UT Southwestern Medical Center

The Evolving Role of Interventional Endoscopic Ultrasound (EUS) in Cancer Management

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Disclosures

- None
- This presentation includes off-label use of lumen-apposing metal stents (LAMS)

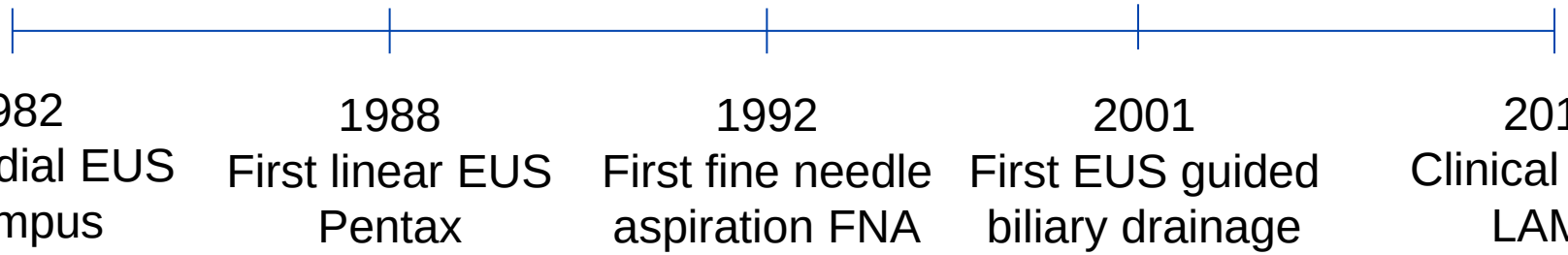
Learning objectives

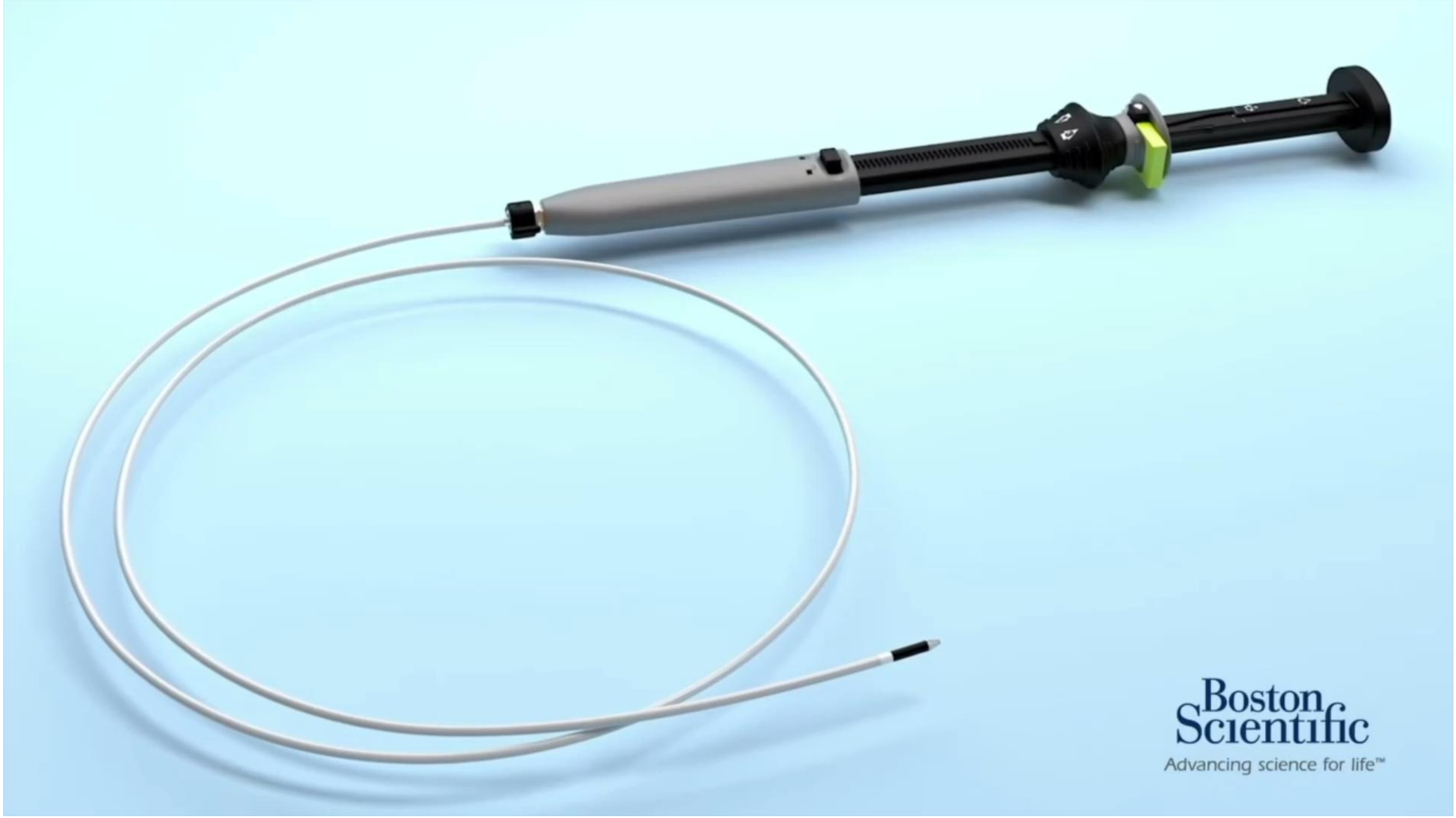
1. Recognize the role of EUS in palliative cancer management
2. Identify good candidates for interventional EUS
3. Determine contraindications for interventional EUS

Outline

- Palliative management of gastric outlet obstruction
- EUS-guided biliary drainage

History

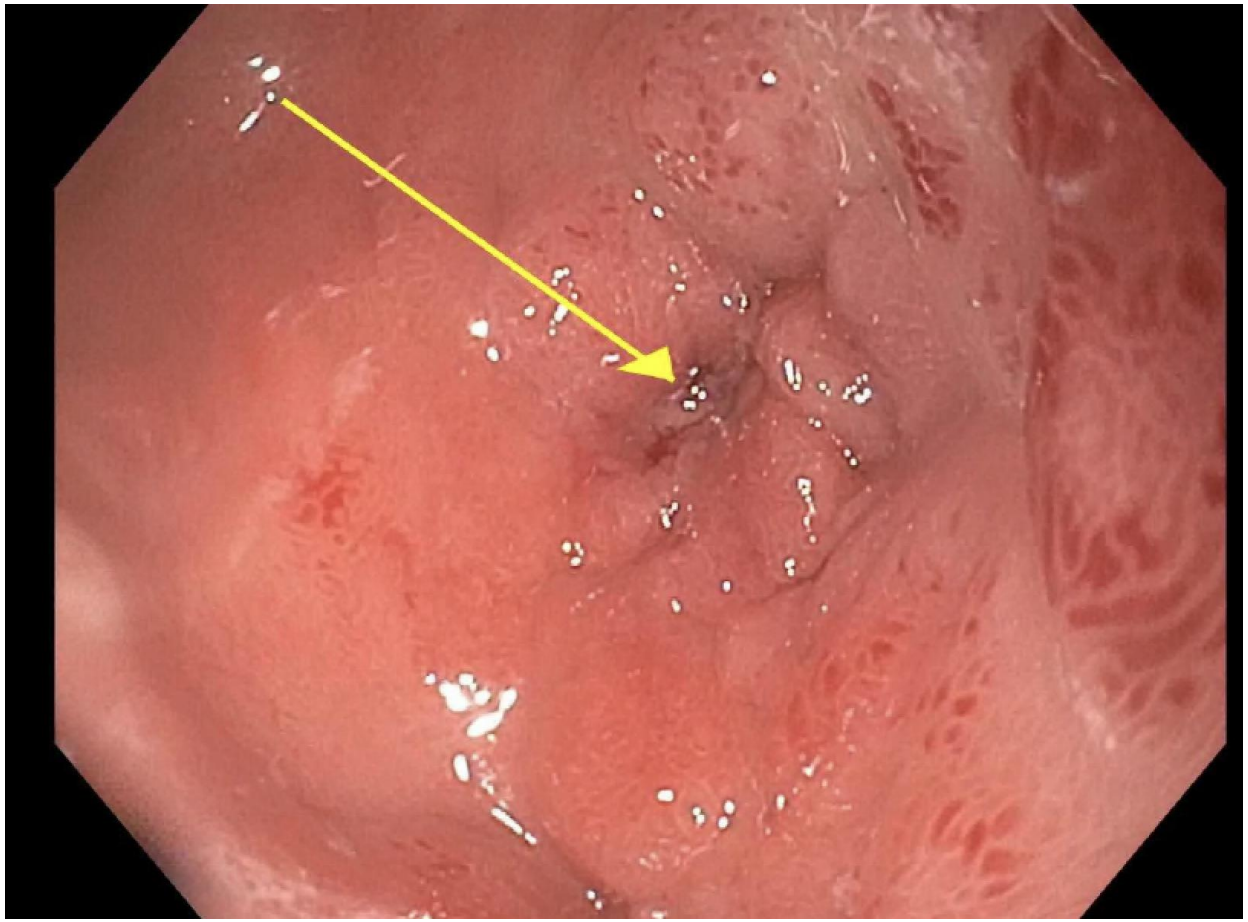


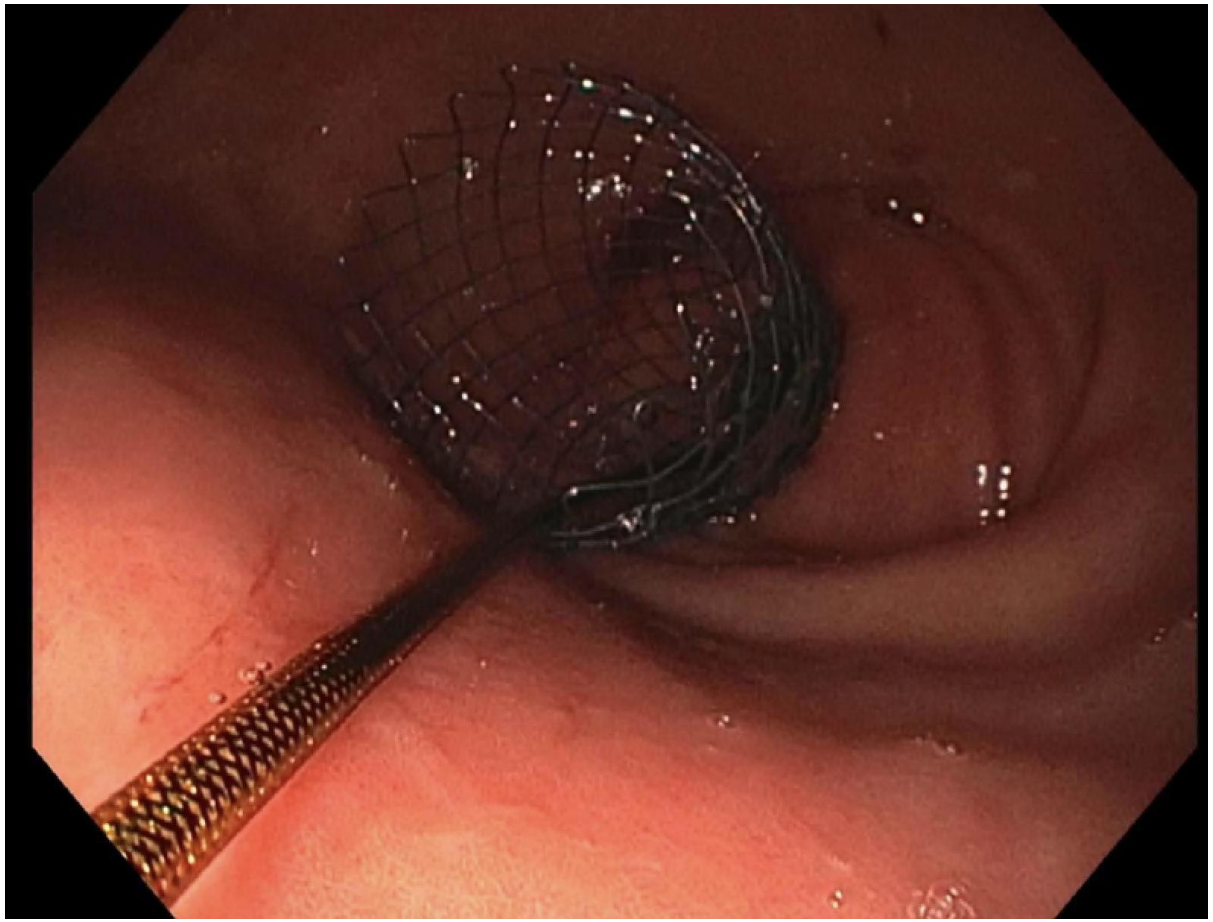


Case #1

- 48 y/o female with history of metastatic gallbladder adenocarcinoma diagnosed when she had cholecystectomy for cholecystitis who presented with 5 days of upper abdominal pain, severe nausea/vomiting
- She had been tolerating liquid diet only

EGD





Case #1

- She presented again 2 months later with recurrent symptoms of abdominal pain, nausea and vomiting
- CT showed stent obstruction from tissue ingrowth
- What do you do now?

Treatment options

Luminal stenting

Stent obstruction

Surgical gastroenterostomy

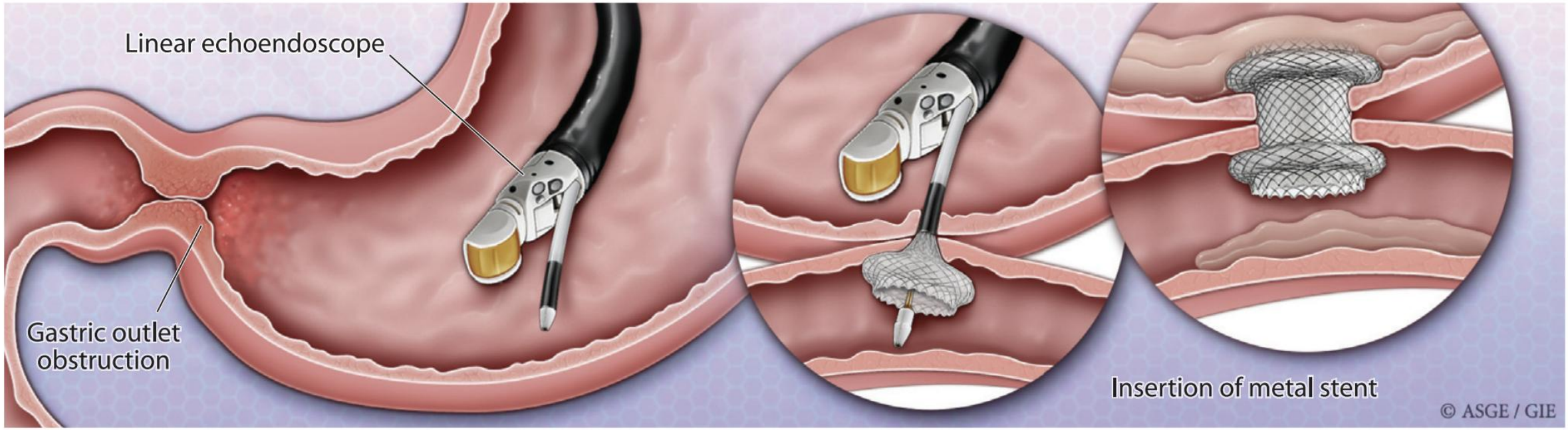
Invasive

Surgical morbidity

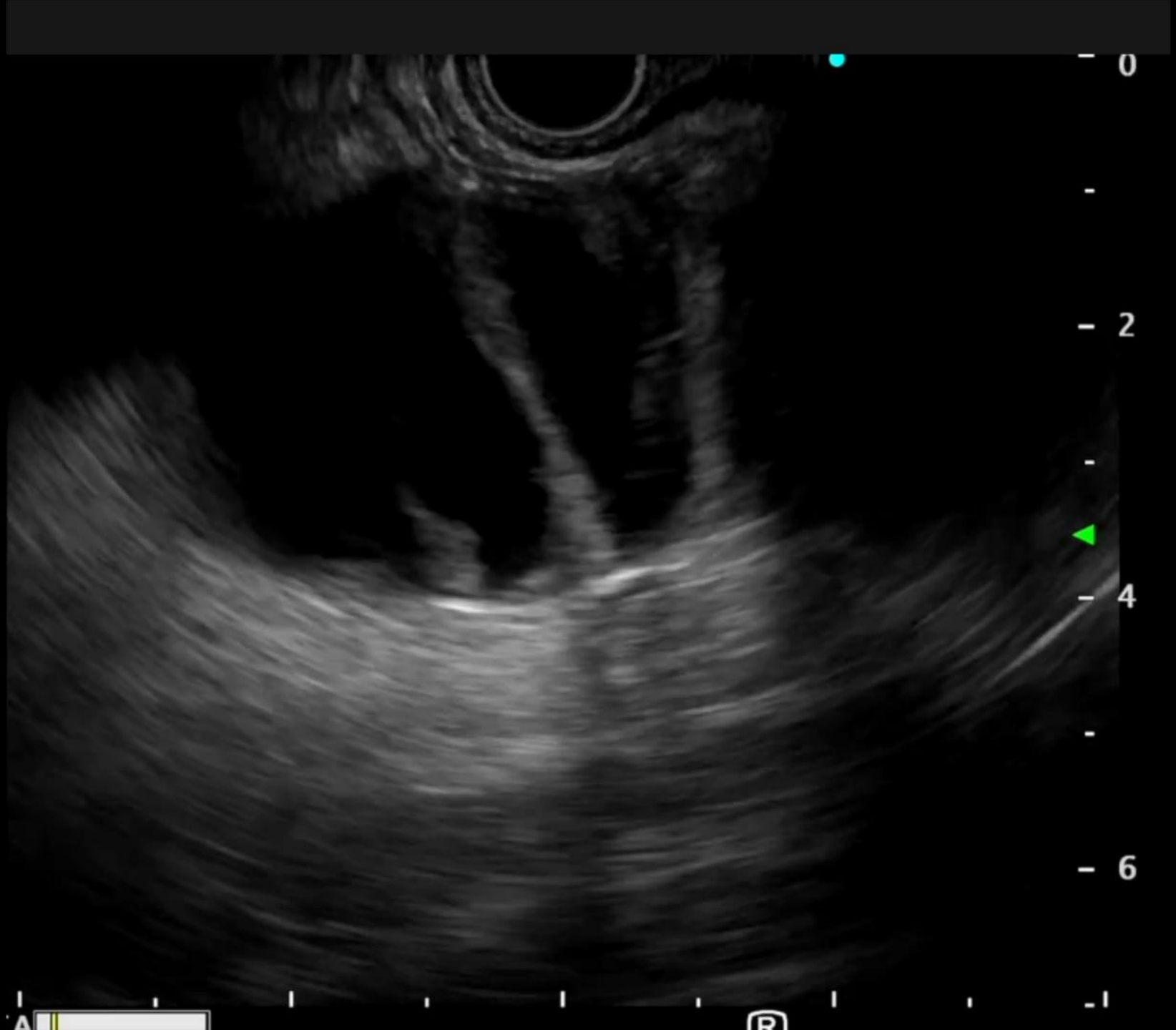
Delayed gastric emptying

What is the alternative?

EUS-guided Gastroenterostomy (GE)



Gastrointestinal Endoscopy. 2020 Mar;91(3):537-542.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EUS-guided GE

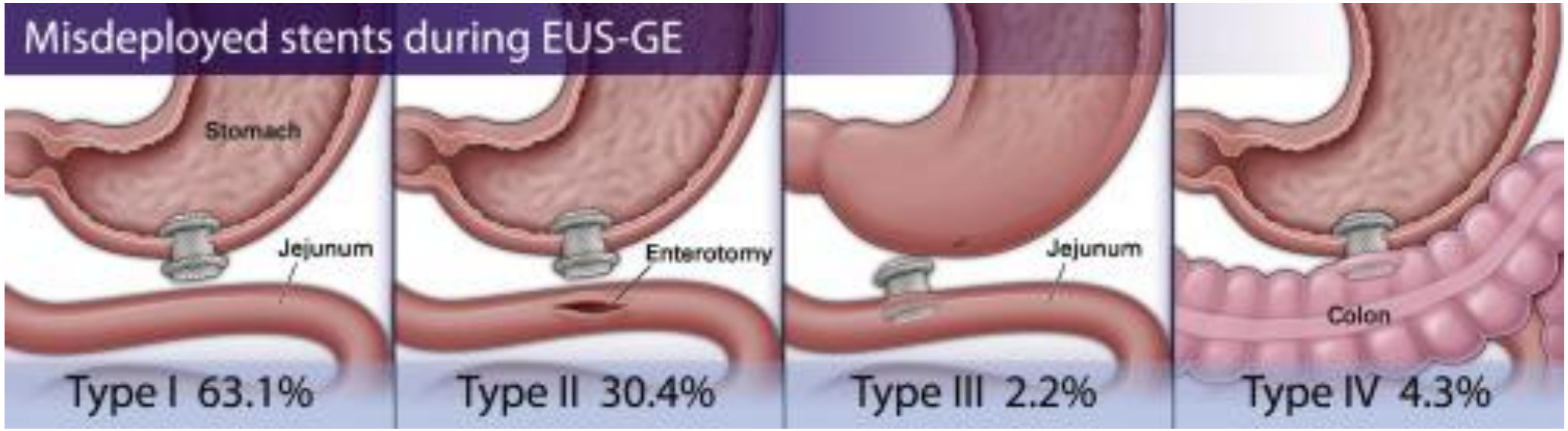
- A meta-analysis of 12 studies including 285 patients:
- Technical success: 92% (95% CI: 88%-95%)
- Clinical success: 90% (95% CI: 85%-94%)

Iqbal et al. Endoscopic Ultrasound 2020 Jan-Feb; 9(1): 16–23.

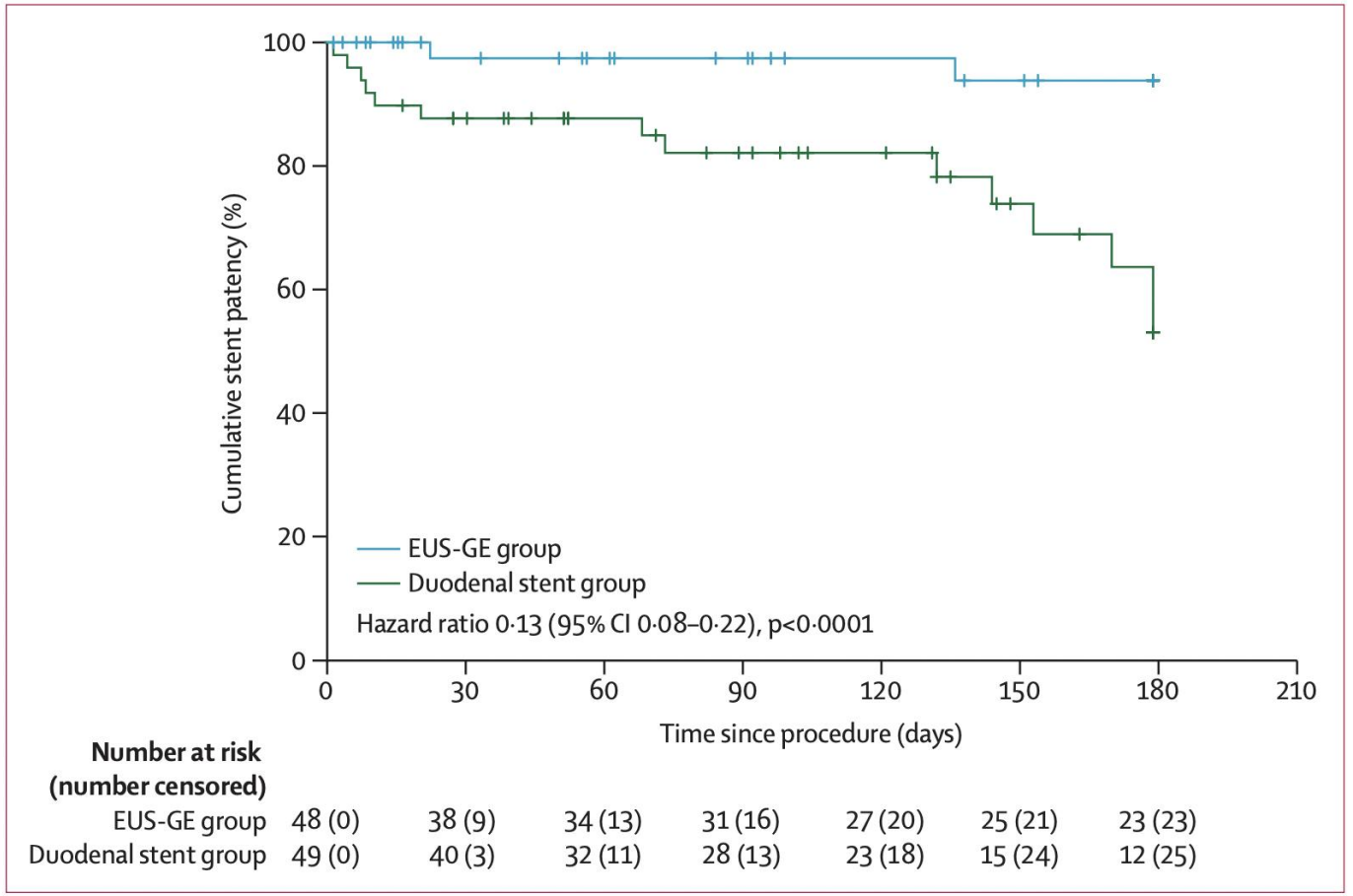
EUS-guided GE
Adverse events

Adverse events: 12% (95% CI: 8%-16%)

Stent misdeployment, peritonitis, bleeding, migration



Enteric stent vs EUS-guided GE?
Stent patency



Number at risk (number censored)							
EUS-GE group	48 (0)	38 (9)	34 (13)	31 (16)	27 (20)	25 (21)	23 (23)
Duodenal stent group	49 (0)	40 (3)	32 (11)	28 (13)	23 (18)	15 (24)	12 (25)

Teoh et al. Lancet Gastroenterol Hepatol. 2024 Feb;9(2):124-132.

EUS-guided GE
Surgical vs EUS-guided GE?

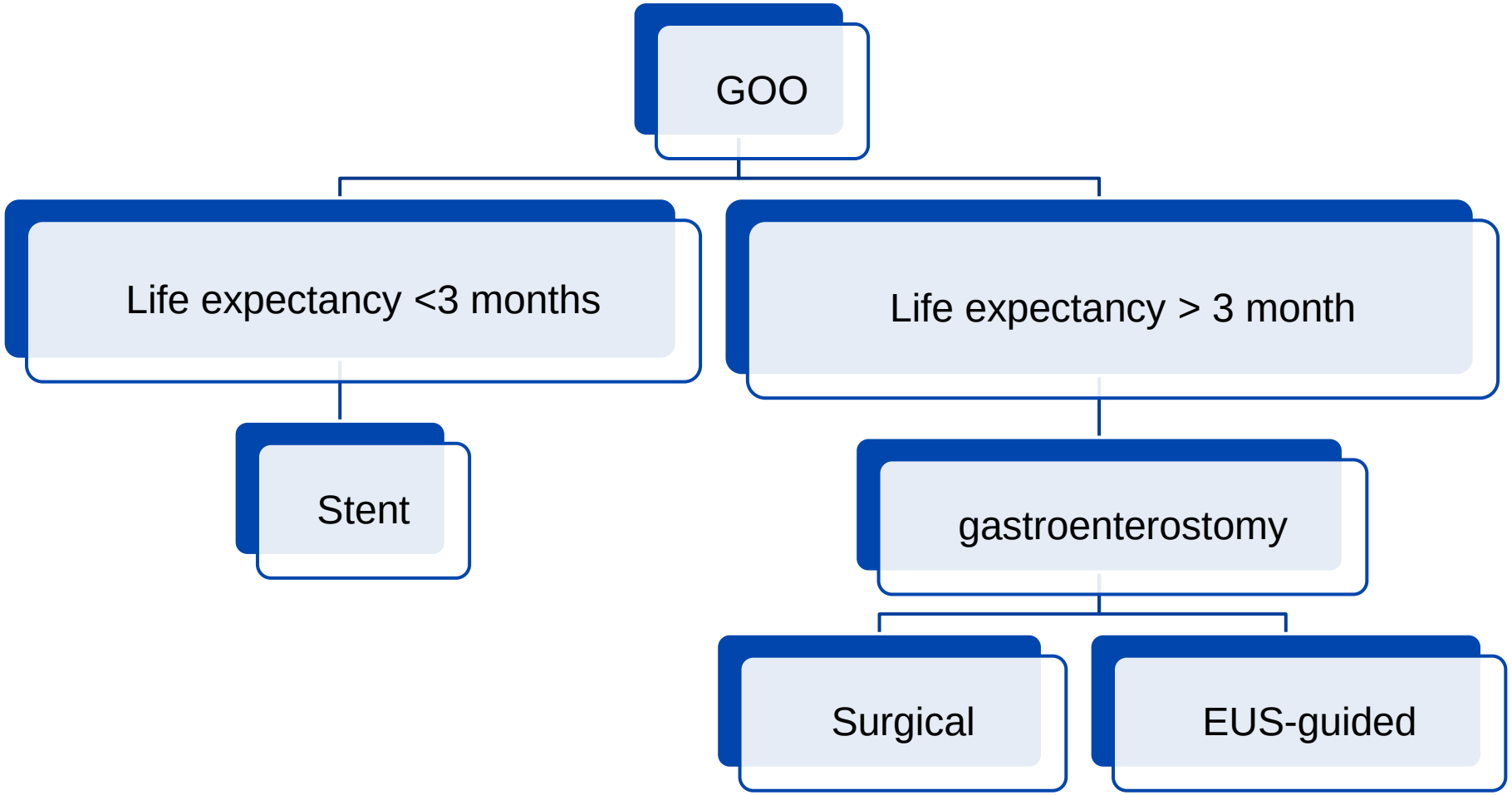
	EUS-GE, N=187	Surgical-GE, N=123	
Technical success	97.9%	100%	
Clinical success	94.1%	94.3%	
AE	13.4%	33.3%	<0.001
Resumption of oral intake	1.4 days	4.06 days	<0.001
LOS	5.31 days	9 days	<0.001

Canakis et al. Gastrointest Endosc. 2023 Sep;98(3):348-359.e30.

EUS-guided GE Advantages

- Minimally invasive, thus avoiding the AEs of surgical gastrojejunostomy
- More effective than enteral stenting because of marked reduction in reintervention rates and longer stent patency
- Short recovery and less invasive compared to surgery

Patient selection



Contraindications

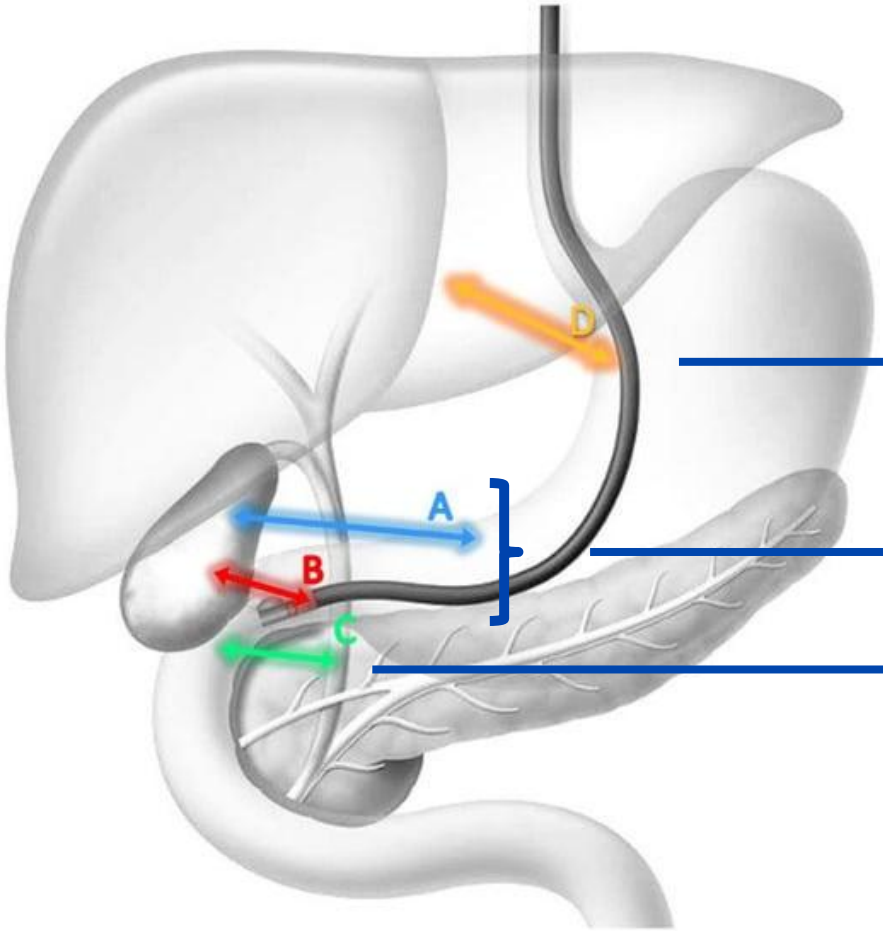
1. Presence of uncontrolled ascites (risk for peritonitis and failure to obtain gastric-small bowel fusion)
2. Evidence of obstruction within the distal small bowel
3. Cancerous involvement of gastric or small bowel wall
4. Interfering mucosal abnormalities (ulcers)

The role of interventional EUS in cancer management

EUS-guided Gastroenterostomy

EUS-guided Biliary Drainage

EUS guided biliary drainage



Hepaticogastrostomy (HG)

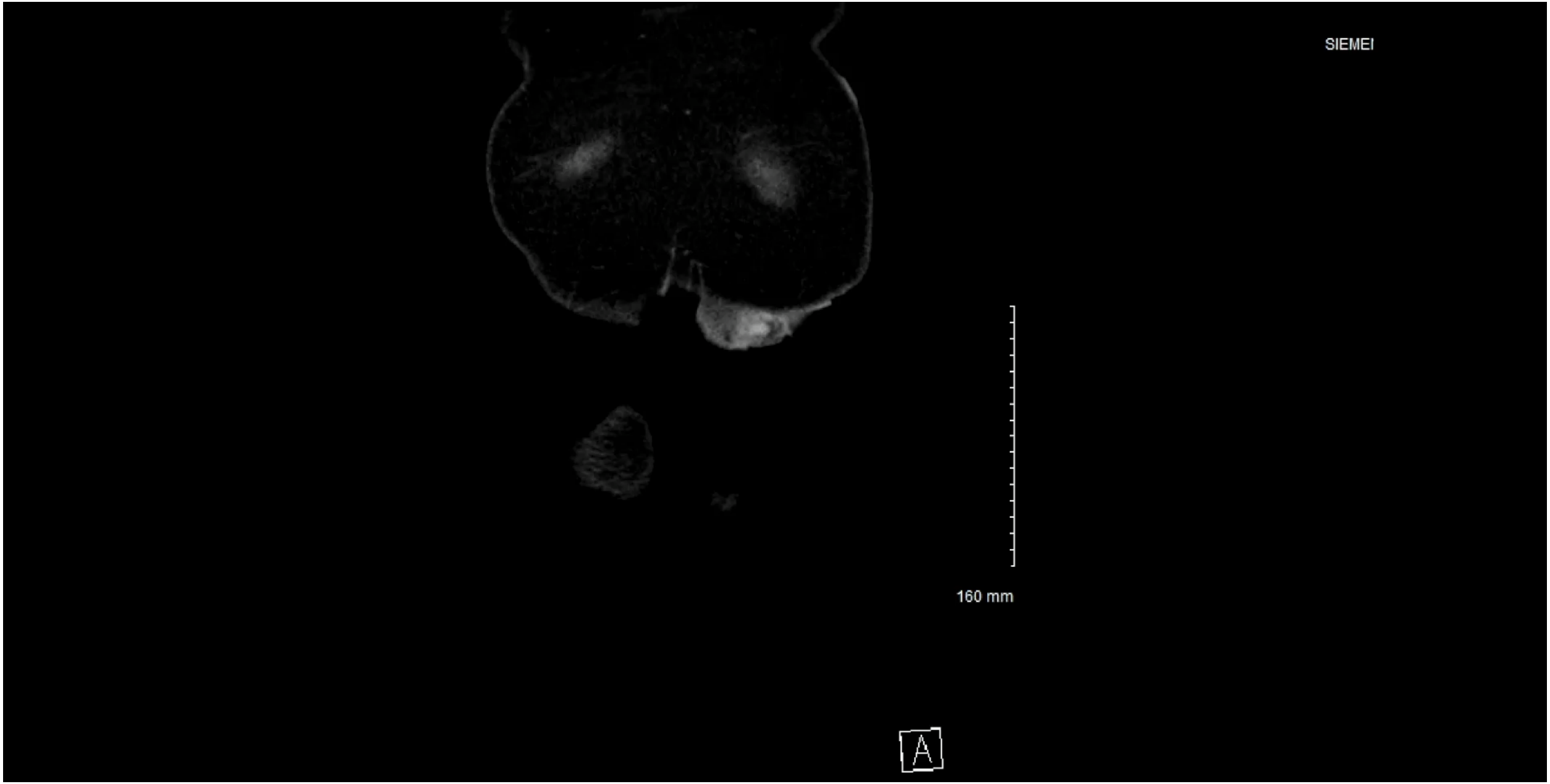
Gallbladder drainage

Choledochoduodenostomy

Paduano et al. Cancers (Basel). 2023 Jan 12;15(2)

Case #2

- 33 y/o woman with metastatic sigmoid adenocarcinoma status post diverting colostomy and chemotherapy presented with RUQ abdominal pain with fever 102
- She has history of biliary obstruction from a metastatic hilar mass status post ERCP with bilateral uncovered metal stent
- Vitals: HR: 120, BP: 105/70, Temp: 101
- Labs: WBC: 15, Bili 1.7, Alk phos 714, ALT 103, AST 126



Case #2

- Surgery evaluated her but she was deemed not a surgical candidate. What is the next step?

1. Cholecystostomy tube
2. ERCP to place a trans-cystic stents
3. EUS-guided gallbladder drainage

ERCP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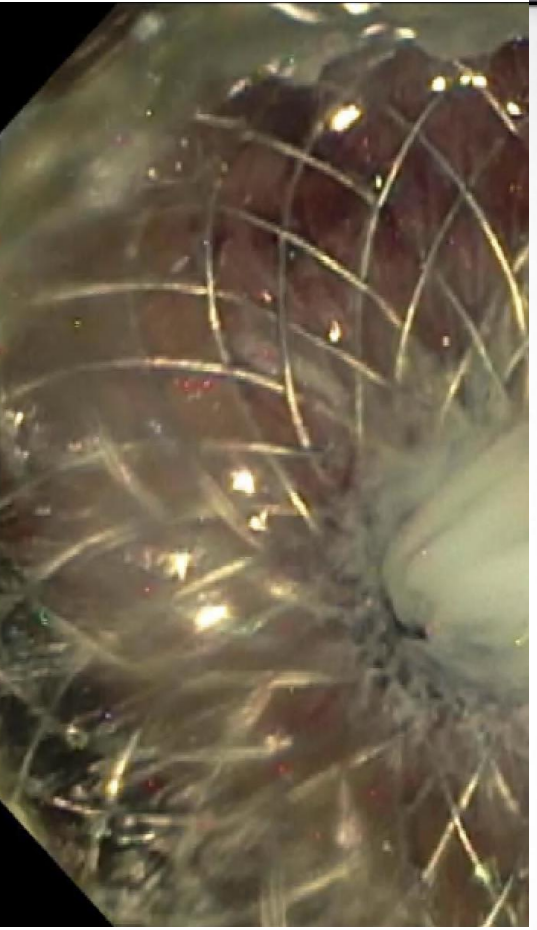
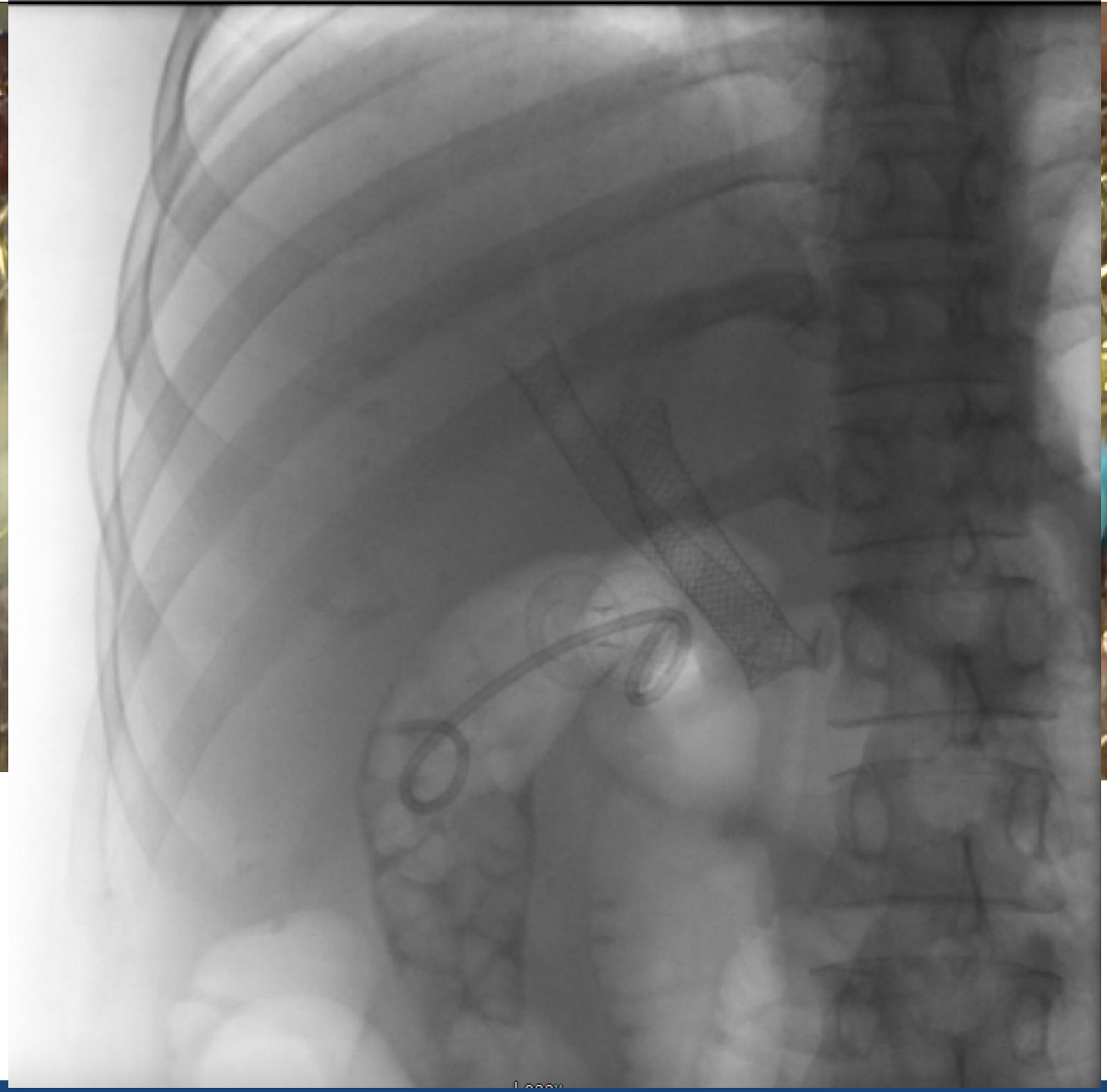
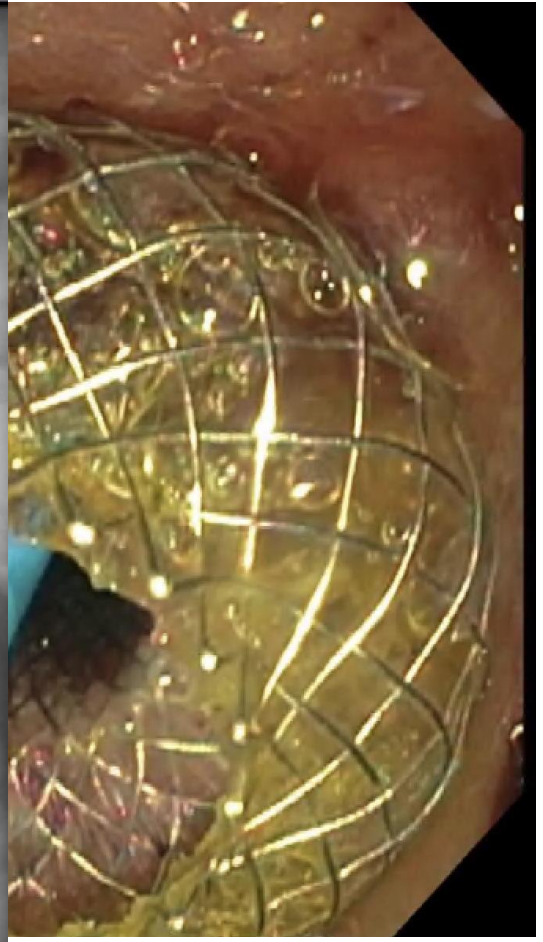
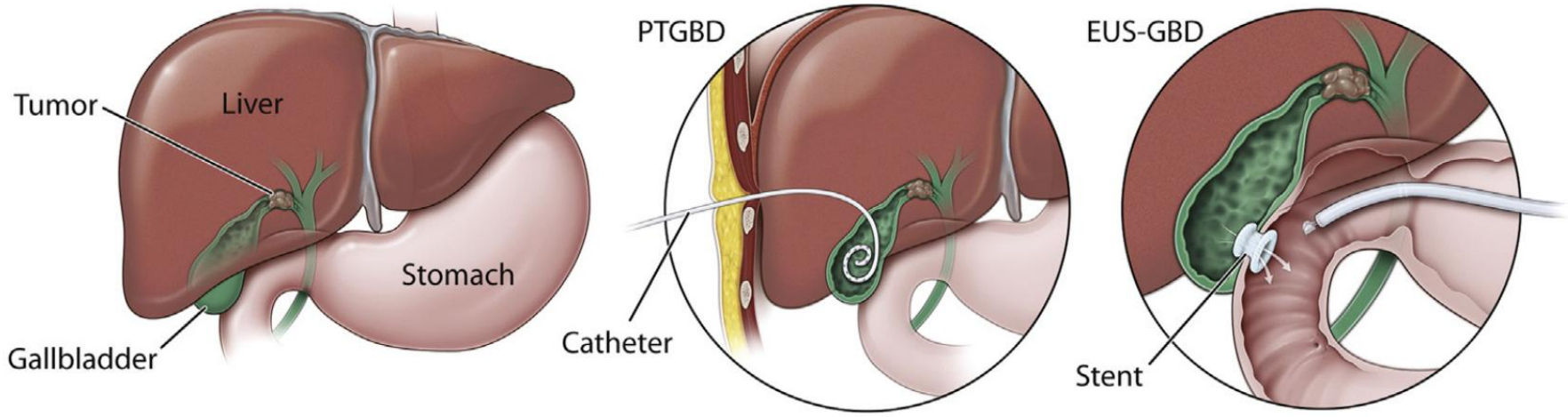






EUS-guided Gallbladder Drainage
Percutaneous cholecystostomy vs EUS-GBD

- A retrospective 1:1 matched cohort study of 118 patients with acute cholecystitis who were unfit for cholecystectomy

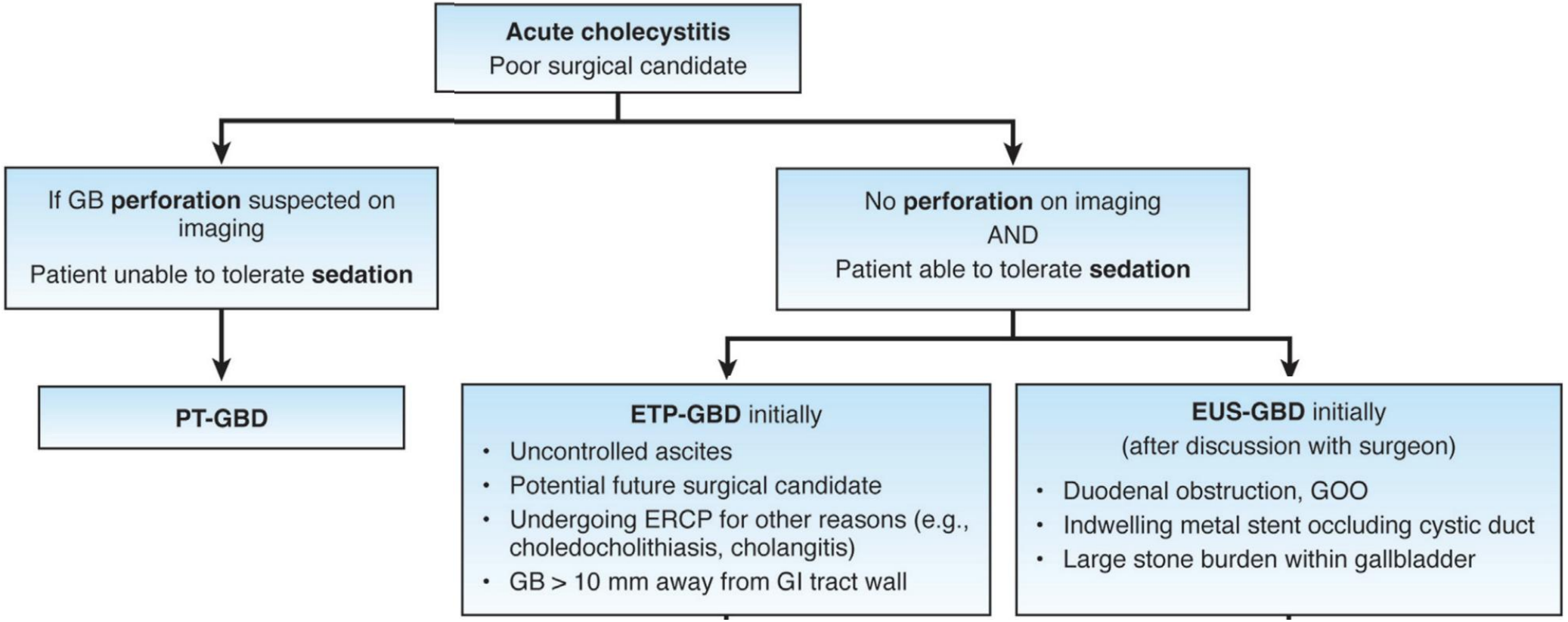


Teoh et al. Endoscopy 2017; 49: 130–138

EUS-guided Gallbladder Drainage
Percutaneous cholecystostomy vs EUS-GBD

	EGBD n = 59	Percutaneous cholecystostomy n = 59	*P* value
Technical success, n (%)	57 (96.6)	59 (100)	0.15
Clinical success, n (%)	53 (89.8)	56 (94.9)	0.30
Unplanned admissions related to the intervention, n (%)	4 (6.8)	42 (71.2)	<0.001
Recurrent acute cholecystitis, n (%)	0 (0)	4 (6.8)	0.12

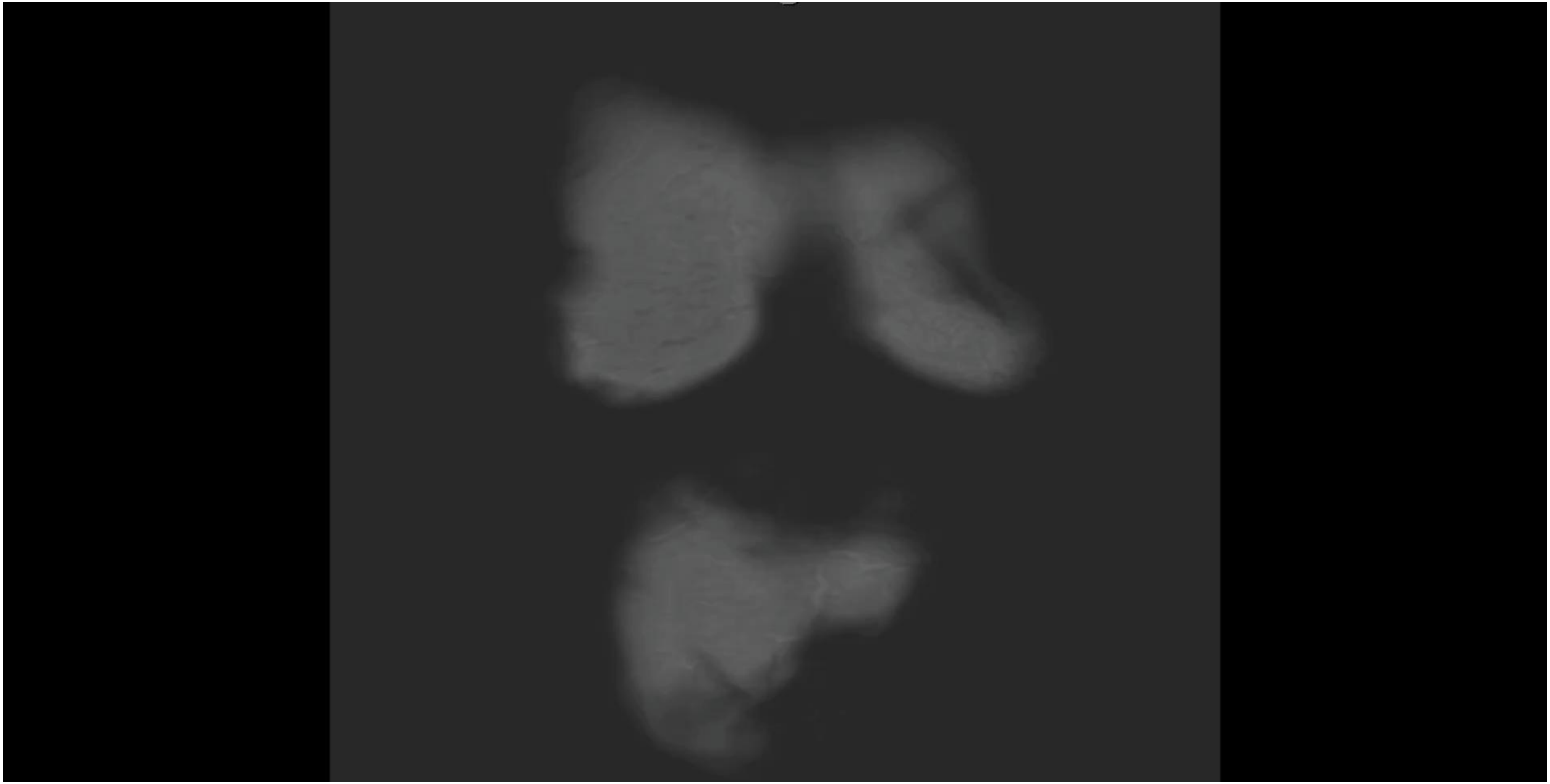
Teoh et al. Endoscopy 2017; 49: 130–138



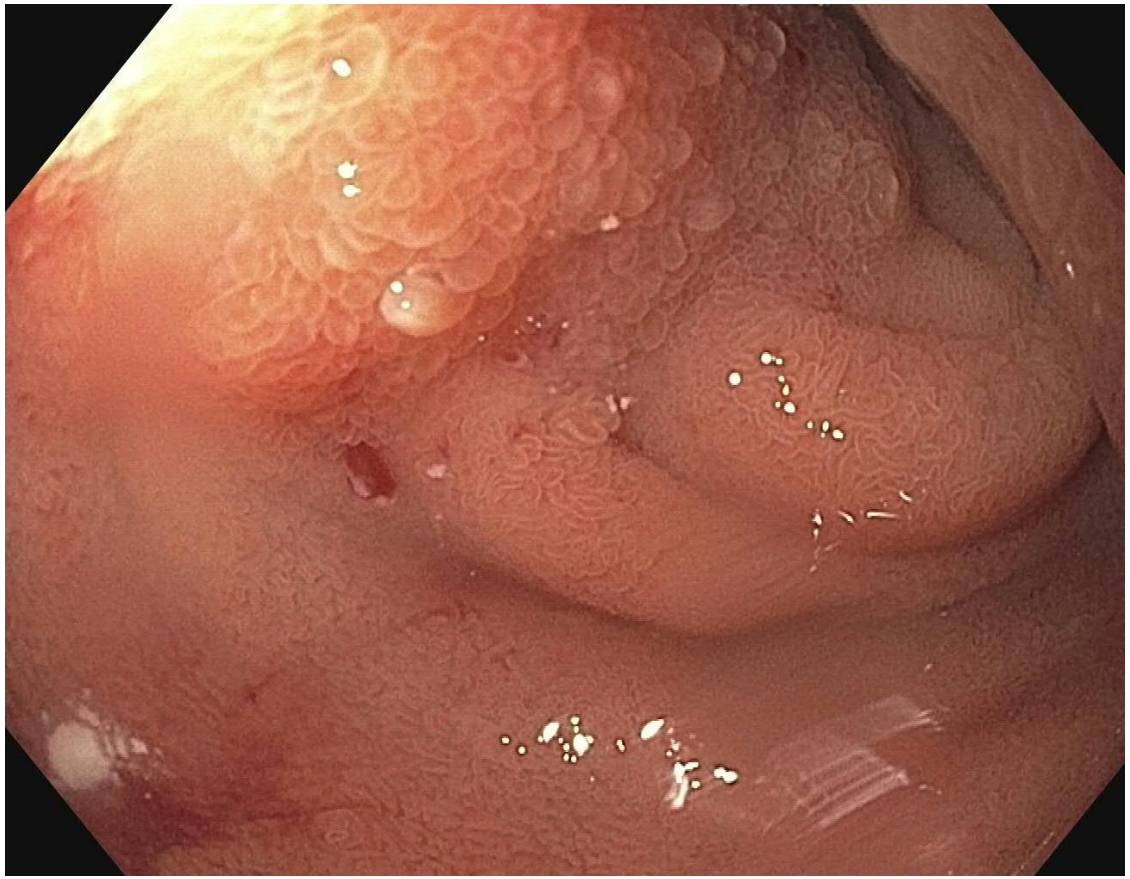
Irani et al. Clinical Gastroenterology and Hepatology 2023;21:1141–1147

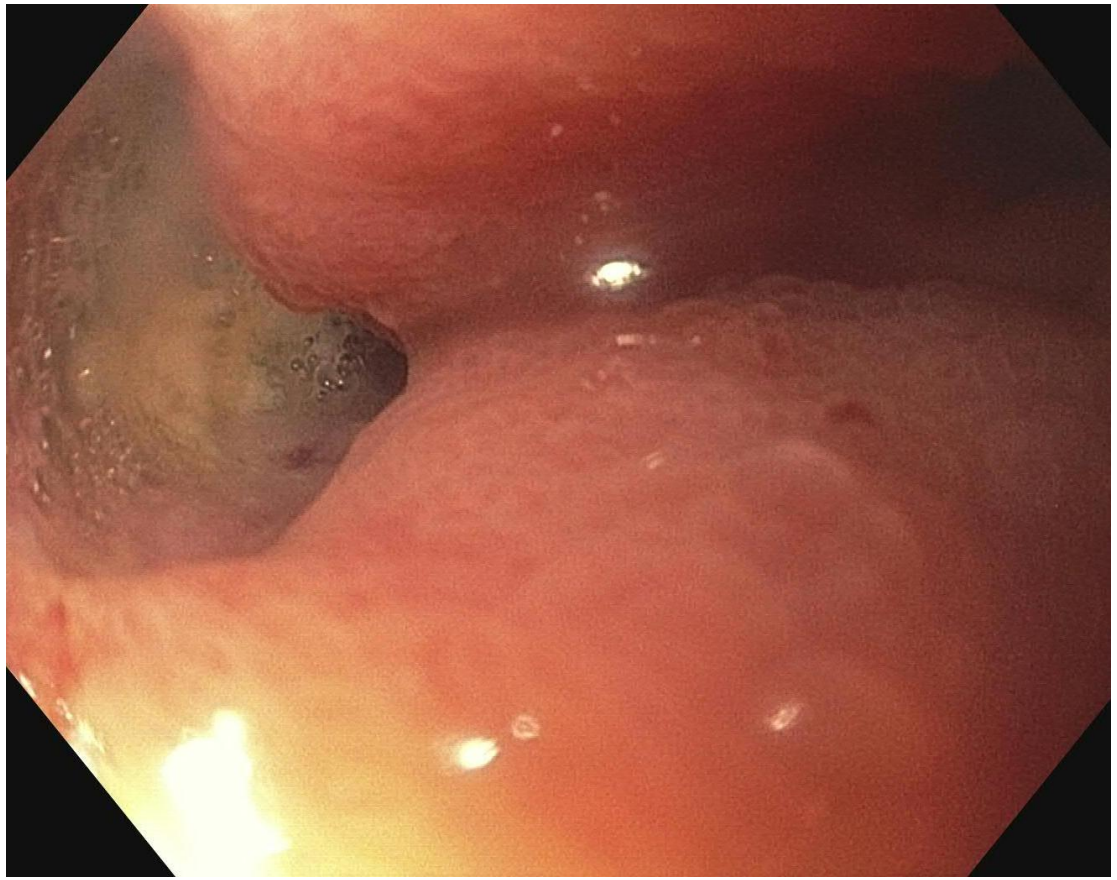
Case #3

- 67 y.o. woman with recently diagnosed metastatic ampullary adenocarcinoma presented with abdominal pain, nausea/vomiting and Jaundice for one week
- She had been on chemotherapy for 4 weeks
- In the ED, he was hemodynamically stable
- Labs: Bilirubin 8 mg/dl



ERCP attempted





What are the options after failed ERCP?

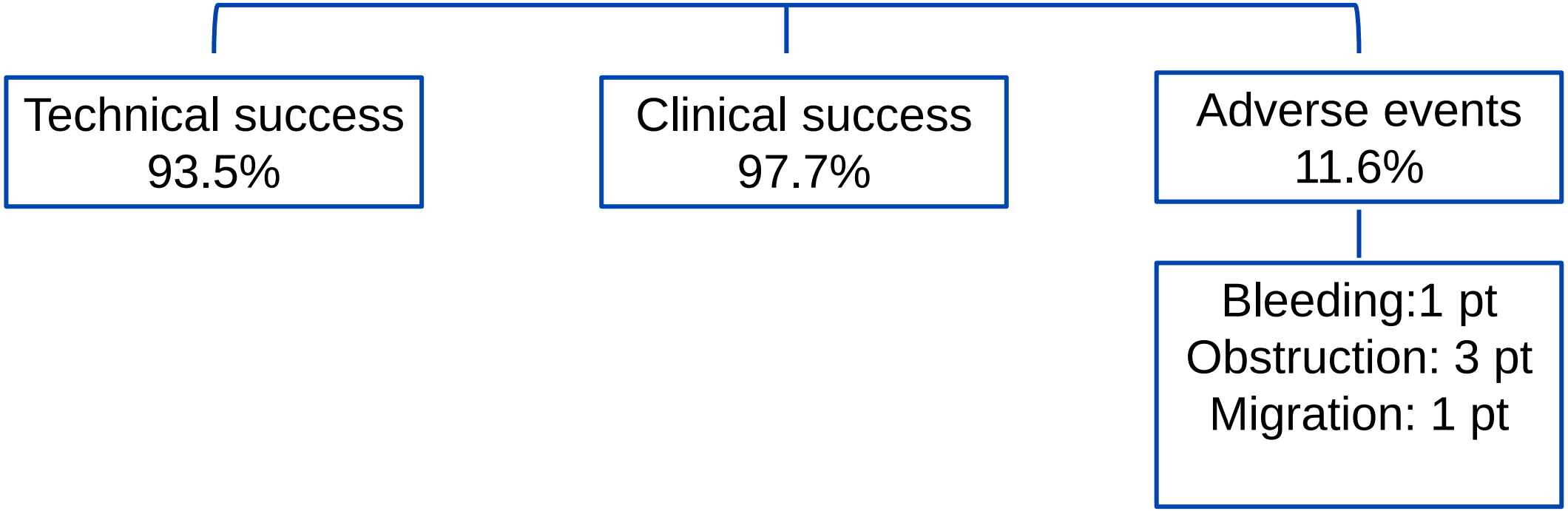
1. Percutaneous transhepatic biliary drainage PTBD
2. EUS-guided choledochoduodenostomy EUS-CD
3. Surgical drainage

EUS-guided choledochoduodenostomy

Anderloni,et al. Gastrointestinal Endoscopy. 2019 Jan;89(1):69-76.

EUS-guided Choledochoduodenostomy

- 46 patients with inoperable malignant distal bile duct obstruction and failed ERCP at a single center



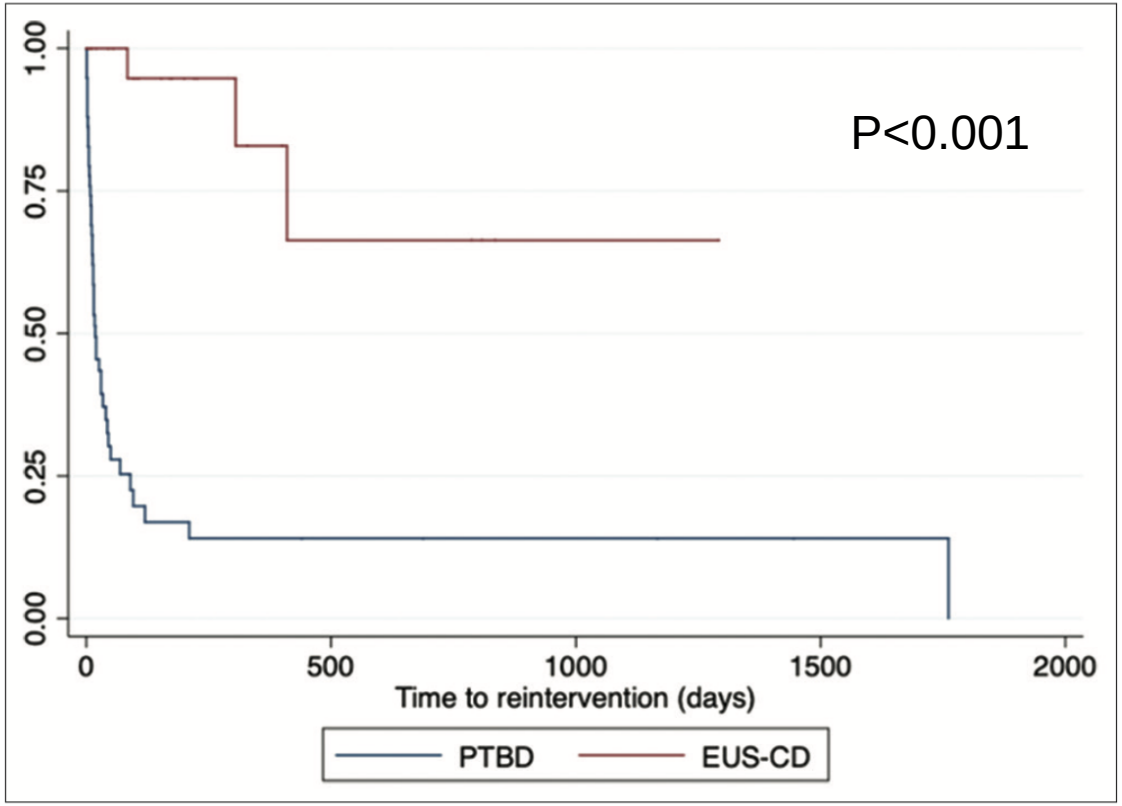
Anderloni,et al. Gastrointestinal Endoscopy. 2019 Jan;89(1):69-76.

EUS-guided Choledochoduodenostomy
Which is safer and more effective EUS-CD vs. PTBD?

Outcomes	Overall cohort (n=86)		
	EUS-CD (*n*=28)	PTBD (*n*=58)	*P*
Technical success, *n* (%)	28 (100)	56 (96.6)	0.3
Clinical success, *n* (%)	22 (84.6)	36 (62.1)	0.04
Adverse events, *n* (%)	4 (14.3)	17 (29.3)	0.1
Occlusion	1 (3.6)	6 (10.3)	0.3
Cholangitis	3 (10.7)	7 (12.1)	0.85
Migration	0	4 (6.9)	0.16
Perforation	0	1 (1.7)	0.49
Bile leak	2 (7.1)	2 (3.5)	0.45
Bleeding	0	3 (5.2)	0.2
Need for reintervention, *n* (%)	3 (10.7)	45 (77.6)	<0.001

Sawas et al. Endoscopic Ultrasound. 2022 Jan 28.doi: 10.4103/EUS-D-21-00031.

EUS-guided Choledochoduodenostomy
Which is safer and more effective EUS-CD vs. PTBD?



Sawas et al. Endoscopic Ultrasound. 2022 Jan 28.doi: 10.4103/EUS-D-21-00031.

EUS-guided Choledochoduodenostomy
Patient selection

- Obstructive jaundice and failed ERCP or no access to the ampulla:

1. Duodenal obstruction
2. In situ enteral stent
3. Failed cannulation because of infiltrative tumor

- No contraindication for EUS (Severe coagulopathy)
- Acceptable Life expectancy

Sawas et al. Endoscopic Ultrasound. 2022 Jan 28.doi: 10.4103/EUS-D-21-00031.

Conclusion

- Interventional EUS has evolved dramatically in the last decade with the introduction of LAMSs which allow endoscopic anastomosis
- EUS guided gallbladder drainage is an FDA approved treatment for cholecystitis in non-surgical patients
- Interventional EUS improves the quality of life of cancer patients by eliminating the need for external drains and decreasing the need for reintervention
- EUS-GE might be a preferable therapy for patients with long life expectancy
- Multidisciplinary approach is important in patient's selection

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Thank you

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