Postoperative Complications after Esophagectomy

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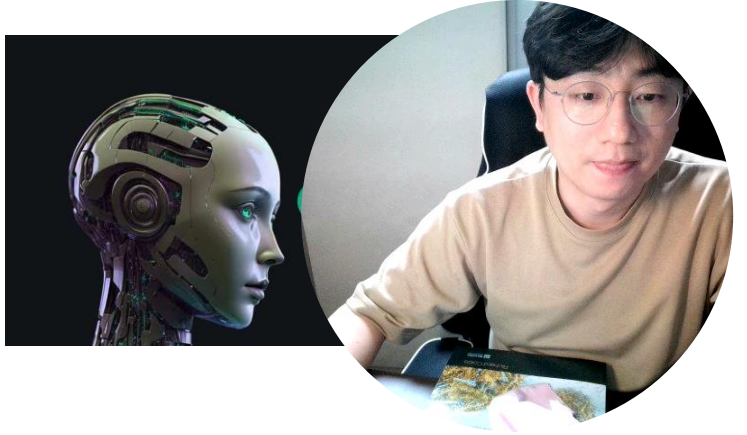
ChatGPT4



Q. Tell me about the types of complications after esophagectomy.

A.

- Anastomotic leak: This occurs when the connection between the remaining esophagus and the stomach leaks, which can cause infection and other complications.
- Pulmonary complications: These may include pneumonia, acute respiratory distress syndrome (ARDS), or lung collapse.
- Cardiovascular complications: These may include heart attack, stroke, or deep vein thrombosis (DVT).
- Wound infection: The surgical incision may become infected, which can lead to fever, redness, and swelling.
- Delayed gastric emptying: This occurs when the stomach takes too long to empty, which can cause nausea, vomiting, and abdominal pain.
- Reflux: Some patients may experience reflux of stomach acid into the esophagus, which can cause heartburn, chest pain, and difficulty swallowing.
- Nutritional deficiencies: After esophagectomy, some patients may have difficulty absorbing nutrients from food, which can lead to nutritional deficiencies.

→ It's important to note that not all patients will experience complications after esophagectomy, and the risk of complications can be reduced through **careful preoperative evaluation and planning, proper surgical technique, and close postoperative monitoring.**

Mortality

- In-hospital mortality: 0 ~ 22%
- 30-day mortality (excluding in-hospital deaths): < 6%
- Similar mortality rate: Cancer vs. Benign disease
- The development of postoperative complications → affect longer-term mortality rates

- **Systemic complications**
  - Pulmonary
    :pneumonia, bronchospasm, ARDS, pulmonary embolism
    COPD exacerbation
  - Cardiac
    : A-fib, MI
- **Procedure-specific complications**
  - Conduit complications
    : anastomotic leak, conduit ischemia, anastomotic stricture
  - RLN injury
  - Chylothorax
- **Functional disorders**
  - dysphagia, delayed gastric emptying, reflux, dumping syndrome
- **Hiatal hernia**

Esophageal Cancer Surgery

- Extensive and Aggressive surgical procedures

- **Pneumonia (+)**
- **Old age**
- **Conduit complication (+)**

→ ***Mortality risk*** ⬆

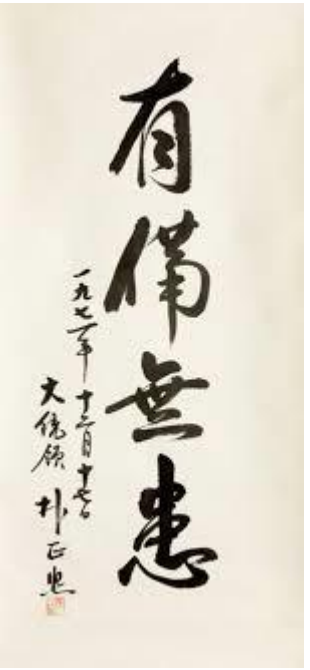
Risk Factors for Complications

- Increasing age
- Compromised pulmonary function (COPD)
- Malnutrition
- Renal or Hepatic dysfunction
- Emergency operation
- Comorbid illness (DM, CAD, LC, obese)

“An ounce of prevention is worth a pound of cure”

- Benjamin Franklin

- proper patient selection
- preparation
- selection of esophagectomy type
- conduct of the operation
- intraoperative anesthesia management
- meticulous postoperative care



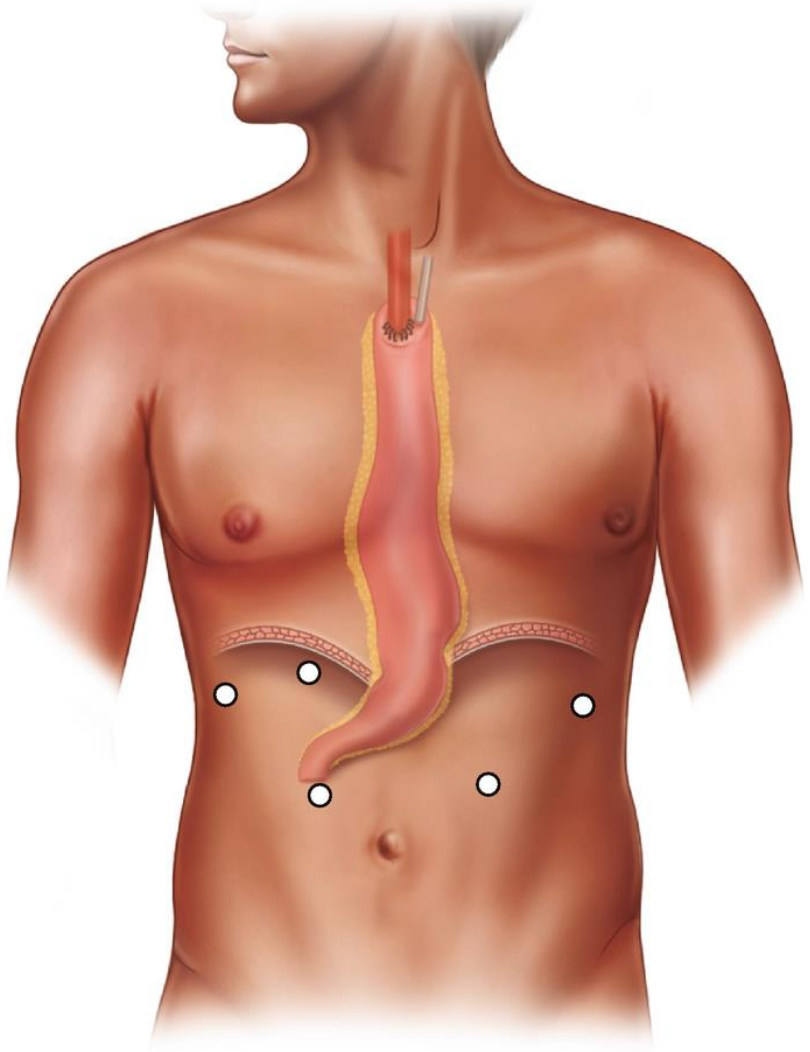
Pulmonary Complications

- m/c (16 to 67%)
- Pneumonia, Bronchospasm, ARDS, acute exacerbation of COPD, pulmonary embolism
- Two thirds of mortality related to esophageal cancer surgery
- Pneumonia is an independent risk factor for postoperative mortality

Aspiration

- Preoperative respiratory rehabilitation
- Postoperative lung care
- Proper perioperative oral hygiene
- Adequate pain management
- ***Minimally Invasive Esophagectomy (VATS/ RAMIE)***

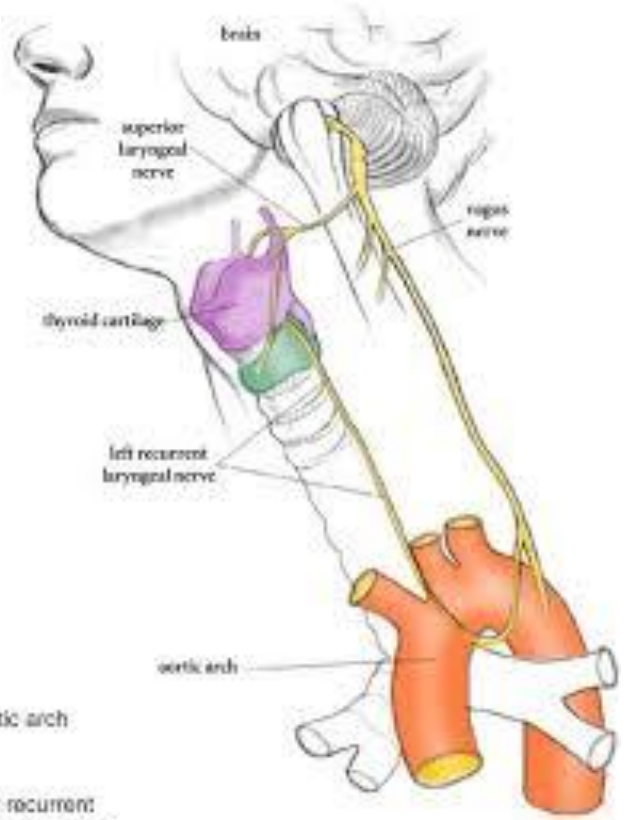
Aspiration

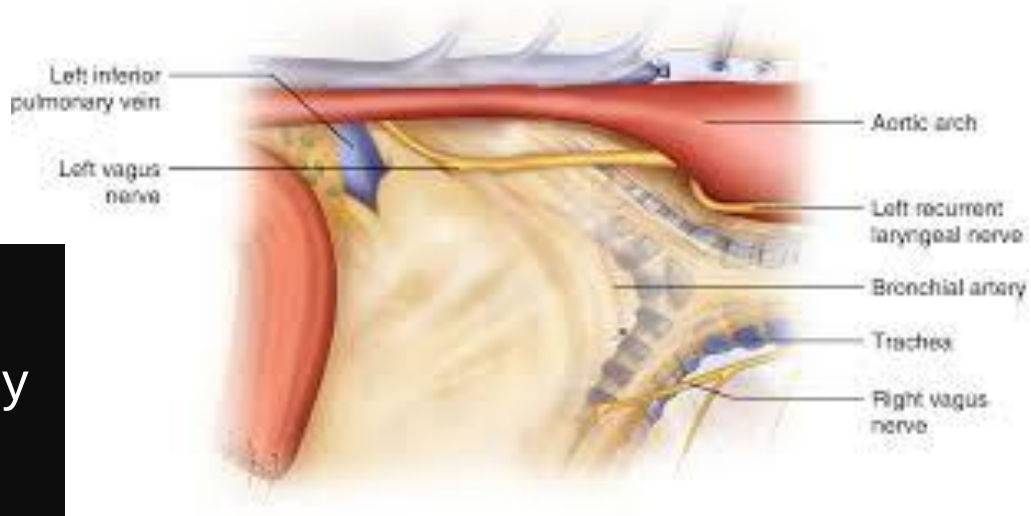


1. RLN injury
2. Anastomotic stricture
3. Hiatus narrowing
4. Pylorus narrowing
5. Regurgitation

RLN injuyry

- Hoarseness, dyspnea, aspiration pneumonia
- Laryngoscopy, swallowing evaluation, Voice
- Vocal cord injection





1. Three-Field esophagectomy
2. Cervial anastomosis
3. Transhiatal esophagectomy

Cardiac Complication

- **A-fib (first warning sign)**
  - up to 20%
  - significantly higher rates of pulmonary complication, anastomotic leaks, and mortality rates

- **MI**
  - significantly implication for the health of the conduit

Conduit complications

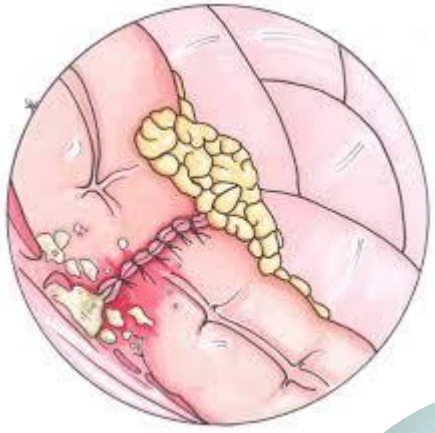
- Viable conduit needs to be
  - well-vascularized
  - adequately mobilized (reduced tension)
  - not long (ischemic portion resected)
  - treated gently

- The anastomosis needs to be
  - sufficiently wide
  - closed securely

1. **Anastomotic leak**
2. **Conduit ischemia**
3. **Anastomotic stricture**

1. Anastomotic Leak

- Incidence – 5 to 40 %
- Factors that influence the incidence of anastomotic leak include:
  - anastomotic technique (hand sewn vs stapled vs hybrid)
  - location of anastomosis (neck vs chest)
  - type of conduit (stomach vs colon vs small bowel)
  - location of the conduit (orthotopic vs heterotopic)
  - conduit ischemia
  - neoadjuvant therapy
  - comorbid conditions (HF, HTN, renal insufficiency)
  - Etc. (surgeon's experience,,,,)



1. Anastomotic Leak

Table 1. Esophagogastric Anastomotic Leak Classification[a]

Grade	Leak Classification	Definition	Treatment
I	Radiologic	• No clinical signs or symptoms • Purely radiologic diagnosis	• No change in management
II	Clinical minor	• Minor clinical signs (eg, cervical wound inflammation or drainage) • Radiographically contained intrathoracic leak • Fever, leukocytosis	• Delay oral intake • Antibiotics • Wound drainage • CT-guided drain placement
III	Clinical major	• Significant anastomotic disruption requiring surgical revision • Minor anastomotic disruption with systemic sepsis	• Esophageal stent placement • Surgical debridement • Anastomotic revision
IV	Conduit necrosis	• Conduit necrosis necessitating esophageal diversion	• Conduit resection with esophageal diversion

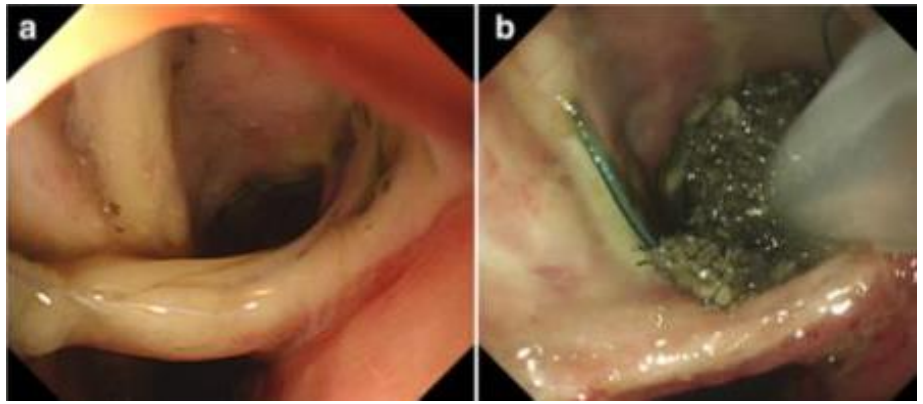
Price et al. Ann Thorac Surg 2013;95:1154-61

1. Anastomotic Leak

- Incidence : Cervical anastomosis > thoracic anastomosis
  - The morbidity of pleural and mediastinal soilage is theoretically higher

✓ Cervical anastomotic leaks – drainage of the neck wound with subsequent wet-to-dry dressing changes

✓ Thoracic anastomotic leaks – more likely to require re-exploration



Endoscopic stenting / ***Endoluminal VAC***

(in selected circumstances)

1. Anastomotic Leak

- **Basic principle** of anastomotic leak management

  - 1. Blood flow to the esophageal conduit is vulnerable to hypotension

    : adequate hemodynamic monitoring / euvolemia / avoidance of vasopressors

  2. Adequately drainage

    : wound opening or percutaneous drainage

    CT for extraluminal collection

  3. NG tube, NPO

  4. Systemic antibiotics (empirically, antifungal therapy)

2. Conduit Ischemia

- Incidence – 9%
- The presence of comorbid illness increased the risk of conduit ischemia
- Similar on gastric pull up and colon interposition
- Diagnostic tool – Endoscopy (best)
- Take-down of the gastric pull-up, resection of the necrotic bowel,

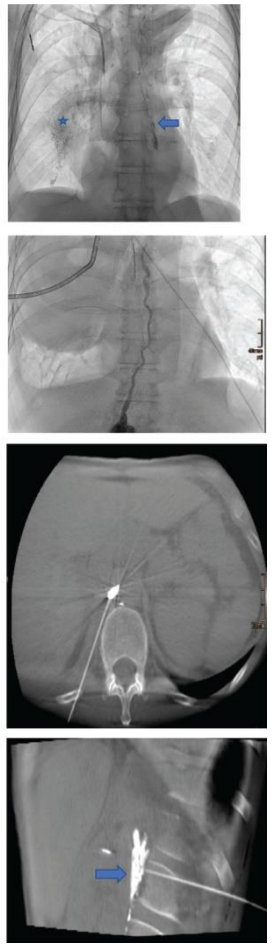
  cervical esophageal diversion, and placement of a feeding jejunostomy

3. Anastomotic Stricture

- Incidence – 9~40%
- Due to conduit ischemia or recurrent disease at the anastomotic site
- Dysphagia, odynophagia, aspiration, inadequate dietary intake, and malnutrition
- Diagnostic tool – Endoscopy (best)
- Often closely linked to conduit malperfusion/ischemia or surgical technique

+ anastomotic leak

Chylothorax

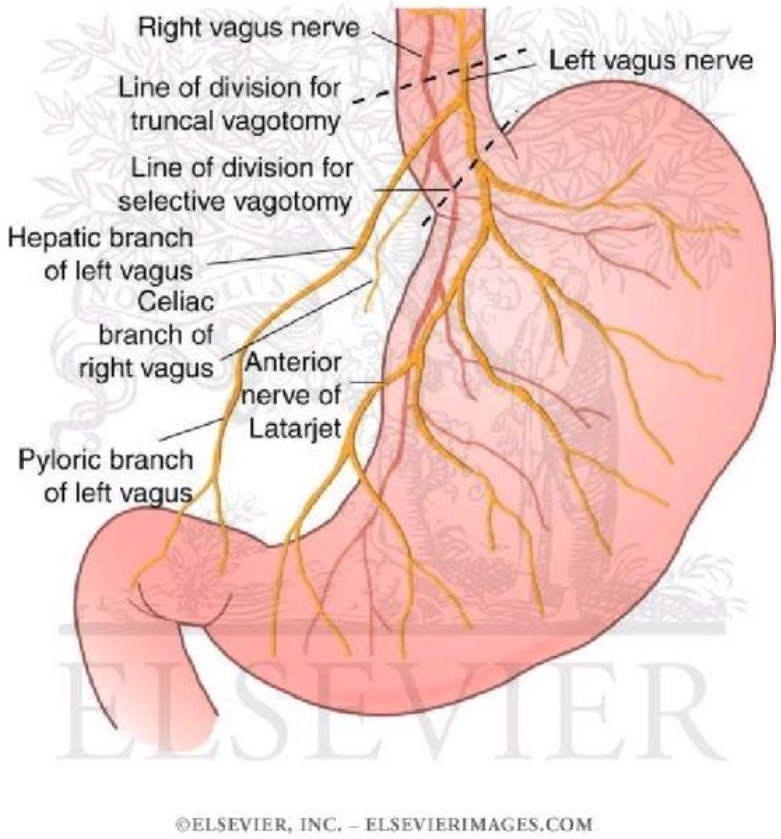


- Incidence : 0 – 8%
- Prophylactic ligation of the thoracic duct is controversial
- Elimination of enteral nutrition, parenteral nutritional support (TPN)
- Close observation of chest tube output
- Octreotide and fluid resuscitation
- Surgical intervention : > 10mL/kg over 5 days

Functional Disorders

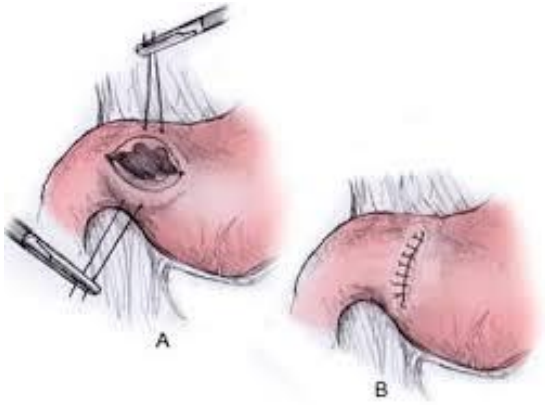
- Dysphagia – up to 65% (m/c: anastomotic stricture – ischemia/recurrence)
- **Delayed gastric emptying** (m/c: truncal vagotomy)
- **Reflux**
- Dumping syndrome (early dumping)

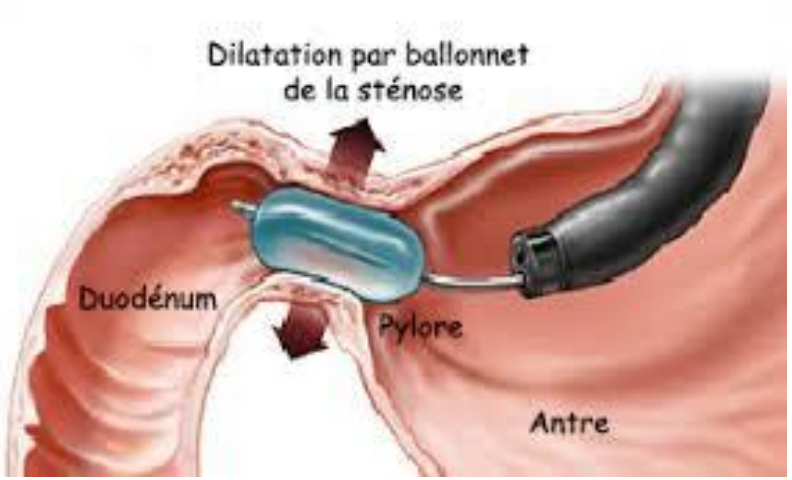
  → increased frequency, decreased size of meals

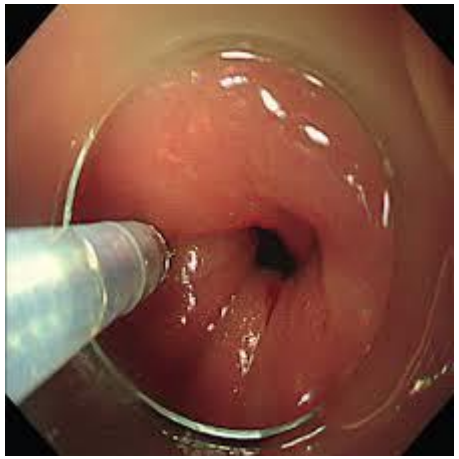


Delayed Gastric Emptying

- One of the major causes of severe aspiration pneumonia
- Gastric outlet procedures (pyloromyotomy or pyloroplasty)
- s/e: dumping, duodenal reflux (biliary reflux) – Endoscopic balloon dilatation
  Botox injection

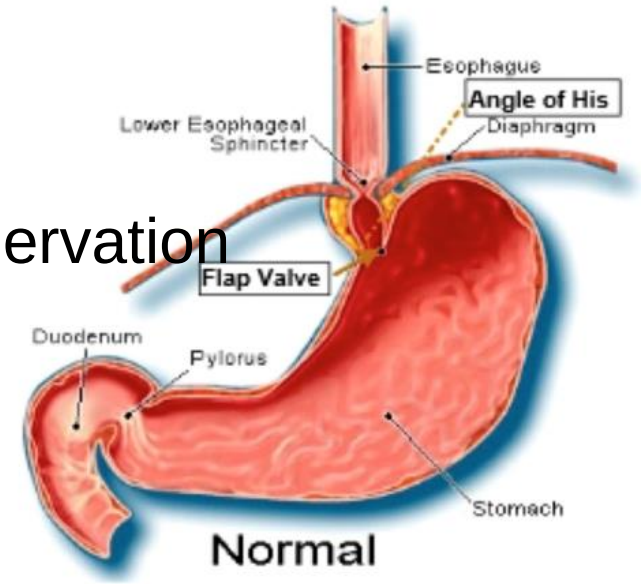






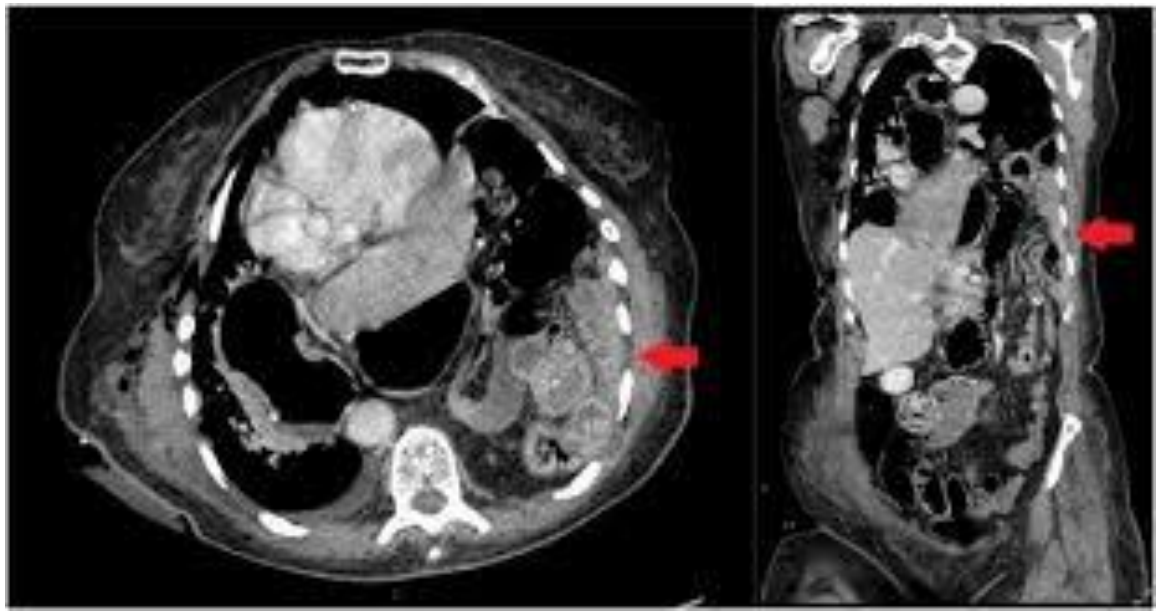
Reflux

- Loss of anti-reflux mechanism (LES, angle of His, diaphragmatic sling)
- Direct anastomosis with no sphincter-like mechanism to prevent reflux
- Positive intra-abdominal pressure, negative intrathoracic pressure
- Impaired conduit motility
- Impaired esophageal remnant motility, possibly related to denervation



PPI + Motility agents

Diaphragmatic Hernia



- Uncommon but challenging problem
- More often after MIE (VATS, Robot)
- Nausea, vomiting, progressive chest pain, and unexplained weight loss
- Reduction of hernia contents
- Primary repair of the hernia defect
- Avoiding injury to the vasculature of the esophageal conduit
- The abdominal approach is preferred

Thank You For Your Attention