Reflux in Upper GI Cancers

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Disclosure

- Consultant for Boston Scientific Corp, Olympus, Fujifilm, Neptune Medical

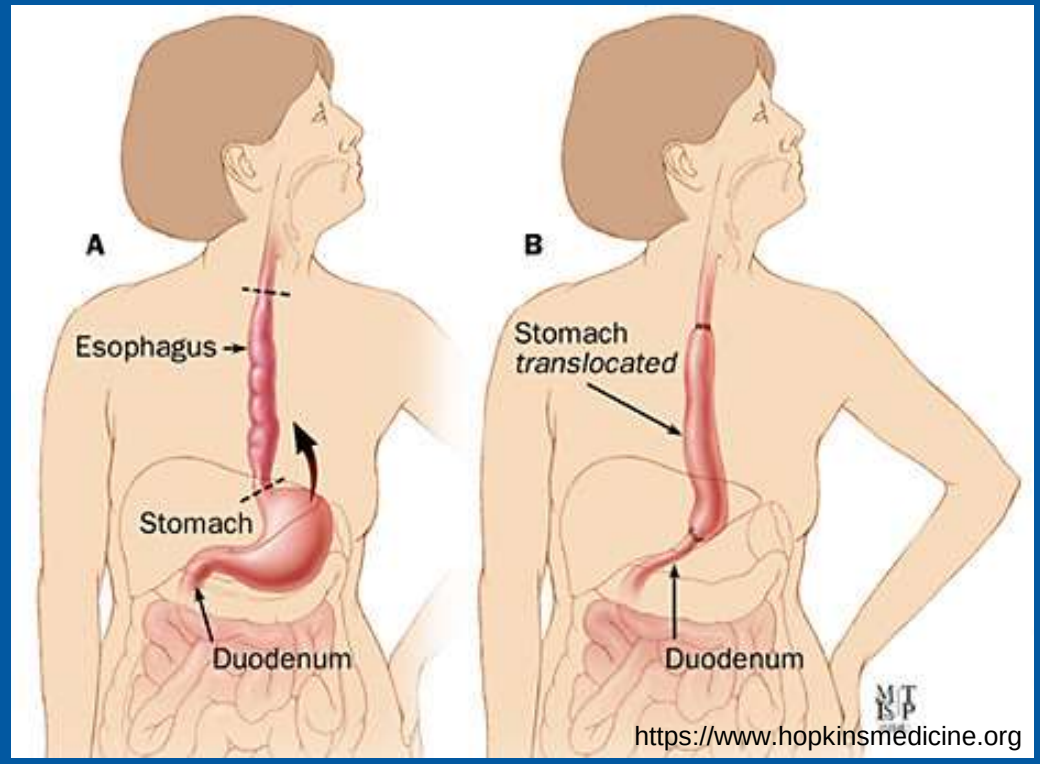
Common GI symptoms after Distal Esophagectomy

- Reflux (39%)
- Delayed gastric emptying (37%)
- Dumping (21%)
- Anastomotic stenosis (16%)
- Anastomotic leakage (5%)

Deldycke A. et al. J Surg Oncol . 2016

Reflux after Esophagectomy

- Disruption of normal anti-reflux mechanisms
  - Lower esophageal sphincter, angle of His, and diaphragmatic muscle
  - Denervation of the vagus nerve



↑ Acid reflux
↑ Duodenogastroesophageal reflux

Yuasa et al. Am J Gastroenterol 2005

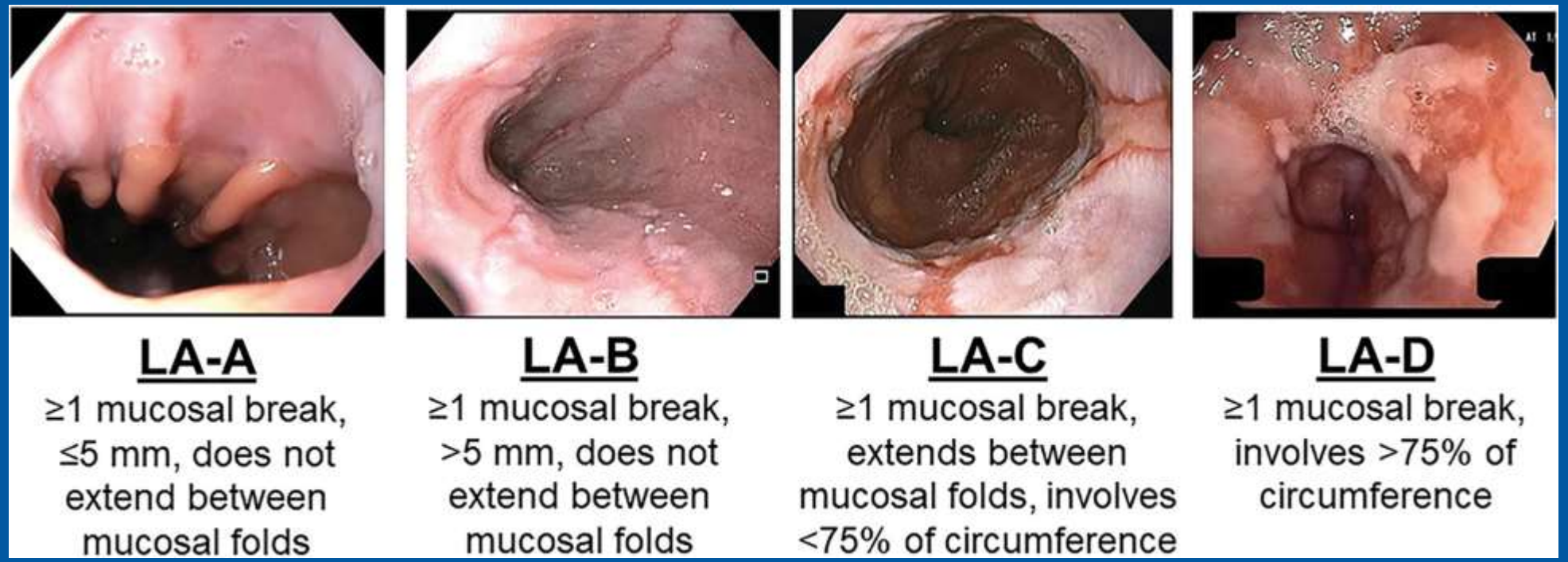
Reflux after Esophagectomy

- Typical symptoms: heartburn, regurgitation
- +/- atypical symptoms: coughing, postprandial pain, belching, discomfort of the pharyngolarnyx

- Lying down or sleeping - the position or posture is the main cause of worsening symptoms

Reflux after Esophagectomy

- EGD:
  - 72% of esophagectomy patients have reflux esophagitis

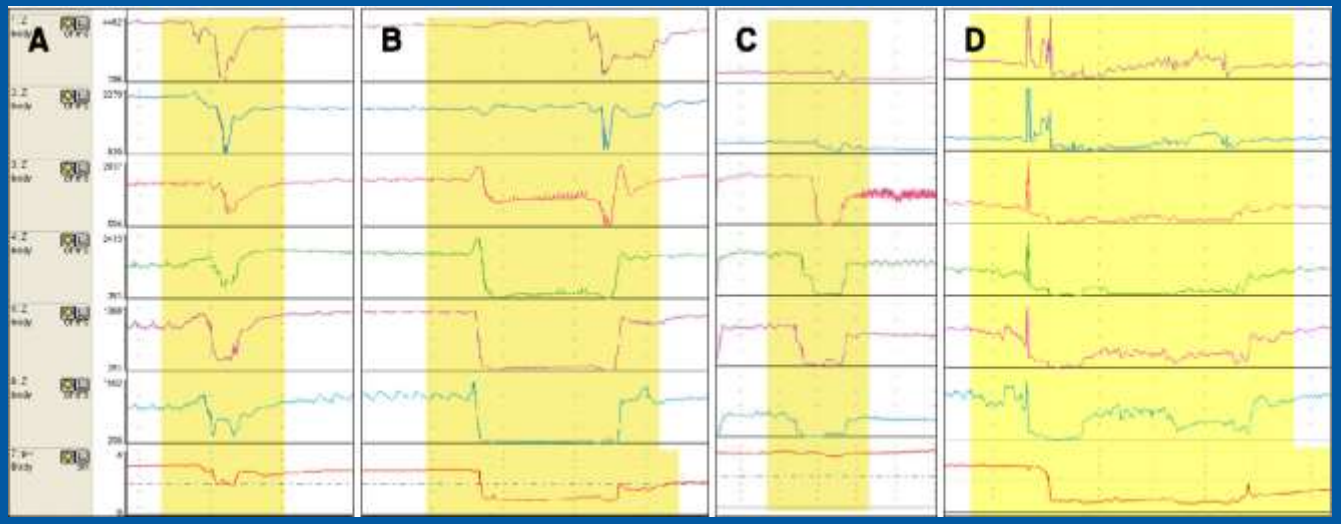


Los Angeles (LA) Grades of Erosive Esophagitis

Shibuya S, et al. World J Surg 2003
Spechler SJ. Clinical Gastroenterology and Hepatology. 2024

Reflux after Esophagectomy

- Esophageal pH monitoring:
  - 24-hour impedance-pH testing
  - An objective method used to evaluate reflux after esophagectomy



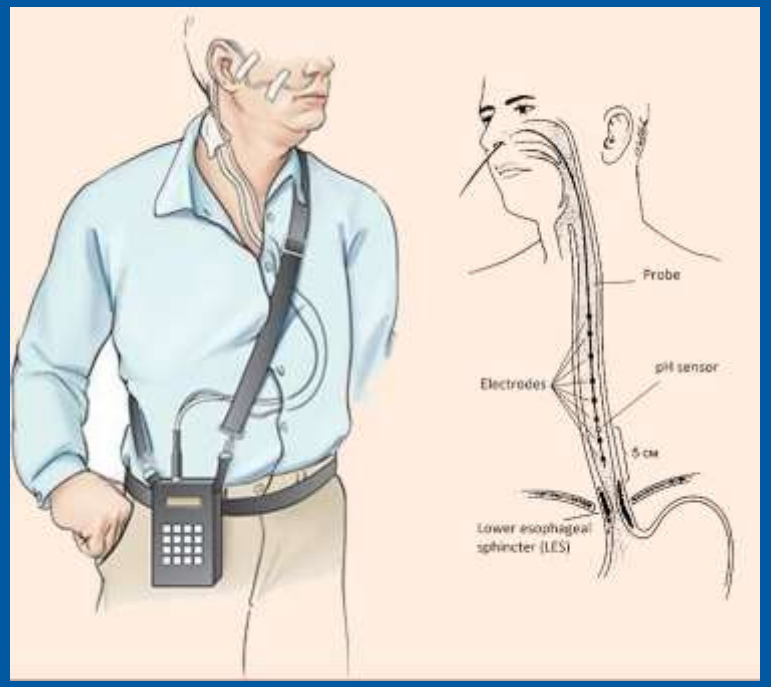


Table 1. Normal Values for Impedance pH Monitoring: Reflux Episodes (95th percentile)

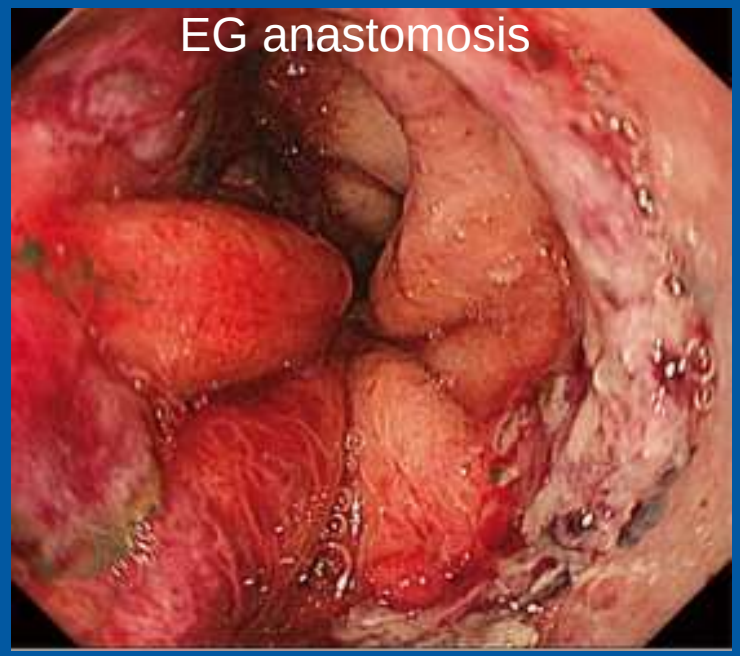
	Distal reflux events (5 cm above LES)					Proximal reflux events (15 cm above LES)				
	Total	Acid	Weakly acid	Weakly alkaline	Super-imposed acid	Total	Acid	Weakly acid	Weakly alkaline	Super-imposed acid
Total	73	55	26	1	4	31	28	12	1	2
Upright	67	52	24	1	4	29	25	11	1	2
Recumbent	7	5	4	0	1	3	2	1	0	0

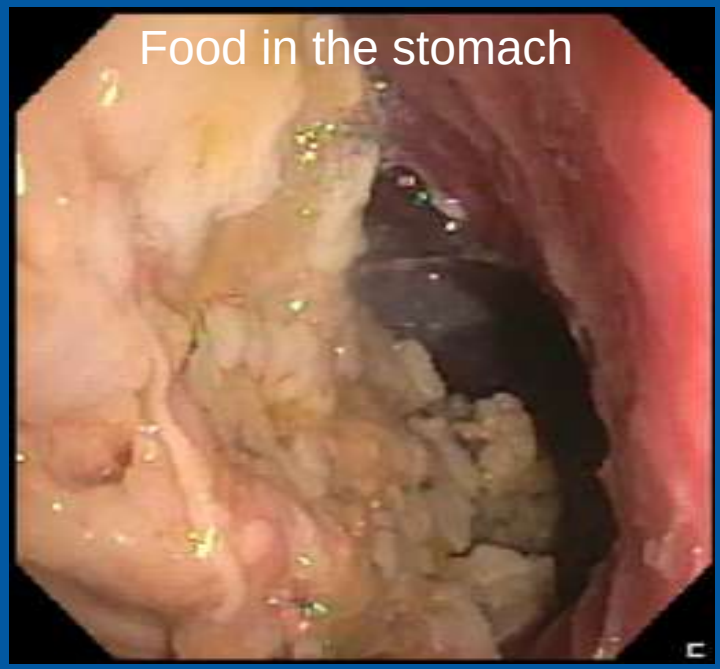
LES, lower esophageal sphincter.

Shibuya S, et al. World J Surg 2003
Cho Y. Journal of Neurogastroenterology and Motility. 2010

Case: HM: reflux, N/V, early satiety after esophagectomy

- EGD:
  - LA grade D (severe) esophagitis
  - Patent ulcerated EG anastomosis in the mid esophagus
  - Residual food in the stomach
  - Patent pylorus
  - Normal duodenum





Kobayashi S. Langenbeck's Archives of Surgery. 2023.

Delayed gastric emptying after esophagectomy

- Occur in 15–39% patients after esophagectomy

Causes
Relaxation dysfunction of the pylorus
Dysfunctional peristalsis (complete vagotomy)
Unfavorable pressure gradient (negative thoracic pressure, positive abdominal pressure)
Torsion or angulation of the conduit
Redundant gastric conduit
Insufficient widening of esophageal hiatus

Lee HS, et al. Ann Thorac Surg. 2005

Delayed gastric emptying after esophagectomy

Presentation:

- Nausea, vomiting, anorexia, early satiety, loss of appetite, bloating and abdominal pain
- Without any evidence of mechanical obstruction from CT/MR enterography

Lee HS, et al. Ann Thorac Surg. 2005

Delayed gastric emptying after esophagectomy

Presentation:

- Nausea, vomiting, anorexia, early satiety, loss of appetite, bloating and abdominal pain
- Without any evidence of mechanical obstruction from CT/MR enterography
- Heartburn, regurgitation, dysphagia to solids, coughing, chest pressure
- Increases the risk of aspiration pneumonia and anastomosis leak

Lee HS, et al. Ann Thorac Surg. 2005

Delayed gastric emptying after esophagectomy

- CT: r/o any sign of mechanical obstruction in the GI tract

Lee HS, et al. Ann Thorac Surg. 2005

Delayed gastric emptying after esophagectomy

- CT: r/o any sign of mechanical obstruction in the GI tract
- Endoscopy:
  - Confirm the presence of an anastomotic stricture or narrow pyloric orifice
  - The presence of residual food in the gastric conduit during endoscopy despite proper fasting is an important clue

Lee HS, et al. Ann Thorac Surg. 2005

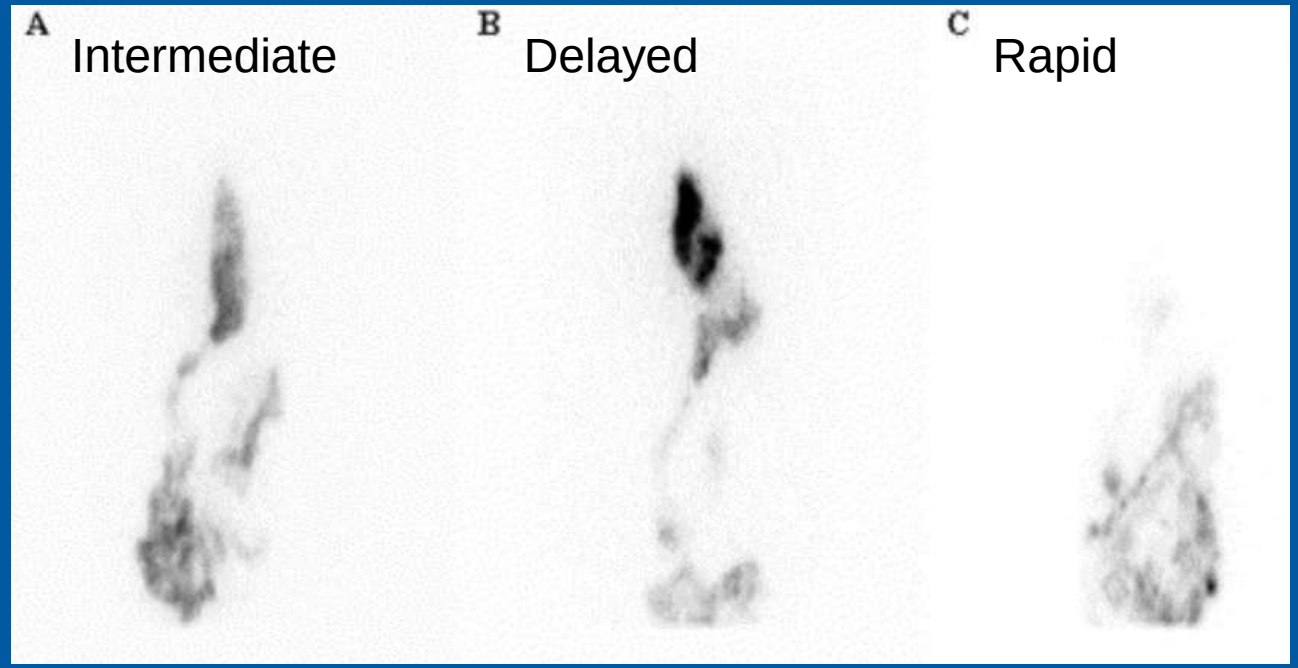
Delayed gastric emptying after esophagectomy

- CT: r/o any sign of mechanical obstruction in the GI tract
- Endoscopy:
  - Confirm the presence of an anastomotic stricture or narrow pyloric orifice
  - The presence of residual food in the gastric conduit during endoscopy despite proper fasting is an important clue
- Barium swallowing test: Redundancy, kink, or herniation of the gastric conduit, the level of mechanical obstruction

Lee HS, et al. Ann Thorac Surg. 2005

Delayed gastric emptying after esophagectomy

- Scintigraphy: confirms diagnosis



(A) Intermediate gastric emptying is defined as 50% gastric emptying within 180 minutes.
(B) Delayed gastric emptying is defined as 50% gastric emptying taking more than 180 minutes.
(C) Rapid gastric emptying is defined when the radioisotope was dumped into the small intestine immediately after swallowing a radiolabeled meal.

- Difficult to standardize different protocols for each institution

Lee HS, et al. Ann Thorac Surg. 2005

Delayed gastric emptying after esophagectomy

Management:

- Intrathoracic gastric motility gradually improves over a period of 6 months to 3 years after surgery

- Less invasive approach first:
  - Dietary modification, medication, or endoscopic intervention
- In severe cases, revisional surgery may be required

Rove JY, et al. J Thorac Cardiovasc Surg. 2017

Delayed gastric emptying after esophagectomy

Management:

- Dietary modifications
  - Smaller, more frequent, and more liquid-based meals
  - Soft and cooked foods consisting of low-fat and low-fiber ingredients

Rove JY, et al. J Thorac Cardiovasc Surg. 2017

Delayed gastric emptying after esophagectomy

Management:

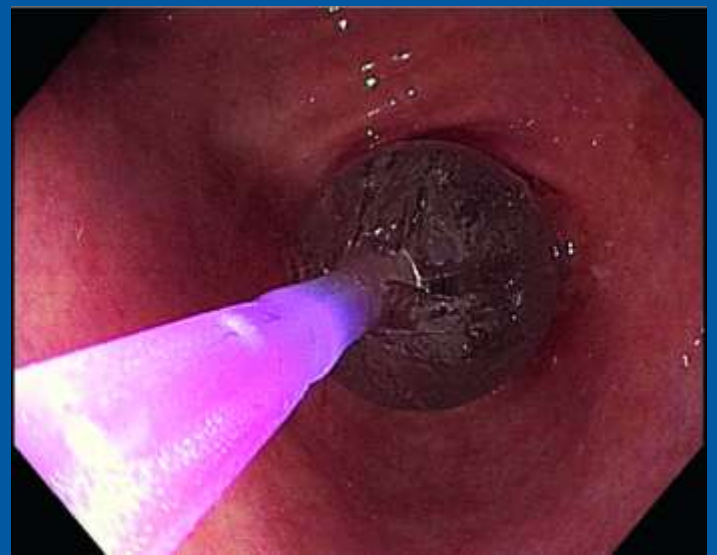
- Prokinetics
  - Metoclopramide (the only drug approved by FDA for the treatment of gastroparesis), domperidone, cisapride
    - No clear evidence of benefits in patients with DGE after esophagectomy
  - Erythromycin
    - Motilin receptor agonist in the antrum and duodenum
    - Limited by its tachyphylaxis. Its effects wane after a few weeks of daily use

Dhir R, et al. J Clin Gastroenterol. 2004

Delayed gastric emptying after esophagectomy

Endoscopic Management:

- Endoscopic balloon dilatation of the pylorus
  - A safe and effective therapy
  - Two thirds of patients with delayed gastric emptying show increased rates of gastric emptying
  - Balloon size of 30 mm was more successful than a 20-mm balloon



Kim JH et al. European Journal of Cardio-Thoracic Surgery, 2008

Delayed gastric emptying after esophagectomy

Endoscopic Management:

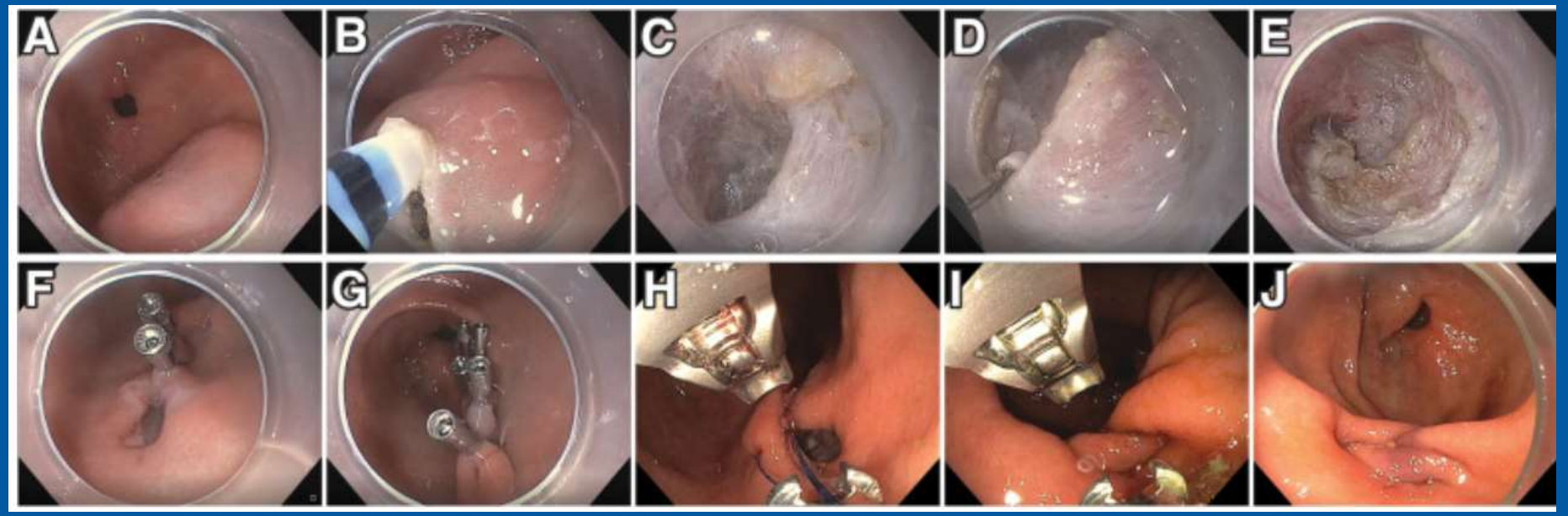
- Intra-pyloric injection of Botulinum toxin
  - Botulinum toxin could weaken the pyloric smooth muscles temporarily during the early postoperative period
  - Relaxing effect might disappear within 12 weeks
  - Potentially decreased bile reflux and dumping syndrome
  - Studies results are conflicting

Lee HS, et al. Ann Thorac Surg. 2005

Delayed gastric emptying after esophagectomy

Endoscopic Management:

- Gastric Peroral Endoscopic Myotomy
  - 1-year pooled clinical success rate of 61% in gastroparetic patients
  - Refractory gastroparesis



Khashab MK et al. Gastroenterology. 2023