Endoscopic management of malignant Gastric outlet obstruction

By

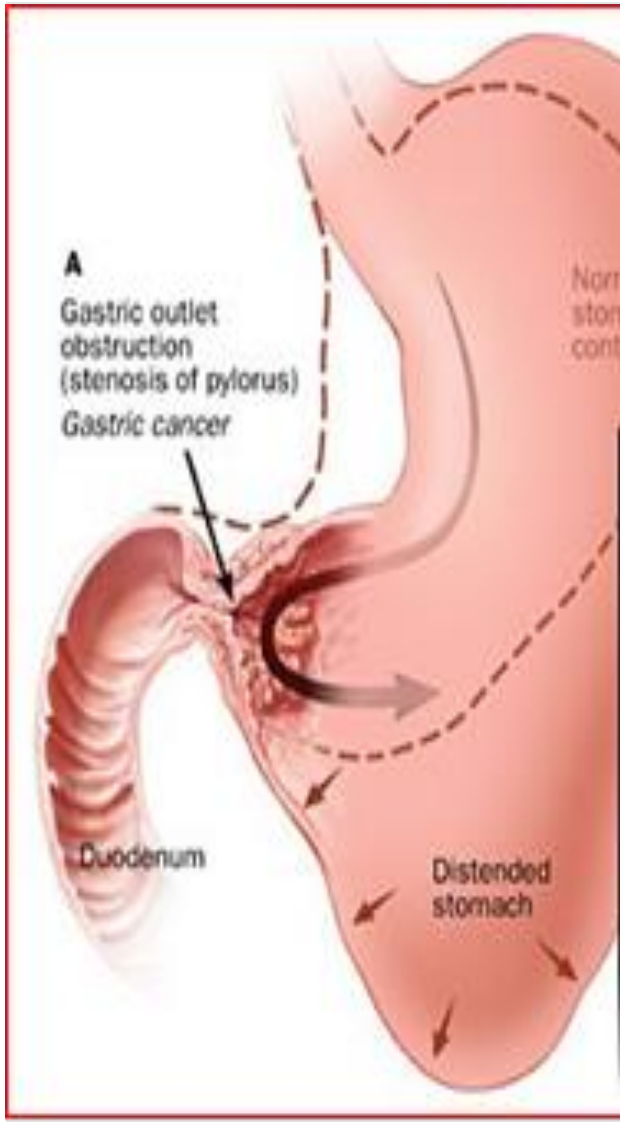
Ahmed Altonbary, MD, FRCP, FESGE, FASGE

Associate professor of Gastroenterology & Hepatology

Consultant of Advanced Therapeutic GI Endoscopy

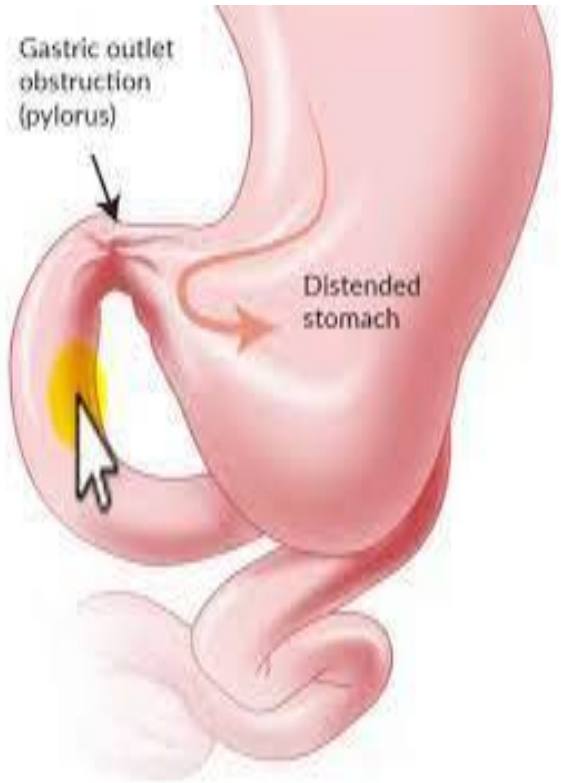
Mansoura University, Egypt

Member of WEO, EGEUS, EASL & ECCO



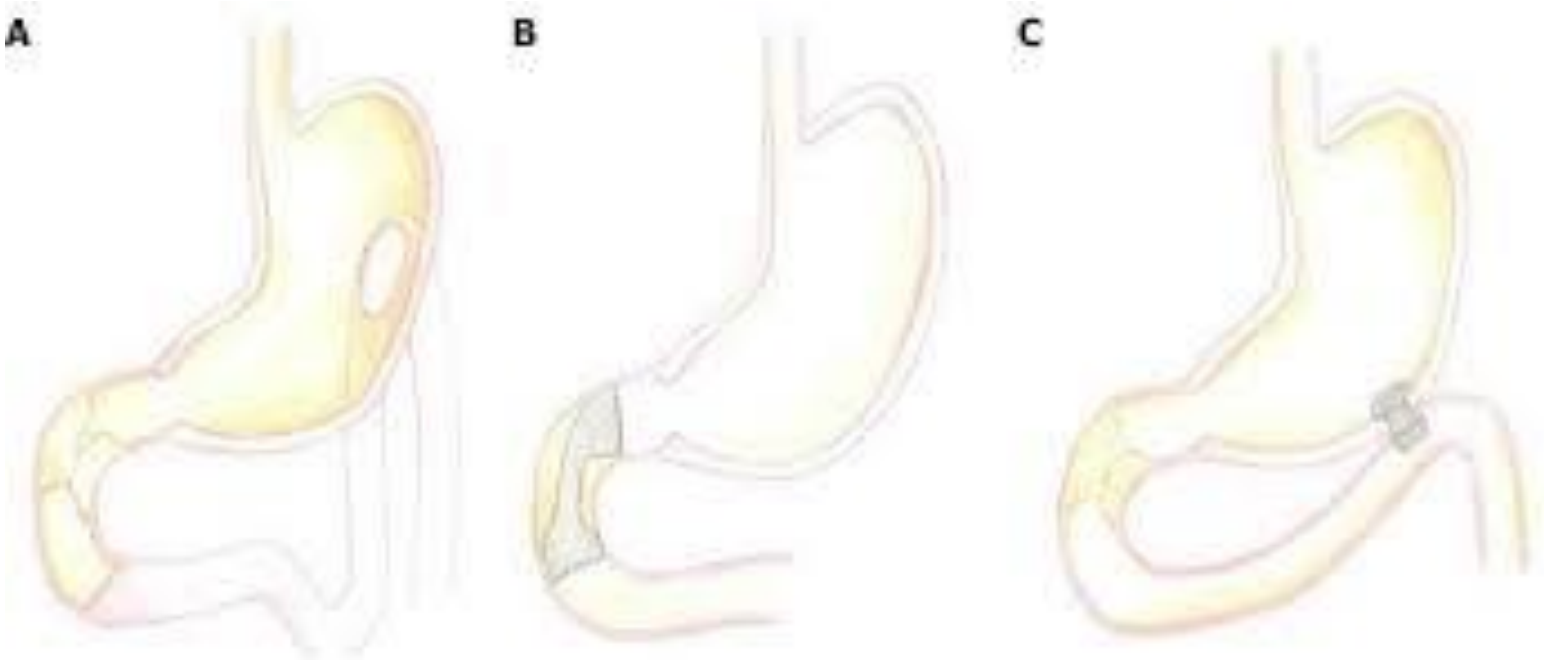
Introduction

- Malignant gastric outlet obstruction (MGOO) is defined as the mechanical obstruction of the duodenum secondary to compression/infiltration from advanced loco-regional malignancies.
- Patients with MGOO typically present with nausea and vomiting, abdominal pain, weight loss, malnutrition and dehydration secondary to poor oral intake.

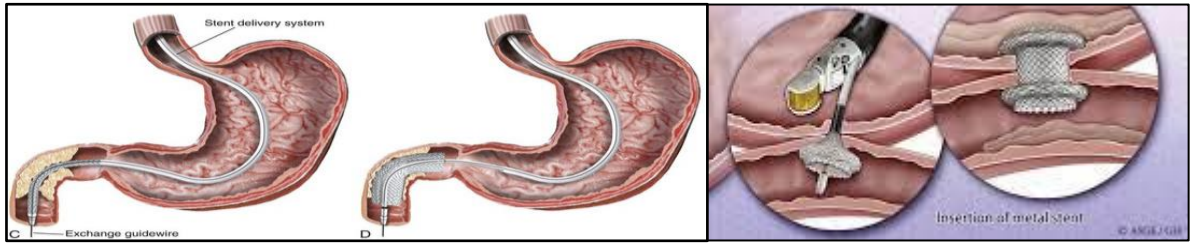


Introduction

- Less invasive approaches have been developed and proposed over time, aimed at providing fast and effective relieve of symptoms and return to an adequate oral feeding with the highest safety, the shortest hospitalization time.

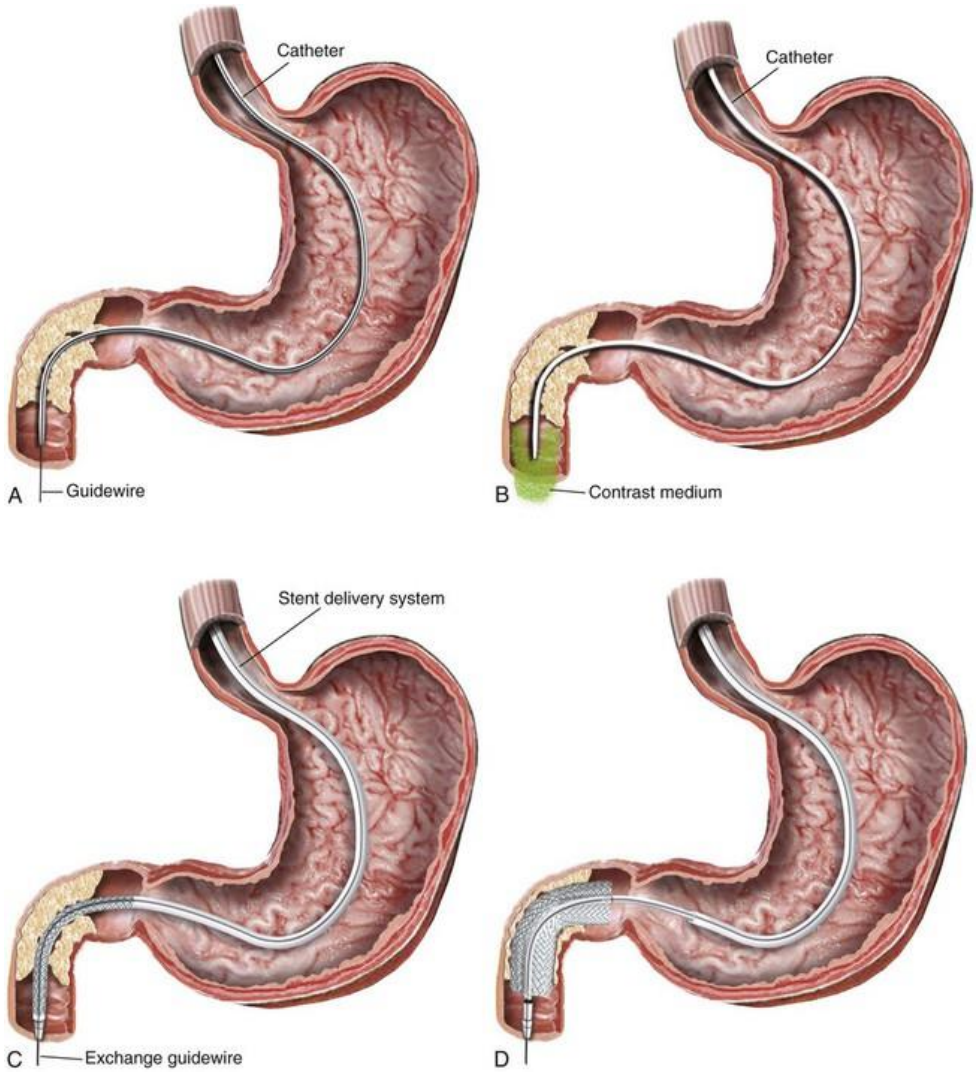


Technique


Stent delivery system
C
Exchange guidewire
D

Insertion of metal stent

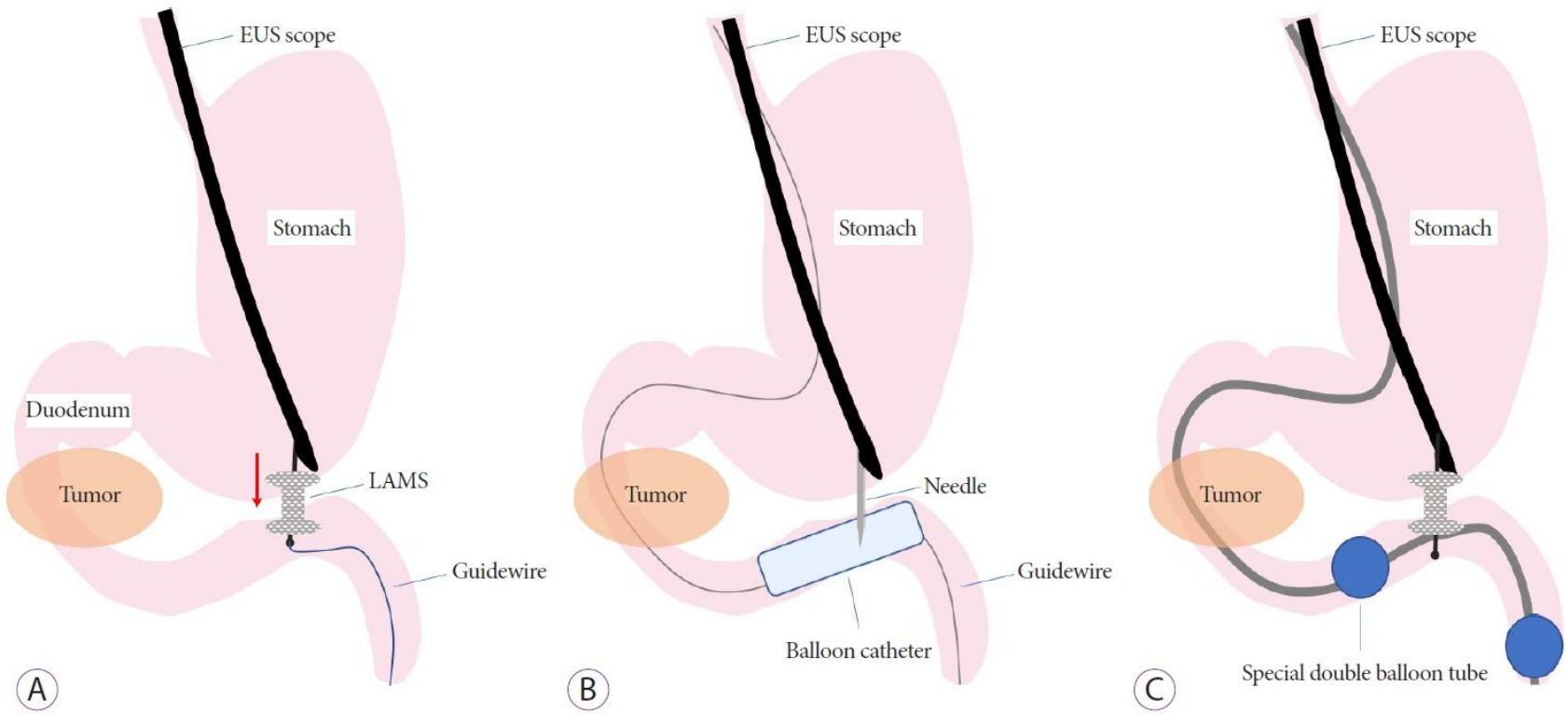
Technique
Duodenal stent



Technique
Duodenal stent

Technique
Duodenal stent

Technique
EUS-GE



Technique
EUS-GE

Flowchart of technical steps to perform an EUS-GE (using WEST or EPASS technique)

- Guidewire advancement across the duodenal stenosis
- Placement of the orojejunal tube
- EUS-guided identification of the target small bowel loop
- Controlled loop distention through saline
- Creation of the best operative window
  - The shortest possible interluminal distance (preferably <5 mm)
  - The larger possible operative space (ideally 4 cm for a 20 mm LAMS)
  - Oblique loop course aligned with the scope's operative channel
- Advancement of an electrocautery-enhanced LAMS using pure-cutting current
- LAMS release
- Optional confirmation of correct LAMS placement

LAMS size options for EUS-GE

- HOT AXIOS Stent 20 mm (Boston Scientific, Marlborough, MA)
- HOT AXIOS Stent 15 mm (Boston Scientific)
- Niti-S SPAXUS Stent 16 mm (Taewoong, Seoul, South Korea)

Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

Technique
EUS-GE

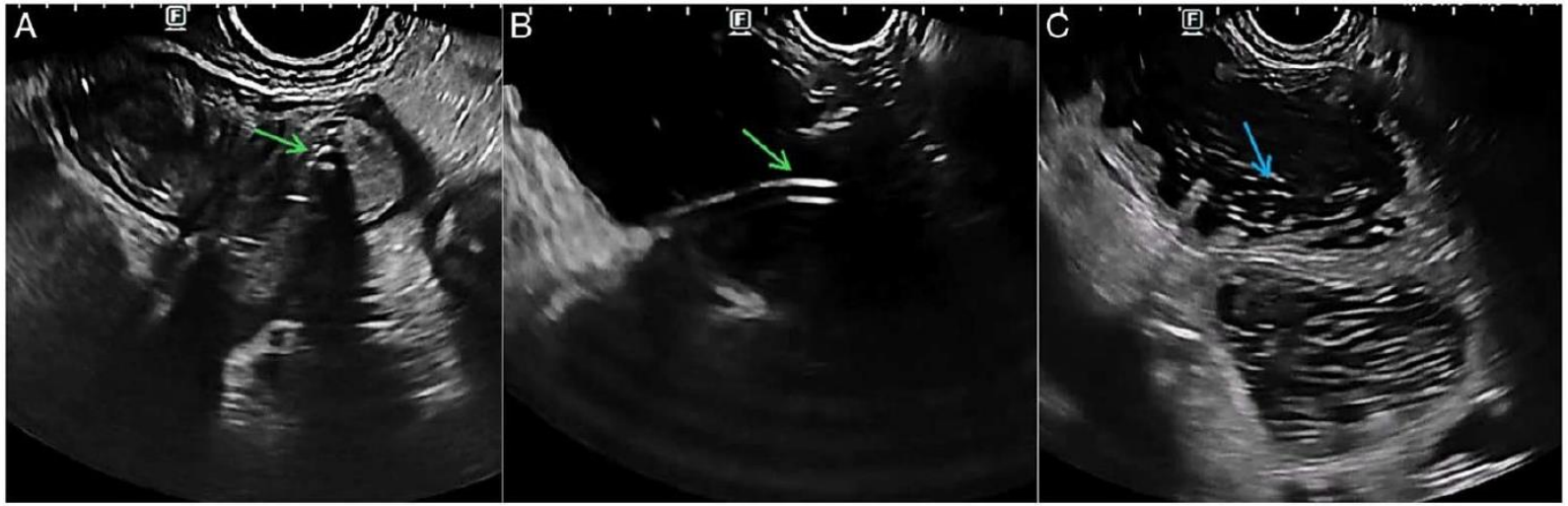


FIGURE 7. Endosonographic identification of the target jejunal loop. A–B, Visualization of the OJT tip inside the bowel loop lumen (green arrows) before (A) and after (B) fluid injection. C, Fluid turbulence within the bowel loop caused by saline injection through the OJT (blue arrow).

Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

Technique
EUS-GE

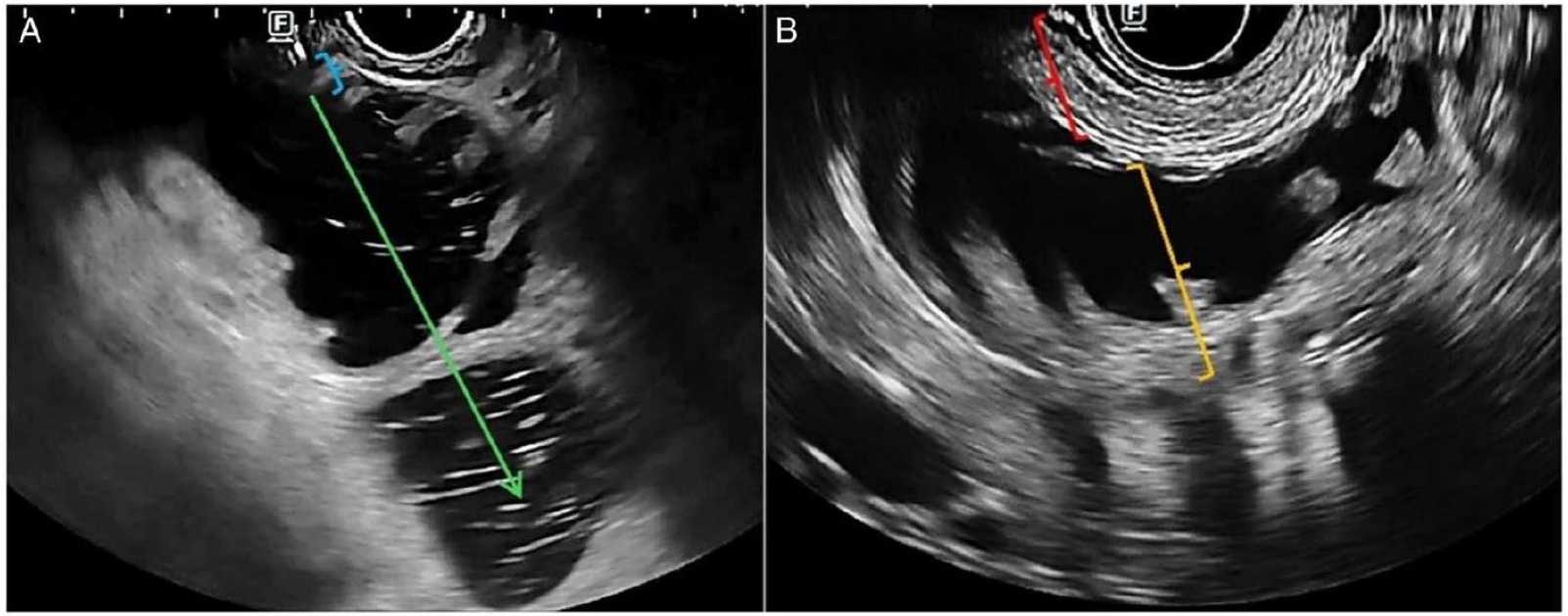


FIGURE 6. EUS operative windows. A, Ideal appearance of the target jejunal loop, with adequate operative space (>4 cm) for LAMS deployment (green arrow) and short (<5 mm) interluminal distance (blue bracket). B, Inappropriate window for EUS-GE showing a loop with an excessively transverse course, an insufficient caliber for safe LAMS deployment (yellow bracket), and excessive interluminal distance to be transversed (red bracket).

Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

Technique
EUS-GE

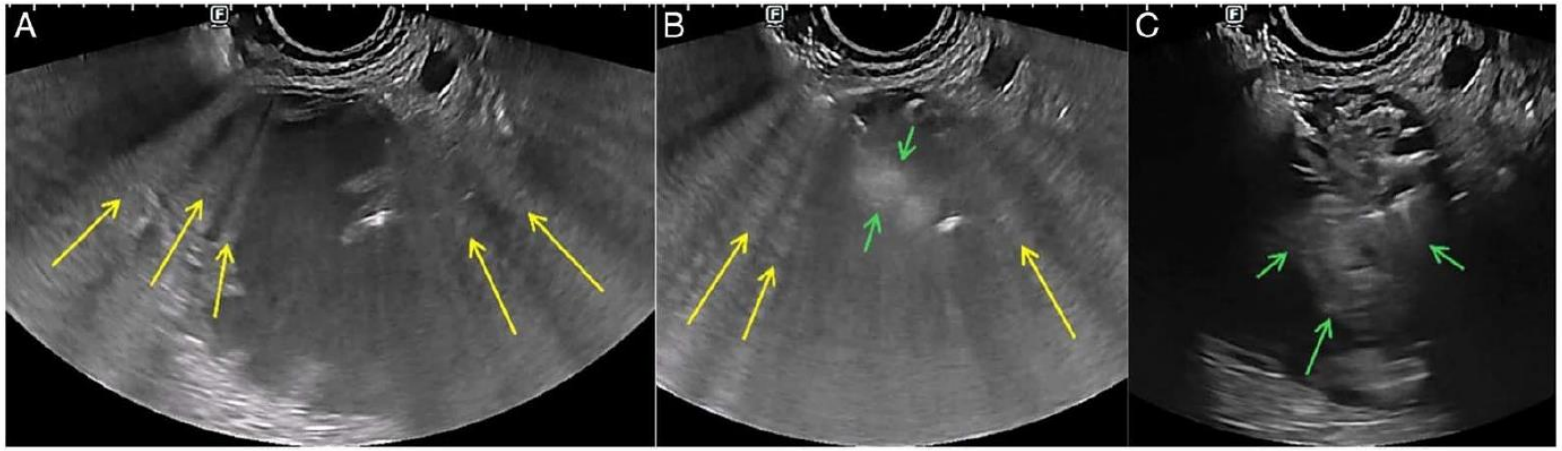


FIGURE 8. A–B, Application of current through the electrocautery-enhanced LAMS causes the appearance of image artifacts (yellow arrows). B–C, "Boiling water effect": the perturbation of water molecules inside the intestinal loop lumen as they interact with the electricity passing through the electrocautery tip should be visible (green arrows) starting during current application (B) and progressing after the cessation of current application (C).

Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

Technique
EUS-GE

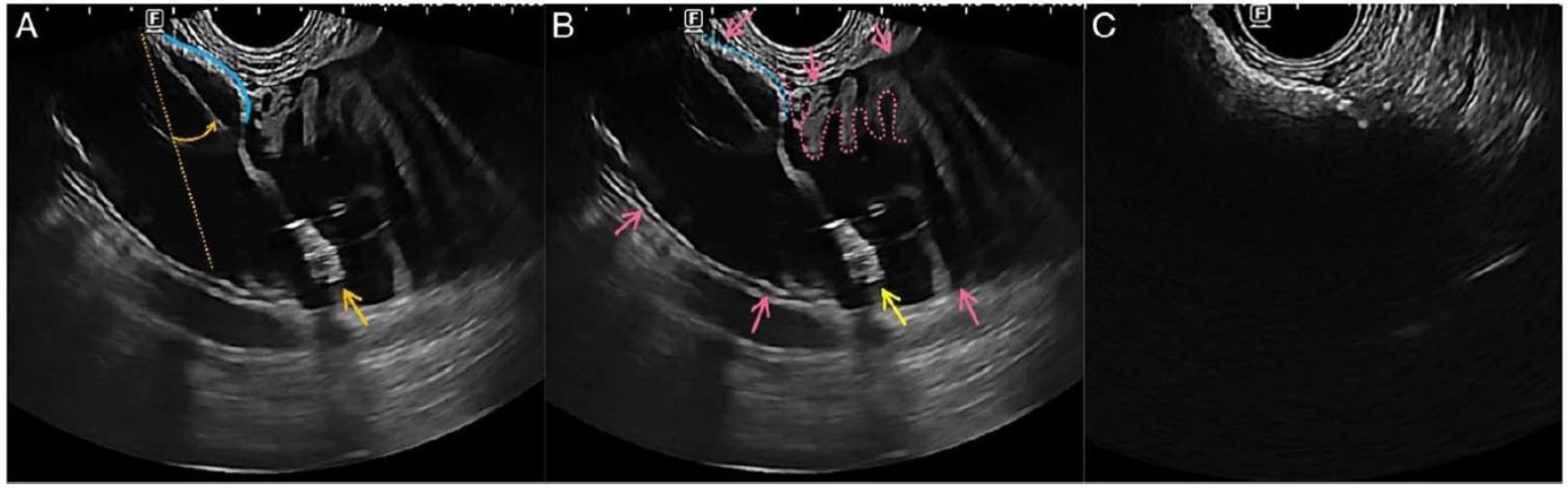


FIGURE 10. EUS signs of correct (or incorrect) distal flange placement. A, Catheter deviation (yellow arrows) toward the flange side (blue line) upon retraction of the catheter, following distal flange release. B, When the catheter is retracted to appose the 2 walls, the LAMS flange (blue line) and catheter tip (yellow arrow) should be visible inside the loop, defined by the jejunal walls (pink arrows) and folds (pink dashed line). C, EUS view of the distal LAMS flange, not surrounded by fluid, and with no visibility of the jejunal walls or catheter tip inside the jejunal loop is suggestive of stent misdeployment.

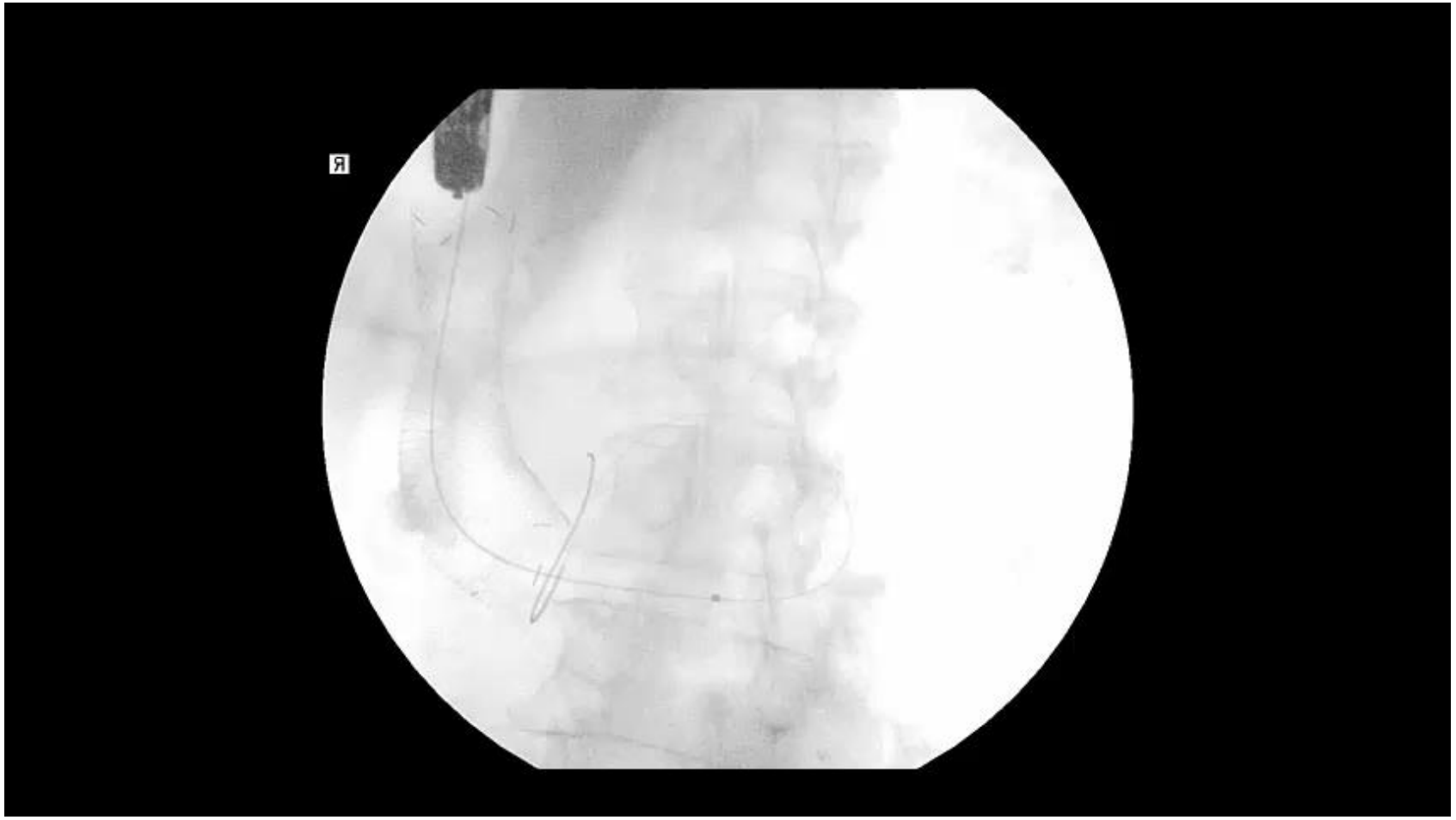
Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

Technique
EUS-GE

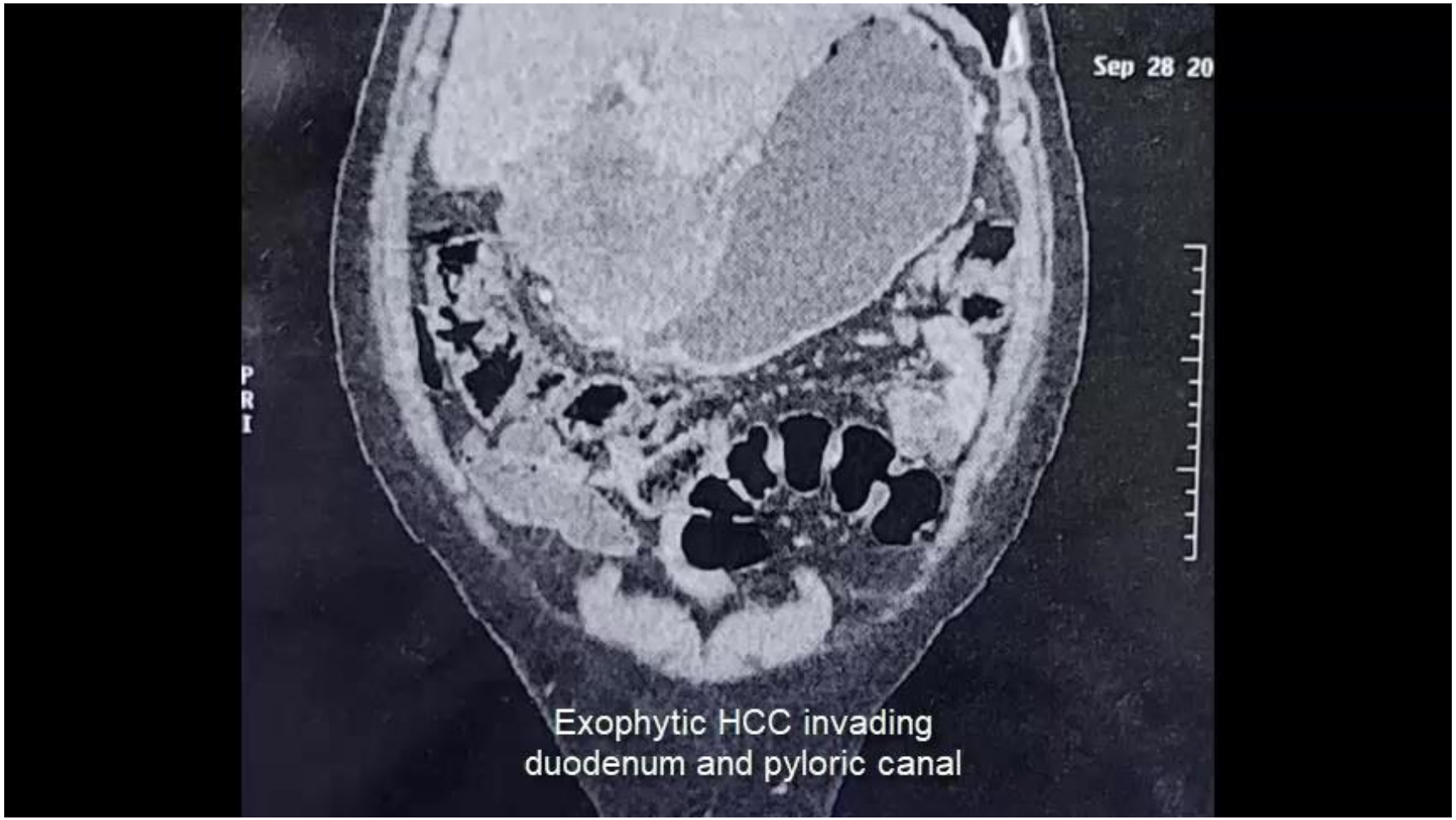
FIGURE 11. Endoscopic vision of the "blue stream" of dyed fluid flowing through the LAMS, from the jejunal loop to the gastric lumen, confirming correct stent positioning.

Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

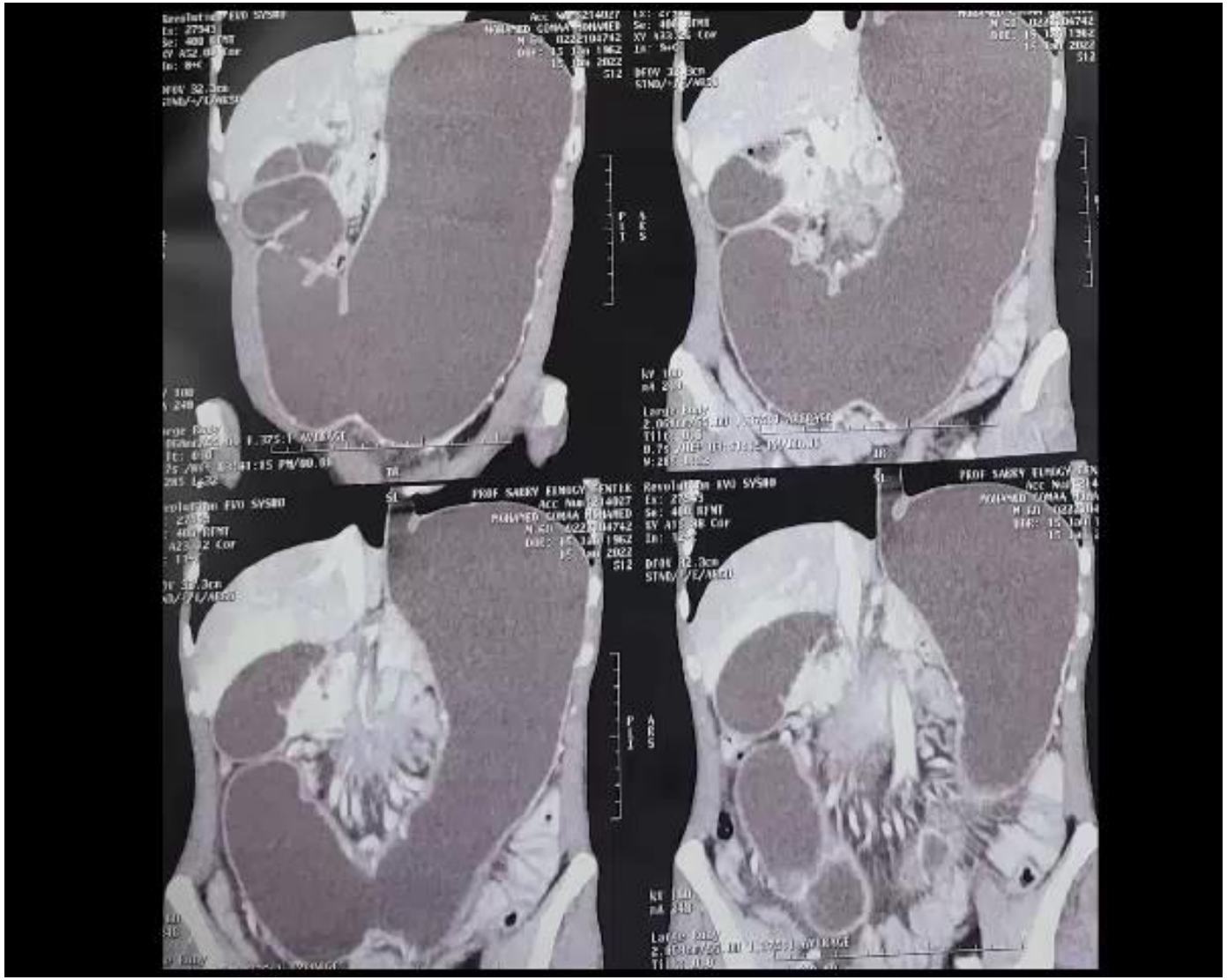
Technique
EUS-GE



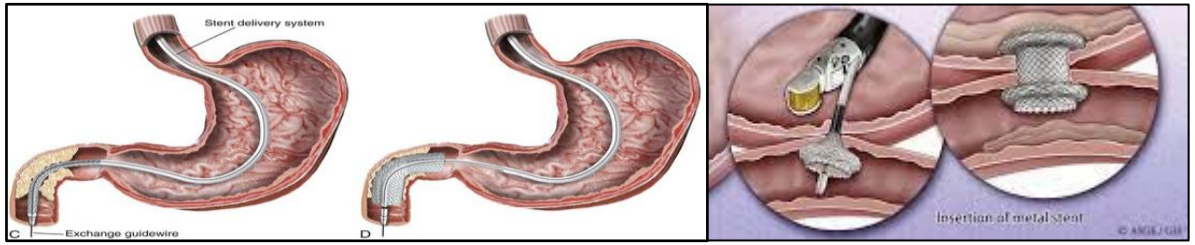
Technique
EUS-GE



Technique
EUS-GE



Contraindications



EUS-GE
Contraindications

EUS-GE contraindications

- Severe malignant ascites
- Extensive peritoneal carcinomatosis
- Gastric linitis plastica
- Specific morphologic factors:
  - Excessive interluminal distance
  - Inability to maintain distention of the target enteral loop diameter > 2.5 cm
  - Interposition of enteral/colonic loops or blood vessels
- General contraindications to interventional procedures
  - Severe, uncorrectable coagulopathy
  - Severe systemic comorbidities precluding anesthesia

Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

EUS-GE
Contraindications

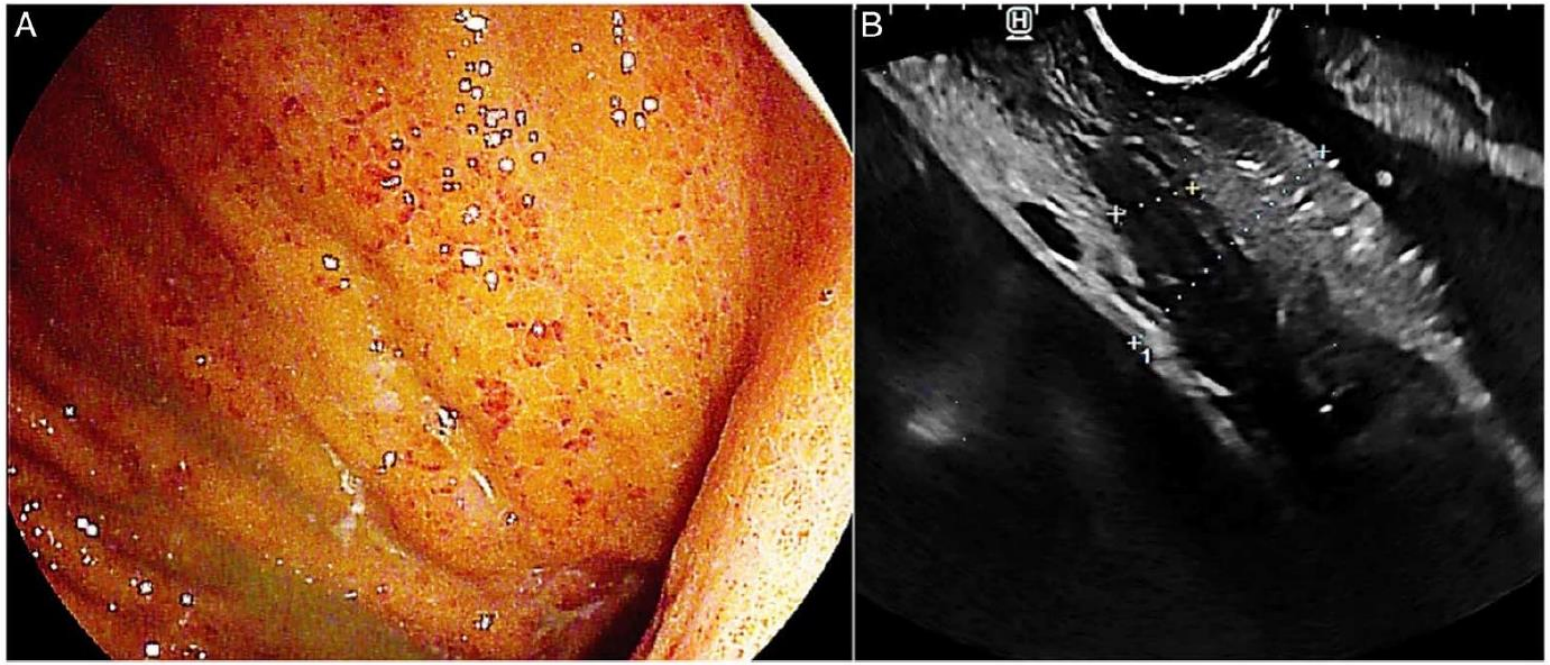
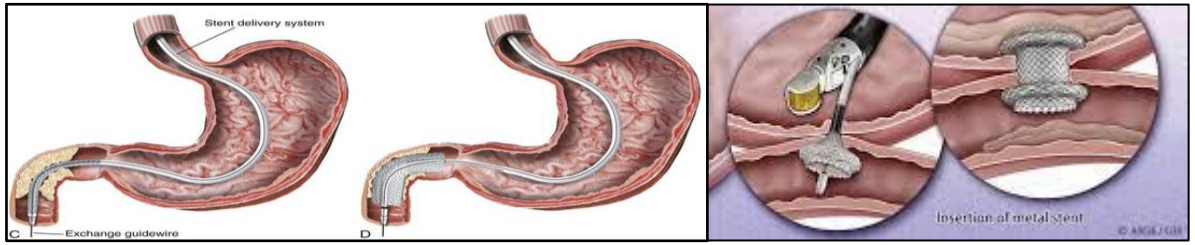


FIGURE 2. Endoscopic (A) and EUS (B) appearance of a diffuse neoplastic infiltration of the gastric wall in a context of linitis plastica. On the EUS image, the black (hypoechoic) layer (smaller dotted line) represents a significantly thickened muscularis propria, while the longer dotted line represents the total thickness of the gastric wall, exceeding 1.5 cm (normal values below 3 to 5 mm).

Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

Adverse events



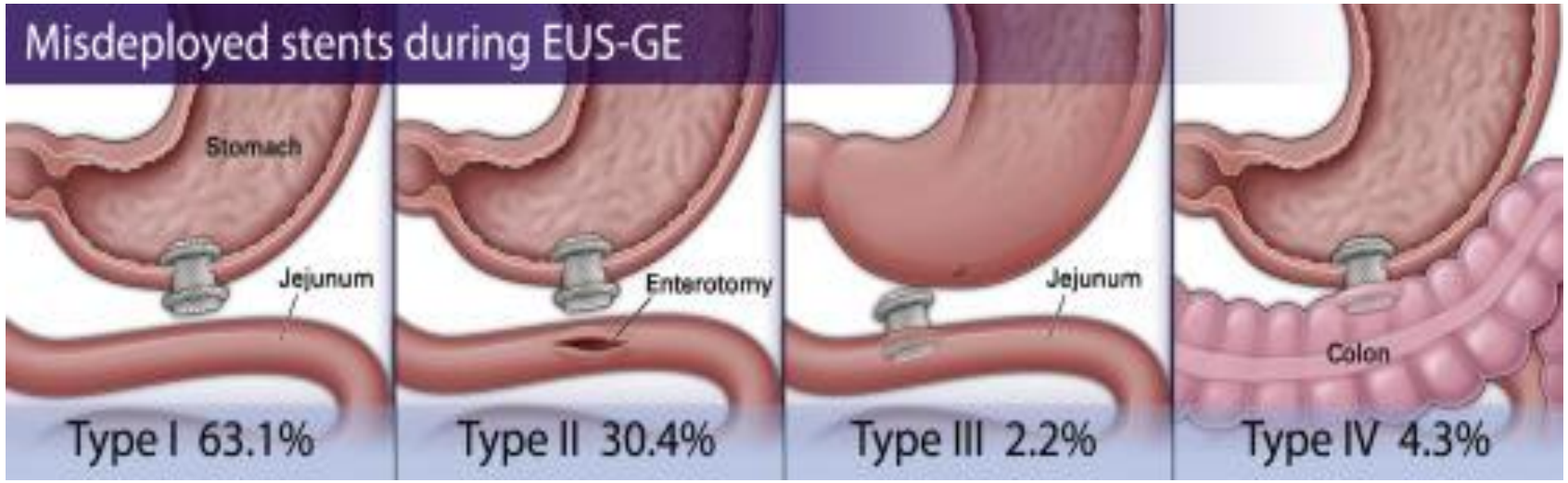
EUS-GE
Adverse events

EUS-GE adverse events

- LAMS misdeployment
- Bleeding
- Cholangitis
- Abdominal pain
- Aspiration pneumonia
- Tissue reactions on the jejunal or gastric side
- LAMS obstruction

Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

EUS-GE
Adverse events



Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

Technique
EUS-GE

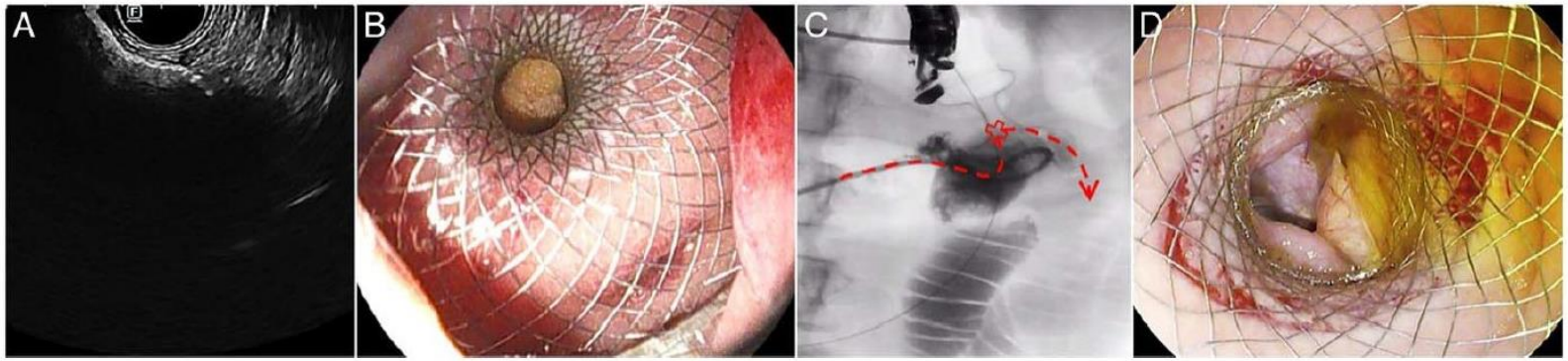


FIGURE 18. Signs of misdeployment with erroneous release of the distal flange of the LAMS inside the peritoneal cavity. A–C, Refer to the same case. A, Absence of the visualization of fluid and the jejunal walls surrounding the LAMS. B, Visualization of the peritoneum through the LAMS. C, Absence of the "contrast bypass confirmation." D, Visualization of the target jejunal loop inside the peritoneal cavity through a dilated LAMS.

Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

EUS-GE
Adverse events

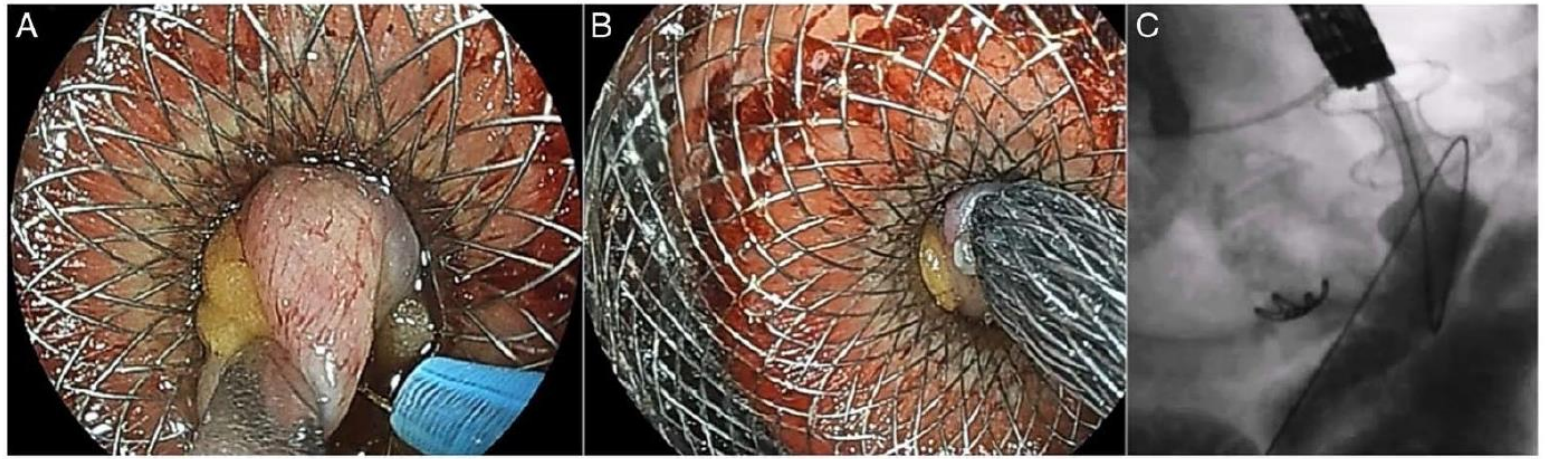


FIGURE 19. NOTES salvage procedure following a type II misdeployment. A, Through-the-LAMS peritoneoscopy, allowing to grasp the target jejunal loop with forceps and to perform an enterotomy using a precut knife. B, After loop cannulation with a guidewire, a new LAMS is advanced and released inside the misdeployed LAMS, stably reconnecting gastric and jejunal lumen. C, Radiologic confirmation of the correct LAMS-in-LAMS placement.

Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

EUS-GE
Adverse events

FIGURE 20. Type IV misdeployment (gastrocolonic anastomosis). A, EUS image showing a distended colonic loop interposition (yellow arrows) between the gastric lumen and the target jejunal loop (pink arrows). B, Endoscopic visualization of the colonic wall through the LAMS. C, Endoscope passing through the LAMS from the stomach to the transverse colon (yellow dashed line) instead of the jejunal lumen (pink dashed line).

Vanella Giuseppe, Frigo, Francesco, Bronswijk Michiel et al. Standardizing Success and Troubleshooting in EUS-Guided Gastroenterostomy: An International Technical Review (With Videos). Journal of Clinical Gastroenterology :10.1097, 2025.

Which is better?

EUS-GE vs DS

	EUS-GE	DS
Technical success	93.3%	98.3%
Clinical success	**88%**	78%
Severe adverse events	**11.6%**	31.3%

EUS-guided gastroenterostomy versus duodenal stent placement and surgical gastrojejunostomy for the palliation of malignant gastric outlet obstruction: a systematic review and meta-analysis. Langenbeck's Archives of Surgery 2021: 406:1803–1817.

EUS-GE vs DS

	EUS-GE	DS
Stent obstruction	**3.3%**	24%
Hospital stay	1.4 days	1.4 days
Reintervention	**6.6%**	28.5%

EUS-guided gastroenterostomy versus duodenal stent placement and surgical gastrojejunostomy for the palliation of malignant gastric outlet obstruction: a systematic review and meta-analysis. Langenbeck's Archives of Surgery 2021: 406:1803–1817.

EUS-GE vs S-GE

	EUS-GE	S-GE
Technical success	91.5%	**100%**
Clinical success	86.7%	90%
Severe adverse events	11.6%	10.4%

EUS-guided gastroenterostomy versus duodenal stent placement and surgical gastrojejunostomy for the palliation of malignant gastric outlet obstruction: a systematic review and meta-analysis. Langenbeck's Archives of Surgery 2021: 406:1803–1817.

EUS-GE vs S-GE

	EUS-GE	S-GE
Hospital stay	**1.4 days**	5.1 days
Reintervention	8.7%	10.5%

EUS-guided gastroenterostomy versus duodenal stent placement and surgical gastrojejunostomy for the palliation of malignant gastric outlet obstruction: a systematic review and meta-analysis. Langenbeck's Archives of Surgery 2021: 406:1803–1817.

EUS-GE vs DS vs S-GE

- The results favours the use of **EUS-GE** for malignant GOO instead of DS, and similar results when compared to SGJ, there remains a lack of consensus guidelines for the management of malignant GOO.
- All patients should be evaluated individually with consideration towards anatomic issues, disease prognosis, available resources, local expertise, and specific patient preferences.


Thank
You!