatment Related Adverse Events			
Leak on Esophagram	0/14 (0%)	0/10 (0%)	p = 1*
Delayed Treatment Related Adverse Events			
Dysphagia	0/14 (0%)	1/10 (10%)	p = 0.42*
Pain	1/14 (7%)	1/10 (10%)	p = 1*
Fever	0/14 (0%)	0/10 (0%)	p = 1*

\*Fisher's Exact test; <sup>^</sup>Two-tailed, unpaired T test.

S1143

**Endoscopic Retrograde Cholangiopancreatography-Guided Gallbladder Drainage Is a Better Alternative to Percutaneous Cholecystostomy as Bridging Therapy to Cholecystectomy in Acute Cholecystitis**Swethaa Manickam, MD<sup>1</sup>, Hassam Ali, MD<sup>1</sup>, Rahul Pamarthy, MD<sup>1</sup>, Shiva Poola, MD<sup>2</sup>, Prashant Mudireddy, MD<sup>1</sup>.<sup>1</sup>East Carolina University, Greenville, NC; <sup>2</sup>ECU Health Medical Center/Brody School of Medicine, Greenville, NC.

**Introduction:** In patients presenting with acute cholecystitis (AC), ERCP-guided gallbladder drainage (ERGD) is an alternative to percutaneous cholecystostomy (PTC) as select patients may not be candidates for index cholecystectomy. We intended to compare the outcomes of ERGD to PTC in inpatient US population.

**Methods:** We retrospectively analyzed AC patients using the National Inpatient Sample database between 2016 and 2019. The primary outcome was the length of stay (LOS), mean inpatient cost (MIC), and mortality between the two groups. Secondary outcomes included the open cholecystectomy risk and complication rate. Exclusion criteria included cholecystectomy within the first three days of admission, no cholecystectomy, gallbladder perforation, hepatic abscess, or pregnancy. Additionally, patient were excluded if they underwent ERCP but no stenting or transpapillary gallbladder drainage was performed (Figure).

**Results:** Out of 63,065 weighted hospitalizations, 95.6% underwent PTC, and 4.4% underwent ERGD. The mean length of stay in patients who underwent PTC was 7.63 ± 0.07 days, while the length of stay in patients who underwent ERGD was 5.89 ± 0.11 days (P < 0.001). The MIC of patients with PTC was \$89982 ± 1170 and in ERGD was \$91131 ± 1190 (P < 0.001). (P < 0.001). There was a 88% decreased risk with all-cause 30-day mortality in patients who underwent ERGD compared to PTC (HRadj 0.31, [95% CI 0.10-0.59], P < 0.001) (Figure 2). There was a 87% decreased association with conversion to open cholecystectomy in patients who underwent ERGD compared to PTC (AOR 0.13, [95% CI 0.10-0.38], P < 0.001). There was a lower association of blood transfusion (AOR 0.31, [95% CI 0.16-0.59], P < 0.001), AHRF (AOR 0.37, [95% CI 0.26-0.52], P < 0.001), ARF (AOR 0.48, [95% CI 0.38-0.59], P < 0.001) and hypovolemia (AOR 0.61, [95% CI 0.45-0.83], P < 0.001). There was a higher association of Choleperitonitis with ERGD compared to PTC (AOR 3.3, [95% CI 1.04-10.5], P < 0.05). There was no significant association between ileus, shock, SBO, and LGIB with ERGD or PTC.

**Conclusion:** ERGD is a safer alternative to PTC in patients with AC awaiting cholecystectomy. The mortality and risk of complications are lower in ERGD compared to PC, with a lower risk of conversion to open cholecystectomy as well.

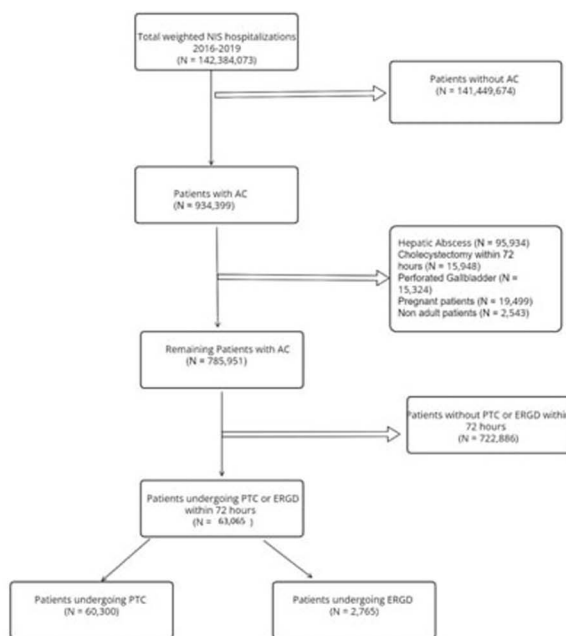
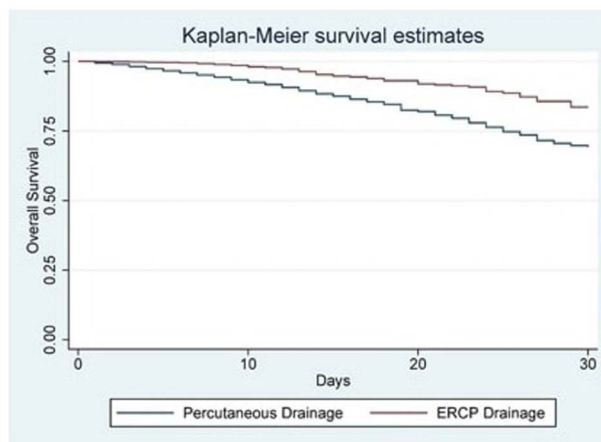


Figure 1



[1143] **Figure 1.** Flowsheet for data selection (2) Kaplan Meier Survival Estimates for patients undergoing ERCP guided gallbladder drainage compared to Percutaneous drainage for Acute cholecystitis.

S1144

#### Comparison of Endoscopic Mucosal Resection versus Endoscopic Submucosal Dissection for Treatment of Rectal Neuroendocrine Tumors: A Systematic Review and Meta-Analysis

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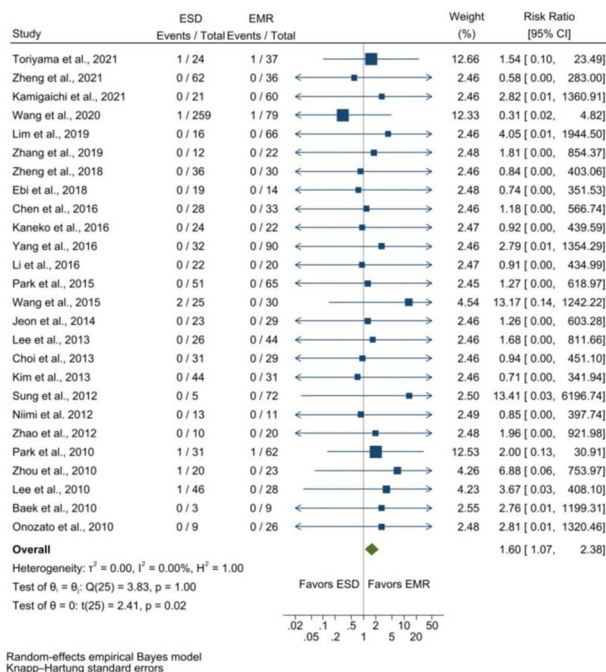
<sup>1</sup>Creighton University School of Medicine, Omaha, NE; <sup>2</sup>Washington State University Elson S. Floyd College of Medicine, Clarkston, WA.

**Introduction:** Rectal neuroendocrine tumors (NETs) represent a small portion of gastrointestinal malignancies. Endoscopic mucosal resection (EMR) and endoscopic submucosal dissection (ESD) are two treatment options of interest to therapeutic gastroenterologists. Recently the usage of EMR and ESD has increased, yet studies comparing the techniques across diverse patient populations are lacking. The aim of this systematic review and meta-analysis is to analyze the findings of all studies which compare these two treatment modalities for the management of rectal NETs.

**Methods:** Studies were identified by searching PubMed, Google Scholar, and reviewing citations within previously published meta-analyses. Only articles in English were included and 26 studies were selected for final analysis. The Newcastle-Ottawa Scale (NOS) was used to evaluate individual study quality. When comparing EMR to ESD, mean differences were estimated for procedure time, whereas risk ratios were calculated for histologic resection, perforation, and delayed bleeding rates (a continuity correction of 0.2 was used when any group had no adverse events). Pooled effects were estimated using random-effects meta-analysis, while between-study heterogeneity was calculated using the Paule-Mandel estimator with Hartung-Knapp adjusted standard errors. Funnel plots were used to assess publication bias.

**Results:** Of the 26 studies, 24 were retrospective, 1 was prospective, and 1 was mixed prospective/retrospective. A total of 1,880 lesions were included from 1,863 patients. Most studies were single-center retrospective analyses and scored low on the NOS scale indicating poor methodological quality. Mean procedure time was 12.14 minutes shorter for EMR than ESD [9.99-14.30, 95% confidence interval]. Relative risk of perforation and bleeding was 1.60 [1.07-2.38] and 1.67 [1.14-2.43] times more likely, respectively when using ESD. Attaining complete histologic resection was 1.10 [1.02-1.19] times more likely with ESD. (Figure)

**Conclusion:** EMR and ESD are increasingly prevalent treatment options for superficial rectal neoplasms. Data indicates that EMR variations were superior to ESD for decreasing procedure time and minimizing perforation and bleeding rates. However, complete histologic resection was more likely with ESD. Given the poor methodologic quality of current studies, additional randomized, prospective, multicenter trials should be performed to better understand the efficacy and safety outcomes of ESD and EMR techniques for treatment of rectal NETs.



[1144] **Figure 1.** Perforation events associated with each treatment modality within individual cohort studies. When cross-comparing all studies, the overall relative risk of perforation was 1.60 [1.07-2.38, 95% confidence interval] times greater when performing endoscopic submucosal dissection (ESD) compared to endoscopic mucosal resection (EMR) for treatment of rectal neuroendocrine tumors (NETs).

S1145

**Hypoglycemia Is Associated With Worse Outcomes in Patients Admitted With Cholangitis and Underwent Endoscopic Retrograde Cholangiopancreatography**

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**Introduction:** Hypoglycemia has been associated with poorer outcomes in hospitalized patients undergoing surgical interventions. In cholangitis, endoscopic retrograde cholangiopancreatography (ERCP) is often a critical adjunct to surgery, capable of diagnosing and treating various biliary and pancreatic pathologies. While technically less invasive than surgery, the effect of hypoglycemia on clinical outcomes of patients with cholangitis undergoing ERCP has not been elucidated.

**Methods:** Data were extracted from the National Inpatient Sample (NIS) database from 2016-2019. Using the ICD-10-CM codes, patients diagnosed with cholangitis and underwent ERCP were identified. Baseline demographic data, comorbidities, in-hospital mortality, hospital charges, and hospital length of stay (LOS) were extracted and compared based on the presence or absence of hypoglycemia. Statistical analysis was done using t-test and Chi-squared analyses. A multivariate analysis for the mortality odds ratio (OR) was calculated to adjust for possible confounders.

**Results:** A total of 256,540 patients with cholangitis underwent ERCP were identified, 2,810 of them had hypoglycemia during their hospitalization. The mean age of the hypoglycemia group was 64.41 years. Most patients were females (54%) and whites (57%). More patients in the hypoglycemia group had a history of alcoholism and congestive heart failure (CHF). Hypoglycemia was associated with higher odds of in-hospital mortality (OR 6.71, CI 5.49-8.2;  $p < 0.0001$ ). In addition to hypoglycemia, age  $> 65$  years, non-white race, and CHF were independently associated with higher mortality (Table). Moreover, patients with hypoglycemia had higher total hospital charges (\$87,147 vs. \$133,400;  $P < 0.0001$ ) and a significant increase in the LOS (9.7 vs. 6.7 days;  $P < 0.0001$ ).

**Conclusion:** Previous studies in the surgical literature have linked hypoglycemia to increased incidence of atrial fibrillation, usage of mechanical ventilation, and application of circulatory support. Hypoglycemia may also affect the metabolism of the heart, leading to myocardial ischemia and malignant arrhythmias. However, it is unclear if hypoglycemia represents a proxy for the severity of patient illness, as septic shock and renal insufficiency are common etiologies that may strongly impact mortality. Therefore, careful glycemic control during hospitalization should be practiced, as hypoglycemia serves as a poor prognostic indicator that should not be overlooked.

**Table 1. Univariate and multivariate analysis of potential factors affecting in-hospital mortality in patients with cholangitis underwent ERCP**

Variable	Univariate		Multivariate	
	OR (CI 95%)	P-value	OR (CI 95%)	P-value
Hypoglycemia	6.74 (5.56-8.17)	$< 0.0001$	6.71 (5.49-8.2)	$< 0.0001$
Age $> 65$	1.41 (1.30-1.54)	$< 0.0001$	1.3 (1.19-1.42)	$< 0.0001$
Female	1.02 (0.95-1.11)	0.46	0.96 (0.89-1.04)	0.430
Non-White	1.29 (1.19-1.40)	$< 0.0001$	1.32 (1.21-1.43)	$< 0.0001$
Congestive heart failure	2.21 (2.02-2.42)	$< 0.0001$	2.11 (1.91-2.32)	$< 0.0001$
Obesity (BMI $> 30$ )	0.81 (0.72-0.92)	0.001	0.82 (0.03-0.04)	0.001
Smoking	0.61 (0.55-0.67)	$< 0.0001$	0.62 (0.56-0.68)	$< 0.0001$

S1146

**Impact of Frailty on ERCP Outcomes**

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<sup>1</sup>Yale University School of Medicine, New Haven, CT; <sup>2</sup>University of Aleppo, Milford, CT; <sup>3</sup>FMH College of Medicine & Dentistry, Lahore, Punjab, Pakistan.

**Introduction:** Frailty has been recognized as an important risk factor and predictor of mortality and adverse events in the inpatient setting. It has not been studied as a tool to assess risk among patients undergoing Endoscopic Retrograde Cholangiopancreatography (ERCP). We aim to determine the association between frailty and risk of adverse events in hospitalized patients undergoing ERCP.

**Methods:** We conducted a cohort study using the 2017 Nation Inpatient Sample database, using International Classification of Diseases (ICD) diagnostic codes to identify adult patients who underwent ERCP and the Hospital Frailty Risk Score (HFRS) to classify patients as Frail or non-Frail. HFRS is a validated algorithm of ICD-10 codes. Multivariable analysis logistic regression was performed for outcomes of frail patients compare to non frail patients

**Results:** 216,775 hospitalizations met inclusion criteria, of which 31.7% (68,555) were identified as frail and 68.3% (148,220) as non-frail. Baseline characteristics of both groups are compared in Table. Frail patients had worse post procedure complications including post ERCP pancreatitis (7.3% vs 3.4%,  $p < .001$ ), perforation (1.2% vs 0.4%,  $p < .001$ ) and peritonitis (1.2% vs 0.3%,  $p < .001$ ). Frail patients had more cardiovascular (22.2% vs 5.5%,  $P < .001$ ), pulmonary (22.1% vs 4.7%,  $P < .001$ ), GI (25.9% vs 19.8%,  $P < .001$ ) and infectious (39.2% vs 4.6%) adverse events compared with non-frail patients. Frail patients also had higher ICU admission (8.5% vs 0.5%,  $p < .001$ ), increased length of stay (9.3 days vs 4.3 days,  $p < .001$ ), more total charges (118,875\$ vs 62,386\$,  $p < .001$ ) and higher all-cause inpatient mortality rates (4.2 % vs 0%,  $P < 0.001$  as compared to non-frail. When adjusted for age, gender, race, hospital location, teaching status, insurance, median household income and Charlson co-morbidity index frail patients were had a higher risk of cardiac[OR 2.29 (95% CI 2.12-2.46),  $p < 0.001$ ], pulmonary[OR 4.9 (95% CI 4.52-5.31),  $p < 0.001$ ], infectious[OR 12.83 (95% CI 11.85-13.88),  $p < 0.001$ ], GI [OR 1.68 (95% CI 1.58-1.77),  $p < 0.001$ ] adverse events as well as inpatient mortality[OR 9.93 (95% CI 7.3-13.3),  $p < 0.001$ ] as compared to non-frail.

**Conclusion:** In hospitalized patients undergoing ERCP, frailty status is associated with increased adverse events including all-cause mortality. The use of frailty assessments can further guide clinical decision-making when considering ERCP and the risk of adverse events in adult patients.

**Table 1. Baseline characteristics and outcomes of the frail and non-frail groups undergoing ERCP**

Variable	ERCP + Not Frail n=148,220	ERCP + Frail* n= 68,555	p-value
Female, %	59.69	52.61	< 0.001
Age (years), mean ± SD	55.87 ± 18.93	69.37 ± 15.35	< 0.001
Age ≥65 years, %	37.20	67.85	< 0.001
Race, %			< 0.001
White	65.18	70.06	
Black	9.21	10.58	
Hispanic	17.38	11.67	
Other	8.24	7.70	
Charlson co-morbidity index, mean ± SD	1.33 ± 1.98	3.11 ± 2.59	< 0.001
Hospital Frailty Risk Score, mean ± SD	1.71 ± 1.55	8.56 ± 3.14	< 0.001
In-hospital all-cause mortality, %	0.25	4.20	< 0.001
Length of Stay (Days), mean ± SD	4.37 ± 3.80	9.39 ± 10.32	< 0.001
Total Charges (\$), mean ± SD	62,386.77 ± 50,903.26	118,875.9 ± 175,602	< 0.001
Post Procedure complications, %			
Post-ERCP pancreatitis	3.44	7.38	< 0.001
Perforation	0.43	1.28	< 0.001
Bleeding	0.31	0.81	< 0.001
Peritonitis	0.29	1.25	< 0.001
Cardiac complications, %	5.50	22.19	< 0.001
Pulmonary complications, %	4.75	22.11	< 0.001
GI complications, %	19.82	25.95	< 0.001
ID complications, %	4.59	39.23	< 0.001
Anesthesia and drug-related complications, %	0.02	0.08	0.001
Required Intensive Care Unit, %	0.53	8.56	< 0.001
<b>Multivariate Regression for the Outcomes#</b>			
Outcome	Adjusted Odds Ratio (FrailERCP vs NonFrailERCP)	95% CI	p-value
In-hospital mortality	9.93	[7.38 – 13.35]	< 0.001
Length of Stay (Days)	4.53 <sup>&amp;</sup>	[4.28 – 4.77]	< 0.001
Total Charges (\$)	54,659.9 <sup>&amp;</sup>	[50,176.52\$ – 59,143.28\$]	< 0.001
Cardiac complications	2.29	[2.12 – 2.46]	< 0.001
Pulmonary complications	4.90	[4.52 – 5.31]	< 0.001
GI complications	1.68	[1.58 – 1.77]	< 0.001
ID complications	12.83	[11.85 – 13.88]	< 0.001
Anesthesia and drug-related complications	3.68	[2.13 – 15.13]	0.001
Required Intensive Care Unit	17.19	[13.99 – 21.13]	< 0.001

\*Frail =Hospital Frailty Risk Score (HFRS)≥5.  
#Analysis adjusted for age, gender, race, hospital location and teaching status, insurance, median household income and Charlson co-morbidity index.  
&Adjusted co-efficient representing the average difference in this outcome between FrailERCP and NonFrailERCP.

S1147

#### Endoscopic Retrograde Cholangiopancreatography Adverse Events in Patients With Non-Alcoholic Steatohepatitis

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**Introduction:** Non-alcoholic steatohepatitis (NASH) is an important manifestation of non-alcoholic fatty liver disease (NAFLD). NASH is characterized by liver inflammation and is associated with the development of fibrosis and cirrhosis. Prior studies have indicated that patients with NAFLD may have an increased risk for post-ERCP pancreatitis (PEP) and mortality. Mechanisms explaining these observations are unclear, but may be related to underlying NASH and associated co-morbidities. We aimed to study the association between NASH and post-ERCP AEs in this context.

**Methods:** We queried a commercial database (Explorys Inc, Cleveland, OH) with electronic medical record data from 26 major U.S. healthcare systems. Adult patients ( $\geq 18$  years old) with and without NASH who underwent ERCP between 1999 and 2021 were identified based on systematized nomenclature of medicine-Clinical Terms (SNOMED-CT). Differences in baseline characteristics and demographics were analyzed using chi-squared tests. Odds ratio analyses were performed between NASH and non-NASH patients for post-ERCP AEs within 30 days. Subgroup analysis was performed on patients with NASH without cirrhosis. We defined P-values less than 0.05 to be statistically significant.

**Results:** A total of 147,320 patients were found to have undergone ERCP. Of those, 1760 (1.2%) had NASH. NASH patients were more likely to be under the age of 65 (49.4% vs 41.6%,  $P < 0.0001$ ), more likely to be male (43.8% vs 40%,  $P = 0.0315$ ), identified with White race (87.5% vs 78.8%,  $P < 0.0001$ ) and had a greater likelihood of having cirrhosis (64.8% vs 6.2%,  $P < 0.0001$ ). NASH patients were more likely to experience same day PEP (OR: 1.23,  $P = 0.0072$ ), sepsis (OR: 1.87,  $P < 0.0001$ ), gastrointestinal bleeding (GI) (OR: 2.16,  $P < 0.0001$ ), AKI (OR: 3.37,  $P < 0.0001$ ), MI (OR: 1.28,  $P = 0.044$ ) and 30-day mortality (OR: 41.6,  $P < 0.0001$ ). There was no difference in delayed PEP (1-7 days) or intestinal perforation. Subgroup analysis of NASH patients without cirrhosis had an increased likelihood of same day PEP (OR: 1.29,  $P = 0.0425$ ), delayed PEP (OR: 4.41,  $P < 0.0001$ ), GI bleeding (OR: 1.50,  $P = 0.0306$ ). There was no difference in AKI, sepsis, cholangitis, intestinal perforation and 30-day mortality. (Table)

**Conclusion:** This study demonstrates that patients with NASH (with and without cirrhosis) may have a greater chance of experiencing post-ERCP AEs. However, some of these outcomes, particularly mortality, may be driven by an enriched prevalence of cirrhosis amongst those diagnosed with NASH.

**Table 1. Comparison of Post-ERCP Outcomes in Non-Alcoholic Steatohepatitis (NASH) and Non-NASH Patients**

Outcome	ERCP in NASH (N=1760)	NASH (%)	ERCP in non-NASH (N=145560)	Non-Nash (%)	P-Value	Odds Ratio	CI (95%)
Post ERCP Pancreatitis < 1d	190	10.8%	13030	9.0%	0.0072	1.2309	1.0577, 1.4324
Post ERCP Pancreatitis 1-7d	60	3.4%	4730	3.2%	0.7076	1.0508	0.8110, 1.3616
30-day mortality	10	0.6%	20	0.01%	< 0.0001	41.5829	19.4359, 88.9660
Sepsis	210	11.9%	9810	6.7%	< 0.0001	1.8748	1.6208, 2.1686
Cholangitis	350	19.9%	33180	22.8%	0.0039	0.8407	0.7474, 0.9457
GI perforation	20	1.1%	1390	1.0%	0.4377	1.1922	0.7648, 1.8584
GI bleed	120	6.8%	4770	3.3%	< 0.0001	2.1597	1.7903, 2.6053
AKI	330	18.8%	9320	6.4%	< 0.0001	3.3734	2.9874, 3.8093
MI	70	4.0%	4560	3.1%	0.0441	1.2808	1.0066, 1.6296
Age							
18-65	360	49.4%	60610	41.6%	0.0001		
>65	260	51.1%	83110	57.1%	0.0003		
Gender							
Female	990	56.3%	87270	60.0%	0.0181		
Male	770	43.8%	58250	40.0%	0.0315		
Race							
White	1540	87.5%	114770	78.8%	0.0001		
AA	100	5.7%	15210	10.4%	0.1244		
Asian	20	1.1%	2160	1.5%	0.8834		
Hispanic/Latino	30	1.7%	1740	1.2%	0.8038		
Comorbidities							
Cerebrovascular disease	330	18.8%	21270	14.6%	0.0323		
CAD	560	31.8%	33210	22.8%	< 0.0001		
Cardiomyopathy	150	8.5%	7680	5.3%	0.0849		
CHF	380	21.6%	19760	13.6%	0.0001		
COPD	340	19.3%	25420	17.5%	0.3858		
PAD/PVD	870	49.4%	44750	30.7%	< 0.0001		
HTN	1460	83.0%	88840	61.0%	< 0.0001		
HLD	1240	70.5%	72640	49.9%	< 0.0001		
DM	1120	63.6%	44140	30.3%	< 0.0001		
CKD	670	38.1%	25390	17.4%	< 0.0001		
ESRD	200	11.4%	4580	3.1%	< 0.0001		
Presence of cirrhosis	1140	64.8%	9050	6.2%	< 0.0001		
Alcohol abuse	170	9.7%	7710	5.3%	0.012		
Tobacco abuse	360	20.5%	25390	17.4%	0.1238		
Obesity	1100	62.5%	36760	25.3%	< 0.0001		

S1148

#### A National Inpatient Sample Analysis of Paralytic Ileus and ERCP Complications

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**Introduction:** Paralytic ileus is often seen in critically ill, hospitalized patients. Patients with pancreaticobiliary diseases require endoscopic retrograde cholangiopancreatography (ERCP) for diagnosis and treatment. ERCP can lead to multiple post-procedural complications, which can worsen the morbidity and mortality of patients. The associations between paralytic ileus and post-ERCP complications have not been explored previously.

**Methods:** The National Inpatient Sample database was used to identify hospitalized patients over 18 years old who had an ERCP procedure between 2007 - 2017 using ICD-9 and ICD-10 codes. Patients were divided into two groups: those with and without paralytic ileus. Primary outcomes were mortality, length of stay, payor status, and total charges. Secondary outcomes were rates of post-ERCP pancreatitis, cholangitis, cholecystitis, infection, hemorrhage, and perforation. Patients were matched by age, race, sex, and Elixhauser comorbidity index. Chi-squared tests compared categorical data, independent t-tests compared continuous data, and multivariate analyses assessed secondary outcomes.

**Results:** Of the 87,502 patients who met the inclusion criteria, 43,859 had paralytic ileus. There were no differences in age or race between the two groups, but those with paralytic ileus had an increased length of stay, higher total charges, more patients on Medicaid or Medicare, and mortality compared to the control group ( $p < 0.001$ ). The data was also significant ( $p < 0.001$ ) for an increased odds ratio for post-ERCP pancreatitis (OR 5.6), perforation (OR 14.6), cholangitis (OR 15.3), cholecystitis (OR 7.4), infection (OR 10.4), hemorrhage (OR 15.2), and mortality (OR 2.1).

**Conclusion:** Paralytic ileus is commonly seen in hospitalized patients with up to 6% mortality. Ileus is usually caused by dysregulation of sympathetic and parasympathetic control affecting the gut. This condition usually occurs secondary to medications, metabolic derangements, and surgical interventions. Their clinical status puts them at higher risks for multiple post-procedural complications. Therefore, patients with paralytic ileus should be medically optimized before undergoing ERCP. (Table)

**Table 1. Clinical Outcomes in Patients With and Without Paralytic Ileus who Underwent Endoscopic Retrograde Cholangiopancreatography (ERCP)**

	Odds Ratio (95% CI)	P-Value
Post-ERCP Pancreatitis	5.6 (4.6-6.7)	< 0.001
Post-ERCP Perforation	14.6 (9.3-23.0)	< 0.001
Post-ERCP Cholangitis	15.3 (11.9-19.6)	< 0.001
Post-ERCP Cholecystitis	7.4 (4.3-12.6)	< 0.001
Post-ERCP Infection	10.4 (8.9-12.2)	< 0.001
Post-ERCP Hemorrhage	15.2 (9.0-25.8)	< 0.001
Mortality	2.1 (1.9-2.2)	< 0.001

CI = Confidence Interval.

S1149

#### CT-Based Pancreatic Stone Density Evaluation Is a Determinant of the Number of Sessions for ESWL Success in Patients With Chronic Calculous Pancreatitis

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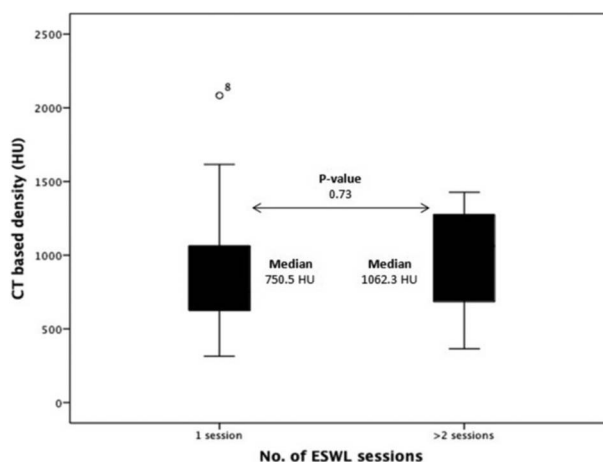
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**Introduction:** Extracorporeal shock wave lithotripsy (ESWL) is the first line treatment for pancreatic stones in chronic pancreatitis. The role of assessment of stone density on computer tomography (CT) scan in determining the success of ESWL in renal stones has been well established. However, there is limited data on its utility in patients with chronic pancreatitis. In this study, we are investigating the role of CT-based assessment of pancreatic stone density in the success of ESWL in terms of stone fragmentation.

**Methods:** We retrospectively evaluated chronic pancreatitis patients with pancreatic stones who underwent ESWL therapy. Besides relevant demographic and clinical data, stone-related CT features including number, location, size, and density in terms of the mean value of CT attenuation and pancreatic duct diameter were noted. Details of ESWL including the number of sessions, power, frequency, and the total number of shocks, adverse events, and fragmentation success defined by the breakdown of calculi to < 3mm in size were also recorded. Data was then analyzed to determine the relationship between stone density and parameters of ESWL that determined successful fragmentation.

**Results:** Nineteen patients (Mean age  $54.7 \pm 16.8$  years, 63.1% female) underwent ESWL. 11(57.9%) patients had alcoholic etiology and the remaining 8(42.1%) were idiopathic. On CT imaging, single stones were found in 7(36.8%), multiple ( $\geq 2$ ) stones in 5(26.4%), and a multifocal pattern of calcification was found in the remaining 7(36.8%). The head was the most common site and the mean stone density was  $906.7 \pm 478.9$  Hounsfield units (HU). 14(73.7%) patients needed one session, 4(21.1%) needed two, and 1(5.3%) patient needed five sessions respectively (Table). The density of stones requiring a single session for fragmentation was (median 750.5 HU) considerably lower than those requiring two or more sessions (median 1062.3 HU), however, this was not statistically significant ( $p = 0.74$ ) (Figure). 1 patient developed post-procedure pancreatitis.

**Conclusion:** The pancreatic stone density measured using CT is a possible predictor of the technical efficacy of ESWL in terms of the number of sessions required for successful fragmentation.



[1149] **Figure 1.** Relationship between stone density and number of ESWL sessions

**Table 1. Parameters related to ESWL**

ESWL Parameter	Value	
	Mean	+/- SD (Range) N (%)
Average number of sessions	1.42	± 0.96 (1-5)
Mean frequency of shocks	3505.26	± 605 (2500-4000)
Mean Power	7	± 2.43 (5-10)
Fragmentation		
1. Complete	13	(68.4)
2. Partial	6	(31.6)
Post ESWL Pancreatitis	1	(5.2)

S1150

**Readmission Rates Following Endoscopic, Percutaneous, and Surgical Pseudocyst Drainage**

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**Introduction:** Endoscopic ultrasound (EUS) transmural pancreatic pseudocyst drainage is increasingly being performed for patients with clinical symptoms. Limited data is known about readmissions rates of such patients when compared to percutaneous and surgical techniques. We aim to assess outcomes and unplanned readmission rates of pancreatic pseudocyst drainage based on type of procedural intervention.

**Methods:** The National Readmission Database was used to identify all patients in 2016 with pancreatic pseudocyst who underwent endoscopic, percutaneous (IR), or surgical drainage. Patient selection was based on coding in accordance with the ICD-10 CM. The demographic characteristics and inpatient outcomes were calculated for all patients based on procedural type. Bivariate and multivariate logistic regression analysis was performed to identify independent predictors multi-day readmission rates. P value of ≤ 0.05 denotes statistical significance.

**Results:** Of the 32139 discharges for pancreatic pseudocyst, 2220 underwent pseudocyst drainage: 36.2% were endoscopic, 51.6% were percutaneous, and 12.2% were surgically drained. Of these cases 4.23% required unplanned readmission within ≤30 days: 29.8% were endoscopic, 61.7% were percutaneous, and 8.5% were surgical drainage, p=0.126. Adjustment for the surgical group revealed EUS vs IR-guided drainage had a 30-day readmission rate of 3.5% vs 5.1%, which approached statistical significance, p=0.096. Regression analysis showed index intervention by EUS-guided drainage had decreased risk for unplanned readmission at ≤ 60 days (OR 0.639, p=0.034) and ≤ 90 days (OR 0.626, p=0.02) when compared to the IR-guided group. Adjusted multivariable regression analysis showed patients with endoscopic pseudocyst drainage (aOR 0.591, p=0.031) had an independent decreased risk of unplanned 30-day readmission, (Figure). Multivariable regression analysis showed no statistical significance of inpatient mortality when comparing EUS-guided and IR-guided pseudocyst drainage (p=0.108).

**Conclusion:** Patients undergoing EUS-guided pseudocyst drainage were at lower risk of 30-day readmission after index hospitalization when compared to those receiving IR-guided pseudocyst drainage. Endoscopic intervention also had decreased risk of unplanned readmission at day 60 and 90 after initial discharge. EUS therapy was shown to have an associated shorter hospital stay and decreased healthcare cost. Multi-center randomized control trials will be required to further examine and validate these findings.

**Table 1: Characteristics of inpatients with pseudocyst drainage based on procedure type**

		EUS-guided (n=803)	Percutaneous Imaging-guided (IR) (n=1146)	Surgical (n=271)	P value
Age, median (IQR), years		55 (43 – 66)	57 (45 – 68)	52 (43 – 64)	<b>0.001</b>
Gender, %	Male	59.9	57.4	57.9	0.542
	Female	40.1	42.6	42.1	
Insurance, %	Medicare	32.4	39.4	29.5	0.210
	Medicaid	23.7	22.0	23.3	
	Private	37.0	29.5	36.0	
	Other, Self-Pay, no charge	6.9	9.1	11.3	
Hospital size, %	Small	4.2	7.7	8.2	<b>&lt;0.001</b>
	Medium	15.5	22.4	25.3	
	Large	80.3	69.9	66.4	
Weekend admission, %		20.2	20.5	12.0	<b>0.003</b>
Teaching hospital, %		86.2	79.2	79.3	<b>&lt;0.001</b>
Length of stay, median (IQR), days		7 (4–15)	9 (5–19)	11 (6–19)	<b>&lt;0.001</b>
Total cost, median (IQR), \$		73 332 (40843 – 139944)	77 340 (40096 – 162009)	94 281 (48098 – 228544)	<b>&lt;0.001</b>
In-patient death, %		1.1	2.9	4.1	<b>0.007</b>
Subsequent admission procedure	Endoscopic, %	56.9	29.7	14.3	<b>0.001</b>
	IR, %	28.8	58.4	57.1	
	Surgical, %	11.5	11.9	28.6	
Readmissions	30-day, n	28	58	8	0.126
	60-day, n	34	74	9	<b>0.030</b>
	90-day, n	38	84	11	<b>0.021</b>

**Table 2: Readmission rates and regression analysis comparing endoscopic versus IR pseudocyst drainage**

	Endoscopic-guided Pseudocyst Drainage		IR-guided Pseudocyst Drainage	P
30-day readmission, %	3.5		5.1	0.096
60-day readmission, %	4.2		6.5	<b>0.033</b>
90-day readmission, %	4.7		7.3	<b>0.017</b>
	Endoscopic vs IR drainage Bivariable Regression OR (95%CI)	P	Endoscopic vs IR Drainage Multivariable Regression* OR (95%CI)	P
30-day readmission	0.675 (0.427 – 1.069)	0.094	0.591 (0.367 – 0.952)	<b>0.031</b>
60-day readmission	0.639 (0.421 – 0.968)	<b>0.034</b>	0.590 (0.384 – 0.907)	<b>0.016</b>
90-day readmission	0.626 (0.423 – 0.928)	<b>0.020</b>	0.570 (0.380 – 0.857)	<b>0.007</b>
In-patient mortality	0.380 (0.181 – 0.799)	<b>0.011</b>	0.533 (0.871 – 4.041)	0.108

\*Adjusted for age, gender, income, comorbidities, hospital size, teaching hospital, primary expected payer

[1150] **Figure 1.** Tables 1 and 2



S1151

**Pregnancy After ESG: Are All Efforts Thwarted?**

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**Introduction:** Endoscopic Sleeve Gastroplasty (ESG) is an organ sparing bariatric procedure aimed to reduce gastric volume and modify gastric motility with full thickness endoscopic suture. Pregnancy is a condition in which physiologically the pregnant woman potentially undergoes weight gain.

**Methods:** A retrospective analysis of a prospective database was conducted to evaluate weight trajectories and lifestyle modification in women that got pregnant after ESG. Weight loss outcomes, evolution of comorbidities and Bariatric Analysis and Reporting Outcome System (BAROS) questionnaire were analyzed at the beginning and at the end of the pregnancy and at the first follow-up visit after delivery.

**Results:** From May 2017 to October 2021, out of 115 fertile women 10 became pregnant after ESG [nine Rome (Fondazione Policlinico Universitario Agostino Gemelli) and one in Israel (Hadassah Medical Center)] with a mean interval of  $5.8 \pm 4.0$  months. Baseline BMI was  $38.4 \pm 3.5$  kg/m<sup>2</sup>. Two patients reported H-INS and another one had both H-INS and HBP. Two women affected by Poly-Cystic Ovary Syndrome (PCOS) reported difficulty getting pregnant before ESG. At the beginning of pregnancy and at the delivery mean TBWL was  $18.1 \pm 8.1\%$  and  $10.4 \pm 12.2\%$ , whereas mean EWL was  $55.7 \pm 24.6\%$  and  $30.4 \pm 37.2\%$ . Six out of 10 patients had weight gain in the ranges recommended by the Centers for Disease Control and Prevention. At the first follow-up visit after the delivery (mean interval,  $3.7 \pm 2.5$  months) the TBWL was  $9.9 \pm 9.9\%$ , the EWL was  $30.5 \pm 30.7\%$ , whereas the BAROS score was  $3.5 \pm 2.2$ . The patient affect by H-INS and HBP resolved both before and during the pregnancy, whereas one patient with H-INS had an improvement during the gestation.

**Conclusion:** Lifestyle changes after ESG do not disappear after pregnancy and allow for a gradual loss of weight gained during gestation. Weight loss following ESG could help those women who have difficult-to-get-pregnancy, such as PCOS.

**Table 1.** Weight loss outcomes of the ten patients who got pregnant after Endoscopic Sleeve Gastroplasty. All data are reported as mean value  $\pm$  Standard. Deviation

Population (N=10)	Weight loss (kg)	EWL (%)	TBWL (%)	BMI (kg/m <sup>2</sup> )	$\Delta$ BMI (kg/m <sup>2</sup> )	EBMIL (%)	BAROS (pt)	QoL
Beginning of Pregnancy	18.3 $\pm$ 8.9	55.7 $\pm$ 24.6	18.1 $\pm$ 8.1	30.9 $\pm$ 4.0	6.8 $\pm$ 3.2	55.7 $\pm$ 24.6	4.8 $\pm$ 1.9	2.3 $\pm$ 0.7
Delivery	11.4 $\pm$ 14.1	30.4 $\pm$ 37.2	10.4 $\pm$ 12.2	33.7 $\pm$ 4.5	4.0 $\pm$ 4.6	30.4 $\pm$ 37.2	3.4 $\pm$ 1.7	2.1 $\pm$ 0.7
First follow-up after the delivery	10.3 $\pm$ 11.2	30.5 $\pm$ 30.7	9.9 $\pm$ 9.9	34.0 $\pm$ 5.0	3.7 $\pm$ 3.7	30.5 $\pm$ 30.7	3.5 $\pm$ 2.2	2.1 $\pm$ 0.9

Abbreviations: EWL = Excess Weight Loss; TBWL = Total Body Weight Loss; BMI = Body Mass Index;  $\Delta$ BMI = Variation of BMI; EBMIL = Excess BMI Loss; BAROS = Bariatric Analysis and Reporting Outcome System questionnaire; QoL = Quality of Life subcategory of the BAROS.

S1152

**Assessment of the Learning Curve for Single-Use Disposable Duodenoscope for a Single Operator**

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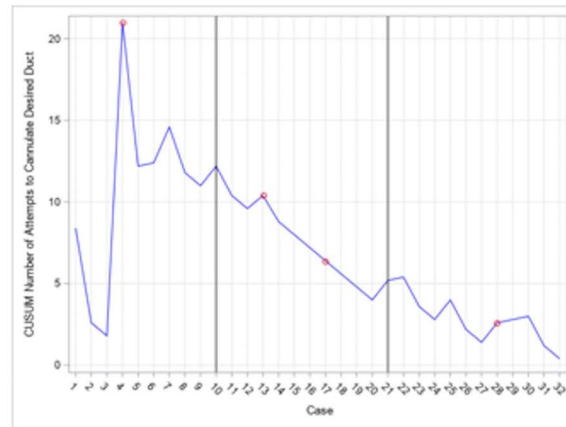
**Introduction:** In response to reports of duodenoscope-related infectious outbreaks of multidrug-resistant organisms, the FDA has recommended a transition to duodenoscopes with innovative designs that may include disposable components or fully disposable duodenoscopes. We aim to characterize the learning curve (LC) for disposable duodenoscopes, to ensure the adoption of these innovative devices in a safe and thoughtful manner.

**Methods:** We performed a retrospective review of data from 32 patients who underwent ERCP by a single, experienced operator using the EXALT Model D\* disposable duodenoscope at a single tertiary referral center. The LC for this device was described by the number of cases needed to achieve proficiency using cumulative sum (CUSUM) analysis. Number of attempts to cannulate and time to cannulate the desired duct were assessed. The overall mean number of attempts and mean time to cannulation were used as target values in the respective CUSUM analyses. Proficiency was defined as the number of procedures where an inflection point was reached in the CUSUM graph. This observation indicates improving operator performance as shown by a decrease in the number of attempts and shortening of cannulation time after the defined number of procedures.

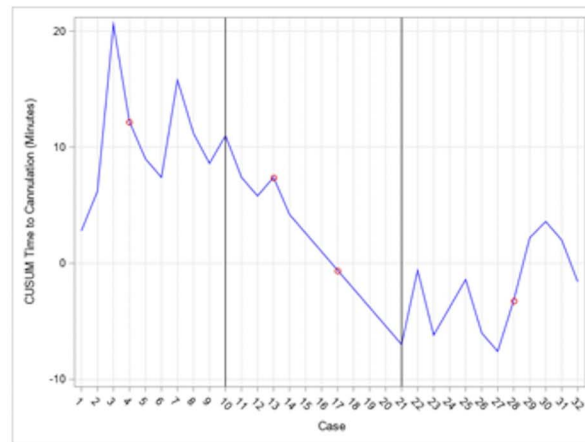
**Results:** Overall, 32 patients underwent ERCP using the disposable duodenoscope by a single experienced endoscopist (Table). 6 (19%) patients had a native papilla and the majority of these procedures were classified as ASGE complexity level 2 or above. The procedure was completed using solely the disposable duodenoscope in 28 patients (87%), while a reusable duodenoscope was required for procedure completion in 4 patients (13%). Procedure-related complications are described in Table: Number of attempts to cannulate the desired duct and time to cannulation are illustrated by CUSUM plots in Figure: In both endpoints, an inflection of the CUSUM curves is achieved at approximately 10 cases, indicating sustained shortening of cannulation attempts and time to cannulation.

**Conclusion:** Among an experienced ERCP endoscopist, approximately 10 ERCPs can be considered the threshold to achieve proficiency with the use of a disposable duodenoscope. Procedure-related complications are consistent with those expected with reusable duodenoscopes. The need to cross-over from single-use duodenoscope to reusable duodenoscope did not appear to be related to the learning curve. These results can be used to guide adoption of single-use duodenoscopes into clinical practice.

**CUSUM plot for number of attempts to cannulate the desired duct**



**CUSUM plot for time to cannulation**



Red circles in graphs denote cases with cross-over to a reusable duodenoscope

[1152] **Figure 1.** Cumulative sum analysis (CUSUM) curves

**Table 1. Patient demographics, procedural characteristics, outcomes and complications (n = 32)**

Variable	n (%) <sup>a</sup>
Demographic data	
Mean age (years)	60 (31-84) <sup>†</sup>
Female	14 (43)
Procedural characteristics	
Native papilla	6 (19)
ASGE complexity level <sup>‡</sup>	
1	6 (19)
2	15 (47)
3	11 (34)
Procedural outcome	
Technical success – procedure completion using disposable duodenoscope	28 (87)
Cases which required switching to a reusable duodenoscope	4 (13)
Procedural complications	
Post-ERCP pancreatitis	1 (3)
Post-procedural abdominal pain	13 (46) <sup>¶</sup>
Intra-procedural or post-procedural bleeding	1 (3)
Visceral perforation	0 (0)

<sup>a</sup>Values are n (%) unless otherwise specified.

<sup>†</sup>Range.

<sup>‡</sup>Based on the ASGE ERCP complexity scale (Gastrointest Endosc 2011;73:868-874).

<sup>¶</sup>10 patients had transient abdominal pain that resolved prior to discharge from the recovery room, while 3 patients required hospitalization for further management.

S1153

### Gaining Traction: A Novel Through-the-Scope Steerable Grasping Arm vs Clip Line Traction for Gastric and Rectosigmoid ESD

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**Introduction:** An important technical aspect of endoscopic submucosal dissection (ESD) is traction which leads to more successful dissections and reduced procedure times. Clip line (CL) traction is an established method where string is attached to a clip applied at the proximal edge of the lesion and tension is applied to create counter-traction. Recently, a novel through-the-scope steerable grasping arm device (SGA) (TracMotion™ FujiFilm) became available which allows for better visualization, tissue manipulation, and retraction due to its independently moveable and rotatable jaws. In this study, we compared the dissection speed, achievement of R0 resection and complication rate between these two traction methods for ESD of gastric and rectosigmoid lesions.

**Methods:** This was a retrospective medical record review of consecutive patients undergoing ESD by a single endoscopist at a tertiary care center between 3/2019 and 11/2021. Inclusion criteria included gastric and rectosigmoid lesions removed *en bloc* by ESD where either SGA or CL was utilized for traction. Data collected included ESD dissection time, instrumentation, lesion characteristics, resected specimen size, pathology interpretation, and complications.

**Results:** Four gastric and 4 rectosigmoid lesions were resected using CL traction, and 2 gastric and 4 rectosigmoid lesions were resected using SGA. For gastric lesions, the average dissection speed using CL was 12.04 mm<sup>2</sup>/min compared with an average dissection speed of 5.36 mm<sup>2</sup>/min using SGA. However, for rectosigmoid lesions, SGA (18.64 mm<sup>2</sup>/min) outperformed CL traction (12.39 mm<sup>2</sup>/min). R0 resection rate was higher overall for SGA cases compared to CL (83% vs 75%, respectively). There were no complications for any SGA cases. There was one episode of delayed bleeding following dissection of a gastric lesion with CL traction requiring endoscopic intervention.

**Conclusion:** ESD dissection speed utilizing SGA outperformed CL for removal of rectosigmoid lesions. While this was not the case for gastric lesions, we hypothesize this may be due to the use of an older two channel endoscope with limited retroflexion making gastric ESD more difficult. Further, the learning curve associated with the increased working distance created by the SGA device may have contributed to the difference in dissection speeds. ESD conducted with SGA yielded higher rates of R0 resection for gastric and rectosigmoid lesions without any complications suggesting increased efficacy and safety of this new device.

S1154

### Training Experience and Outcomes of the First Cohort of the ASGE Diagnostic EUS Training Program

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**Introduction:** Despite the expanding role and need for endoscopic ultrasound, training opportunities for established endoscopists in the USA are limited. ASGE launched a novel competency-based program to address this training need in 2019. It includes an online learning modules, live webinars, a hands-on weekend course, a summative knowledge exam, followed by a customizable preceptorship with an EUS expert.

**Aim:** To describe the training experience of a sample from the first cohort of the ASGE Diagnostic EUS training program.

**Methods:** A total of 26 applicants were chosen for the first cohort of the training program in 2019. We describe the experience of 3 endoscopists (ST at the Swedish Digestive Health Institute, Seattle, WA; BM at the Borland Groover Clinic, Jacksonville, FL and JH at Guthrie, Sayre, PA) who completed their hands-on training. Their case volumes were 160 (4 mentors), 185 (2 mentors) and 185 (3 mentors) respectively over a total of 12 weeks each. While 1 trainee (JH) was able to get trained at the same institute where he was employed, the other 2 (ST, JH) had to seek training in another state due to lack of preceptorship sites within their states of employment. One center tracked TEESAT scores (The EUS and ERCP Skills Assessment Tool) for every 5 procedures for their trainee (ST), and he was noted achieved a global score of 4 by the 150 th procedure.

**Results:** All 3 trainees have been credentialed for EUS privileges at their respective institutes, and are performing EUS independently.

**Conclusion:** The ASGE EUS diagnostic training program was able to fulfil the training needs of motivated established clinicians in full time practice. The main challenges encountered were identifying willing institutes and expert EUS preceptors, and institutional administrative barriers. COVID restrictions were a unique hurdle to the timely completion of preceptorship. This program's success in the future depends on buy in from EUS experts in the community and their respective institutions.

S1155

### Early Intervention With Double Balloon Enteroscopy Has Higher Yield for Inpatient Overt Obscure Gastrointestinal Bleeding

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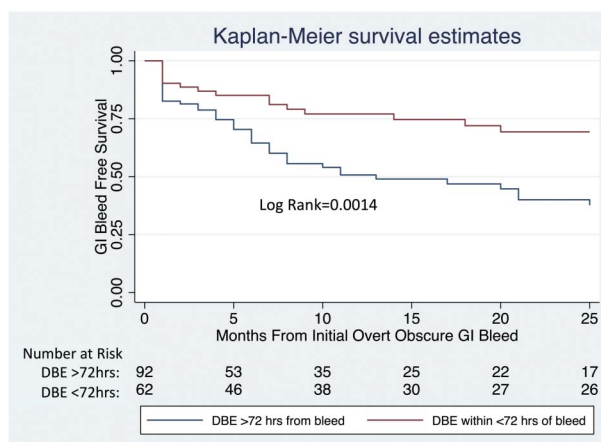
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**Introduction:** Obscure gastrointestinal bleeding (OOGIB) is defined as continued bleeding with unknown source despite esophagogastroduodenoscopy (EGD) and colonoscopy. Small bowel evaluation through video capsule endoscopy (VCE) or double balloon enteroscopy (DBE) is often warranted. We studied the timing of DBE in OOGIB regarding diagnostic yield, therapeutic yield, and GI re-bleeding.

**Methods:** We performed a retrospective review of DBEs performed at a tertiary medical center between 11/2012-12/2020. Inclusion criteria consisted of first admission for OOGIB undergoing DBE. Those without previous EGD or colonoscopy were excluded. Patients were stratified into 2 groups: DBE within 72 hours (hrs) of OOGIB (emergent) vs beyond 72 hrs of OOGIB (nonemergent). Logistic regression analysis assessed factors associated with diagnostic and therapeutic yield. Kaplan-Meier survival curve depicted GI bleed free survival following initial bleed and was compared using log rank test.

**Results:** A total of 154 patients met inclusion criteria of which 62 had emergent DBE and 92 had nonemergent DBE. Baseline variables were similar between our 2 groups. Univariate and multivariable logistic regression analysis depicted a significant associated between VCE and emergent DBE with diagnostic and therapeutic yields ( $P < 0.05$ ). Emergent DBE patients had increased GI bleed free survival then the nonemergent group (log rank=0.001).

**Conclusion:** Our data demonstrates emergent DBE during inpatient OOGIB can impact overall diagnostic yield, therapeutic yield, and GI rebleeding post-DBE.



[1155] **Figure 1.** Kaplan Meier Curve for GI bleed free survival up to 25 months following initial Double Balloon Enteroscopy

**Table 1.**

Diagnostic Yield				
Variable	Univariate Analysis		Multivariable Analysis	
	Odds Ratio [95% CI]	P value	Odds Ratio [95% CI]	P value
Age	1.02 [0.99-1.04]	0.16	1.01 [0.98-1.04]	0.51
Female	0.88 [0.46-1.71]	0.72	0.82 [0.39-1.71]	0.59
BMI < 25	1.66 [0.73-3.76]	0.22	1.61 [0.67-3.87]	0.29
ESRD	0.58 [0.23-1.47]	0.25	0.63 [0.21-1.85]	0.40
ICU admission	0.76 [0.37-1.56]	0.46	0.72 [0.33-1.58]	0.41
VCE	<b>3.71 [1.83-7.52]</b>	0.00	4.26 [1.98-9.20]	0.00
Emergent DBE	<b>2.21 [1.10-4.46]</b>	0.03	2.79 [1.28-6.08]	0.01
Therapeutic Yield				
Variable	Univariate Analysis		Multivariable Analysis	
	Odds Ratio [95% CI]	P value	Odds Ratio [95% CI]	P value
Age	0.96 [0.51-1.79]	0.89	1.00 [0.98-1.03]	0.87
Female	1.01 [0.99-1.04]	0.34	0.90 [0.45-1.81]	0.77
BMI < 25	1.21 [0.57-2.56]	0.62	1.13 [0.51-2.53]	0.76
ESRD	0.41 [0.15-1.08]	0.07	0.42 [0.14-1.24]	0.12
ICU admission	1.02 [0.51-2.05]	0.96	0.99 [0.46-2.11]	0.98
VCE	<b>2.77 [1.38-5.56]</b>	0.00	3.26 [1.53-6.94]	0.00
Emergent DBE	<b>2.36 [1.22-4.59]</b>	0.01	2.79 [1.36-5.70]	0.00

S1156

#### The Use of a Flexible Rigidizing Overtube for Endoscopic Retrograde Cholangiopancreatography in Post-Whipple Anatomy

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**Introduction:** Endoscopic retrograde cholangiopancreatography (ERCP) remains a technically challenging procedure in patients with altered post-surgical anatomy after pancreaticoduodenectomy (PD). The flexible rigidizing overtube (FRO) consists of a single use overtube that operates in two states, flexible or stiffened. Once the endoscope and overtube are advanced, vacuum application hardens the overtube, allowing for endoscope advancement while limiting loop formation. This device has the potential to improve endoscope stability, maneuverability, and facilitate endoscope exchange to a shorter endoscope that allows for the use of conventional ERCP accessories. This study reports our experience using the FRO for altered anatomy ERCP at a US-based academic cancer center.

**Methods:** Between 1/2019 and 10/2021, patients with prior PD who underwent an ERCP were retrospectively evaluated. Data abstracted included patient demographics, procedure indication, whether the ERCP was conventional or the FRO was used, procedure-related complications, type of therapeutic interventions performed, endoscopes, and accessories used.

**Results:** A total of 40 ERCPs were performed on 26 patients post pancreaticoduodenectomy. Overall technical success was achieved in 82.5% (33/40) of cases. The FRO was used in 20% (8/40) of procedures, including 1 for PJ evaluation. Failed biliary cannulation occurred in 14.3% (1/7) patients in the FRO group compared to 12.9% (4/31) cases in the conventional group. After reaching the anastomosis, a colonoscope was exchanged for a therapeutic upper endoscope for additional therapeutic interventions in 25% (2/8) of the cases when the FRO was used compared to 12.5% without the overtube (4/32). A 10 Fr plastic biliary stent was more commonly placed in the PRO group 42.8% (3/7) vs. 12.9% (4/31) in the conventional group. In patients where PJ anastomosis evaluation was the goal, the anastomosis was not reached in both cases due to a jejunal stricture preventing further endoscope advancement (one in each group). No procedure-related complications were reported. (Table)

**Conclusion:** This data demonstrates that the performance of ERCP can be facilitated with the use of the FRO, potentially allowing for a higher likelihood of reaching the anastomotic site and exchange to shorter endoscopes possibly allowing for more therapeutic options. Additional, larger studies are needed to evaluate this device's efficacy, safety, and cost-effectiveness for ERCP in post-surgical anatomy.

**Table 1.**

	Flexible rigidizing overtube used (n=8)	Conventional (n=32)
Age, median (IQR)	67 (59-75)	65 (62-74)
Gender, male, n (%)	4 (50)	24 (75)
Indication		
Jaundice, n (%)	1 (14.3)	3 (9.4)
Abdominal pain, n (%)	1 (14.3)	0
Cholangitis, n (%)	1 (14.3)	7 (21.9)
Abnormal liver enzymes, n (%)	4 (50)	11 (34.4)
Pancreatitis, n (%)	0	1 (3.1)
Routine stent exchange or removal, n (%)	1 (14.3)	10 (31.3)
Procedure intent		
Bilio-enteric anastomosis, n (%)	7 (87.5)	31 (96.8)
Pancreaticojejunostomy, n (%)	1 (3.1)	1 (14.3)
Afferent limb reached, n (%)	8 (100)	32 (100)
Bilio-enteric anastomosis reached, n (%)	7 (100)	28 (90.3)
Pancreaticojejunostomy reached, n (%)	0	0
Cannulation success of bilioenteric anastomosis, n (%)	6 (85.7)	27 (87.1)

Table 1. (continued)

	Flexible rigidizing overtube used (n=8)	Conventional (n=32)
Exchange from colonoscope to therapeutic upper endoscope, n (%)	2 (25)	4 (12.5)
10 Fr biliary stent placed, n (%)	3 (42.8)	4 (12.9)
Balloon dilation of bilio-enteric anastomosis, n (%)	4 (57.1)	8 (25.8)
Balloon dilation of intra or extrahepatic bile ducts, n (%)	2 (28.5)	4 (12.9)

S1157

### Outcomes of Endoscopic Retrograde Cholangiopancreatography in Patients With Inflammatory Bowel Disease: A Nationwide Study

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**Introduction:** Endoscopic retrograde cholangiopancreatography (ERCP) has become a commonly utilized procedure for both diagnostic and therapeutic purposes. There is a paucity of data for patients with inflammatory bowel disease (IBD) who undergo ERCP. The aim of this study is to examine potential complications, costs and inpatient outcomes of patients with IBD undergoing ERCP.

**Methods:** For this retrospective-cohort study we utilized the National Inpatient Sample database for the years 2018-2019. We compared potential indications, outcomes, ERCP-related procedures, and resource utilization in patients who underwent ERCP and had a diagnosis of IBD to that of patients who underwent ERCP without a diagnosis of IBD. We utilized a multivariate regression model that accounted for several potential confounders.

**Results:** We identified 318,590 ERCP procedures. Among them, 3,625 ERCP procedures were performed in patients with an associated diagnosis of IBD. Patients with IBD who underwent ERCP had higher odds of acute kidney injury (aOR 1.27; 95% CI: 1.01-1.60) and sepsis (aOR 1.33; 95% CI: 1.07-1.67) compared to patients without IBD (Table). However, inpatient mortality and other complications were not statistically different between the two groups. Patients with IBD were also less likely to undergo biliary sphincterotomy (aOR 0.75; 95% CI: 0.62- 0.88) but there were no other differences in performance of ERCP-related therapeutic interventions between the two groups. Adjusted costs and charges were not statistically different between the two groups.

**Conclusion:** The use of ERCP in patients with IBD was examined. Patients who underwent ERCP with and without a diagnosis of IBD did not display differences in inpatient mortality or in ERCP-related complications. However, patients with IBD did display higher odds and rates of non-PSC cholangitis, as well as higher rates of obstructive choledocholithiasis when compared to patients without IBD. This study provides basic data on the inpatient ERCP outcomes in patients with and without IBD. Future prospective studies are needed to clearly establish the association and causality between IBD disease activity and patient outcomes. In addition, this data should be compared to that of outpatient ERCP in patients with IBD.

Table 1. Odds of complications and ERCP-related procedures in patients who underwent ERCP comparing patients with and without IBD

	IBD combined aOR (95% CI)	Crohn's aOR (95% CI)	Ulcerative Colitis aOR (95% CI)
ERCP related procedures			
Bile duct stenting	1.16 (0.98-1.36)	1.19 (0.96-1.48)	1.30 (1.04-1.63)
Pancreatic duct Stenting	1.25 (0.99-1.58)	1.26 (0.94-1.70)	1.11 (0.81-1.52)
Biliary Sphincterotomy	0.75 (0.62-0.88)	0.71 (0.57-0.89)	0.76 (0.60-0.95)
Pancreatic Sphincterotomy	1.88 (0.28-12.7)	Not enough data	3.10 (0.44-22.08)
Biliary ductal dilation	1.25 (0.95-1.65)	1.53 (1.09-2.15)	1.34 (0.93-1.92)
Pancreatic duct dilation	1.34 (0.50-3.63)	1.76 (0.56-5.56)	1.13 (0.28-4.56)
Ampullectomy	1.23 (0.17-9.13)	Not enough data	2.01 (0.27-14.77)
Complications			
Mortality	0.99 (0.49-2.02)	0.67 (0.21-2.11)	1.01 (0.41-2.46)
Shock	1.24 (0.85-1.79)	1.12 (0.66-1.88)	1.48 (0.96-2.29)
Acute kidney injury	1.27 (1.01-1.60)	1.30 (0.96-1.75)	1.38 (1.02-1.85)
Sepsis	1.33 (1.07-1.67)	1.25 (0.94-1.68)	1.69 (1.28-2.23)
Multiorgan failure	1.24 (0.99-1.54)	1.17 (0.87-1.56)	1.37 (1.04-1.81)
Post ERCP pancreatitis	0.99 (0.80-1.24)	1.09 (0.82-1.44)	0.76 (0.55-1.04)
Bile duct perforation	1.73 (0.65-4.64)	3.04 (1.13-8.16)	0.72 (0.10-5.18)
Post-procedural bleeding	1.03 (0.87-1.31)	Not enough data	Not enough data

aOR: Adjusted odds ratio; CI: Confidence interval; ERCP: endoscopic retrograde cholangiopancreatography.

S1158

### Acute Renal Failure and Post-ERCP Complications: A Nationwide Inpatient Sample Database Analysis

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**Introduction:** Acute renal failure (ARF) occurs when there is recent kidney injury. The insult can stem from an inflammatory response, which can be seen in pancreaticobiliary diseases. Endoscopic retrograde cholangiopancreatography (ERCP) is a diagnostic and therapeutic tool for diseases affecting the pancreas and biliary tract. End stage renal disease is known to increase the risks of post-ERCP complications but there is a lack of evidence evaluating the relationship between ARF and post-ERCP complications.

**Methods:** The National Inpatient Sample database was used to identify patients over 18 years old who had an ERCP procedure between 2007 - 2017 using ICD9 and ICD10 codes. Patients were divided into two groups: those with and without ARF. Primary outcomes were length of stay, payer status, and total charges. Secondary outcomes were rates of post-ERCP pancreatitis, cholangitis, cholecystitis, infection, hemorrhage, perforation, and overall mortality. Patients were matched by age, race, sex, and Elixhauser comorbidity index (ECI). Chi-squared tests compared categorical data and independent t-tests compared continuous data. Multivariate analyses were performed to assess secondary outcomes.

**Results:** Of 413,517 total patients, 206,893 had ARF. For both groups, 56.6% were males, and the majority of the patients were White. The ECI was 14.8 in ARF group vs 12.7 in control group. Patients with ARF were older (70.4 years old vs 70.2,  $p < 0.001$ ), had longer length of stay (12.1 days vs 7.5 days,  $p < 0.001$ ), payer status with most patients having Medicare ( $p < 0.001$ ), and higher average total charges (\$130,844 vs \$80,935,  $p < 0.001$ ). Secondary outcomes were significant ( $p < 0.001$ ) for pancreatitis (OR 2.0), perforation (OR 1.9), cholangitis (OR 2.8), cholecystitis (OR 3.2), infection (OR 4.4), hemorrhage (OR 3.3), and mortality (OR 4.9). (Table)

**Conclusion:** Acute renal failure is seen in severely ill patients, which is demonstrated by an increased ECI, length of stay, and average total charges. These patients may be slightly older and have Medicare. In ARF, elevated blood urea nitrogen and creatinine may lead to falsely elevated mortality scores especially in post-ERCP pancreatitis, leading to inappropriate management. ARF is also an immunocompromised

state that can lead to increased rates of post-ERCP infection, cholangitis, cholecystitis, perforation, hemorrhage, and mortality. Further studies are needed to look into other scoring systems that can better predict morbidity and mortality in patients with ARF.

**Table 1. Clinical Outcomes of Patients with Acute Renal Failure who Underwent Endoscopic Retrograde Cholangiopancreatography (ERCP)**

	Odds Ratio (95% CI)	P-Value
Post-ERCP Pancreatitis	2.0 (1.8-2.2)	< 0.001
Post-ERCP Perforation	1.9 (1.5-2.4)	< 0.001
Post-ERCP Cholangitis	2.8 (2.4-3.1)	< 0.001
Post-ERCP Cholecystitis	3.2 (2.5-4.1)	< 0.001
Post-ERCP Infection	4.4 (4.1-4.7)	< 0.001
Post-ERCP Hemorrhage	3.3 (2.7-4.1)	< 0.001
Mortality	4.9 (4.7-5.1)	< 0.001

CI = Confidence Interval.

S1159

### The Relationship Between Patient Satisfaction and Use of Healthcare Services in Patients With Barrett's Esophagus Using Confocal Laser Endomicroscopy versus Standard of Care

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**Introduction:** The global prevalence and burden of Barrett's esophagus, a precursor to esophageal adenocarcinoma, is increasing. The object of the present study was to analyze patient satisfaction while comparing differences in gastroenterology health services utilization among patients treated using Cellvizio (Confocal Laser Endomicroscopy, CLE) versus standard of care.

**Methods:** A retrospective, multicenter chart review was conducted on 60 patients with Barrett's esophagus. Individuals were classified into 1 of 2 cohorts of 30 patients each according to whether they received at least 1 Cellvizio procedure (i.e., Cellvizio versus random 4-quadrant biopsy standard of care—also known as the Seattle Protocol). Patient age, gender, and 12 comorbidity indicators were also captured as covariates. Bivariate differences in variable means across the 2 groups were assessed using the Kruskal-Wallis equality of populations test. Finally, linear multivariate models of the 8 health services measures were estimated. Patient's were also given a survey requesting them to rank their experience utilizing Cellvizio versus standard of care. The satisfaction scale went from 1 (would not undergo again) to 10 (highly recommend).

**Results:** Compared to those receiving standard of care, Cellvizio patients were older (71 versus 63 years;  $p=0.002$ ). No other statistically significant differences in gender or comorbidities were detected. Controlling for covariates, while patients in the Cellvizio cohort had greater use of Cellvizio and fluorescein (3.94 more of each than standard of care;  $p<0.001$ ), they also had 1.04 fewer endoscopies and anesthesia services ( $p=0.001$ ), 7.49 less biopsy bottles ( $p<0.001$ ), 1.30 fewer ablations ( $p<0.001$ ), and 1.46 less brush cytology services ( $p<0.001$ ). The patient's surveys also revealed a satisfaction score of 8.5 with Cellvizio and 6.3 with standard of care. (Table)

**Conclusion:** Barrett's esophagus, a precursor to esophageal adenocarcinoma, is a common condition with increasing global prevalence and burden. Screening for gastrointestinal adenocarcinomas using conventional endoscopy and biopsies has showed success, however, Cellvizio showcases a lot of potential due to its specificity of producing high resolution images of the mucosal layer as well as the reduced number of biopsies needed. We reveal that the use of Cellvizio is associated with lower health services utilization of endoscopy, anesthesia, biopsy, ablation and higher patient satisfaction.

**Table 1. A list of different variables in patients who underwent standard of care versus cellvizio**

Variable	Standard of Care (N=30)	Cellvizio (N=30)	p-value
Male	0.63	0.43	0.18
Age (years)	63.13	71.23	0.00
Hospital:			
Advocate	0.00	0.23	0.12
Advocate/St. Joseph	0.00	0.03	0.82
Christ	0.10	0.00	0.51
Good Samaritan	0.23	0.00	0.12
Oak Lawn	0.27	0.03	0.12
Silvercross	0.23	0.40	0.27
St. Joseph	0.17	0.30	0.38
Comorbidities:			
Hypertension	0.73	0.67	0.66
Asthma/Chronic Obstructive Pulmonary Disease	0.07	0.13	0.66
Diabetes	0.27	0.30	0.82
Hypersensitivity Lung Disease	0.37	0.37	1.00
Coronary Artery Disease	0.17	0.17	1.00
Thyroid Disease	0.10	0.07	0.82
Anxiety/Depression	0.10	0.07	0.82
Pancreatitis	0.03	0.10	0.66
Dyslipidemia	0.10	0.07	0.82
Liver Disease	0.10	0.00	0.51
Atrial Fibrillation	0.07	0.10	0.82
Rheumatoid Arthritis	0.03	0.07	0.82

Table 1. (continued)

Variable	Standard of Care (N=30)	Cellvizio (N=30)	p-value
<b>Number of:</b>			
Endoscopy	5.03	4.13	0.0003
Cellvizio	0.00	4.13	0.0000
Biopsy Bottle	8.60	1.17	0.0000
Ablation	2.43	1.33	0.0000
Brush Cytology	1.60	0.00	0.0000
Anesthesia	5.03	4.13	0.0003
Fluorescein	0.00	4.13	0.0000
Endoscopy Suite	5.03	4.13	0.0003

S1160

#### Use of the Forward-Viewing Curvilinear Array Echoendoscope for EUS-Guided Liver Biopsy

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**Introduction:** Liver biopsy (LB) remains an important procedure for diagnosis, despite advancements in non-invasive evaluation. For patients requiring esophagogastroduodenoscopy (EGD) and EUS, a forward-viewing curvilinear array (FV-CLA) echoendoscope may be particularly useful, as this single device combines a gastroscope for video examination along with an echoendoscope. This study evaluated the performance of the FV-CLA echoendoscope to determine whether the theoretical advantages of this hybrid device translate into usability for EGD and EUS-LB procedures.

**Methods:** EUS evaluations in 25 patients with indications for LB were performed with the FV-CLA. This study was a retrospective review of charts for these patients.

**Results:** Twenty-five patients (18 female) underwent EUS-LB using the FV-CLA. Mean age of was 51.16 years (median = 52, SD = 13.43). 24 of the patients indicated their race as Caucasian, and 1 Black. The most common indications for EGD were evaluation of abdominal pain/dyspepsia, GERD, and rule out esophageal varices (Table). EGD was unremarkable in 13, inflammation, ulceration, or gastric polyps were found in 10, and 1 with Barrett's esophagus. Endosonographically, the liver was normal in 9 patients, hyperechoic in 9, and heterogeneous in 7. Left lobe LB was performed in 10 patients, right lobe LB in 1 patient, and bilobar LB in 14. Reasons for LB were abnormal liver function tests (19 patients), hepatomegaly (4 patients), and possible cirrhosis (2 patients) (see Table). Pathological diagnosis was possible in all biopsies. Liver histology showed steatosis in 8 patients, NASH without fibrosis in 7, NASH with fibrosis in 6, cirrhosis in 2, steatosis with fibrosis in 1, and normal histology in 1. In all cases, there was adequate LB cores for a pathologic diagnosis. Length of longest piece was 13.0 mm (range 5.3 – 22.6) for left lobe and 14.6 mm (5.8 – 28.0) for right. Aggregate specimen length was 49.5 mm (19.0 – 131.9) for biopsies obtained from the left lobe and 39.7 (10.4 – 68.1) from the right. In all procedures, the FV-CLA was easy to maneuver and provided good images. All procedures were completed successfully with no adverse effects.

**Conclusion:** The FV-CLA echoendoscope allows use of a single scope for EGD and LB. Visualization of both the right hepatic lobe (transduodenal probe location) and left (transgastric probe location) is good, and excellent LB samples can be obtained from both lobes.

Table 1. Procedural Details

Patients: 7 males, 18 females
Age: 51.16 years (range 24-72 years)
EGD indications
6 Abdominal pain or dyspepsia
6 GERD or rule out Barrett's esophagus
1 Investigate melena
5 Rule out esophageal varices
1 Investigate chronic diarrhea
1 EUS-biliary tree evaluation
2 EUS-LB only
1 EUS-Endoscopic work-up prior to RYGB
Liver biopsy indications
19 Abnormal liver function test results
2 Possible cirrhosis on CT
4 Hepatomegaly
EGD, esophagogastroduodenoscopy; GERD, gastroesophageal reflux disease; EUS, endoscopic ultrasound; LB, liver biopsy; RYGB, Roux-en-Y gastric bypass; CT, computed tomography.

S1161

#### Real World Experience of the Overstitch Endoscopic Suturing System: Insights From the FDA Manufacturer and User Facility Device Experience (MAUDE) Database

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**Introduction:** The Overstitch Endoscopic Suturing System allows for the placement of full thickness sutures endoscopically. The Overstitch system has been utilized in the closure of gastrocutaneous fistulas, mucosal defects following endoscopic submucosal dissection, perforations, and anastomotic leaks. Real-world data on the Overstitch system is sparse and no large studies describing common device failures and patient complications exist. We investigated the number and type of complications associated with the Overstitch device using a public-access governmental database.

**Methods:** Post-marketing surveillance data from the FDA Manufacturer and User Facility Device Experience (MAUDE) database from October 2010 through Dec 2021 was analyzed for device failures and patient complications.

**Results:** During the study period, approximately 102 cases with 64 patient complications, 31 device failures, and 7 combined device failures with patient complications were identified. The most common patient complication was mucosal laceration (24.3%). The most common device failure was impaired tissue helix release (25%).

**Conclusion:** The Overstitch system requires a complex multistep process for the placement of full-thickness sutures. A single misstep in the sequence of events can lead to device failure, patient complications, or a combination of both. The MAUDE database highlights common patient adverse outcomes and device failures thereby providing insight into potential areas for improvement of medical devices.



S1162

### A Comparison of Technical Failures and Patient-Related Adverse Events Associated With Three Widely Used Mechanical Lithotripters for ERCP: Insights From the FDA MAUDE Database

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**Introduction:** Mechanical lithotripsy is a commonly used, effective method for fragmenting large biliary or pancreatic duct stones. Real-world data on the most commonly reported complications and modes of failure associated with mechanical lithotripters are limited. We analyzed the post-marketing surveillance data from the FDA's Manufacturer and User Facility Device Experience (MAUDE) database for three commercially available mechanical lithotripters for use during ERCP.

**Methods:** A search of the FDA MAUDE database from January 2010 to October 2021 was conducted for the the following mechanical lithotripters: Trapezoid RX (Boston Scientific, Natick, MA), LithoCrush (Olympus Endoscopy, Center Valley, PA), and the Fusion Lithotripsy Extraction Basket (Cook Endoscopy, Winston Salem NC). Results were compiled and reviewed.

**Results:** 1,128 medical device reports with 2,129 device malfunctions and 205 patient complications were identified. Most device malfunctions were due to guidewire port or sheath failure (n=379, 17.8%), basket entrapment (n=357, 16.8%), and basket tip separation failure (n=315, 14.8%). The most commonly reported adverse events to patients were an additional procedure to remove an entrapped basket (n=170/205, 82.9%), bleeding (n=15/205, 7.3%), and bowel perforation (n=5/205, 2.4%).

**Conclusion:** Findings from the MAUDE database highlight device and patient-related adverse outcomes that should be recognized to improve clinical success and reduce patient risk.

S1163

### Endoscopic Full Thickness Resection of Gastrointestinal Neoplasia – Single Center Experience

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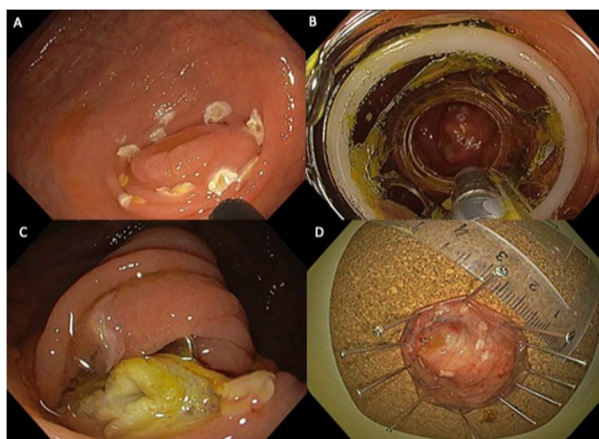
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**Introduction:** Endoscopic full-thickness resection (EFTR) is emerging therapeutic option for en-bloc treatment of subepithelial tumors and epithelial neoplasia with significant fibrosis. Study aim was to evaluate results at advanced endoscopy center.

**Methods:** This was retrospective analysis of 18 EFTR cases from 01/2020 till 11/2021, that were performed in advanced endoscopy center with a dedicated full thickness resection device (FTRD\*, Ovesco, Germany). We recorded the demographic, procedural and technical characteristics. Lesion pathology (surface size, type, location), timing of procedure, technical success (defined as reaching the lesion, deploying the clip, and performing an en bloc and macroscopically complete resection), clinical success (defined as R0 resection and histopathology evaluation compatible with adequate endoscopic treatment) and rate of procedure-related complications (bleeding, perforation, need for emergency surgery, infectious complications and cardio-pulmonary adverse events associated with sedation) were also recorded (Table).

**Results:** Majority of lesions had previous failed attempts at removal (n=10, 55.5%). Other lesions (n=8, 44.4%) included appendiceal orifice (n=6, 33.3%) or neuroendocrine neoplasia (n=2, 11.1%). Mean age of patients was 67.4 years +/- (SD) 10.9 years. 8/18 (44.4%) patients were female. Procedures were performed with conscious sedation (midazolam) and analgesia (piritramide), with pulse oximetry monitoring. There were no cardiopulmonary adverse events. (Figure) One procedure was aborted due to postsurgical anatomy; the endoscope with the FTRD device could not be passed through. One patient developed post procedural appendicitis and a surgical appendectomy was performed, although the EFTR was technically successful. No other complications were recorded. Mean procedure time was 42.1 +/- (SD) 14.3 minutes. Technical success of the procedure was 94.4% (n=17/18), clinical success was achieved in 88.2% (n=15/17). One patient was referred to surgery due to insufficient safety margins of removed specimen and one patient due to presence of invasive adenocarcinoma (pT2). All but one (post-procedural appendicitis) patients were discharged after one day of observation.

**Conclusion:** Our results confirm that EFTR is effective endoscopic technique. It is exceptionally useful in fibrotic lesions and neuroendocrine neoplasia. Technically less challenging than endoscopic submucosal dissection it can still pose technical difficulties especially in cases with postsurgical anatomy.



[1163] **Figure 1.** A) Pre-EFTR marks of a 20 mm sessile serrated lesion of the appendiceal orifice. B) Deployment of the EFTR device. C) Resection defect after EFTR. D) Mucosal side of the resected specimen. The pathology showed sessile serrated lesion.

**Table 1. Demographics and Procedure Characteristics.** SD - standard deviation. Timing of procedure (time of endoscopy and deployment of the device). Technical success (defined as reaching the lesion, deploying the clip, and performing an en bloc and macroscopically complete resection). Clinical success (defined as R0 resection and histopathology evaluation compatible with adequate endoscopic treatment). Other – hyperplastic polyps, fibrotic tissue and lipoma

Sex (n=18) (n, %)	
Male	10 (55.6)
Female	8 (44.4)
Mean age +/- SD (years)	67.4 +/- 10.9
ASA classification, (n, %)	
II	12 (66.7)
III	6 (33.3)
Mean dose of midazolam +/- SD, mg	0.7 +/- 0.83
Mean dose of piritramide +/- SD, mg	4.5 +/- 5.1
Location of the lesion, n=18 (n, %)	

Table 1. (continued)

Rectum	8 (44.4)
Transverse Colon	2 (11.1)
Ascending Colon	1 (5.6)
Appendiceal Orifice	6 (33.3)
Body of Stomach	1 (5.6)
Mean Procedure Time +/- SD, min	42.1 +/- 14.3
Technical success, n=18 (n, %)	
Yes	17 (94.4)
No	1 (0.06)
Clinical success, n=17 (n, %)	
Yes	15 (88.2)
No	2 (12.8)
Pathohistology of the Retrieved Specimen, n=17 (n, %)	
Adenoma with Low Grade Dysplasia	5 (29.4)
Sessile Serrated Lesion	3 (17.6)
Adenocarcinoma	3 (17.6)
Neuroendocrine Neoplasia	2 (11.8)
Other	4 (23.5)

S1164

#### Lumen-Apposing Metal Stents for Pancreatic Fluid Collections Reduce 90-Day Readmission Rates

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**Introduction:** Management of symptomatic mature pancreatic fluid collections (PFCs) such as pancreatic pseudocysts or walled-off necrosis now involve the use of lumen-apposing metal stents (LAMS) under endoscopic ultrasound (EUS) guidance. LAMS appear to be superior compared to traditional plastic stents however require close follow up. Numerous studies have shown a benefit of LAMS for short-term (e.g., 4-week) outcomes. However, there is a lack of data evaluating longer term outcomes. Our aim was to investigate 90-day readmission rates after LAMS placement over an 8-year period.

**Methods:** We identified all patients  $\geq$  18 years who underwent deployment of a LAMS from 01/01/2014 to 06/01/2021 at our urban, safety net hospital. We subsequently collected demographic data, cyst characteristics, and stent information. Follow-up upper endoscopies and imaging were examined to determine stent removal date and assess for complications. Hospital admission rates 90 days before and after stent placement were collected. Admissions were stratified into gastrointestinal (GI)-related or other.

**Results:** We identified 27 patients who underwent LAMS for drainage of mature PFCs. Of these, 18 were simple pancreatic pseudocysts (PP), 6 walled-off necrosis (WON), and 3 mixed collections. Mean age was  $52.1 \pm 11.0$  years, 66.7% male, 66.7% non-white, and 59.3% reported alcohol use. The average collection was  $6.6 \pm 2.0$  cm. Stents were removed in 81.5% of patients at a median of 37.5 days. 7.4% were lost to follow up, and 22.2% of patients had stent complications during follow-up: 2 bleeding, 2 stent migration, and 2 stent occlusions. Patients on average had  $1.00 \pm 0.20$  hospital admissions in the 90 days prior to stent placement vs  $0.48 \pm 0.17$  admissions 90 days after placement (mean difference  $0.52 \pm 0.17$ ,  $p < 0.05$ ). Of these patients, 64.7% of pre-stent hospitalizations were due to GI complaints vs 22.2% of post-stent hospitalizations ( $p < 0.05$ ). Neither cyst size nor time to stent removal were significantly related to complications.

**Conclusion:** LAMS for the management of mature pancreatic fluid collections were effective at reducing 90-day readmission rates especially in the setting of GI-related complaints. Although there was a delay in LAMS removal with a median of 38 days, it did not appear to translate into higher complication rates. Perhaps an extended use of LAMS beyond 4 weeks may prove to be safe and efficacious, however larger studies are required.

S1165

#### Endoscopic Retrograde Cholangiopancreatography Outcomes in Inflammatory Bowel Disease Patients: A 12-Year Analysis of a National Database

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**Introduction:** Inflammatory bowel disease (IBD) patients undergoing ERCP have not been well studied, with few prior studies existing within the current literature with conflicting results. The purpose of this study is to evaluate the impact of IBD on the occurrence of adverse events (AE) relating to ERCP.

**Methods:** This project utilized the National Inpatient Sample (NIS) database, the largest inpatient database in the United States. All patients 18 years or older with and without IBD undergoing ERCP were identified from 2008 to 2019. Relevant patient characteristics were identified using ICD-9 and ICD-10 codes. Bivariate analyses were conducted using chi-square tests for categorical variables and t-tests for continuous measures. The AEs of interest were pancreatitis, cholecystitis, infection, perforation, gastrointestinal (GI) bleeding, length of stay (LOS), and total inpatient cost. These post-ERCP AEs were analyzed using multivariate logistic or linear regression controlling for age, race, and existing comorbidities using the Charlson comorbidity index (CCI). The primary and secondary diagnoses were used as the procedure indication and the subsequent diagnoses as complications. All analyses accounted for the complex sampling scheme of the NIS. P-values less than 0.05 were considered statistically significant.

**Results:** 2,013,712 patients had an ERCP from the years 2008 to 2019. Of those, 5993 had IBD. IBD patients undergoing ERCP experienced decreased post-ERCP pancreatitis (PEP) (2.41% vs 3.56%,  $p=0.0242$ ), GI bleeding (0.24% vs 0.96%,  $p=0.0093$ ), mortality (0.35% vs 1.47%,  $p=0.0014$ ), LOS (5.4 vs 6.4 days,  $p < 0.0001$ ) and inpatient cost (\$53,848 vs \$70,096,  $p < 0.0001$ ). There was no significant difference in cholecystitis, infection, or perforation. Adjusted logistic regression indicated that IBD patients remained less likely to experience post-ERCP bleeding (OR: 0.29,  $p < 0.0001$ ). There was no difference between PEP or mortality after adjusting for covariates. (Table)

**Conclusion:** There was no significant difference in PEP or mortality, except for an apparent lower risk of GI bleeding in the IBD group. Multiple factors may have contributed to these findings including significant advances in medical therapy for IBD. Additionally, the association of biliary disease with IBD does not necessarily parallel active intestinal inflammation. This is the largest study evaluating outcomes in IBD patients undergoing ERCP.

**Table 1. Comparison between Post-ERCP Outcomes in Inflammatory Bowel Disease (IBD) and Non-IBD Patients**

Outcome	IBD Status		p-value
	Yes (n=5993)	No (n=2,007,719)	
Age	52.6 (0.59)	59.5 (0.13)	< .0001
Race			< .0001
White	4,382 (73.1%)	1,257,759 (62.6%)	
Black	458 (7.6%)	169,493 (8.4%)	
Hispanic	412 (6.9%)	291,708 (14.5%)	
Asian or Pacific Islander	71 (1.2%)	70,233 (3.5%)	
Native American	20 (0.3%)	12,865 (0.6%)	
Other	147 (2.5%)	64,217 (3.2%)	
Unknown	503 (8.4%)	141,445 (7.0%)	
Gender			0.0006
Female	3,244 (54.13%)	1,181,239 (58.83%)	
Male	2,749 (45.87%)	825,269 (41.10%)	
Comorbidity Index	0.9 (0.03)	1.8 (0.01)	< .0001
Pancreatitis	144 (2.41%)	71,381 (3.56%)	0.0242
Cholecystitis	46 (0.76%)	20,878 (1.04%)	0.3501
Infection	388 (6.48%)	147,601 (7.35%)	0.2166
Perforation	6 (0.09%)	1,915 (0.10%)	0.9882
Bleeding	15 (0.24%)	19,369 (0.96%)	0.0093
Mortality during hospitalization	21 (0.35%)	29,580 (1.47%)	0.0014
Length of Stay (mean, SE)	5.4 (0.18)	6.4 (0.03)	< .0001
Total Charges (mean, SE)	\$53,848 (2,645.45)	\$70,096 (789.21)	< .0001
Adjusted Logistic Regression	Model 1. Pancreatitis	Model 2. Bleeding	Model 3. Mortality
Independent Variable	Odds Ratio (95% CI)	Odds Ratio (95% CI)	Odds Ratio (95% CI)
No IBD	1.38 (0.97-1.96) p=0.0711	3.47 (1.13-10.63) p=0.0297	2.14 (0.81-5.64) p=0.1262
Age at admission	1.00 (1.00-1.00) p< .0001	1.01 (1.01-1.01) p< .0001	1.03 (1.03-1.03) p< .0001
Race	p< .0001	p< .0001	p< .0001
White	ref	Ref	Ref
Black	1.03 (0.96-1.11)	1.30 (1.15-1.46)	1.39 (1.27-1.51)
Hispanic	1.45 (1.32-1.58)	1.13 (1.01-1.25)	0.93 (0.84-1.02)
Asian or Pacific Islander	1.83 (1.64-2.05)	1.91 (1.65-2.21)	1.26 (1.11-1.42)
Native American	0.95 (0.75-1.20)	1.20 (0.80-1.79)	1.28 (0.92-1.79)
Other	1.13 (1.01-1.26)	1.27 (1.06-1.52)	1.16 (1.00-1.35)
Unknown	0.78 (0.70-0.87)	1.17 (1.04-1.33)	1.19 (1.06-1.33)
Female Gender	0.99 (0.95-1.02) p=0.4110	0.81 (0.76-0.87) p< .0001	0.85 (0.80-0.89) p< .0001
Comorbidity Index	1.00 (0.99-1.01) p=0.5016	1.04 (1.03-1.05) p< .0001	1.30 (1.29-1.31) p< .0001

S1166

**Effects of Gastrointestinal Surgery on Post-ERCP Complications: A National Inpatient Sample Database Analysis**

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**Introduction:** Endoscopic retrograde cholangiopancreatography (ERCP) is a diagnostic and therapeutic tool for pancreaticobiliary diseases. Surgery on the gastrointestinal tract can alter the anatomy and lead to challenges for ERCPs performed. There is currently no data on the association between ERCP complications and post-operative patients with GI tract surgeries.

**Methods:** The National Inpatient Sample database was used to identify hospitalized patients over 18 years old who had an ERCP procedure between 2007-2017. Patients were divided into two groups: those who had GI tract surgeries and those who did not. Patients were matched by age, race, gender, and the Elixhauser comorbidity index. Primary outcomes were rates of post-ERCP pancreatitis, cholangitis, cholecystitis, infection, hemorrhage, and perforation. The types of GI tract surgeries were then specified to evaluate their rates of complications as secondary outcomes. Multivariate analyses were performed to assess outcomes.

**Results:** There were 79,335 patients admitted from 2007-2017 who underwent an ERCP procedure and had GI tract surgeries. Primary outcomes were significant (p< 0.05) for post-ERCP pancreatitis (OR 1.3), cholangitis (OR 0.7), infection (OR 1.3), hemorrhage (OR 5.0), and perforation (OR 1.5). Patients were then separated into those who had procedures for an artificial opening which was significant (p< 0.05) for post-ERCP pancreatitis (OR 1.9) and infection (OR 1.4), bariatric surgery which was significant for pancreatitis (OR 1.4), cholangitis (OR 0.3), and perforation (OR 2.3), and those with intestinal bypass and anastomosis which was significant for pancreatitis (OR 0.3), cholangitis (0.5), and infection (0.5).

**Conclusion:** We postulate that the post-operative anatomical changes, type of surgery performed, and equipment limitations can lead to increased risks of post-ERCP pancreatitis, infection, hemorrhage, and perforation. In addition, patients with artificial openings such as gastrostomy tubes have a tract for pathogens that can predispose them to infections. Those with bariatric surgeries have a decrease in post-ERCP cholangitis rates that could be due to the technique used which can minimize bile duct obstruction. Also, the decrease in post-ERCP pancreatitis, cholangitis, and infection in patients with intestinal bypass surgeries may depend on the indication and extent of the bypass surgery. Patients who had GI tract surgeries will need to understand these risks associated with ERCP procedures. (Table)

**Table 1. Clinical Outcomes of Patients With all types of Gastrointestinal Tract Surgeries, Artificial Opening, Bariatric surgery, or Intestinal Bypass and Anastomosis, who had Endoscopic Retrograde Cholangiopancreatography (ERCP)**

Complication	GI Tract Surgeries		Artificial Opening		Bariatric Surgery		Intest. Byp/ Anast.	
	P-Value	Odds Ratio (95% CI)	P-Value	Odds Ratio (95% CI)	P-Value	Odds Ratio (95% CI)	P-Value	Odds Ratio (95% CI)
Post-ERCP Pancreatitis	0.020	1.3 (1.0-1.7)	0.001	1.9 (1.3-2.8)	0.039	1.4 (1.0-2.0)	0.002	0.3 (0.2-0.7)
Post-ERCP Cholangitis	0.044	0.7 (0.5-1.0)	0.272	1.3 (0.8-2.0)	< 0.001	0.3 (0.1-0.6)	0.027	0.5 (0.3-0.9)
Post-ERCP Cholecystitis	0.397	0.7 (0.4-1.5)	0.997	1.0 (0.3-3.4)	0.958	NS	-	-
Post-ERCP Infection	0.013	1.3 (1.1-1.6)	0.005	1.4 (1.1-1.8)	0.625	1.1 (0.8-1.5)	0.027	0.5 (0.3-0.9)
Post-ERCP Hemorrhage	0.001	5.0 (1.9-13.0)	0.938	1.0 (0.5-2.1)	0.355	0.7 (0.3-1.5)	-	-
Post-ERCP Perforation	0.044	1.5 (1.0-2.3)	0.122	1.7 (0.9-3.1)	0.006	2.3 (1.3-4.3)	-	-

CI = Confidence Interval, NS = Not Significant.

S1167

**Effects of Race on Post-ERCP Complications: A National Inpatient Sample Database Analysis**

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**Introduction:** Various risk factors have been identified that increase the risk of complications of endoscopic retrograde cholangiopancreatography (ERCP). Limited studies have evaluated race as a risk factor for post-ERCP complications. We aim to compare rates of post-ERCP complications among patients of different races to determine if it is a risk factor.**Methods:** The National Inpatient Sample database was used to identify hospitalized patients over 18 years old who had an ERCP procedure between 2007 - 2017 using ICD-9 and ICD-10 codes. Patients were divided into six groups by race identified by the Agency for Healthcare Research and Quality (AHRQ). Primary outcomes were the associations of race with post-ERCP pancreatitis, cholangitis, cholecystitis, infection, hemorrhage, and perforation as determined by chi-squared analysis. Rates of complications were calculated per 1,000 ERCP procedures done for each race as well to compare complications within each race.**Results:** Of 1,828,218 patients who met inclusion criteria, 1,239,056 were identified as White; 167,859 as Black; 281,136 as Hispanic; 66,264 as Asian or Pacific Islander; 12,317 as Native Americans; and 61,586 as Other. Primary outcomes were significant ( $p < 0.001$ ) when comparing the number of patients with post-ERCP pancreatitis, perforation, cholangitis, cholecystitis, infection, and hemorrhage among different races. Comparison of the rates per 1,000 ERCP procedures showed that Asians or Pacific Islanders were noted to have higher rates of pancreatitis, cholangitis, infection, hemorrhage, and perforation. Infection was the most common complication within each race, followed by pancreatitis.**Conclusion:** We postulate that the elevated rates of post-ERCP pancreatitis, cholangitis, infection, hemorrhage, and perforation in Asians or Pacific Islanders can be attributed to the higher incidences of biliary tract pathology. Other variations in post-ERCP complications among the different racial groups may be related to the different rates of pancreaticobiliary diseases, possibly from genetic predispositions that have not been studied yet. Moreover, the NIS database has a disproportionately large sample size of Whites compared to other racial groups, which makes the NIS database not an ideal database for this study. Further studies with a more balanced, diverse population will be needed to better analyze these racial differences.

S1168

**EUS Assessment of Portal Pressure Gradient Identifies a Significant Amount of Previously Undiagnosed Clinically Significant Portal Hypertension**Jerome C. Edelson, MD<sup>1</sup>, Scott Edelson, MD<sup>1</sup>, Don Rockey, MD<sup>2</sup>, Christian Horn, MD<sup>3</sup>, John Magulick, MD<sup>4</sup>, John Quiles, MD<sup>3</sup>. <sup>1</sup>Brooke Army Medical Center, San Antonio, TX; <sup>2</sup>Digestive Disease Research Center, Medical University of South Carolina, Charleston, SC; <sup>3</sup>San Antonio Military Medical Center, Fort Sam Houston, TX; <sup>4</sup>San Antonio Uniformed Services Health Education Consortium, San Antonio, TX.**Introduction:** Portal hypertension (PH) is a complication of cirrhosis and a harbinger of decompensation. Assessment of the portal pressure gradient (PPG) provides valuable information to aid in the assessment, staging, and prognostication of disease. Previously, PPG assessment was performed by interventional radiology and did not include simultaneous endoscopic assessment. Newer techniques have been developed that enable direct EUS directed vascular access, enabling assessment by endoscopists. We report our data on a real-world experience in the utilization of this technique.**Methods:** We performed a retrospective analysis of patients who underwent EUS-PPG from February 2021 to May 2022 performed at a military tertiary care center. Extensive demographic and clinical data were abstracted (including indication, referral source, effect on management, medical history, social history, endoscopic findings, procedural characteristics, and biopsy results). Statistical analysis was performed with t-test assays.**Results:** 18 patients underwent EUS-PPG (Table). Technical success was achieved in 17/18 patients. There were no adverse events. Average age was 64 years, 72% were male, 33% had a prior history of NAFLD/NASH, and 22% had a known diagnosis of cirrhosis. The average Child-Pugh score was  $5.1 \pm 0.5$ , MELD-Na was  $9 \pm 3$ , and FIB-4 was  $3.74 \pm 4.5$ . The most common indication for evaluation was to establish or exclude the diagnosis of cirrhosis. Esophageal varices were present in 11% of patients and portal hypertensive gastropathy was present in 33%. On EUS, 33% of patients had a nodular liver contour. The mean PPG was  $5.8 \pm 4.5$  mmHg and 27% of patients had clinically significant portal hypertension (CSPH, PPG  $\geq 10$  mm Hg). The middle hepatic vein and left portal vein were the most frequently accessed. Concurrent EUS-liver biopsy was performed in 15/18 patients, was 100% diagnostic, and concordant with PPG findings. The left lobe was most commonly accessed (73%) and bilobar biopsy was performed in 26%. PPG data led to management changes in 94% of patients including confirming or refuting a diagnosis of cirrhosis, changing medications, or proceeding with surgery.**Conclusion:** EUS-PPG is safe and technically feasible. PPG measurement resulted in significant changes in patient management. Larger studies are required to correlate EUS-PPG with other non-invasive assessments of liver disease.**Table 1.**

Variable	Average $\pm$ (Standard Deviation) or n (%) total
Demographics	
Age	64 $\pm$ 12
Male gender	13 (72%)
Hispanic race/ethnicity	6 (33%)
Caucasian	10 (55%)
African American	1 (5%)
Asian	1 (5%)
Clinical Features	
History of NASH/NAFLD	6 (33%)

Table 1. (continued)

Variable	Average ± (Standard Deviation) or n (% total)
History of cirrhosis	4 (22%)
History of alcohol use	12 (66%)
MELD-Na	9 ± 3
Child-Pugh Score	5.1 ± 0.5
FIB-4	3.74 ± 4.5
LSM (kPa, Fibroscan) (n=9)	22 ± 20
Indication	
Establish/exclude diagnosis of cirrhosis	10 (55%)
Assess surgical risk/candidacy	5 (27%)
Assess ability to switch medications	3 (16%)
Alternative indication for endoscopy	9 (50%)
Endoscopic findings	
Esophageal varices	2 (11%)
Gastric varices	1 (5%)
Portal hypertensive gastropathy	6 (33%)
Portal pressure findings	
Clinically significant portal hypertension ( >10mmHg)	5 (27%)
Average hepatic vein pressure (mmHg)	11.2 ± 8.9
Average portal vein pressure (mmHg)	15.3 ± 6.8
Average PPG (mmHg)	5.8 ± 4.5
Middle hepatic vein access	13 (72%)
Left portal vein access	13 (72%)
EUS Findings	
Nodular liver contour	6 (33%)
Hyperechoic parenchyma	14 (77%)
Liver Biopsy (n=15)	
Adequate specimens	15 (100%)
Wet suction technique	15 (100%)
Bilobar biopsies	4 (26%)
Left lobe only biopsy	11 (73%)
Outcome	
Changed surgical plan	5 (27%)
Changed diagnosis of cirrhosis (de-escalation)	4 (22%)
Escalated care (confirmed advanced fibrosis vs cirrhosis)	5 (27%)
Changed medication (Rx or dose)	4 (22%)

## INTERVENTIONAL ENDOSCOPY

S2795 Presidential Poster Award

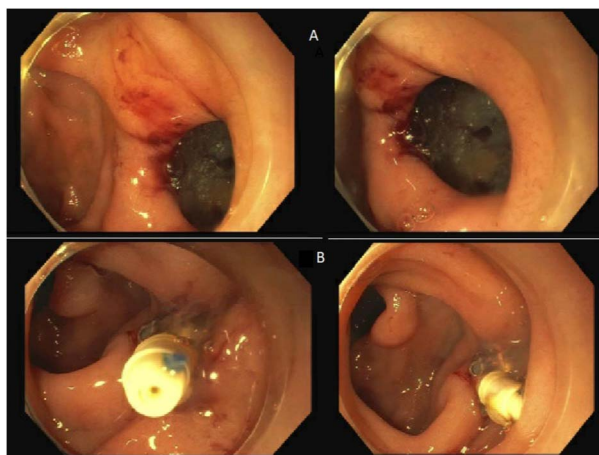
## Closure of an Iatrogenic Duodenal Perforation Using a Novel Tack and Suturing System

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**Introduction:** The novel endoscopic tack and suturing system, X-Tack endoscopic HeliX tacking system (Apollo Endosurgery, Austin, Tex, USA), is an emerging technique used for the closure of large tissue defects, but its efficacy in closure of full-thickness defects remains limited. We describe a case of a successful closure of a full-thickness iatrogenic defect in the duodenum.

**Case Description/Methods:** We present the case of a 65-year-old female diagnosed with an iatrogenic duodenal perforation. The patient was initially referred for an upper gastrointestinal tract endoscopic ultrasound (EUS) for evaluation of an asymptomatic 6mm pancreatic tail cyst found incidentally on computed tomography (CT). The EUS was complicated by a duodenal perforation in the first portion of the duodenum. The defect was 20mm in size and was immediately repaired using the tack and suture device. The patient was admitted for observation post-procedure. She was treated with broad spectrum antibiotics to prevent intra-abdominal infection. Tight closure was confirmed by absence of oral contrast extravasation on CT imaging. Her hospital course remained uncomplicated and she was discharged on day 5 after advancing her diet. (Figure)

**Discussion:** This case demonstrates the utility and safety of the X-Tack endoscopic suturing system for full thickness gastrointestinal perforations of the upper GI tract. Its ease of use makes it a promising technique that can become widely employed. In this case, the location of the perforation in the first portion of the duodenum makes the use of other closure devices challenging. Further data is needed to make recommendations on its routine use in the closure of full-thickness defects.



[2795] Figure 1. A: Duodenal defect B: Duodenal defect after closure.

S2796 Presidential Poster Award

## Combined Antegrade Retrograde Dilatation of Radiation-Induced Benign Esophageal Obstruction With Septum Formation: A Case Report

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**Introduction:** Approximately 0.8% to 2.6% of patients develop esophageal stenosis and strictures after exposure to radiation therapy for oropharyngeal cancer treatment. Partial esophageal stenosis is usually treated with antegrade dilatation. However, this is not possible with complete esophageal strictures. We present a case with radiation induced complete esophageal obstruction with septum formation that was treated using a combined antegrade retrograde dilatation (CARD) technique with the use of a needle knife for septotomy.

**Case Description/Methods:** A 76-year-old male patient who was recently diagnosed with stage 3 squamous cell carcinoma at the base of the tongue and has a feeding percutaneous gastrostomy (PEG) tube presented with symptoms of dysphagia and recurrent aspirations three weeks after he completed the last radiation therapy session. A video swallow test was done and showed findings suggestive of esophageal obstruction. Endoscopic evaluation was performed and esophagoscopy demonstrated a benign appearing complete esophageal septum. The scope could not traverse the septum (Figure a). Another trial using the Ultraslim scope also failed. Then, the CARD technique was performed where an Ultraslim gastroscopy was introduced through the PEG tube track and advanced to the level of obstruction in the proximal esophagus. Simultaneously, the adult gastroscopy was introduced through the mouth until it reached the level of obstruction. The transillumination from the adult gastroscopy was seen by the Ultraslim scope on the opposite side. Free needle septotomy was performed under the guidance of both the transillumination and direct visualization (Figure b). A 0.035-inch Jagwire was advanced through the needle knife to the distal side of the esophagus. A Savary wire was advanced under the direct vision of the adult gastroscopy through the septotomy. Dilatation was performed with a Savary dilator under fluoroscopy and endoscopy guidance with the Ultraslim scope situated in the distal esophagus (Figure c). EGD was repeated after two weeks and showed a patent lumen.

**Discussion:** Complete esophageal stenosis after radiation therapy is not uncommon and should always be kept in mind when patients present with dysphagia symptoms. CARD technique is considered the preferred initial intervention in most cases where a glidewire or suction septotomy are usually used. However, the use of needle knife for septotomy can be considered in selected cases such as in our case.





Figure 1 a



Figure 1 b



Figure 1 c

[2796] **Figure 1.** a) complete esophageal septum/membrane b) Free needle septotomy c) a Savary dilator under endoscopic guidance.

S2797 Presidential Poster Award

#### Closing the Gap: First Report of Endoscopic Suture Closure of Malignant Gastric Hemorrhage

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<sup>1</sup>University of Minnesota, Minneapolis, MN; <sup>2</sup>Minneapolis Veterans Affairs Health Care System, Minneapolis, MN; <sup>3</sup>University of Minnesota and Minneapolis Veterans Affairs Health Care System, Minneapolis, MN.

**Introduction:** Gastrointestinal bleeding secondary to luminal malignancy is typically difficult to manage with conventional endoscopic therapies. Endoscopic suturing devices have become increasingly popular for the management of various resection defects, inadvertent perforations, and bariatric endosurgery. Limited recent data suggests that this technology is effective for refractory bleeding from benign peptic ulcer disease. Herein we describe a case of the successful endoscopic closure of a bleeding malignant gastric ulcer using endoscopic suturing.

**Case Description/Methods:** A 60-year-old male with a past history of primary thrombocytopenia, and recent diagnosis of signet ring gastric adenocarcinoma/linitis plastica (T2, N2, M0) on FLOT chemotherapy (5-fluorouracil, leucovorin, oxaliplatin, and docetaxel) presented with hematemesis and acute on chronic anemia. Physician examination was notable for tachycardia and hypotension. Laboratory evaluation was notable for a hemoglobin of 7.8 g/dL from 15.0 g/dL four days prior. The patient was intubated and urgent upper endoscopy in the intensive care unit was performed which showed active oozing and bleeding from a cratered gastric ulcer (previously biopsy proven adenocarcinoma) on the proximal lesser curvature measuring approximately 20 mm in size (A). Diffuse thickening of gastric folds consistent with linitis plastica was also seen. Initial attempts with bipolar cautery and epinephrine injection were unable to achieve hemostasis. An endoscopic suturing system was employed to place a suture in a figure of

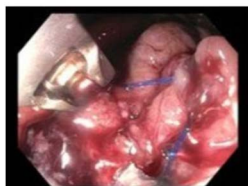


eight fashion and cinched at end with closure of the ulcer bed (B). The ulcer bed was not visible after suturing and hemostasis was achieved (C). Repeat upper endoscopy after two weeks for nasojejunal feeding tube placement did not show presence of ulcer and any recurrent bleeding. Patient is being clinically optimized to resume chemotherapy.

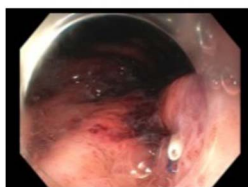
**Discussion:** To our knowledge, we describe herein the first case of successful use of endoscopic suturing for closure of a bleeding malignant gastric ulcer. We hypothesize that the thickened gastric folds secondary to the histologic nature of linitis plastica allowed for adequate tissue purchase at the margins of the bleeding gastric ulcer which would typically be precluded in malignant tissue due to its friable nature.



**Figure 1) A:** Endoscopic image of gastric adenocarcinoma and associated cratered ulcer with oozing hemorrhage.



**Figure 1) B:** Endoscopic image of suturing device during closure.



**Figure 1) C:** Endoscopic image of successfully approximating edges of ulcer after endoscopic suturing without evidence of bleeding.

[2797] **Figure 1.** A: Endoscopic image of gastric adenocarcinoma and associated cratered ulcer with oozing hemorrhage. B: Endoscopic image of suture device during closure. C: Endoscopic image of successful approximating edges of ulcer after endoscopic suturing without evidence of bleeding.

#### S2798 Presidential Poster Award

##### Diagnosis and Correction of Afferent Limb Reflux After Single Anastomosis Duodenoileostomy: A Novel Endoscopic Approach

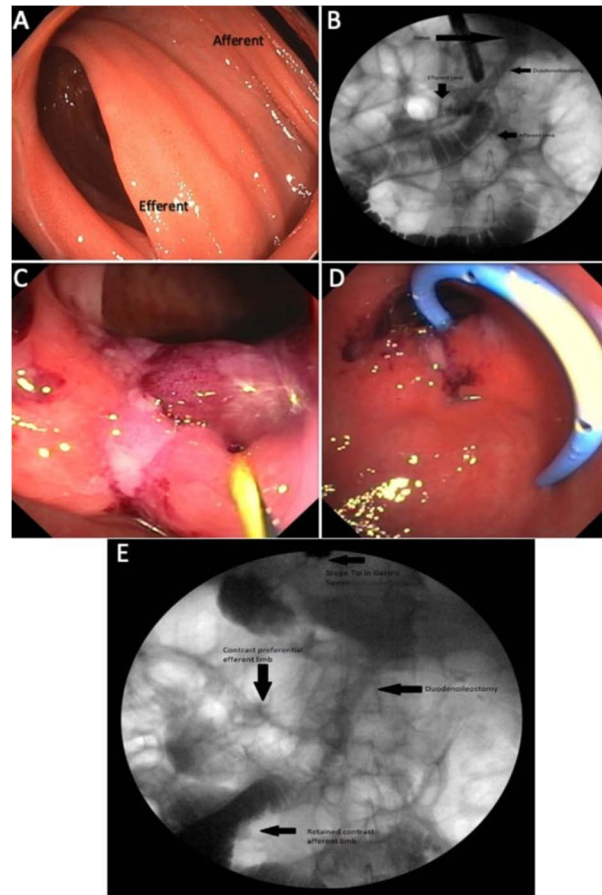
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**Introduction:** Symptomatic afferent hepatobiliary limb reflux is a rare complication after single-anastomosis duodenoileostomy with sleeve gastrectomy (SADI-S). This condition is clinically distinct from afferent loop syndrome (ALS), and is characterized by retrograde filling of the afferent limb without features of mechanical obstruction. It previously necessitated surgical revision to include creation of a Braun entero-enterostomy (BEE). During surgery, preventative tacks can be placed to minimize afferent limb reflux. Endoscopic diagnosis and treatment are not well described. Here, we report a case of symptomatic afferent limb reflux causing dehydration treated with full thickness endoscopic plication.

**Case Description/Methods:** A 62-year-old male underwent SADI-S with afferent limb tacking proximal to the pylorus. Two months later, he presented with RUQ pain, nausea, constipation, and poor oral liquid intake necessitating IV fluid hydration. Heavier liquids and solids were tolerated. Due to concern for anastomotic complication, imaging was obtained with UGI series and CT with contrast which were normal. Given high clinical suspicion for limb reflux the patient was referred for upper endoscopy. Endoscopy demonstrated a normal esophagus and gastric sleeve anatomy. The biliopancreatic (BP) limb was noted to have acute angulation and contained bile [A]. The scope was then advanced and fluoroscopy confirmed the correct limb. The patient was then placed in Trendelenburg position and contrast was injected into the stomach, demonstrating preferential flow in the BP limb, which confirming afferent limb reflux [B]. Using an endoscopic suturing device, the septum of the anastomosis was sutured to the pylorus, reducing the limb diameter and changing the angle of the anastomosis [C]. To avoid ALS, a double pigtail plastic stent was placed in the BP limb [D]. Final fluoroscopic image demonstrated preferential flow of contrast into the efferent limb [E]. The procedure was tolerated well at follow-up, his oral tolerance had returned to normal with resolution of all symptoms.

**Discussion:** We present the case of a patient who underwent SADI-S and developed symptomatic afferent hepatobiliary limb reflux despite prophylactic tacking. This was successfully managed with endoscopic suturing, avoiding further surgical intervention. Our case demonstrates a novel use of endoscopic suturing devices and future research is needed to better understand and develop uses of these devices in treating bariatric surgery complications.



[2798] **Figure 1.** A. Biliopancreatic (BP) limb B. Fluoroscopy demonstrating retrograde flow in the BP limb C. Anastomotic septum after suturing D. Pigtail placed in the BP limb E. Preferential flow into the efferent limb after plication.

S2799 Presidential Poster Award

**Disseminated Cryptococcosis Masquerading as Large Abdominal Mass Concerning for Pancreatic Malignancy in HIV-Positive Patient**

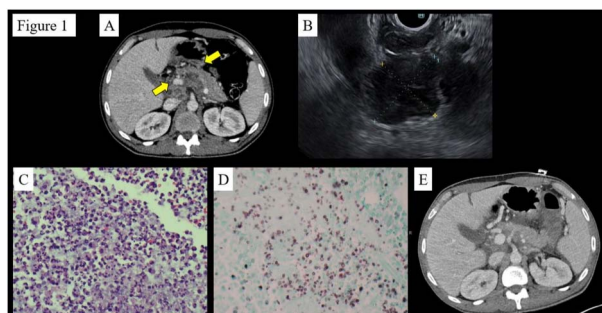
Monica Dzwonkowski, DO<sup>1</sup>, Umair Iqbal, MD<sup>1</sup>, Nihit Shah, MD<sup>2</sup>, Bradley D. Confer, DO<sup>1</sup>.

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**Introduction:** Gastrointestinal cryptococcus is a rare occurrence in HIV-positive patients. Symptoms may be nonspecific thus the differential for abdominal masses must remain broad. We report a patient with HIV who presented with abdominal pain and watery diarrhea, found to have a large abdominal mass on computed tomography initially thought to be lymphoma or a primary pancreatic tumor. He underwent endoscopic ultrasound-guided (EUS) biopsy of the mass which was consistent with a cryptococcoma.

**Case Description/Methods:** A 55-year-old male presented with severe, diffuse abdominal pain for one week duration associated with profuse watery, non-bloody diarrhea and intermittent chills. Medical history included HIV for 30 years with poor compliance with antiretroviral regimen, recent pneumocystis pneumonia and previous cryptococcal meningitis. Physical exam revealed an ill appearing, cachectic male with abdominal tenderness. Labs revealed a white blood cell count of 18.5 K/uL (ref: 4.0-10.8 K/uL) with 84% neutrophils (ref: 40-75%), sodium of 132 mmol/L (ref: 135-146 mmol/L) and potassium 2.7 mmol/L (ref: 3.5-5.1 mmol/L). His viral load was 109,385 copies/mL (ref: neg copies/mL) and absolute CD4 count was 56 lymphocytes/uL (ref: 330-1520 lymphocytes/uL). Liver chemistries were unremarkable. Stool studies for regional pathogens, ova and parasites, and clostridium difficile were negative. A CT scan of the abdomen and pelvis revealed ill-defined cystic/necrotic upper abdominal lymphadenopathy with mass effect and possible invasion of the adjacent liver (Figure 1A). The pancreas and caudate lobe of the liver were inseparable from the mass which raised concern for primary pancreatic tumor or lymphoma. He underwent EUS-guided biopsy of the peripancreatic mass (Figure 1B) with pathology consistent with a cryptococcoma (Figure 1C, 1D). He was started on amphotericin B and transitioned to high dose fluconazole due to adverse effects. Repeat imaging revealed significant reduction of the mesenteric lymphadenopathy (Figure 1E). He was discharged in stable condition and remained on fluconazole indefinitely.

**Discussion:** Cryptococcal infection remains the second most common cause of acquired immunodeficiency syndrome related mortality after tuberculosis. The most common sites of cryptococcal infection are the lungs, brain, eyes, or central nervous system; abdominal dissemination is rare. Biopsy via EUS can be useful in diagnosis of cryptococcoma. Early identification and treatment of cryptococcal infections can increase survival rates.



[2799] **Figure 1.** A) CT image showing ill-defined cystic/necrotic upper abdominal lymphadenopathy with mass effect and possible invasion of the adjacent liver B) Endoscopic ultrasound imaging showing peripancreatic mass C) Hematoxylin and Eosin cellblock at 40X magnification showing abundant neutrophils and necrotic debris D) Grocott's Methenamine Silver stain showing fungal yeast with narrow base budding E) Significant reduction of the mesenteric lymphadenopathy after antifungal therapy initiation.

#### S2800 Presidential Poster Award

##### Endoscopic Ultrasound Guided Drainage of a Massive Right Sided Hemorrhagic Liver Cyst: The Rapidly Evolving Field of Endo-Hepatology

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**Introduction:** Hepatic cysts are the most common benign lesions in the liver. Overall incidence among the population is about 5%, being more common in women. Therapeutic interventions are reserved for acutely symptomatic patients with life threatening complications. Herein, we highlight a unique case of a patient with a massive right hepatic cyst, drained under the guidance of an endoscopic ultrasound (EUS), along with a literature review of its applications in Endo-Hepatology.

**Case Description/Methods:** A 76-year-old male with a history of benign liver cyst, presented with severe right upper quadrant abdominal pain associated with nausea and vomiting. On physical examination, he had a markedly distended, diffusely tender abdomen, with palpable hepatomegaly. Initial blood work revealed a Hb of 6.7 g/dL (known baseline Hb was 9 g/dL). Compared to previous imaging from 2014 (**Figure A**), CT abdomen revealed significant enlargement of a known right hepatic cyst (largest dimension: 24.2 X 16 X 25.6 cm) (**Figure B**). Volume resuscitation with blood transfusions was done. An EUS guided drainage of the cyst using a Lumen-Apposing Metal Stent (LAMS) was performed. After locating an appropriate avascular window, the cyst was successfully traversed, sterile contrast was used to delineate the lesion, followed by deployment of the LAMS. A total of 2.8 liters of dark, reddish-brown fluid was drained, with an additional 1.1 liter suctioned out through a nasogastric (NG) tube over the next 24 hours. Following the procedure, the patient remained hemodynamically stable with significant improvement symptomatically.

**Discussion:** Diagnostic imaging is essential in delineating the characteristics of liver cysts to determine the appropriate intervention. Decision regarding the choice of intervention should be individualized for each patient. Therapeutic interventions for liver cysts are predominantly performed through a percutaneous (PC) route, with EUS being deemed as a safe alternative when PC intervention is not favorable. The efficacy and recurrence rates of liver cysts after drainage with EUS versus PC drainage with sclerotherapy have been compared previously, with EUS guided drainage being recognized traditionally as a safe approach in drainage of left/caudate lobe hepatic cysts, and PC drainage being preferred for right lobe/hepatic dome cysts. EUS also aids in detection of smaller, focal liver lesions not apparent on gross imaging, elastography, biopsies, portosystemic pressure gradient monitoring and thermal ablative therapy.



[2800] **Figure 1.** Figure A : 2014, demonstrates the right hepatic cyst. Figure B : 2022, demonstrates the significantly enlarged right hepatic cyst (largest dimension : 24.2 X 16 X 25.6 cm).

#### S2801 Presidential Poster Award

##### Mucosal Ablation Salvage Therapy After Prior TIF for Recurrent GERD

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**Introduction:** Gastroesophageal reflux disease (GERD) is a major cause of upper GI complaints and affects approximately a quarter of Americans. If medical therapy with proton pump inhibitors or histamine antagonists fails, there are endoscopic interventions that can be offered to decrease symptoms. One such endoscopic procedure is called anti-reflux mucosal ablation or ARMA. ARMA is a minimally invasive option available to the general endoscopist even in low resource settings and can be an effective treatment even after other techniques have been attempted such as transoral incisionless fundoplication (TIF).

**Case Description/Methods:** A 66-year-old female with severe GERD, confirmed with pH impedance testing, presented with recurrent heartburn two years after successful treatment with TIF. High dose PPI improved the pain but did not resolve it. She continued to have daily severe symptoms. She could not identify any dietary triggers or exacerbating factors other than laying down or bending over. She had no hematemesis, dysphagia or abdominal pain. There was no family history of esophageal or gastric cancer. After discussion of her therapeutic options, she chose to pursue endoscopy with anti-reflux mucosal ablation (ARMA). The patient's GERD quality of life questionnaire was obtained at 0, 3 and 6-month follow-up from ARMA. The questionnaire consists of 10 questions on a scale of 1-5 with highest numbers being the most severe symptoms related to GERD. Her scoring improved from an initial score of 33 (max 50) down to 13 then 7 at 0, 3, and 6-month follow-up, respectively. (Figure)

**Discussion:** ARMA consists of ablation of the gastric mucosa in a horseshoe shape around the lower esophageal sphincter to induce scar tissue formation. As it contracts, it creates a tighter junction and decreases the risk of reflux. (See picture below). Circumferential ablation is avoided to decrease the risk for strictures. ARMA is an accessible anti-reflux endoscopic intervention because it utilizes argon plasma coagulation (APC) which is readily available to general endoscopists and has promising results for symptomatic relief for patients. It is less invasive than other anti-reflux surgeries and can be performed after other interventions if patients have recurrent symptoms of reflux and has the advantage of being repeatable. Importantly, this procedure is accessible to patients in low-resource environments, such as our county health system.



[2801] **Figure 1.** Example of Endoscopic View: a Pre-ARMA. Endoscopy in retroflexion demonstrated significant hernia but no sliding component. b Immediately post-ARMA. Endoscopy in retroflexion showed horseshoe-shaped artificial ulcer. c Appearance at 1 month post-ARMA. Mucosal flap valve was re-shaped. Inoue H et al. Anti-reflux mucosal ablation (ARMA) as a new treatment for gastroesophageal reflux refractory to proton pump inhibitors: a pilot study. *Endosc Int Open.* 2020 Feb;8.

#### S2802 Presidential Poster Award

##### Novel Use of Lumen Apposing Metal Stent for Management of Gastrointestinal Perforations

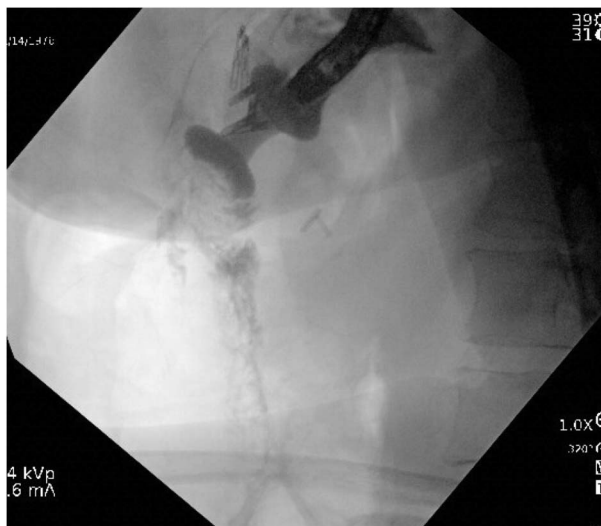
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<sup>1</sup>Wright Center for Graduate Medical Education, Scranton, PA; <sup>2</sup>University of Texas McGovern Medical School, Houston, TX.

**Introduction:** Gastrointestinal perforations located in the stomach or duodenum are most commonly managed by surgical repair. Recently, some cases have been reported in which fully covered stents have been utilized for repair in these perforations. To our knowledge, lumen-apposing self-expandable metal stents (LAMS) have not been used before for primary or secondary management of gastroduodenal perforations. Herein, we present 2 cases of perforations which were successfully managed using LAMS which are primarily indicated for managing pancreatic fluid collections.

**Case Description/Methods:** Case 1: A 45-year-old female with history of gastric bypass underwent outpatient balloon dilation for gastrojejunostomy anastomotic stricture which was complicated by a perforation. Patient was transferred to the hospital and underwent emergent EGD. True anastomotic lumen was difficult to visualize due to edema and clip closure placed during the initial procedure. Wire Guided ERCP balloons under fluoro were able to identify true jejunal lumen. A 20 x 10mm Axios stent (type of LAMS) was deployed to completely seal off the transmural defect. Contrast was injected through the LAMS with no extravasation noted. The LAMS was removed 2 months later at which time significant improvement was noted in the stricture without any evidence of mural defect. Case 2: A 66-year-old female was admitted with duodenal perforation who underwent repair with modified Graham patch. 4 days later, Gastrografin upper GI series revealed leak at the junction of first/second part of duodenum. Patient was referred to advanced endoscopist who performed egd with endoscopic over the scope clip closure and Axios placement. This was performed by using ERCP wire to identify the true lumen under fluoroscopic guidance all the way to ligament of trietz. This was followed by advancement of Axios 20 x 10 mm stent across the leak area. Contrast was injected without evidence of leak. The LAMS was removed 6 weeks later without complication.

**Discussion:** Use of covered metal stents is an emerging technique in management of GI perforations, however they do have an increased risk of migration. The “dumbbell” design of LAMS allows for dual anchoring capabilities and leads to a lower risk of migration. As demonstrated by our cases, LAMS could be considered for use during endoscopic management of GI perforations in the appropriate setting. With further studies, LAMS could become the standard of care for endoscopic management of GI perforations. (Figure)



[2802] **Figure 1.** 20 mm x 10 mm LAMS deployed across the gastrojejunal anastomosis.

#### S2803 Presidential Poster Award

##### Relief of Malignant Gastric Outlet Obstruction With Lumen Apposing Metallic Stent-Assisted Percutaneous Endoscopic Gastrostomy Tube After Roux-en-Y Gastric Bypass

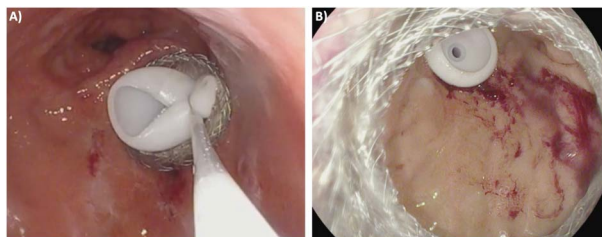
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**Introduction:** Accessing excluded parts of the GI tract via lumen-apposing metallic stent (LAMS) has opened a new horizon of possibilities for biliary and luminal interventions in patients with altered anatomy including Roux-en-Y gastric bypass (RYGB). LAMS is routinely placed for biliary intervention in patients with RYGB, however data is lacking to demonstrate its feasibility for bowel decompression. Here, we present a case of a percutaneous endoscopic gastrostomy (PEG) tube placement in the bypassed stomach using LAMS.

**Case Description/Methods:** A 63-year-old woman with a history of a lap-band converted to RYGB and metastatic small bowel adenocarcinoma on palliative chemotherapy presented with recurrent small bowel obstruction. Due to her extensive peritoneal carcinomatosis and malignant ascites, she was a poor candidate for surgical or radiological enterostomy tube placement. A decision was therefore made to proceed with a palliative LAMS assisted PEG tube placement. Under endoscopic ultrasound guidance, the bypassed stomach was punctured with a 19-gauge fine needle aspiration Slimline needle. A mixture of iodinated contrast with normal saline was injected, resulting in expansion of the bypassed stomach under fluoroscopic guidance. Following this, an electrocautery enhanced AXIOS delivery catheter was used to puncture and deploy a 20 mm x 10 mm LAMS into the bypassed stomach. The AXIOS was then dilated with a through-the-scope balloon dilator to a maximum diameter of 18mm under fluoroscopy. The endoscope was passed through the stent and the bypassed stomach was insufflated with carbon dioxide to oppose the gastric and abdominal walls. A 20Fr gastrostomy tube was then placed using the “pull guidewire” technique in the distal gastric body. A 25mm snare was used to grasp the bumper in order to minimize the surface size for ease of passage through the AXIOS stent. There was no immediate adverse event and the patient was successfully discharged one day post procedure after clinical resolution of her obstructive symptoms. (Figure)

**Discussion:** The venting tube is usually placed radiologically or surgically within the alimentary limb of the jejunum in patients with RYGB. However, in certain patients with obstruction distal to the jejuno-jejunal anastomosis or within the biliopancreatic limb, decompression of the excluded stomach is required. This case illustrates the feasibility of an EUS assisted venting PEG tube in a patient with gastric bypass anatomy.



[2803] **Figure 1.** A) Minimizing bumper surface size with a snare for ease of passage through the AXIOS stent. B) Successful placement of percutaneous gastrostomy placement through an AXIOS stent.

Video: <https://www.abstractscorecard.com/uploads/Tasks/upload/13811/VPBWHMTX-1279343-1-ANY.mp4>

#### S2804 Presidential Poster Award

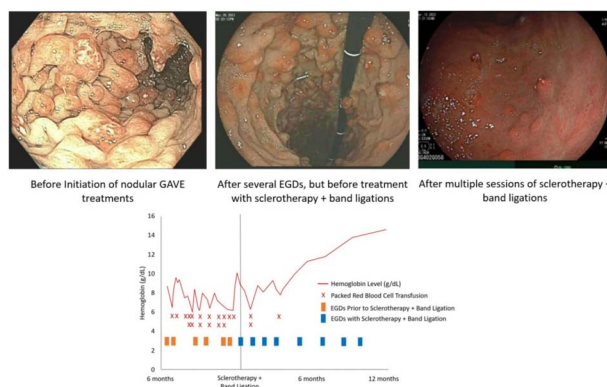
##### Refractory Bleeding From Nodular Gastric Antral Vascular Ectasia (GAVE): Is Combination Therapy of Sclerotherapy and Band Ligation the Solution?

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**Introduction:** Gastric antral vascular ectasia (GAVE) is a rare condition that presents in the distal stomach as dilated longitudinal columns of blood vessels prone to bleeding. Nodular GAVE is an even rarer variant and is often refractory to standard therapy for GAVE. Endoscopic treatment options widely varies and include rubber band ligation, radiofrequency ablation (RFA), argon plasma coagulation (APC), and resection with hot snare. We present a case study of successful treatment of nodular GAVE of a patient who has been refractory to repeated APC with combination therapy of band ligation and sclerotherapy.

**Case Description/Methods:** 63-year-old female with history of alcoholic cirrhosis and pancreatitis who has had persistent iron deficiency anemia thought secondary to chronic blood loss requiring constant transfusions. Initial EGD was performed at age of 60 with evidence of small grade 1 esophageal varices, portal hypertensive gastropathy, and innumerable gastric polyps in the gastric body and antrum that on biopsy was consistent with nodular GAVE. She then underwent 5 repeat EGDs over a span of 6 months with a combination RFA, APC, snare resection followed by hemostatic clipping, and banding, with continued recurrence of nodular GAVE and transfusion dependent anemia, with total of 17 units of packed red blood cell (pRBC) transfusions required over the same 6 month period. On her seventh EGD, she then underwent combination therapy of sclerotherapy (1% sodium tetradecyl sulfate (STS), 20mL total), which were injected at the base of the nodular areas, along with placement of 12 bands. Her transfusion requirements subsequently subsided after the initial sclerotherapy and band ligation combination session, and the patient received additional 6 EGD sessions with repeat combination therapy over the next 12 months, with notable visual improvement endoscopically subsequent to 2 sclerotherapy plus banding sessions. She only required a total of 3 units of pRBC transfusion over the same period. (Figure)

**Discussion:** We described the first known case of combination sclerotherapy and band ligation therapy for treatment of refractory nodular GAVE. The treatment resulted in significant reduction in transfusion requirements with concomitant improvement of the appearance of nodular GAVE even after just 2 sessions, and may be particularly useful in patients who have failed more conventional treatments. Additional studies will need to be performed to determine the safety and efficacy of this combination treatment modality.



[2804] **Figure 1.** endoscopic images of nodular GAVE before and after serial treatments, along with a timeline of hemoglobin level, transfusions, and endoscopic sessions/therapies over the patient's follow up period of 1.5 years.

#### S2805 Presidential Poster Award

##### Spiration Valve to Manage Esophago-Bronchial/Pleural Fistulas: A Novel Approach

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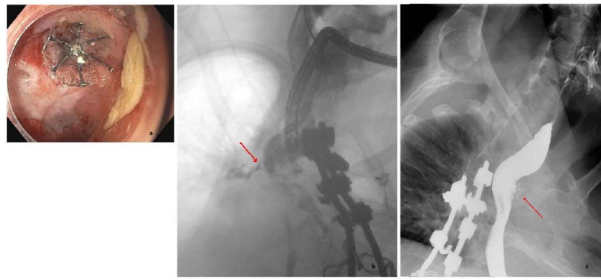
**Introduction:** Complications such as esophago-bronchial/pleural fistulas are the source of considerable morbidity/mortality. Surgical management is not possible in all patients and recurrence after conventional methods like clipping is common. Our aim was to develop novel endoscopic strategies to treat these fistulas where conventional methods either failed or were not advised.

**Case Description/Methods:** We used a combined endoscopic bronchoscopic approach to place a spiration valve in the management of non-healing, recurrent esophago-bronchial/pleural fistulas. A case report presented here illustrates this concept- in January 2022, a 39-year-old male with an esophago-bronchial fistula was treated with placement of a spiration valve. He was diagnosed in 2020, when he presented with an esophageal diverticulum with a fistulous opening at the base of the diverticula (Figure 1b). This was treated with a padlock clip which subsequently migrated. A repeat padlock clip was placed which migrated again with the formation of exuberant granulation tissue likely related to the padlock clip. Considerable edema was noted, and a feeding tube was placed so that edema could resolve before deciding about further intervention. A decision was made to use a combined endoscopic bronchoscopic approach to place a spiration valve. Valve placement was challenging, and a 9 mm valve was used (Figure 1a). It was accomplished under fluoroscopic, endoscopic and bronchoscopic guidance. Only a small amount of contrast leak was noted and that too only when contrast was injected under pressure in the esophagus.

**Discussion:** Immediate clinical success was noted. Fluoroscopic esophagogram after 14 days showed no oral contrast entering the tracheobronchial tree. Further follow up esophagograms in February and March 2022 showed persistent but considerably improved sinus tract adjacent to the spiration valve (Figure 1c).

**Conclusion:** Spiration valve placement is an effective way to manage esophago-bronchial/pleural fistulas especially where conventional methods have either failed or were not feasible. Trials on more cases are required to see the efficacy of this novel approach.





[2805] **Figure 1.** a- Spiration Valve in place (endoscopic image) b- TEF before treatment (fluoroscopic image) c- Spiration valve in situ controlling the leak (fluoroscopic image).

S2806

#### Biliary Stenting of Caustic Proximal Esophageal Stricture Complicated by Fistula From Prior Dilation

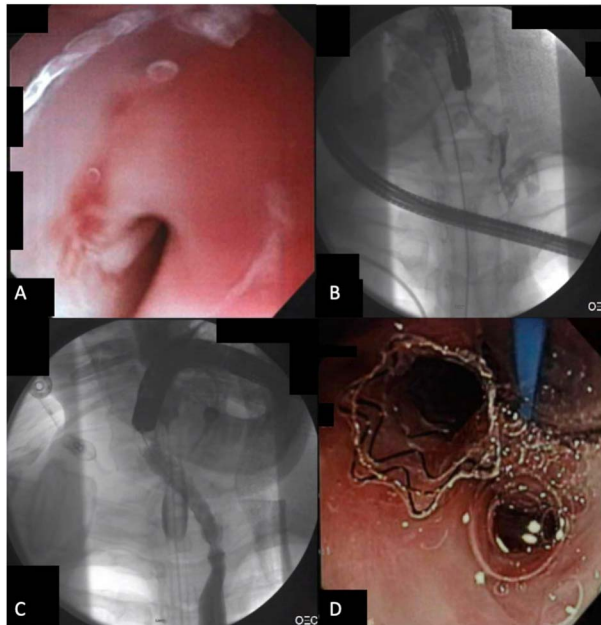
*Mohamad I. Itani, MD<sup>1</sup>, Anirudh R. Damughatla, DO<sup>1</sup>, Baraa Osman, DO<sup>1</sup>, Ahmad Abu-Hejja, MBBS<sup>1</sup>, Lawrence N. Diebel, MD<sup>2</sup>, Thomas E. Kelly, MD<sup>2</sup>.*

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**Introduction:** Caustic ingestions can lead to recalcitrant strictures of the upper esophagus. Endoscopic treatment options include dilations and/or covered esophageal stents; however, a stricture at a high anatomic location renders traditional stenting difficult. Dilation has the risk of perforation and fistula development. We present a patient with complex, proximal and distal esophageal strictures from caustic ingestion who was managed surgically then salvaged endoscopically using biliary stents.

**Case Description/Methods:** A 28-year-old woman with a history of caustic ingestion of bleach and was found to have airway injuries, severe proximal digestive tract injuries, and transmural gastric necrosis. She underwent a total gastrectomy and cervical esophagostomy followed by Roux esophagojejunostomy and stepwise reconstruction. She then had esophageal strictures initially treated with Savary dilation complicated by perforation and fistula formation between upper stricture and pleura. Endoscopy revealed a 3-mm lumen at the upper esophageal sphincter (UES)(Figure). Initial contrast injection revealed no passage into esophagus, with contrast passing to pleura. XP gastroscope was used to pass a guidewire through the proximal stricture and into the esophagus. A 10mm x 6cm biliary fully covered self-expanding metal stent (FCSEMS; Gore Viabil Biliary Endoprosthesis) was deployed across the stricture, covering the fistula. The patient subsequently had repeated endoscopies for stent migration and to reach the distal stricture for stenting.

**Discussion:** Esophageal stents are not typically placed across the UES due to foreign body sensation. In this case, the anatomic location of the stricture and presence of fistula required stenting across the UES. We chose a biliary FCSEMS that had anti-migratory features (flanges and conformability) and did not foreshorten. Despite these measures, the stent did migrate multiple times requiring re-intervention over a period of months, eventually allowing access to the distal esophageal stricture after upper esophageal remodeling around the shape of the stent. At the time of presentation to advanced endoscopy, colonic interposition was a less preferred option due to lack of healthy pharyngeal or esophageal tissue for anastomosis. Through the use of biliary stents in the esophagus, we were able to simultaneously treat a difficult stricture and fistula, allowing eventual access to a distal stricture for endoscopic treatment.



[2806] **Figure 1.** Endoscopic and fluoroscopic imaging showing (A) proximal esophageal stricture from caustic ingestion, (B) contrast injection showing stricture with fistula to pleura prior to stenting, (C) contrast injection through biliary FCSEMS deployed across proximal stricture without evidence of leak, and (D) proximal endoscopic view of the biliary FCSEMS above the arytenoid and close to endotracheal tube in subsequent endoscopy.

S2807

#### Gastric Cancer in the Excluded Stomach Following Roux-en-Y Gastric Bypass

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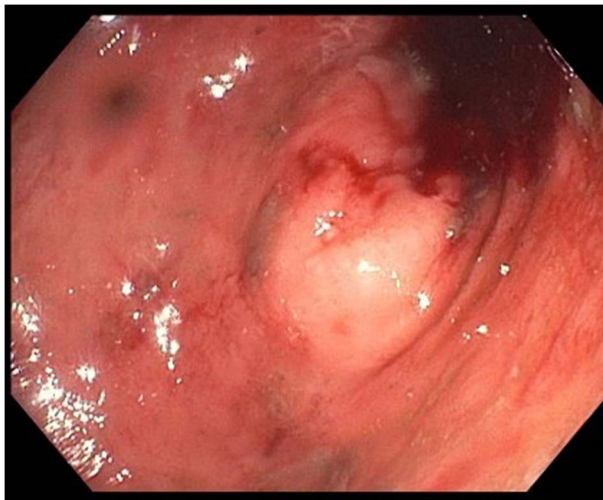
*University of Kentucky, Lexington, KY.*

**Introduction:** Bariatric surgeries, such as Roux-en-Y gastric bypass, provide a long-term weight loss option for patients. Many studies report a reduced risk of obesity-related cancer after bariatric surgery. However, there are roughly 15 case reports of gastric cancer of the excluded stomach following Roux-en-Y gastric bypass. Of note, cancer of the excluded stomach is difficult to diagnose as this structure is

endoscopically challenging to access and symptoms are often nonspecific. Most cases are diagnosed at advanced stages. We present a case in which gastric adenocarcinoma of the excluded stomach was successfully diagnosed through endoscopic ultrasound (EUS)-guided creation of a jejuno-gastric anastomosis.

**Case Description/Methods:** A 77-year-old woman with history of remote Roux-en-Y gastric bypass, atrial fibrillation, and diabetes presented with two days of left sided abdominal pain, nausea, and vomiting. CT imaging showed distended excluded stomach and gastric pouch with concern for gastric outlet obstruction at the level of the pylorus. A jejuno-gastric anastomosis was created under EUS guidance between the proximal jejunum and the excluded stomach using a 15 mm x 10 mm lumen apposing metal stent (AXIOS) with plans to repeat endoscopy in two weeks. A week later, she presented to the emergency department with abdominal pain and one episode of hematemesis. Repeat CT scan showed worsened dilatation of the bypassed excluded stomach after stent placement. Repeat esophagogastroduodenoscopy (EGD) with exploration of the excluded stomach revealed severe pyloric stenosis (4-5mm in diameter) and friable, nodular, and scarred mucosa in the antrum (Figure). Pathology revealed invasive intestinal type gastric adenocarcinoma. The patient is undergoing evaluation by radiation oncology as she is a poor surgical candidate due to multiple comorbidities.

**Discussion:** Cancer of the excluded stomach is rare and there are few case reports of this phenomenon. Due to this, the risk of developing cancer of the excluded stomach remains unknown. Malignancy can affect the excluded stomach as it does the gastric remnant. Practitioners should thus have a high index of suspicion for malignancy of the excluded stomach for Roux-en-Y patients who present with symptoms of gastric outlet obstruction or upper GI bleeding. Early EUS-guided creation of a jejuno-gastric anastomosis to visualize and examine the excluded stomach should be considered.



[2807] **Figure 1.** Friable, nodular, and scarred mucosa in the antrum, found to be gastric adenocarcinoma.

S2808

#### Diagnostic Dilemma: Utilizing Endoscopic Ultrasound (EUS) Guided Biopsy to Assist With the Diagnosis of the Duodenal Duplication Cyst

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**Introduction:** Duodenal duplication cyst (DDC) is a rare congenital anomaly that often presents in the neonatal period with presentations later in life less common. Duplication cysts can develop anywhere from the mouth to the anus with only 4-12% are located in the duodenum. DDC is an uncommon cause of acute pancreatitis but the diagnosis is difficult to make in adults because the symptoms are non-specific. We present a case of diagnostic dilemma of a 53 years old female patient with recurrent acute pancreatitis (RAP), attributed to DDC.

**Case Description/Methods:** Her first index episode of pancreatitis was 12 years prior to her presentation. Patient was found to have a large cyst in the 2<sup>nd</sup> portion of the duodenum that appeared to be separate from the biliary tree and pancreas on EGD (Figure a), EUS (Figure b) and MRI (Figure c), abutting the major papilla. The initial EUS showed a 20 mm x 13.4 mm anechoic cyst with layering and debris seen in the cavity. Aspiration of the cyst was performing, returning with elevated CEA at 817 ng/mL. No features of chronic pancreatitis were seen. Given elevated CEA, there was a concern for mucinous cyst, prompting a repeat EUS. EUS guided biopsy of the internal cyst wall was performed and histology was consistent with small bowel suggestive of a duplication cyst.

**Discussion:** Our patient presented with recurrent episodes of pancreatitis that could be explained by the intermittent occlusion of the pancreatic duct by debris and sludge found within the cyst. The elevated CEA and inconclusive radiographic results initially suggested possible mucinous cyst, presenting a diagnostic dilemma. Therefore, EUS guided biopsies were essential to confirm the diagnosis and allowing for further endoscopic management. The presence of a smooth muscle coat is absolutely essential for the diagnosis of a duplication cyst which was the case for our patient. DDC are covered both inside and outside by duodenal mucosa containing a distinct layer of smooth muscle. Given its malignancy potential, resection of these cysts is indicated. Endoscopic resection is minimally invasive and has been proposed as an alternative to surgery in selected patients especially given the close proximity of major papilla. Resection techniques using standard polypectomy, or large incision of the roof of the duplication cyst has been discussed in the literature. In our case, endoloop was applied around the base of the cyst, leading to strangulation and necrosis for obliteration of the cyst.



[2808] **Figure 1.** (a) shows a large cyst in the 2nd portion of the duodenum that appeared to be separate from the biliary tree and pancreas on EGD abutting the major papilla, (b) shows the cysts on EUS and (c) shows the cyst on MRI.

S2809

#### Detection and Management of an Intact Splenic Artery Branch Within a Pancreatic Pseudocyst During EUS-Guided Cystogastrostomy

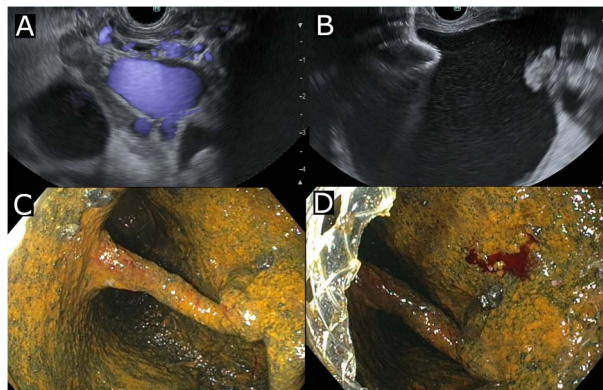
*Sanjita Gowda, Samuel S. Ji, DO, Amirali Tavangar, MD, Marc Monachese, MD, John Lee, MD, Jason Samarasena, MD, MBA, FACG,  
University of California Irvine, Orange, CA.*

**Introduction:** Peripancreatic arteries are highly susceptible to pseudoaneurysm formation in chronic pancreatitis (CP) due to exposure to auto-digestive enzymes. Pseudoaneurysm incidence in CP is estimated between 10% - 17%, with rupture associated with a mortality rate of 40%.<sup>1</sup> This case report describes the event of an endoscopic ultrasound (EUS) guided cystogastrostomy of a pancreatic pseudocyst within which an intact splenic artery branch was discovered after stent deployment, despite preceding EUS not revealing intervening vessels.



**Case Description/Methods:** A 22-year-old man with a history of chronic pancreatitis presented for epigastric pain, nausea, and vomiting. CT abdomen and pelvis (CTAP) revealed a large necrotic area within the pancreas. Initial EUS demonstrated chronic pancreatitis along with an adjacent large fluid collection with surrounding collateral vessels. As flow doppler did not reveal internal vasculature, a lumen-apposing metal stent (LAMS) was placed. Insufflation of the now collapsed pseudocyst and repeat EUS revealed an 8mm vessel with notable pulsation. Following consultation with the hepatobiliary surgery service and repeat review of CTAP, the team determined that this vessel was a distal branch of the splenic artery. An 11 mm Conmed clip was then placed at the origin of the vessel for interventional radiological localization. The LAMS was removed, and the tract was closed to prevent the risk of catastrophic hemorrhage. Arterial embolization of the splenic artery branch with an 8 mm Amplatzer Family of Vascular Plug 4 and Azur coils was performed, with angiogram revealing occlusion of the artery. Subsequent EUS and gastroscopic visualization revealed negative flow on Doppler and no evidence of active bleeding, respectively. The LAMS and two double pigtail stents were replaced. The patient tolerated the procedure well and was transferred back to the referring facility.

**Discussion:** Despite close inspection of the pseudocyst with doppler and B-mode evaluation prior to LAMS deployment an internal vessel was not seen and at risk of transection during LAMS placement. Careful review of CT imaging and detailed evaluation of cysts should be undertaken prior to therapeutic intervention. Multidisciplinary consultation with hepatobiliary surgery and interventional radiology is critical when high-risk anatomy is discovered to coordinate care. Prevention of hemorrhage should be the priority and once obtained, further therapy of fluid collections can be attempted. (Figure)



[2809] **Figure 1.** A. Flow doppler of pancreatic fluid collection without evidence of vasculature B. Placement of LAMS C. Visualization of arterial vessel within pseudocyst D. Placement of clip near origin of arterial vessel for IR localization.

S2810

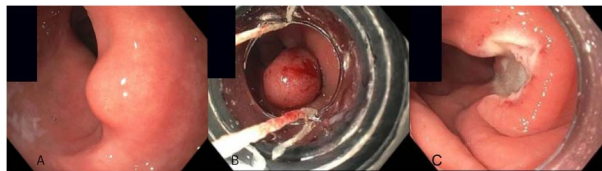
#### Endoscopic Mucosal Resection Ligation for Rectal Schwannoma: A Case Report

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**Introduction:** Gastrointestinal (GI) schwannomas are a type of gastrointestinal autonomic nerve tumor related to the myenteric plexus. They are 2-6% of all mesenchymal tumors and 0.1% of all benign GI tumors. Treatment of rectal schwannomas is complete excision with negative microscopic surgical margins. Here, we describe a case of rectal schwannoma, initially suspicious for carcinoid tumor on endoscopic ultrasound, finally retrieved via ligation endoscopic mucosal resection.

**Case Description/Methods:** A 55-year-old male without any significant past medical history was referred for management of rectal sub-epithelial lesion on outpatient screening colonoscopy. On evaluation, a subepithelial nodule was found 10 cm proximal to the anus. Endoscopic ultrasound (EUS) using forward viewing scope showed a well circumscribed hypoechoic 8 mm x 6 mm round intramural lesion, with well-defined borders arising within the deep mucosa of the rectum suspicious for carcinoid tumor. No additional wall layers were involved. Subsequently, a ligation endoscopic mucosal resection (EMR-L) of the lesion was performed. Biopsy showed homogenous tumor cells containing eosinophilic cytoplasm arranged in a microcystic/reticular pattern and lacking the Antony A/Antony B areas and Verocay bodies, thus suggestive of non-microcystic/reticular Schwannomas. The resection margins were negative. The neoplastic cells were strongly and diffusely positive for SOX-10 and S-100. Biopsy specimen stained negative for AE1/AE3, DOG-1, CD34, CD117, SMA, BER-EP4, desmin, HMB45 and MelanA. Patient was diagnosed with benign microcystic/reticular Schwannoma based on immunohistochemical profile. Image shows endoscopic appearance of rectal subepithelial lesion pre-EMR (Figure A), EMR-ligation (Figure B) and post-procedure image of site of lesion (Figure C).

**Discussion:** The incidence of rectal neuroendocrine tumors is increasing likely due to aggressive screening, improved treatment modalities and surveillance techniques, approaches which have also increased overall life expectancy. Our patient presented with an incidental finding of rectal subepithelial mass on screening colonoscopy. Here, we describe a novel approach to management of rectal mass via EMR-L using a forward viewing EUS scope, which can be utilized for safe and effective resection of these lesions.



[2810] **Figure 1.** A) Endoscopic appearance of subepithelial lesion. B) Ligation EMR was performed for rectal subepithelial lesion. C) Post EMR appearance of the site of lesion.

S2811

#### Case of a Severe Cholecystocutaneous Fistula

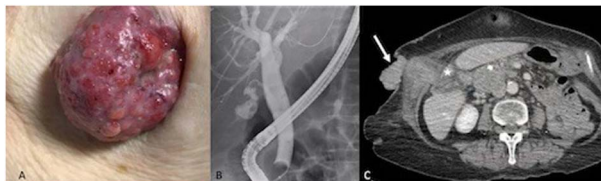
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**Introduction:** Cholecystocutaneous fistulae (aberrant communications of the gallbladder with the skin) have been recognized since the 17<sup>th</sup> century as possible complications of neglected gallbladder disease. However, in the era of modern medicine they remain uncommon.

**Case Description/Methods:** An 83 year-old female with a history of anxiety, depression, and a self-inflicted abdominal gunshot wound presented to our institution 2 years ago with acute calculous cholecystitis and cholelithiasis. She declined surgery and endoscopic management and was treated with percutaneous cholecystostomy drainage and antibiotics. Subsequent clinical course included multiple tube changes with complaints of recurrent drain dislodgement, leakage, and weight loss. Her cholecystostomy was changed to a percutaneous transhepatic biliary drain. She ultimately presented to the gastroenterology clinic for internalization of her biliary drain. On examination, a large palpable mass was seen in the right upper quadrant with serosanguinous and bloody drainage, consistent with chronic gallbladder extrusion from the abdominal wall. ERCP with removal of percutaneous drain, sphincterotomy, stone extraction, and stent placement was performed. CT abdomen showed a gallbladder mass extending into hepatic segment V as well as through the right abdominal musculature to the skin surface. Enlarged retroperitoneal adenopathy was concerning for metastatic involvement. The patient was deemed a poor surgical candidate, and she opted for hospice care. (Figure)

**Discussion:** Cholecystocutaneous fistula is a recognized sequela of unresolved gallbladder inflammation, usually due to persistent biliary outflow obstruction. Other causes may include trauma, iatrogenic causes, gallbladder perforation, or carcinomas. Fistulae may also develop along the track of percutaneous drains following cholecystostomy for management of acute cholecystitis. Surgical management of

cholecystocutaneous fistulae with either laparoscopic or open cholecystectomies and fistulae resections have been described with good success. Cholecystocutaneous fistulae in the setting of gallbladder malignancy have poor outcomes due to the spread to adjacent structures. Improved imaging diagnosis of gallstone and gallbladder disease, antibiotic therapies, early surgical intervention for gallbladder disease, and endoscopic alleviation of biliary outflow obstructions have made such a presentation of cholecystocutaneous fistula a rarely seen phenomenon.



[2811] **Figure 1.** A patient found to have cholecystocutaneous fistula with (A) gallbladder extruding from the abdominal wall, (B) occlusion cholangiogram post-removal of multiple common bile duct stones showing dilated CBD and cholelithiasis in an irregular, contracted gallbladder, and (C) CT scan showing a mass (star) with extrusion of gallbladder through the liver and skin (arrow).

S2812

#### Cholelithiasis Resulting in Partial Mirizzi Syndrome and Liver Abscess

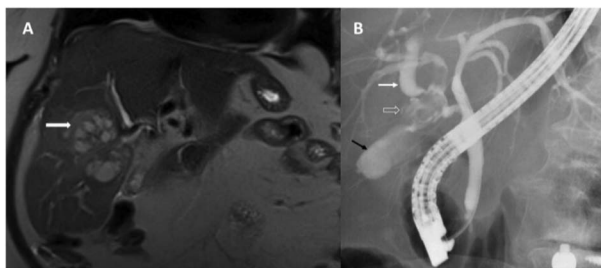
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**Introduction:** Mirizzi syndrome is defined as common hepatic duct (CHD) obstruction caused by extrinsic compression from an impacted stone in the cystic duct or gallbladder infundibulum. Failure to recognize it prior to cholecystectomy, can result in intraoperative bile duct injury and subsequently in significant morbidity. Patients present with one or more of the following: right upper quadrant pain, fever and jaundice; classically with elevated bilirubin and alkaline phosphatase.

**Case Description/Methods:** A 67-year-old female presented with fever, right upper quadrant abdominal pain and emesis. Workup revealed leukocytosis, bilirubin 0.4 mg/dL ( $\leq 1.2$ ), alkaline phosphatase 226 IU/L (35-104), aspartate aminotransferase 42 IU/L ( $< 32$ ) and alanine transferase 86 IU/L ( $< 33$ ). CT scan followed by magnetic resonance cholangiopancreatography showed a 7.2 x 6.1 cm heterogenous lesion in the right hepatic lobe of the liver consistent with a liver abscess, contracted gallbladder with cholelithiasis, and a large gallbladder neck/cystic duct stone externally compressing the right hepatic duct causing upstream dilatation resulting in a partial Mirizzi syndrome (Figure A). The left hepatic duct, CHD, and common bile duct (CBD) were unaffected. Endoscopic retrograde cholangiopancreatography (ERCP) confirmed a large gallbladder neck stone compressing the right hepatic duct, with a normal left hepatic duct, CHD, and CBD (Figure B). Biliary sphincterotomy with basket sweep of the CBD and stent placement was performed. Follow up cholangiogram revealed a decompressed biliary tree. The liver abscess was drained percutaneously, and patient was discharged on intravenous antibiotics. She underwent elective cholecystectomy with right hepaticojejunostomy after 8 weeks. Postoperative imaging showed intact hepaticojejunostomy and no residual abscess.

**Discussion:** This case is unique as patient did not develop classic obstructive jaundice due to intact drainage on the left but developed a liver abscess due to prolonged biliary stasis on the right. The patient required a combined endoscopic, interventional, and surgical approach for therapeutic success. Recognition of Mirizzi syndrome was key to planning therapeutic steps with ERCP followed by abscess drainage prior to surgery to ensure the best possible outcome for the patient.



[2812] **Figure 1.** A: MRCP showing right liver lobe abscess (white arrow). B: ERCP showing gallbladder (black arrow) with stone in gallbladder neck (black arrow) causing compression and upstream intrahepatic dilatation of right intrahepatic duct (white arrow). MRCP (magnetic resonance cholangiopancreatography), ERCP (endoscopic retrograde cholangiopancreatography).

S2813

#### Compacted Periapillary Diverticulum Masquerading as Pancreatic Head Mass on Endoscopic Ultrasound

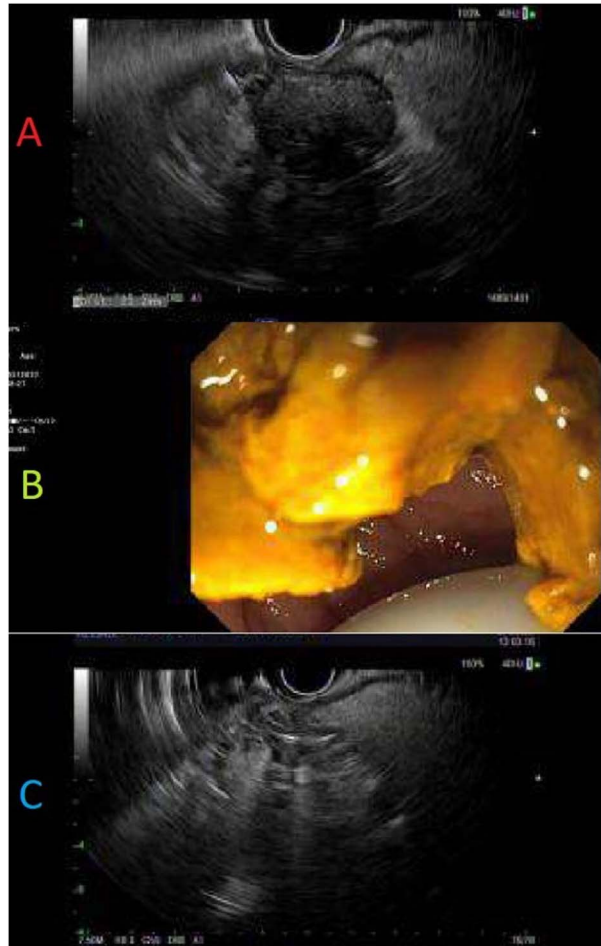
Pranav Reddy, MD, MPH<sup>1</sup>, David Valadez, MD<sup>2</sup>, Amit Rastogi, MD<sup>2</sup>, Richard Sutton, DO<sup>2</sup>, Charlie Altfillisch, MD<sup>3</sup>.

<sup>1</sup>Jefferson Health Northeast, Philadelphia, PA; <sup>2</sup>University of Kansas Medical Center, Kansas City, KS; <sup>3</sup>University of Kansas Medical Center, Kansas City, MO.

**Introduction:** Endoscopic ultrasound (EUS) has become an increasingly important modality in the diagnosis and treatment of gastrointestinal malignancy as well as both pancreatic and biliary disease. It provides high-resolution, real-time imaging of the GI tract and surrounding structures. EUS is classically operator dependent and can often display suboptimal sensitivity and specificity. Numerous techniques such as Endoscopic guided fine-needle aspiration (EUS-FNA), EUS fine needle biopsy (EUS-FNB), rapid on-site cytological evaluation (ROSE) and contrast harmonic-enhanced EUS (CH-EUS) help to increase the sensitivity and specificity of this diagnostic modality. The following case describes a patient with initial EUS findings concerning for pancreatic head malignancy which was ultimately identified as a periampullary diverticulum compacted with sludge.

**Case Description/Methods:** A 70-year-old patient with a past medical history of prostate cancer and cholelithiasis status post recent cholecystectomy presented with CT imaging findings concerning for pancreatic head mass. The patient underwent initial EGD with EUS which illustrated a well circumscribed, heterogeneously echoic 26.8 x 24 mm uncinus process mass concerning for neuroendocrine tumor (NET). FNB was performed and cytology ultimately showed no evidence of malignancy. Due to continued concern for pancreatic NET, patient underwent repeat EGD and EUS. EUS redemonstrated the large heterogeneously echoic pancreatic head lesion concerning for mass. Attempts were made to visualize the ampulla with linear EUS scope, however there was significant debris in the second portion of the duodenum. Duodenoscope was then passed and a large caliber but narrow opening periampullary diverticulum was visualized and appeared to be filled with compacted sludge. A combination of biopsy forceps and water lavage was used to clean out the compacted sludge. The EUS scope was then re-advanced into the second part of the duodenum and the suspected mass which was previously visualized was no longer visible. (Figure)

**Discussion:** EUS is an important, minimally invasive diagnostic procedure that has both high clinical success rate with relatively few adverse events. EUS, like many other diagnostic modalities, has limitations when identifying and ruling out malignancy. This case highlights one such limitation showing that although initial findings were concerning for malignancy, further investigation revealed a duodenal diverticulum with compacted debris masquerading as an uncinus mass.



[2813] **Figure 1.** A. EUS showing heterogeneously echoic 26.8 x 24 mm uncinate process mass B. Duodenoscope showing perampullary diverticulum compacted with sludge, removed with lavage and biopsy forceps C. Repeat EUS showing absence of previously visualized uncinate mass.

S2814

#### Diverting Disaster: EUS-Guided Trans-Gastric Biliary Drainage

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**Introduction:** Lumen-apposing metal stents (LAMS) are a relatively new intervention that can be used for high risk surgical cases, such as malignant obstructions not amenable to ERCP. There are few case reports using LAMS with Endoscopic Ultrasound (EUS) to achieve drainage and palliative therapy in these situations, especially using a gastric over duodenal approach. In this case, we add to the growing body of literature supporting a transgastric approach for biliary drainage using LAMS.

**Case Description/Methods:** A 73 year-old male was admitted due to concerns for obstructive jaundice. He presented with pruritis, nausea, vomiting, copious nasogastric tube bilious output and a total bilirubin of 19.8mg/dL. MRCP revealed a distal CBD stricture measuring 12 mm in length, marked intrahepatic and extrahepatic biliary dilatation and an 8mm dilated pancreatic duct. EGD revealed a submucosal mass within the duodenal bulb causing gallbladder impingement (a). EUS was then completed and revealed similar findings to MRCP including an atrophic pancreas and severely dilated gallbladder (b). The ampullary mass, noted on CT, was also identified under EUS and fine needle biopsy was performed. A 10mm x 10mm LAMS was placed under endoscopic and fluoroscopic visualization within the flanges in the gallbladder and the antrum of the stomach (c) and resolved the patient's symptoms the next day. Surgical pathology demonstrated pancreatic ductal carcinoma of the major and minor papillae, pancreatic head and uncinate process.

**Discussion:** Interventions for obstructive jaundice include ERCP with biliary stenting, percutaneous transhepatic biliary drainage, EUS with LAMS placement, as well as surgery. While ERCP is the first line option, the patient's distorted ampullary anatomy would have made cannulation and stenting challenging and high risk. Percutaneous drainage would expose the patient to risk of dislodging, obstructing, leaking, and infection. Seen below, LAMS has a relatively large diameter which allows for immediate biliary drainage, proven by the patient's rapid relief of symptoms. Since a duodenal approach is more commonly used, current literature displays only a small number of cases showcasing the technical success of gastric approach for CBD access via LAMS, for instance, in the setting of duodenal stenosis. Our case demonstrates the versatility of the Axios stent with another successful alternative approach and proves a transgastric approach with LAMS is a viable alternative to surgery for malignant obstructive jaundice.



[2814] **Figure 1.** Image a: Dilated minor and major papillae with evidence of duodenal obstruction. b: EUS view of the dilated gallbladder. c: Biliary drainage from gallbladder after LAMS placement.

S2815

### Endoscopic Stricturectomy Followed by Axios Stent Placement for Management of Tight Ileorectal Anastomotic Stricture

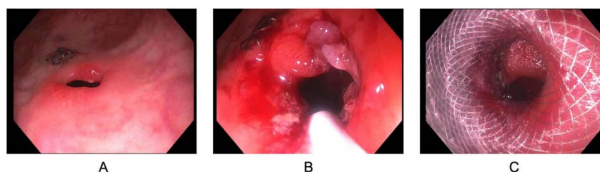
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**Introduction:** Although endoscopic balloon dilation has been the mainstay management of benign colorectal anastomotic strictures, novel techniques such as endoscopic stricturectomy or stricturoplasty (defined as stricturectomy with clip placement) have been increasingly employed by advanced endoscopists based on their expertise. We describe a novel technique of stricturectomy followed by AXIOS stent placement in the same setting for a tight short segment ileorectal anastomotic stricture in a patient with MUTYH associated polyposis (MAP).

**Case Description/Methods:** A 61 yo M with MAP managed with subtotal colectomy and ileorectal anastomosis was found to have asymptomatic anastomotic stricture noted on surveillance colonoscopy which was unable to be traversed with a pediatric colonoscope. Balloon dilation to 15 mm was performed. A year later the patient presented with vomiting and abdominal distension and with imaging evidence of distended small bowel. Colonoscopy showed a tight anastomotic stricture (1 cm in length and 3 mm in diameter). Endoscopic stricturectomy was performed in a circumferential fashion using an IT nano 2 knife with electrocautery, followed by the placement of an AXIOS stent (10 mm x 20 mm). There were no major complications. At one month follow up, the patient had complete resolution of his symptoms and is planned for stent removal. (Figure)

**Discussion:** Endoscopic balloon dilation is the most common form of management of benign colorectal strictures with restenosis observed in about 11% of cases. Novel advanced endoscopic techniques such as stricturectomy or stricturoplasty have been performed predominantly for IBD related anastomotic strictures with comparable efficacy to surgical resection. The combination of stricturectomy followed by stent placement in the same setting is novel, and can be considered to maintain lumen patency for tight strictures to achieve durable response. Major complications during stricturectomy include bleeding that ranges from 3-14%. This complication can easily be treated using soft coagulation setting with the endoknife, coagulation grasper forceps, and other simple tamponade techniques. Risk of perforation is very rare. In summary, we describe a novel endoscopic technique for the treatment of benign colorectal anastomotic strictures which may result in more durable patency. Further studies are needed to assess long term outcomes.



[2815] **Figure 1.** Endoscopic view of ileorectal anastomotic stricture (A) traversed with IT nano 2 knife (B) followed by AXIOS stent placement (C).

S2816

### Duodenal Stent Fixation Using Through-the-Scope Helix Tack and Suturing Device

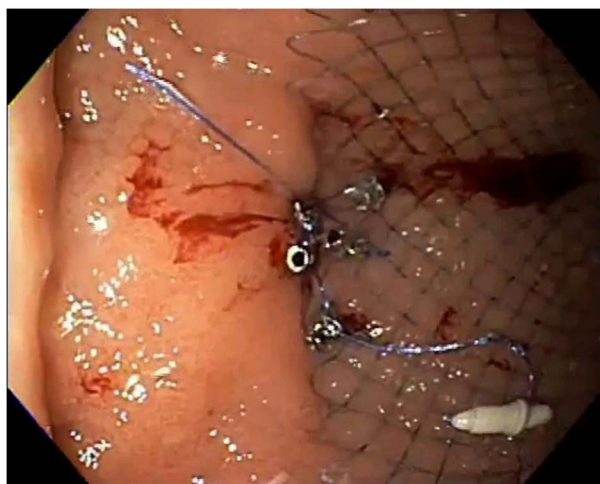
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**Introduction:** Malignant gastroduodenal strictures are a leading cause of gastric outlet obstruction and are often managed with endoscopic stent placement. One of the main limitations of duodenal self-expanding metal stents (SEMS) is the risk of migration. Multiple techniques have been used to prevent stent migration, including stent fixation using through-the-scope (TTS) clips, over-the-scope stent fixation devices, and endoscopic suturing. TTS suturing using the helix tack and suturing device is a novel suturing method that is generally used for defect closure, though it has been rapidly gaining popularity for alternate uses. Here, we report its use as a stent fixation method in a patient with gastric outlet obstruction due to a malignant duodenal stricture.

**Case Description/Methods:** A 73-year-old male with pancreatic adenocarcinoma on neoadjuvant chemotherapy presented with 3 weeks of vomiting and abdominal distension. Imaging showed pancreatic adenocarcinoma with duodenal obstruction. Esophagogastroduodenoscopy (EGD) was performed and showed duodenal stenosis from tumor infiltration at the duodenal sweep. The adult upper endoscope was able to traverse the stenosis with significant resistance and the stenosis measured 2 cm in length. The patient was borderline resectable, and per institutional protocol, endoscopic ultrasound-guided gastrojejunostomy is only performed for patients who are not surgical candidates, therefore, decision was made to proceed with duodenal stent placement. A 25 mm in diameter and 10 cm in length uncovered SEMS was placed across the stenosis. Given that the upper endoscope was able to traverse the stenosis, decision was made to fixate the stent to reduce migration prior to stent expansion and tissue ingrowth to keep the stent in place. The TTS suturing device was used and the stent was fixated with four tacks placed in stent-mucosa-mucosa-stent fashion (Figure). A cinch was placed in the end. The patient tolerated the procedure well and no adverse events were reported within the first 4 weeks of the procedure.

**Discussion:** Duodenal SEMS are widely used in the setting of malignant gastroduodenal obstruction. While uncovered stents typically carry a lower risk of migration compared to covered stents, in this case, the tissue apposition was less than desired and thus the TTS suturing device was used for stent fixation. In this report, we demonstrate that the TTS suturing device may be a safe and effective technique for duodenal stent fixation.



[2816] **Figure 1.** The duodenal stent has been fixated with four tacks placed in a stent-mucosa-mucosa-stent fashion.



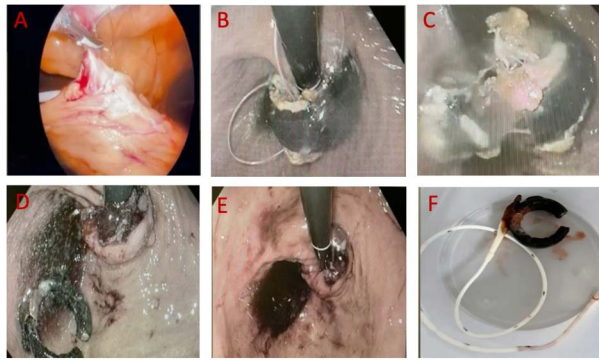
S2817

**Endoscopic Removal of Eroded Gastric Laparoscopic Band***Murad H. Ali, MD<sup>1</sup>, Rabia De Latour, MD<sup>2</sup>.*<sup>1</sup>University at Buffalo, Buffalo, NY; <sup>2</sup>NYU Grossman School of Medicine, Bellevue Hospital Center, New York, NY.

**Introduction:** Gastric laparoscopic adjustable banding (LAGB) is a weight loss procedure in which a band is inflated around the proximal stomach to effectively create a pouch, satiety and resultant weight loss. A known complication of LAGB is band erosion into the lumen of the stomach, typically requiring surgical excision. We present a case report of an endoscopic removal of the eroded gastric lap band with upper endoscopy (EGD) utilizing readily available tools from the endoscopy unit.

**Case Description/Methods:** A 45-year-old female with a history of obesity status post LAGB placement 8-years ago presents with worsening epigastric and port site pain, prompting an EGD that revealed erosion of the gastric lap band through the gastric mucosa into the lumen of the proximal stomach. Multidisciplinary plan with bariatric surgery was made for endoscopic removal of the eroded gastric lap band. Initial laparoscopy transected distal band tubing and was withdrawn orally (A). Subsequent EGD discovered eroded gastric lap band in the gastric cardia. Forceps loosened the band so that wire could loop around it, allowing lithotripter to cut the band (B,C). Lap band was pulled into the gastric lumen, using cut plastic cord left from laparoscopy in the peritoneum. Using forceps, the gastric lap band and attached cord were removed from the stomach trans-orally (D). At the end of the case, the surgical team entered the peritoneum laparoscopically and performed an air leak test on the stomach/cardia, which was negative (E). Band was successfully removed without complications (F).

**Discussion:** LAGB is a restrictive weight loss procedure approved by the FDA in 2001 for morbid obesity, in which a silicone band is placed around the proximal stomach and inflated with saline through a subcutaneous access port to create satiety and resultant weight loss. Despite decreased popularity, it still accounts for up to 3% of all annual weight loss surgical interventions. Band erosion is a late complication of LAGB, seen in 0.5-10% of patients. Risk factors for it include overfilling of the band with saline which can result in inflammation or ischemia, inflammatory foreign body reaction of the stomach, gastric wall injury during placement. Band erosion typically presents with non-specific abdominal pain, weight regain, discoloration of the fluid in the band. If infected it can present with sequelae of infection including port infection, sepsis and peritonitis. Our case obviated the need for invasive surgical removal or a specialized band cutter.



[2817] **Figure 1.** (A) Initial laparoscopy did not show the lap band by view as it was surrounded and encased an inflammatory rind, but band tubing was seen emerging and distal tubing was transected close to the abdominal wall. (B) A Tracer Metro long wire was advanced through the gastroscope into the stomach and looped around the band itself. (C) Soehendra lithotripter was used to cut the lap band while the gastroscope was situated within the stomach (retroflexed) visualizing the cutting of the band. (D) Using rat tooth forceps, the gastric lap band and attached cord were removed from the stomach successfully and removed trans-orally. (E) At the end of the case, the surgical team entered the peritoneum laparoscopically and performed an air leak test on the stomach/cardia, which was negative. (F) Removed gastric band ex-vivo.

S2818

**Endoscopic Removal of a Symptomatic Benign Esophageal Sub-Mucosal Lesion***Aaron Rampersad, MD<sup>1</sup>, Davis B. Berry, DO<sup>2</sup>, Luis Lizaro, MD<sup>1</sup>, Robert Farrar, MD<sup>1</sup>, Veeral Oza, MD<sup>3</sup>.*<sup>1</sup>Prisma Health, Greenville, SC; <sup>2</sup>East Tennessee State University, Johnson City, TN; <sup>3</sup>University of South Carolina School of Medicine Greenville, Prisma Health, Greenville, SC.

**Introduction:** The esophagus is a rare site for benign mucous duct cyst (mucocele). Mucoceles commonly occur from an obstructing salivary gland duct or rupture of the salivary gland. Therefore, mucoceles are most often found in the oral cavity. Symptomatic esophageal polyps or cysts have traditionally required surgical intervention. Endoscopic resection has become an option over the last few years and includes endoscopic mucosal resection or submucosal dissection. We present a case of an esophageal submucosal polypoid lesion that was removed endoscopically and revealed a rare and interesting pathology.

**Case Description/Methods:** A 70 year old female was referred for evaluation of reflux symptoms. During her initial outpatient visit she described worsening reflux symptoms and dysphagia, initially having dysphagia just to liquids but now progressing to solids. A trial of pantoprazole significantly improved her reflux symptoms but her esophageal dysphagia persisted. An upper endoscopy revealed a polypoid lesion at least 2.5 cm in length in the upper third of the esophagus (Figure a). A 2.5 cm heterogenous polypoid lesion without vascularity was seen on endoscopic ultrasound and doppler exam. Given lack of vascularity, the decision was made to attempt endoscopic resection. An endoloop was used to place at the base of the lesion, followed by resection (Figure b) Endoscopic appearance was most consistent with a fibrous polyp. Histologic study demonstrated the wall consisted of two muscle layers consistent with benign mucous cyst (Figure c). On follow up patients' symptoms had resolved.

**Discussion:** A symptomatic esophageal polyp identified on an endoscopy carries an extensive differential diagnosis ranging from benign to malignant. Esophageal mucoceles are thought to occur due to recanalization of the upper digestive tract with subsequent coalescence of vacuoles. Histologically, benign mucous cysts are lined with two muscle layers. Prior cases have reported mucoceles emerging in the esophageal remnant directly following bypass surgery or secondary to tracheoesophageal fistula. We report a unique case of spontaneous emergence of mucocele without an obvious prior etiology or pre-disposing surgical intervention. Rarely, an esophageal cyst causes symptoms of dysphagia or regurgitation requiring removal. Endoscopic resection has gained popularity in recent years, due to the low rates of morbidity and mortality. Additional reports of esophageal mucoceles will help in understanding this rare condition better.



[2818] **Figure 1.** a: Endoscopic appearance of an esophageal submucosal lesion; b: nodule post-resection; c: Histologic study demonstrated the wall consisted of two muscle layers consistent with benign mucous cyst.

S2819

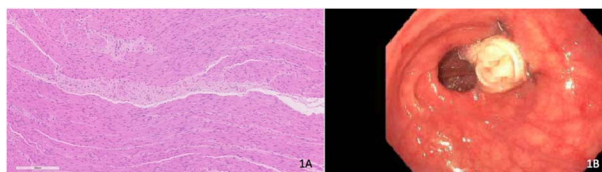
#### Endoscopic Full-Thickness Resection as a Means to Diagnose Hirschsprung Disease

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**Introduction:** Hirschsprung Disease (HD) is the congenital absence of ganglionic cells in the rectum and often thought of as a disease of childhood. However, this disease may persist into adulthood and symptoms such as chronic constipation can negatively affect quality of life. Patients often require a multidisciplinary approach between geneticists, colorectal surgeons, endoscopists and gastrointestinal pathologists during initial evaluation. Confirming the diagnosis has historically required a suction or open rectal biopsy, which is considered the gold standard for diagnosis. This is an invasive procedure that is prone to complications. Potential biopsy modalities include open, punch, suction and endoscopic. Interestingly, endoscopic biopsy using an endoscopic full-thickness resection (EFTR) device is rarely reported.

**Case Description/Methods:** Here we present a case of a 42-year-old female with a history of Hirschsprung disease diagnosed as a child. The patient had an extensive surgical history including colostomy, colostomy reversal, and closed loop obstruction. The patient had also been recently diagnosed with an enterocutaneous fistula. The patient was evaluated by a general surgeon who referred her to gastroenterology motility clinic. Gastrografin enema confirmed extensive stool burden without strictures. The patient underwent anorectal manometry, which found abnormal push, high sphincter pressure at rest, and absence in rectal inhibitory reflex, findings concerning for HD. A flexible sigmoidoscopy was performed to determine the extent of the disease. Full thickness endoscopic biopsy of the rectum using an EFTR device showed an absence of ganglionic cells. The patient underwent a takedown of enterocutaneous fistula as well with improvement in symptoms. (Figure)

**Discussion:** Endoscopic biopsy of the rectum is a minimally invasive technique that can provide adequate tissue samples to confirm a diagnosis. There is a paucity of data regarding the comparison between endoscopic versus traditional techniques. Based on our experience, we suggest that endoscopic rectal biopsy may be a safe and effective method to diagnose Hirschsprung Disease in the adult population. EFTR devices are potentially able to resect the entire wall of the gastrointestinal tract. This technique could greatly simplify the diagnostic process in that it is safe and effective, and less invasive than surgical techniques. However, further studies are needed to better characterize the utility of this technique in this specific patient population.



[2819] **Figure 1.** A) H&E showing absence of myenteric ganglion cells B) Successful endoscopic full-thickness resection of tissue with Ovesco clip in place.

S2820

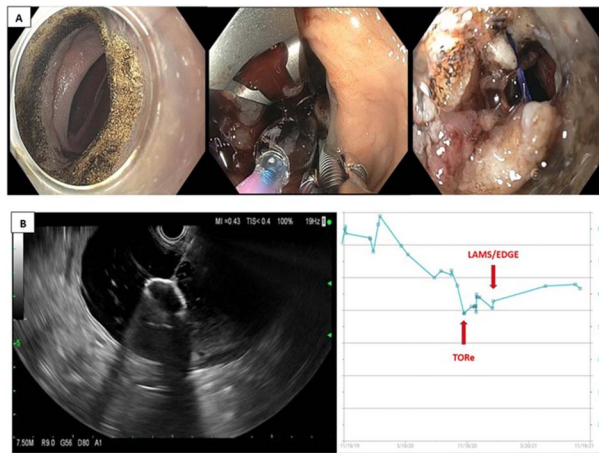
#### Endoscopic Management of Dumping Syndrome in a Roux-en-Y Gastric Bypass (RYGB) Patient With Transoral Outlet Reduction and Remnant Stomach Access With Lumen Apposing Metal Stent

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**Introduction:** Dumping syndrome is a possible complication of RYGB. Treatment has been limited to dietary changes, medications, surgical reversal, and enteral nutrition. Recently, transoral gastric outlet reduction (TORe) and lumen apposing metal stent (LAMS) placement to access the remnant stomach have shown promising results. We report a patient with severe dumping syndrome who had significant improvement after both TORe and LAMS placement.

**Case Description/Methods:** 68 year old man underwent RYGB and presented with over 100 lbs weight loss, weakness, recurrent syncope, tachycardia, and persistent hypoglycemia. Initial Sigstad's score was 27. He had tachycardia of 105, BMI of 16.6, and cachexia resulting in non-ambulatory status. Labs showed potassium 3.2, bicarbonate 36, glucose 41, total protein 4.8, albumin 2.0, and prealbumin 7. Modified glucose tolerance test was positive. Exogenous insulin use, adrenal insufficiency, and insulinoma were ruled out. Despite behavioral modification, acarbose, and guar gum, he had persistent symptoms and became TPN dependent. He underwent TORe (Figure A), which improved Sigstad's score from 27 to 10 with 10 lbs weight regain in 2 months. Incidentally, patient developed cholelithiasis and required LAMS placement for transgastric ERCP. After successful ERCP, the LAMS was intentionally left in place to allow access of food to the remnant stomach. In 8 months, Sigstad's score improved additionally from 10 to 5 and the weight increased additionally by 11 lbs (Figure B). After both procedures, he was ambulatory, on normal diet, and able to stop TPN. BMI improved to 20.1. Labs became normal.

**Discussion:** Dumping syndrome occurs as a result of rapid transit of hyperosmolar foods and carbohydrates in small intestine. This causes early and late dumping syndrome due to rapid fluid shift and hyperinsulinemic response, resulting in hypotension, tachycardia, and hypoglycemia. Sigstad's score above 7 suggests dumping syndrome. Modified glucose test confirms the diagnosis. Vargas et al reported 150 RYGB patients with severe dumping syndrome refractory to behavioral/medical treatment and underwent TORe. Sigstad's score improved from a mean of 17 to 2.6 (P=0.0001). The authors also consider LAMS placement to access remnant gastric stomach as another viable option and await prospective study results. In conclusion, RYGB patients with severe dumping syndrome refractory to medical and behavioral therapy can be treated with TORe and LAMS placement to access the remnant stomach.



[2820] **Figure 1.** A) Endoscopic Images of Transoral Gastric Outlet Revision with APC of the gastrojejunal anastomosis followed by purse string full thickness suturing over a 10 mm CRE balloon. B) EUS image of demonstrating distal phalange deployment of LAMS into the remnant stomach for EUS guided transgastric ERCP. B. Weight chart demonstrating weight loss after RYGB and regain with TORe and LAMS placement.

S2821

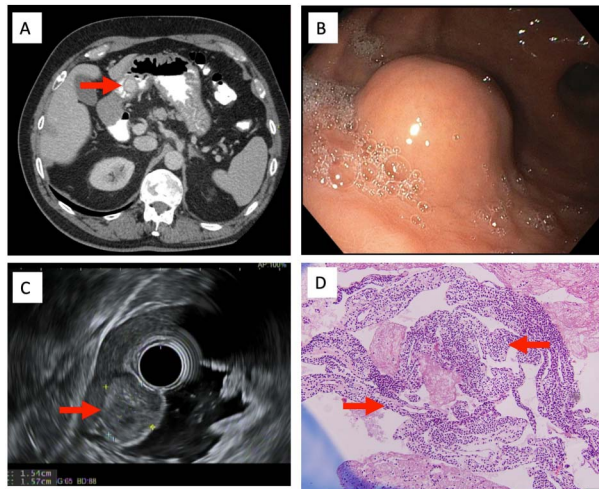
#### Endoscopic Evaluation of Gastric Glomus Tumors

*Alexander Malik, MD<sup>1</sup>, Muhammad Nadeem Yousaf, MD<sup>2</sup>, Sami Samiullah, MD<sup>1</sup>, Tahan Veysel, MD<sup>2</sup>, Yuchu Sun, MD<sup>1</sup>, Amin Mahdi, MD<sup>1</sup>, Omer Basar, MD<sup>2</sup>.*  
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**Introduction:** Gastric glomus tumors (GGT) are benign mesenchymal neoplasms that originate from the submucosal layer of the stomach, predominantly the antrum, and represent up to 1% of all gastric tumors. Most patients present with vague abdominal pain, gastrointestinal bleeding, or perforation. However, GGT is detected incidentally during esophagogastroduodenoscopy (EGD) in a proportion of asymptomatic patients. Endoscopic ultrasound (EUS) evaluation of GGT is essential to establish the diagnosis and to differentiate it from gastrointestinal stromal tumors (GIST) or gastric carcinoids.

**Case Description/Methods:** An 80-year-old man presented for abdominal discomfort without weight loss, changes in appetite, melena, or hematochezia. He was incidentally found to have a gastric antral nodule on EGD. EGD with biopsy demonstrated benign patchy, moderately erythematous gastric antral mucosa and a 1.5cm subepithelial lesion 10cm from the gastric antrum along the greater curvature. EUS revealed a subepithelial 1.56cm x 1.28cm isoechoic, homogenous lesion with small calcifications on the gastric greater curvature abutting the left hepatic lobe. Immunohistochemical staining of the fine needle biopsy (FNB) specimen of the gastric nodule was diffusely positive for neoplastic cells, smooth muscle actin, vimentin, patchy muscle specific actin, and focal synaptophysin. Cell staining was negative for pancytokeratin, desmin, CD117, DOG1, S100, CK7, CDX-2, Pax-8, HepPar1 and CD34. There were no atypical cytologic features or mitoses. These findings were consistent with GGT. The patient was not deemed to be a candidate for surgical resection due to advanced age and resolution of his symptoms. A shared decision was made with the patient to proceed with regular surveillance of the GGT rather than surgical resection. He was discharged with a plan of repeat EUS for surveillance of the GGT in one year. (Figure)

**Discussion:** The present case illustrated the importance of EUS evaluation of GGT to establish the diagnosis and to differentiate it from other common gastric tumor types. Currently, there are no guideline recommendations for the surveillance of GGT detected on routine EGD in asymptomatic individuals. A definitive surgical treatment with partial gastrectomy was favored in previously published literature. However, for asymptomatic patients with GGT or those with resolution of symptoms, careful surveillance may be a reasonable option, especially in older patients with poor surgical candidacy.



[2821] **Figure 1.** A. Abdominal CT scan with contrast (axial view) showing a 2.1cm x 1.7cm intraluminal mural mass projecting into the lumen of the distal stomach without gastric outlet obstruction (red arrow). B. Upper endoscopy of a 15mm subepithelial lesion along the gastric greater curvature. C. EUS demonstrating a subepithelial 1.56cm x 1.28cm isoechoic, homogenous lesion (red arrow) with small calcifications on the gastric greater curvature abutting the left hepatic lobe. D. Histology of FNB with H&E staining (10x) shows lobules and cords of epithelioid cells containing predominantly clear to eosinophilic granular cytoplasm and oval nuclei, invested in a loose fibrous stroma (red arrows). No mitotic figures, atypia or necrosis are identified.

S2822

#### Endoscopic GJ With LAMS for Preoperative Nutrition in Neoplastic Gastric Outlet Obstruction

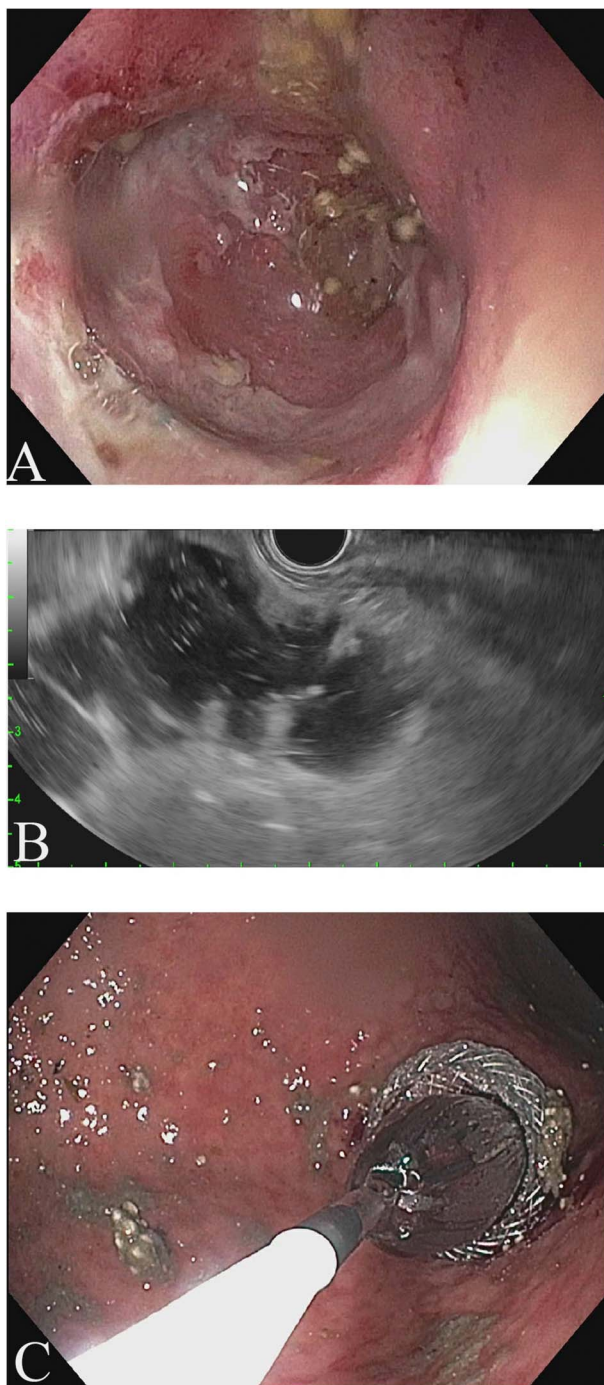
*David Cheung, MD<sup>1</sup>, Vamsi Vemireddy, MD<sup>2</sup>, Peter H. Nguyen, MD<sup>2</sup>, Amiral Tavangar, MD<sup>2</sup>, James Han, MD<sup>2</sup>, Jason Samaraseena, MD, MBA, FACC<sup>2</sup>.*  
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**Introduction:** Malignant gastric outlet obstruction resulting from gastric cancer can prevent adequate oral intake and lead to malnutrition. Optimization of preoperative nutrition improves postsurgical outcomes and increases overall survival. Duodenal stenting is a common method of bypassing the obstruction; however, for patients with near obstruction of the gastric outlet, novel techniques may be needed. Here we present a case of post pyloric malignant gastric outlet obstruction that was bypassed by creating a gastrojejunostomy with lumen-apposing metal stent (LAMS).

**Case Description/Methods:** A 79-year-old male presented for a 2-month history of nausea, vomiting, abdominal pain, weight loss. A prior endoscopy showed evidence of gastric outlet obstruction due to poorly differentiated metastatic gastric adenocarcinoma with signet ring features at the pylorus. Prior to starting neoadjuvant chemotherapy, the patient was referred to our facility for placement of a duodenal stent. Upon evaluation, the patient was a good candidate to trial gastrojejunostomy (GJ) w/ LAMS. With water used as an acoustic interface to distend the distal duodenum and proximal jejunum, an ultrasound-guided gastrojejunostomy was created using a 20-mm electrocautery-enhanced lumen-apposing metal stent (LAMS) (Figure) The patient tolerated the procedure well and there were no complications. He was able to advance his diet, gain 15 lbs of weight, and obtain chemotherapy. Four months after GJ placement and chemotherapy, EGD showed presumed resolution of gastric adenocarcinoma and post pyloric obstruction. Six months after, the patient underwent curative subtotal gastrectomy with removal of the LAMS at the time of the operation.

**Discussion:** LAMS were initially designed for transgastric or transduodenal endoscopic drainage of pancreatic pseudocyst or walled off necrosis. Here we present a case of successful deployment of a LAMS to create an endoscopic GJ for nutritional support as a bridge to curative subtotal gastrectomy. Endoscopic GJ is typically used in palliative cases where surgery is not planned. In this case, the surgeon was able to remove the LAMS at the time of surgery. This case highlights GJ w/ LAMS as an alternative solution to duodenal stenting or surgical J tube for malignant gastric outlet obstruction and its utilization in nutritional support.



[2822] **Figure 1.** A) Gastric Outlet Obstruction B) Water as an Acoustic Interface C) Placement of LAMS with dilating tract with balloon.

S2823

**Endoscopic Bypass of Gastric Outlet Obstruction After Spontaneous Celiac Artery Dissection**

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**Introduction:** Spontaneous isolated celiac artery dissection (SICAD) is a unique pathology with unclear management guidelines. Complications include hematoma formation and rarely intestinal ischemia. Gastric outlet obstruction (GOO) may occur because of luminal narrowing from ischemic duodenitis or extrinsic compression from hematoma. EUS-guided gastroenterostomy (EUS-GE) is an accepted approach in the management of malignant obstruction however currently there is no guidance for benign obstruction. We describe a case of SICAD complicated by GOO requiring bypass with EUS-GE.

**Case Description/Methods:** A 56-year-old man presented with a weeklong history of epigastric abdominal pain. A computed tomography angiography (CTA) of the abdomen demonstrated a 1.3cm dissection of the celiac artery with associated hemorrhage. He was managed with intravenous anti-hypertensive medications and discharged 2 days later. He returned in 1 week with intractable nausea and vomiting. Repeat CT abdomen demonstrated duodenitis, dilation of the stomach and proximal duodenum and resolving hemorrhage surrounding the celiac artery. Nasogastric decompression returned 1100ml bilious output. Esophagogastroduodenoscopy (EGD) demonstrated edematous mucosa within the proximal duodenum with luminal narrowing preventing passage of the scope. The decision was made to proceed with EGD-EUS. EUS demonstrated a dilated. Celiac artery with a areas of hemorrhage within the celiac axis and adjacent to the duodenum. After successful creation of an EUS-GE the patient was discharged on oral intake a day later. Surveillance imaging 2 months later demonstrated improvement of hemorrhage. (Figure)

**Discussion:** Our case illustrates a rare case of GOO as a result of a hematoma causing duodenal compression. Until the recently, the only option for management for benign GOO was radical surgical intervention. Endoscopic management with either balloon dilation or intraduodenal stents are poor choices due to risk of perforation and durable patency is not guaranteed. Current guidelines do not provide recommendations on EUS-GE for benign etiologies of GOO. Small retrospective studies have illustrated success however prospective and randomized trials are needed to demonstrate efficacy and safety in benign causes of GOO.

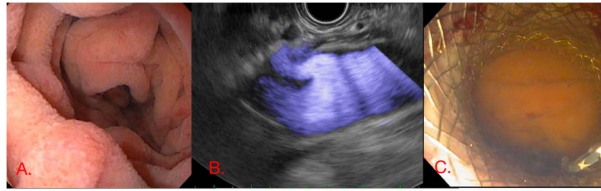


Image 1: Panel A. EGD with duodenal narrowing. B. EUS demonstrating celiac artery dissection. C. Lumen-apposing metal stent (LAMS)

[2823] **Figure 1.** Panel A. EGD with duodenal narrowing. B. EUS demonstrating celiac artery dissection. C. Lumen-apposing metal stent (LAMS).

S2824

**Endoscopic Papillectomy for Gangliocytic Paraganglioma**

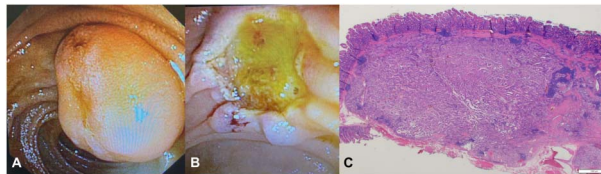
Edward Cay, DO<sup>1</sup>, Nicholas McDonald, MD<sup>2</sup>, Mohammad Bilal, MD<sup>3</sup>.

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**Introduction:** Neuroendocrine tumors (NET) most commonly occur in the small bowel; however, NETs at the ampulla of Vater are rare and more aggressive, irrespective of size. Gangliocytic paragangliomas (GP) are a more benign type of NET that must be properly differentiated from other similar appearing NETs, which may carry a worse prognosis.

**Case Description/Methods:** A 77-year-old man presented with right flank pain and was incidentally found to have a duodenal mass in the periampullary region measuring 11 x 8 mm, with dilation of the common bile duct to 10 mm on computed tomography scan. Laboratory data showed normal liver function tests. Esophagogastroduodenoscopy revealed a subepithelial lesion at the ampulla, and endoscopic ultrasound (EUS) demonstrated a 15 x 12 mm hypoechoic subepithelial lesion arising from the submucosa. A fine needle biopsy was performed and immunohistochemical staining was positive for synaptophysin, chromogranin and pankeratin, consistent with neoplasm with neuroendocrine differentiation. Subsequent DOTATATE PET scan showed uptake in the ampullary region with no uptake anywhere else. The case was discussed in multidisciplinary conference, and the decision was made to proceed with endoscopic papillectomy given concerns for NET. An endoscopic retrograde cholangiopancreatography (ERCP) with endoscopic papillectomy was performed. A biliary and pancreatic duct stent was placed. The pathology was consistent with gangliocytic paraganglioma, and the patient had no adverse events with removal of stents after four weeks. (Figure)

**Discussion:** Gangliocytic paragangliomas typically arise in the second part of the duodenum, presenting as gastrointestinal bleeding and abdominal pain. Although its distribution varies significantly, GPs in particular embody epithelioid, spindle-shaped, and ganglion-like cell types. While GPs are predominantly benign, rare reports of spread to regional lymph nodes are present. Our report shows that endoscopic papillectomy is safe and effective for both diagnostic and therapeutic purposes in the management of ampullary gangliocytic paragangliomas.



[2824] **Figure 1.** Ampullary lesion prior to (A) and after endoscopic papillectomy (B), with histopathology consistent with gangliocytic paraganglioma (C).

S2825

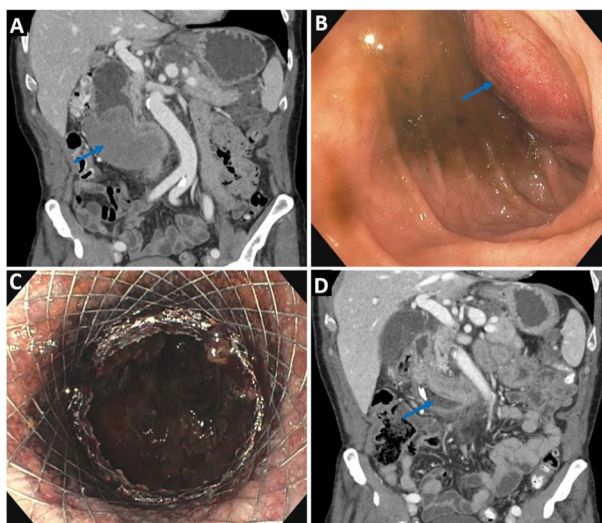
**Endoscopic Management of an Obstructing Duodenal Wall Hematoma in the Setting of Acute Pancreatitis**

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**Introduction:** Spontaneous duodenal wall hematoma is a rare condition which can be associated with acute and chronic pancreatitis. It is often complicated by small bowel obstruction. When conservative management fails, options are limited. Here we describe a case of small bowel obstruction secondary to pancreatitis-associated duodenal wall hematoma which was successfully managed endoscopically through cystduodenostomy.

**Case Description/Methods:** A 69-year-old male with HIV and normal CD4 count presented with acute abdominal pain and non-bloody emesis with elevated lipase of 374 U/L (ULN 82). Computed tomography revealed a 5.8 cm multilobulated pancreatic pseudocyst with associated inflammation and coarse calcifications and a 10 cm circumferential submucosal mass within the duodenum with significant luminal narrowing and compression of the adjacent inferior vena cava (a). Endoscopic ultrasound confirmed a homogenous, hypoechoic subepithelial lesion obstructing the second portion of the duodenum consistent with a hematoma (b). A nasogastric-jejunal tube was placed for feeding and decompression. Due to persistent obstruction and IVC compression, on hospital day 10 endoscopic drainage of the duodenal hematoma was performed via cystduodenostomy with a 15x10 mm electrocautery-enhanced lumen-apposing metal stent (LAMS) (AXIOS, Boston Scientific, Marlborough, MA, USA) (c). The LAMS was immediately removed after near-complete evacuation of the hematoma cavity to minimize the risk of bleeding complications. A plastic double-pigtail stent was left in place to facilitate complete drainage. The duodenum was then dilated with a 12-13.5-15mm hydrostatic balloon dilator. The pigtail stent was removed 3 days later with clinical, radiographic, and endoscopic resolution of the duodenal obstruction (d).

**Discussion:** Duodenal hematoma is a previously described rare complication of pancreatitis. Endoscopic evacuation was a safe and effective means of relieving the duodenal obstruction in this patient. This minimally invasive option resulted in immediate resolution and can be considered when conservative management fails.



[2825] **Figure 1.** 10 cm duodenal wall hematoma on CT scan (a) and endoscopy (b). Endoscopic drainage via cystoduodenostomy with a lumen-apposing metal stent (c). Resolution of the duodenal wall hematoma (d).

S2826

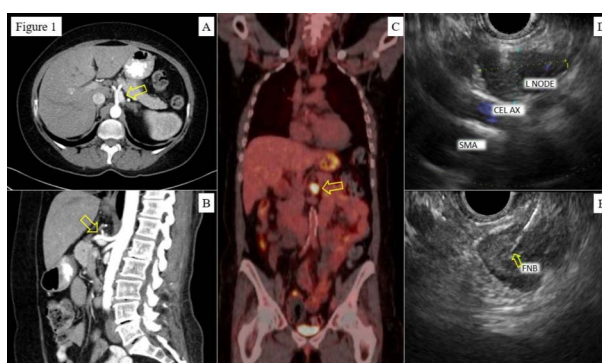
#### Endoscopic Ultrasound-Guided Biopsy of Non-Functioning Retropancreatic Celiac Paraganglioma Masquerading as Malignant Lymph Node

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**Introduction:** Paragangliomas are rare, extra-adrenal neuroendocrine tumors derived from chromaffin cells. Pheochromocytomas are in the adrenal medulla, whereas paragangliomas are extra-adrenal and can be found anywhere in the body. We present a unique case of a woman presenting with abdominal pain, found to have a micro-lobulated mass at the bifurcation of the celiac axis on imaging, suspected to be metastatic lymphadenopathy. She was referred for endoscopic ultrasound (EUS) guided fine-needle biopsy which revealed the mass to be a paraganglioma.

**Case Description/Methods:** A 59-year-old female with a history of chronic kidney disease and tobacco use presented to her primary care physician's office with complaint of abdominal fullness, diffuse abdominal pain, and urinary frequency. She underwent CT imaging of her abdomen and pelvis which revealed a 2.8 cm mass with micro-lobulated margins located at the bifurcation of the celiac axis (Figure 1A, 1B). A follow up PET scan revealed increased uptake by the mass with a standardized uptake value of 6.7 (Figure 1C). Due to the delicate location of the lesion, the patient was referred to gastroenterology for biopsy of the mass. She underwent EUS-guided fine-needle biopsy (FNB) using a 25G FNB needle which revealed two hypochoic, triangular masses (20mm and 10mm) in the celiac region thought to be lymph nodes (Figure 1D, 1E). Pathology was consistent with paraganglioma. Lab workup revealed a urinary free cortisol of 56mcg/24hr (ref: 4.0 to 50.0 mcg/24hr) and normal urine catecholamines. She opted to see an endocrine surgical specialist and is undergoing surveillance with potential future surgical resection.

**Discussion:** Paragangliomas are a rare phenomenon and may be misdiagnosed as patients can have nonspecific findings and the lesions vary in location. Most masses are benign but 15-20% may be malignant, thus clinicians should maintain a high index of suspicion for paraganglioma in patients with unexplained abdominal masses. Imaging and biopsy are the mainstays of diagnosis. Endoscopic ultrasound is a useful modality in obtaining sampling via FNB, especially from difficult to reach lesions as was the case for our patient.



[2826] **Figure 1.** A,B: Computed tomography images showing abdominal mass near celiac bifurcation, transverse (A) and sagittal (B) planes. 1C: Positron emission tomography scan revealing enhancement of abdominal mass, coronal view. 1D: Endoscopic ultrasound image of mass suspected to be lymph node near celiac axis. 1E: Endoscopic ultrasound guided fine-needle biopsy of mass.

S2827

#### Endoscopic Full Thickness Resection of a Sigmoid Colon GIST Diagnosed by EUS FNA

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**Introduction:** Subepithelial lesions of colon are often encountered during colonoscopy with lipoma being a common etiology, with other etiologies such as neuroendocrine tumors, leiomyoma, schwannoma, and GIST being rare. While a lipoma can be diagnosed by endoscopic appearance, pillow sign, and fat on biopsy; a diagnostic dilemma is presented if these findings are not present. EUS can be used for lesions that are within reach of an echoendoscope, but the sonographic appearance may still not be diagnostic without tissue sampling. This is a case of a subepithelial lesion in the sigmoid colon noted on colonoscopy that was diagnosed as a gastrointestinal stromal tumor by EUS FNA.

**Case Description/Methods:** A 67 year old man was noted to have a one centimeter smooth round lesion in his sigmoid colon on screening colonoscopy. The endoscopic appearance was consistent with a subepithelial lesion. A pillow sign was negative, showing a firm mobile mass. He was referred for endoscopic ultrasound. A radial echoendoscope was used to localize the lesion. It was round, well demarcated, hypoechoic, and originated in the fourth layer (muscularis propria). The radial scope was exchanged for a linear echoendoscope and FNA was performed using a 20 gauge biopsy needle. Pathology showed a spindle cell lesion that was positive for CD 117 staining consistent with a gastrointestinal stromal tumor. Multidiscipline discussion with colorectal surgery was had, and the decision to proceed with endoscopic resection using an over the scope clip to perform full thickness resection. Following the resection the patient had some post-procedure pain and was hospitalized for observation, treated with antibiotics, and serial imaging. No perforation was noted. Final pathology showed a 1.7cm low grade GIST with positive microscopic margins. Multidiscipline discussion at tumor board recommends continued surveillance for the low grade GIST. (Figure)

**Discussion:** Colonic GISTs are rare lesions with variable clinical courses. Full thickness endoscopic resection is an option using either an over the scope clip or dedicated full thickness resection device, or surgery are available options for management. Size, location, and multidiscipline discussion are needed to determine the best management strategy.



[2827] **Figure 1.** 4th layer hypoechoic lesion, sigmoid colon.

S2828

#### Failed Break-Away Tip Mechanism of Impacted Stone Retrieval Basket During Endoscopic Retrograde Cholangiopancreatography

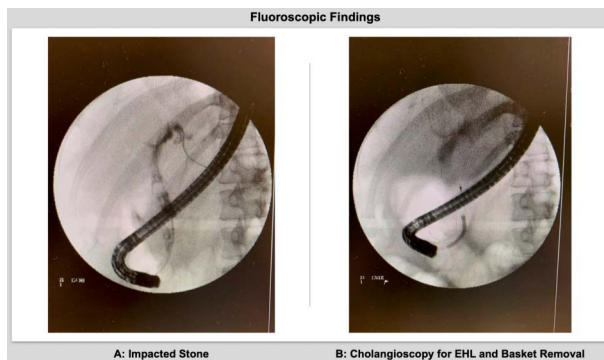
*Kush Fansiwala, MD<sup>1</sup>, Elissa Lin, MD<sup>2</sup>, Adarsh M. Thaker, MD<sup>1</sup>.*

<sup>1</sup>UCLA, David Geffen School of Medicine, Los Angeles, CA; <sup>2</sup>UCLA, Los Angeles, CA.

**Introduction:** Retrieval baskets are a common device used to extract biliary stones during endoscopic retrograde cholangiopancreatography (ERCP). Basket-related complications can include impaction around a stone. To manage this, specialized baskets were developed with a break-away tip to assist basket removal. Here, we describe a case of failure of the tip disengagement of an impacted Trapezoid retrieval basket (Boston Scientific, Marlborough, MA) and a rescue technique to manage this unexpected situation.

**Case Description/Methods:** A 43-year-old woman with severe choledocholithiasis with incomplete stone removal on prior ERCP presented for repeat ERCP. Cholangiogram showed a narrow common bile duct (CBD) with upstream dilation and multiple filling defects, including one very large stone. Multiple balloon sweeps failed to clear the duct. A digital cholangioscope was advanced into the CBD and electrohydraulic lithotripsy (EHL) was performed to break the distal-most stones. The largest stone was unable to be reached due to downstream fragments. These could not be balloon swept from the duct so basket sweeps were attempted, but the largest stone was inadvertently captured. The stone and basket became impacted in the mid duct. Mechanical lithotripsy (ML) was attempted with the basket, but the stone remained intact and the fail-safe break-away tip failed to disengage. Instead, the handle of the basket snapped. To troubleshoot, the basket wires were cut near the handle. The scope was then removed entirely and reinserted beside the wires. The cholangioscope was then passed alongside the wires and additional extensive EHL was performed until the impacted stone was finally reached and fractured, releasing the impacted basket. After additional stone removal, two plastic biliary stents were placed to maintain drainage. Approximately one month later, the patient eventually underwent repeat ERCP with stent removal and definitive clearance of the stones. (Figure)

**Discussion:** Although basket impaction of large stones is not uncommon, there are fail-safe mechanisms, including mechanical lithotripsy and break-away tips. The failure of both of these does not appear to have been previously reported with this basket. Rescue options for other baskets also include manipulation of severed wires and argon plasma coagulation to cut the wires. This case describes another option: cholangioscopy with EHL beside the basket wires to reach/fracture the stone and free the basket.



[2828] **Figure 1.** Fluoroscopic Findings.

S2829

#### ERCP via EUS Guided Duodenojejunostomy for a Biliary Stricture After Roux-en-Y Hepaticojejunostomy

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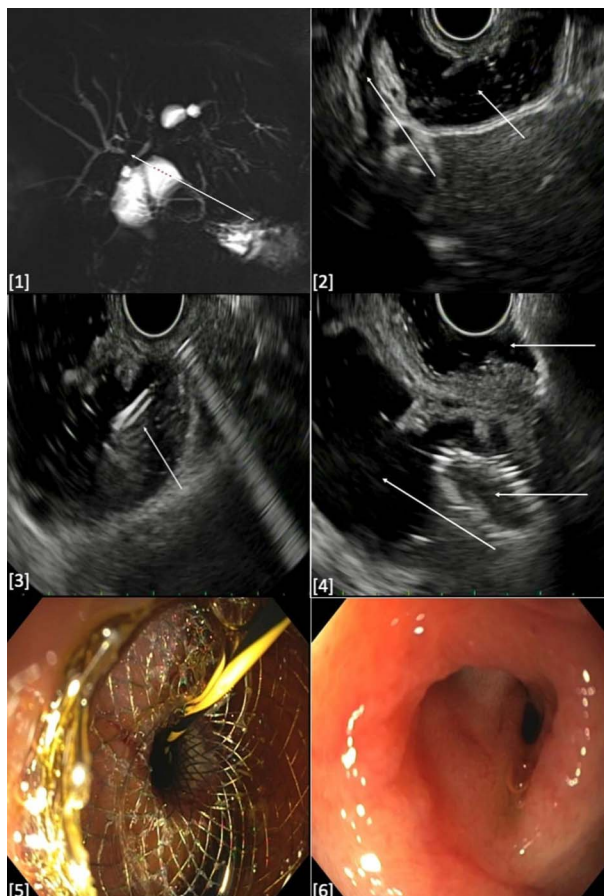
<sup>1</sup>San Antonio Uniformed Services Health Education Consortium, San Antonio, TX; <sup>2</sup>Brooke Army Medical Center, Fort Sam Houston, TX; <sup>3</sup>Brooke Army Medical Center, San Antonio, TX.



**Introduction:** Patients with a Roux-en-Y hepaticojejunostomy (RYHJ) present a unique challenge when endoscopic retrograde cholangiography (ERC) is required. Standard approaches range from a surgical approach involving laparoscopic assistance to device assisted enteroscopy, with transoral approaches generally being variably successful, due to anatomy, length of intestinal limbs after surgery, and limitations in available accessories for use in device assisted enteroscopy. Here, we report the endoscopic use of a LAMS to create a duodenojejunostomy (DJ), thereby enabling ERC in a patient with RYHJ.

**Case Description/Methods:** A 46-year-old woman status post cholecystectomy complicated by common bile duct injury necessitating RYHJ and prior anastomotic strictures, presented with recurrent self-limited cholangitis. She presented to clinic with intermittent episodes right upper quadrant pain, and fever which were treated conservatively with antibiotics. MRCP demonstrated stricture of the hepatic duct near the anastomosis [1]. Device assisted endoscopy was performed, but the anastomosis was unable to be reached. After discussing endoscopic, IR, and surgical options we proceeded with EUS guided interventions given the anticipated need for recurrent interventions for a biliary stricture. EUS demonstrated mild intrahepatic dilation with limited access points for hepaticogastrostomy. The bile duct and hepaticojejunostomy were visualized from the bulb with small bowel adjacent to the anastomosis [2]. The jejunum was accessed using a 19 G FNA needle, and bile was aspirated to confirm intraluminal location. The jejunum was filled with 200 mL of sterile water and contrast [3]. A 15 mm x 10 mm AXIOS was then deployed in good position, creating a DJ, which was confirmed fluoroscopically and endoscopically [4]. Contrast was then injected through the stent to exclude a leak. 4 weeks later, ERCP was performed via the DJ [5]. Cholangioscopy was performed which showed some edematous bile duct mucosa without findings concerning for malignancy [6]. Biopsies and brushings were performed and three plastic stents were placed. The patient tolerated the procedure well, the tissue was benign and the patient has had resolution of her cholangitis symptoms.

**Discussion:** In conclusion, we report a novel use of LAMS enabling ERC in patient's status post RYHJ which allows easy access for repeat interventions and avoids the difficulties and limitations of device assisted enteroscopy ERCP.



[2829] **Figure 1.** Image 1. MRCP showing hepatic duct stricture near the anastomosis Image 2. EUS with bile duct adjacent to fluid filled jejunum Image 3. EUS with FNA needle accessing hepaticojejunostomy Image 4. EUS with LAMS deployed from duodenum to jejunum Image 5. Matured duodenojejunostomy Image 6. Cholangioscopy demonstrating edematous mucosa.

S2830

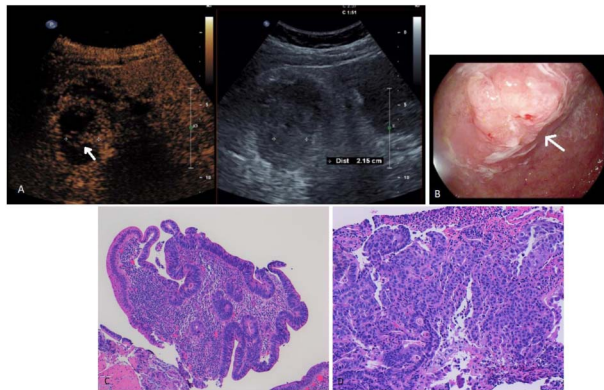
#### EUS-Guided Cholecystoduodenostomy Gallbladder Mass Biopsy via AXIOS™ Stent

*Blake Purtle, MD, Keith Garrison, MD, Tanmay Gaglani, MD, Zubair Khan, MD, Jamie Everett, MD, Srinivas Ramireddy, MD.*  
The University of Texas Houston Health Science Center, Houston, TX.

**Introduction:** Gallbladder carcinoma (GBC) is a rare malignancy with an incidence rate of 2-4 people per 100,000 with a 5% five-year survival rate.<sup>1</sup> Imaging modalities typically used to diagnose GBC are Magnetic Resonance Imaging (MRI), Computed Tomography (CT), and Magnetic resonance cholangiopancreatography (MRCP). However, an emerging diagnostic technique is Endoscopic Ultrasound (EUS) which has a more favorable sensitivity at 92-97%.<sup>2</sup> Following imaging diagnostics, either surgery or tissue biopsy is sought. Ultrasound-guided fine-needle aspiration (FNA) and Endoscopic retrograde cholangiopancreatography (ERCP) have been used as modalities for achieving a biopsy.<sup>3</sup> EUS-guided cholecystoduodenostomy (EUS-CDS) has emerged as a new alternative in high-risk patients. This procedure involves using endoscopic ultrasound to identify an area where the AXIOS delivery catheter can be inserted to deploy a stent. We present the case of an 89-year-old male who underwent a trans-AXIOS stent gallbladder mass biopsy during EUS-CDS.

**Case Description/Methods:** An 89-year-old male with a past medical history of coronary artery disease, heart failure with reduced ejection fraction, and atrial fibrillation was admitted for cholecystitis. Interventional radiology (IR) was consulted to place a percutaneous cholecystostomy tube. Outside hospital records had reported concern for gallbladder malignancy. Gastroenterology (GI) was then consulted and recommended further workup with MRCP. This showed multiple lesions within the gallbladder. Contrast-enhanced ultrasound was then done, which showed the enhancement of 3 polypoid lesions within the gallbladder lumen shown in Figure a. EUS-CDS was then done via the AXIOS stent, which demonstrated multiple masses within the lumen. Finally, multiple biopsies of the masses shown in Figure b were taken. Subsequent pathology (Figures 1c and 1d) is shown. The patient was later seen by surgery; however, he was not a surgical candidate. Instead, he was seen by oncology and was placed on Gemcitabine-Cisplatin therapy.

**Discussion:** GBC is primarily found in the later stages of its course, and when found preoperatively, only 15-47% are suitable for resection.<sup>4</sup> This case presents a unique way in which a high-risk individual was able to undergo a biopsy. It will be essential to consider EUS-CDS as means to not only perform gallbladder drainage but also for tissue diagnosis. As this is an emerging technique, it is vital to contribute cases and experiences to the literature for further investigations.



[2830] **Figure 1.** a) shows one of the three intraluminal gallbladder polyps (white arrow). Largest Measuring 2.7cm. b) is the endoscopic picture of the friable necrotic appearing mass proceeding multiple biopsies (white arrow). c) shows WT 10X dysplasia = 100X magnification of background dysplasia – left side of the tissue demonstrate inflamed no neoplastic epithelium with basally oriented nuclei, compared to high-grade dysplasia with loss of nuclear polarity, nuclear atypia, and enlarged hyperchromatic nuclei. d) shows WT 20X adenocarcinoma = 200X magnification- cohesive aggregate of neoplastic glandular cells with surface ulceration and luminal necrotic debris.

S2831

#### ERCP via Gastrostomy: A Work Around for Esophageal Stricture or Obstruction

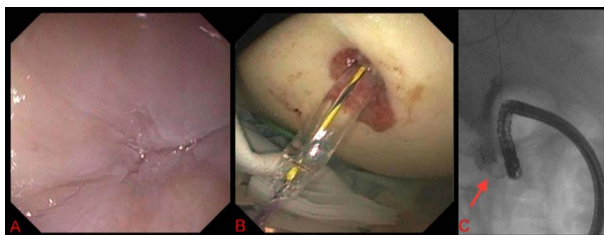
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**Introduction:** In the setting of biliary obstruction, endoscopic retrograde cholangiopancreatography (ERCP) can be a life-saving intervention. Most often performed via the trans-oral approach, there are indications of ERCP via gastrostomy (GERCP), largely for patients with altered anatomy from Roux-en-Y gastric bypass surgery. Few reports exist regarding GERCP in the setting of esophageal obstruction or stricture. We present a patient with complete esophageal obstruction with subsequent percutaneous gastrostomy (PEG) tube requiring GERCP with a pediatric duodenoscope for acute management of choledocholithiasis.

**Case Description/Methods:** An 84-year-old female with history of a severe benign esophageal stricture refractory to serial dilations, esophageal stenting, and ultimately requiring 20 Fr PEG placement presented with back pain after a mechanical fall. Computed-tomography abdomen/pelvis: intra- and extra-hepatic biliary ductal dilatation with an 8 mm density in the distal common bile duct and a distended gallbladder. Labs: AST/ALT 68/89 IU/L, alkaline phosphatase 610 IU/L, and total bilirubin 2.7 mg. Magnetic resonance cholangiopancreatography confirmed choledocholithiasis. Endoscopic management was the only viable option due to poor surgical candidacy. ERCP via a trans-oral approach was attempted, but the esophageal stricture was completely stenosed, precluding passage of a 0.035 inch guidewire (Image A). The external PEG tube was removed and the gastrostomy stoma was dilated using a 12mm biliary balloon dilator under fluoroscopic guidance (Image B). An Olympus PJF-160 7.5mm diameter duodenoscope was passed through the stoma into the duodenum and the bile duct was cannulated. Fluoroscopy revealed 15mm duct dilation with a 10mm distal filling defect. Stone removal was accomplished via sphincterotomy and balloon, dilation-assisted-stone extraction (Image C). A 20 Fr externally replaceable PEG tube was placed at the stoma site at the end of the procedure.

**Discussion:** This case demonstrates an alternative approach to an arduous ERCP in a patient with a severe esophageal stricture which was not amenable to dilation or esophageal stenting. GERCP requires extra vigilance due to technical challenges related to positioning and thermal injury risk with a small caliber scope tip, but can serve as another option in an interventional endoscopist's arsenal for managing biliary disease in patients with esophageal strictures.



[2831] **Figure 1.** A) Upper endoscopy showing complete esophageal stenosis B) Dilatation of gastrostomy stoma with 12mm biliary balloon dilator C) Cholangiogram showing 12mm balloon dilator in the common bile duct with filling defect consistent with stone.

S2832

#### First Trimester Subcapsular Hepatic Hematoma Following Endoscopic Retrograde Cholangiopancreatography

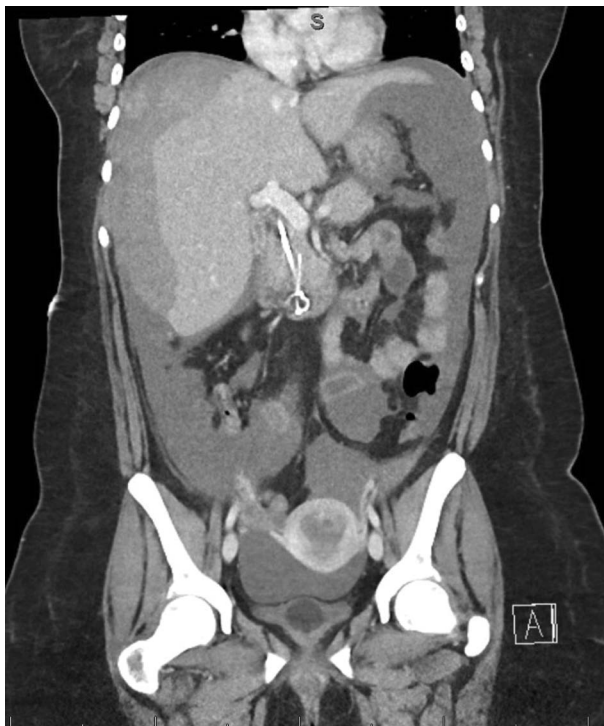
*Brandon Ganjineh<sup>1</sup>, Tarek Alansari, MD<sup>2</sup>, David M. Friedel, MD<sup>2</sup>.*

<sup>1</sup>Virginia Tech Carilion School of Medicine, Roanoke, VA; <sup>2</sup>NYU Langone Medical Center, Mineola, NY.

**Introduction:** Endoscopic retrograde cholangiopancreatography (ERCP) is commonly utilized to treat pancreaticobiliary diseases and is considered safe in pregnancy. We describe a case of ERCP indicated for choledocholithiasis in a newly pregnant patient which resulted in a very rare complication related to guide wire trauma.

**Case Description/Methods:** A 24-year-old female presented to the emergency department with right upper quadrant pain, fever, leukocytosis, and obstructive jaundice. Bloodwork revealed she was 8 weeks pregnant. Imaging studies showed acute cholecystitis and choledocholithiasis with a dilated common bile duct of 1.2 cm. Therapeutic ERCP was performed with minimal use of fluoroscopy to reduce fetal exposure. Double wire technique was utilized and the bile duct was successfully cannulated with a 0.025 mm angled-tipped hydrophilic wire. Sphincterotomy was performed, followed by sphincteroplasty. The bile duct was swept with a 12 mm balloon but only one stone was extracted. To avoid further fetal fluoroscopy exposure, double plastic stents were placed into the common bile duct and a single pigtail plastic stent was placed into the pancreatic duct. The following day, she became hemodynamically unstable. Labs suggested an improved cholestatic pattern and improved leukocytosis post ERCP decompression. Due to worsening hepatocellular injury and hemodynamic instability, a computed tomography angiogram was performed. A 3.9 cm subcapsular hepatic hematoma with capsular retraction and parenchymal distortion of the superior right hepatic lobe was found. Interventional radiology catheter embolization was attempted. Aggressive conservative management with blood transfusions and close monitoring successfully stabilized the patient. The patient ultimately had a spontaneous abortion and returned for an outpatient ERCP with biliary stent removal and stone extraction.

**Discussion:** Although a very rare complication, this case does highlight the possibility of angled-tipped hydrophilic guide wire hepatic trauma and clinically significant bleeding. When strongly indicated, ERCP should be performed in people who are pregnant, but exposure to fluoroscopy should be minimized. Similar cases hypothesize that liver injury is attributable to traumatic damage to the intrahepatic biliary tree and hepatic parenchyma by the ERCP guide wire.



[2832] **Figure 1.** Computed tomography of the abdomen revealed a hypodense subcapsular collection on the right side of the liver. The bleed continues inferiorly and medially. A plastic pancreatic stent and a plastic biliary stent are also visible.

S2833

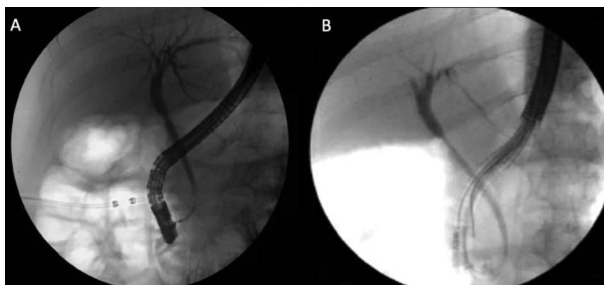
#### Feasibility of a New Generation Single Use Duodenoscope in a Patient With Roux-en-Y Gastric Bypass

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**Introduction:** Single-use duodenoscopes decrease the risk of cross-contamination and can limit costs by eliminating the need for processing and repair. The "aScope Duodeno" by Ambu\* is a fully disposable, single use duodenoscope, but experience in its use for complex endoscopic retrograde cholangiopancreatography (ERCP) is limited.

**Case Description/Methods:** A 32-year-old female with a history of a Roux-en-Y gastric bypass for obesity and cirrhosis secondary to alcohol use disorder, status-post liver transplant, presented with ascending cholangitis and choledocholithiasis. She was found to have bacteremia with *Klebsiella* species. Considering the acuity of her symptoms, a percutaneous transhepatic internal-external biliary drain was placed for biliary decompression. To address the obstructive stones, a staged endoscopic ultrasound-guided transgastric ERCP (EDGE) procedure was performed. First, a lumen-apposing metal stent (LAMS) was placed to connect the gastric pouch and the bypassed stomach. Two weeks later, an ERCP was performed through the LAMS using a traditional, reusable duodenoscope. Despite successful stone extraction, the procedure was technically difficult due to pyloric stenosis requiring dilation with a balloon dilator, limited mobility of the endoscope due to the constraints of the altered anatomy, and difficulty with fluoroscopic visualization of the entire bile duct. Given persistent elevation in alkaline phosphatase and concern for a retained biliary stone, the patient underwent a repeat ERCP in three weeks. This time, the Ambu\* single use duodenoscope was advanced through the LAMS to the level of ampulla. Due to the high flexibility of the scope and its light weight, the procedure was performed with technical ease. Balloon sweep of the CBD was unremarkable for residual stones or debris. As the distal portion of the insertion tube and the flexible portion of the Ambu\* scope are transparent under fluoroscopy, a cholangiogram was obtained with minimal contrast and limited need to maneuver the scope. The LAMS was then removed, and the iatrogenic gastro-gastric fistula was closed with an endoscopic tacking system. (Figure)

**Discussion:** Single use duodenoscope by Ambu\* is a feasible device in patients with altered anatomy. The fluoroscopically transparent distal end of the scope is a unique feature of this device and beneficial in challenging positions with limited space for maneuverability.



[2833] **Figure 1.** The single use aScope Duodeno can provide advantages in endoscopic retrograde pancreatography with limitations in maneuverability, as shown in this procedure in a patient with a Roux-en-Y gastric bypass performed through a LAMS-based iatrogenic gastro-gastric fistula. (A) Traditional endoscope being used to extract stones (B) aScope Duodeno being used to fully clear the biliary ducts on follow-up ERCP with transparent distal end under fluoroscopy.



S2834

**Gastro-Cutaneous Fistula Closure Using Novel Tack Suture System***Munraj Singh, MD, Catherine Hudson, MD, MPH.**Louisiana State University Health Sciences Center, New Orleans, LA.*

**Introduction:** Gastro-cutaneous fistulas that develop at prior gastrostomy sites are usually successfully closed by the use of endoscopic suturing or the over-the-scope clips (OTSC). However, the endoscopic suturing device and the OTSC device measure approximately 16 mm and 14 mm, respectively, resulting in them not able to pass through narrow esophageal strictures. The endoscopic tack suture system is a novel technique that includes a through the scope suture-based device that was recently designed for the closure of large and irregular defects in the gastrointestinal tract. Even more advantageous is the ability for the tack suture system to be passed through the working channel of a standard gastroscope.

**Case Description/Methods:** A 61-year-old male with past medical history of head and neck cancer presented with persistent gastro-cutaneous fistula drainage following gastrostomy tube removal. On endoscopic evaluation, a benign appearing esophageal stenosis in the upper esophagus required downgrading the scope from a therapeutic scope to a gastroscope. A gastric fistula was noted in the gastric body, but the exact site of the fistula was unclear as there were 2 defects side by side (Figure A). Both defects were treated with APC and the entire area was closed with a single tack suture system with 4 tacks drilled in healthy tissue surrounding the defect (Figure B). Following tack placement, a single suture was used to cinch down and close the defect (Figure C). On follow up the patient had no further fistula drainage.

**Discussion:** Our case presents the use of a novel tack suturing system to close a persistent gastro-cutaneous fistula in the setting of an esophageal stricture. Commonly used defect closing devices such as the OTSC and endoscopic suturing device can be too large to navigate severe esophageal strictures. The endoscopic tack suture system has the ability to aid in the closure of fistulas, perforations, anastomotic leaks and submucosal dissections. While preclinical data reported no adverse events, possibilities include wound dehiscence, delayed perforation, and bleeding if the tacking system is improperly placed. Mahmoud et al. conducted the first and only multi-center study describing the feasibility and safety of the endoscopic tack suturing device in the clinical setting and found successful closure of defects in approximately 90% of cases. This novel tack suture system is a useful tool in cases that are confined to the parameters of a standard gastroscope.



[2834] **Figure 1.** A: Gastric fistula. B: Fistula following APC with 4 tacks drilled in healthy tissue surrounding the defect. C. Cinching of single suture with closure of gastric fistula.

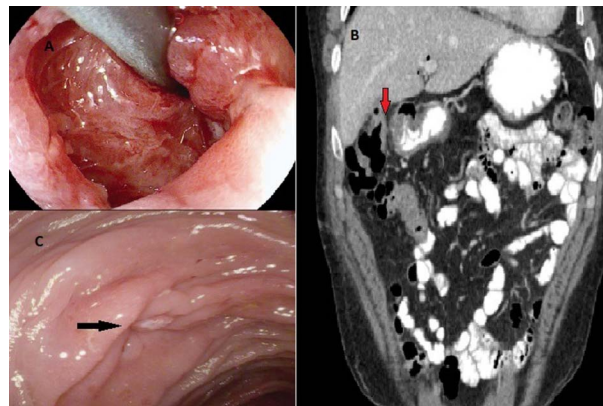
S2835

**Gastro-Cholecysto-Colonic Fistula Following Endoscopic Ultrasound-Guided Gallbladder Drainage for Stump Cholecystitis: A Case Report***Nicholas J. Koutlas, MD, Swati Pawa, MD, Girish Mishra, MD, Rishi Pawa, MBBS.**Atrium Health - Wake Forest Baptist, Winston-Salem, NC.*

**Introduction:** Cholecystocolonic fistulas (CCF) usually occur as a complication of gallstones but cases due to malignancy, peptic ulcers, and Crohn's disease have been reported. We present a case of a gastro-cholecysto-colonic fistula after endoscopic ultrasound guided-gallbladder drainage (EUS-GBD) for stump cholecystitis.

**Case Description/Methods:** A 50 year old male presented with abdominal pain. CT scan noted acute cholecystitis. He underwent laparoscopic converted to open subtotal cholecystectomy due to significant inflammation around the gallbladder. He represented 3 weeks later for abdominal pain. CT showed stump cholecystitis. Gastroenterology was consulted for EUS-GBD given his poor surgical candidacy. Diagnostic EUS revealed choledocholithiasis. Endoscopic retrograde cholangiography (ERC) with cholangioscopy, electrohydraulic lithotripsy, and stone removal was completed. Transgastric EUS-GBD with a 10 x 10 mm electrocautery enhanced lumen apposing metal stent (LAMS) was then performed followed by double pigtail stent (DPT) placement within the LAMS. At a follow up visit, abdominal pain resolved but he developed debilitating diarrhea and was started on cholestyramine. Upper endoscopy 4 weeks after EUS-GBD revealed a gastro-cholecysto-colonic fistula with the proximal end of the DPT in the colon. Cholecystoscopy confirmed absence of gallstones so the LAMS and DPT were removed. Clips were used to close the cholecystogastric tract. Oral contrasted CT with delayed images showed tethering of the gallbladder to the hepatic flexure but no extravasation of contrast into the gallbladder from either the stomach or colon. Given this, clinical observation was pursued. Six weeks later, CT noted similar tethering without contrast leak. On colonoscopy, an area of inflamed mucosa at the hepatic flexure was seen without a patent fistula tract. Biopsies showed chronic colitis. Diarrhea subsequently resolved. (Figure)

**Discussion:** CCFs are a rare complication of gallstone disease. If untreated, biliary sepsis can occur. Surgery is the standard treatment but endoscopic transpapillary gallbladder drainage with a DPT can promote fistula healing in non-surgical patients. We present a case of a gastro-cholecysto-colonic fistula in a poor surgical candidate after EUS-GBD for stump cholecystitis. This was managed with closure of the cholecystogastric tract. CCF closure occurred spontaneously. In cases of persistent CCF, transpapillary gallbladder drainage should be considered.



[2835] **Figure 1.** A. Double pigtail stent migrated into transverse colon with gastro-cholecysto-colonic fistula as viewed from the gallbladder lumen. B. CT scan showing tethering of hepatic flexure to remnant gallbladder (red arrow) without contrast extravasation into the gallbladder from the stomach or colon. C. Closed cholecystocolonic fistula (black arrow) viewed from the hepatic flexure.

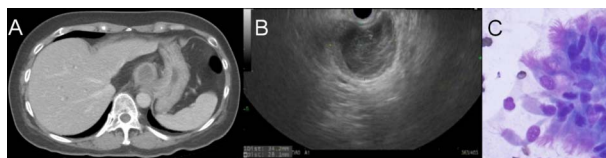
S2836

**Gastrohepatic Ligament Bronchogenic Cyst Diagnosed by EUS FNA***Ellen C. Tan, DO<sup>1</sup>, David Y. Lo, MD, FAGC<sup>2</sup>.**<sup>1</sup>OhioHealth Riverside Methodist Hospital, Columbus, OH; <sup>2</sup>Ohio Gastroenterology Group, Inc, and The Ohio State University College of Medicine, Columbus, OH.*

**Introduction:** Bronchogenic cysts pose diagnostic and therapeutic challenges due to its varied locations and presentations.

**Case Description/Methods:** 58-year-old woman presented with two weeks of epigastric and RUQ abdominal pain. Presenting labs: TB 4.3 mg/dL, DB 3.4 mg/dL, AP 328 U/L, AST 1,265 U/L, ALT 1,890 U/L. Workup was negative for pancreatitis, acute hepatitis, and acetaminophen toxicity. CT scan showed biliary duct dilatation with a 5mm stone in the common bile duct, and a 3.5 x 3.6 cm thick-walled mass with rim enhancement and hypodense central component within the gastrohepatic ligament (GHL) (A). EUS characterized the mass as a hypoechoic cystic lesion with a concentric 4mm thick wall (B). Fine needle aspiration (FNA) of the cyst produced 14ml of brown and viscous fluid. After cyst aspirate, FNA of the decompressed cyst wall was also performed. Cyst fluid amylase was < 3 U/L, CEA was 157 ng/mL, and cytology was negative for malignancy. Cytology of the cyst wall showed benign ciliated columnar epithelial cells consistent with a bronchogenic cyst (C). ERCP was performed during EUS for stone extraction. She then underwent cholecystectomy with improvement of symptoms and liver enzymes. Her asymptomatic bronchogenic cyst is undergoing active surveillance. (Figure)

**Discussion:** Bronchogenic cysts are foregut-derived malformations of the respiratory tract and while relatively rare, is the most common primary cyst of the mediastinum accounting for 6-15% of primary mediastinal masses. The location depends on the embryological stage of development when the anomaly occurs. Most are in the mediastinum and uncommonly in the lung parenchyma, esophagus, heart, subdiaphragm, and retroperitoneum. Only one other case has been reported of a bronchogenic cyst in the GHL. Reported prevalence is 1:42,000-68,000 admissions in two hospital series. Some present with symptoms such as cough, fever, pain, and dyspnea. Complications can arise with compression of mediastinal structures, recurrent infection, hemorrhage, rupture, and malignant degeneration. Others are asymptomatic and incidentally found on chest radiograph or cross-sectional imaging. No standard exists for treatment. Traditionally, patients underwent surgical excision for definitive diagnosis and management. EUS FNA serves as a less invasive method for diagnosis. Controversy still exists regarding management of asymptomatic cysts with several reports advocating for complete removal due to likelihood of development of symptoms and potential for serious illness.



[2836] **Figure 1.** CT, EUS, Cytology.

S2837

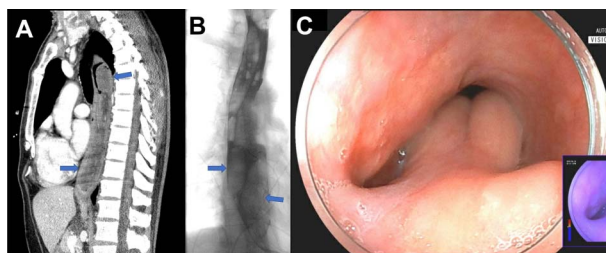
#### Giant Fibrovascular Esophageal Polyp Resected by Endoscopic Submucosal Dissection

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**Introduction:** Esophageal lipomas are rare, accounting for 1% of all benign esophageal neoplasms. Fibrovascular polyps are a subset of esophageal lipomas that can present with dysphagia, hematemesis, melena and/or profound anemia. We describe a case of a giant esophageal fibrovascular polyp (GFVP) which was treated with endoscopic submucosal dissection (ESD).

**Case Description/Methods:** A 62-year-old man presented for evaluation of a two-month history of dysphagia to solids and liquids, 4 kg weight loss, and melena. Examination revealed a chronically ill pale man with no palpable neck masses, a nontender, nondistended, soft abdomen, and melena confirmed by digital rectal exam. Blood work showed hemoglobin of 4.7g/dL, MCV of 78.1 fl. and albumin of 3.6 g/dL. A Chest CT with IV contrast showed a soft tissue mass filling the entire length of the esophagus (Figure A). Differential diagnosis included esophageal carcinoma, pedunculated fibrovascular polyp, and leiomyomatosis. Barium esophagram showed smooth lobular defects filling the entire esophageal lumen (Figure B). Upper endoscopy and endoscopic ultrasound (EUS) revealed a near circumferential large stalk starting at the upper esophageal sphincter and diverging into 3 separate stalks measuring 15, 18, and 20 cm respectively with a small distal hematoma (Figure C). Because neither a 33mm snare nor endoloop could encircle the polyp heads, a technically complex ESD was performed using ERBE I knife and Endo Cut Q for submucosal incision. Standard SB knife was used for submucosal release before dissection with DryCut and the Olympus ITknife2. Hematoxylin & eosin staining confirmed the diagnosis of a GFVP. On one month follow up, the patient's dysphagia had resolved completely, he had no recurrence of melena, and hemoglobin was stable.

**Discussion:** Patients with GFVPs present with dysphagia, coughing, and a sensation of throat fullness. There are rare reports of large upper esophageal polyps regurgitating into the oropharynx and leading to subsequent asphyxiation. Prompt removal via cervicotomy or thoracotomy are the most common interventions, but upper endoscopy with ESD is a minimally invasive option that may facilitate improved recovery. ESD was chosen over endoscopic mucosal resection in this case due to multiple factors: less risk of intra and post procedural bleeding, technical difficulty for loop ligation since the polyp heads were large, and for superiority of ESD at achieving complete resection.



[2837] **Figure 1.** A: Sagittal CT chest reveals entire esophageal lumen filled with soft tissue mass. B: Water soluble esophogram showing smooth lobular filling defects throughout the esophageal lumen. C: Endoscopic appearance of the large stalk of the multilobulated giant fibrovascular polyp inserting at the upper esophageal sphincter.

S2838

#### Giant Choledocholithiasis Treated by Direct Cholangioscopy With Gastroscope and Electrohydraulic Lithotripsy

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**Introduction:** The extraction of very large bile duct stones can pose significant challenges. In the following report, we describe the use of direct cholangioscopy with a gastroscope to facilitate electrohydraulic lithotripsy (EHL) and remove a giant common bile duct (CBD) stone.

**Case Description/Methods:** A 71-year-old female presented to the emergency department with 3 months of intermittent right upper quadrant pain. She denied having nausea, vomiting, or loss of appetite, and physical examination was unremarkable. A CT of the abdomen and pelvis was performed, which revealed a large 9 x 4 cm hyperdense mass underneath the liver, adjacent to the gallbladder. An endoscopic ultrasound showed a very large radiopaque filling defect in a very dilated bile duct, and a cholangiogram during endoscopic retrograde cholangiopancreatography confirmed a very large stone occupying the entire CBD. To remove the stone, a biliary sphincterotomy was performed, and the bile duct orifice was dilated with a 12-15 mm balloon. Next, the duodenoscope was replaced with a standard adult gastroscope. The gastroscope was guided through the major papilla into the bile duct, and EHL was used for stone fragmentation. Large stone fragments were removed under direct visualization using a wire basket through the gastroscope. Two sessions of EHL via direct cholangioscopy with the gastroscope were required to achieve complete bile duct clearance. (Figure)

**Discussion:** Choledocholithiasis is the presence of a gallstone in the CBD, occurring in up to 20% of patients with cholelithiasis. While smaller stones (< 1.5 cm) can often be removed intact via endoscopic sphincterotomy and sphincteroplasty, larger stones can be more difficult to remove and may require lithotripsy (mechanical, EHL or laser). In rare instances and depending on local expertise, surgery is also considered. Nevertheless, cholangioscopy using SpyGlass and EHL is the most common technique for bile duct stone fragmentation. In this case, due to the large size of the CBD and giant size of the stone, we decided to use direct cholangioscopy via a standard adult gastroscope and EHL. Scope stability and visibility within such a large bile duct was significantly superior to SpyGlass, and irrigation and suction through

the gastroscope allowed for high quality EHL and removal of large debris. This technique can only be applied to bile ducts that are dilated more than 15 mm in diameter and requires advancing the gastroscope into the distal bile duct using a free-handed technique.



[2838] **Figure 1.** Computed tomography of the abdomen and pelvis revealing a large 9 x 4 x 4 cm bile duct stone.

S2839

#### Gastrointestinal Bleeding Secondary to Splenic Artery Aneurysm: A Delayed Complication of a Lumen Apposing Metal Stent

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<sup>1</sup>Geisinger Medical Center, Danville, PA; <sup>2</sup>Geisinger Health System, Danville, PA.

**Introduction:** Lumen apposing metal stents (LAMS) have been widely used for drainage of peri-pancreatic collections. Pseudoaneurysm formation and rupture is an uncommon complication of LAMS. A possible mechanism for bleeding with current LAMS is its bi-flanged design which does not allow mobility of walls or the stent when the size of collection reduces in size post drainage. This can theoretically cause tension over the wall and surrounding vasculature which lead to pseudoaneurysm formation and bleeding.

**Case Description/Methods:** A 71-year-old female with a history of necrotizing pancreatitis complicated by splenic vein thrombosis on warfarin underwent LAMS placement with a significant reduction in the peri-pancreatic collection on follow up imaging. Three months later, she presented with two days of melena and hematochezia. On evaluation, she was hypotensive and tachycardic. Lab work revealed hemoglobin of 6.1 g/dl from a baseline of 12 g/dl. A computerized tomography angiography (CTA) which did not show active GI bleeding. EGD showed a large pulsating non-bleeding vessel within LAMS. Due to the potential of increasing bleeding with the removal of LAMS, a mesenteric angiogram was done demonstrating a splenic artery pseudoaneurysm, and this was successfully embolized with coils. She subsequently underwent repeat EGD following the coiling with successful removal of LAMS. No further bleeding followed stent removal.

**Discussion:** A ruptured pseudoaneurysm can present with abdominal pain, signs of GI bleeding, or hemobilia. CTA is an important (Figure) diagnostic step but can be unremarkable such as in this case. Pseudoaneurysm formation can be prevented with timely removal of LAMS after the successful drainage and reduction in the size of the pancreatic collection. Empiric embolization before removal of LAMS can prevent life-threatening bleeding, and therefore discussion with the interventional radiologist should be done before attempting removal of LAMS in such high-risk cases. Although GI bleeding secondary to rupture pseudoaneurysm with LAMS is a rare complication, it should be considered in patients with recent LAMS placement who present with GI bleeding.



[2839] **Figure 1.** Digital subtraction angiogram of the Celiac artery demonstrating luminal irregularity and dilation, consistent with pseudoaneurysm of the main Splenic artery, about the inferior margin of the AXIOS stent.

S2840

### Hepatic Tuberculoma Caused by *Mycobacterium Fortuitum*: A Rare Case Diagnosed by EUS-FNA

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**Introduction:** *Mycobacterium fortuitum* is a type of nontuberculous mycobacteria belonging to a group classified as Rapidly Growing Mycobacteria (RGM), along with *Mycobacterium abscessus* and *Mycobacterium chelonae*. *M. fortuitum* is predominantly associated with skin, soft tissue, and surgical-wound infections. Catheter-related sepsis and disseminated disease can also occur. Isolated liver involvement by atypical mycobacterial infection is exceedingly rare. Here we describe a case of *M. fortuitum* presenting as an asymptomatic liver mass.

**Case Description/Methods:** A 67-year-old male was referred for endoscopic ultrasound (EUS) to evaluate a gastric body subepithelial lesion (SEL) and a 3 cm incidental liver mass. He was asymptomatic. Percutaneous CT-guided biopsy was performed, but pathologic results were nondiagnostic. Patient was thus referred for EUS to evaluate the gastric SEL and determine if the liver mass represented metastasis. A 14 by 4 mm elongated intraluminal hypoechoic mass arising from the muscularis propria highly suggestive of a leiomyoma or GIST was identified. A heterogeneous mass with cystic spaces and echogenic foci in the left liver lobe measuring 27 by 20 mm was sampled using a 22g FNA needle. Pathology revealed granulomatous inflammation with necrosis. An AFB stain was positive for acid fast bacilli. PCR analysis of the specimen detected *M. fortuitum* DNA. Patient was treated with levofloxacin 750 mg daily plus trimethoprim and sulfamethoxazole (Septra DS) 800 mg - 160 mg twice daily. Follow-up contrast-enhanced MRI revealed complete resolution of liver lesion after 3 months of antibiotics.

**Discussion:** Isolated liver involvement by nontuberculous mycobacteria is uncommon, usually asymptomatic, and its diagnosis can easily be missed or mistaken. We report the first case of a hepatic tuberculoma caused by *M. fortuitum* diagnosed by EUS-FNA. Precise and accurate recognition by a minimally invasive technique via EUS-FNA resulted in prompt treatment and resolution of the disease.

S2841

### Ileo-Rectal Anastomotic Defect Treated Twice With Endoscopic Tack Suture System and Stenting

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**Introduction:** The endoscopic tack suture system is a novel technique that includes a through the scope (TTS) suture-based device that was recently designed for the closure of large and irregular defects in the gastrointestinal tract. Choice of closure device depends on the location, size, and working space around the defect. Over-the-scope clips (OTSC) and endoscopic suturing devices require withdrawal of the scope to load and are harder to maneuver through smaller spaces such as strictures. The TTS tack suturing system prevents the need to withdraw the scope and can be deployed in very small spaces. We present a case of a recurrent post-surgical leak leading to wound dehiscence and enterocutaneous fistula of an ileorectal anastomosis associated with a stenosis requiring the tack suture device and stenting for closure.

**Case Description/Methods:** A 60-year-old woman was admitted after a recent subtotal colectomy with ileo-colonic anastomosis for a large adenoma that was unable to be resected endoscopically. She developed a pelvic abscess and wound dehiscence. She underwent exploratory laparoscopy with resection of the anastomosis with end-ileostomy creation. She later underwent open ileostomy reversal with ileo-rectal anastomosis and drain placement. Output continued from both the drain and the midline incision. Colonoscopy showed a large defect in the ileo-rectal anastomosis that was 40% circumferential with significant stenosis. The tack suturing system was employed after argon plasma coagulation (APC) and a fully covered esophageal stent was deployed across the defect (Figure A). During repeat colonoscopy, the initial tack and suturing device was found to be in place on the ileal mucosa, but two tacks had dislodged from the colonic mucosa. An improved small, well defined, round defect was found at the anastomosis (Figure B). The defect was again treated with APC, tack suturing, and stent placement with subsequent resolution of symptoms (Figure C).

**Discussion:** This case highlights the novel tack suturing system which ultimately prevented this patient from undergoing further operations and requiring a colostomy. The tack suture system is an ideal tool for defect closure in tight spaces where OTSC or endoscopic suturing are too bulky. Mahmoud et al. conducted the first and only multi-center study describing the feasibility and safety of the endoscopic tack suturing device in the clinical setting and found successful closure of defects in approximately 90% of cases.



[2841] **Figure 1.** (A) Tack placement following APC at anastomotic defect. (B) Initial tack suture with 2 tacks dislodged from colonic mucosa and small improved defect in anastomosis. (C) Tack placement for closure of persistent defect.

S2842

### Hyperechoic Lesions on Endoscopic Ultrasound Are Not Always Benign

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**Introduction:** Liposarcomas are rare tumors usually diagnosed in late adulthood with an uncommon incidence. Here, we present a case of a hyperechoic mass seen on the endoscopic ultrasound (EUS) with fine needle biopsies confirming a metastatic liposarcoma.

**Case Description/Methods:** A 70-year-old female with a distant history (>10 years) of retroperitoneal liposarcoma with a left renal, adrenal, and colon metastasis treated with extensive surgical resection presented to a primary care clinic for health maintenance. Patient was without significant gastrointestinal symptoms or laboratory abnormalities at the visit. Patient underwent a surveillance CT of the abdomen and pelvis, where a soft tissue lesion was found in the left posterior retroperitoneal space. Patient was referred to interventional gastroenterology for EUS guided tissue biopsy. During the procedure, an oval mass was identified in the peri-splenic area at prior nephrectomy bed. The mass was hyperechoic with some isoechoic areas, 31 mm by 29 mm in maximal cross-sectional diameter, and the outer margins were not well defined (Figure). Fine needle biopsy using a 22 Gauge core biopsy needle was performed. Cytology analysis revealed a well-differentiated liposarcoma indicating recurrence of the disease. Patient was subsequently referred to the multidisciplinary tumor board for further evaluation and treatment.

**Discussion:** Interpreting echogenicity of gastrointestinal lesions with an EUS is an important part of the differential diagnosis. Lipomas are ubiquitous lesions with a classic hyperechoic appearance on EUS. Lesions with high fat or collagen content are usually hyperechoic as a result of higher ultrasound wave scattering. Liposarcoma is a very rare soft tissue malignancy of mesenchymal origin. Four subtypes of liposarcomas exist (well-differentiated, myxoid, dedifferentiated, pleomorphic), among which a well-differentiated subtype has the largest fat content. Commonly affected sites are upper extremities, thighs, gluteal, and retroperitoneum, last of which can be detected on the EUS. Endosonographers must have a higher clinical suspicion to diagnose metastatic process while evaluating patients with history of mesenchymal tumors.





[2842] **Figure 1.** A hyperechoic, peri-splenic mass on EUS.

S2843

#### How Many Stones Are Too Many Stones?

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**Introduction:** Gallstones disease or cholelithiasis has become one of the most prevalent diseases of the developed world in the last few decades. Certain populations, including pregnant females, have been identified to be at increased risk. Gallstones can be present in 1-3% of all pregnancies and acute cholecystitis is the second cause of non-obstetric indication for surgery in pregnancy. In pregnancy, there is an influx of estrogen, which increases cholesterol secretion. By the other side, increased progesterone levels reduce bile secretion and delay gallbladder emptying. These changes result in super-saturation of bile with cholesterol and a predisposition to gallstone formation. We present the case of a postpartum female that presented with cholelithiasis and choledocholithiasis.

**Case Description/Methods:** A 28-year-old female with past medical history significant for hypothyroidism and recent pregnancy, presented to the hospital with complaints of right upper quadrant (RUQ) abdominal pain. She had gone out of the country in order to seek medical attention and was prescribed Flagyl and Ketorolac, with no symptomatic relief. She had worsening RUQ pain described as “colicky”, worse in the epigastric region, in addition to significant pruritus. Patient’s review of systems was positive for nausea, dark urine, and jaundice for the last 4 days. In the hospital, she had abnormal liver enzymes. Ultrasound and abdominal CT presented with significant biliary dilation. Magnetic resonance cholangiopancreatography (MRCP) demonstrated “innumerable gallstones”, measuring between 3 to 6mm, located in the cystic and common bile duct. Endoscopic retrograde cholangiopancreatography (ERCP) with sphincterotomy resolved patient symptomatology. (Figure)

**Discussion:** Despite the increased frequency of gallstone disease in pregnancy, there is no consensus on the management of symptomatic cholelithiasis and/or choledocholithiasis, in this setting. Conservative management with symptomatic treatment has been the gold standard for decades. However, the risk for recurrent symptoms and subsequent hospital admission is high, at times up to 72%. The Society of American Gastrointestinal and Endoscopic Surgeons recommend laparoscopic cholecystectomy as the treatment of choice for symptomatic cholelithiasis, regardless of pregnancy state. Developing a standard guide to manage symptomatic cholelithiasis and choledocholithiasis in pregnancy would save both time and cost to the patient and healthcare system.



[2843] **Figure 1.** Shows the magnetic resonance cholangiopancreatography (MRCP) of our patient with numerous stones on the common bile duct (Panel 1 and 2). Endoscopic retrograde cholangiopancreatography (ERCP) showing some of the multiple stones that came out after sphincterotomy was performed (Panel 3).

S2844

#### Hidden in Plain Sight: Cholangiocarcinoma Diagnosed With Laparoscopy After Multiple Non-Diagnostic ERCPs

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**Introduction:** Cholangiocarcinoma (CCA) is a malignancy of the biliary tree, composed of epithelial cells and presents insidiously. Endoscopic retrograde cholangiopancreatography (ERCP) is used in the diagnosis and treatment of biliary strictures and malignant biliary obstruction.

**Case Description/Methods:** A 42-year-old man with a 9-month history of cholestatic-pattern of liver test elevation who presented for evaluation of abnormal liver tests, persistent pruritus, intermittent abdominal pain. Social history was negative for toxic habits. Prior to presentation, the patient was being treated for presumed drug-induced liver injury (DILI) with a cholestatic pattern of liver injury. On admission, the patient’s vital signs were within normal limits. Physical examination was significant for generalized pruritus, jaundice, and right upper quadrant abdominal pain and negative for signs of chronic liver disease. Liver biopsy revealed ductular proliferation with periportal fibrosis and a neutrophil-rich portal infiltrate suggestive of a large duct obstruction. Magnetic resonance cholangiopancreatography (MRCP) revealed a high-grade stricture involving the common hepatic duct (CHD) with intrahepatic duct dilation. An initial ERCP with SpyGlass was performed with visualization of the CHD stricture, which was dilated, biopsied and stented. Biopsy results revealed intestinal metaplasia. A repeat ERCP was completed due to continued abdominal pain and revealed a 40 mm stricture in the CHD with the mucosa appearing friable, ulcerated, and nodular with masses suspicious for CCA. Biopsy resulted in inflammation without malignancy. Repeat ERCP and endoscopic ultrasound (EUS) revealed prior CHD stricture, an irregular, spiculated mass in the CHD. Biopsy results revealed benign epithelium. He was referred for surgical evaluation but surgery was deferred due to multiple benign tissue samples and the risk of surgery. He was ultimately discharged and underwent an exploratory laparotomy in Houston and was found to have CCA. (Figure)

**Discussion:** CCA is the second most common primary hepatic malignancy. Imaging can assist in the identification of CCA, but confirmation is with tissue biopsy. Tissue is obtained through endoscopic means or open surgical resection. In this case, multiple ERCP-guided biopsies revealed benign tissue, but found to have CCA after exploratory laparotomy. When diagnostic imaging and procedures fail to establish a diagnosis, the physician must rely on their own expertise and knowledge to identify the underlying cause.



[2844] **Figure 1.** Deeply ulcerated, friable and strictured mucosa identified via SpyGlass in the common hepatic duct.

S2845

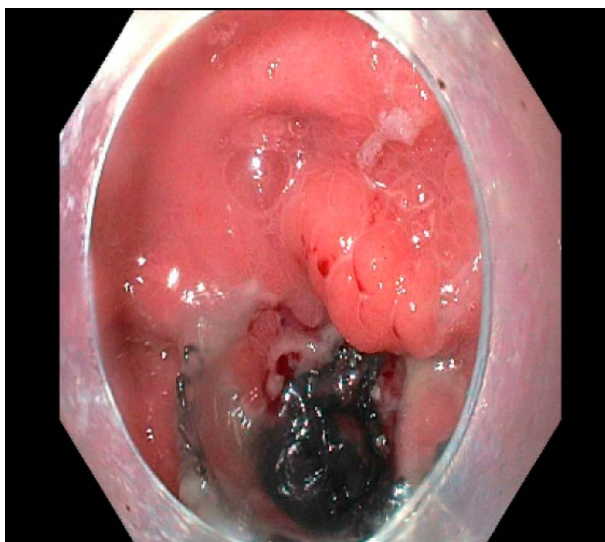
#### Inadvertent Treatment of a Vertical Banded Gastroplasty Stricture With a LAMS for Two Years

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**Introduction:** Lumen-apposing metal stents (LAMS) are innovative endoscopic devices representing the next significant advancement in stent technology. LAMS have demonstrated success, most notably with improving drainage of pancreatic fluid collections. Other clinical indications for using LAMS include biliary drainage, gastroenterostomy, or the management of luminal tract strictures. The stent has a larger lumen diameter than previously created stents as well as a unique "dumbbell" shape to limit migration. Studies have demonstrated advantages such as shorter procedure times and overall reduced repeat endoscopic procedures. As LAMS has gained notoriety, there have been increasing studies demonstrating potential complications of the device. Most common consequences of LAMS include bleeding, biliary stricture, and buried LAMS syndrome. As the anatomical design has decreased migration risk, prompt removal is recommended to prevent buried LAMS syndrome, where the stent is embedded in the wall of the gastric mucosa and can eventually not be visualized endoscopically. In this case, we will present a patient with an endoscopically placed LAMS, which was successfully removed with minimal complications after two years in place.

**Case Description/Methods:** Our patient is a 68 year old female with a Vertical Banded Gastroplasty Stricture. She had required multiple repeat endoscopies for dilation therapy but the stricture was refractory to dilation, as a result, she underwent LAMS placement. Due to the onset of the COVID pandemic, patient was lost to follow up. On a repeat EGD two years after placement, the stent remained in its original location. There were signs of mild gastric tissue overgrowth at the right lateral side of the LAMS. The stent was then removed easily with no signs of bleeding. After removal, the stricture remained dilated as the scope could be passed without difficulty. Over course of COVID she ate better than she had in years. (Figure)

**Discussion:** LAMS have demonstrated significant success in a variety of endoscopic interventions. Their potential complications are well documented in various studies. This case is unique in regards to the length of time in which the LAMS remained in position. From a literature review, no study has demonstrated a LAMS in place as long as two years for stricture management. More remarkable is the lack of complications from the stent such as no bleeding with removal and no true buried LAMS syndrome as there was minimal tissue overgrowth.



[2845] **Figure 1.** LAMS on endoscopic evaluation two years after placement.

S2846

### Liquid Nitrogen Cryoablation Alone Is an Effective Palliative Treatment for Metastatic Esophageal Squamous Cell Carcinoma

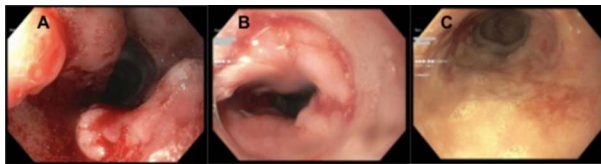
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**Introduction:** In 2012, Esophageal squamous cell carcinoma (ESCC) was reported as the most common type of esophageal cancer in the world. In patients with metastatic ESCC, the mainstay of palliative management includes radiation therapy and esophageal stenting. Endoscopic cryoablation has emerged as a minimally invasive treatment for malignant esophageal neoplasm. The administration of liquid nitrogen, achieving a temperature of  $-85^{\circ}\text{C}$ , causes transient tissue ischemia and recruitment of immune cells resulting in localized tissue destruction. Most preliminary studies assessing cryoablation in esophageal cancer have demonstrated symptomatic improvement in esophageal adenocarcinoma. Few studies have assessed the use of cryoablation in ESCC. A prospective study conducted in China demonstrated cryoablation's ability to achieve complete remission in patients with moderate to high grade ESC neoplasm. Here we present a case utilizing endoscopic liquid nitrogen cryoablation as palliative therapy in a symptomatic patient with metastatic ESCC.

**Case Description/Methods:** 82-year-old male former smoker with daily alcohol use presented with dysphagia and weight loss. CT scan of the chest revealed a mid-esophageal mass concerning for malignancy. Upper endoscopy demonstrated a large, fungating esophageal mass with partial obstruction (Figure A). Pathology revealed invasive poorly-differentiated ESCC. PET scan confirmed metastatic disease involving the right lung and parasophageal, mediastinal, supraclavicular and right thoracic inlet lymph nodes. A multidisciplinary team offered palliative chemotherapy and radiation, which he declined. Due to worsening dysphagia and a 35lbs weight loss, he agreed to cryoablation (Figure B). He underwent an additional three sessions at two-months, three-months, and five-months for small areas of mucosal abnormalities (Figure C). He is four months out from treatment with improved dysphagia and stable weight.

**Discussion:** This case report provides further evidence for the use of cryoablation alone as a minimally invasive, palliative intervention in patients with ESCC. Previous studies have highlighted the effectiveness of cryoablation in improving dysphagia and quality of life in symptomatic patients. This case report provides endoscopic evidence of cryoablation's ability to reduce tumor burden and achieve complete remission in ESCC. Cryoablation alone appears to be a safe and well tolerated palliative treatment for patients with metastatic ESCC.



[2846] **Figure 1.** Upper endoscopic liquid nitrogen cryoablation of esophageal neoplasm. A) Initial upper endoscopy demonstrating large fungating mass in mid-esophagus with partial obstruction. B) Following completion of cryoablation treatment. C) Following three additional cryoablation sessions for treatment of residual disease.

S2847

### Long-Term Follow-Up of Hepatic Cyst After Endoscopic Ultrasound-Guided Sclerotherapy

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**Introduction:** Hepatic cysts can be found in up to 18% of the population. (1) In most cases they are benign, asymptomatic and do not require any intervention. For symptomatic cysts, management includes surgical unroofing or sclerotherapy. Endoscopic ultrasound (EUS)-guided sclerotherapy with ethanol has emerged as an alternative to surgical intervention and percutaneous drainage (PCD) with sclerotherapy. There is few long-term data and randomized control trials comparing the efficacy of these interventions. This case highlights the outcome of EUS-ablation with ethanol for hepatic cyst after long-term follow up.

**Case Description/Methods:** Patient is a 47-year-old female with a history of Systemic Lupus Erythematosus who initially presented with dyspnea and intermittent right upper quadrant pain then found to a large hepatic cyst on echocardiogram. Her cardiopulmonary workup was otherwise unremarkable. Liver function tests were within normal limits. She underwent liver MRI which showed a 6.9cm left lobe (segment III) unilocular hepatic cysts. Tumor markers were negative. She was referred to GI and EUS-guided cyst ablation with ethanol was performed. Analysis of cyst fluid was benign. CT 1 month after ablation showed decreased hepatic cyst to 3.5cm and patient reported significant improvement in symptoms. Two months later, a second EUS-guided ablation was done in attempt to achieve complete cyst eradication. MRI after second ablation demonstrated further decrease in size of hepatic cyst to 2.6cm. Seventeen months after initial ablation imaging showed stable reduction in size of hepatic cyst (1.8cm).

**Discussion:** Prior to interventions for simple hepatic cysts, it is necessary to ensure that symptoms are not from alternative etiologies. The approach to management of symptomatic simple hepatic cysts depends on location, comorbidities and patient preference. EUS-guided sclerotherapy is a promising alternative to surgery and PCD with sclerotherapy. A single center retrospective study reported 100% cyst reduction at 15 month follow up in the group that received EUS guided sclerotherapy. EUS-guided ablation allows for easier access to the left, caudate and posterior segments of the liver compared to PCD and is overall safe. (2)

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S2848

### Massive Pseudo-Pneumoperitoneum After Endoscopic Necrosectomy

*Maria Goretti Ochi, MD, Deepak Agrawal, MD, MPH, MBA, Cristal Brown, MD, MHS.*

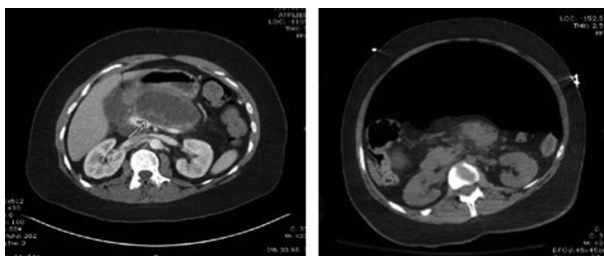
Dell Medical School, Austin, TX.

**Introduction:** Encapsulated peripancreatic fluid collection and walled-off necrosis are some of the complications of acute pancreatitis. Most resolve spontaneously but symptomatic pseudocysts or walled-off necrosis require drainage. The preferred therapeutic management is endoscopic ultrasound (EUS) guided drainage with stent placement. Known iatrogenic complications of the procedure include bleeding and perforation.

**Case Description/Methods:** A 39-year-old woman with history of ulcerative colitis, in remission on certrolizumab presented with symptomatic walled-off necrosis after idiopathic necrotizing pancreatitis. EUS-guided drainage and stent placement was successfully performed. On subsequent upper endoscopy for necrosectomy, post-procedure large pneumoperitoneum was noted on imaging leading to emergent surgical evaluation with laparoscopy. However, no perforation or pancreatic fluid contamination was seen. On post-operative day 1, patient was asymptomatic and tolerating diet. She was discharged on post-operative day 2. At 3-month follow-up, patient remained asymptomatic and plastic stents were removed.

**Discussion:** Pneumoperitoneum is an uncommon but dreaded complication of EUS guided cystogastrostomy. This occurs when there is separation of the gastric wall and the wall of the pancreatic cyst or walled-off necrosis. If perforation is detected during cystgastrostomy, it may be possible to use a LAMS to close the defect by bridging the walls or close the gastric defect endoscopically with clips or sutures. Immediate surgery (such as cyst-enterotomy with closure of the wall defect) should be performed if there is generalized contamination of the peritoneum with cyst fluid content and subsequent signs of peritonitis. (Figure) Our case, to our knowledge, is the only one that describes pneumoperitoneum after endoscopic necrosectomy, two weeks after placement of LAMS. Our hypothesis is that the walled-off necrosis moved away from the gastric wall after removal of LAMS, which had aided apposition of the gastric wall and cyst wall due to its flanges and short saddle length. Pneumoperitoneum, in the absence of peritoneal findings, is referred to as benign peritoneum. Our case describes massive benign pneumoperitoneum after endoscopic necrosectomy without perforation. There is a paucity of literature on non-surgical management of post-endoscopic pneumoperitoneum and we hope that our case, will help endoscopists carefully select patients who will benefit from surgical management of pneumoperitoneum.





[2848] **Figure 1.** Figure A. CT abdomen showing pancreatic walled off necrosis containing turbid fluid and debris. Figure B. Massive pneumoperitoneum seen on CT abdomen after EUS-guided drainage and double pig-tailed stent placement for continued drainage.

S2849

#### Not All Submucosal Lesions Are Created Equal: A Report of a Rare Cause of Abdominal Pain

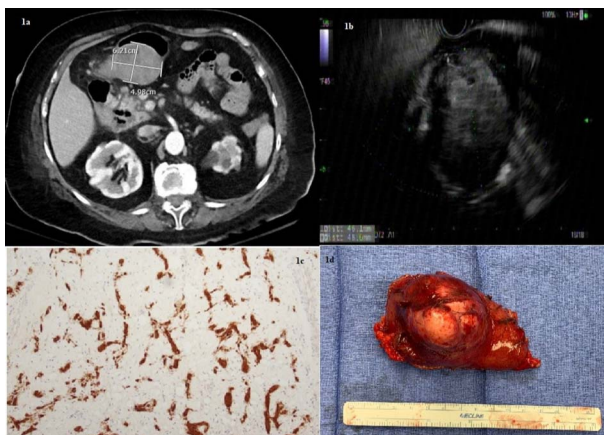
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**Introduction:** Gastric submucosal lesions are a common finding during endoscopy. However, they rarely present as or cause any symptoms. We present an interesting and rare case of a gastric submucosal lesion causing symptoms

**Case Description/Methods:** An 82-year-old woman with multiple comorbidities presented with worsening nausea and abdominal pain and early satiety. Physical examination had no findings of abdominal tenderness or a palpable mass. A contrast enhanced computed tomography (CT) scan was then performed, and a 6.2cm x 4.9 cm gastric mass was noted. (Figure a) An upper endoscopy revealed an extrinsic compression in the gastric antrum. An endoscopic ultrasound(EUS) examination was then performed, and on EUS, a large perigastric mass in the distal stomach was noted. The lesion appeared hypoechoic and measured 4.6 x 4.9cm with minimal amount of vascularity under EUS-doppler. (Figure b) Transgastric biopsies were obtained. Final pathology revealed spindle cell neoplasm with myxoid stroma, most consistent with schwannoma. The immunohistochemical profile was consistent with schwannoma (Figure c). The patient then underwent surgical resection (Figure d) and pathology confirmed a gastric schwannoma

**Discussion:** Schwannomas are spindle cell mesenchymal tumors originating from the Schwann cell sheath. Gastric schwannomas arise from the gastrointestinal neural plexus. Gastric schwannomas are typically benign and incidentally found, but rarely can have malignant transformation. The tumors are predominantly found in middle-aged females. Gastric schwannoma usually presents in the gastric body. It is important to distinguish these tumors from the two other types of mesenchymal tumors, such as gastrointestinal stromal tumors and leiomyoma. Schwannomas typically have a spindle cell pattern with vague nuclear palisading and peritumoral lymphoid cuff without encapsulation with S100 positive staining and negative for CD34 and CD117, which differentiates them from gastrointestinal stromal tumors and autonomic nerve tumors. Schwannomas stain negatively for actin, unlike leiomyomas. Treatment is typically surgery with recurrence rarely described. The type of surgical approach is dependent on tumor size and location. Due to the excellent outcomes, some endoscopic options are also considered safe. Our patient did well and on follow had resolution of all prior symptoms. This case report illustrates the importance of the consideration of schwannomas in the differential diagnosis of perigastric and submucosal lesions



[2849] **Figure 1.** a: CT scan appearance of the perigastric mass; b: Mass as seen on EUS; c: Pathology with S100 staining; d: Resected specimen.

S2850

#### Migrated Esophageal Stent Obstructing the Distal Jejunum, Safely Removed by Double-Balloon Enteroscopy Using a Water Immersion Technique

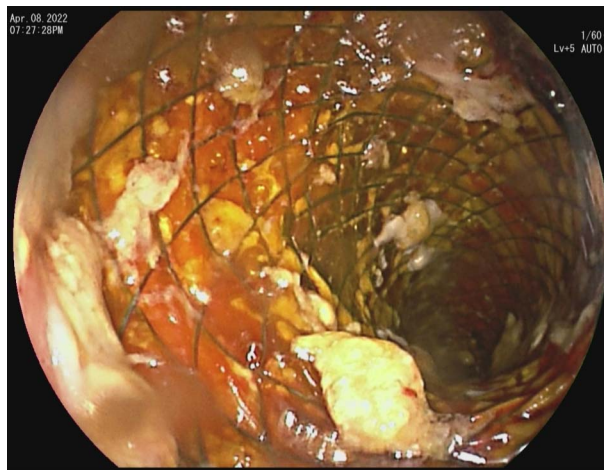
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**Introduction:** Self-expanding esophageal metal stents are now also used for treatment of gastric and duodenal lesions. Stent migration is a potential risk. Endoscopic retrieval after distal small bowel migration is challenging, often requiring surgery. Double-Balloon Enteroscopy (DBE) enables endoscopic access throughout the small bowel, but small bowel tortuosity makes retrieval of stents in the distal small bowel extremely challenging, so it is performed infrequently. We describe a case of migration of a fully covered metal stent to the distal jejunum successfully removed by DBE via a water immersion technique. (Figure)

**Case Description/Methods:** A 43 year old female s/p sleeve gastrectomy developed a symptomatic gastric body stricture, so a 12 cm fully covered self-expanding metal stent (Hanaarostent 22) was placed. 5 weeks later she awoke with severe persistent abdominal pain and presented to the ED for further evaluation. CT abd revealed stent migration to the distal jejunum, with proximal dilation and proximal ascending colon compression by the small bowel loop containing the stent. Antegrade DBE was performed and revealed multiple serpiginous ulcers and large deep ulcers. The stent was embedded into the distal jejunal mucosa, 310 cm distal to the pylorus. Attempts to collapse the stent by pulling the retrieval lasso with a forceps failed after the strings snapped, making stent removal challenging. A 30 mm Snare was used to collapse the stent head and the proximal portion of the stent. The stent was slowly retracted proximally. However, due to distal stent expansion and small bowel tortuosity, stent retraction was repeatedly retarded at jejunal turns, giving concern for further mucosal trauma. To maintain bowel distension and decrease trauma, the enteroscope balloon was inflated to 2/3 its normal capacity and water was infused to distend the jejunal lumen. These maneuvers enabled the stent to be safely extracted by keeping the lumen patent, reducing turn angulation, and minimizing trauma to the ulcerated small bowel walls. The stent was successfully extracted and a CT scan revealed no mucosal damage or evidence of perforation. The patient's pain was immediately alleviated.

**Discussion:** This case of endoscopic removal of distal jejunal stent migration was complicated severe mucosal ulceration and failure of the stent repositioning device. The water infusion and semi-inflated enteroscope balloon technique enabled safe extraction. To our knowledge, this technique has not previously been described in the literature.



[2850] **Figure 1.** Stent migrated into the distal jejunum.

S2851

#### Muscle-Retracting Sign During Colorectal Endoscopic Submucosal Dissection

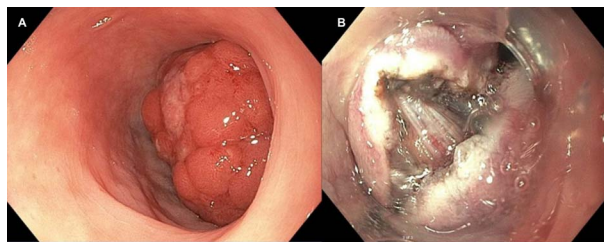
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**Introduction:** Endoscopic submucosal dissection (ESD) allows for en-bloc resection of large early-stage gastrointestinal tumors. During the submucosal dissection of colorectal polyps, the muscle layer can be found to extend into the polyp, this is termed as Muscle-Retracting Sign. This endoscopic sign requires a high index of suspicion to prevent inadvertent dissection of the muscle layer. This case demonstrates the first reported case in the US of the Muscle-Retracting sign identified during colorectal endoscopic submucosal dissection (ESD) of a large adenoma.

**Case Description/Methods:** A 74-year-old male presented for routine colon cancer screening and was found to have a 5cm pedunculated sigmoid colon polyp. Biopsy of the polyp revealed tubular adenoma with high-grade dysplasia with mucosal prolapse-type changes. Given the endoscopic impression of the mass lesion, a more advanced pathology could not be ruled out. The patient was planned to undergo ESD through the stalk of the large polyp. Submucosal dissection was performed using a dual and IT knife. In the center of the tumor stalk, muscle retraction sign was seen, with the muscular propria being pulled towards the center of the polyp. The procedure was stopped due to the risk of muscle perforation. The patient went home after the procedure, was doing well on follow up and had no adverse events. Given the high-grade dysplasia, the patient was referred to surgery for resection. (Figure)

**Discussion:** Some colorectal neoplastic lesions can have the muscle layer drawn toward the center of the neoplasm. Previous studies in Japan have shown lesions positive with MR sign, have a significantly lower successful resection rate. These lesions should be carefully dissected and elective surgical resection should be considered if appropriate.



[2851] **Figure 1.** Colorectal ESD of 5 cm pedunculated sigmoid colon polyp (1A), showing the Muscle Retraction Sign (1B).

S2852

#### Dislodged Esophageal Stent Extracted via PEG Tube Site: An Uncommon Solution for a Real Life Problem

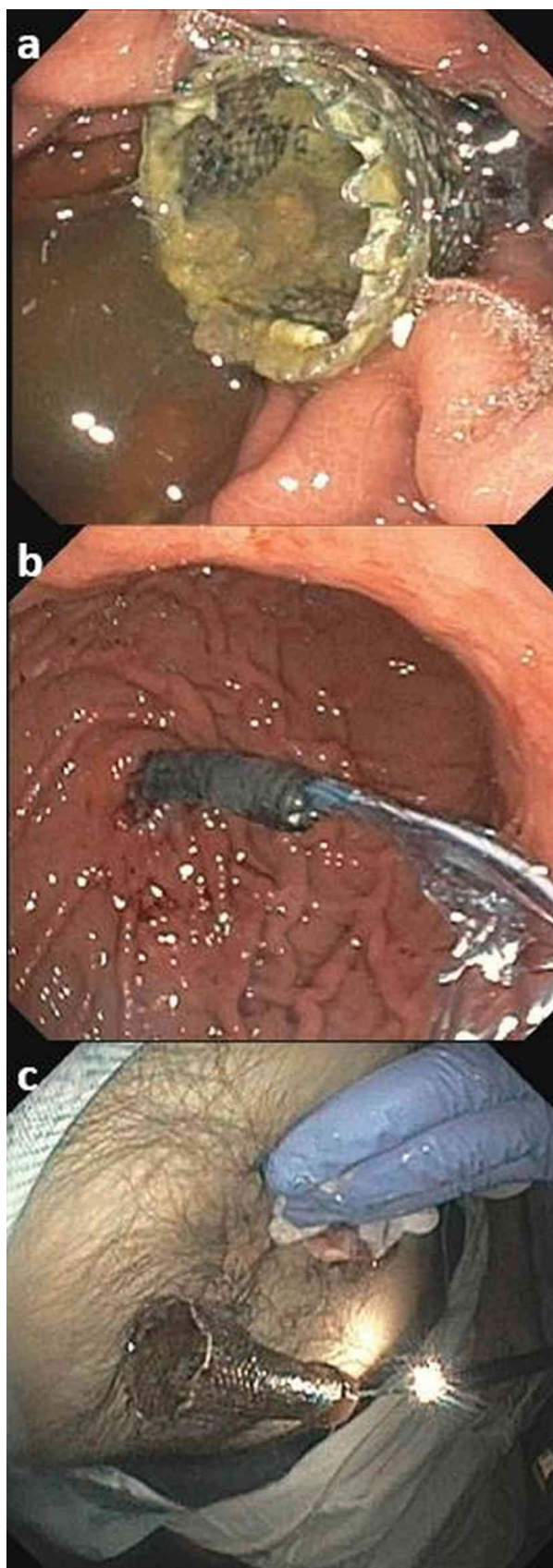
*Kwabena O. Adu-Gyamfi, MBChB<sup>1</sup>, Praneeth Kudaravalli, MD<sup>2</sup>, Viveksandeep Chandrasekar, MBBS<sup>1</sup>, Subbaramiah Sridhar, MBBS, MPH<sup>3</sup>, John Erikson L. Yap, MD<sup>1</sup>.*

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**Introduction:** Esophageal stents have been used for management of refractory benign strictures and has risk of stent migration even with endoscopic suturing or clipping techniques. With esophageal stricture present, the retrieval of the migrated stent becomes a dilemma. We present one such case that required retrieval of the migrated stent through a pre-existing percutaneous endoscopic gastrostomy (PEG) tube site.

**Case Description/Methods:** A 62-year-old man with history of supraglottic small cell carcinoma treated with chemo-radiation therapy developed a severe benign esophageal stricture. He had multiple esophageal dilations and steroid injections which failed and eventually treated by esophageal stent placement with stent fixation via endoscopic suturing. He presented with food impaction and esophago-gastroduodenoscopy (EGD) found a severe distal esophageal stricture which could only be traversed with a pediatric gastroscope. The previously placed 20mmx80mm fully covered self-expanding metal stent (FCSEMS) had migrated into the stomach (Figure 1a). Exhaustive attempts at endoscopic retrieval past the esophageal stricture was unsuccessful. He had a pre-existing 20Fr PEG tube and the PEG tract was gradually dilated to 15mm. An adult gastroscope was passed through the PEG site and a raptor forceps was used to grab and extract the forceps successfully (Figure 1b-c). A new 24Fr PEG tube was placed. Mild oozing was seen in the tract, otherwise patient tolerated the procedure well. He was referred to discuss surgical options for further treatment of his esophageal stricture. (Figure)

**Discussion:** Esophageal stents are being increasingly utilized in the management of not only malignant strictures, but also benign esophageal disease such as recurrent esophageal strictures, anastomotic leaks, perforations and fistulae. Stent migration may occur frequently in benign disease with risk factors being use of FCSEMS, distal location and previous migration. An unretrieved stent may cause small bowel obstruction. Anchoring stents with endoscopic suturing, and clips may reduce the risk of migration. If unable to be removed endoscopically then a surgical approach will be needed. Luckily, the presence of a mature gastrostomy tract provided an alternate extraction route for our patient. Risks associated with this modality include bleeding, gastrostomy site disruption, gastric perforation and peritonitis. Increased physician awareness of endoscopic options in such a case may obviate the need for surgical intervention.



[2852] **Figure 1.** Endoscopic image of dislodged esophageal stent in stomach (a). Endoscopic image of adult gastroscope passed through PEG site dilated with CRE balloon (b). Image of dislodged esophageal stent retrieved via dilated PEG site (c).



S2853

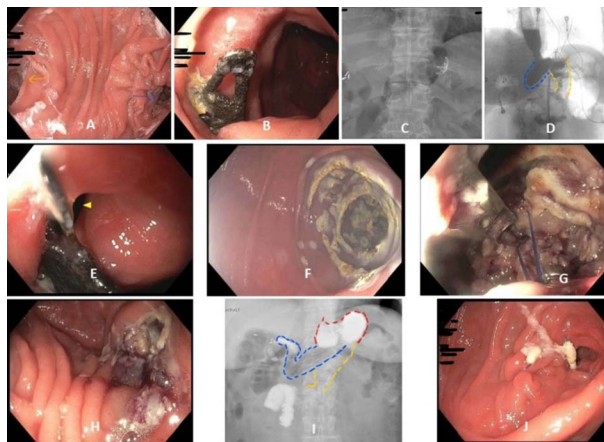
### Novel Endoscopic Technique for Treatment of Candy Cane Syndrome

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**Introduction:** Candy cane syndrome is an underrecognized complication of Roux-en-Y gastric bypass resulting from a long blind afferent Roux limb at the gastrojejunostomy causing nausea, vomiting, reflux and pain due to food accumulation. We present a case of novel endoscopic treatment of candy cane syndrome.

**Case Description/Methods:** 67-year-old female with vertical banded gastroplasty revised to Roux-en-Y gastric bypass and multiple open abdominal surgeries presented with worsening of persistent post prandial epigastric pain. Upper endoscopy showed Roux-en-Y anatomy. Also noted was gastro-gastric (GG) fistula (A) and an embedded over the scope clip (OTSC) in this area (B). There were no medical records of placement of the clip or patient recall of OTSC clip. A fluoroscopic upper GI series showed candy cane loop and gastro-gastric (GG) fistula (D). Her bariatric surgeon felt that her acute symptoms were likely from candy cane syndrome. Given that she had a fairly extensive surgical history she was deemed high risk for surgery, decision made to offer endoscopic therapy for candy cane syndrome. APC (1L/min, 50W) was used to coagulate the mucosal layer of the entire afferent limb (F) and then the enteric walls of the afferent limb were approximated by placing three purse string sutures using endoscopic suturing device attached to a 2-channel therapeutic upper endoscope (G). Sutures started from the end of the blind limb towards the GJ anastomosis leading to total closure of the afferent limb (Pic 1H). One month follow up upper GI series showed direct transit of most of the contrast into efferent limb with redemonstration of a much smaller though persistent candy cane limb (I and J). (Figure)

**Discussion:** Candy cane syndrome results from creation of a long nonfunctional limb during creation of gastro-jejunostomy at time of gastric bypass. This causes intestinal dysmotility resulting in stasis, and gradual expansion of the limb over time. Upper GI series has been used traditionally to diagnose this condition though endoscopic demonstration of off-axis orientation of roux limb using a simple guide wire has also been proposed. Historically, it has been managed surgically. We present an interesting case of endoscopic reduction of candy cane loop using advanced endoscopic suturing technique.



[2853] **Figure 1.** (A) Roux-en-Y anatomy with afferent limb (blue), efferent limb (yellow). (B) Metallic prong seen in the lumen of gastric pouch. (C) Metallic FB identified as OTSC clip on x ray. (D) Upper GI series demonstrating rapid pooling of contrast in candy cane limb (blue) and the Roux limb (yellow). (E) fistula seen adjacent to the clip. (F) ablated afferent limb mucosa. (G) purse string suturing of the ablated afferent limb. (H) completely obliterated of afferent limb after sutures. (I) upper GI series 1 month later shows transit of most contrast from gastric pouch (red) into Roux limb (yellow) but a persistent candy cane limb (blue). (J) one month post suturing endoscopic view of closed afferent limb.

S2854

### POEM, G-POEM, Z-POEM and D-POEM With Unedited Videos

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**Introduction:** Peroral endoscopic myotomy (POEM or E-POEM) was introduced in the last decade to treat primary achalasia, and has since been developed into different techniques including gastric POEM (G-POEM), Zenker's POEM (Z-POEM), and diverticulum POEM (D-POEM). POEM has a clinical success (defined as post therapy Eckardt scores  $\leq 3$  and no further treatments) of greater than 90% after 2-3 years and greater than 80% after 5 years. POEM is now applicable to treat non-achalasia esophageal motility disorders including nutcracker esophagus, jackhammer esophagus (JE), diffuse esophageal spasm (DES) and esophagogastric junction outflow obstruction (EGJOO). The purpose of this paper is to document unedited videos of E-POEM, G-POEM, Z-POEM and D-POEM that are less than 10 minutes long.

**Case Description/Methods:** E-POEM was performed on a 28-year-old female with dysphagia occurring daily for 6 months. G-POEM was performed on a 29-year-old female with idiopathic gastroparesis for one year despite dietary modifications and medications. The patient that underwent Z-POEM is a 58-year-old male with dysphagia and regurgitation for many years, with worsening during the last two years and weight loss. D-POEM was performed on a 67-year-old female patient with dysphagia for a few years that had an EGD showing a large diverticulum in the middle esophagus. All of these POEM procedures were videoed and not edited. They are all under 10 minutes.

**Discussion:** The patient that underwent E-POEM was discharged with a reduction of symptoms and an Eckardt score decrease from 7 to 2. The patient that underwent G-POEM reported a decrease in symptoms and had a gastroparesis cardinal symptoms index reduction from 3.5 to 1.5. The patient that underwent Z-POEM reported reduction of symptoms and improvement of food tolerance 1 month post procedure. The patient that underwent D-POEM reported improvement of symptoms. No adverse events were reported from any of the patients. (Figure) We are providing unedited videos of four different types of POEM procedures to allow more endoscopists to use these techniques in order to benefit patients. Based on experience, when performing a POEM it is advised to always use CO<sub>2</sub> and a cap on the tip of the endoscopy, as well as to never perform a POEM on a patient with severe esophagitis or gastritis.



[2854] **Figure 1.** Endoscopic pictures. (A-D): E-POEM; (E-H): G-POEM; (I-L): Z-POEM; (M-P): D-POEM.

S2855

#### Pneumomediastinum and Pneumoperitoneum After Spray Cryotherapy

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**Introduction:** Pneumomediastinum and pneumoperitoneum are potential complications of endoscopic procedures that can be fatal if not recognized quickly. Endoscopic technology has advanced considerably to reduce risk for complications, especially perforation. Though the risk is less than 1%, understanding which patients are at a higher risk for esophageal perforation and how to quickly assess and address free air in the mediastinum can prevent a dire situation. We present a case of an elderly male patient with esophageal adenocarcinoma who developed an esophageal perforation during liquid nitrogen spray cryoablation.

**Case Description/Methods:** An 81 year old male with history of T2 distal esophageal adenocarcinoma presented for cryotherapy. Patient tolerated a previous cryotherapy session without any complications. During the procedure, after the second cycle of freezing and thawing, the patient's abdomen suddenly became significantly rigid as well as having notable crepitus on his chest tracking up to his neck on exam. When advancing the endoscope, the stomach was notably decompressed. As anesthesia started to note difficulty ventilating, the patient went into PEA arrest. Rapid recognition of tension pneumothorax bilaterally clinically prompted the anesthesia to due bilateral needle compression in the 2nd intercostal space mid axillary line. Upon needle decompression, vitals signs immediately improved. The patient was resuscitated and imaging confirmed bilateral pneumothoraxes, pneumoperitoneum, and pneumomediastinum, likely all resulting from perforation of his esophageal tumor in setting of cryotherapy. T Patient was intubated and required bilateral chest tubes. Fortunately, he was extubated within a day after and was discharged safely within a week.

**Discussion:** Prompt recognition of pneumomediastinum and pneumoperitoneum is essential as they can be lethal complications of endoscopy. In this specific case, the presence of malignancy and the location of the tumor in the distal esophagus resulted in an increased risk for perforation. Key physical exam findings of crepitus, distended and tympanic abdomen, or respiratory changes, along with endoscopic findings of a decompressed stomach correlate with perforation. Spray cryotherapy leads to massive gas production and if adequate evacuation is not occurring, barotrauma can result. The team participating in these procedures need to understand that these types of complications can happen, albeit rarely.

S2856

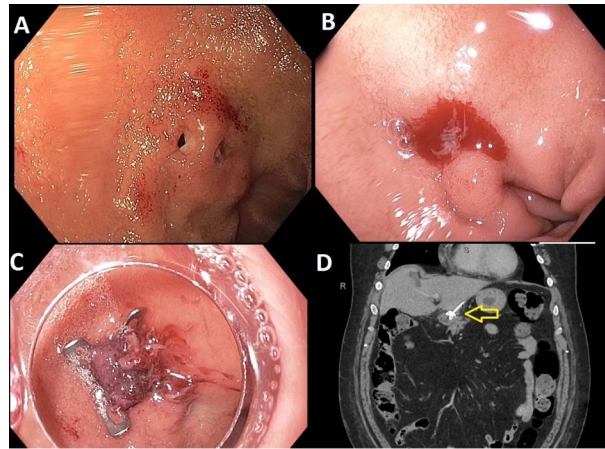
#### Poke the Bear and Get the Claws: Life-Threatening Bleeding by Hepatic Artery Infusion Pump Fistula Managed by Over the Scope Clip Closure

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University of Alabama at Birmingham, Birmingham, AL.

**Introduction:** Hepatic artery infusion (HAI) pumps may be used for regional delivery of chemotherapy for treatment of colorectal cancer liver metastases. Complications are rare, but can include arterial thrombus and catheter dislocation. We present a case of duodenal fistula associated with hepatic artery infusion pump and subsequent closure with over the scope clip.

**Case Description/Methods:** We present the case of a 57-year-old male with stage IV colon adenocarcinoma and liver metastasis who underwent placement of hepatic artery infusion (HAI) pump for local chemotherapy. 6 months later, he presented with 3 days of melena and fatigue with vitals demonstrating heart rate 129 bpm and blood pressure was 111/69 mmHg. Notably, hemoglobin was 9.1 g/dL, down from a baseline of 14.4 g/dL. He was admitted to the surgical oncology service and gastroenterology was consulted for suspected upper GI bleed. Esophagogastroduodenoscopy (EGD) performed the day after admission revealed suspected fistula in the duodenal bulb. Bleeding resolved with proton pump inhibitor therapy alone with plan for outpatient repeat endoscopy. 1 month later the patient presented with anemia, melena and acute blood loss. Repeat EGD demonstrated a bleeding duodenal bulb lesion and hemostasis was achieved by placement of a 12/6t over the scope clip placement. Subsequent CTA scan identified the hepatic artery infusion pump tip adjacent to over the scope clip in the proximal duodenum with no extravasation suggesting resolution of bleeding after clip placement. (Figure)

**Discussion:** We present a rare case of duodenal bleeding due to hepatic artery infusion catheter tip dislocation. A large single center experience of 544 patients over a 15-year period demonstrated the most common complications from HAI to include arterial thrombosis (6%), catheter occlusion/dislodgement (6%) and extrahepatic perfusion (3%)<sup>1</sup>. Furthermore, literature search for cases from 1975-2022 reveals fewer than 10 cases with this bleeding complication. In this case we demonstrate the successful use of an OTSC to manage bleeding associated from the fistula created by the infusion pump catheter between hepatic artery and duodenal bulb.



[2856] **Figure 1.** A: Index endoscopy showing fistula in the bulb of the duodenum. B: Subsequent endoscopy with bleeding fistula. C: Fistula closure and successful hemostasis with over the scope clip. D: CT scan showing clip with close approximation to the hepatic artery infusion catheter tip.

S2857

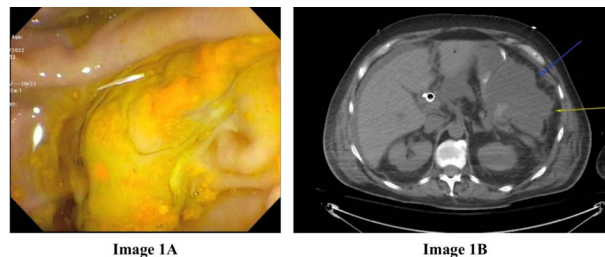
#### Post-ERCP Greater Curvature Hematoma Complicated by Polymicrobial Infection: Case Report and Literature Review

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**Introduction:** ERCP has become critical in diagnosing and treating biliary and pancreatic diseases. ERCP-related complications occur in 2.5 - 8% of procedures and include pancreatitis, biliary hemorrhage, and cholangitis. Rarely, subcapsular hepatic, splenic, and duodenal hematomas have been reported in case reports. Here we present a rare case of an intramural post-ERCP hematoma at the greater curvature of the stomach, complicated by polymicrobial infection.

**Case Description/Methods:** A 67-year-old male with a past medical history of choledocholithiasis status-post ERCP with plastic stent placement three months prior presented as a transfer from an outside hospital in septic shock on vasopressors. Upon arrival ultrasound revealed a 13mm common bile duct (CBD) and gallstones measuring up to 1 cm. Emergent ERCP was performed and showed a proximally migrated CBD plastic stent with distal flap not visible and pus extruding from the major papilla (Image A). Multiple maneuvers were required to extract the stent including balloon, rat-tooth forceps, and flower basket. The patient was too unstable for further maneuvers such as Spyglass. The CBD was swept with a balloon and a fully-covered metal stent was placed. Liver function tests after the ERCP improved; however, the patient had a hemoglobin drop of 2 g/dL and continued to require pressors so a computed tomography of abdomen and pelvis was performed. It demonstrated an 11.3 cm fluid collection centered around the greater curvature of the stomach with hyperattenuating foci concerning for blood of varying chronicity (Image 1B). The collection was drained by radiology the next day and appeared grossly bloody. Upon culture the fluid grew *Pseudomonas aeruginosa*, *Enterococcus faecalis*, and *Candida albicans*. Patient was subsequently given multiple different antibiotic regimens due to resistance and the hematoma has nearly resolved since. (Figure)

**Discussion:** ERCP-related complications can occur even when done by skilled endoscopists. Complex interventions are more likely to cause such complications. In particular, scope placement in the "long scope position" could have sheared the short gastric veins and resulted in our patient's hematoma. While it is a rare complication, hematoma formation can cause ischemia and infection and lead to significant morbidity or mortality. Our case highlights a rare complication of ERCP that requires early recognition and response.



[2857] **Figure 1.** Image 1A: Pus near major papilla concerning for cholangitis Image 1B: 11.3 cm collection/hematoma in the left upper abdomen, centered at the greater curvature of the stomach. Scattered hyperattenuating foci within the stomach and within this collection, which likely represent blood products of varying ages.

S2858

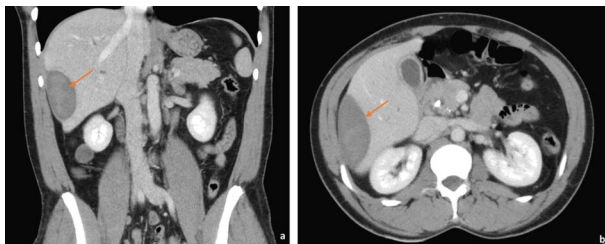
#### Post-ERCP Subcapsular Hepatic Hematoma

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**Introduction:** Endoscopic retrograde cholangiopancreatography (ERCP) is both a diagnostic and therapeutic procedure used for management of biliary pathology. Rates of even the most common complications, including biliary perforation and pancreatitis, are low, however other complications can be life-threatening and must be kept in mind when evaluating a patient post-ERCP. Here, we describe a case of post-ERCP subcapsular hepatic hematoma (SHH).

**Case Description/Methods:** A 39-year-old man with a history of hypertension, type II diabetes mellitus and alcohol use disorder complicated by chronic pancreatitis with multiple episodes of common bile duct (CBD) stricture status post multiple ERCPs presents with epigastric pain and right upper quadrant pain. He was admitted two weeks prior for epigastric pain, where he was found to have CBD stricture, and underwent ERCP with stent placement. Pain did not completely resolve after his last hospitalization and escalated to a 10/10. On arrival, he was afebrile with stable vitals. Physical exam demonstrated epigastric tenderness to palpation with voluntary guarding, but a soft abdomen without rebound tenderness. Labs significant for WBC count of  $10.8 \times 10^9/L$ , alkaline phosphatase of 117 U/L, and hemoglobin 11.7 g/dL. Abdominal ultrasound showed a 7.3 x 3.9 cm area of mixed echogenicity in the right liver lobe. Triple phase CT of the abdomen and pelvis showed a 9 x 6.5 x 2.5 cm heterogeneous subcapsular liver collection. He was given Zosyn, and WBCs downtrended. On day 3, liver function tests (LFTs) rose: aspartate aminotransferase was 397 U/L, alanine aminotransferase was 206 U/L, alkaline phosphatase was 571 U/L, and total bilirubin was 5.0 mg/dL. Repeat CT showed expected hematoma resolution with correct biliary stent placement. Antibiotics were re-started. LFTs and symptoms improved. He was discharged on a 14-day course of Levofloxacin and Metronidazole. (Figure)

**Discussion:** SHH is a rare but known complication of ERCP. Hematomas can expand, resulting in significant anemia and LFT elevation, or become infected with resultant sepsis. Patients with SHH must be carefully monitored in the post-ERCP setting. This patient exhibited an elevated WBC count with delayed elevation in LFTs, concerning for potential infection of the hematoma, yet without overt signs of infection, including lack of fever. He was managed with antibiotics without hematoma drainage, demonstrating the efficacy of conservative management for such a potentially deadly complication of ERCP.



[2858] **Figure 1.** Triple phase computed tomography scan of the abdomen and pelvis demonstrating a right-sided subcapsular hematoma in segment 6 of the liver in the coronal (a) and transverse (b) planes (arrow).

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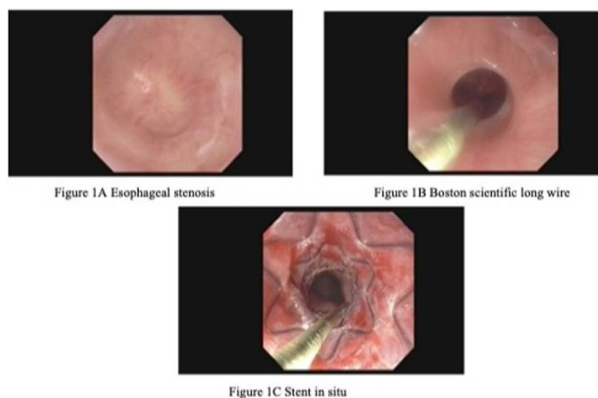
#### Rendezvous Endoscopic Recanalization of a Stenosed Esophagus: A Case Report and Review of the Procedure

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**Introduction:** Complete esophageal stenosis is a rare complication of radiotherapy for head and neck cancers. The associated dysphagia severely impacts quality of life even when alternative routes of feeding are established. Different techniques for endoscopic management of complete esophageal stenosis have been described. We report an interesting case of total esophageal obstruction successfully treated with rendezvous endoscopic recanalization.

**Case Description/Methods:** A 76-year-old male with a history of subglottic squamous cell carcinoma status post chemoradiotherapy with a feeding gastrostomy and tracheostomy tube presented with worsening of his chronic dysphagia, now unable to swallow oral secretions. Esophagogastroduodenoscopy (EGD) a month prior revealed total stenosis of upper third of esophagus. On exam vitals were normal with BMI 20.68 kg/m<sup>2</sup>. Abdomen was nontender, with a feeding gastrostomy tube in place. Patient was seen by the gastroenterology service and had an EGD with an antegrade-retrograde rendezvous procedure described below. Procedure Complete esophageal stenosis was identified at 20cm from incisors. A pediatric gastroscope was advanced through the gastrostomy tube site in a retrograde fashion to the site of obstruction. A Boston scientific stiff wire was probed through the thinnest area which was determined by transillumination and advanced into the pharynx. An adult gastroscope was advanced through the mouth and the wire grabbed with a rat tooth forceps. A guide wire was then threaded through the canalized obstructed segment in an antegrade fashion and then loaded with a CRE balloon. The stenosed segment was balloon-dilated to 9 mm and then stented with a 10 mm x 40mm GORE VIABIL. Images of the procedure are shown in Figure A to 1C. Post-op, patient noted return of worsening dysphagia after 48hours. Repeat EGD showed the esophageal stent partially clogged with tissue debris. The stent along with the tissue debris was removed. The area was dilated to 12 mm and re-stented with a GORE VIABIL 10 mm x 80 mm.

**Discussion:** This case illustrates the successful endoscopic treatment of complete esophageal stenosis using antegrade-retrograde rendezvous procedure. Though there are no randomized trials on this approach, it is an effective means of treatment. The success of recanalization depends on features such as location and length of the stenosis. Complications include clogging of stent as seen in our patient but overall safety and success is higher compared to antegrade dilatation only.



[2859] **Figure 1.** Endoscopic images of procedure.

S2860

#### Role of Endoscopic Ultrasound in the Diagnosis of Extrapulmonary, Disseminated Coccidiomycosis as a Cause of Recurrent Ascites and Acute Pancreatitis

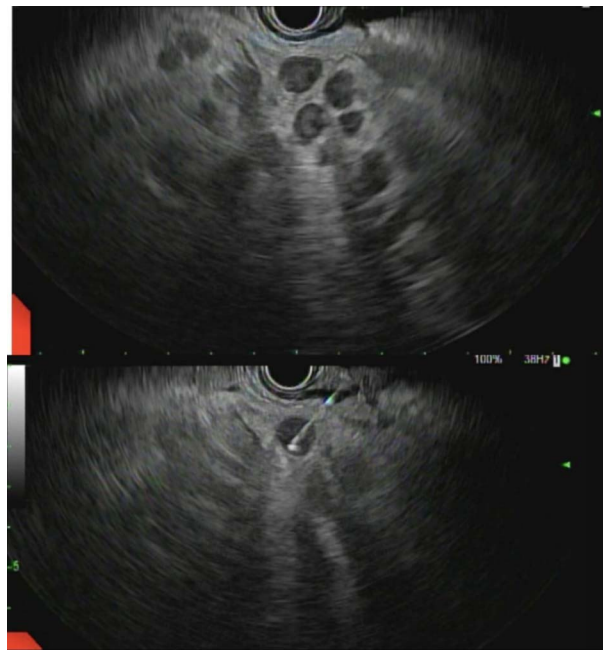
*Venkata Pulivarthi, MD<sup>1</sup>, Aida Rezaie, MD<sup>2</sup>, Chinonso Ilo, MD<sup>2</sup>, Kayvon Sotoudeh, MD<sup>2</sup>, Hadiatou Barry, MD, MPH<sup>2</sup>, Brett Hughes, MD<sup>2</sup>, Savio Reddymasu, MD<sup>2</sup>.*  
<sup>1</sup>Creighton University School of Medicine, Phoenix, AZ; <sup>2</sup>Creighton University, Phoenix, AZ.

**Introduction:** Coccidiomycosis (Valley Fever) is an endemic fungal infection in the Southwestern United States caused by *Coccidioides immitis* and *posadasii*. Extrapulmonary involvement is very rare (approximately < 1%) and diagnosis can be challenging as the yield for culture detection is low. We present the utility of endoscopic ultrasound (EUS) with fine needle aspiration (FNA) in diagnosing a rare case of extrapulmonary coccidiomycosis with recurrent pancreatitis.

**Case Description/Methods:** 44 year old male with history of hypertension, diabetes mellitus type 2, alcoholic cirrhosis with ascites was referred to gastroenterology clinic for evaluation of recurrent pancreatitis of unclear etiology. Prior to his third admission for recurrent pancreatitis, his ascites was well-controlled on diuretics and a low sodium diet. Labs were notable for hemoglobin of 12.7 gm/dl, platelets 117 K/mL, creatinine 1.03 mg/dl, triglycerides 116 mg/dL, lipase 124U/L, bilirubin 2.2 mg/dL and otherwise normal hepatic function panel. His alcohol level and Phosphatidylethanol were negative. Computed tomography of the abdomen and pelvis without contrast showed acute interstitial pancreatitis. Ultrasound showed a normal biliary system without gallstones or common bile duct dilation (CBD) and ascites. Patient underwent multiple paracentesis before and after these hospitalizations with normal cell counts, negative acid-fast bacillus, bacterial and fungal cultures, and serum-albumin gradient consistent with portal hypertension. Endoscopy showed small, non-bleeding esophageal varices in distal esophagus, portal hypertensive gastropathy and no gastric varices. EUS was performed revealing multiple rounded, hypoechoic lymph nodes (LN) in periportal area and peripancreatic area with largest measuring 2 cm and normal pancreatic parenchyma, pancreatic duct, and CBD. FNA biopsy of the LN was positive for granulomas with fungal organisms consistent with *Coccidioides* and negative for malignancy. The patient was subsequently started on oral fluconazole 800 mg daily. (Figure)



**Discussion:** EUS with FNA is an underutilized but highly valuable diagnostic method for extrapulmonary Coccidiomycosis. To our knowledge, this is one of the first cases in which EUS was utilized to diagnose disseminated Coccidiomycosis with lymphadenopathy as an etiology of recurrent pancreatitis. In this case, biopsy of peri-pancreatic lymphadenopathy from *coccidioides* was deemed the etiology of recurrent pancreatitis by compressing pancreaticobiliary system.



[2860] **Figure 1.** Top: EUS revealed multiple lymph nodes in the periportal and peripancreatic area. Bottom: EUS-guided fine needle biopsy was performed on the largest lymph node measuring 2 cms.

S2861

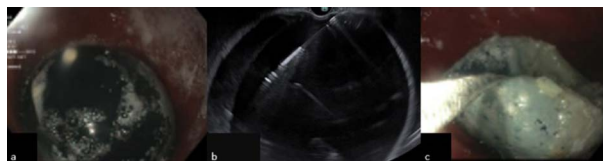
#### Removal of Orbera Intra-gastric Balloon Using Endoscopic Ultrasound

*Cynthia Cohen, MD<sup>1</sup>, Dafna Somogyi, BS<sup>2</sup>, Jakob Saidman, MD, MS<sup>3</sup>, Shireen Pais, MD<sup>3</sup>.*  
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**Introduction:** The Orbera intra-gastric balloon [IGB] was FDA-approved in the United States in 2015 for management of obesity. The balloon is placed endoscopically and requires endoscopic removal within six months. Most patients who undergo IGB placement initially experience mild gastrointestinal symptoms such as nausea, vomiting, acid reflux, and abdominal pain due to gastric accommodation. Occasionally, early removal of the balloon is necessary due to intolerable symptoms, dehydration, gastric outlet obstruction, or infection. We present a novel case of IGB removal using endoscopic ultrasound [EUS]-guided aspiration.

**Case Description/Methods:** A twenty-four-year-old woman with obesity underwent Orbera IGB placement in the Dominican Republic without initial complication and lost forty-five pounds. Two months after IGB placement, she presented to the emergency room with two weeks of progressive epigastric pain, nausea, nonbilious but occasionally blood-streaked vomiting, inability to tolerate oral intake, and constipation. Vital signs were normal. Laboratory studies demonstrated hemoconcentration and low serum magnesium levels. She was also deficient in folate, iron, and vitamins A, D, and E. Abdominal radiograph demonstrated air and fluid in the stomach. She was admitted to the hospital for fluid resuscitation. On hospital day two, she underwent esophagogastroduodenoscopy [EGD] and EUS with removal of the IGB. On initial EGD inspection, the Orbera balloon was identified in the stomach and the scope was able to pass beyond the balloon. The scope was withdrawn and then the EUS was performed. The balloon was identified and a nineteen-gauge echotip needle was introduced into balloon. Six hundred milliliters of methylene-blue colored fluid were aspirated. The EGD scope was reintroduced and the deflated balloon was removed with a grasper. On EGD inspection after balloon removal, continuous edema and erosion of the mucosa were seen in the fundus. Post-procedure, her symptoms resolved and she was discharged home. (Figure)

**Discussion:** As the use of IGBs for obesity management becomes more common, it is important that endoscopists have the ability to safely remove them. Medical centers that do not specialize in bariatric endoscopy are unlikely to stock IGB removal kits. Other techniques such as puncturing the balloon with biopsy forceps or a needle knife are generally ineffective. EUS-guided aspiration of an IGB was successful in this case and can be easily replicated at any institution with an endoscopist proficient in EUS.



[2861] **Figure 1.** a. Fully inflated Orbera intra-gastric balloon b. Orbera under EUS with needle catheter inserted for deflation c. Removal of fully deflated Orbera.

S2862

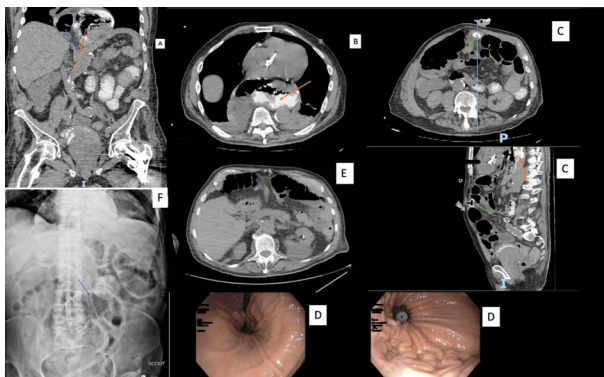
#### Recurrent Early Buried Bumper Syndrome in Context of Large Paraesophageal Hernia

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**Introduction:** Percutaneous Endoscopic Gastrostomy (PEG) is the creation of external access to the stomach bypassing the enteral pathway in order to provide medications and nutrition. Alternatives to endoscopic gastrostomy tube placement include surgical or radiographically placed gastrostomy tubes individual anatomic and clinical circumstances. Buried Bumper Syndrome (BBS), is a well known late complication of PEG tube placement and occurs due to the tight apposition of the external bolster against the abdominal wall creating traction on the internal bolster, resulting in gastric erosion. Incidence of BBS is estimated to be about 0.3%-2.4% and can recur multiple times even after correction.

**Case Description/Methods:** We report a case of an 83 year old man with a history of Pallister Killian Syndrome, aortic stenosis, atrial fibrillation and asthma. The patient presented to the emergency department for the evaluation of a dislodged PEG tube and peristomal cellulitis 4 weeks after PEG tube placement at another hospital. An abdominal CT scan revealed evidence of BBS with a large hiatal hernia associated with partial intrathoracic stomach without evidence of gastric volvulus. The PEG tube was removed and after resolution of peristomal cellulitis, a new PEG tube was placed. On post procedure day 2, the patient began to develop progressive abdominal distension and pain. A repeat abdominal CT scan demonstrated recurrent BBS. A subsequent fluoroscopic tube study showed immediate intra-abdominal extravasation of contrast. The patient then underwent laparoscopic hiatal hernia reduction with anterior gastropexy and surgical jejunostomy placement. (Figure)

**Discussion:** Literature for early BBS is sparse, with few cases reported. On review, early BBS has been reported in patients on chemotherapy or with pre-procedural cachexia. It is likely that chemotherapeutic destruction of mucosal tissue and poor wound healing may accelerate gastric erosion leading to early BBS. PEG placement has long been thought of as a means to prevent paraesophageal hernias. The fixation of the stomach at the greater curvature should prevent proximal movement of the gastrointestinal tract at the level of the diaphragm. As seen in our case, it is possible that continued cephalad movement of the large hernia may have placed significant traction on the internal bumper resulting in recurrent early BBS. We hypothesize that large paraesophageal hernia may be a risk factor for early BBS and gastropexy should be considered during initial PEG placement.



[2862] **Figure 1.** (A) orange arrow showing intrathoracic transposition of stomach and blue arrow showing intrathoracic loop of small bowel. (B) orange arrow showing intrathoracic transposition of stomach. (C) (linked sagittal and coronal CT) green arrow showing internal bumper terminating within fibrinous, orange arrow showing intrathoracic stomach. (D) endoscopic visualization of hiatal hernia and internal bumper. (E) green arrow denoting internal bumper with surrounding edema in ventral abdominal wall. (F), (FL tube study) purple arrow showing intra abdominal contrast extravasation and green arrow showing bumper.

S2863

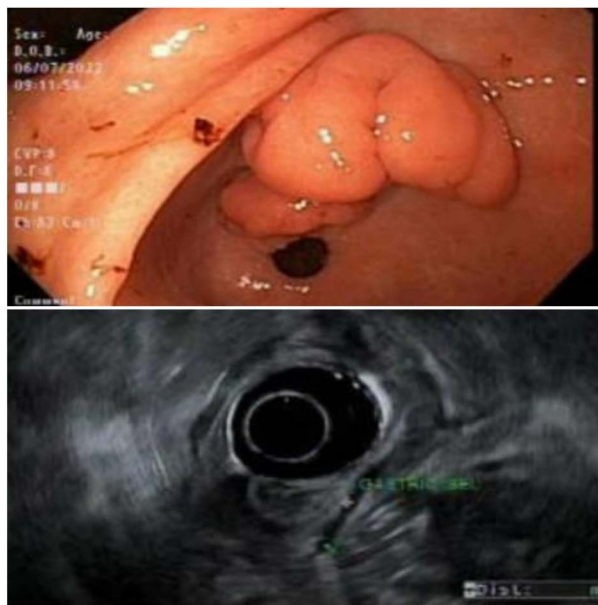
#### Reinforcement of Theory: Gastritis Cystica Profunda. A Pre-Malignant Lesion for Gastric Adenocarcinoma

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**Introduction:** Gastritis cystica profunda (GCP) is a rare lesion characterized by cystic dilation of gastric glands within the submucosal layer. Although considered to be benign, these lesions are thought to be intermediate in progression to neoplasia. We present a case of incidental resected gastric subepithelial lesion (SEL) found to be gastritis cystica profunda with intestinal metaplasia (IM) and a focus of intramucosal adenocarcinoma (IMAC).

**Case Description/Methods:** A 68-year-old woman presented with a 3-month history of intermittent epigastric pain. Review of systems, past medical, past surgical, family, and social histories were unrevealing. She underwent an esophagogastroduodenoscopy (EGD) which identified a 2.5 cm non-obstructing multilobulated antral subepithelial lesion (SEL) extending along lesser curvature from proximal antrum to prepyloric region. An endoscopic ultrasonography (EUS) was performed, revealing lesion to be hypochoic and heterogeneous with well-defined borders and extending into submucosa. Band-assisted endoscopic mucosal resection (EMR) was carried out with histologically showing IMAC arising in a background of IM and GCP. All margins were negative for carcinoma, dysplasia, or metaplasia. Pathological stage was pT1a. Immunohistochemical stains for MLH1, PMS2, MSH2, MSH6, Her2 and PDL-1 were all negative. (Figure)

**Discussion:** GCP often presents in a non-specific and indolent manner. It has been theorized to arise secondary to prior gastric trauma and chronic inflammation. It is also often considered a premalignant lesion. Our case tends to suggest this above assertion given the finding of IMAC overlying GCP. Perhaps the etiology of both gastric cancer and GCP are shared, leading to a close relationship noted in several case reports and series. Our patient had complete resection of her carcinoma via band-assisted EMR, once again enforcing endoscopic resection as appropriate curative option for early gastric malignancies, sparing patients morbidity and mortality associated with surgical approaches. Despite this, long term close follow up is advised due to unclear significance of GCP and possible premalignant nature of both GCP and IM.



[2863] **Figure 1.** Top to bottom: Multilobulated antral subepithelial lesion (SEL) on endoscopy. Hypoechoic lesion involving submucosa on ultrasound.

S2864

#### Retroperitoneal Yolk Sac Tumor Diagnosed by Endoscopic Ultrasound

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**Introduction:** Yolk sac tumors are rare malignant germ cell tumors, which usually occur in the ovaries or testes. However, they can arise anywhere in the abdomen. We present a case of a retroperitoneal yolk sac tumor diagnosed by endoscopic ultrasound (EUS).

**Case Description/Methods:** A 38-year-old man with a past medical history of hypertension and chronic hepatitis C presented with abdominal pain. He reported progressive abdominal pain over the preceding 2 months, with associated nausea, and unintentional weight loss. Physical exam was notable for right lower quadrant tenderness and a large palpable mass in the periumbilical area. Labs were pertinent for an elevated alpha-fetoprotein of 15,691 ng/mL. Computerized tomography (CT) of his abdomen and pelvis revealed an 18.3 cm necrotic mass within the abdomen centered in the retroperitoneum which was concerning for malignancy (A). Patient underwent upper endoscopy and EUS which showed a large hypoechoic extrinsic mass invading the duodenum (B), and forceps and fine needle biopsies (FNB) were obtained. Pathology of the retroperitoneal mass revealed a yolk sac tumor (C). Patient then underwent bilateral testicular ultrasound, which revealed 3 discrete masses in the right testicle. Before the patient could pursue management of his newly diagnosed metastatic yolk sac tumor he developed septic shock secondary to bowel perforation, and he eventually passed away (Figure).

**Discussion:** Patients with germ cell tumors usually present with a painless mass in the testes. Patients with extragonadal tumors can have symptoms such as vague abdominal pain, abdominal distension, back pain, fatigue, or unintentional weight loss. Mortality is higher in extragonadal disease, and it is imperative to make a diagnosis early. Extragonadal yolk sac tumors in men can be either metastatic or primary. It is important to do a thorough physical exam along with obtaining a testicular ultrasound. EUS is effective at visualizing and biopsying lesions in the gastrointestinal tract, pancreas, mediastinum, and retroperitoneum. EUS FNB has been effective in the diagnosis of retroperitoneal germ cell tumors, but very few case reports exist. Once a diagnosis has been made, treatment usually includes surgery and chemotherapy with cisplatin, etoposide, and bleomycin. One should consider a germ cell tumor in the differential of a retroperitoneal mass.



[2864] **Figure 1.** Retroperitoneal Yolk Sac tumor. (A) CT of abdomen/pelvis demonstrating an 18.3 cm retroperitoneal mass. (B) EGD/EUS showing a large extrinsic mass invading the duodenum. (C) Pathology of the retroperitoneal mass revealing a yolk sac tumor.

S2865

#### Seismic Pseudocyst Predicament: Pericardial Effusion, Bacteremia, and Fistula From Pancreatic Fluid Collection Requiring Therapeutic Lumen Apposing Metal Stent

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**Introduction:** Pancreatic fluid collections are common in episodes of recurrent pancreatitis that may persist and cause pseudocysts. As the size of pseudocyst increases, it can cause multisystemic inflammation. One of the therapeutic approaches for reducing the size is by using Lumen Apposing Metal Stent (LAMS) placement via EUS. Here we present an unusual case of a patient with pericardial effusion and esophagocystic fistula from a pseudocyst. While LAMS implantation drastically resolved the cyst's size mitigating further complications, its original paraesophageal position and resultant edema induced a pericardial effusion and small extraluminal channel at the esophagocystic junction causing bacteremia from gastroenteral translocation.

**Case Description/Methods:** A 52-year-old female with a past medical history of recurrent pancreatitis from alcohol use initially presented with epigastric pain and nausea. CT abdomen and pelvis showed a pericardial effusion and severe esophageal inflammation with edema due to a multilocular pancreatic pseudocyst. The pseudocyst was 7.9 x 6 x 4.2cm emanating from the pancreatic tail extending to the spleen, stomach, and mediastinal/paraesophageal region. Chemical necrosectomy and LAMS was done via EGD/EUS. Two weeks later, the patient had pleuritic chest pain and was diagnosed with a large pericardial effusion requiring pericardiocentesis. Eventually, the patient returned for LAMS removal and was found to have a 6mm esophagocystic fistula. Esophagram confirmed an active leak next to the esophagogastric junction, to the fundus of the stomach, and to the tail of the pancreas. Subsequently, blood cultures showed *Sphingobacterium spiritivorum* and *Sphingomonas paucimobilis*. APC via EGD was used in the margins of the fistula to promote healing and closure of the leak.

**Discussion:** This is a complex case of a necrotic pseudocyst causing periesophageal swelling and pericardial effusion that required therapeutic cyst necrosectomy and LAMS. The pericardial effusion was potentially reactive to the periesophageal swelling and edema. Although LAMS resolved the pseudocyst, the extensive nature and positioning of the pseudocyst with inflammatory changes resulted in several ramifications. Extensive necrotic pseudocyst can be life threatening, especially in this case given the patient's multi-system involvement, but further complications were potentially avoided with therapeutic LAMS intervention.

S2866

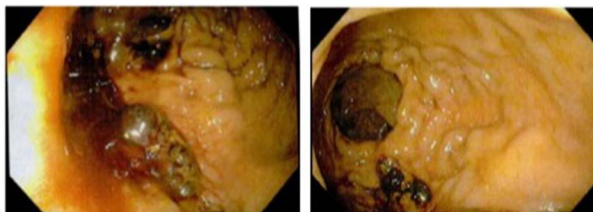
#### Rectal Variceal Hemorrhage Requiring Treatment With Endoscopic Band Ligation

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*San Ysidro Health/Scripps Mercy Chula Vista Hospital, San Diego, CA.*

**Introduction:** Acute variceal hemorrhage is a gastrointestinal emergency and a major cause of death in cirrhotics. We present a rare case of rectal variceal hemorrhage causing clinically significant bleeding. **Case Description/Methods:** A 38 year old with alcohol use disorder presented with jaundice and confusion. He was ill-appearing, unable to follow commands, with scleral icterus, abdominal distention with positive fluid wave and anasarca. He had a hemoglobin of 3.7 g/dL, platelet count of 100 K/mcL, creatinine of 1.9 mg/dL, total bilirubin of 36.3 mg/dL, lactate of 9.9 mmol/L, ammonia of 82 mcmol/L and INR of 4.3. Computed tomography of the abdomen and pelvis with contrast showed a cirrhotic appearing liver, portal venous hypertension, moderate ascites and mesenteric varices. He was transfused 2 units of packed red blood cells (pRBC) with improvement in hemoglobin to 7 and initiated on treatment for decompensated cirrhosis. Gastroenterology was consulted with esophagogastroduodenoscopy (EGD) finding grade D esophagitis without evidence of varices or ulcerations. Despite lactulose and rifaximin, his encephalopathy worsened and he was intubated for airway protection. His stool became increasingly saturated with blood and his hemoglobin continued to downtrend, requiring a total of 9 units of pRBCs over the course of 4 days. A repeat EGD found no varices. Colonoscopy was performed which revealed 5 tortuous bleeding rectal varices that were band ligated. Transfusion requirements dramatically decreased post-procedure. (Figure)

**Discussion:** Due to rarity, there are no established guidelines for treatment of rectal varices as opposed to esophageal varices. Unlike bleeding gastroesophageal varices, no randomized control trials have shown proven benefit for use of vasoactive drugs such as octreotide in bleeding rectal varices. Management of rectal varices can include methods involving endoscopy, interventional radiology or surgery. One retrospective study showed that endoscopic injection sclerotherapy has greater efficacy compared to endoscopic band ligation with less rebleeding rate. However, another study showed endoscopic band ligation to be superior. Additional procedures such as transjugular intrahepatic portosystemic shunt with or without embolization and balloon-occluded retrograde transvenous obliteration have also demonstrated resolution of acute bleeding. Failure of these methods leads to surgical treatment such as suture ligation and porto-caval shunt. We achieved hemostasis with endoscopic variceal ligation.



[2866] **Figure 1.** Colonoscopy images showing bleeding rectal varices.

S2867

#### Symptomatic Ménétrier Disease of the Esophageal Inlet Patch Managed With Endoscopic Submucosal Dissection

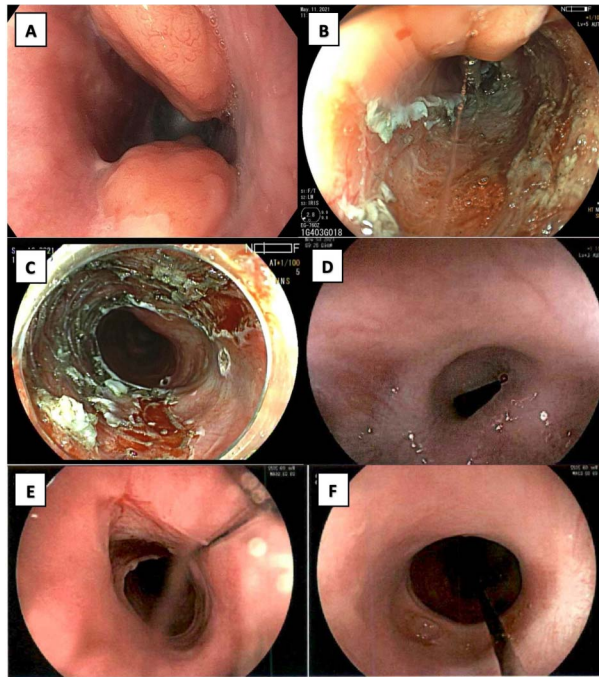
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**Introduction:** Ménétrier disease (MD) is a rare protein-losing hypertrophic gastropathy usually confined to the gastric fundus and body. Involvement of the esophageal inlet patch is extremely rare. We report a case of symptomatic MD involving the inlet patch that was managed with endoscopic submucosal dissection (ESD).

**Case Description/Methods:** A 27-year-old woman with a history of MD was referred to our clinic for further evaluation of dysphagia and globus sensation. She had a family history of MD and gastric adenocarcinoma in her maternal grandmother who passed away at the age of 56. Outside upper endoscopy (EGD) revealed two proximal esophageal lesions, biopsies of which revealed gastric heterotopia. We performed an EGD with endoscopic ultrasound. Two 15 and 20-mm subepithelial lesions were found in the proximal esophagus at 18 cm from the incisors (Figure, panel A), and the lesions appeared to arise from the superficial submucosa. Biopsies revealed hyperplastic gastric foveolar epithelium, consistent with MD involving the esophageal inlet patch. We proceeded with ESD of the two lesions in two separate sessions. First, ESD of the 20 mm lesion was successful, and histologic examination showed MD with negative margins and no evidence of intestinal metaplasia or dysplasia (Figure, panel B). One month later, she underwent ESD of the 15 mm lesion (Figure, panel C). Histologic examination showed MD with negative margins and no evidence of intestinal metaplasia or dysplasia. The patient continued to report dysphagia and underwent EGD 3 weeks later which showed a benign-appearing esophageal stricture at the ESD site (Figure, panel D). This was dilated to 12mm. She then underwent three more dilations to 12, 13, and 15mm at 6, 10, and 22 weeks later, respectively (Figure, panels E and F). There was no evidence of residual or recurrent disease on any of the repeat endoscopies. The patient has remained symptom-free for 3 months now.

**Discussion:** To our knowledge, this is the first report of symptomatic MD involving the esophageal inlet patch that was managed with ESD for two reasons. First, the lesions appeared to arise from the superficial submucosa. Second, underlying malignancy could not be ruled out in either lesion given family history of gastric adenocarcinoma. In patients with symptomatic MD at high-risk of gastric adenocarcinoma, ESD, when compared with mucosal resection, has the advantage of en-bloc resection which in the setting of malignancy can provide staging data and can be potentially curative.



[2867] **Figure 1.** Endoscopic appearance of the two upper esophageal subepithelial lesions (panel A). Endoscopic submucosal dissection (ESD) was performed in two separate sessions (panels B and C). Benign-appearing post-ESD stricture before (panel D) and after dilation (panels E and F). Patient remains asymptomatic 3 months after last stricture dilation.

S2868

#### Successful Endoscopic Management of Laparoscopic Sleeve Gastrectomy Leak

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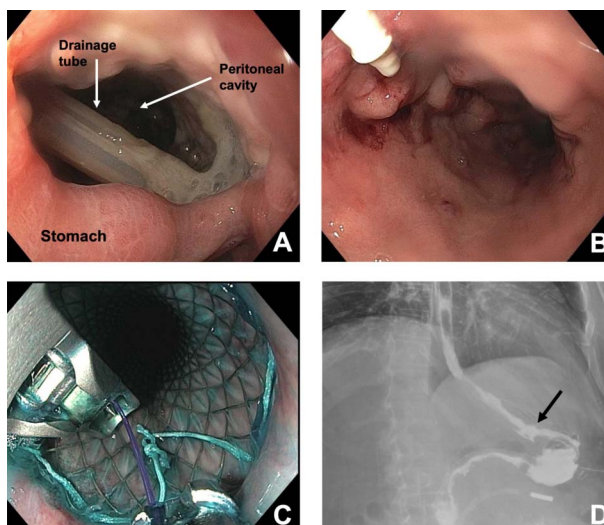
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**Introduction:** Laparoscopic sleeve gastrectomy (LSG) is a popular weight loss surgery. LSG staple line leak occurs in 0.1% of patients. We present a case of LSG leak successfully managed with Overstitch™ endoscopic suturing system (OESS) and esophageal stent (ES) placement.

**Case Description/Methods:** A 54-year-old man with HTN, DM and morbid obesity with one week status post LSG performed in a neighboring country presented to emergency room with diffuse abdominal pain, nausea, vomiting, and constipation since surgery. His BP was 106/72mmHg, HR was 125bpm, T was 97.8 F, WBC was 19.04 k/ul, and Hb was 13.6 g/dL. CT abdomen showed large intraabdominal fluid collections. An LSG staple line leak was suspected. An NG tube was placed for decompression, antibiotics were begun, and he was taken for urgent diagnostic laparoscopy revealing large amount of intraperitoneal serosanguinous fluid. Gastric leak was confirmed, and multiple abdominal and pelvic drains were placed. Significant friable tissues prevented surgical repair of the leak. Total parenteral nutrition (TPN) was started. A week later GI service was consulted. EGD showed a 20 mm perforation along LSG staple line located 3cm below gastroesophageal junction (GEJ). Using OESS the defect was successfully closed followed by placement of a 23mmx155mm fully covered ES. Upper GI series (UGI) along with per oral methylene blue administration excluded leak. Naso-jejunal (NJ) feeding was then started and TPN was weaned off. Patient did well and discharged home. ES was removed at a follow up EGD in five weeks, and 2-3mm residual LSG staple line defect without contrast extravasation was identified and endoscopic suturing was repeated. NJ feeding was continued. UGI in 1 week showed no leak. NJ feeding was discontinued, and oral feeding was begun. Patient has been doing well since on subsequent follow up in the clinic. (Figure)

**Discussion:** LSG is a popular bariatric procedure due to its simplicity and efficacy. But LSG leak can be fatal if not managed appropriately. Prompt surgical measures are the key steps. In unusually complicated cases as ours, multidisciplinary management brings a favorable outcome. Endoscopic closure of the LSG defect can be vital in source control when surgical measures fail. The success of endoscopic therapy depends on leak onset, with healing achieved in about 48.5% at one month to 73.6% at 6 months. In our case, OESS coupled with covered esophageal stent placement completely healed a large LSG defect.





[2868] **Figure 1.** (A) Endoscopic view of large LSG staple line defect that is in open communication with peritoneal cavity with pus, a drainage tube was seen in situ. Note healthy gastric mucosa (B) Total closure of the LSG staple line defect with Overstitch™ endoscopic suturing system (C) Stent fixation with Overstitch™ Endoscopic Suturing System (D) UGI shows no contrast extravasation, and black arrow points at the location of the endoscopic suture placement.

S2869

#### Simultaneous Two Scope Method for Placement of Endoscopic Gastrojejunostomy With LAMS

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**Introduction:** Lumen-Appling Metal Stents (LAMS) have been a tremendous advance in the field of Interventional Gastroenterology. Originally designed for pseudocyst/walled-off necrosis drainage, a number of novel indications have emerged for use of these stents. One of the most innovative uses is the creation of a gastro-enteric anastomosis for patients with gastric or duodenal outlet obstruction such as from cancer. This is a case of using two scopes side-by-side simultaneously to place the LAMS and create an endoscopic Gasto-jejunal (GJ) anastomosis.

**Case Description/Methods:** This is a 51 yo male who presented to hospital with symptoms of nausea and vomiting over 1 week. CT showed a massively distended stomach. EGD revealed a mass at the pylorus and a tight stricture. EUS FNA confirmed adenocarcinoma. Decision was made to perform an Endoscopic GJ with LAMS. Initially, the Olympus XP-190N with a 5mm diameter was advanced through the mouth, into the stomach and past the obstruction. The scope was advanced into the 2nd portion of the duodenum. The umbilicus was disconnected from the processor but the scope was still attached to the foot activated water jet. We then put the EUS scope down alongside the "baby scope" and under EUS guidance we searched for a loop of bowel while simultaneously filling the lumen with water using the baby scope. EUS was able to identify a loop easily that was actively being filled with water and puncture was performed and LAMS was placed. (Figure)

**Discussion:** The placement of a LAMS to create a Gastrojejunal anastomosis is a great advance in the field but must be performed with the utmost concern for safety. With the "two-scope" method described we are able to rapidly and continuously fill the intestinal lumen via the "baby scope" using foot activated water jet thereby providing a large target for EUS-guided puncture of the bowel. Furthermore, passage of the scope past the stricture is often easier than passing a wire and then advancing a catheter such as a naso-biliary drain over the wire and then removing the wire. Given we are using the baby scope as "the catheter" we are saving time on exchanges. This method has been used on 4 patients recently with 100% technical and clinical success.



[2869] **Figure 1.** EUS image of LAMS being placed into a water-filled jejunum.

S2870

#### Successful Use of EUS-Guided Choledochoduodenostomy With LAMS in a Post-Liver Transplant Patient With Recurrent Choledocholithiasis and Cholangitis

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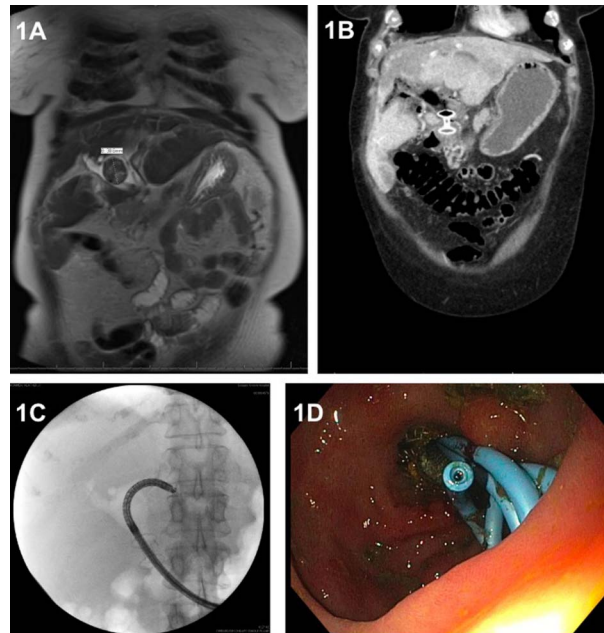
**Introduction:** Biliary complications, like anastomotic stricture and cholangitis, are seen in 10-15% of orthotopic liver transplants (OLT). OLTs often require multiple endoscopic retrograde cholangiopancreatography (ERCP) for recurrent disease. Endoscopic ultrasound guided choledochoduodenostomy (EUS-CD) has been effective in treatment of malignant distal biliary obstruction after failed ERCP;



however, there are limited reports regarding EUS-CD in OLTs. We present a case of successful EUS-CD with lumen apposing metal stents (LAMS) in an OLT with recurrent cholangitis secondary to benign anastomotic stricture refractory to management with ERCP.

**Case Description/Methods:** A 61-year old female with 3 OLTs (1996 and twice in 2008) for autoimmune hepatitis presented with recurrent cholangitis secondary to anastomotic biliary stricture in the setting of duct mismatch with a dilated common hepatic bile duct to 3 cm. She had recurrent choledocholithiasis measuring 3 cm despite prior mechanical and electrohydraulic lithotripsy with cholangioscopy confirmed clearance. As a result, she had undergone a total of 26 prior ERCP treatments (2012-2021). She underwent an EUS-CD with LAMS for definitive treatment. 2-weeks later, an upper endoscope was traversed through the LAMS to perform lithotripsy of remaining choledocholithiasis. At this time, the patient remains free of cholangitis for the past 8 months. (Figure)

**Discussion:** Biliary complications, like anastomotic stricture and recurrent cholangitis, are a common occurrence in OLTs. With use of various ERCP techniques, obstructions can be removed or ameliorated. Timely treatment of cholangitis is imperative as the mortality rate is high (10-30%). With each cholangitis episode and subsequent ERCP, the cumulative procedural risk and mortality increases. EUS-CD has been demonstrated to be effective in treatment for malignant distal biliary obstruction after failed ERCP. Our patient had previously undergone 26 ERCPs and additionally was on Warfarin for pulmonary embolism putting her at very high risk for complications with additional future endoscopic procedures. This represents a case of successful use of EUS-CD with LAMS in a patient post-OLT with a significant distal common bile duct stricture which had been refractory to traditional management via ERCP. Long term studies are indicated to see if this can provide durable benefit.



[2870] **Figure 1.** 1A. MRI imaging demonstrating a large 3 cm choledocholithiasis within the dilated CBD, which formed as a result of bile stasis. 1B. CT coronal view demonstrating successful deployment of LAMS to complete EUS-CD. 1C. Fluoroscopic view of the standard upper scope traversing through the LAMS for definitive lithotripsy and dredging of remaining choledocholithiasis. 1D. Endoscopic view of the final LAMS placement with double pigtail plastic stents.

S2871

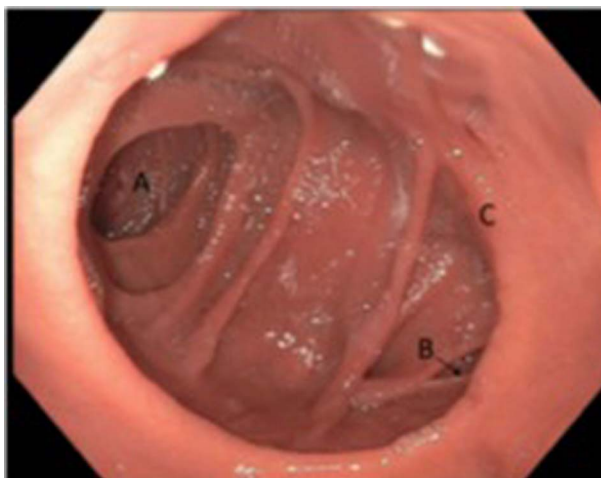
#### Successful Treatment of “Candy Cane” Syndrome Through Endoscopic Gastrojejunal Anastomosis Revision

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**Introduction:** “Candy cane” syndrome is a post-surgical Roux-en-Y gastric bypass (RYGB) complication associated with a markedly long, surgically-created blind end of the afferent Roux limb distal to the gastrojejunostomy. Gradual filling of this long blind limb with food can result in symptoms, including postprandial epigastric pain, nausea, vomiting, or regurgitation. Treatment of candy cane syndrome traditionally consists of laparoscopic resection of the redundant blind afferent limb. We present the first case of successful treatment of candy cane syndrome through endoscopic revision of the gastrojejunal (GJ) anastomosis.

**Case Description/Methods:** A 40-year-old female presented for evaluation of intractable acid reflux, nausea, and weight recidivism eight years post RYGB. Esophagogastroduodenoscopy revealed evidence of prior RYGB, a healthy-appearing GJ anastomosis, a direct path across the GJ anastomosis into the blind afferent limb, and the enteral efferent limb located at a more angulated orientation toward the 4:00 position. An upper gastrointestinal series revealed an exaggerated blind afferent limb with pooling of contrast in the afferent blind limb before spilling to progress down the Roux limb. This finding suggested the reflux likely stemmed from the excessively long blind afferent limb. The patient wished to avoid surgery and a novel endoscopic suturing technique was performed that narrowed the GJ anastomosis and oriented flow towards the enteral efferent limb. This resulted in 1) limiting acid reflux 2) assisting with weight loss and 3) redirecting flow of contents more toward the enteral efferent limb. Post-procedure our patient had no additional weight gain and her acid reflux and nausea resolved. (Figure)

**Discussion:** Candy cane syndrome is an underappreciated complication reported following RYGB. It results from an excessively long blind afferent Roux limb at the gastrojejunostomy that can lead to food accumulation. Patients often present with nausea, vomiting, food intolerance, acid reflux, and abdominal pain. Many patients remain undiagnosed due to vague gastrointestinal symptoms, delayed presentation, and physician unawareness. Historically, treatment has required surgical revision. Endoscopic suturing revision of the GJ anastomosis can provide an alternative less invasive and possibly safer treatment option that address the reflux symptoms, weight regain, and aberrant flow of contents into the blind limb.



[2871] **Figure 1.** Figure: Endoscopic view of direct access into the blind afferent limb A, the acute angle of the enteral efferent limb B, and dilated gastrojejunal anastomosis C.

S2872

#### Stenting as Salvage Therapy for Colonic Perforation

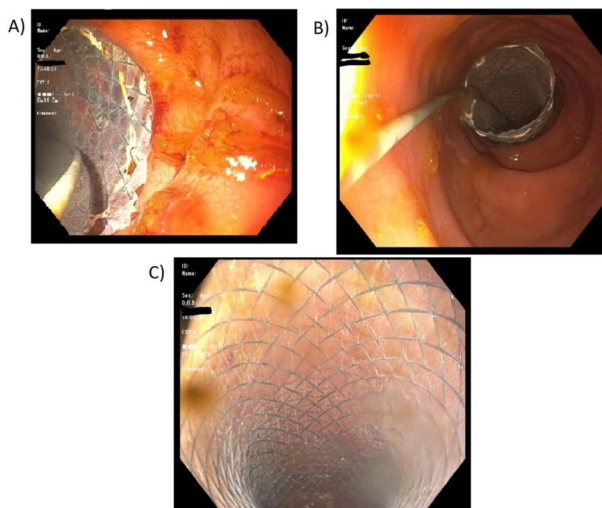
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**Introduction:** The presence of Cirrhosis in perforated diverticular disease can amplify mortality several-fold. Ascites and abdominal venous collaterals can limit operative intervention. The absence of meaningful data limits rescue therapy in such cases. We present a unique case of colonic stent placement as a rescue attempt in a patient with decompensated cirrhosis and perforated diverticular disease.

**Case Description/Methods:** A 62-year-old female with a history of alcohol-related cirrhosis decompensated by variceal bleeding presented with 3 days of diffuse abdominal pain and abdominal distention. CT scan revealed a contained micro-perforation in the sigmoid colon along with new onset ascites. Paracentesis done on admission was indicative of underlying secondary bacterial peritonitis (ScBP) and the patient was started on antimicrobial therapy. Colorectal surgery evaluated the patient and recommended conservative management in the setting of a contained micro-perforation. The patient's course was complicated by frank perforation and septic shock. The patient was deemed not to be a surgical candidate given high intra-operative mortality in the setting of Child Pugh Category C Cirrhosis. Shock physiology resolved with antimicrobial therapy and TPN, but the patient continued to have ScBP on repeat paracentesis. Given the patient's good functional status prior to the admission, rescue therapy was attempted. Three 20 mm wide, 15 cm long fully covered stents were placed endoscopically in an overlapping fashion starting 10cm proximal to the presumed site of perforation and extended to the rectum. A total of 40-45 cm in length was covered. The proximal and distal stents were each anchored with three 16mm Duraclips. Subsequently, there was a decrease in ascitic fluid neutrophil count from 7,614/uL to 2,116/uL. However, one of the stents dislodged on day 3 post procedure and the ascitic fluid neutrophil count increased to 10,000/uL again. Unfortunately, the patient developed variceal bleeding a week later and the family decided to proceed with comfort care measures. (Figure)

**Discussion:** Colonic perforation is a dreaded complication of diverticular disease with an annual incidence of 4/100,000. The associated mortality in patients undergoing an operative intervention is estimated at 12% to 36%. The presence of underlying cirrhosis and ascites can amplify mortality many-fold. In such conditions, when a surgical approach is contraindicated, endoluminal salvage therapy with colonic stents to bypass the perforation can be attempted.



[2872] **Figure 1.** A and B) Stent placement in sigmoid colon. C) Patent stent with free flowing stool through the stent.

S2873

#### Splenic Vascular Laceration After Endoscopic Necrosectomy and Cyst-Gastrostomy Placement

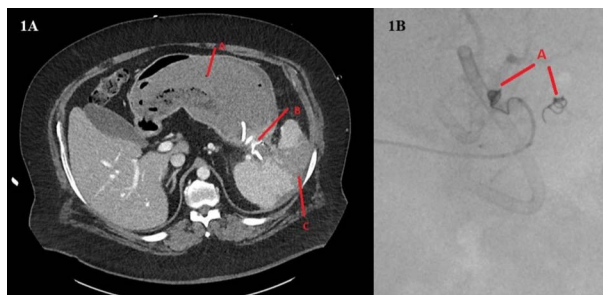
*Ameya Deshmukh, DO<sup>1</sup>, Zarir Ahmed, DO<sup>2</sup>, Michelle Baliss, DO<sup>2</sup>, Jason Taylor, MD<sup>2</sup>, Antonio Cheesman, MD<sup>2</sup>.*

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**Introduction:** Endoscopic cyst-gastrostomy and necrosectomy have been shown to be highly effective in the treatment of pancreatic walled of necrosis (WON). However, these procedures can be associated with significant complications including bleeding, infection, and perforation. Herein, we describe a case of upper GI bleeding secondary to erosion of a cyst-gastrostomy stent array into the splenic vasculature.

**Case Description/Methods:** A 45-year-old male with a history of chronic pancreatitis presented to the emergency room with acute-onset hematemesis, melena, and abdominal pain. Two weeks prior, he presented to an outside hospital with abdominal pain and vomiting. He was found to have a 6.7 x 3.4 cm WON collection in the pancreatic tail on MRCP. EUS with FNA revealed necrotic debris and was negative for malignancy. Due to ongoing pain and poor oral intake, he underwent EUS-guided cyst-gastrostomy and necrosectomy 1 week later. A hot 10 x 15 mm lumen apposing metal stent (LAMS) was placed with balloon-dilation of the LAMS. Then, necrosectomy of cyst cavity was done via irrigation and suction with placement of coaxial double pigtail plastic stent. On presentation to our institution, he was afebrile and hypotensive, with a hemoglobin of 11.7 g/dL from 16.2 g/dL one week prior. Emergent abdominal CT angiogram revealed pigtail stent migration into the splenic arterial branches at the splenic hilum, causing splenic artery injury and large splenic infarct. Interventional radiology performed successful coil embolization of the splenic artery with bleeding cessation. The patient progressed well and was discharged home. (Figure)

**Discussion:** While endoscopic cyst-gastrostomy provides safe and effective treatment of pancreatic WON, it still carries the potential for serious complications. Prior literature reveals endoscopic therapy has a 26-33% bleeding rate and a mortality rate of 5.8-11%. Stent migration is a relatively rare complication that occurs in 0.7% of patients. In our case, disruption of the splenic vasculature likely resulted from mechanical injury by the cyst-gastrostomy stent. CT angiography is the best initial diagnostic test with excellent sensitivity and specificity. Treatment usually involves transcatheter embolization or surgery for patients with persistent hemodynamic instability. Splenic vascular injury and infarcts, while infrequent, can still occur as immediate and delayed complications and endoscopists should be vigilant of their occurrence post-procedure.



[2873] **Figure 1.** (1A) Gastric lumen with hemorrhagic material (A). Cyst-gastrostomy connecting stomach and pseudocyst (B). Wedge-shaped splenic infarct (C). (1A) Successful embolization of splenic artery branches with multiple coils (A).

S2874

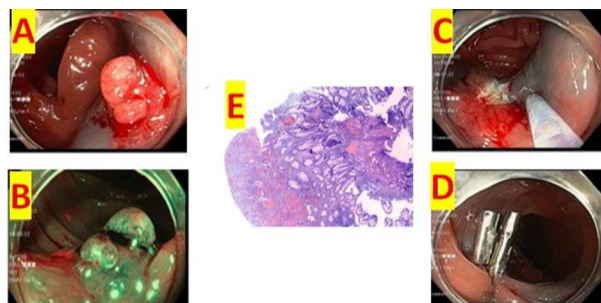
#### Sporadic Inflammatory Polyp Causing Persistent Hematochezia

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**Introduction:** Inflammatory polyps (IPs) are a rare, benign colonic entity. It can be caused by any condition that leads to prolonged inflammation or tissue injury. We present a rare case of sporadic inflammatory polyp causing persistent hematochezia which required repeated endoscopic interventions to completely resolve symptoms.

**Case Description/Methods:** A 43 y/o female without significant past medical history was seen due to persistent hematochezia. She denied NSAID use, family history of colon cancer/polyps, unintentional weight loss, abdominal pain or change in bowel habits. Her physical exam was unremarkable; recent laboratory parameters revealed a hemoglobin of 12.8 g/dL, and ferritin is 18ng/dL, while on oral iron supplementation, consistent with iron deficiency. Initial colonoscopy was performed by a local gastroenterologist with a 10mm sessile transverse colon polyp found and biopsied. The polyp continued to ooze necessitating hemostasis control using a hemoclip. Pathology revealed an inflammatory pseudopolyp and the patient was referred to our institution for endoscopic management. In the interim, patient continued to have hematochezia with bowel movements. Repeat colonoscopy showed an oozing sessile polyp which was completely removed via endoscopic mucosal resection (EMR) and coagulation of capillaries using the snare tip surrounding the polyp EMR site. The site was then closed by approximating mucosa using 3 hemoclips. The patient did not experience any further bleeding following intervention.

**Discussion:** IPs are a well-recognized entity in patients with IBD, however it can also be associated with ischemic colitis, infectious colitis, intestinal ulcers, and mucosal anastomosis. One third of the time, IPs may develop sporadically and share morphological features of epithelial polyps, adenocarcinoma, and vascular tumors. The majority are asymptomatic but can cause bleeding. Endoscopically, polyps are lined with normal edematous or superficially ulcerated mucosa. The stalk is often fibrous and vascular but may also contain muscle fascicles. IPs are confirmed with pathologic finding of inflammatory cells, replaced granulation tissues and episodic presence of hyperplastic changes. Sporadic IPs are typically treated endoscopically via polypectomy or EMR. Some cases might need ablation for bleeding control or surgical resection. Endoscopists should keep IPs in the differential diagnosis as an etiology for hematochezia. (Figure)



[2874] **Figure 1.** A: Magnified view of the inflammatory polyp with sessile appearance and oozing B: Narrow band imaging view of the IP C: Post EMR view with coagulation of the visible vessels surrounding the IP D: Post EMR view with hemoclips deployed E: 40x H&E: Colonic mucosa with hyperplastic changes, surfaced by a polypoid projection of granulation tissue (note prominent dilated vasculature with intervening inflammation).

S2875

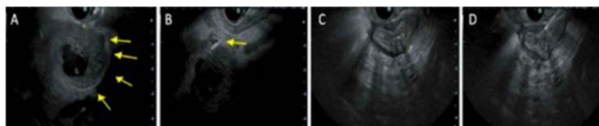
#### The Utility of Endoscopic Ultrasound and Fine Needle Biopsy in Diagnosing Remnant Gastric Cancer After Roux-en-Y Gastric Bypass Procedure

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**Introduction:** Roux-en-Y gastric bypass (RYGB) procedure is commonly performed for severe obesity. These patients are at risk of developing remnant gastric cancer. Double-balloon endoscopy (DBE) is typically used to obtain a biopsy. We present two cases of remnant gastric cancer diagnosed using endoscopic ultrasound (EUS).

**Case Description/Methods:** Case 1 is a 76-year-old female status post RYGB who presented with 40-pound weight loss, anorexia and constipation. Labs showed hemoglobin of 6.1 g/dL. Computed tomography (CT) of the chest, abdomen and pelvis revealed hepatic masses and gastric remnant thickening. CA 19-9 was 200,000 U/ml and CEA was 683 ng/dL. Esophagogastroduodenoscopy (EGD) revealed Roux-en-Y gastrojejunostomy with healthy appearing mucosa and a normal jejunum. Colonoscopy showed internal hemorrhoids. Liver biopsy was inconclusive. Concern for remnant gastric cancer, in light of no obvious primary, prompted transgastric EUS guided fine needle biopsy (FNB) of the remnant pouch which confirmed gastric adenocarcinoma. Case 2 is a 49-year-old female status post RYGB who presented with left flank pain, 12-pound weight loss and fevers. Labs showed hemoglobin 9 g/dL. CT of the abdomen showed wall thickening involving the gastric pouch and gastric remnant. CEA was 96.6 ng/dL and CA-125 was 348.7 U/ml. EGD revealed a small gastric pouch, gastrojejunal anastomosis characterized by polypoid appearing lesions which were biopsied and found to be benign, and a normal jejunum. Colonoscopy showed inflammation in the cecum and transverse colon and biopsies revealed adenocarcinoma consistent with metastatic signet ring cell carcinoma. Transjejunal EUS guided FNB of the gastric remnant confirmed signet ring cell adenocarcinoma. (Figure)

**Discussion:** EUS is a valuable tool for tissue acquisition especially because DBE has challenges of high operator dependence and long procedure times. Case reports have described EUS guided placement of lumen-apposing metal stents (LAMS) to create a conduit into the gastric remnant to obtain biopsies. However, LAMS are highly operator dependent and carry complications of stent migration, bleeding, infection and perforation. The EUS guided FNB technique is shown in image 1. There were no complications intra or post operatively. Our cases show that EUS with a trans-gastric or trans-jejunal approach provides a less invasive approach that is more operator-friendly, time saving and yields adequate tissue acquisition.



[2875] **Figure 1.** EUS images. A, Case 1: Transgastric view of thickened gastric remnant. B, Case 1: Fine needle biopsy of gastric remnant wall. C, Case 2: Transjejunal view of thickened gastric remnant. D, Fine needle biopsy of gastric remnant wall.

S2876

#### To the Duodenum, and Beyond! Using the BougieCap for Duodenal Stricture Dilation

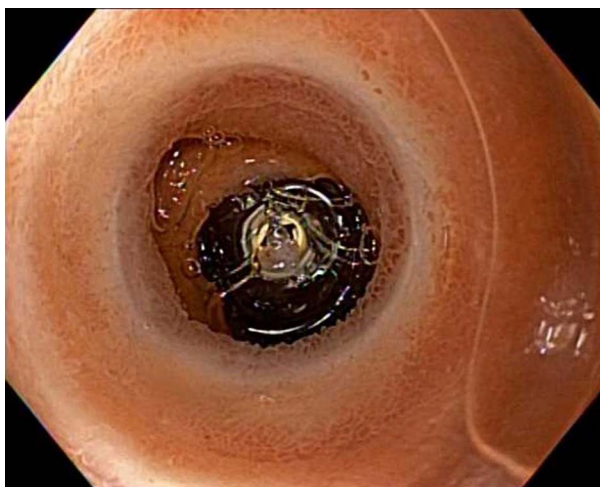
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**Introduction:** Benign duodenal strictures are typically caused by peptic ulcer disease, caustic ingestion, surgical anastomoses, or inflammatory bowel disease. Treatment of benign strictures usually involves endoscopic dilation using through-the-scope (TTS) balloon dilators with or without fluoroscopy. TTS balloon dilators allow visualization during dilation, but they do not provide haptic feedback. The BougieCap dilator is a newer device that attaches to the endoscope and allows direct visual and haptic feedback during dilation. While it is generally used for dilation of esophageal strictures, this report describes its use for dilation of a benign duodenal stricture.

**Case Description/Methods:** A 75-year-old male with stage IV non-small cell lung cancer on immunotherapy was found to have biliary dilation on imaging. He subsequently underwent endoscopic ultrasound which incidentally revealed a duodenal stricture at the junction of the first and second portions of the duodenum. The stricture was unable to be traversed with the linear echoendoscope or an adult upper endoscope. TTS balloon dilation from 8 to 12 mm was performed, however, the adult upper endoscope was still unable to traverse the stricture. Biopsies of the stricture were obtained and were negative for malignancy and gastric biopsies did not reveal any evidence of *Helicobacter pylori* infection. Approximately 4 months later, the patient developed progressive nausea and vomiting. Upper endoscopy again showed the duodenal stricture which was unable to be traversed. The decision was made to use the BougieCap device for dilation. The stricture was then sequentially dilated from 10 to 12 mm using the BougieCap with direct visualization of mucosal disruption during dilation as expected (Figure). The adult upper endoscope was then able to traverse the stricture easily. There were no procedural complications or adverse effects and the patient reported improvement in his symptoms.

**Discussion:** Benign duodenal strictures are typically treated with endoscopic dilation using TTS balloon dilators, although this method is limited by the lack of haptic feedback or complete visualization in some cases. In this case, TTS balloon dilation was ineffective for initial stricture dilation, thus the BougieCap was used for more precise dilation under direct visualization. While the BougieCap is generally used for esophageal stricture dilation, it may also serve as a safe and effective method to dilate refractory benign duodenal strictures.



[2876] **Figure 1.** Endoscopic image of BougieCap dilation of the duodenal stricture.

S2877

#### Weight Loss Utilizing Endoscopic Sleeve Gastroplasty (ESG), Benefit for Ostomy Reversal in Obese Patient With Ulcerative Colitis (UC)

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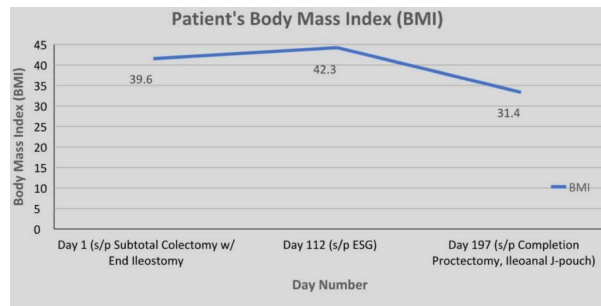
**Introduction:** Over the last thirty years, the prevalence of both obesity and inflammatory bowel disease has increased globally. Surgical management in ulcerative colitis (UC) is reserved for medically refractory UC, most typically in a three-stage pattern: initial removal of the colon and creation of an end ileostomy, followed by removal of the rectum and construction of ileal pouch anal anastomosis and diverting ileostomy, followed by reversal of the ileostomy. Proctectomy is particularly difficult in obese patients due to increased visceral adiposity, thickened abdominal wall, adhesions, and reduced mobility secondary to bulky mesentery. Patients with Body Mass Index (BMI) greater than 30 are found to have greater risk for complications in comparison to normal BMI counterparts. Endoscopic sleeve gastroplasty (ESG) is a



newer, minimally invasive procedure for the treatment of obesity which endoscopically reduces gastric volume through an endoscopic suturing system. We present a novel case where ESG was used as a tool for weight loss in a patient who encountered delayed ostomy reversal due to morbid obesity.

**Case Description/Methods:** A 39-year-old man with medical history significant for morbid obesity and medically refractory UC became a candidate for proctocolectomy with an ileal pouch anal anastomosis. However, given the patient's obesity, there was concern of the J-pouch-end ileostomy being unable to reach the patient's pelvis. Patient underwent a da Vinci assisted laparoscopic subtotal colectomy with end ileostomy in order to preserve the rectum for a potential J-pouch after his weight loss. Post subtotal colectomy and end ileostomy, patient was referred for endoscopic sleeve gastroplasty due to additional weight gain post-op due to symptom mediated inactivity, thereby further delaying his ostomy reversal and placement of ileoanal J-pouch. Patient underwent endoscopic sleeve gastrectomy (ESG) with effective weight loss, anatomically allowing successful ostomy reversal, completion proctectomy, and J-tube construction. (Figure)

**Discussion:** Future studies are required to determine whether ESG weight loss should be an integral initial step of medical management of IBD in obese patients to inevitably avoid surgical intervention. In summary, ESG may be a pivotal modality as a tool for weight loss in patients with UC and morbid obesity who may encounter delayed proctectomy and ostomy reversal, overall helping contribute to decreased surgical morbidity, complications, and faster improvement in overall quality of life.



[2877] **Figure 1.** Clinical management and BMI over patient's clinical course.

S2878

#### When One Stent Fails, Another One to the Rescue: A Novel Approach to Managing Small Post-Op Gastric Leaks Following Laparoscopic Sleeve Gastrectomy

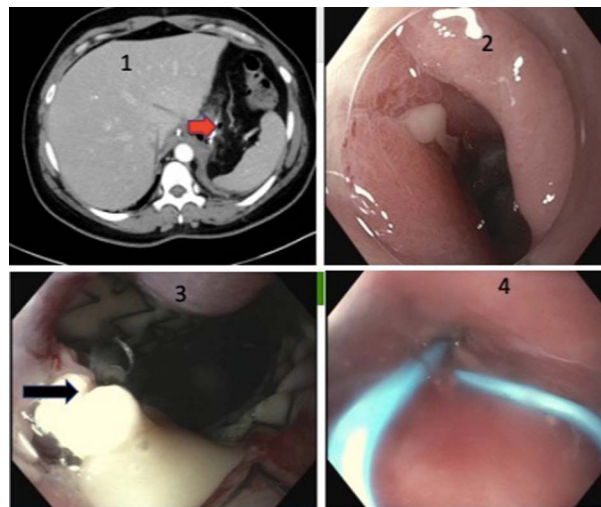
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**Introduction:** Laparoscopic sleeve gastrectomy (LSG) is a commonly used procedure in the surgical management of Obesity. However, post-op complications such as gastric leaks and their sequelae pose challenges. We present a case of a novel alternative in managing a small contained post-op gastric leak, which was difficult to define radiographically but was visible endoscopically causing the patient symptoms.

**Case Description/Methods:** A 47 year old female with history of prior LSG, hiatal hernia, pernicious anemia presented for revision of her LSG for continued weight gain and hernia repair for dyspepsia. Surgery was uneventful but on post-op day 25 she developed fever (101.5 F), tachycardia (HR125), BP 131/74, RR 18, Sat 96%. Suspecting gastric leak, CT scan was performed which showed only extraluminal bubbles (Panel 1). Despite a negative upper GI series she was placed on prophylactic antibiotics and 3 days later an EGD performed confirmed the presence of pus 3-4 cm below GE junction consistent with an anastomotic leak. (Panel 2). A therapeutic 23 x 150 mm fully covered esophageal metal stent was placed, however 6 days later she developed nausea, vomiting and left upper quadrant pain. Abdominal x-ray showed distal migration of the esophageal stent confirmed by subsequent EGD (Panel 3). At that point, the stent was removed and a 7 Fr x 7 cm plastic double pigtail stent was placed into the abscess cavity for drainage of purulent fluid (Panel 4) into the stomach. Successful drainage of the abscess was achieved and confirmed by repeat EGD on post-op day 83 indicating normal gastric mucosa. The pigtail stent was subsequently removed. The patient has since been asymptomatic.

**Discussion:** Endoscopic stenting has been widely used to manage post-op LSG gastric leak by closing off the cavity and draining extra-luminally. However, its migration causes significant patient discomfort, allows persistent fluid collection and abscess formation, delays healing and prolongs hospital stay. We propose a novel technique of mimicking a transgastric pseudocyst drain using a double pigtail plastic stent as an effective method of treating a small post-op LSG gastric leak after esophageal stent migration. In our patient, this technique hastened recovery, and decreased morbidity-related outcomes and hence this technique can be considered as future first line treatment.



[2878] **Figure 1.** (1) CT Ab/Pelvis arrowhead notes extraluminal bubbles near the GE Junction (arrowhead) (2) EGD showing white fluid (pus) 3 – 4 cms below the EG junction consistent with post-op LSG gastric leak (3) EGD showing increased pus anterior to tip of migrated stent (arrowhead) (4) Placement of double pigtail for successful drainage of purulent material.

S2879

#### Trans-colonic Endoscopic Ultrasound-Guided Fine Needle Aspiration Biopsy of a Challenging Liver Lesion: A Novel Technique

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**Introduction:** Endoscopic ultrasound (EUS) has become more popular for liver biopsy and sampling of liver lesions. EUS-LB offers several advantages including its ability to target both lobes, and increased patient satisfaction with a comparative diagnostic accuracy compared with other modalities. We report here a case of metastatic liver lesion which was biopsied by EUS guided trans-colonic approach.

**Case Description/Methods:** A 73-year-old male with a history of laparoscopic abdominoperineal resection with the formation of a sigmoid colostomy for rectal cancer and lung cancer treated with lobectomy was referred for the evaluation of enlarging mesenteric nodule on surveillance CT abdomen and pelvis which was concerning for metastatic rectal cancer. He underwent whole body PET-CT for the evaluation of further metastasis which showed both a new metabolically active focus in the inferomedial right hepatic lobe in segment V and left lower lobe pulmonary nodule suspicious for metastases. He was referred for percutaneous CT-guided biopsy of the left lung nodule but was not visualized and could not be biopsied. The liver mass was also not visualized adequately for biopsy using CT or US technique He was referred for EUS-guided sampling of the liver mass. Given the right liver lesion would not be accessible with upper EUS, a lower EUS was done with a forward viewing echoendoscope via the sigmoid colostomy. The scope was advanced with water infusion to the cecum and then withdrawn to the hepatic flexure. Gentle torquing revealed a 20 x 20 mm inferior right liver lobe lesion which was successfully biopsied using a trans-colonic approach. Pathology confirms metastatic poorly differentiated adenocarcinoma with necrosis, compatible with colorectal primary.

**Discussion:** Limited data have been published so far regarding the utility of lower EUS in the evaluation and sampling of extra-colonic lesions. A retrospective study on 13 patients revealed that trans-colonic EUS-guided fine-needle aspiration has a sensitivity, specificity, and accuracy of 91%, 100%, and 92%, respectively in detecting malignant lesions. The trans-colonic approach utilizing forward viewing echoendoscope we reported here has not been described before for the sampling of challenging liver lesions and can be considered in such cases to establish the diagnosis.

S2880

#### Transpapillary Cystic Duct: A Rare Novel Genetic Variant

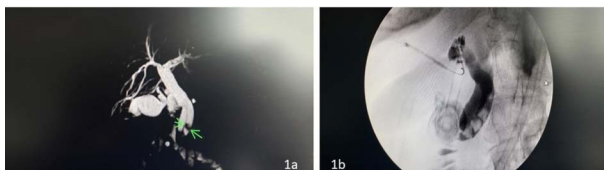
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**Introduction:** Patients with cholecystitis often present with abdominal pain, nausea and vomiting. The treatment for cholecystitis often is a cholecystectomy. Pathogenesis of cholecystitis entails blockage of the cystic duct resulting in inflammation up-stream from the site of obstruction. Stones are often the cause of this obstruction, and can often enter the bile duct, causing bile duct obstruction. Cystic duct often merges with the common hepatic duct in the extrahepatic but non-pancreatic portion. Imaging such as Ultrasound and MRI in such cases would reveal a filling defect within the bile duct. We present a case where the cystic duct opened directly at the ampulla.

**Case Description/Methods:** A 68 year-old female presented with abdominal pain, nausea and vomiting. Laboratory testing revealed normal AST, ALT and Alkaline phosphatase. Bilirubin was elevated. Ultrasound imaging revealed findings of cholecystitis. A magnetic resonance cholangiopancreatography was performed (Figure a) that revealed a normal common bile duct (CBD), and a dilated cystic duct with a filling defect consistent with a stone. Interestingly, it revealed cystic duct insertion close to the ampulla. During laparoscopic cholecystectomy, an intraoperative cholangiogram (Figure b) with contrast injection into the cystic duct revealed multiple filling defects in the cystic duct with contrast draining into the small bowel through the papilla. ERCP with cholangioscopy confirmed the cystic duct opening into the ampulla. Treatment entailed ERCP with cholangioscopy and lithotripsy.

**Discussion:** Recognizing anatomical variants and considering these in the differential can help in understanding unusual clinical presentations of biliary pathologies.



[2880] **Figure 1.** a: MRCP images showing stones (green arrow) in cystic duct with cystic duct opening at the ampulla; b: Intraoperative cholangiogram confirming cystic duct stones with cystic duct opening at the ampulla.

S2881

#### Unusual Complication of a Plastic Double Pigtail Cystogastrostomy Stent Causing Muscular Injury

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**Introduction:** Complications of plastic stents placed across the cystogastrostomy tract include occlusion, retroperitoneal and tract site bleeding, migration, pressure erosion, and rarely, visceral perforations. Compared to metal lumen apposing stents, complications related to plastic stents are usually low. We present a case of a plastic cystogastrostomy stent eroding into the adjacent flank musculature.

**Case Description/Methods:** A previously healthy 33-year-old man was admitted and treated for hypertriglyceridemia-induced necrotizing pancreatitis. One month later, patient underwent an EUS-guided cystogastrostomy (CG) tract creation using a 15 mm x 10 mm lumen-apposing metal stent (LAMS) for drainage of retroperitoneal walled-off necrosis cavity. He had three more necrosectomies over 4 weeks with complete necrotic removal. At the conclusion, five 10 French double-pig-tail (DP) plastic stents were placed to maintain patency of the CG tract. One year later, patient presented to the ER with left sided flank pain radiating to the inguinal region associated with nausea and vomiting. CT of the abdomen and pelvis with IV contrast was obtained: it showed a minimal residual CG tract extending inferiorly along the left paracolic gutter. However, adjacent to the CG stent punctate air foci with fat stranding along the flank musculature were noted (Figure). These findings indicated stent associated injury to the left iliopsoas muscle. Patient was admitted and underwent an endoscopic removal of all five DP plastic stents without complications. One month after the CG stent removal, patient presented at the follow-up visit with complete improvement in symptoms.

**Discussion:** After initial lumen apposing metal stent placement to create cystogastrostomy tract, it is now standard of care to maintain patency of the tract with multiple plastic stents. Double pig-tail stents are used in such settings to avoid vascular injury in the necrotic tract. In our case, a DP plastic stent is attributed to causing a direct injury to the iliopsoas muscle. Although rare, gastroenterologists should be cognizant about such complications associated with plastic stents placed across cystogastrostomy tract.





[2881] **Figure 1.** Axial view of the CT abdomen/pelvis showing a CG DP plastic stent adjacent to the L flank musculature.

S2882

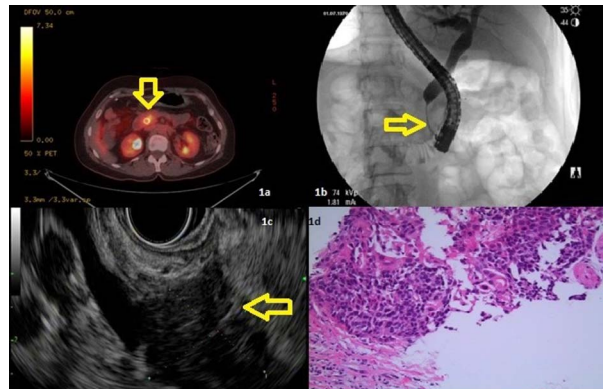
#### Uterine Cervical Squamous Cell Carcinoma: A Rare Cause of Biliary Obstruction

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**Introduction:** The incidence of biliary obstruction is 5 cases per 1000 people in the United States with reports of 21% caused by metastatic lesions to the pancreaticobiliary system. Metastatic lesion to the pancreas is rare, with few cases on uterine squamous cell cancer (SCC) metastasizing to the pancreas. We present a case report of a uterine cervical SCC with metastasis to the pancreas resulting in biliary obstruction.

**Case Description/Methods:** A 51-year-old female with a history of stage 4b uterine cervical SCC previously treated with radiation and chemotherapy six years prior presented with elevated aspartate transaminase (AST), alanine transaminase (ALT), and alkaline phosphatase (ALP) levels two times the upper limit of normal and jaundice. Prior to presentation she was in remission. However, CT on presentation demonstrated new thickening of the midthoracic esophagus, with subcarinal lymphadenopathy and a 1.9 x 2.2 cm mass in the uncinate process of the pancreas causing biliary dilation. Follow-up PET imaging showed evidence of a new intense uptake in the pre-carinal space and new pancreatic head involvement (Figure 1a). She simultaneously underwent an Endoscopic Ultrasound (EUS) and Endoscopic retrograde cholangiopancreatography (ERCP) for stent placement (Figure 1b). EUS showed a 21 mm x 20 mm hypochoic lesion at the pancreatic head/uncinate process (Figure c). A fine needle biopsy was performed. Pathologic evaluation was consistent with a metastatic lesion secondary to a keratinizing SCC subtype was identified. (Figure d).

**Discussion:** Metastasis to the pancreas accounts for 2-5% of pancreatic malignancies. Majority of SCC are associated with cervical high risk-human papilloma virus (HPV) with HPV-16 and HPV-18 being responsible for the most common types of cervical cancers. To date there have been only two published reports in the literature on SCC of the uterine cervix metastasizing to the pancreas. This case report emphasizes the importance of differentiating primary pancreatic carcinomas from metastatic lesions to the pancreas from other primary sources. There are various imaging modalities for diagnosis such as PET, CT, MRI/MRCP, ultrasonography, and EUS. In our case we were able to identify a new mass in the pancreas with CT, MRI and PET imaging and diagnose it with EUS. The usage of EUS to achieve accurate histopathologic diagnosis is becoming more important to tailor specific management and treatment options for pancreatic tumors



[2882] **Figure 1.** a: PET avid lesion; b: Stricture as seen on ERCP within the distal CBD; c: Pancreatic mass on EUS; d: pancreatic tissue involved by sheets of cells with round to oval and angulated nuclei, moderate amounts of dense eosinophilic cytoplasm, intercellular bridges, and focal keratin formation. Scattered mitoses, dyskeratotic keratinocytes and apoptotic debris

S2883

#### Hemorrhagic Shock After TRUS-guided Prostate Biopsy Successfully Treated With Endoscopic Therapy

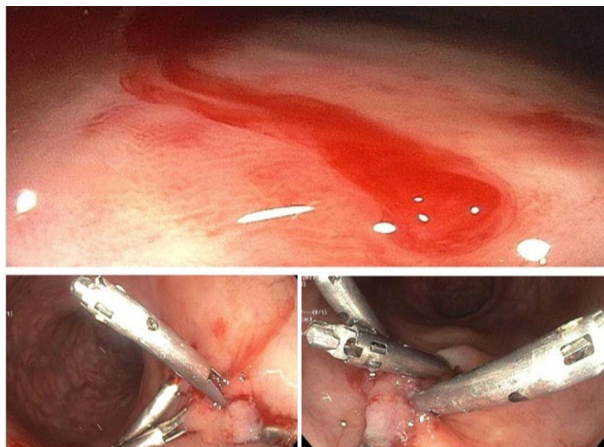
*Ana Martinez-Nunez, MD, Niel Dave, MD, Steven Kaplan, MD, Hector Gonzalez, MD, Mina Ayad, MD.*  
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**Introduction:** Prostate cancer is the leading cause of malignancy and the 2nd overall cause of cancer-related deaths for men in the US today. Diagnosis involves transrectal ultrasound-guided prostate biopsy (TRUS-guided prostate biopsy), which has remained the gold standard. It provides a rapid diagnosis with a relatively low complication profile. Post biopsy, patients may commonly experience mild rectal bleeding, prostatitis, hematospermia or hematuria. However, one of the rarest complications of TRUS-guided prostate biopsy is massive rectal bleeding requiring angiographic or endoscopic therapy. In literature to date, only a few case reports exist describing this. We present a case of hemorrhagic shock after TRUS-guided prostate biopsy that was successfully treated with endoscopic hemoclippping and epinephrine injection.

**Case Description/Methods:** A 64-year-old male presented with 6 episodes of small-volume hematochezia six days after he underwent a TRUS-guided prostate biopsy. Initially, he had normal vitals with a hemoglobin of 8.2 g/dL, compared to a baseline of 13.0 g/dL. On day two, he developed four large episodes of hematochezia, profound hypotension, and had an episode of syncope. The hemoglobin had dropped to 5 g/dL. CT angiogram showed no active bleeding. Massive transfusion protocol was initiated. Emergent flexible sigmoidoscopy showed a raised arterial-appearing lesion with active oozing in the rectum

(Figure). Four hemoclips and 4cc of epinephrine were injected into the lesion, achieving hemostasis (Figure). Post endoscopy, the patient's hematochezia resolved and his hemoglobin stabilized. Patient suffered no further complications and was discharged home 48 hours after the endoscopy.

**Discussion:** Mild rectal bleeding after TRUS-guided Prostate biopsy is common, the management is usually supportive care. Rectal gauze for tamponade can be used to control most cases of rectal bleeding. Uncommonly, these patients can progress to massive bleeding or hemorrhagic shock requiring radiologic or endoscopic therapy. Endoscopic options consist of local epinephrine, sclerosant injections, thermocoagulation, banding, or hemoclips. Recognizing the potential of severe bleeding after TRUS-guided prostate biopsy is integral in deeming who may benefit from early endoscopic therapy.



[2883] **Figure 1.** Active oozing from the biopsy site (top). Status post epinephrine and hemoclip placement (bottom).

S2884

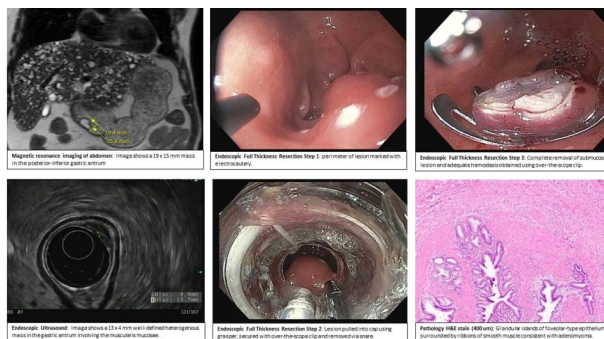
#### Successful Endoscopic Full Thickness Resection of a Submucosal Tumor: A Rare Result

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**Introduction:** Gastric adenomyoma (GA) is a rare submucosal tumor (SMT) often discovered incidentally. Historically it has been diagnosed and treated with surgical resection. Ours is the first reported case of a GA that was successfully removed via endoscopic full thickness resection (EFTR).

**Case Description/Methods:** A 70-year-old Chinese man was incidentally found to have an intramural gastric antral mass on MR Abdomen. Subsequent esophagogastroduodenoscopy (EGD) and endoscopic ultrasound (EUS) confirmed presence of a heterogenous 14 mm submucosal nodule which was successfully removed via non-exposed EFTR. Pathology showed smooth muscle and glands consistent with benign GA with clear margins. No complications were noted on one-month follow-up. (Figure)

**Discussion:** GA is a rare SMT usually found in the gallbladder but also described in the gastric antrum and pylorus. It may present as an incidental finding on cross-sectional imaging or endoscopy. Tumors >20 mm are associated with symptoms (epigastric pain, fullness). GA is usually benign, but cases with co-existing malignancy are reported in literature. Similar to our EUS findings, prior reported cases of GA show a submucosal nodule with heterogenous appearance. However due to paucity of data, EUS characteristics for GA are inadequate to differentiate it from malignant SMTs. Additionally, the malignant potential of small SMTs < 20 mm remains controversial and surgical resection is recommended for high risk lesions (heterogenous appearance, irregular borders, cystic spaces, echogenic foci). Techniques for endoscopic removal of SMTs have developed greatly over the last decade. SMTs < 40 mm have been successfully removed using EFTR without significant complications. Ours is the first reported case of a GA removed using EFTR. We recommend consideration of EFTR as an effective and less invasive alternative to surgical resection in small SMTs with high risk for malignant potential.



[2884] **Figure 1.** Imaging, endoscopic and pathologic findings of a gastric adenomyoma removed using endoscopic full-thickness resection.

S2885

#### Endoscopic Ultrasound-Guided Drainage of a Remnant Gallbladder

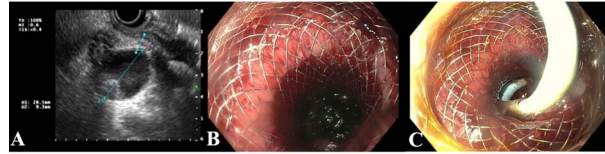
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**Introduction:** Endoscopic Ultrasound (EUS) guided drainage of a remnant gallbladder (RGB) with lumen-apposing metal stents (LAMS) can be safely performed for suppurative cholecystitis and choledocholithiasis following subtotal cholecystectomy (STC).

**Case Description/Methods:** A 68-year-old man presented with recurrent bacteremia secondary to symptomatic RGB after undergoing STC for severe necrotizing gallstone pancreatitis. His preceding course was complicated by infected walled-off pancreatic necrosis, recurrent choledocholithiasis with ascending cholangitis, liver abscess, and bacteremia. His treatments included EUS-guided necrosectomy, multiple endoscopic retrograde cholangiopancreatographies (ERCPs) with unsuccessful attempts at transpapillary gallbladder drainage, and percutaneous cholecystostomy followed by laparoscopic STC. Given his life-threatening complications and poor surgical candidacy EUS-guided drainage of the RGB was pursued. Linear EUS identified the RGB measuring 19.4mm in diameter. Using a 19-gauge FNA needle, the RGB was instilled with 80cc of sterile saline to a diameter of 28.5mm (Figure a). EUS-guided cholecystogastrostomy was then performed using a 10 x 15 mm electrocautery-enabled access catheter-enhanced LAMS. The LAMS was dilated to 12mm sequentially using a controlled radial expansion balloon. Multiple large, pigmented stones passed with several remaining in the gallbladder (Figure b). A 10Fr by 5cm double pigtail

stent was passed over a wire into the gallbladder to complete the procedure (Figure c). At one month follow-up ERCP, the LAMS was removed leaving a mature gastrocholecystic fistula. No recurrence of symptoms noted at 12-month follow-up.

**Discussion:** Laparoscopic cholecystectomy after recovery of gallstone pancreatitis is recommended to reduce risk of recurrent pancreatitis. In some patients, difficult anatomy and inflammation necessitates STC to avoid injury to the extrahepatic bile ducts and surrounding blood vessels. STC is associated with significant morbidity. Completion cholecystectomy for symptomatic complications from RBG is recommended if possible. However, our patient was deemed a poor surgical candidate. Transpapillary drainage of the RBG was also precluded by difficult anatomy with sharp angulation at the confluence of the common hepatic and cystic ducts. This case describes the novel application of EUS-guided drainage of an RBG as a safe and effective alternative to completion cholecystectomy for patients who are poor operative candidates.



[2885] **Figure 1.** EUS used to measure dimensions of remnant gallbladder after injecting 80mL of sterile saline (A). Cholecystogastrostomy was performed using a 10 mm X 15 mm LAMS with cautery tip over a wire and dilated using a controlled radial expansion balloon (B). A double pigtail stent was placed through the lumen of the LAMS (C).

S2886

#### EUS-Guided Jejunojejunostomy Through a Gastrojejunal Stent

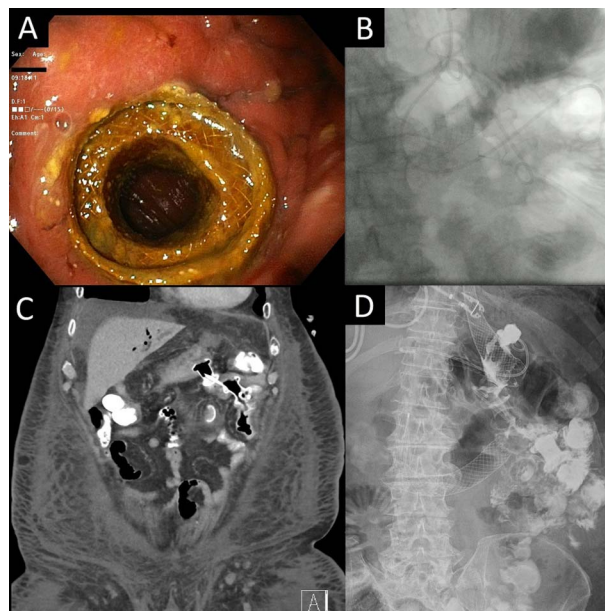
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**Introduction:** In patients with malignant gastric outlet obstruction, surgical gastrojejunostomy has been classically viewed as the intervention of choice. With advancements in endoscopy, enteral self-expandable metal stents (SEMS) have become a non-operative alternative. Although boasting a high rate of success, stent patency is brief, frequently requiring reintervention due to tumor ingrowth. Endoscopic-ultrasound-guided gastrojejunostomy (EUS-GJ) with lumen-apposing metal stents (LAMS) is a newer but feasible approach that provides symptom relief without the invasive risk of surgery or the limited lifespan of enteral stenting.

**Case Description/Methods:** A 75-year-old Caucasian male with a past medical history of metastatic distal esophageal adenocarcinoma presented to the hospital for early satiety and vomiting. He was diagnosed with malignant gastric outlet obstruction, underwent upper endoscopy, and received a SEMS to traverse the duodenal lesion. His obstructive symptoms resolved, but he returned to the hospital shortly after due to recurrent symptoms. He underwent repeat endoscopy and received an EUS-GJ that was functional at discharge. Several months later, the patient was admitted to a sister hospital with recurrent obstructive symptoms, where he received a surgical jejunal tube distal to the EUS-GJ. Shortly after the patient was again unable to tolerate oral or tube feeds, and he was transferred to the original hospital for interventional endoscopy. The initial EUS-GJ was widely patent and easily traversed with the endoscope (Figure A). The jejunal tube was visualized, but the endoscope could not be advanced past the tube due to intraluminal narrowing, which persisted even after removal and exchange of the tube. The decision was made to perform an EUS-guided enteroenterostomy to bypass the jejunal tube and area of obstruction (Figure B). Imaging was obtained to confirm stent patency (Figures C and D) and the patient was able tolerate an oral diet without difficulty.

**Discussion:** Methods of transluminal stenting have been demonstrated previously in patients with altered anatomy. EUS-GJ utilizes similar concepts, allowing for non-surgical bypass of malignant gastrointestinal obstructions. Given its distance from the obstructive tumor, EUS-GJ is not as affected by tumor ingrowth or expansion compared to SEMS. Here we present a novel case of an EUS-guided enteroenterostomy through an existing EUS-GJ. Like an EUS-GJ, EUS-guided enteroenterostomy can be offered for palliation of malignant bowel obstruction.



[2886] **Figure 1.** (A) Patent gastrojejunal stent. (B) Intraoperative fluoroscopy showing a gastrojejunal stent, duodenal stent, and newly inserted jejunojejunal stent. (C and D) Postprocedure abdominal imaging showing the functional jejunojejunal stent.

S2887

#### Stones, Strictures and Atrophy: Treating Sequelae of Infectious Hepatolithiasis

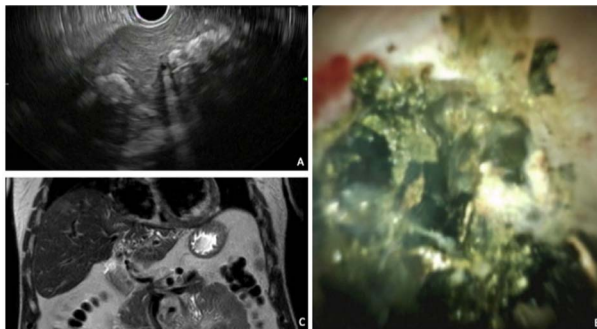
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**Introduction:** Primary intrahepatic cholelithiasis has been well-associated with brown or pigmented stones and recurrent pyogenic cholangitis. However, other important potential chronic complications exist beyond cholangitis of which gastroenterologists should be aware.

**Case Description/Methods:** We present a case of a 57 year-old man with history of diabetes who returned from a 13-month stay in Japan to be admitted to an outside facility with DKA and cholangitis. He was found to have a liver abscess and left hepatic duct stricture treated with sphincterotomy, biliary stenting via ERCP, abscess drainage, and cholecystectomy. He followed up externally for stent removal with normalization of liver chemistries however CT imaging 1 year later showed persistent left hepatic duct stricture with intrahepatic segmental dilation. He experienced no early satiety, weight loss, or jaundice. He was referred to our service for further evaluation of chronic indeterminate biliary stricture. Endoscopic ultrasound demonstrated extensive small and large left-sided hepatolithiasis (A). Cholangiography during ERCP demonstrated complete filling defect of the left intrahepatic biliary ductal system preventing selective guidewire passage. Cholangioscopy was performed with successful electrohydraulic lithotripsy (EHL) of stone burden in the left main hepatic system for selective wire passage and stenting of the left intrahepatic system with a plastic stent. Biliary epithelium appeared smooth and benign. The patient was given antibiotics with no complications. ERCP was repeated in 6 weeks with further cholangioscopy with EHL fragmentation and removal of stones in left intrahepatic ductal branches, however ductal disease remained throughout smaller distal branches of the left lobe on cholangiogram. The main duct was protected with a fully-covered metal stent and antibiotics were given. Follow-up MRI/MRCP demonstrated atrophic left liver lobe (C) in addition to our findings. Left partial hepatectomy was thus performed by Surgery for definitive therapy of the diseased lobe and the patient did well post-operatively with benign pathology. (Figure)

**Discussion:** Even in the absence of a typical recurrent cholangitis clinical syndrome, treatment of other chronic sequelae of severe primary hepatolithiasis is important in the prevention of progression to cirrhosis. Multiple interventional endoscopic methods are available and should be utilized to establish the diagnosis and optimize therapy; which may include surgery in severe cases.



[2887] **Figure 1.** (A) Linear EUS view of left lobe intrahepatic cholelithiasis; (B) cholangioscopic view of intrahepatic cholelithiasis fragmented by electrohydraulic lithotripsy; (C) MRI with left lobe atrophy and hepatolithiasis.

S2888

#### A Case of a Completely Migrated Gastric Toothpick Caught by EUS

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**Introduction:** Foreign body ingestion is a common cause for medical emergencies. Once they reach the stomach, roughly 80% of foreign bodies pass uneventfully through the GI tract. Sharp objects, such as toothpicks, are more likely to cause injury throughout the GI tract. Toothpick ingestion is associated with high rates of mortality and morbidity, with estimated 79% of ingestions leading to gut perforation. Initial diagnosis can be difficult, as ingestion has been found to mimic other conditions, such as renal colic. Endoscopy is warranted in roughly 20% of cases, with about 1% requiring surgical intervention.

**Case Description/Methods:** A 63-year-old male with a history of HTN and DM presented with a 1-week history of altered mental status, fevers, nausea, vomiting, and melena. CT revealed a linear density extending from the lumen of the distal gastric antrum to the posterior wall of the stomach traversing the pancreas in the expected location of the SMV. Follow up EGD and MRI failed to reveal foreign body. He subsequently developed actinomyces bacteremia, was treated with antibiotics along with dental extraction, and was discharged home. The patient later returned with septic shock, found to have recurrent Actinomyces bacteremia. CT re-demonstrated suspicious thin linear density as well as multiple liver abscesses. Again, EGD failed to reveal foreign body. This time, an EUS was performed, and the foreign body was localized to the antrum, 2.4 mm below the luminal surface. Endoscopic mucosal resection was attempted but was unsuccessful. The patient then underwent an exploratory laparotomy with the retrieval of a wooden toothpick. He discharged in stable condition.

**Discussion:** In this case, original CT scans revealed a possible foreign body, the object being localized as expected near the SMV. Given original negative EGD and MRI, it was felt that CT scan findings represented vasculature. When patient returned in septic shock with recurrent actinomyces bacteremia, a second EGD was performed and was negative. A decision was made at that time to investigate with EUS as a diagnostic tool, which ultimately revealed the location of the foreign body. What makes our case particularly unique is the degree of foreign body migration into the gastric wall, causing difficulty in diagnosis through EGD. This case highlights EUS as an important diagnostic modality in cases of foreign body ingestion.

S2889

#### A Bridge Over Troubled Anastomosis: Lumen Opposing Metal Stent for Dilation of Post-Whipple Stricture

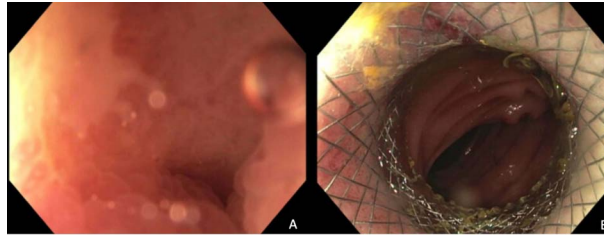
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**Introduction:** The Whipple procedure or pancreaticoduodenectomy is a resection surgery for pancreatic head cancer but has many complications. We present a case of obstruction of the gastrojejunal anastomosis in patient post-Whipple.

**Case Description/Methods:** A 71 year old male with a past medical history of pancreatic adenocarcinoma, one year status-post Whipple procedure presented with nausea, non-bloody emesis, and poor oral intake. A computed tomography of abdomen and pelvis demonstrated dilation of stomach and hepatic jejunostomy limb with soft tissue thickening at the level of the gastrojejunostomy staple line suggesting partial obstruction. Nasogastric tube was placed with significant output with intermittent blood. Upper endoscopy revealed a bleeding esophageal ulcer and was successfully clipped. The gastrojejunostomy was found to be healthy-appearing but the scope was not able to be advanced due to obstruction. Upper GI series demonstrated delayed passage of contrast, and the patient underwent repeat endoscopy 4 days later with dilation for severe stenosis at the efferent limb of gastrojejunal anastomosis. He continued to have symptoms and repeat imaging demonstrated persistence of gastric dilation, and he underwent deployment of lumen-opposing metal stent (LAMS) across the gastrojejunostomy stricture with overstretch. (Figure) The patient was able to slowly advance his diet and was discharged with plan for stent removal in 6 months.

**Discussion:** The Whipple procedure has known complications of delayed gastric emptying, pancreatic fistula, hemorrhage, and biliary leakage. The obstruction of the afferent or efferent limb of the gastrojejunal anastomosis is a rare complication of Whipple procedure that is often due to recurrent malignancy. Traditionally, the obstruction has been managed surgically or with balloon dilation, but LAMS has shown its utility in clinical outcomes and complication rates. Due to the complex anatomy of Whipple procedure and complications, it is important to consider stenosis of the gastrojejunal anastomosis in patients who present with gastrointestinal symptoms. In addition, LAMS can provide a less invasive and effective management option to such complication.





[2889] **Figure 1.** A - Stricture at the efferent limb of the gastrojejunal anastomosis. B - The efferent limb following LAMS deployment

S2890

**A Case for Endoscopic Ultrasound-Directed TransGastric ERCP (EDGE) Procedure: Removal of Choledocholithiasis in Gastric Bypass Patient**

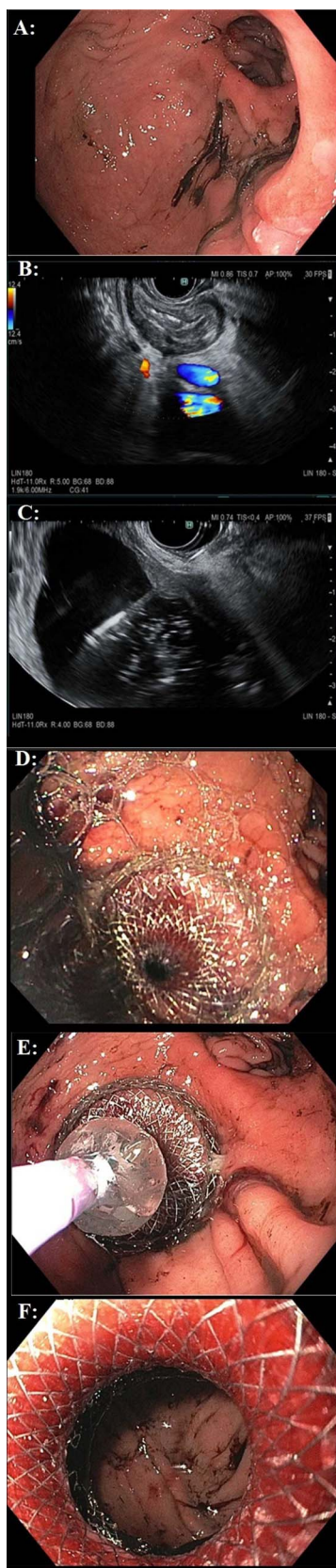
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**Introduction:** Due to rise in obesity, there has been an increased number of gastric bypass surgeries. Around 36% morbidly obese patient develop cholelithiasis or choledocholithiasis (CDL) in their lifetime. Due to the anatomy, a conventional Endoscopic Retrograde Cholangio Pancreatography (ERCP) is often challenging and not possible. We present a case of an altered anatomy ERCP in a patient with CDL and Roux-en-Y gastric bypass (RYGB) who underwent Endoscopic ultrasound Directed trans-Gastric ERCP(EDGE) procedure.

**Case Description/Methods:** A 69-year-old female with a history of RYGB admitted for Hartmann's procedure. During the hospitalization, she complained of RUQ pain and CT abdomen showed a distended gallbladder with cholelithiasis and CBD dilation of 8.3mm; MRCP confirmed five or more CDL. A traditional attempt at an ERCP using a pediatric colonoscope was unsuccessful in reaching the papilla. She underwent cholecystectomy with an intraoperative cholangiogram re-demonstrating the CDL. Options were to do a laparoscopy assisted ERCP v/s double balloon assisted ERCP v/s EDGE. Due to already multiple surgeries patient opted for EDGE procedure. For stage 1 of the EDGE, the excluded stomach was identified under EUS and punctured using a 19-gauge-needle followed by a radiocontrast dye injection into the excluded stomach confirmed under fluoroscopy. Subsequently, a guidewire was advanced through the needle into the pylorus and duodenum to verify the patency of pylorus. After confirming access to the excluded stomach, a 20 x 10 mm (AXIOSTM) lumen apposing metal stent (LAMS) was placed and a gastro-gastric fistula between the gastric pouch and the excluded stomach was formed. The lumen of the stent was subsequently dilated using a CRE balloon confirming the direct visualization of the gastric rugae. (Figure). The LAMS was left for 4 weeks for the tract to mature. Stage 2 of the EDGE procedure was then completed by passing the duodenoscope through the LAMS and completion of the traditional ERCP followed by removal of the LAMS. Overall patient did well.

**Discussion:** EDGE is a minimally invasive EUS guided technique for doing an ERCP in patients with RYGB. Comparison studies have shown EDGE to have similar or better technical success when compared to laparoscopy-assisted ERCP and balloon Enteroscopy-assisted ERCP. Due to the high technical skill required in doing an EDGE, it is best advisable to offer this at institutions where a trained advanced endoscopist well versed with a therapeutic EUS is available.



[2890] **Figure 1.** A: EGD showing gastric pouch post-RYGB B: EUS suggests decompressed excluded stomach C: Injecting contrast into the excluded stomach - to make cystic cavity D: 20 x 10 mm (AXIOS) lumen apposing metal stent placement E: CRE Balloon dilation of LAMS F: Confirmed visualization of excluded gastric mucosa - gastrogastric fistula



S2891

#### A Case of Endoscopic Ultrasound-Guided Gastrojejunostomy for Gastric Outlet Obstruction in a Patient With a Migrated FCSEMS

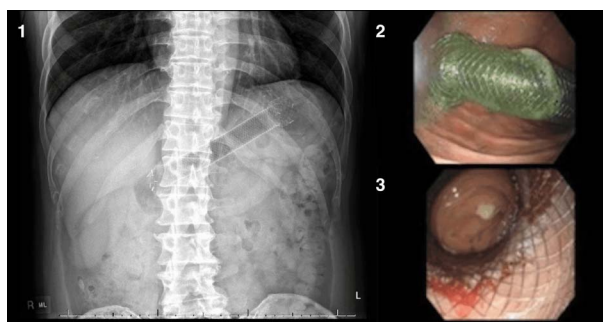
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**Introduction:** Fully covered self-expandable metal stents (FCSEMS) are often used to resolve benign strictures causing gastric outlet obstruction (GOO). With a short length and anti-migration waist, the TaeWoong Medical FCSEMS is designed to produce radial force against the stricture and greatly reduce stent migration. We report the case of a patient with a retroperitoneal hematoma causing GOO secondary to a duodenal stricture. The FCSEMS placed across the stricture was complicated by stent migration to the stomach, and a gastrojejunostomy (GJ) was performed using a lumen-apposing metal stent (LAMS) and LAMS dilation.

**Case Description/Methods:** A 47-year-old man with no significant history was admitted for GOO secondary to spontaneous non-traumatic hemorrhagic retroperitoneal bleeding. He presented with recurrent episodes of acute epigastric pain radiating to his back, nausea, and vomiting and was found to have pancreatitis with an elevated lipase of 661. Computed tomography (CT) showed a retroperitoneal hematoma surrounding a severely thickened descending and proximal duodenum and the head of the pancreas. Marked distention of the stomach was consistent with GOO. The patient was evaluated by the gastroenterology service, and an esophagogastroduodenoscopy (EGD) revealed a stricture involving the distal D2 and proximal D3 that could not be traversed with the endoscope. An 18 mm x 140mm FCSEMS was placed across the stricture and secured to the antral wall. Three days after discharge, he developed a recurrence of symptoms after advancing his diet to solids. Repeat x-ray and an endoscopic ultrasound (EUS) guided EGD showed the complete migration of the duodenal FCSEMS into the stomach (Panels 1 and 2). The FCSEMS was removed using rat-toothed forceps and an EUS GJ was performed using a 20 mm x 10 mm cautery enhanced LAMS (Panel 3). The patient was able to tolerate both solids and liquids before discharge.

**Discussion:** Despite previously reported benefits of stent anchoring and favorable outcomes of the TaeWoong FCSEMS design, migration occurred. GJ to relieve GOO has emerged as an alternative to refractory cases of endoscopic stenting or surgical GJ, with lower reintervention rates. The use of LAMS to create a GJ successfully mitigated the obstruction in this patient with a complicated hospital course. EUS GJ to relieve obstruction has shown to be promising, and continued research on its safety and efficacy compared to standard therapies (namely FCSEMS) is merited.



[2891] **Figure 1.** 1) X-ray abdomen and pelvis showing the migrated duodenal stent. 2) - Endoscopic view of the migrated FCSEMS in the stomach. 3) - Endoscopic view of the fully deployed LAMS showing the anastomotic connection between the stomach and jejunum, bypassing the duodenal stricture.

S2892

#### A Novel Application of Double-Pigtail Plastic Stents for Endoscopic Treatment of Stenoses and Anastomotic Leaks Following Bariatric Surgery: Endoluminal Placement to Facilitate Gastrointestinal Flow

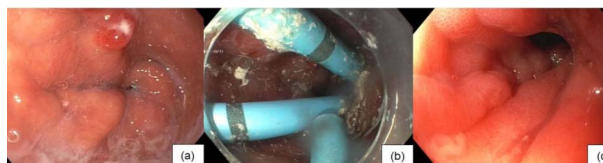
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**Introduction:** Transmural double pigtail plastic stents (DPPS) for treatment of anastomotic leaks have shown high success rates (>75%), while being well-tolerated and cost-effective. For example, DPPS can be endoscopically deployed across staple-line leaks following laparoscopic sleeve gastrectomy (LSG), often combined with dilation of distal sleeve stenoses or kinks. The rationale for this combination treatment is to promote internal drainage AND intraluminal flow. However, there may also be a beneficial role for endoluminal DPPS placement in the treatment of complex anastomotic leaks and luminal stenoses. We present a series of four patients with complicated post-bariatric anatomy successfully managed with endoluminal DPPS placement.

**Case Description/Methods:** Patient 1: 50-year-old female POD5 from LSG and duodenal switch presented with symptomatic gastric sleeve stenosis. Dilation was considered too high-risk. Two 10Fr x 12cm DPPS were endoscopically placed spanning the stenosis, pylorus, and duodenal-ileal anastomosis with instant symptom relief. DPPS were removed on POD65 with continued symptom resolution. Patients 2 and 3: 67-year-old and 70-year-old females POD12 and 14, respectively, from duodenal switch with duodeno-ileal anastomotic leak and stricture. Two 7Fr x 3cm DPPS were deployed across the leak site. A third 10Fr x 3cm DPPS was placed across the anastomosis. All stents were removed on POD45 and POD65, respectively, following leak resolution. Patient 4: 34-year-old female POD3 from complex gastric bypass reversal and duodenal switch complicated by large staple line leak proximal to stenosis. A 10Fr x 3cm DPPS was placed across the leak site. A 10Fr x 9cm DPPS was placed across the gastric stenosis and duodenal-ileal anastomosis. Serial dilation of stenosis began on POD45. All stents were removed on POD95 with resolution of leak and stenosis.

**Discussion:** Transluminal DPPS placement across anastomotic leaks is an effective, well-tolerated, and cost-effective treatment option. This case series suggests that intraluminal DPPS placement may also be clinically beneficial by promoting GI flow and ultimately diverting away from the leak site. Intraluminal DPPS can be used singly or in combination with transluminal DPPS. Applicable scenarios include newly post-operative gastric sleeve stenoses or kinks where dilation is too high-risk and duodenal anastomotic leaks with concomitant anastomotic stricture (where metal stent placement would be challenging and dilation likewise risky). (Figure)



[2892] **Figure 1.** a) Endoscopic image of moderate stenosis of the mid gastric sleeve POD 5 precluding safe dilation; b) two intraluminal DPPS traversing sleeve stricture with symptom resolution; c) improved sleeve stenosis and continued symptom resolution following DPPS removal

S2893

#### A Novel Procedure for Recurrent Gastrocutaneous Fistulas: Enhancing the Over the Scope Clip

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**Introduction:** Gastrocutaneous fistulas (GCF) commonly arise from iatrogenic injury. Although they tend to self-resolve with conservative treatments, many fistulas recur or persist (1). Standardized treatments for these patients include surgical closure, fibrin glue, or endo-clipping (2, 3). However, the recurrence of GCFs following repair occurs in an estimated 20% of cases (4, 5). While the applications of over the scope clip show promising results, its use is limited by the luminal size of the fistula. Therefore, we present an innovative technique utilizing submucosal injections of histoacryl glue to successfully facilitate and stabilize over the scope clips. Overall, successfully closing recurrent GCFs with enlarged lumens.

**Case Description/Methods:** A female in her 40's presents with abdominal pain and recurrence of GCFs. She holds a history of a hiatal hernia, Nissen fundoplication, treatment for a perforated viscus and gastrostomy tube placement. Standardized treatments of the fistula included surgical excision and conservative management with proton pump inhibitors, octreotide, and total parenteral nutrition. Since the fistulas were refractory to standardized treatments, a novel technique was used. A gastroduodenoscope helped visualize the gastric fundal region where a >10mm fistula was located. A histoacryl glue solution (1mL saline and 0.5mL histoacryl) was then injected into the submucosal space surrounding the fistula, approximating the luminal surface. A pad lock, over the scope clip was then advanced to the site where suction helped further approximate the tissue. Application of the clip cleared any notable air leaks demonstrating adequate closure of the fistula. The same technique was utilized for the second >10mm fistula in the gastric antrum with adequate closure.

**Discussion:** Reviews have demonstrated that most successful treatments of fistulas with over the scope clips occur in cases where the lumen is < 10mm (6, 7). The successful treatment of two fistulas measuring >10mm with histoacryl glue prior to over the scope clip application demonstrates the reliability of this innovative technique and may reinvent current standards. The success with this technique may be attributed to a few elements of histoacryl glue. Firstly, compared to fibrin glue, histoacryl is not a protein and therefore resists enzymatic degradation from gastric secretions and fistula effluent

S2894

#### A Rare and Unique Case of Both Afferent and Efferent Loop Syndromes in a Patient With a Modified Whipple's Procedure

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**Introduction:** The presence of malignant resectable neoplasms in the pancreas and premalignant periampullary lesions are both common indicators for a pylorus-preserving pancreaticoduodenectomy (Modified Whipple/PPPD). We present the case of a 68-year old female with a history of pancreatic adenocarcinoma status post PPPD who presented for radiation enteritis causing a gastric outlet obstruction and duodenojejunosomy anastomosis site distortion, but she was also found to have both Afferent Loop Syndrome on initial admission and Efferent Loop Syndrome on readmission which is rare. Two separate lumen-apposing metal stents (LAMS) under EUS (Endoscopic Ultrasound) guidance were used for treatment.

**Case Description/Methods:** A 68-year-old female presented to the hospital with nausea, vomiting, abdominal pain, and poor oral intake. She had a past medical history of stage II pancreatic adenocarcinoma for which she was treated with PPPD and chemoradiation with adjuvant FOLFIRINOX. She was found to have radiation enteritis resulting in an afferent loop obstruction which was relieved by insertion of a lumen-apposing metal stent (LAMS)(Figure). Following discharge she presented again for recurrent nausea, vomiting and abdominal pain. A CT of the abdomen and pelvis showed gastric distention without any changes of the recently-placed LAMS. Subsequently the patient underwent an EUS-EGD that revealed edema and anatomical distortion of the duodeno-jejunal anastomosis resulting in gastric outlet obstruction with a patent afferent limb however now there was efferent limb obstruction. An endoscope was unable to pass through the stenosis, so a sphincterotomy with EUS guidance was done from the antrum into the efferent jejunum and placement of a 20mm x 10mm cautery-enhanced LAMS (Axios), forming a gastrojejunostomy (Figure 2).

**Discussion:** We present a case of a 68-year-old female diagnosed with a stricture secondary to radiation enteritis which led to an afferent loop obstruction. Management was complex as EUS was utilized to eliminate the obstruction. This case is unique because interestingly, the patient was then readmitted with efferent limb obstruction. A gastrojejunostomy was formed using a second cautery-enhanced LAMS to bypass an obstruction that was too stenosed for passage of an endoscope. As shown by our cause, after PPPDs either obstruction of the afferent or efferent limbs of a gastrojejunal anastomosis is a possible complication but rarely do both obstructions occur making our case a very unique presentation.

Figure 1:



Figure 2:



[2894] **Figure 1.** Afferent loop obstruction relieved by insertion of a lumen-apposing metal stent (LAMS) **Figure 2:** Efferent loop obstruction with guidewire

S2895

#### A Rare Case of Inferior Pancreaticoduodenal Artery Pseudoaneurysm Rupture Following Endoscopic Retrograde Cholangiopancreatography

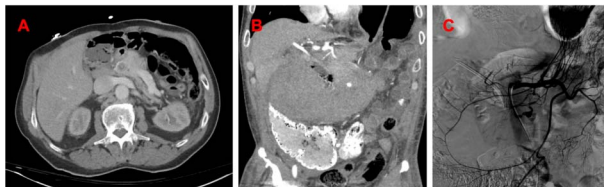
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**Introduction:** Hemorrhage is a known potential complication of endoscopic retrograde cholangiopancreatography (ERCP), often occurring at the site of sphincterotomy. Less commonly, intra- and retroperitoneal hemorrhage can occur secondary to splenic, hepatic, or vascular injury. Here we present a rare case of inferior pancreaticoduodenal artery (IPDA) pseudoaneurysm (PSA) rupture following ERCP in a patient with a large diaphragmatic hernia.

**Case Description/Methods:** The patient is a 68 year old man with a history of hypertension, chronic kidney disease, and splenectomy. He presented with jaundice, fatigue, and labs notable for hypoglycemia, acidemia, acute kidney injury, normal transaminase levels, alkaline phosphatase (129 IU/L), total bilirubin (4.2 mg/dL), direct bilirubin (2.5 mg/dL), and lipase (157 IU/L). Computed tomography (CT) with contrast revealed choledocholithiasis with a 1.2 cm stone in the head of the pancreas associated with pneumobilia, intra- and extrahepatic ductal dilation, and pancreatic ductal dilation. A large left diaphragmatic hernia with protrusion of nonobstructed loops of large and small bowel into the left hemithorax was also noted. He underwent ERCP with biliary sphincterotomy and removal of one stone. One large stone remained. A plastic stent was placed in the common bile duct with plans to repeat ERCP in 4-6 weeks with cholangioscopy and electrohydraulic lithotripsy. Following ERCP, the patient developed acutely worsening anemia without overt evidence of luminal gastrointestinal bleeding. CT angiography revealed active extravasation and a PSA within an intra-abdominal hematoma (18.4 x 8.5 cm). The patient then underwent mesenteric angiography which showed one multilobulated (2 x 1.8 cm) and one smaller PSA arising from an IPDA branch. Coil embolization of the dominant PSA was performed, achieving hemostasis. (Figure, Table)

**Discussion:** Visceral artery aneurysm (VAA) rupture is an exceedingly rare complication of ERCP with IPDA pseudoaneurysms accounting for just 2% of VAA. Although there is a known association of VAA with pancreatitis, the mechanism for PSA formation following ERCP is unclear. It is thought to be associated with sphincterotomy with rupture caused by direct mechanical injury related to pancreaticobiliary manipulation. Mortality related to VAA rupture and hemorrhage can be as high as 19%. A high index of suspicion and early detection followed by angioembolization are critical for reducing mortality.



[2895] **Figure 1.** (A) CT with contrast showing choledocholithiasis with a 1.2 cm stone in the head of the pancreas. (B) CT angiography showing active extravasation and a pseudoaneurysm (PSA) within an intra-abdominal hematoma (18.4 x 8.5 cm). (C) Mesenteric angiography which showed one multilobulated (2 x 1.8 cm) and one smaller PSA arising from an inferior pancreaticoduodenal artery branch.

**Table 1** Summary of currently available case reports of inferior pancreaticoduodenal artery (IPDA) pseudoaneurysm (PSA) development following endoscopic retrograde cholangiopancreatography (ERCP)

	Age/Sex	Comorbidities	ERCP Indication	Interventions	Symptom	Diagnosis	Treatment
Al-Jeroudi et al 2001	76 F	None	Palliation of pancreatic carcinoma	Precut sphincterotomy, biliary stent	Abdominal pain	IPDA PSA	Embolization
Rim et al 2021	27 M	Sickle cell disease	Choledocholithiasis	Sphincterotomy, stone extraction, biliary stent, pancreatic duct stent	Abdominal pain, acute anemia	IPDA PSA rupture	Embolization
Current Case	68 M	Hypertension, chronic kidney disease, diaphragmatic hernia	Choledocholithiasis	Sphincterotomy, stone extraction, biliary stent	Abdominal pain, acute anemia	IPDA PSA rupture	Embolization

S2896

#### A Rare Case of Necrotic Testicular Seminoma Presenting as a Large Retroperitoneal Mass Diagnosed With EUS and Laparotomy

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**Introduction:** Retroperitoneal seminomas are a rare form of cancer that accounts for approximately 2% of all seminomas. Seminomas commonly present with fever, weight loss, abdominal or back pain, and a painless testicular nodule. The differential diagnosis for a retroperitoneal mass is broad, including abscess, lymphoma, sarcoma, metastatic lymph nodes, and extragonadal tumors. The pathogenesis of germ cell tumors is unclear, but the failure of primordial germ cell migration during embryonal development has been suggested. We report an atypical case of a large necrotic retroperitoneal mass diagnosed as a primary retroperitoneal seminoma after EUS and laparotomy.

**Case Description/Methods:** A 33-year-old male with no medical history presented to the ED for new-onset flank pain and night sweats. On admission, the patient was febrile and tachycardic. The testicular exam and US of the testes were normal. CT abdomen and pelvis revealed a well-circumscribed, round mass posterior to the pancreatic head. EUS with FNA was performed, noting a round heterogenous 7.1cm x 6.2cm mass with well-defined borders and a necrotic center located posterior to the pancreatic head. An intact interface was seen between the mass and the duodenum, IVC, pancreas, and right kidney, suggesting a lack of invasion. The FNA yielded 0.5ml of blood-tinged, thick, and purulent fluid with cytology significant for malignant tumors with extensive necrosis. An exploratory laparotomy with excisional biopsy established the diagnosis of extragonadal germ cell tumor with extensive necrosis, consistent with seminoma. The patient completed four cycles of Etoposide followed by a right-sided orchiectomy for residual lesions found on the right testicle. A post-surgical PET scan did not demonstrate recurrence.

**Discussion:** Primary retroperitoneal seminoma is a rare entity that must be considered when evaluating a retroperitoneal mass. GCTs are the most common neoplasm arising from the testes, with < 2% originating in other locations, termed primary extragonadal GCTs. Studies suggest the remission rate with chemotherapy and resection of residual masses was 92%, and the five-year overall survival rate was 88% for primary retroperitoneal tumors. Early identification of primary retroperitoneal seminomas may expand therapeutic possibilities and help improve outcomes for patients with a favorable prognosis. EUS-FNA was attempted in this case to obtain the diagnosis; however, an excisional biopsy was required to confirm the diagnosis.

S2897

#### A Rare Case of a Esophagomediastinal Fistula Closed Endoscopically in a Young Patient With Tuberculosis and HIV

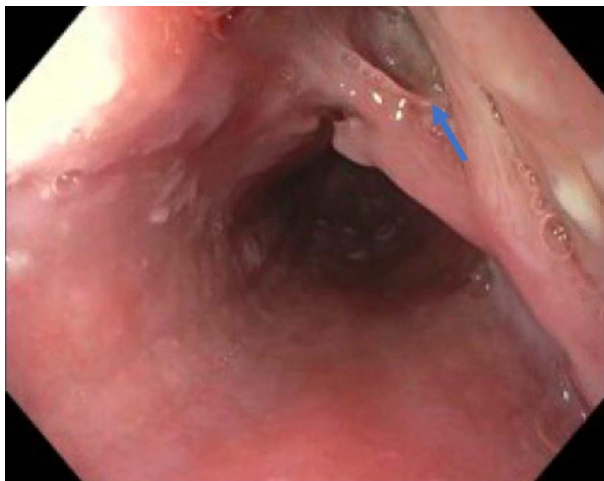
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**Introduction:** Tuberculosis (TB) is usually a primary lung disease affecting approximately 10 million people worldwide. Extrapulmonary manifestations can involve the lymph nodes, vertebrae, and gastrointestinal tract. In immunocompromised patients, TB can manifest in the esophagus as fistulas with the trachea and bronchus and rarely with the mediastinum, which can lead to increased morbidity and mortality.

**Case Description/Methods:** We report a 29-year-old male with human immunodeficiency virus (HIV) and tuberculosis, diagnosed recently by mediastinal biopsy, who presented with dysphagia. His symptoms started one month ago with difficulty swallowing solids and thin liquids, causing him to have pleuritic chest pain, cough, and weight loss. His vitals and basic labs were unremarkable. He is cachectic appearing but in no acute distress with a visible healed scar below the sixth rib. Lung exam had diminished breath sounds in the right lower lung field. CT chest showed trace extraluminal contrast to the right of the esophagus with a small focus of gas within the mediastinum concerning for an esophagomediastinal fistula. Esophagogastroduodenoscopy (EGD) was done that showed esophagitis without bleeding and a fistula in the middle third of the esophagus. Six clips were placed to close the defect and follow-up gastrografin study did not show contrast extravasation. Our patient received a percutaneous gastrostomy tube for nutrition and fistula healing. On follow-up, the patient's symptoms continue to improve without signs of aspiration on chest x-ray.

**Discussion:** Esophagomediastinal fistulas are rare in patients with tuberculosis. They occur in about 17.6% of patients with TB and 35% of patients with concomitant HIV. Fistula tracts develop spontaneously from ruptured caseating lymph nodes that erode into adjacent organs or from iatrogenic procedures such as biopsies. Patients can present with a cough after eating leading to long term malnutrition and weight

loss. The diagnosis can be made with an esophagram, CT, or EGD. It is treated by closing the defect, controlling the infection, and optimizing nutrition. Fistulas are typically closed surgically but they can now be closed endoscopically using clips, stents, and stitches. We were able to demonstrate the first use of through the scope endoclips to successfully close a TB esophagomediastinal fistula. We propose that this method be considered the gold standard because it is low risk, minimally invasive, low-cost, and effective. (Figure)



[2897] **Figure 1.** Esophagomediastinal fistula (blue arrow) seen in the middle third of the esophagus on esophagogastroduodenoscopy (EGD).

S2898

#### A Unique and Challenging Presentation of Abdominal Pain in Patient of Gastric Bypass Anatomy

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**Introduction:** We are presenting an interesting and challenging case of chronic abdominal pain in a patient of gastric bypass surgery. This patient required Endoscopic ultrasound (EUS) directed transgastric Endoscopy (EDGE) for diagnosis and management of pyloric stenosis in a patient with Roux-en-Y gastric bypass anatomy.

**Case Description/Methods:** 61 years old female presented to emergency department with worsening upper abdominal pain for last 2 years. Patient has history of Roux-en-Y gastric bypass surgery in 2002. Patient had multiple prior evaluations with endoscopies and imaging without any significant etiology identified. She underwent repeat endoscopy with finding of a short gastric pouch and normal-appearing gastrojejunal anastomosis and jejunal limbs. An upper gastrointestinal series and small-bowel follow-through showed normal anatomy. A computed tomography of the abdomen significantly distended bypassed stomach (BS) with fluid. Upon further discussion with Radiology, there was abnormal thickening and elongation of the gastric pylorus noted. Subsequently, an EUS directed transgastric endoscopy was performed revealing significantly dilated BS. An AXIOS stent was placed between gastric pouch and BS in order to decompress as well as gaining access to pyloric channel. Tract was dilated and entered with regular gastroscope. Excessive amount of fluid was aspirated from stomach. A severe friable stenosis found at pylorus. This was only traversed with XP190N gastroscope with outer diameter of 5.4mm. Pathology showed benign inflammation. Repeat EGD was performed through the established tract. Pyloric stricture was then dilated up to 12 mm. Patient was subsequently discharged in stable condition and followed up in clinic. She reported significant improvement in symptoms.

**Discussion:** Despite its overall benefit, there are multiple complications associated with Roux-en-Y gastric bypass. EDGE procedure has been routinely performed in order to gain access to biliary tract. Options to gain access to BS include laparoscopic assisted endoscopy versus surgical exploration. EDGE not only provided therapeutic benefit of decompressing significantly distended excluded stomach but also provided access for examining pyloric channel stenosis/thickening concerning for inflammation or neoplasm. After confirming benign nature, repeated endoscopy was performed for dilation. To our knowledge, this is among first few cases of minimally invasive management of gastric outlet obstruction in patient with gastric bypass anatomy.

S2899

#### A Rare Case of Small Cell Lung Cancer in the Posterior Mediastinum Diagnosed With Endoscopic Ultrasound-Guided Fine Needle Biopsy

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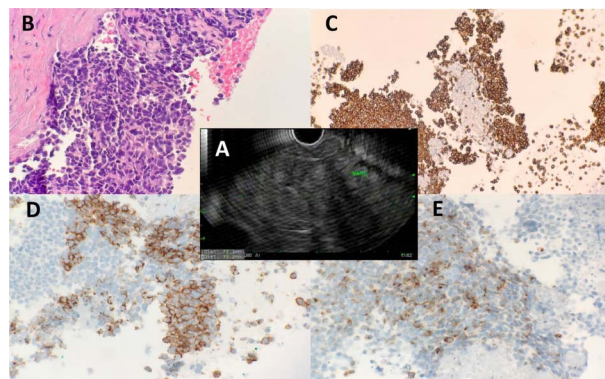
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**Introduction:** Lung cancer is the leading cause of cancer mortality worldwide, accounting for 2 million diagnoses and 1.8 million deaths in 2020.<sup>1</sup> 10-15% of all lung cancers are small cell lung cancer (SCLC), an aggressive form that grows more rapidly and metastasizes more easily than NSCLC. Thus, in patients with suspected lung cancer, a tissue diagnosis is crucial. Here, we present a unique case of a man with a posterior mediastinal mass for whom obtaining a tissue diagnosis presented a diagnostic challenge.

**Case Description/Methods:** A 49 y/o M, with a 30 pack-year smoking history, presented with worsening left-sided chest pain and a 10-pound unintentional weight loss over 2 months. Vital signs and physical exam were unremarkable. Labs demonstrated a mild anemia (Hb 11-12, MCV 82) and elevated inflammatory markers (ESR 54, CRP 70.9). CT scan demonstrated a 12.0x10.7x8.4 cm hypodense soft tissue density mass in the left posterior mediastinum, extending from the level of T1 to T7 vertebral bodies. The mass displaced the trachea, esophagus, and adjacent vessels. Several enlarged mediastinal lymph nodes were seen, the largest measuring up to 1.5 cm. However, there was no lymphadenopathy seen elsewhere and no convincing evidence of metastatic disease in the abdomen or pelvis. CT surgery recommended a CT-guided biopsy with IR vs. endoscopic bronchial US-guided biopsy. IR was unable to find a safe access point to go in for the biopsy as there was no window, as the lung was seen overlying the mass. The patient was discharged, and he returned the next week for outpatient EUS-FNB, which demonstrated a 72x39 mm mediastinal mass (Fig 1A). EUS-FNB was performed and EUS-guided transesophageal biopsies were performed. He was also found to have erosive gastritis, healing superficial sub-cm gastric ulcers, and multiple healing superficial duodenal ulcers. Pathology results demonstrated SCLC (Fig 1B-E) and H. pylori. He was treated with standard quadruple therapy, referred to his PCP to confirm eradication in 6 weeks, and referred to Oncology. For stage III-b SCLC treatment, he completed external beam RT and chemotherapy. Repeat PETCT demonstrated a decrease in the residual mass to 5.5x3.5x5.8 cm.

**Discussion:** For patients presenting with a posterior mediastinal mass, for whom IR may not be able to perform a biopsy, obtaining a tissue diagnosis may be a diagnostic challenge. EUS-FNB provides a useful tool to assess the mediastinum and can provide timely diagnosis and staging of patients with rare forms of lung cancer.





[2899] **Figure 1.** A) A posterior mediastinal mass vs. esophageal mass measuring 72.1 mm by 39.2 mm was identified status-post EUS with FNB x 6. This mass appeared to arise from the muscularis propria of the esophagus; however, an extrinsic mediastinal mass could not be definitively ruled out due to the severe compressive effects of the mass on the esophagus. Mediastinal mass, needle biopsy: -Minute fragments of malignant neoplasm with necrosis. -Tumor cells are positive for AE1/3, CAM5.2, Chromogranin, Synaptophysin, CD56 and negative for p40, CD3, CD20, and CD45. Ki-67 demonstrates about 60% positivity. Combined with morphological features, this immunoprofile supports the diagnosis of small cell carcinoma. B) Hematoxylin and eosin (H&E) stain. C) CAM5.2. D) CD56. E) Chromogranin.

S2900

#### Abdominal Lymphadenopathy from AL Amyloidosis Diagnosed via Endoscopic Ultrasound

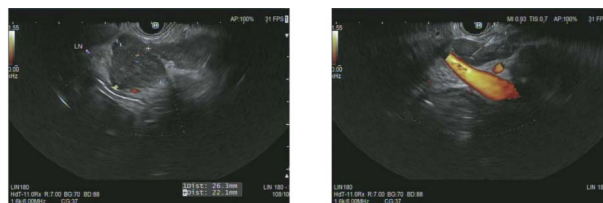
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**Introduction:** Amyloidosis refers to extracellular tissue deposition of protein fibrils which can affect a variety of organ systems. AL (primary) amyloidosis is a disease caused by the deposition of immunoglobulin light chain fragments and often occurs in the setting of an underlying plasma cell dyscrasia. We describe the diagnosis of AL amyloidosis manifesting as diffuse lymphadenopathy via the use of endoscopic ultrasound (EUS)-guided biopsy.

**Case Description/Methods:** A 66-year-old African American female presented with complaints of fatigue and enlarged cervical lymph nodes. No associated weight loss or night sweats was reported. Past medical history was significant for metabolic syndrome and anxiety. Comprehensive work-up, including flow cytometry and tumor markers, was unremarkable. A contrast enhanced CT scan of the neck, chest, abdomen and pelvis showed mediastinal and peripancreatic lymphadenopathy (largest diameter of 20-mm). An endoscopic ultrasound (EUS) showed few round hypoechoic peri-pancreatic/aortocaval lymph nodes. Fine needle biopsy (FNB) was performed with a 22-gauge needle using a trans-gastric approach. Cytopathologic examination revealed abundant lymphocytes, and cell block showed hyalinized eosinophilic fragments which showed strong Congoophilia with focal apple-green birefringence on Congo-red stain consistent with amyloidosis. Liquid chromatography tandem mass spectrometry was performed on peptides extracted from Congo red positive areas of the sample via microdissection and a peptide profile consistent with AL (kappa)-type amyloid deposition was identified. Patient is undergoing workup for an underlying plasma cell dyscrasia and for sites of end organ involvement. (Figure)

**Discussion:** Amyloidosis is a systemic disease which affects many organs, but rarely presents as abdominal lymphadenopathy. EUS-FNB is an important diagnostic modality that allows for tissue diagnosis of Amyloidosis and ruling out malignancy. Our patient presented with diffuse lymphadenopathy, and tissue obtained from a lymph node sampled via EUS-FNB led to the diagnosis of AL amyloidosis.



[2900] **Figure 1.** EUS images demonstrating FNB of an intraabdominal lymph node

S2901

#### Afferent Limb Syndrome Treated With Non-Cautery-Enhanced Lumen Apposing Metal Stent: An Alternate Approach

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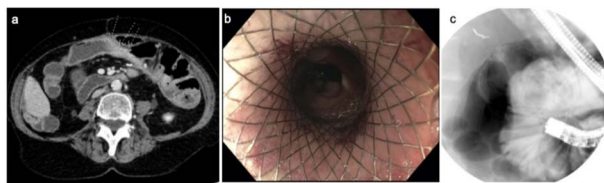
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**Introduction:** Afferent limb syndrome (ALS) is a known complication after gastrojejunostomies from mechanical obstruction of the afferent limb (AL). Recently endoscopic ultrasound (EUS) guided gastroenterostomy placement has provided an alternate to surgical correction. However this approach is not always technically possible. We describe a case successfully treated with endoluminal non-cautery enhanced lumen apposing metal stent (LAMS) placement.

**Case Description/Methods:** A 63 year old woman with a history of ileocolonic Crohns disease (diagnosed at age 25), status post multiple surgeries including ileocolic resections and Billroth II gastrectomy, was referred with persistent abdominal pain. She was recently diagnosed with acute pancreatitis with CT concerning for dilated afferent jejunal limb, a luminal stricture near the biliary anastomosis and dilated intra and extra hepatic bile ducts (Figure a). She underwent two deep enteroscopies revealing a stricture in the AL from intra-abdominal adhesion. This was dilated with minimal improvement in symptoms and imaging. After multi-disciplinary discussion it was decided to attempt EUS guided drainage of the AL to promote drainage of pancreatico- biliary secretions. During the procedure a significant amount of food residue was identified in the gastric remnant. The dilated afferent limb was visualized endosonographically adjacent to the posterior stomach at an acute angle. Considering large amount of food in the stomach, difficult angulation to deploy the AXIOS stent and concern for food entering the already obstructed limb after stent deployment it was decided to reconsider this approach. The AL was then explored with a therapeutic upper endoscope with stenosis at 10 cm from the anastomosis. A wire was passed through the stenosis under fluoroscopy. It was decided to place a stent using the 15 x 10 mm LAMS stent system considering short (< 1 cm) stricture. Using non cautery technique both flanges were deployed successfully across the stricture under fluoroscopic and endoscopic guidance with decompression of the AL (Figure b,c). 1 month follow up imaging demonstrated continued decompression of the AL.

**Discussion:** EUS guided gastrojejunostomy has been increasingly used for ALS. However it can be challenging in situations where a good window cannot be identified. In such settings using a traditional luminal route to reach the stenosis and placing a non-cautery enhanced LAMS can provide a viable alternative.





[2901] **Figure 1.** (a) Dilated afferent limb with stricture (arrows), (b) post non-cautery enhanced LAMS deployment, (c) Fluoroscopy image post LAMS deployment

S2902

#### An Uncommon ERCP Complication: Delayed Uncovered Biliary Stent Migration into the Portal Vein in a Case of Locally Advanced Pancreatic Adenocarcinoma

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**Introduction:** ERCP with biliary stenting remains an important aspect of symptomatic and palliative management in malignant biliary obstruction. We wish to shed light on a newly reported complication of ERCP with biliary stenting demonstrated in a case of locally advanced pancreatic ductal adenocarcinoma (PDAC).

**Case Description/Methods:** We present a 78-year-old female with obstructive jaundice, found to have a 2.5 x 3.4 cm soft tissue mass on MRCP with proximal common bile duct (CBD) dilation and distal CBD narrowing. Initial attempt at ERCP failed due to duodenal stenosis (DS). Patient was referred to a therapeutic endoscopist where endoscopic ultrasound with fine needle biopsy confirmed the presence of PDAC with portal vein (PV) encasement and stenosis. Concurrent ERCP was successful after dilation of the DS, and a fully covered 10 mm x 60 mm self-expandable metal stent (SEMS) was placed into the CBD (Figure A, B). Neoadjuvant chemotherapy (CTX) was then initiated. Two weeks later, patient developed jaundice with acute cholecystitis thought to be related to cystic duct occlusion. Repeat ERCP was performed with removal of the covered stent and replacement with a similar size uncovered SEMS. The patient's liver function tests (LFTs) normalized, cholecystitis resolved with antibiotics, and she was able to complete her CTX regimen. Jaundice recurred two months later, and a repeat ERCP revealed that the previous stent had migrated proximally and the previous DS had completely resolved. Biliary access was achieved, and a new uncovered SEMS was placed with excellent clinical response (Figure C). Due to repeat elevation in LFTs 1.5 months later, another ERCP was performed which revealed tumor ingrowth into the SEMS, and a plastic stent was placed through the metal stent. Five weeks later, CT scan showed a patent CBD stent, and surprisingly revealed migration of the first uncovered SEMS into the PV (Figure D). Patient underwent a successful Whipple procedure after CTX, with good recovery one year after surgery with the stent in place.

**Discussion:** We described the migration of an uncovered biliary stent into the PV in a patient with PDAC with duodenal and PV invasion after CTX, which is an unreported complication of ERCP biliary stenting. While it is unclear how this definitively occurred, a putative explanation is that partial distal uncovered SEMS migration occurred after tumor shrinkage in response to CTX and embedded in the adjacent PV which was completely encased by tumor.



[2902] **Figure 1.** A,B) ERCP showing covered self-expandable metal stent (SEMS) placement. C) ERCP revealing proximal stent migration. D) CT revealing old metal stent in portal vein and newer metal stent in CBD through which a plastic stent was placed due to tumor ingrowth.

S2903

#### An Unusual Case of AXIOS Stent Migration into the Gastric Body and Retrieval Occurring 4 Weeks Post Placement for Drainage of a Pancreatic Pseudocyst in a 48-Year-Old Male

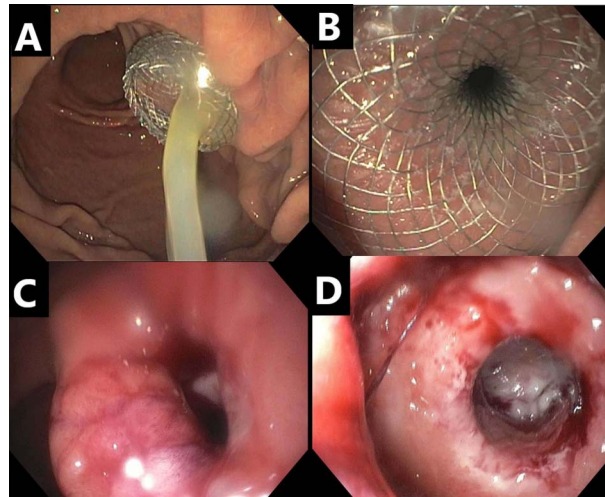
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**Introduction:** Though a patient's clinical picture dictates management, transendoscopic cystogastrostomy stenting is emerging as a favored first line therapy for the management of pancreatic pseudocysts. We present a case of AXIOS stent migration that occurred 4 weeks post placement for drainage of a pancreatic pseudocyst.

**Case Description/Methods:** A 48-year-old male with past medical history of hypertension, duodenal ulcer, and alcohol induced pancreatitis presented to our GI clinic with two-months of persistent epigastric pain. Social history included heavy alcohol and tobacco use. EGD employed for evaluation revealed extrinsic compression of the proximal, horizontal and descending duodenum. Follow-up CT scan of the abdomen and pelvis found a new 9.3 x 9.5 x 10.2 cm cystic lesion occupying the pancreatic head and uncinate process concerning for a pancreatic pseudocyst with extrinsic compression of the distal stomach and descending and transverse duodenum. Mild, diffuse, 5-6 mm pancreatic ductal dilation within the pancreatic body, represented likely extrinsic compression of the pancreatic duct. Follow up EUS and tissue diagnosis confirmed an anechoic lesion suggestive of a pseudocyst in the pancreatic head and body. EGD cystogastrostomy with a 15 x 10 mm AXIOS stent successfully drained large amounts of yellow fluid. The patient tolerated the procedure well and presented four weeks later for stent removal. Follow up EGD and EUS found the previously placed stent to have migrated with the proximal edge of the stent within the stomach wall. Stent was successfully removed with a Raptor grasping device and the cystogastrostomy cavity appeared otherwise healthy. Patient's pseudocyst resolved with no further complications. (Figure)

**Discussion:** Management of pancreatic fluid collections can be surgical percutaneous, or transendoscopic depending on the patient's clinical picture, with endoscopy becoming more widely favored as the first-line treatment. The implementation of lumen-apposing self-expanding stents generally replaced plastic and metallic stents due to their unique shape offering a lesser risk of stent migration. Despite this innovation, rare cases of stent migration still occur. An awareness of the possibility migration allows proceduralist to manage these cases with favorable outcomes, as what occurred in our case.



[2903] **Figure 1.** Image A, B – View of successful placement of 15x10-mm AXIOS stent during cystogastrostomy. Image C – 4 week follow up after placement shows AXIOS stent in the gastric body, migrated inside the gastric wall. Image D – Cystogastrostomy cavity post removal of migrated stent with Raptor grasping device. Cavity is healthy with some granulation tissue.