양성 식도 질환의 치료

황진욱

고려대학교

목차

I. 운동장애질환

Motility disorder

CLASSIFICATION OF ESOPHAGEAL MOTILITY DISORDERS

- Inadequate LES relaxation
  - Classic achalasia
  - Atypical disorders of LES relaxation
- Uncoordinated contraction
  - Diffuse esophageal spasm
- Hypercontraction
  - Nutcracker esophagus
  - Isolated hypertensive LES
- Hypocontraction
  - Ineffective esophageal motility

LOCATION OF ESOPHAGEAL MOTILITY DISORDERS

상부 식도

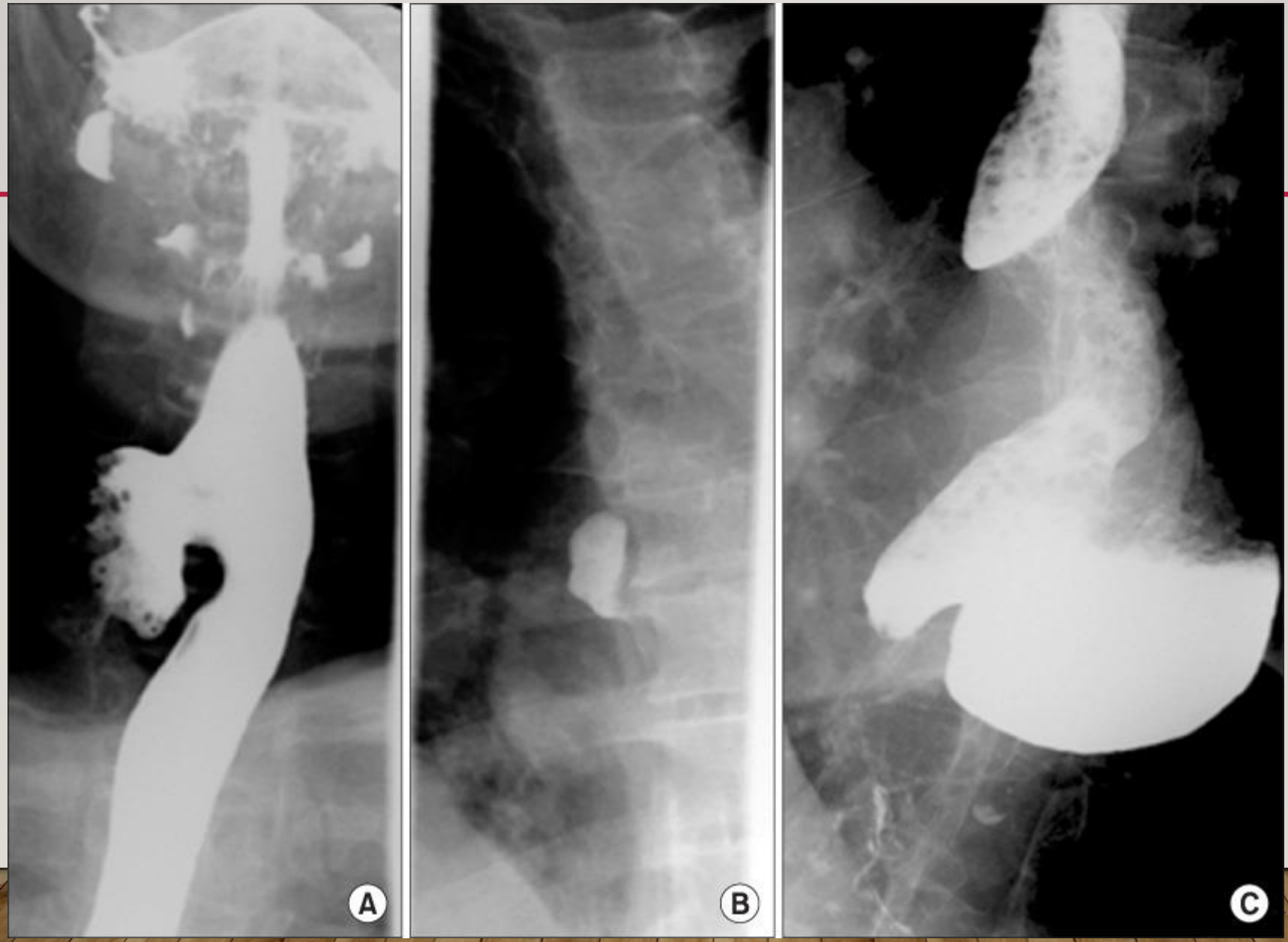
괄약근 운동장애

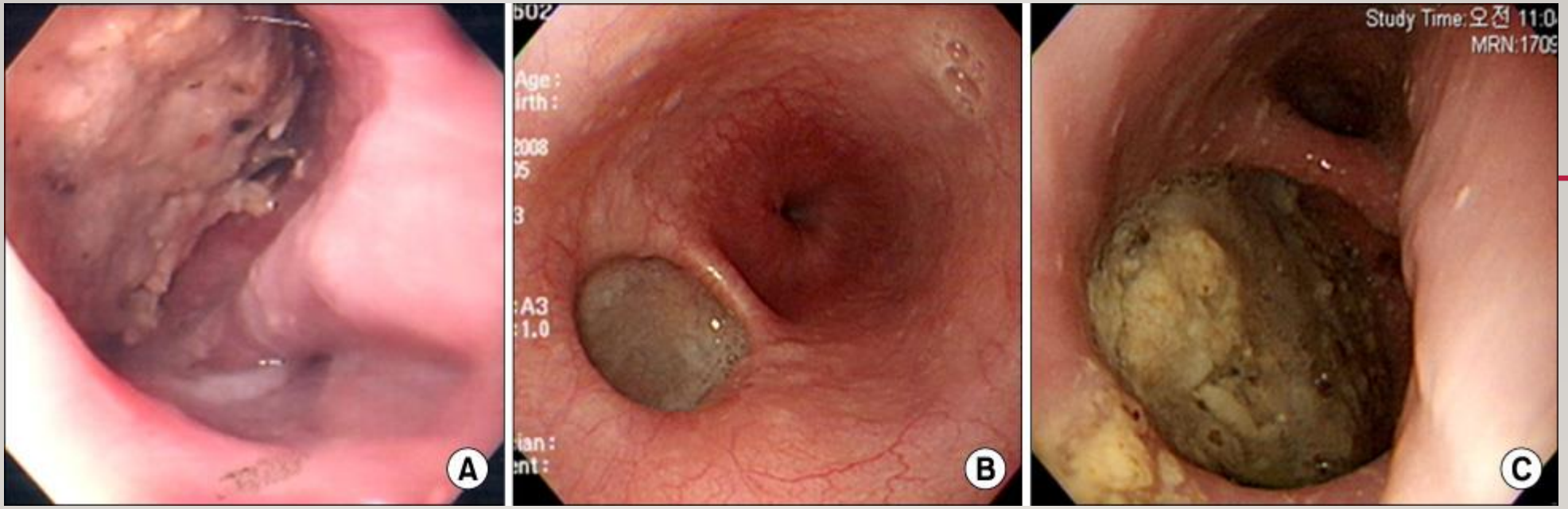
- Zenker's diverticulum

체부 및 하부 식도

괄약근 운동장애

- Achalasia
- Diffuse esophageal spasm
- Nonspecific esophageal motor dysfunction
- Secondary motor dysfunction
- Epiphrenic diverticulum


A
B
C

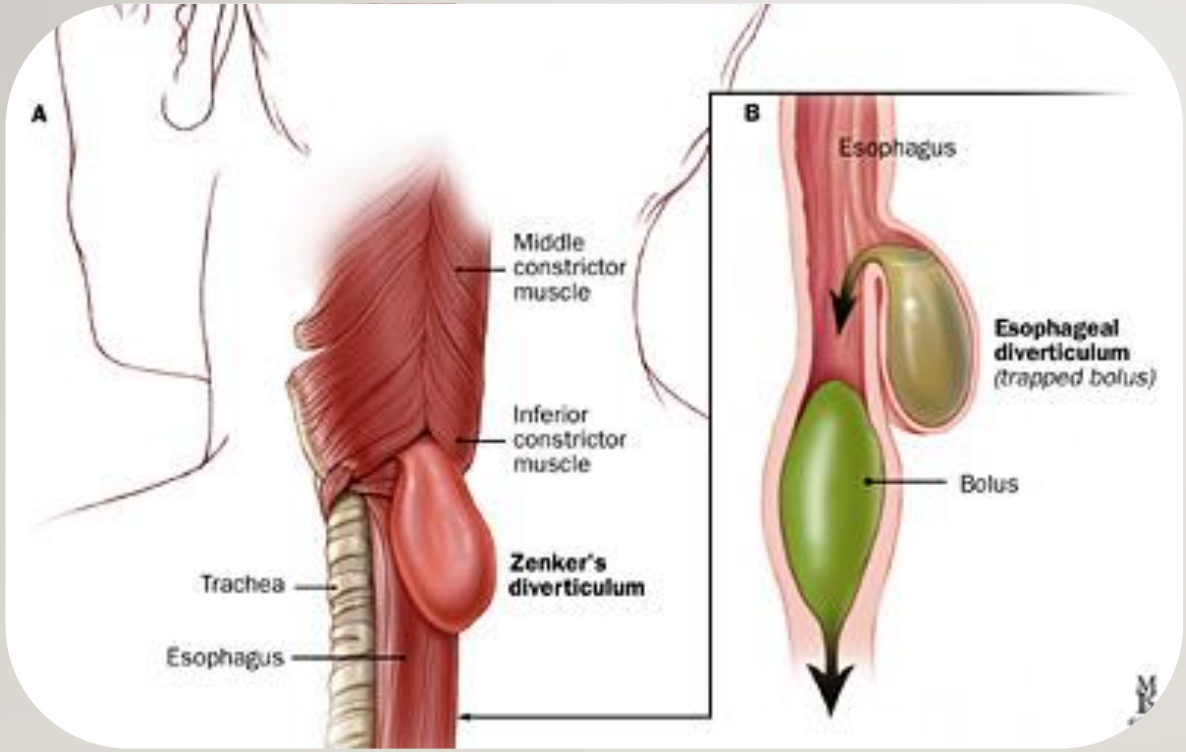


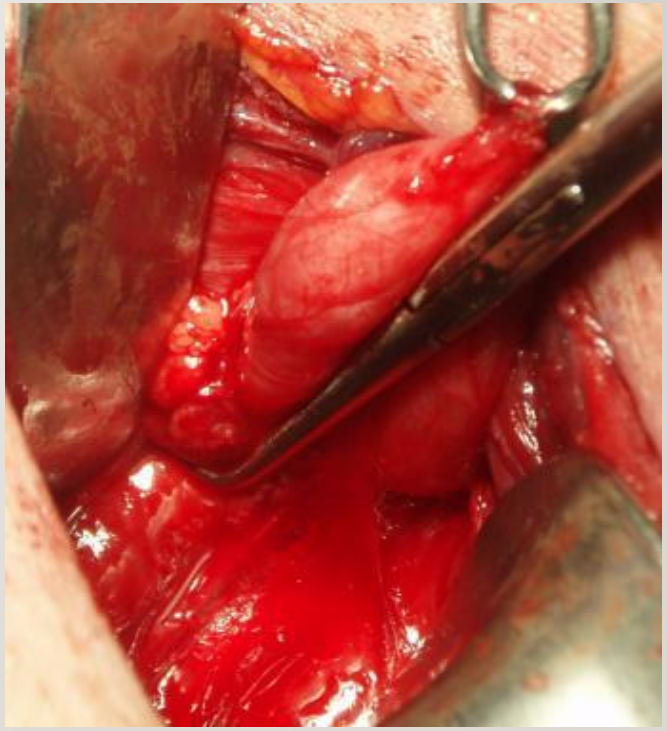
Esophagoduodenoscopic demonstrate (A) phryngoesophageal, (B) midesophageal and © epiphrenic esophageal diverticula.

ZENKER'S DIVERTICULUM

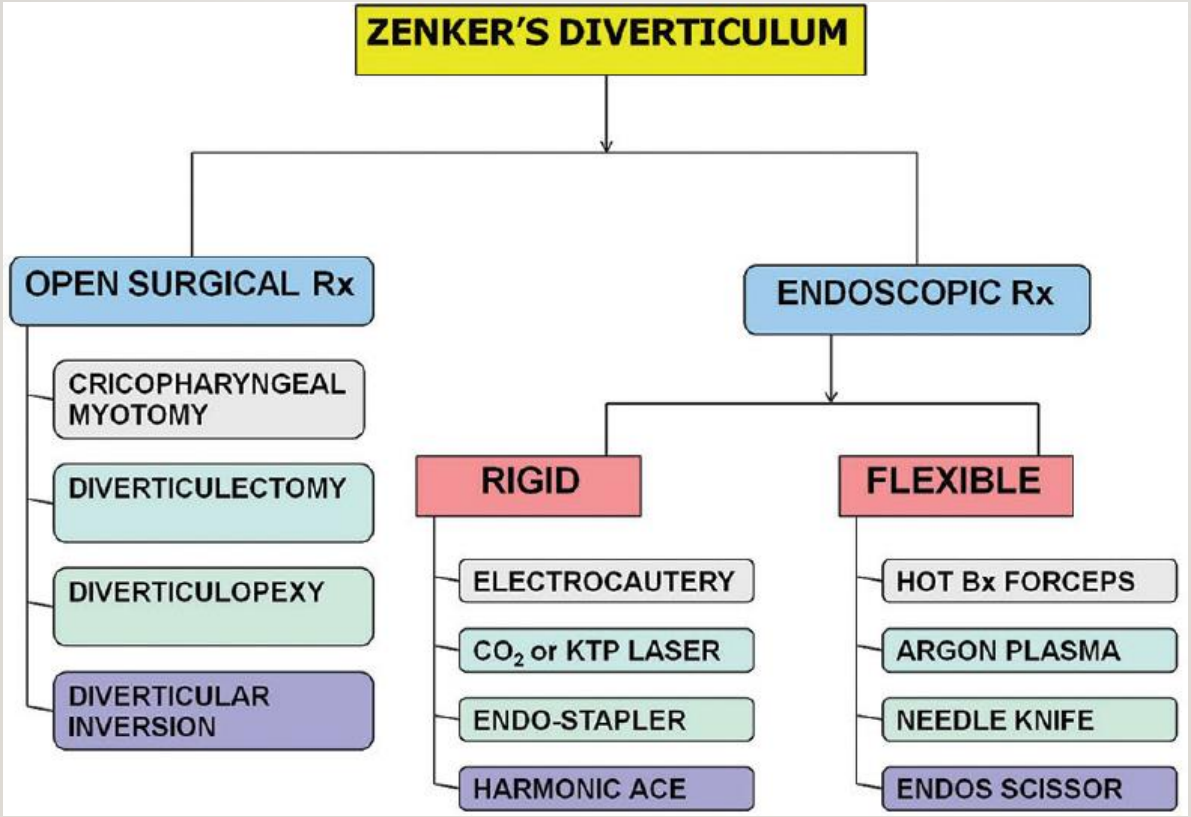
- 27 cases described in 1877 by Zenker and Ziemssen
- Most common esophageal diverticulum
- Killian's trainagle, C6,7 Vertebra level
- Pathogenesis: UES incomplete opening ->pulsion explanation favored(increase pressure in lumen forces tissue through weak spot in muscle layer)
- Location: hypopharynx of elderly(superior to upper esophageal sphincter)
- May become larger and sequester food, with regurgitation, aspiration or mass effect in the neck
- Treatment: surgical resection of larger lesions

ZENKER'S DIVERTICULUM -KILLIAN'S TRIANGLE

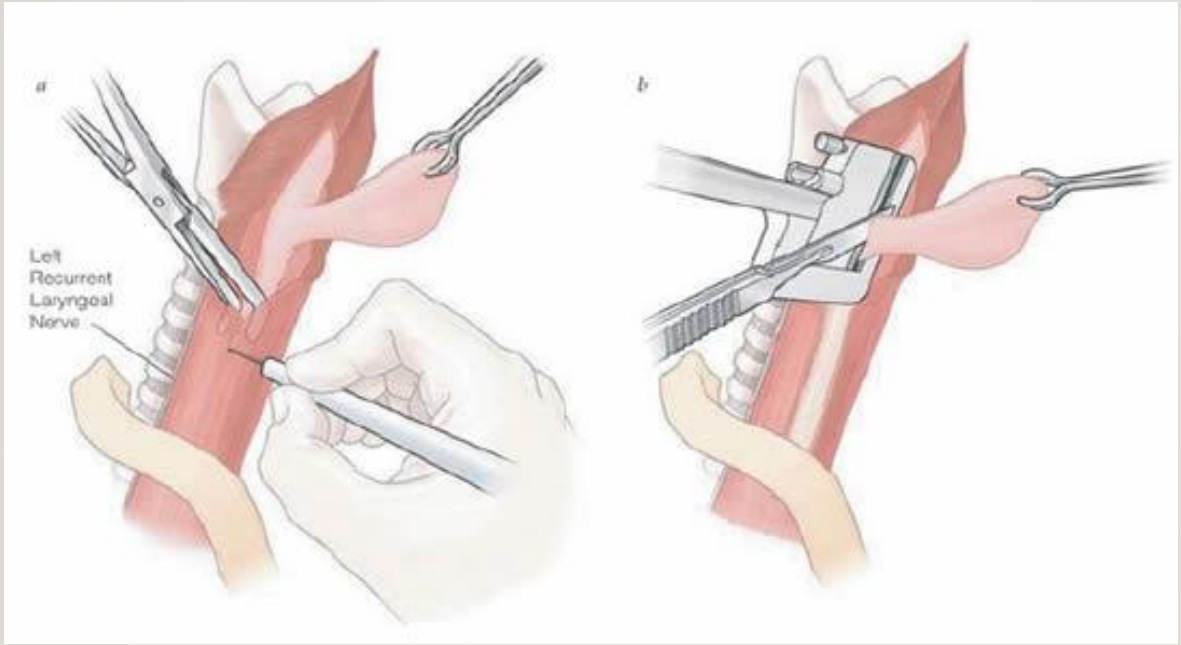




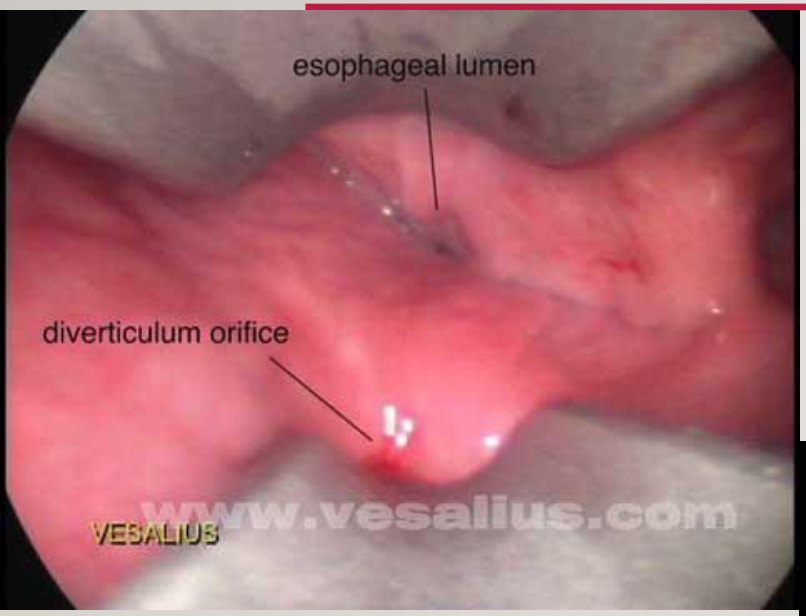
ZENKER'S DIVERTICULUM

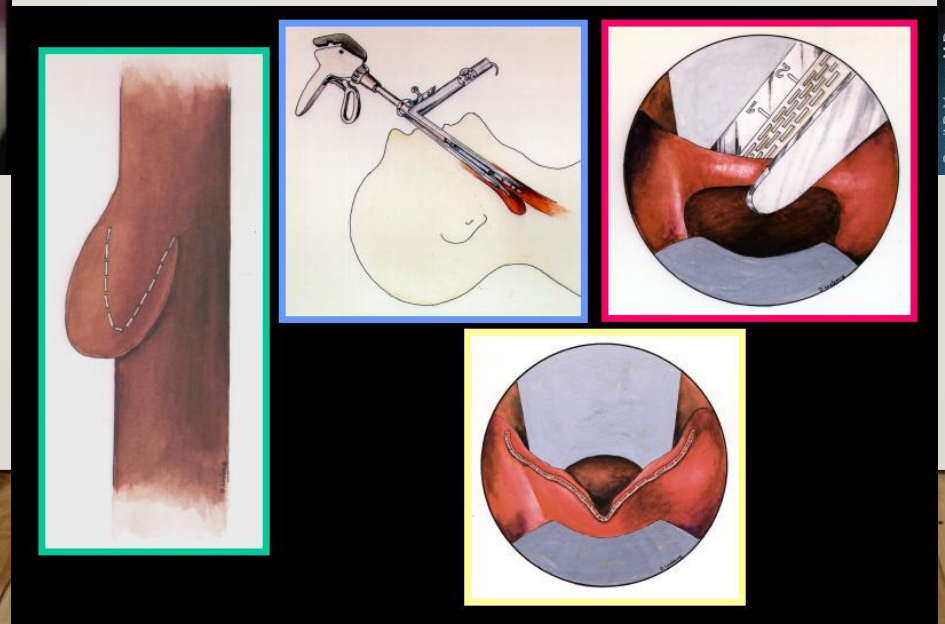


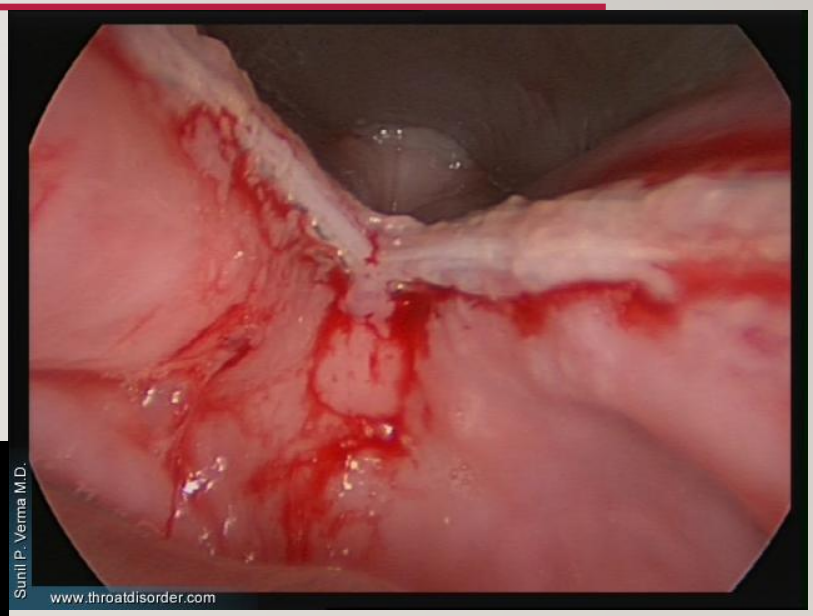
ZENKER'S DIVERTICULUM -DIVERTICULECTOMY



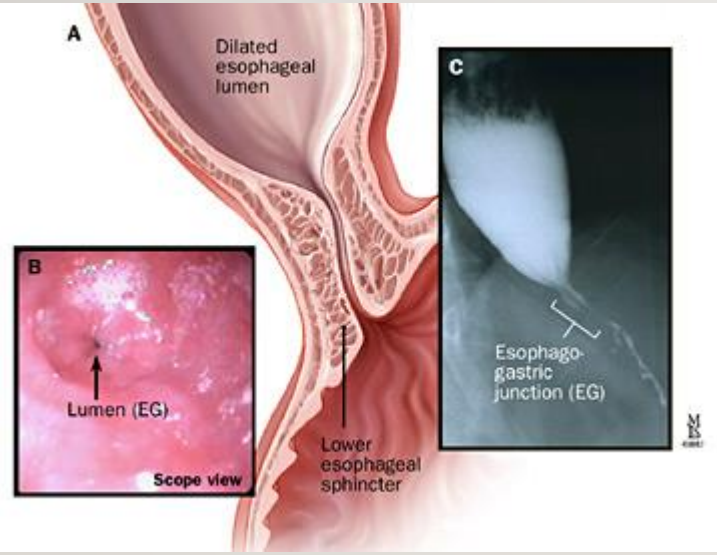
ZENKER'S DIVERTICULUM
-TRANSORAL REPAIR OF ZD (ENDOSTAPLER)







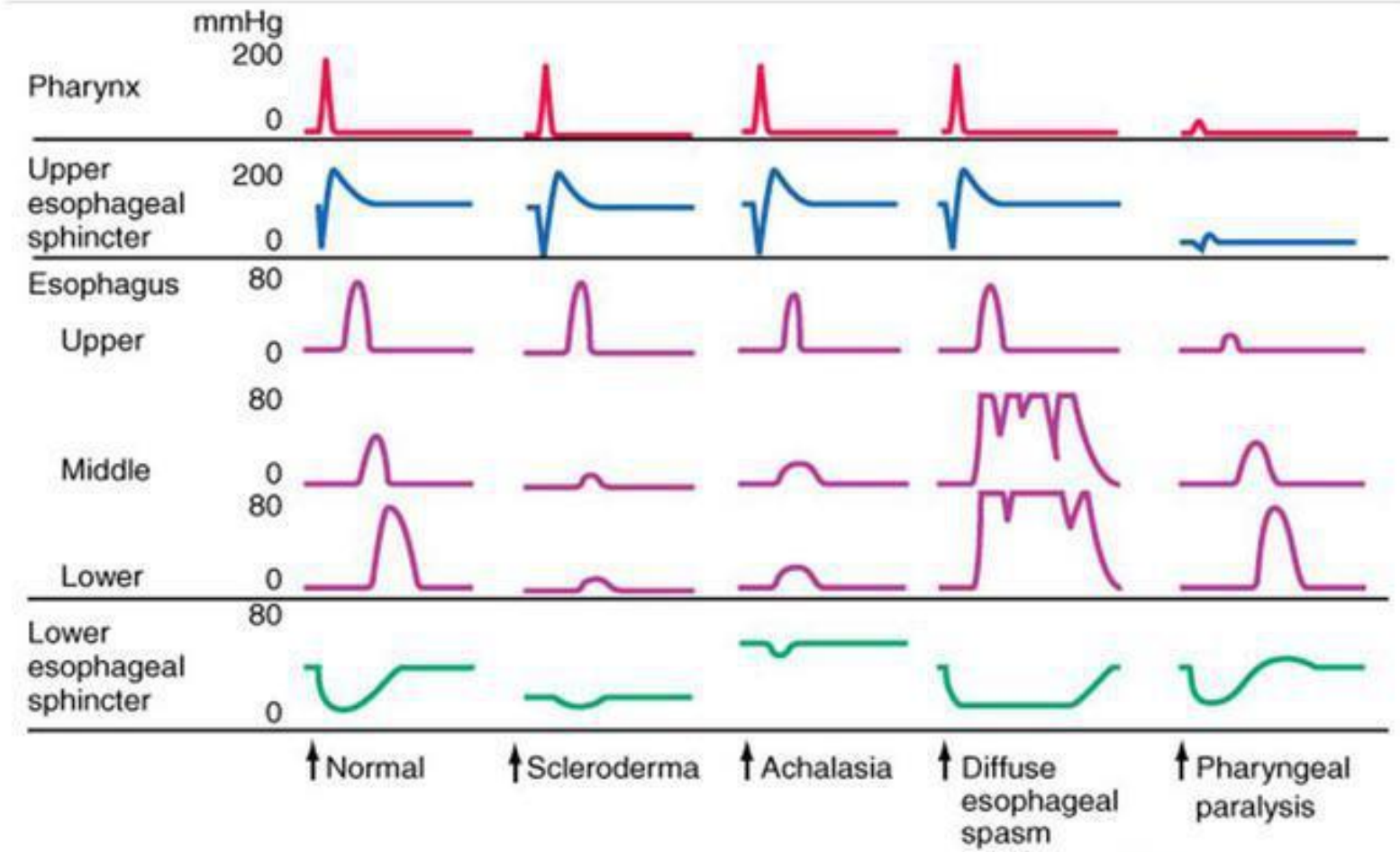
ACHALASIA



- Absence of peristalsis and failure of relaxation of LES.
- T-cell mediated destruction of Myenteric neural plexus

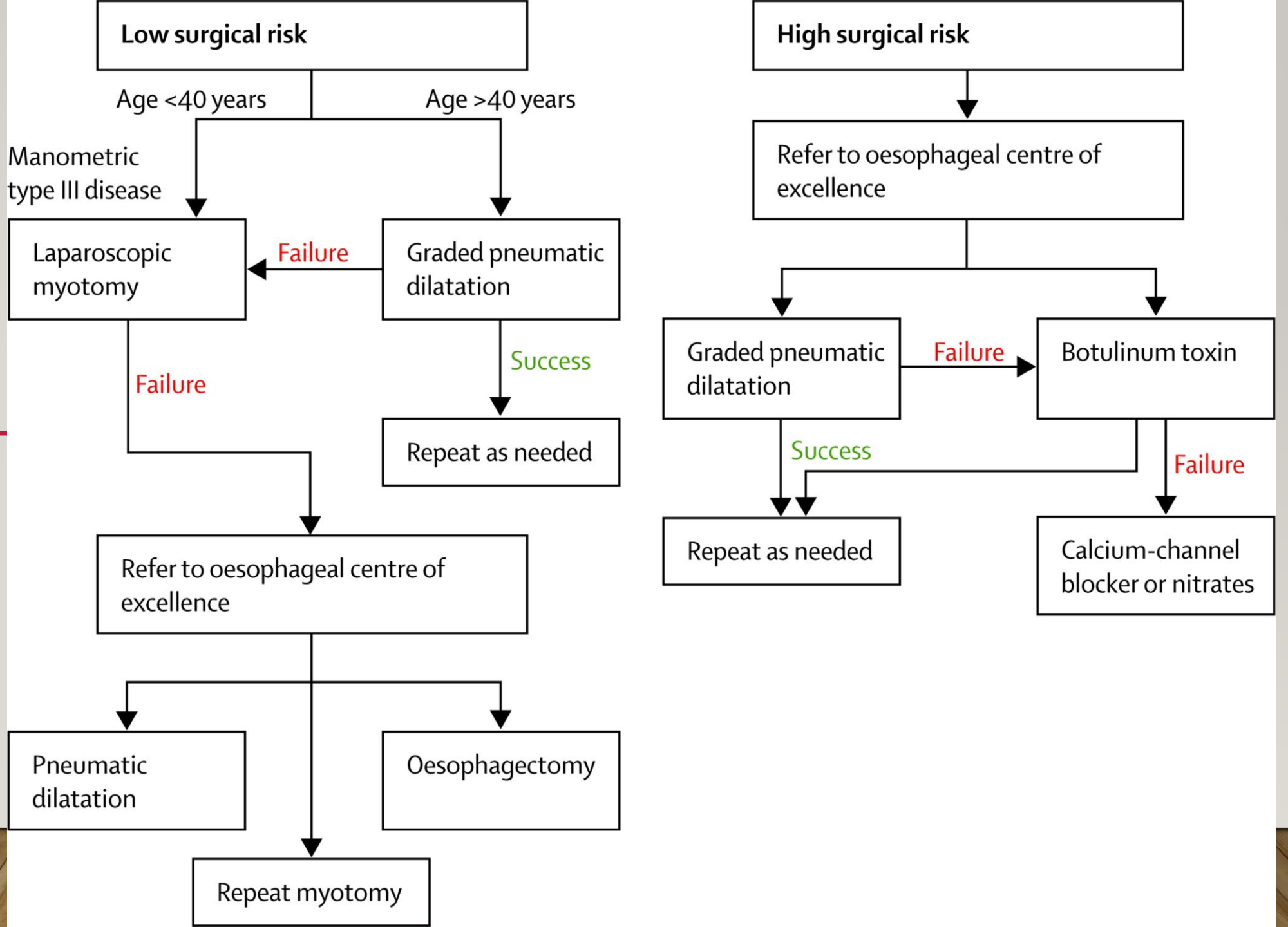
ACHALASIA

Esophageal manometry



ACHALASIA

The Lancet 2014

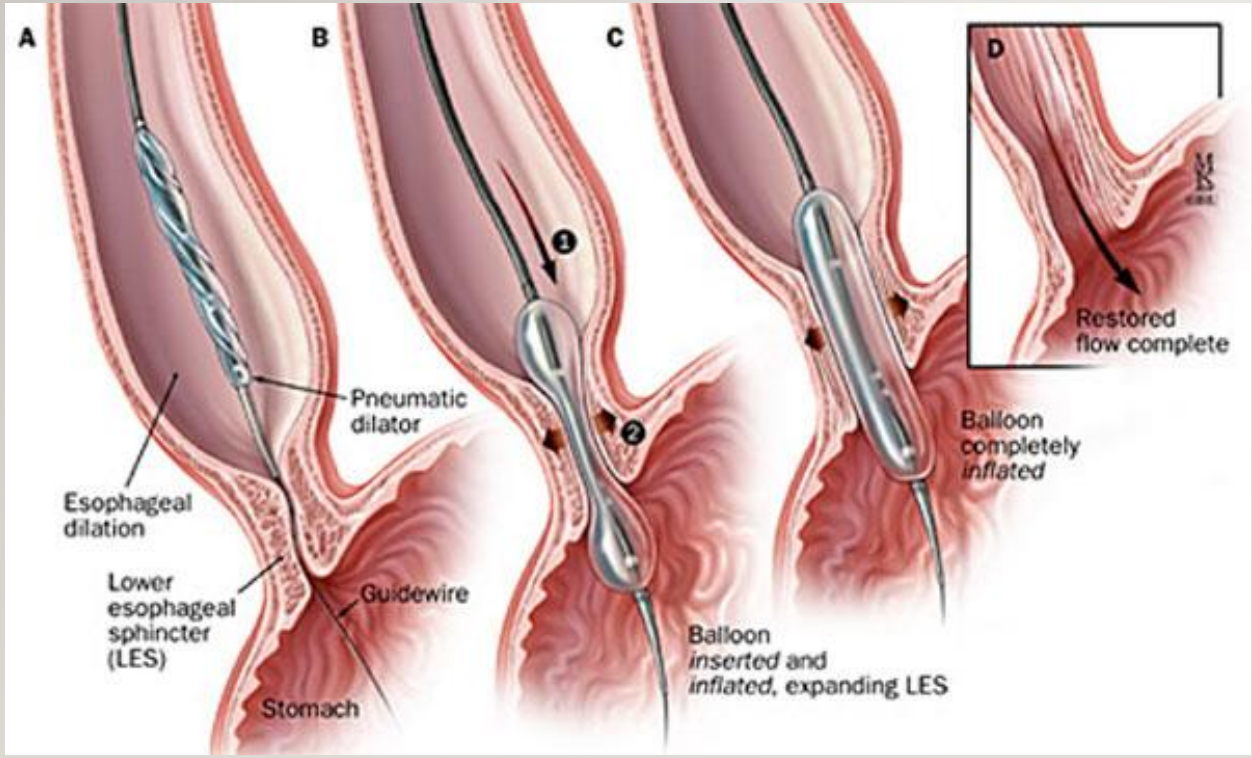


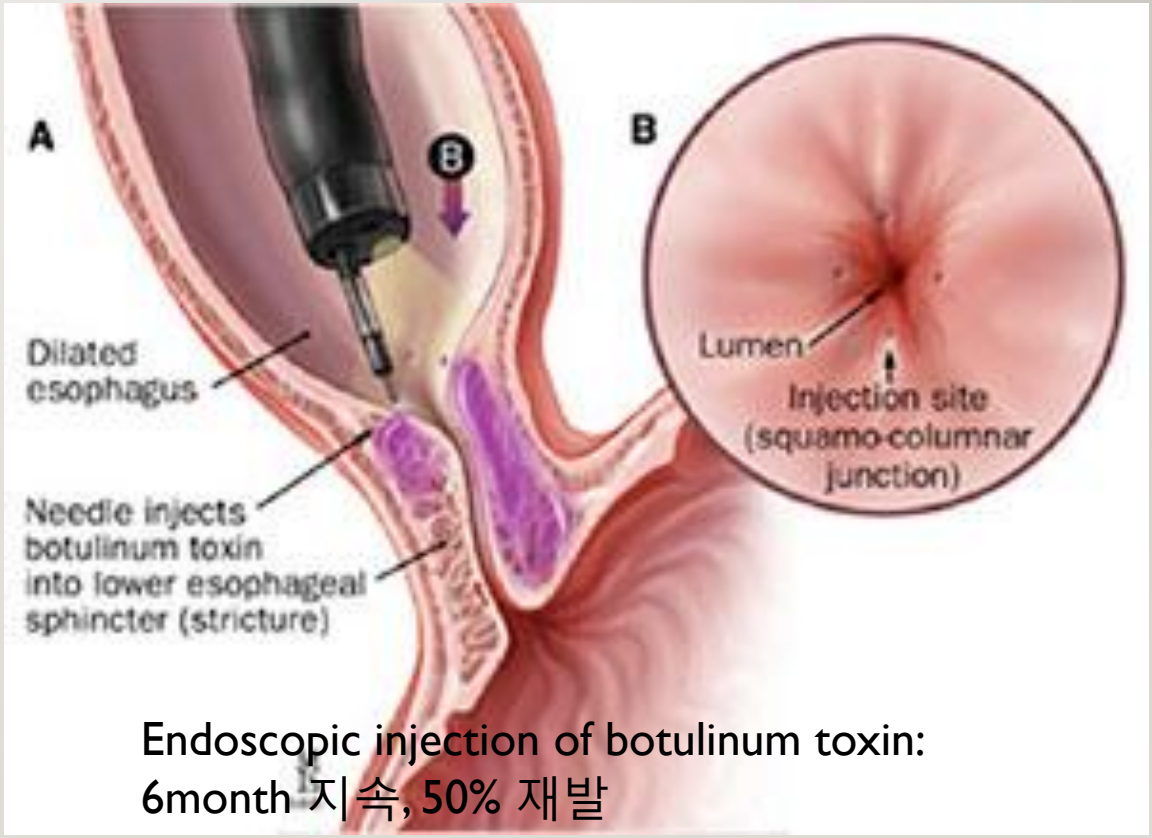
MEDICAL TREATMENT FOR ACHALASIA

Table IV. Indications for pharmacologic treatment of achalasia.

1) Patients with initial achalasia
2) Patients who refuse pneumatic dilation and myotomy
3) Patients with vigorous achalasia before pneumatic dilation.
4) Patients who underwent pneumatic dilation with poor results or who refuse a second dilation
5) Patients with incomplete myotomy or recurrence of muscular stenosis
6) Children
7) Elderly patients
8) Patients with high risks for invasive procedures

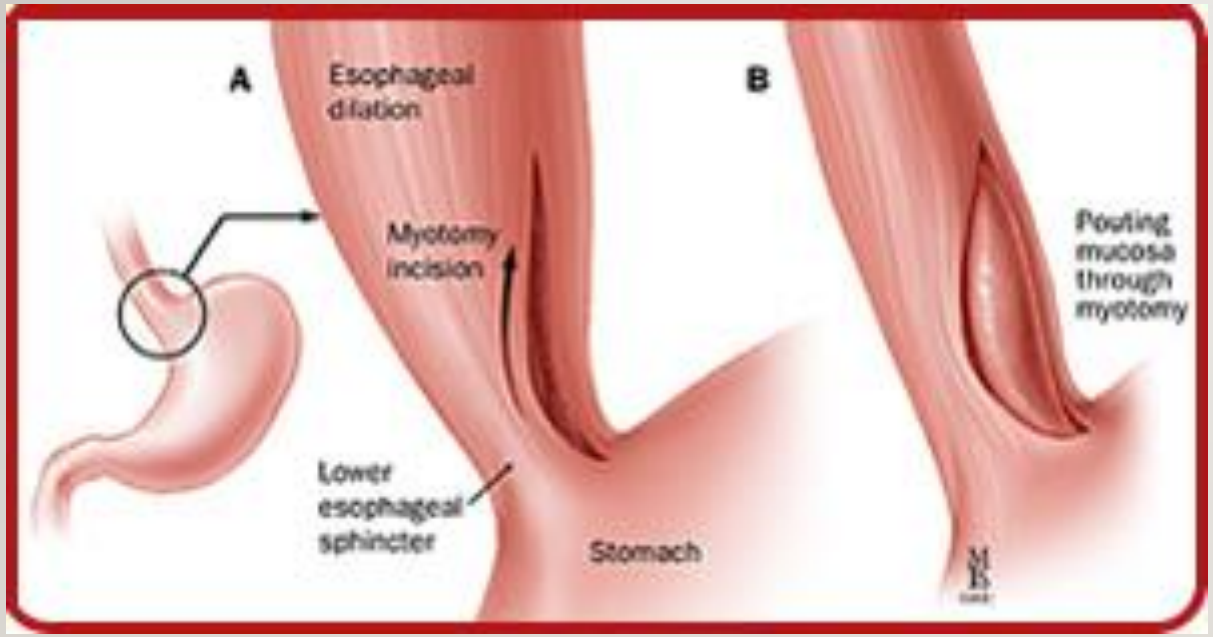
INTERVENTION FOR ACHALASIA

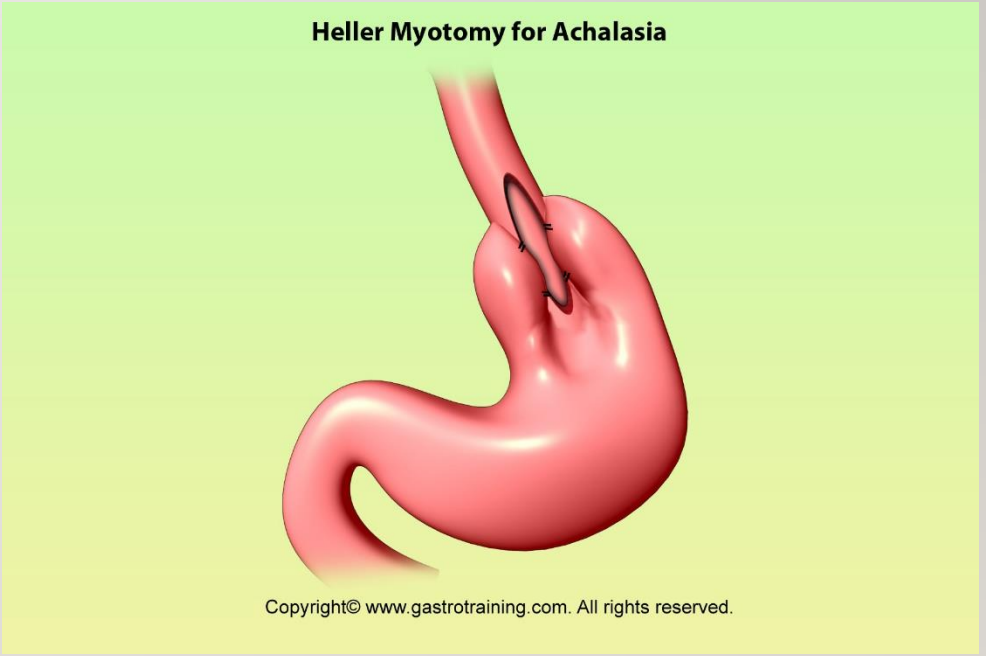




Endoscopic injection of botulinum toxin:
6month 지속, 50% 재발

SURGERY FOR ACHALASIA





Heller's myotomy and partial fundoplicaton

MODIFIED HELLER'S MYOTOMY

- Heller myotomy
- -first performed in 1913
- Performed both anterior and posterior myotomies

Approach has evolved over time

-transabdominal and transthoracic approaches

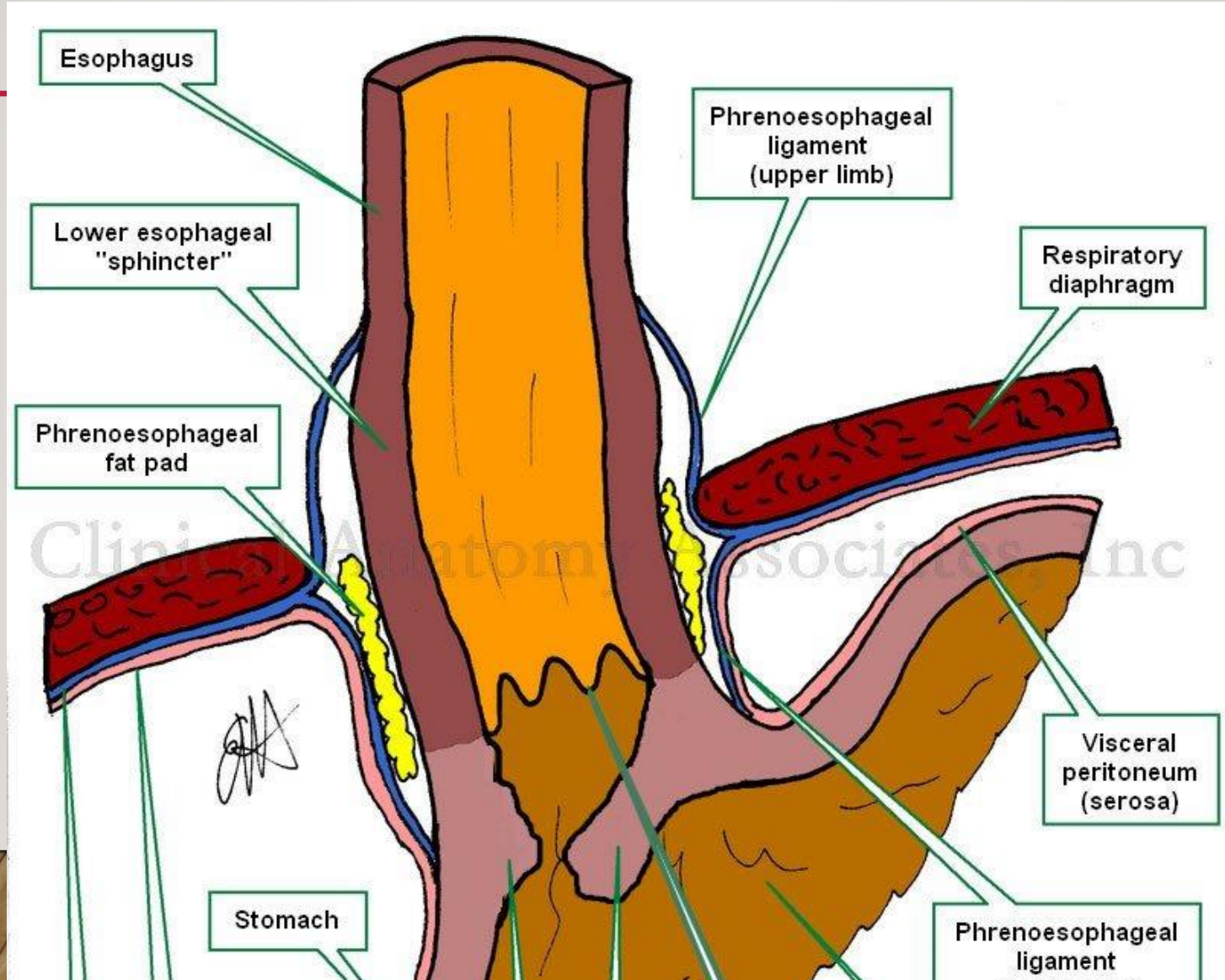
-only single anterior myotomy made

+/- the addition of an antireflux procedure

II. 식도열공허니아 및 역류성 위식도 질환

Esophageal hiatal hernia and GERD

PHRENOESOPHAGEAL MEMBRANE(LIGAMENT)

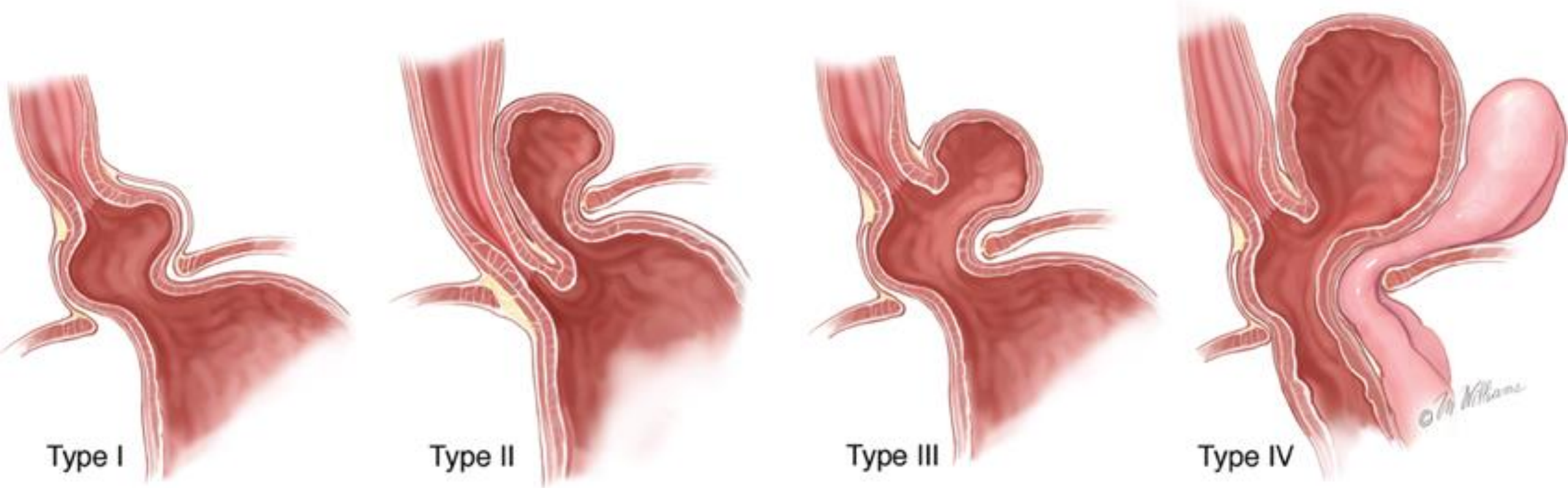


I. Sliding hiatal hernia: GEJ> 2cm above hiatus: > 95% of all hernia

II. Paraesophageal hiatal hernia: GEJ remain below diaphragm, fundus protrusion through hiatus

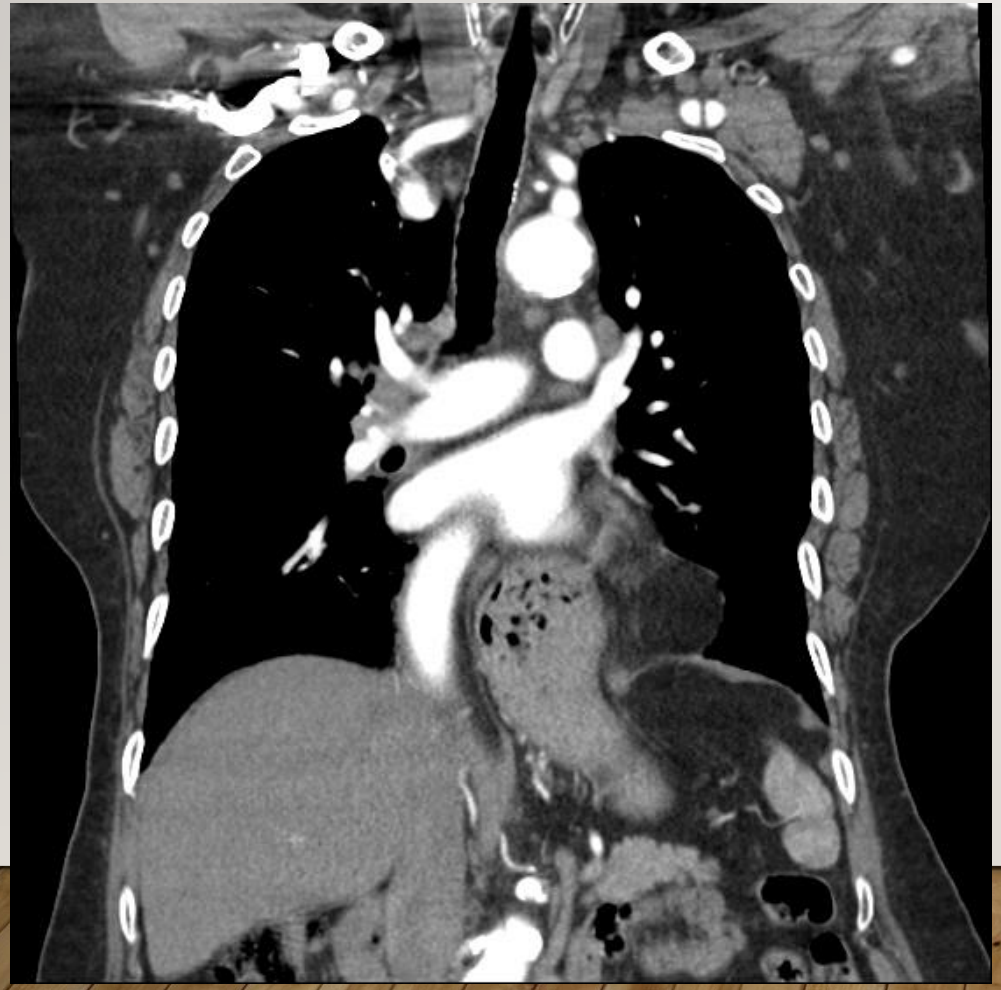
III. Combined hiatal hernia: GEJ above the diaphragm, fundus hernia beside distal esophagus

IV. Multi-organ hiatal hernia

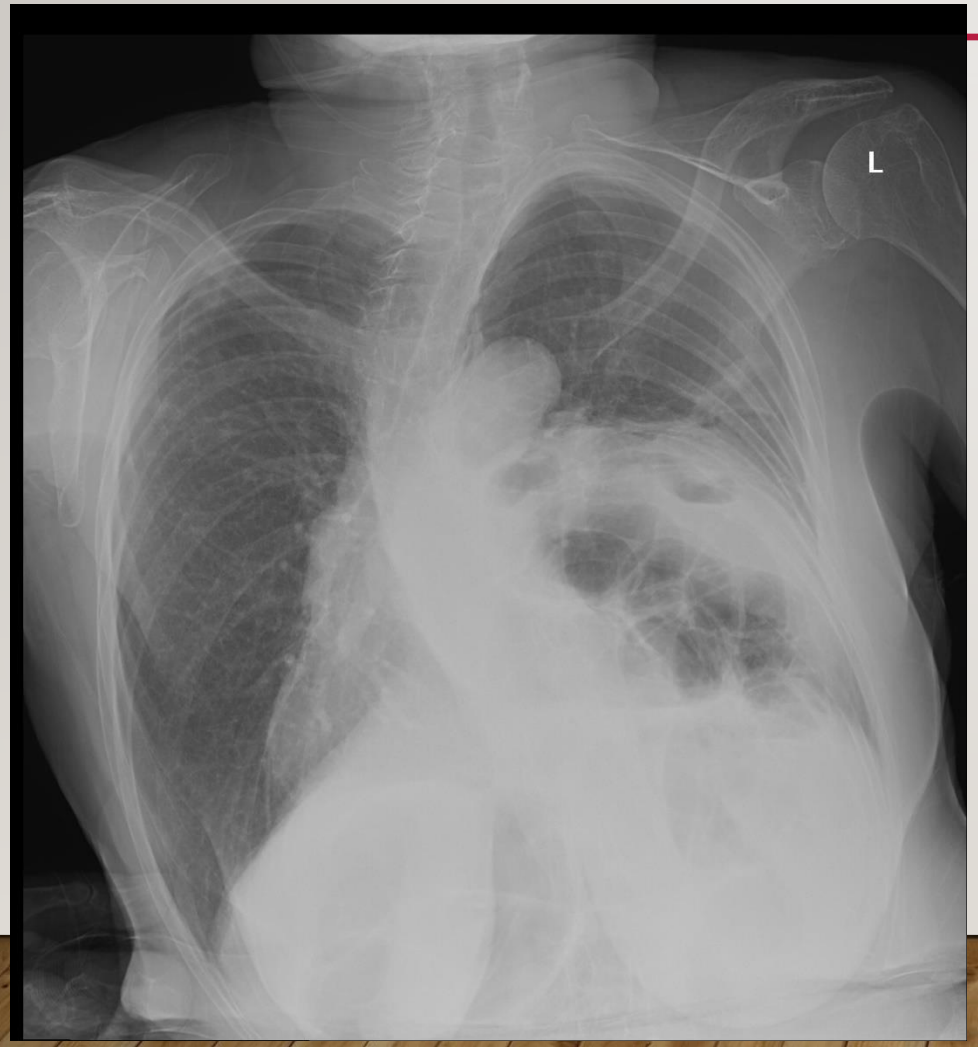


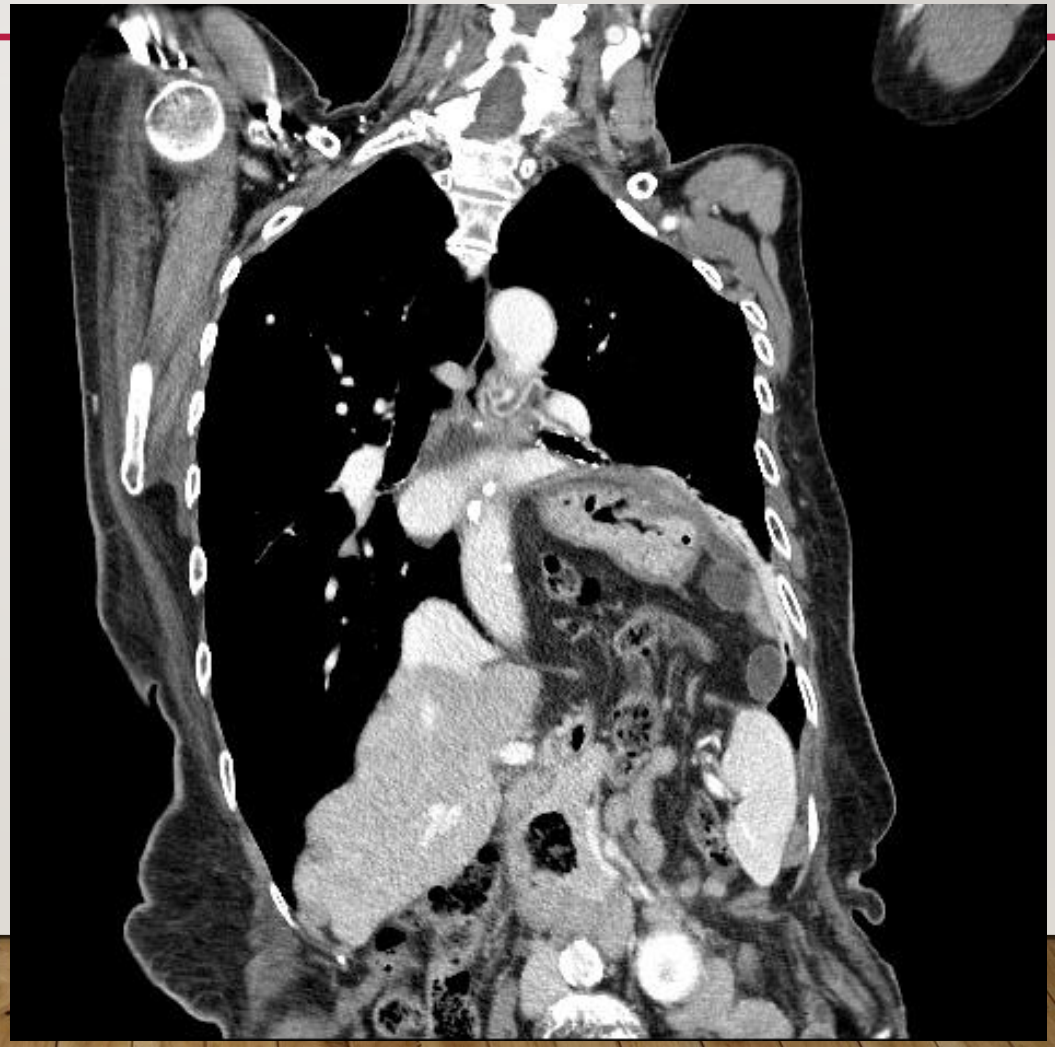
Source: Lisa M. McElroy, Travis P. Webb
Surgery Review Illustrated, Second Edition
www.accesssurgery.com

COMBINED HIATAL HERNIA



MULTI-ORGAN HIATAL HERNIA





PRINCIPLE OF ANTI-REFLUX SURGERY

1. Restoration of the intraabdominal length of esophagus

   1.5 -2.0 c m of tension free intra abdominal esophagus

2. Closure of the crural defect

3. Reconstruction of a functional LES.

   Vagus nerve preservation

INDICATION OF ANTI-REFLUX SURGERY

- Symptoms refractory to medical therapy
- Inability or unwillingness to maintain lifelong acid suppression
- Development of complications of GERD(stricture or persistent erosive esophagitis)

ANTIREFLUX SURGERY

- Nissen (1956), Collis (1957), Dor(1962), Toupet(1963), Skinner and Belsey (1967) and Hill(1967)
- Nissen fundoplication : 360
- Dor: (anterior)
- Toupet repair: 270 (posterior)
- Transthoracic Belsey Mark IV repair: 270(anterior)
- Hill's posterior gastropexy
- Collois gastroplasty

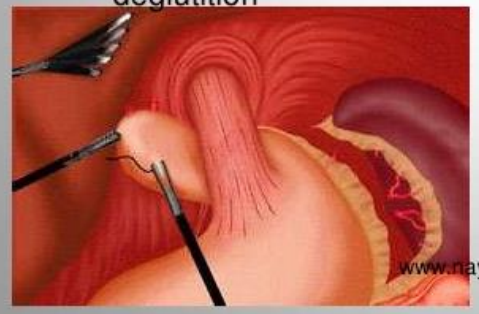
NISSEN FUNDOPLICATION

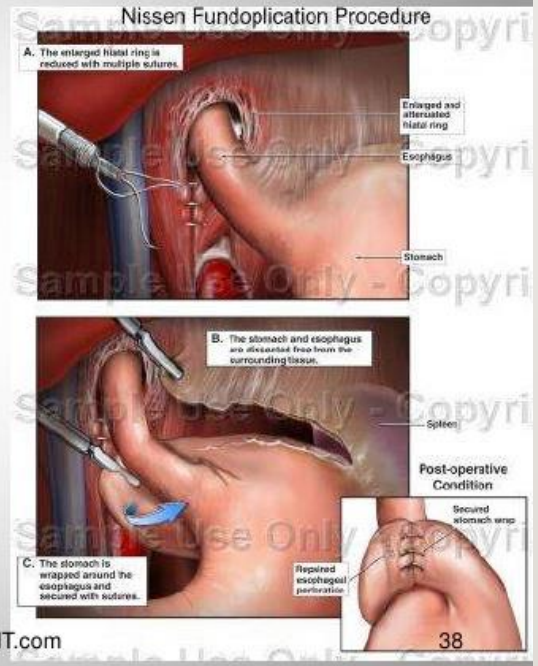
Surgery

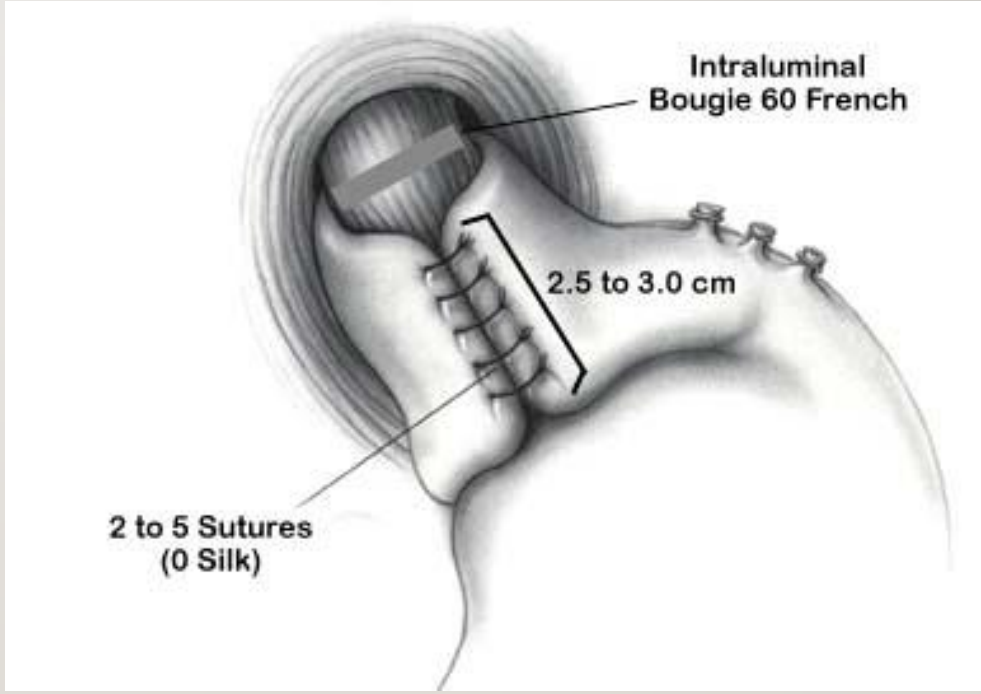
Laparoscopic Nissen Fundoplication

Indications
- Failed drug treatment
- Complications

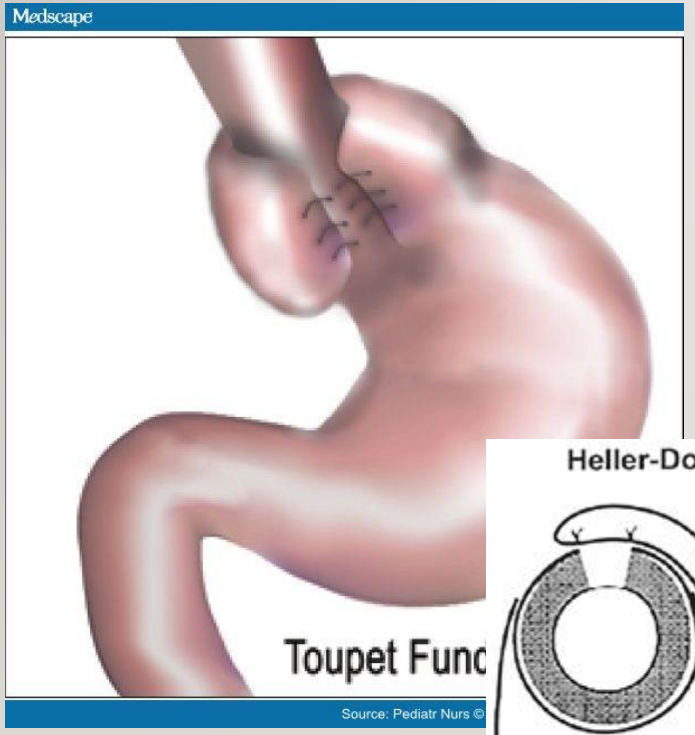
Goal
- Restore natural integrity of LES & maintain normal deglutition

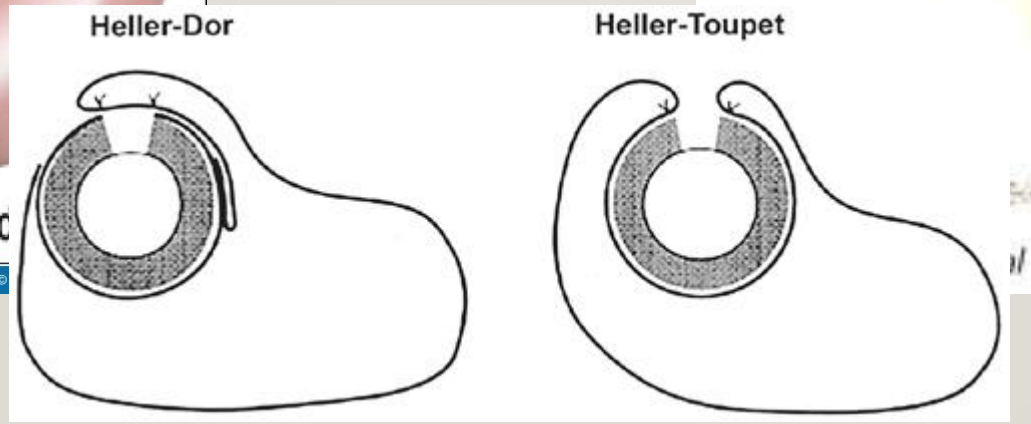


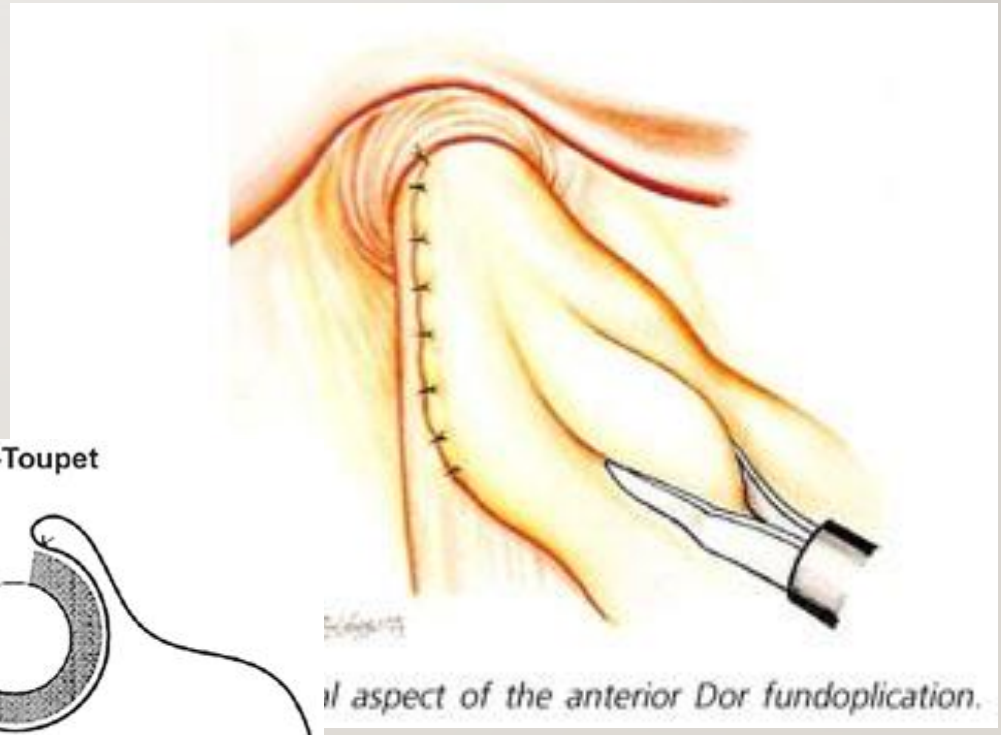




TOUPET VS DOR FUNDOPLICATION

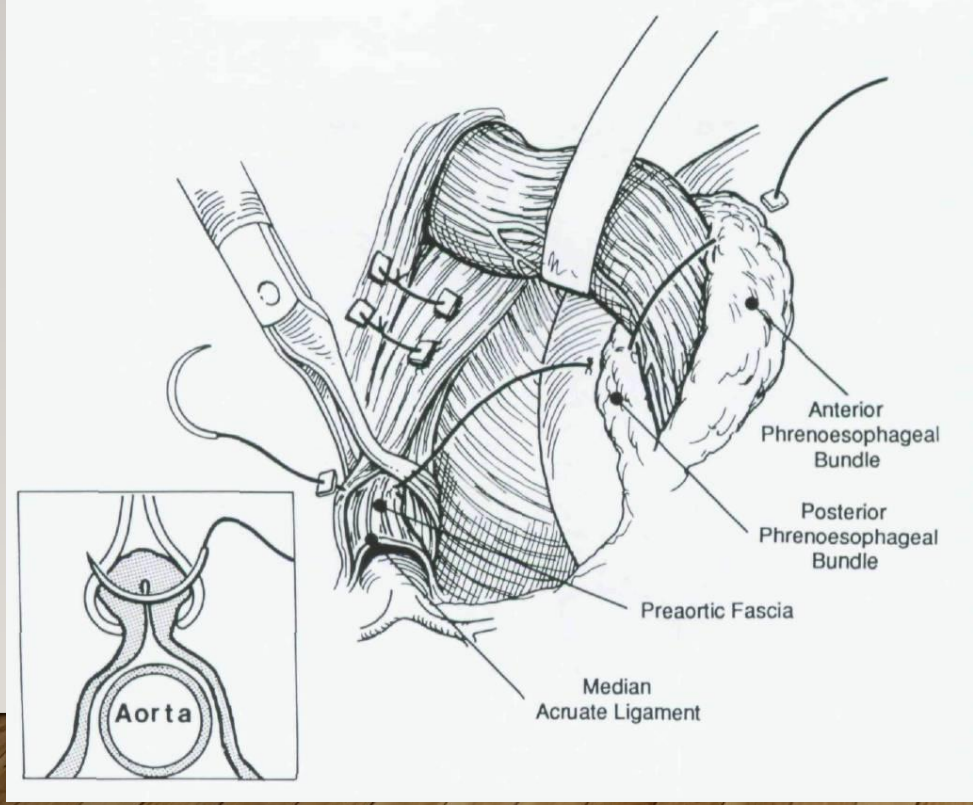


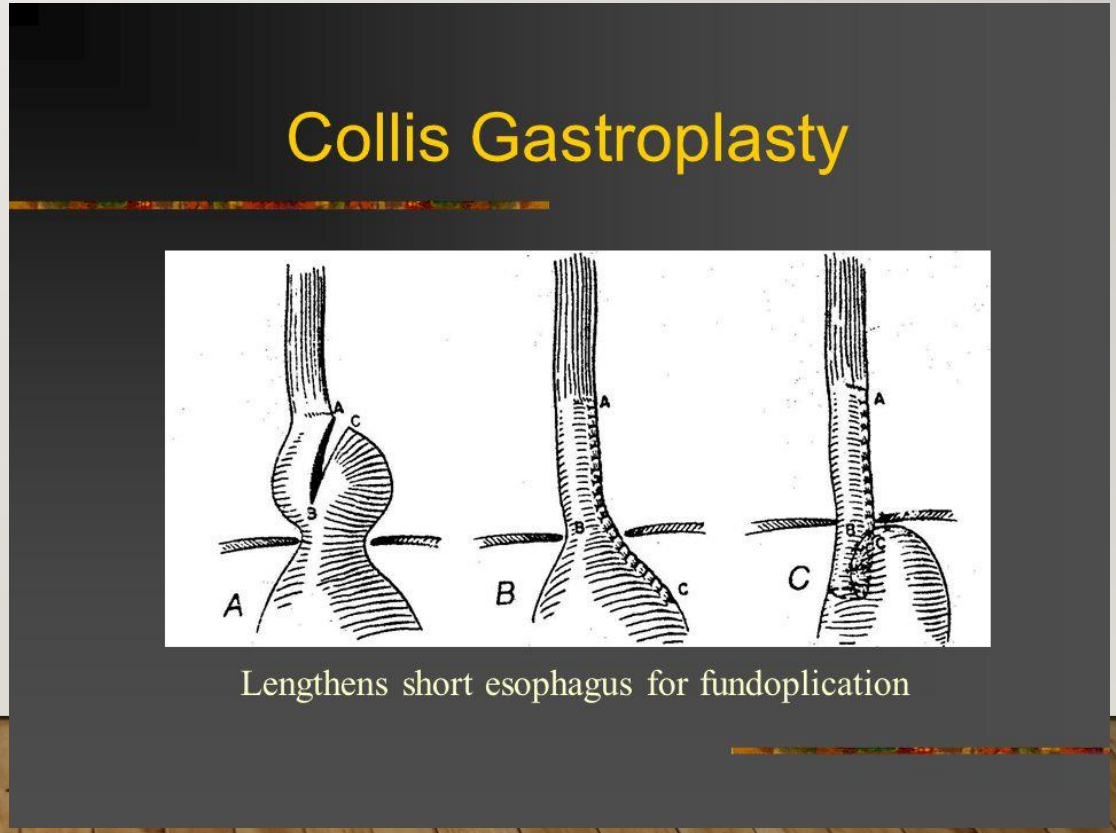




- Hill's gastropexy

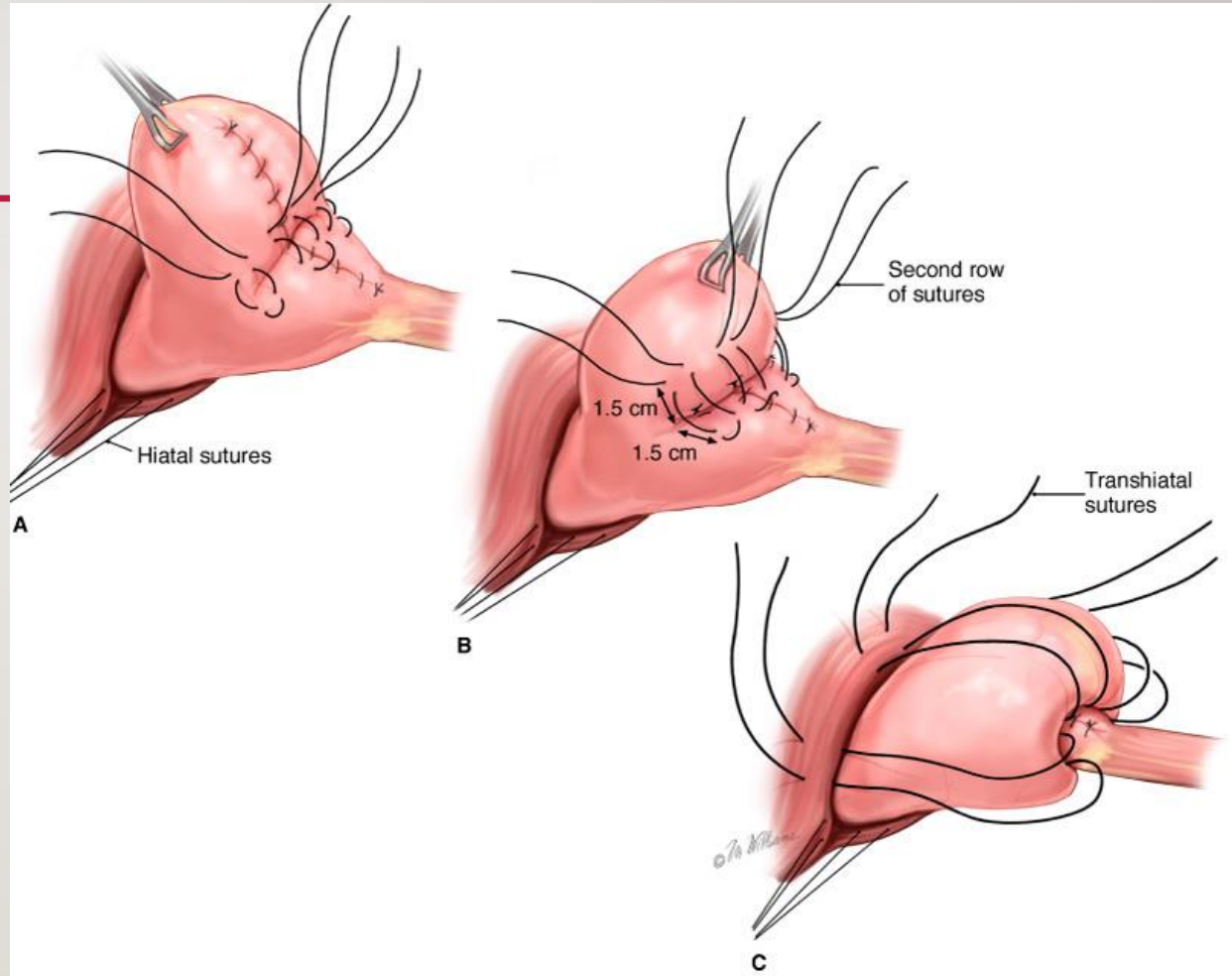
Collis gastroplasty





BELSEY MARK IV REPAIR

- Transthoracic repair to control GERD
- Typically performed through a left thoracotomy(thoracoscopy)
- Distal esophagus and proximal stomach are mobilized and delivered through the esophageal hiatus
- Anterior 270 degree plication of the fundus is performed onto the esophagus
- The fundoplication is buttressed by the diaphragmatic crura



Source: Sugarbaker DJ, Bueno R, Krasna MJ, Mentzer SJ, Zellos L: *Adult Chest Surgery:* http://www.accesssurgery.com

III. 식도협착

Esophageal stricture

CAUSTIC STRICTURE

Chemical burn

Children: accident

Adult: Suicide

- 알칼리성 부식제
- 양잿물
- 빙초산 표백제 <황산
- 전암성 질환 유발

TABLE 70-1 Commonly Ingested Caustic Substances

Acid-Containing Substances
Toilet bowl cleaning products
Automotive battery liquid
Rust removal products
Metal cleaning products
Cement cleaning products
Drain cleaning products
Alkali-Containing Substances
Ammonia-containing products
Oven cleaning products
Swimming pool cleaning products
Automatic dishwasher detergent
Hair relaxers
Bleaches

CAUSTIC INJURY

- Severe damaged locations
- 1. cricopharyngeous
- 2. midesophagus at the level of aortic arch and Left main stem bronchus
- 3. The distal esophagus just above the lower esophageal sphincter

EARLY TREATMENT OF CAUSAL INJURY

- Broad spectrum anti biotics and anti fungal agent and NPO
- Endoscopic examination and frequent PEX, CXR, CT
- Corticosteroid: no proved benefit

TABLE 70-2 Classification of Burns by Depth of Injury

Grade	Depth	Endoscopy
First degree	Mucosal	Mucosal hyperemia and edema
Second degree	Transmucosal, with or without involvement of muscularis. No extension to periesophageal tissue.	Hemorrhagic, exudative, ulcerative pseudomembranes
Third degree	Full-thickness injury with extension into periesophageal tissue. May involve mediastinal or intraperitoneal organs.	Complete obliteration of esophageal lumen by massive edema; charring and eschar; full-thickness necrosis with perforation.

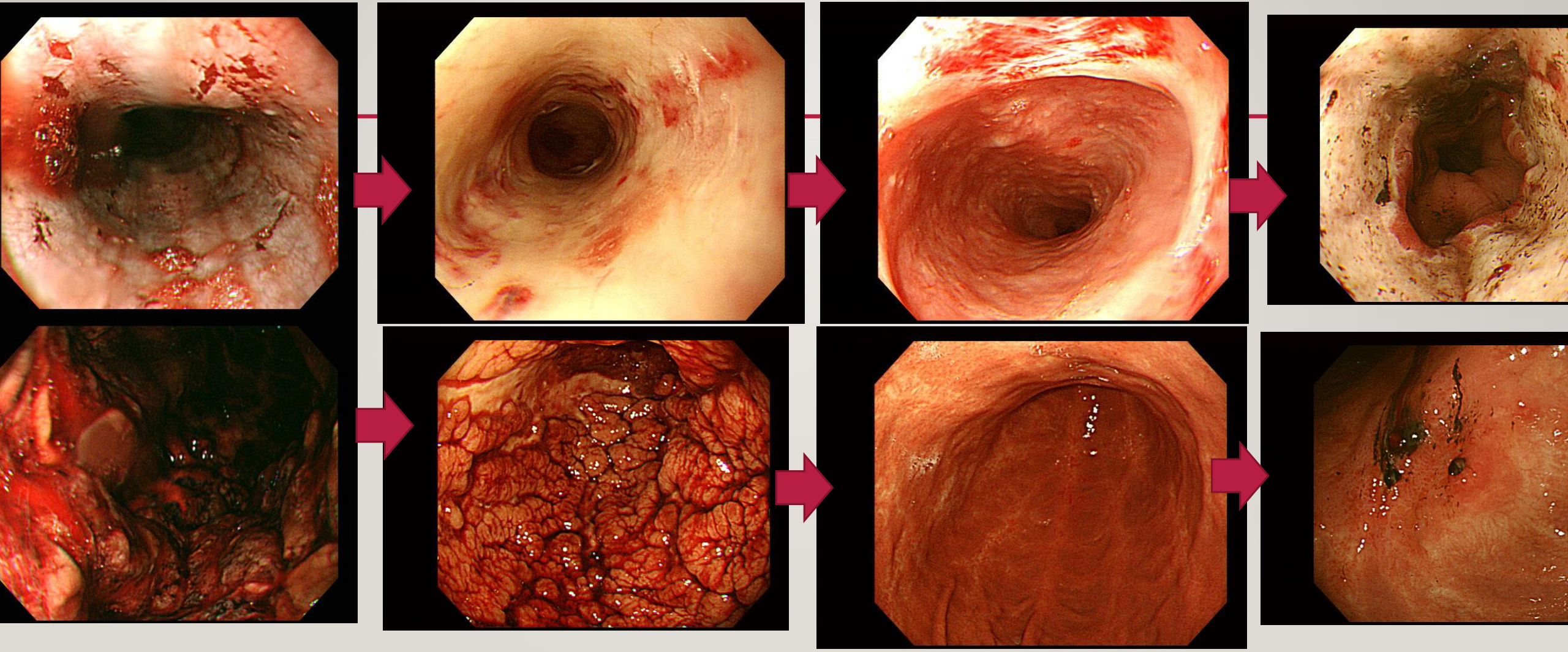
OPERATION OF CAUSTIC INJURY

TABLE 70-3 Indications for Surgery in Caustic Injuries to the Esophagus

Early Indications
Esophageal perforation
Transmural necrosis
Grade 2 or 3 injury
Late Indications
Complete stenosis in which all attempts have failed to establish a lumen
Perforation after dilation
Fistula formation
Inability to dilate or maintain the lumen above a 40-Fr bougie
Patients who are unwilling or unable to undergo prolonged periods of dilation
Esophageal carcinoma

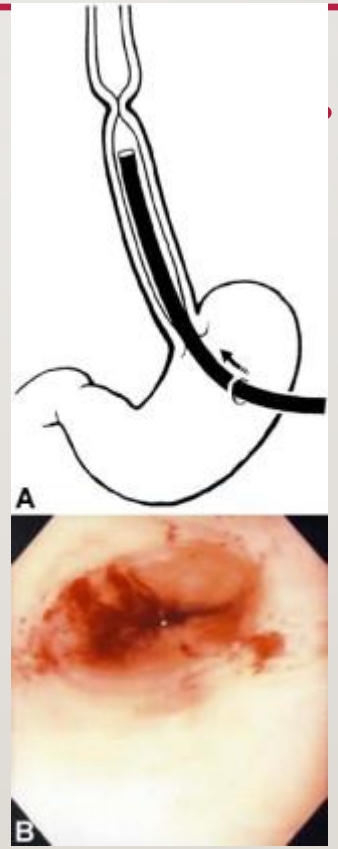
- Esophagostomy and esophagectomy
- +/- gastrectomy
- Drainage and second look operation
- Delayed reconstruction with conduit
- Plastysma flap or jejunal flap : short segment

CASE (ACID)



ENDOSCOPIC DILATATION

- Endoscopic balloon dilatation



- Gastrostomy with retrograde dilatation

SURGICAL OPTIONS

TABLE 70-4 Options for Esophageal Replacement

	Advantages	Disadvantages
Reverse gastric tube	Useful when right gastroepiploic supply poor or disrupted	Technically difficult
Gastric pull-up	Single anastomosis, reliable blood supply	Acid reflux, bulky
Colon interposition	Maintains propulsion	Three anastomoses required; development of redundancy
Jejunal interposition	Maintains peristalsis, diameter match with esophagus Less gastroesophageal reflux	Often requires free vascular anastomosis Variable vascular anatomy Redundancy develops

IV. 양성 식도 종양

Benign esophageal tumor

양성종양

- 식도 종양의 1% 미만 발생
- EUS for diagnosis

Box 36–2
Classification of Benign Esophageal Tumors

Mucosa (First and Second Esophageal Ultrasound [EUS] Layers)
- Squamous papilloma
- Fibrovascular polyp
- Retention cyst

Submucosa (Third EUS Layer)
- Lipoma
- Fibroma
- Neurofibroma
- Granular cell tumor
- Hemangiomas
- Salivary gland–type tumor

Muscularis Propria (Fourth EUS Layer)
- Leiomyoma
- Duplication cyst

Periesophageal Tissue (Fifth EUS Layer)
- Foregut cyst

평활근종(LEIOMYOMA)

- Muscularis propria(confined to the fourth EUS layer)
- Symptomatic mass should be resected.
- Malignant transformation is rare
- Enucleation with preservation of mucosa layer
- D/Dx: Leiomyosarcoma, GIST

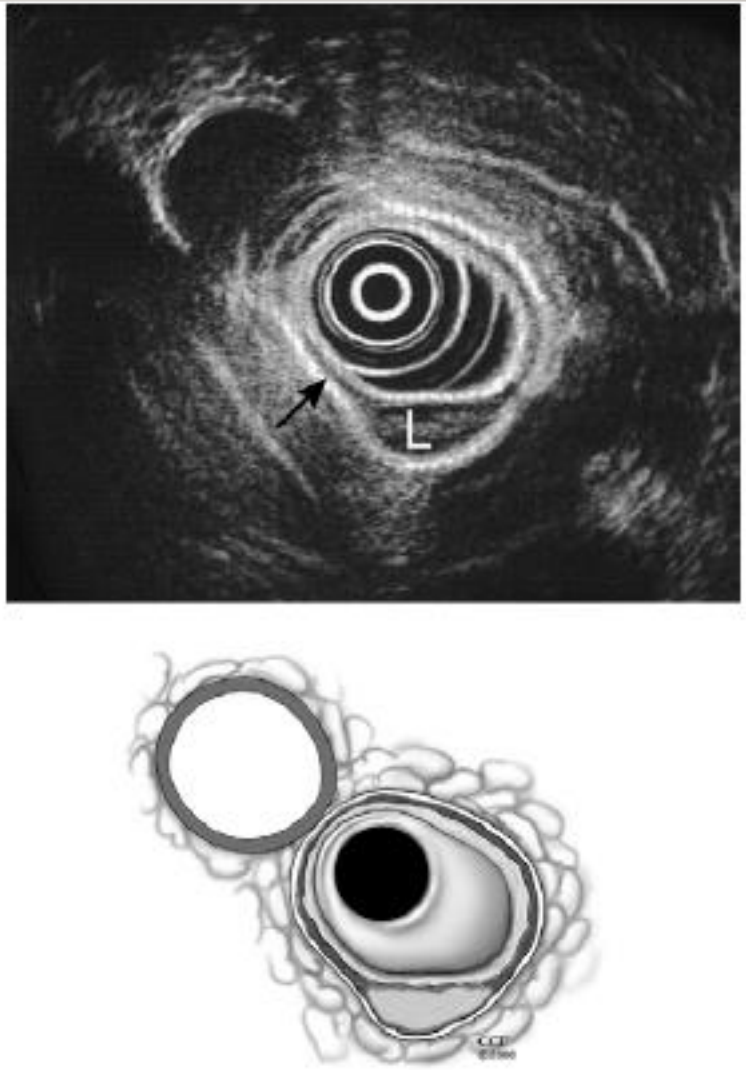


Figure 36–23
An esophageal leiomyoma (L). *Above:* Esophageal ultrasound (EUS) of this most common benign tumor demonstrates a hypoechoic, homogeneous, well-demarcated tumor with no associated lymphadenopathy. EUS balloon overdistention blends the first three ultrasound layers into one hyperechoic layer. Tumor arises from and is confined to the fourth ultrasound layer *(arrow)*. *Below:* A benign leiomyoma arises from and is confined to the muscularis propria.

평활근종(LEIOMYOMA)

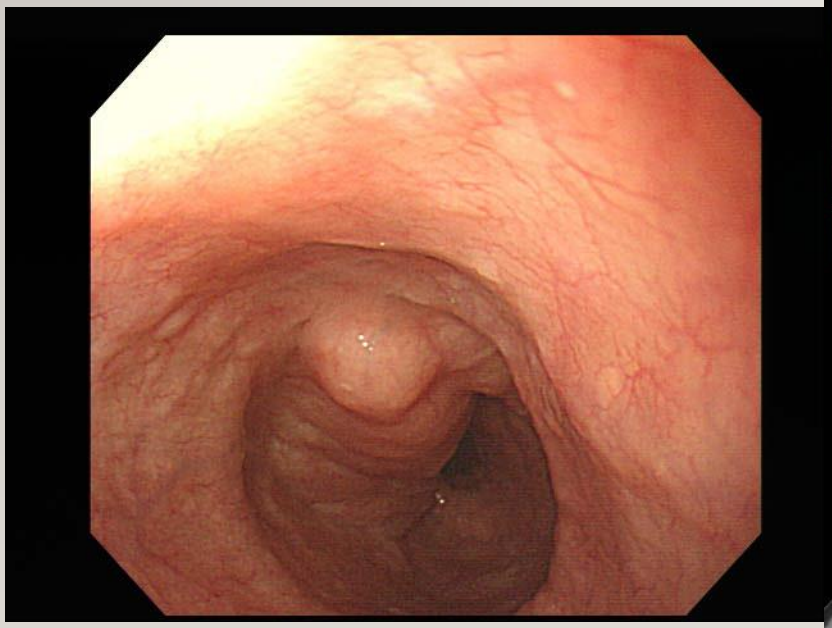
Box 39-1 Indications for Surgical Resection of Leiomyoma

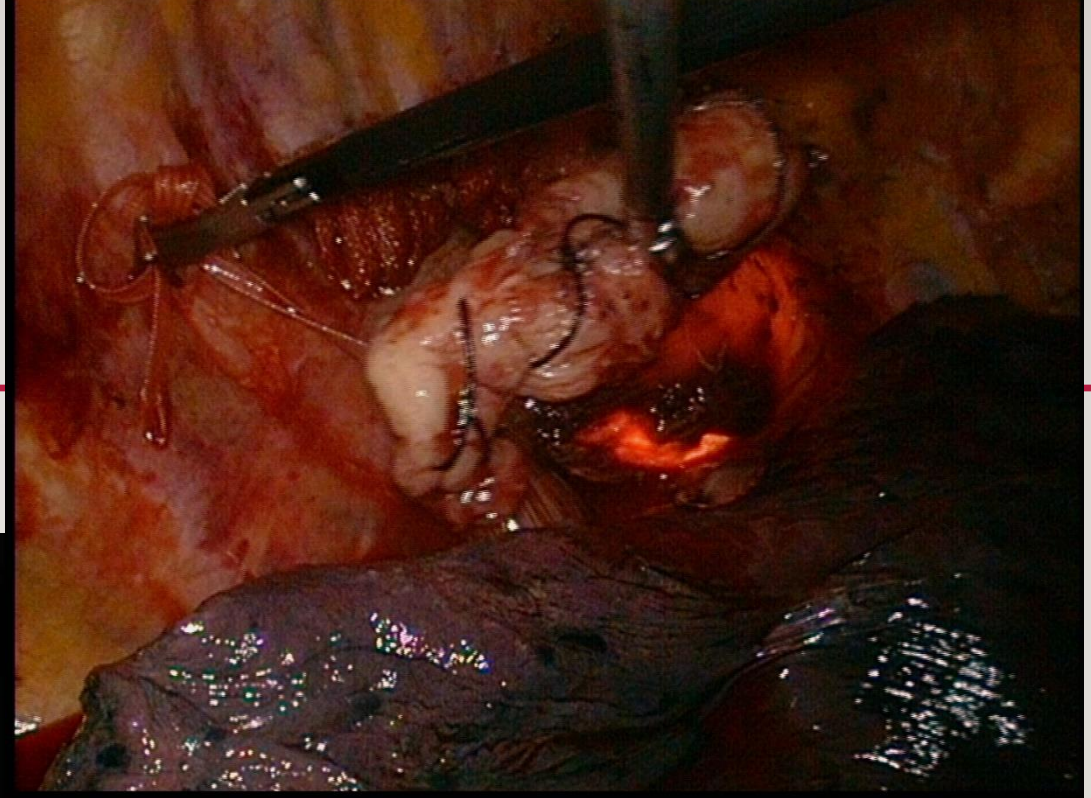
- Unremitting symptoms
- Increasing size of tumor during follow-up
- Need to obtain histologic diagnosis (i.e., clinical diagnosis in doubt)
- Facilitation of other esophageal procedures

- Endoscopic resection: <2cm
- VATS
- Open thoracotomy
- Robotic enucleation

LEIOMYOMA

- VATS enucleation





V. 식도천공

Esophageal perforation

식도 천공

- Common causes:

1) 기구에 의한 천공: 내시경 후 풍선확장술

2) 기구 이외 원인에 의한 천공

(1) 외상성 천공: 둔상, 관통상, 수술 후 합병증

(2) 이물섭취

(3) 자연천공

- Fever, leukocytosis: mediastinal drainage

TABLE 73-1 Causes of Esophageal Perforation

Endoesophageal Instrumentation
Esophagoscopy
Transesophageal echocardiography
Bougienage
Pneumatic dilation
Sclerosis of esophageal varices
Placement of intraesophageal tubes (nasogastric, Sengstaken-Blakemore, prostheses)
Traumatic endotracheal intubation
Periesophageal Surgery
Mediastinoscopy
Thyroid surgery
Anterior spinal surgery
Vagotomy
Pulmonary resection
Antireflux surgery
Thoracic aneurysm resection
Trauma
Penetrating
Foreign body
Caustic ingestion
Barotrauma
Postemetic
Blunt trauma—neck, thorax, abdomen
Compressed air ingestion
Miscellaneous—seizure, childbirth, defecation, brain disease
Tumor
Esophagus
Lung
Mediastinal
Infection
Tuberculosis
Histoplasmosis
Syphilis
Acquired immunodeficiency syndrome

식도 천공

- 증상

경부식도 천공: 국소 종창, 연하곤란, 피하기종

흉부식도 천공: 발열, 빈맥, 쇽, 흉통 전신독성 증상

- 검사

CXR: reactive pleural effusion, subcutaneous emphysema

식도조영술: Gastrografin으로 시행

식도 내시경: 천공 의심시 시행하지 않음

- 치료

보존요법: 심하지 않고 일찍 발견 시 /경부식도

식도 천공

- 드문 게실성 병변과 후천성 누관
- 1) 흉부 중앙의 식도 게실 : traction diverticulum
- 2) 식도벽내 게실증: acquired fistula
- 원인: 악성 종양. TB

BOERHAAVE'S SYNDROME

HISTORY

- October 29, 1723, Hermann Boerhaave
- Professor of medicine at Leyden University

- Baron Jan van Wassenaer
- Grand admiral of the Holland fleet

BOERHAAVE'S SD -PATHOPHYSIOLOGY

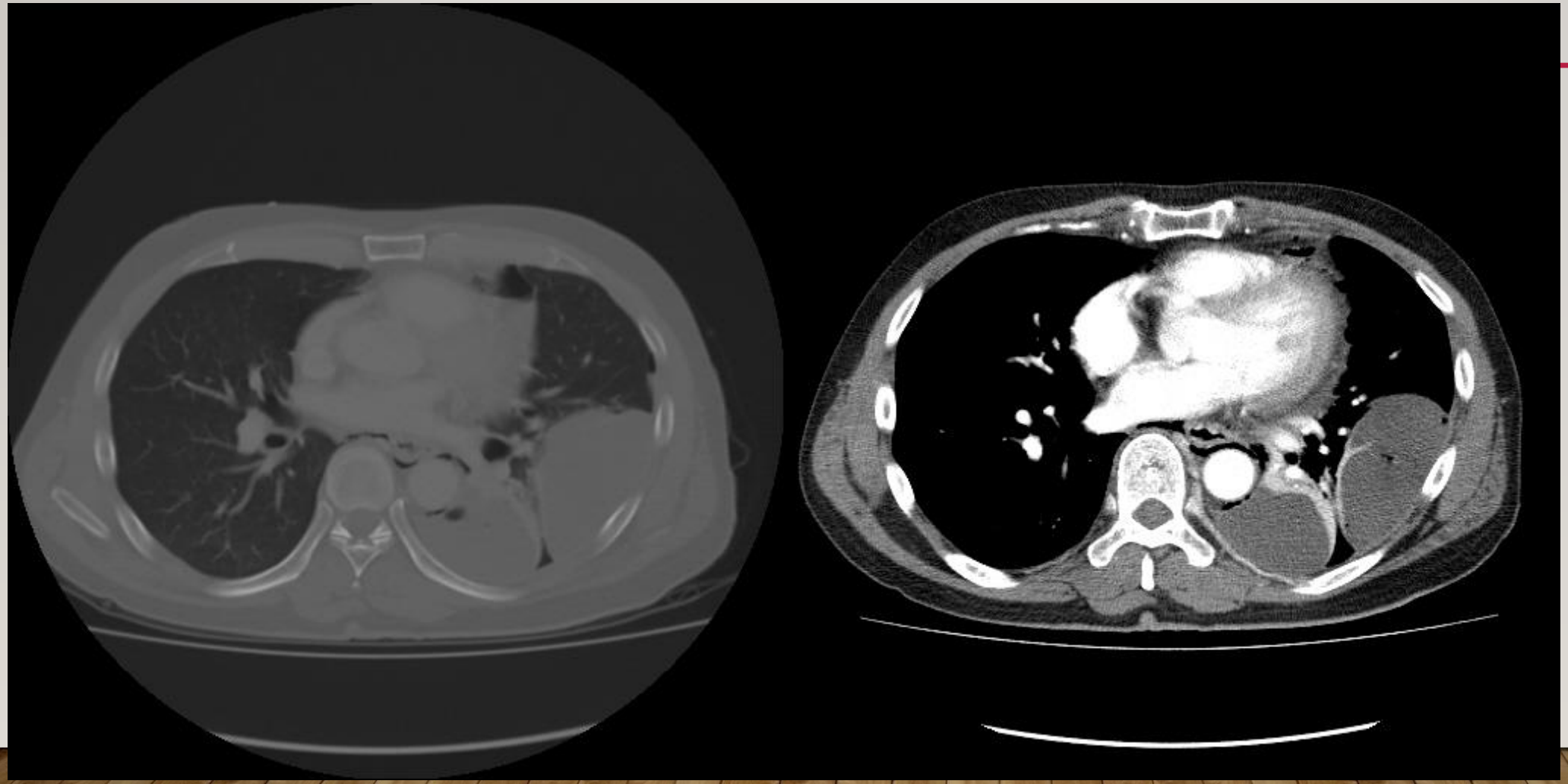
- Alcohol, sedatives, general anesthesia and repetitive vomiting
- Failure of the upper esophageal sphincter to relax -> intraesophageal pressure-> esophageal rupture
- Mallory-Weiss SD(massive hematemesis +/- melena)

Persistent retching or vomiting-> no relaxation of LES-> Single or multi mucosal tear at the EGJ

- Left posterolateral wall of the esophagus to be the site of rupture

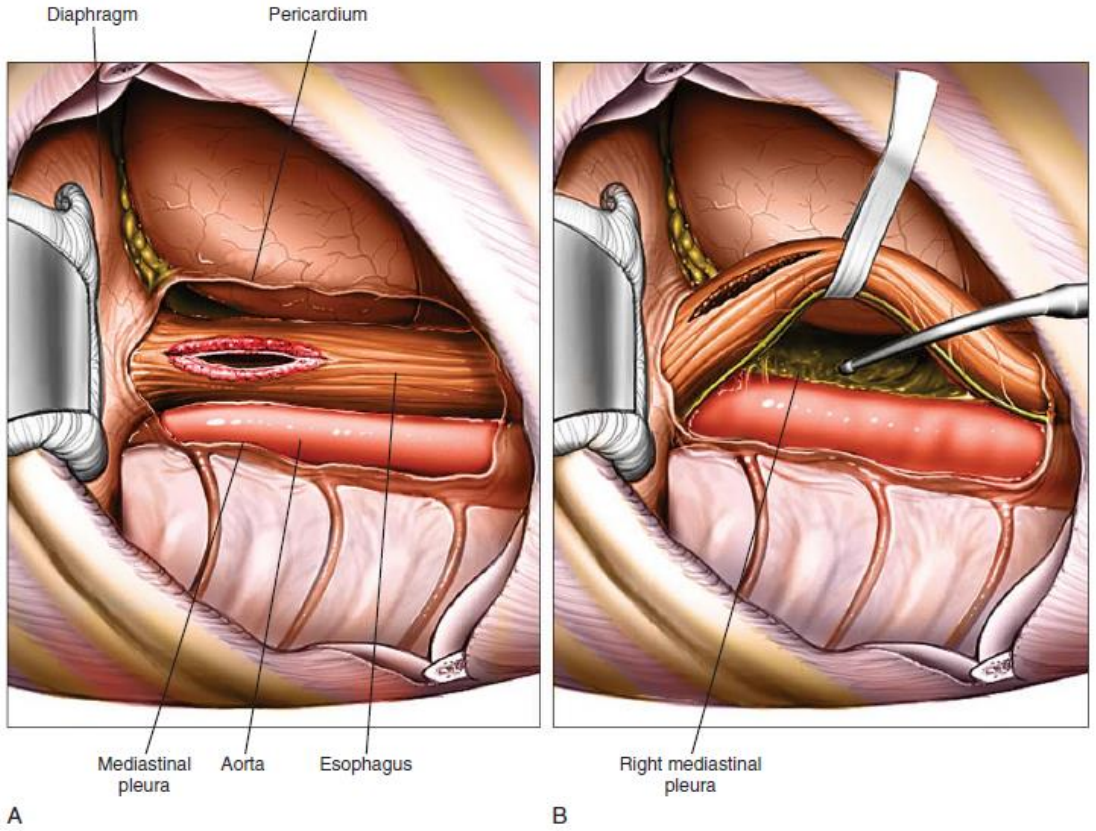
-splaying of muscle fibers in that region or the entrence of blood vessels and nerves.

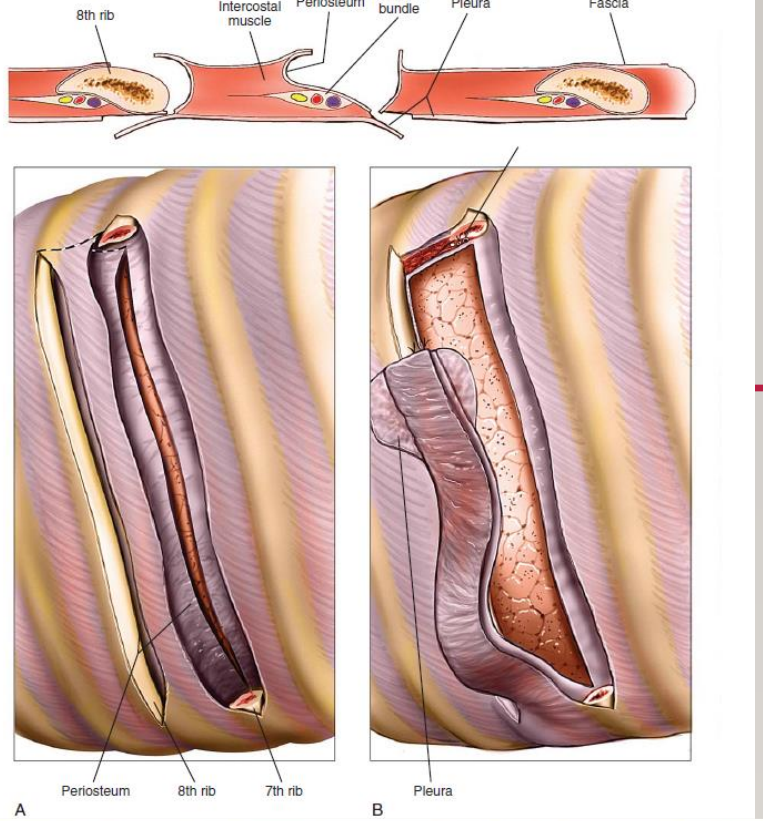
BOERHAAVE'S DISEASE

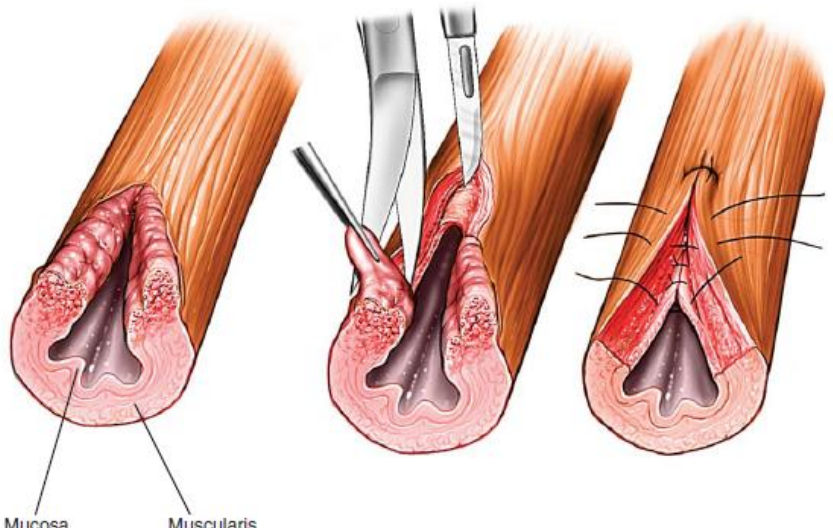


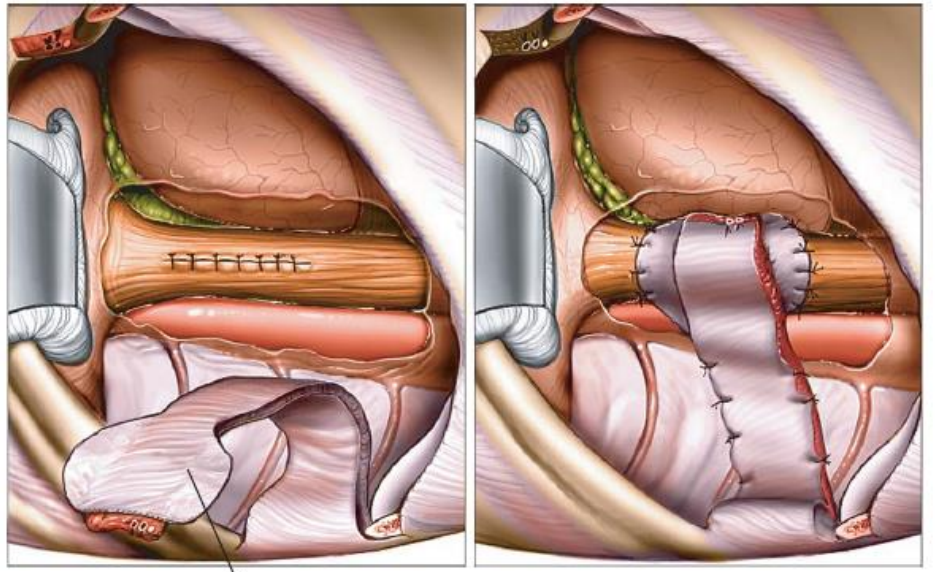
TREATMENT OF THORACIC PERFORATION

1. Debridement and drainage of the mediastinum and pleural spaces
2. Control of esophageal leak
3. Re-expansion of the lung
4. Prevention of gastric reflux
5. Nutrition and ventilator support
6. Appropriate antibiotics
7. Postoperative localization and drainage of residual septic foci

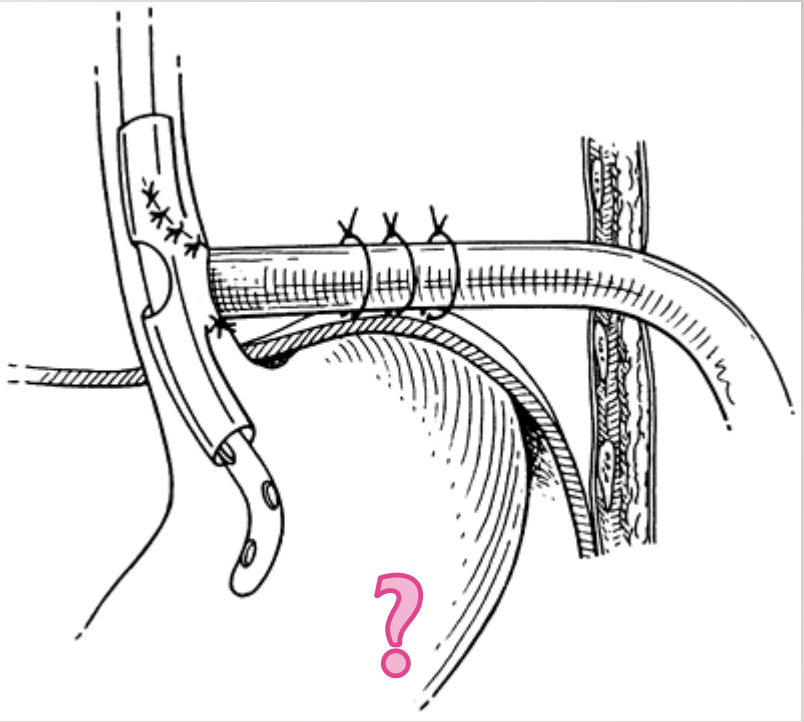

Diaphragm
Pericardium
Mediastinal pleura
Aorta
Esophagus
Right mediastinal pleura
A
B


8th rib
Intercostal muscle
Periosteum
bundle
Pleura
Fascia
Periosteum
8th rib
7th rib
Pleura
A
B


Mucosa
Muscularis


Intercostal musculo-

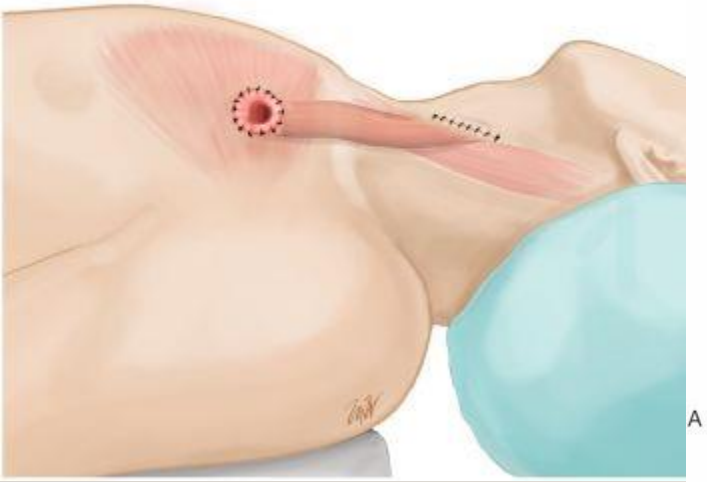
ESOPHAGOGRAPHY

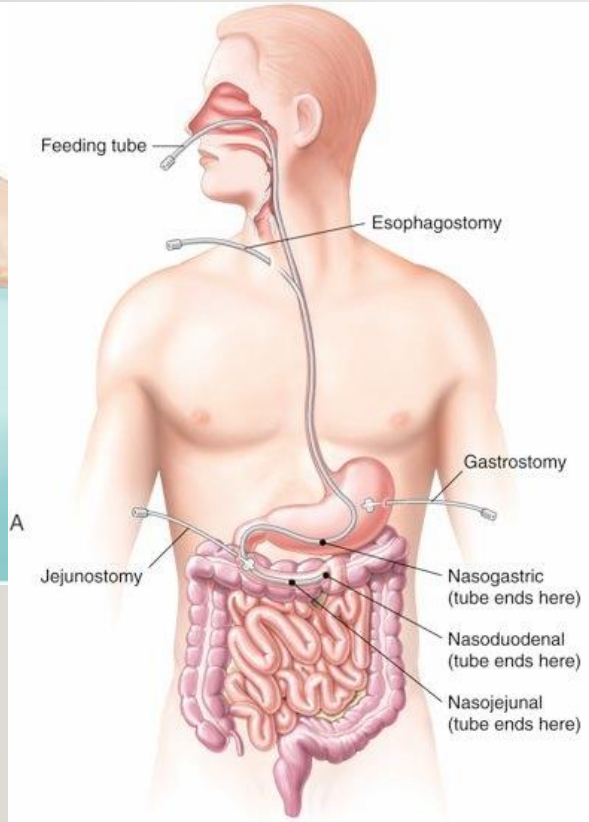


OPERATION

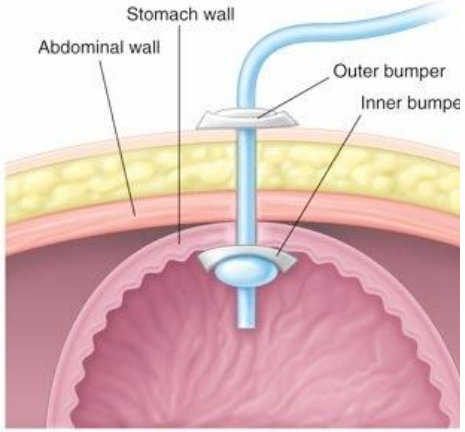
- Closure wit buttress or patch
- Exclusion and diversion
- T-tube fistula
- Thoracic drainage and irrigation
- Intraluminal stents
- Resection and reconstruction

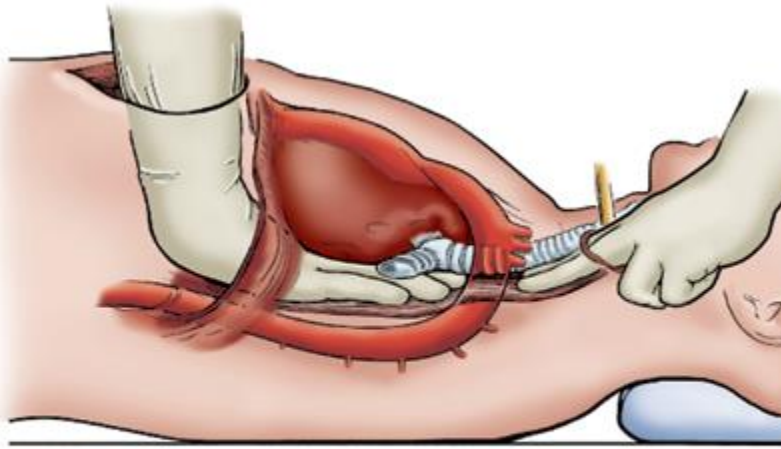
ESOPHAGEAL DIVERSION AND GASTROSTOMY TRANSHIATAL ESOPHAGECTOMY





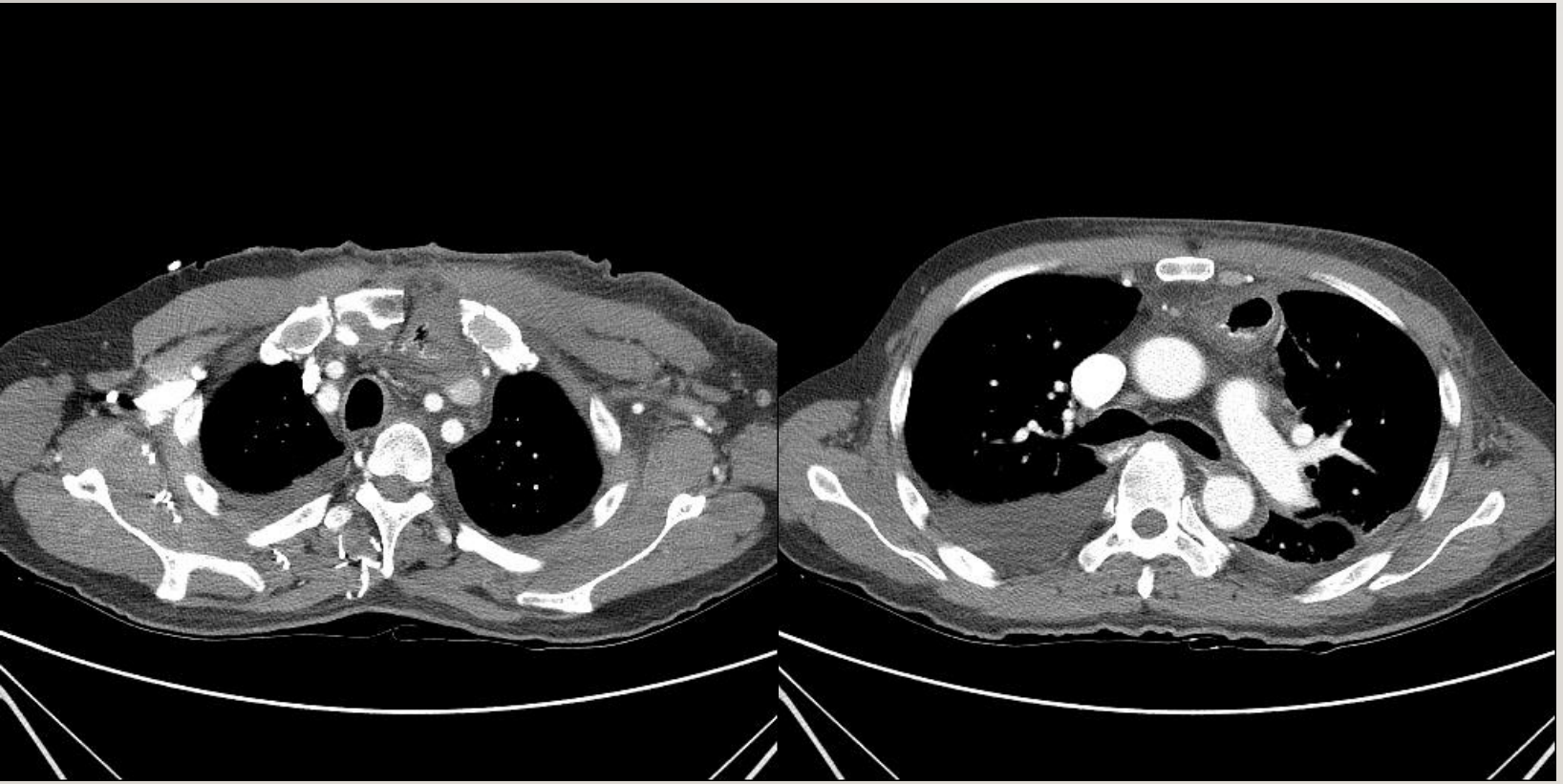
A





Source: Zinner MJ, Ashley SW: *Maingot's Abdominal Operations*, 12th Edition: www.accesssurgery.com

SUBSTERNAL COLON INTERPOSITION

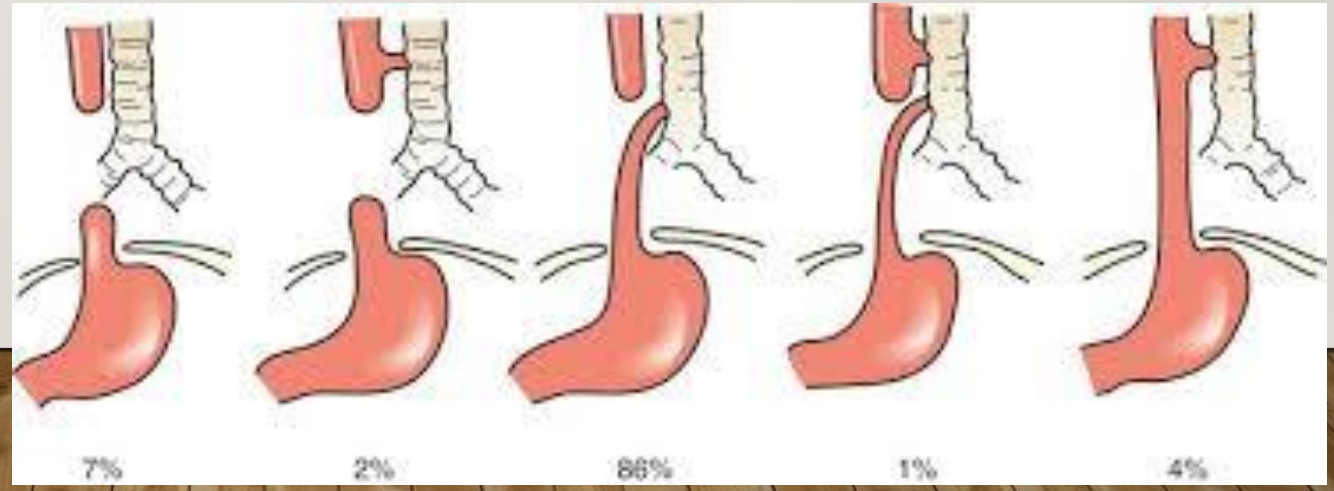


VI. 선천성 식도질환

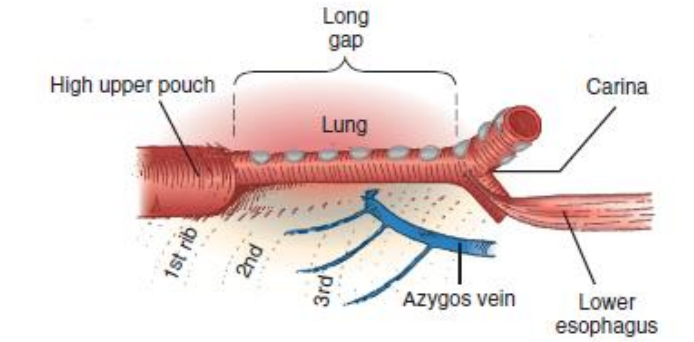
congenital esophageal disease

식도 폐쇄 및 기관식도루

- 발생 빈도 1/1500~3000, 30-76% combined other anomalies (VACTERL, 20%)
- 5가지 형태
- 1) EA with distal TEF (86%)
- 2) EA without TEF
- 3) TEF without EA(H-형)
- 4) 기타 식도 폐쇄증



SURGICAL REPAIR OF LONG-GAP ATRESIA



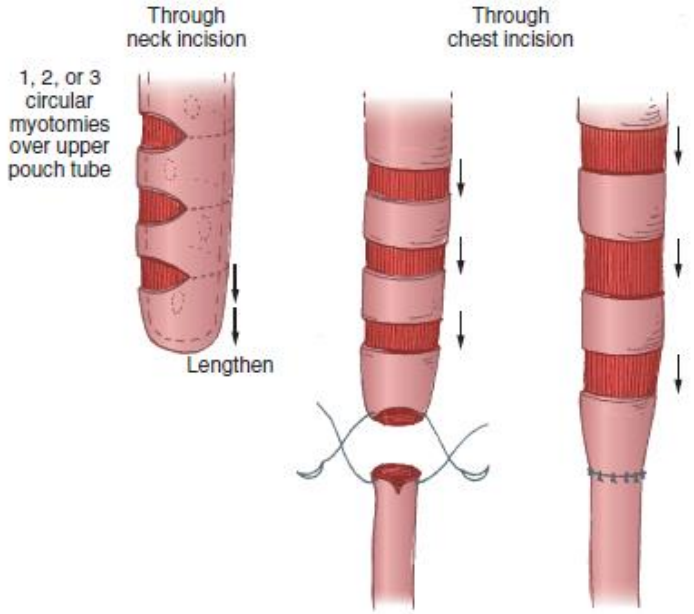


TABLE 10-3 Complications Associated With Esophageal Atresia and Its Repair

Complication	Incidence (%)*
Anastomotic leak	15-20
Recurrent fistula	3-10
Anastomotic stricture	10-35
Gastroesophageal reflux	55-82
Tracheomalacia	10-20

**See text for references.*

PEDIATRIC SURGERY

- VATS repair
- Extra-pleural approach
- Reconstruction using colon graft