

BENIGN DISEASE OF ESOPHAGUS

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CONTENTS

- I. Perforation and fistula
- II. Benign tumor
- III. Strictures
- IV. Congenital diseases
- V. Motility disorders
- VI. Hiatal hernia and GERD



* 양성 식도질환과 관련된 진료 행위 참고 자료

I. 양성식도질환 관련 진료행위: 행위 급여 목록[식도]: 2020년 3월판:

II. 진료행위 연도별 건수 (2015—2019, 심사년도 기준)

보건의료빅데이터개방시스템 (<https://opendata.hira.or.kr/>)



I. PERFORATION AND FISTULA

천공과 누공



PERFORATION

- 원인
 - 기구에 의한 천공: 내시경 풍선 확장술, EMR, ESD 등
 - 기구 이외 원인에 의한 천공
 - 외상성 천공: 둔상, 관통상, 수술 후 합병증
 - 이물섭취: 생선가시, 틀니, 약제 포장지
 - 자연천공: 보하브 증후군
- 전신 증상
 - Fever, leukocytosis
- 수술적 치료의 원칙
 - Mediastinal drainage



PERFORATION

- 천공부위 별 증상 (경부 vs. 흉복부)
 - 경부 : 국소 종창, 연하곤란, 피하기증
 - 흉부 : 발열, 빈맥, 속, 흉통 (subxiphoid, substernal), 전신독성 증상
- 진단 tool
 - 흉부 엑스선 촬영: reactive pleural effusion, subcutaneous emphysema
 - 식도 조영술 : 체내 흡수되는 Gastrografin 으로 시행
 - 식도 내시경: 천공 의심시 시행하지 않음
- 치료
 - 보존 요법: 천공이 심하지 않고, 조기 발견 시
 - 수술 요법: 천공이 심하고, 음식물 오염이 심할 경우

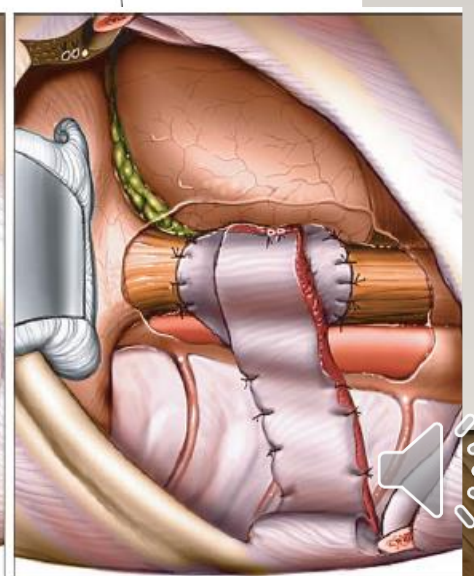
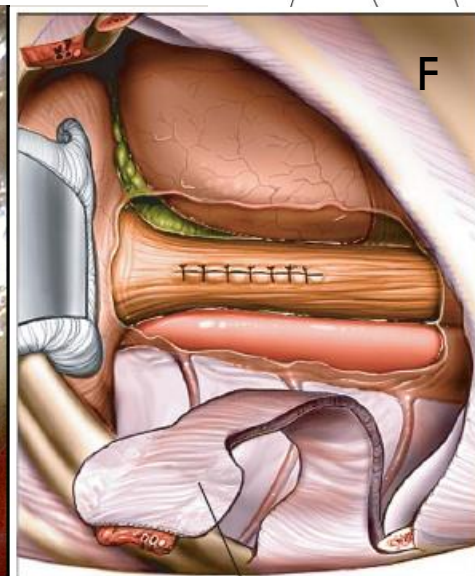
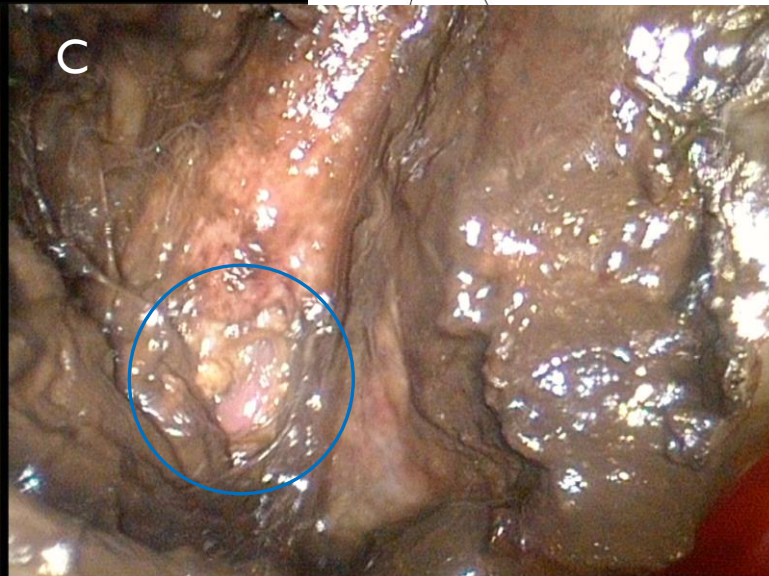
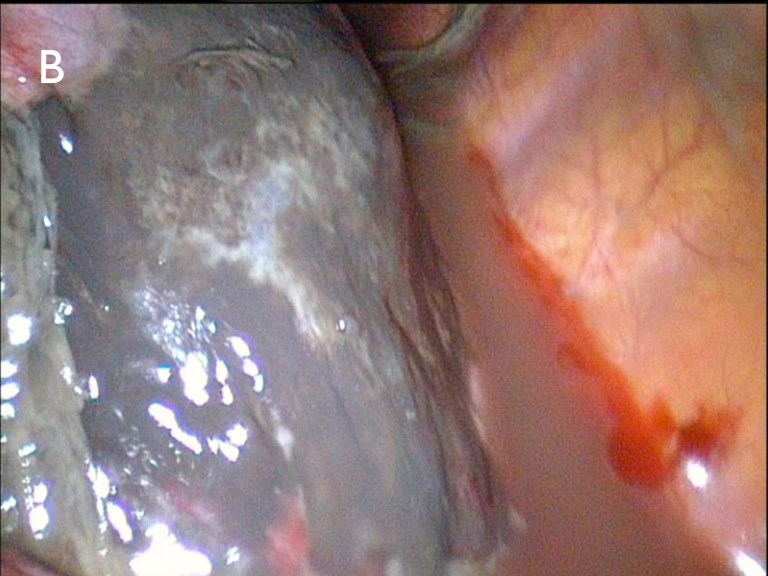
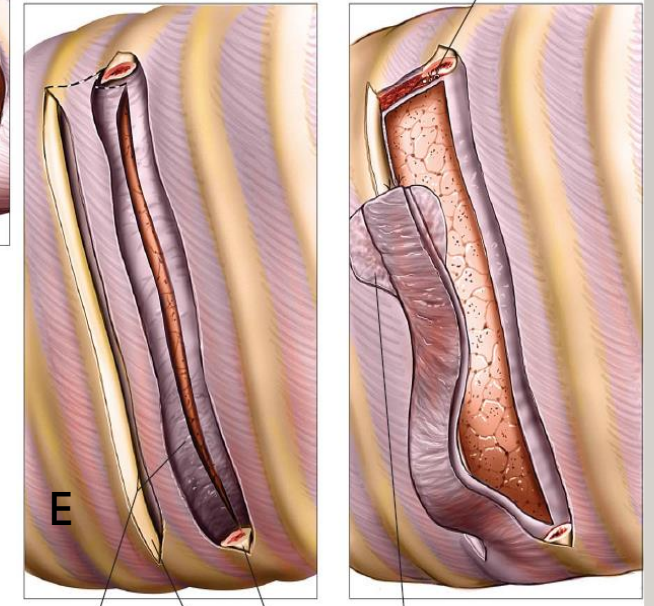
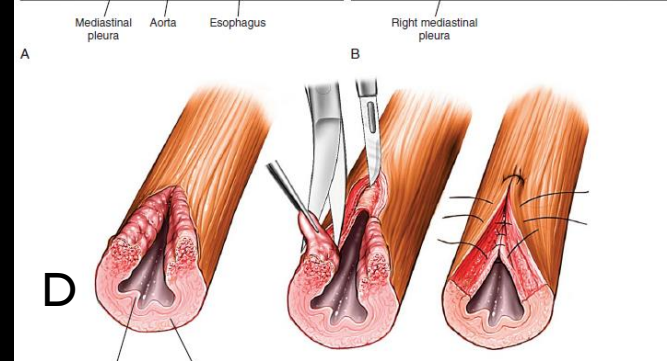
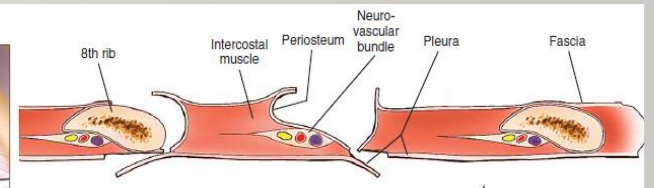
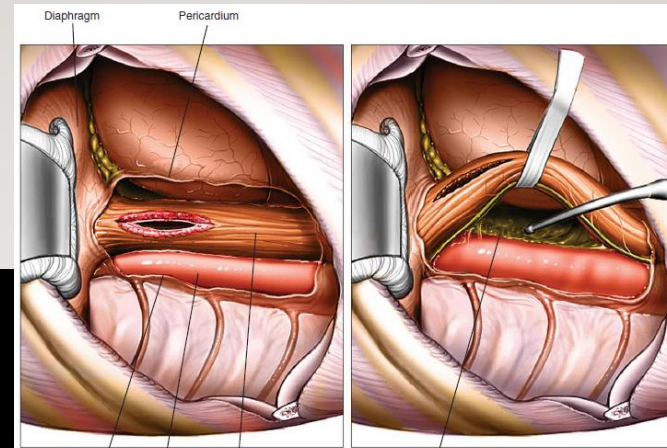
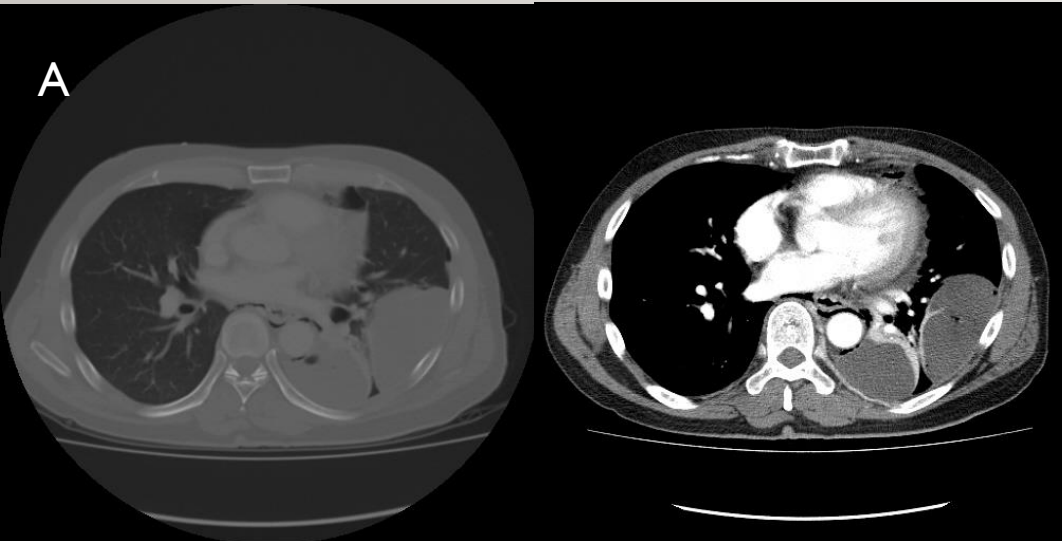


BOERHAAVE'S SYNDROME

- History: October 29, 1723, Hermann Boerhaave
 - Professor of medicine at Leiden University, Netherland
 - Patient: Baron Jan van Wassenaer-Grand admiral of the Holland fleet
- Causes: Alcohol, sedatives, general anesthesia and **repetitive vomiting**
- Mechanism: Failure of the **upper esophageal sphincter** to relax → intra-esophageal pressure → esophageal rupture
 - Mallory-Weiss Syndrome (Massive hematemesis +/- melena)
Persistent retching or vomiting → no relaxation of **LES** → Single or multi-mucosal tear at the EGJ
- Site of rupture: **“Left posterolateral wall of the esophagus”**
splaying of muscle fibers in that region or the entrance of blood vessels and nerves.



BOERHAAVE'S DISEASE



PRIMARY TREATMENT OF ESOPHAGEAL 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 support
6. Appropriate antibiotics
7. Postoperative localization and drainage of residual septic foci



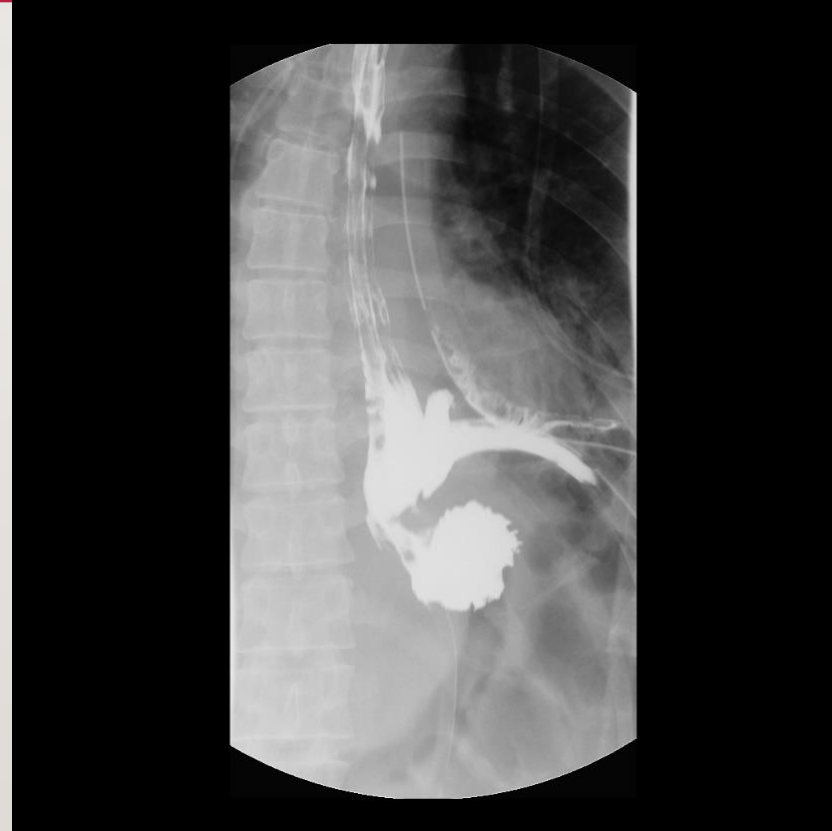
REINFORCEMENT OPTIONS

- Pedicled Pericardial fat
- Transposition of Omentum
- Pedicled Intercostal Muscle flap



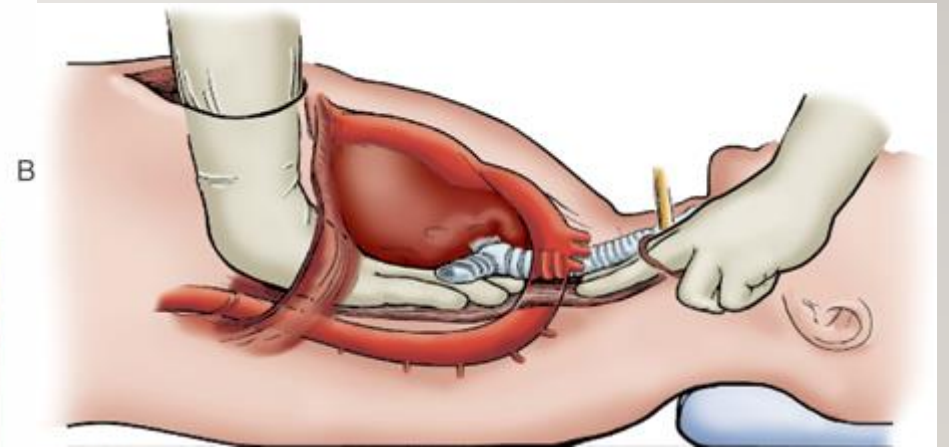
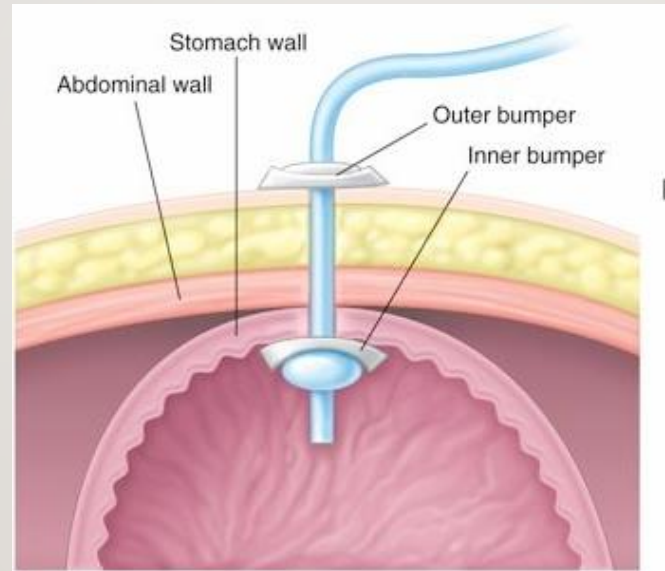
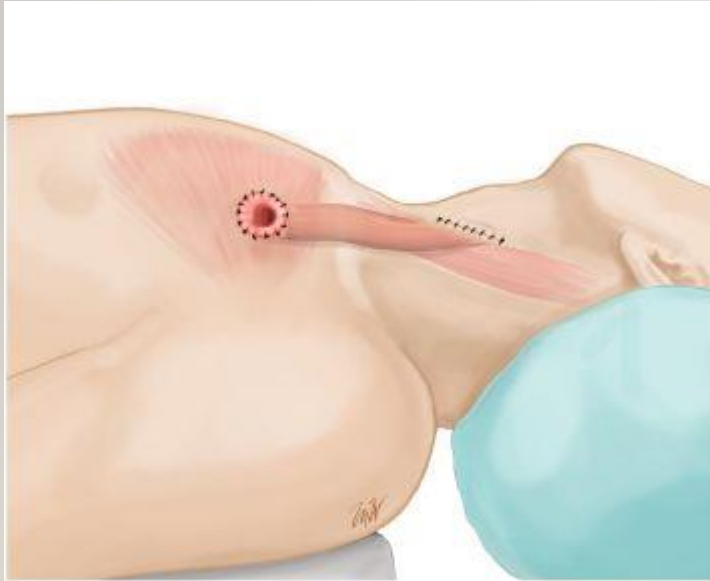
OPERATION AFTER FAILURE OF PRIMARY CLOSURE

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



I. ESOPHAGEAL DIVERSION AND GASTROSTOMY

II. TRANSHIATAL ESOPHAGECTOMY



FISTULA

- 게실성 병변과 후천성 누관
 - 흉부 중앙의 식도 게실 : traction diverticulum
 - 식도벽내 게실증: acquired fistula
- 원인: 악성 종양.TB
- 치료
 - Stenting or fistulectomy and primary closure
 - Esophagostomy
 - Esophageal bypass



진료행위 청구건수(심사년도 15-19, 건수)

	2015	2016	2017	2018	2019
• 식도 조루술 esophagostomy	14-	13-	7-	20-	15
• 식도 봉합술(경부접근) esophageal repair	52-	46-	39-	43-	34
• 식도 봉합술(흉부접근)	104-	95-	92-	127-	92
• 식도 봉합술(복부접근)	3-	4-	4-	10-	6



II. BENIGN ESOPHAGEAL TUMOR

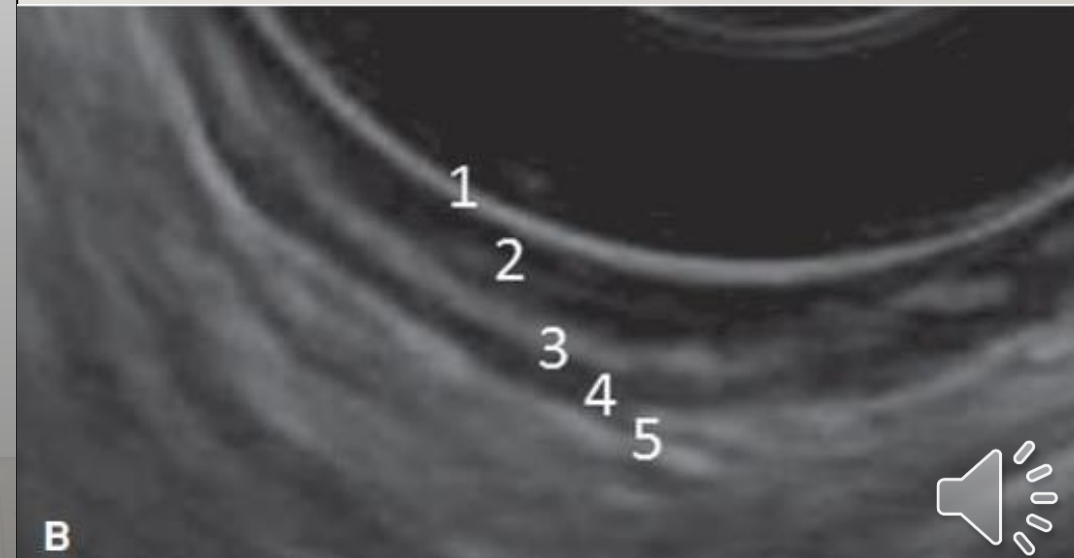
양성 식도 종양



BENIGN TUMOR 양성종양

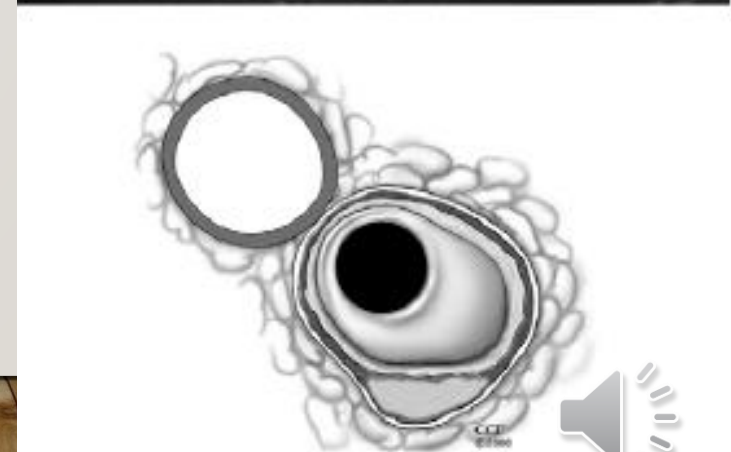
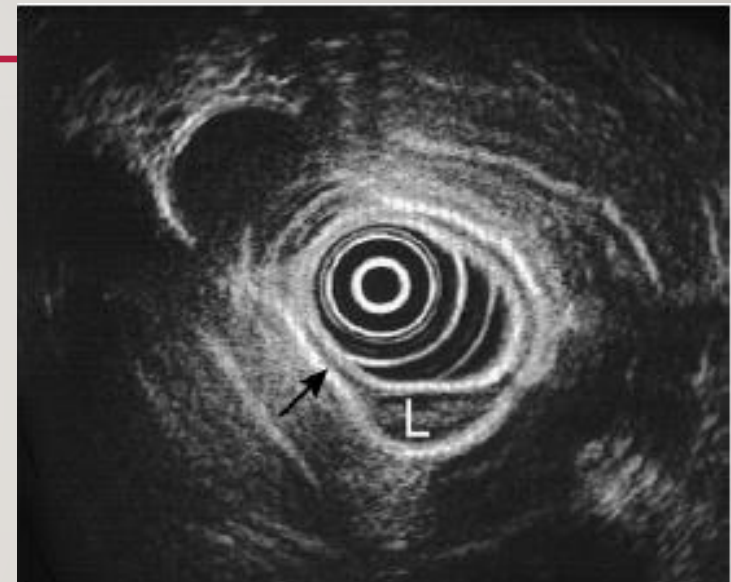
- 식도 종양의 1% 미만 발생.
- Mid thoracic lesion 가 가장 많이 발생.
- EUS for diagnosis.

1. Interface between intraluminal fluid and the superficial mucosa (hyperechoic, white)
2. Deep mucosa including lamina propria and muscularis mucosae (hypoechoic, dark)
3. Submucosa (hyperechoic, white)
4. Muscularis propria (hypoechoic, dark)
5. Adventitia or interface with surrounding mediastinal structures (hyperechoic, white)

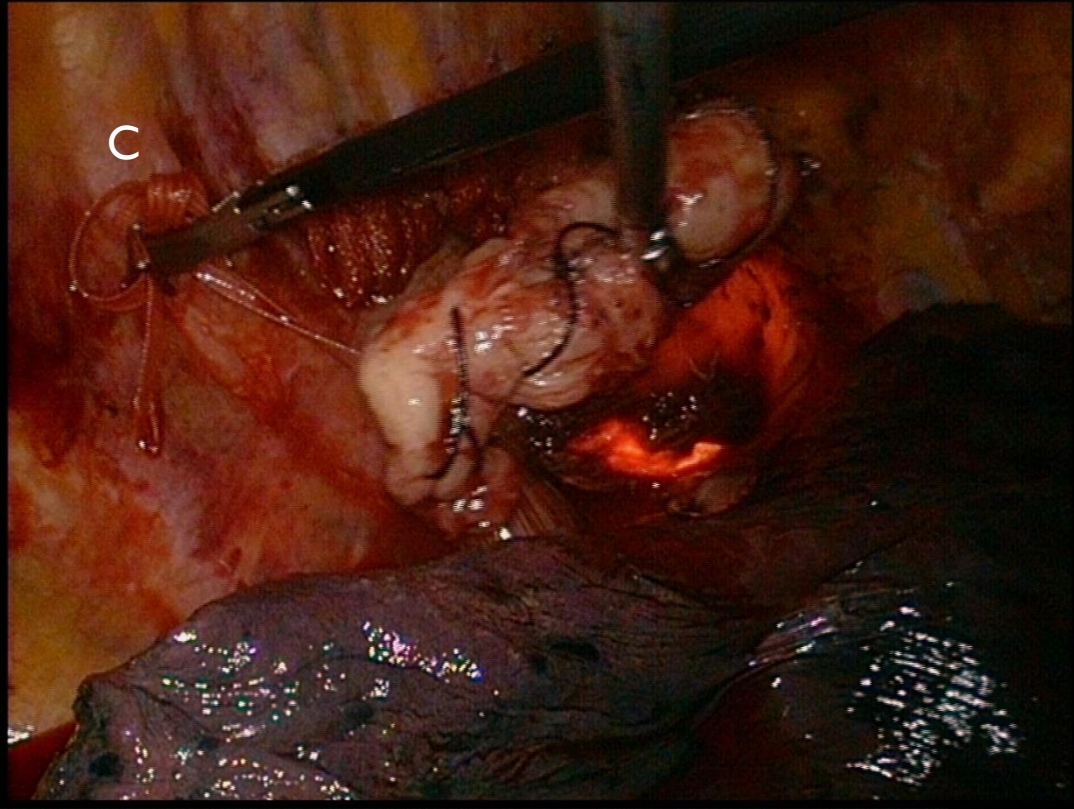
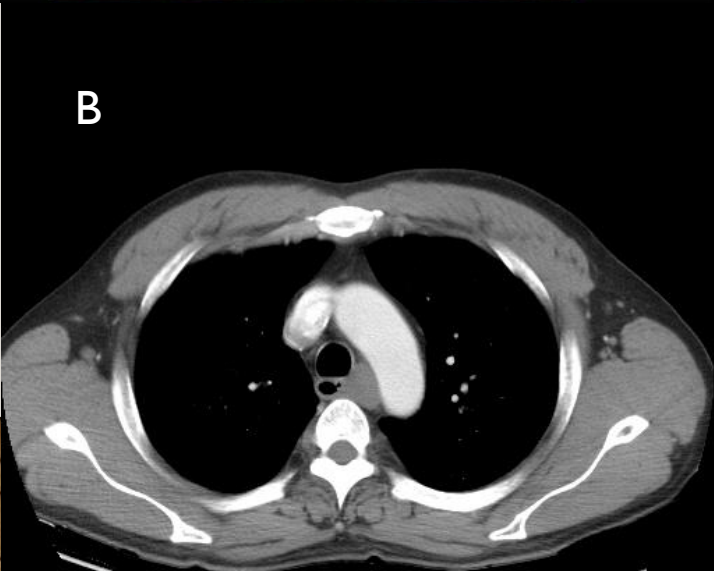
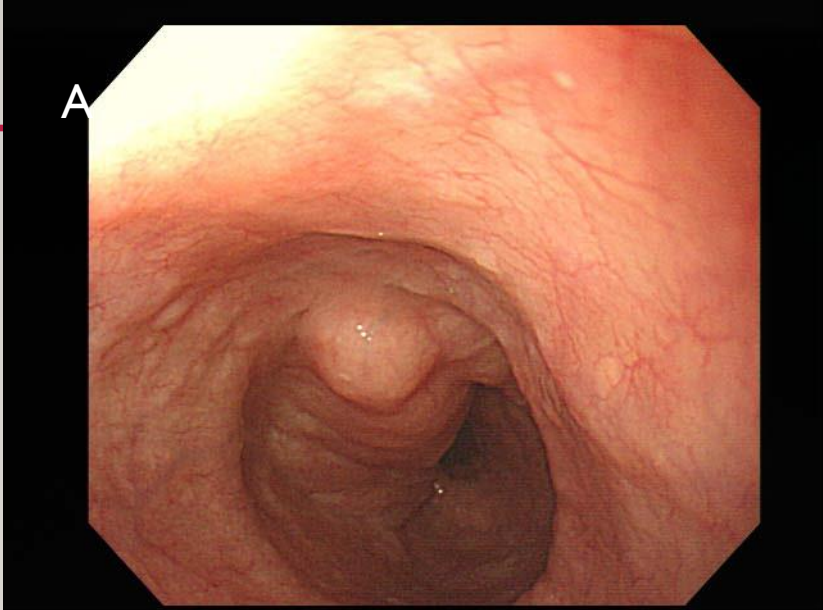


LEIOMYOMA 평활근종

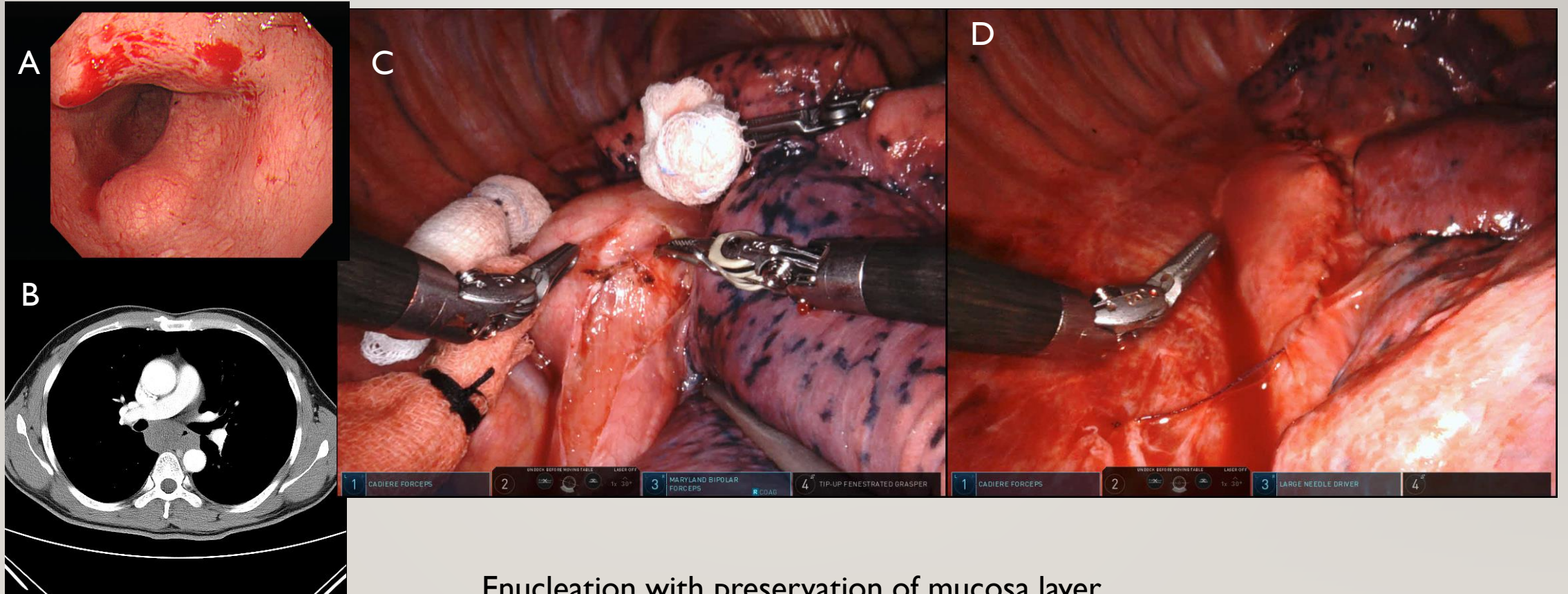
- Muscularis propria (confined to the 4th EUS layer)
- D/Dx: Leiomyosarcoma, GIST
- Malignant transformation: rare
- Endoscopic resection: <2cm
- 수술 적응증
 - 사라지지 않는 증상
 - 크기 증가
 - 악성이 의심될때
 - 다른 식도수술과 동반되었을때



LEIOMYOMA VATS ENUCLEATION



ROBOT ASSISTED ESOPHAGEAL ENUCLEATION



Enucleation with preservation of mucosa layer



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	2015	2016	2017	2018	2019
• 식도 양성 종양 적출술 (식도입구부)	5-	3-	5-	9-	3
• 식도 양성 종양 적출술 (흉부 접근)	55-	52-	43-	62-	48
<ul style="list-style-type: none"> • 주 : 흉강내시경 기구를 이용하여 폐전방부위를 견인하여 늑막개방후 식도근육층을 박리하여 종양부위를 적출하는 경우에도 소정점수를 산정한다. 					
• 식도 양성 종양 적출술 (복부 접근)	7-	7-	11-	2-	10



III. STRICTURE

협착



CAUSTIC INJURY

Chemical burn

Children: Accident

Adult: Accidents, or Suicide

- 알칼리성 부식제/양젯물
- 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

The anatomies of severely damaged (stricture) sites

- 1. Cricopharyngeal level
- 2. mid-esophagus 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

1. Broad spectrum anti-biotics and anti fungal agent and NPO

2. Endoscopic examination and frequent PEX, CXR, CT

-Corticosteroid: no proved benefit!

3. Depth of injury classification

1) First degree: Mucosa

2) Second degree: Transmucosal

3) Third degree: Full-thickness with extension into periesophageal tissue



OPERATION OF CAUSTIC INJURY

-Emergent op indications

Perforation

Transmural necrosis
grade 2 or 3 injury

-Late op indications

Complete stenosis failed to establish a lumen

Perforation after dilation

Fistula formation

Inability to dilate or maintain the lumen

Patient want

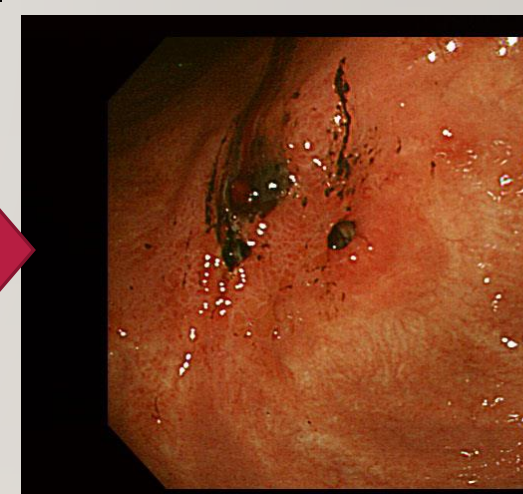
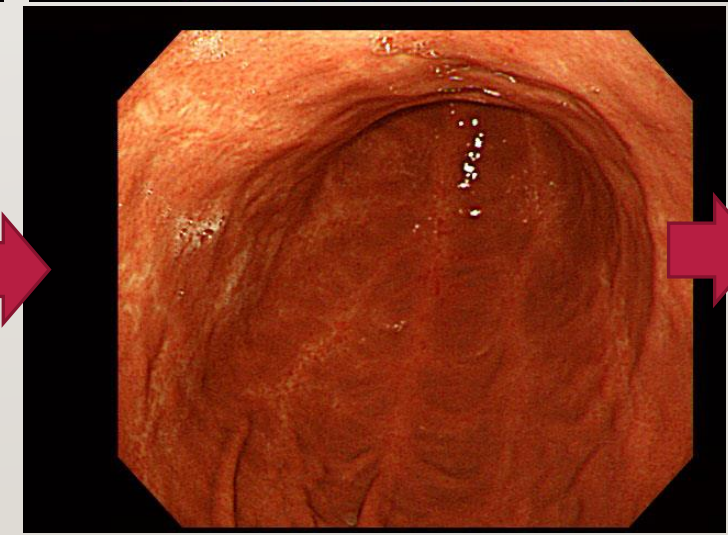
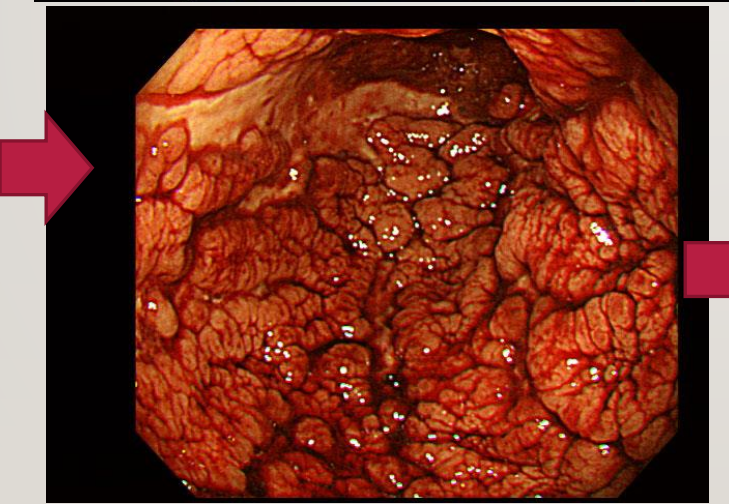
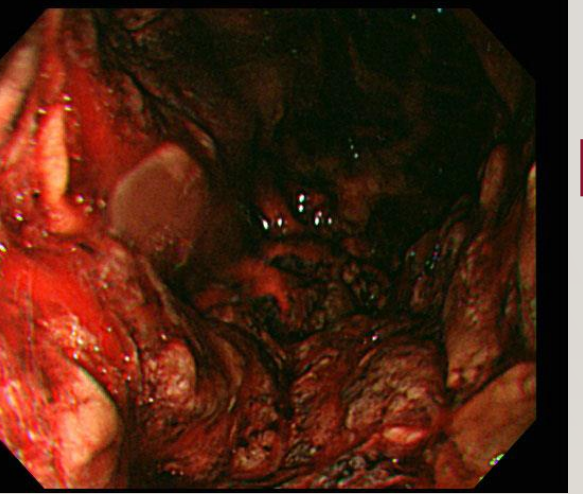
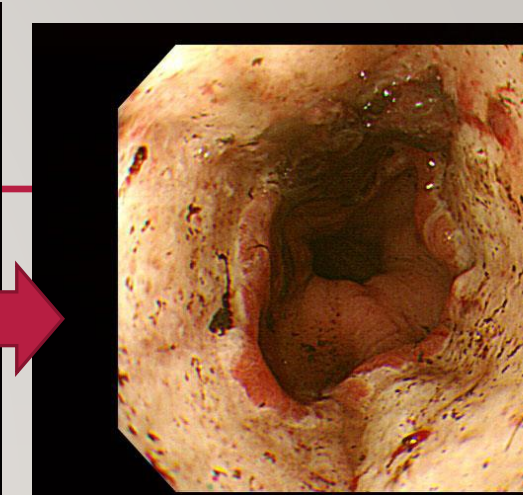
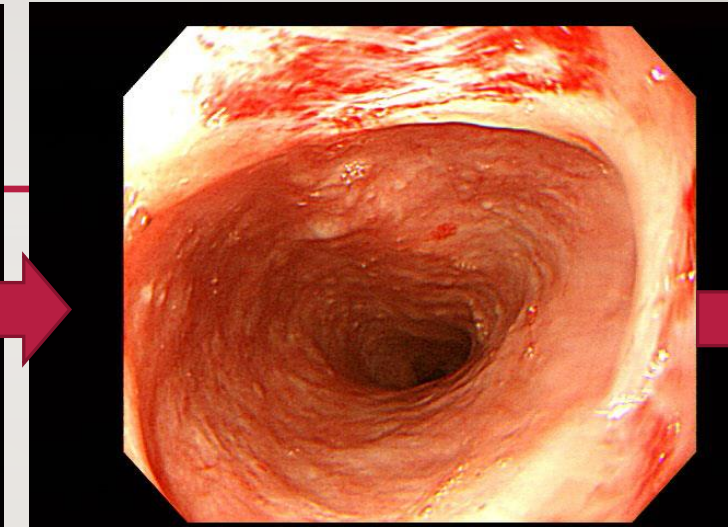
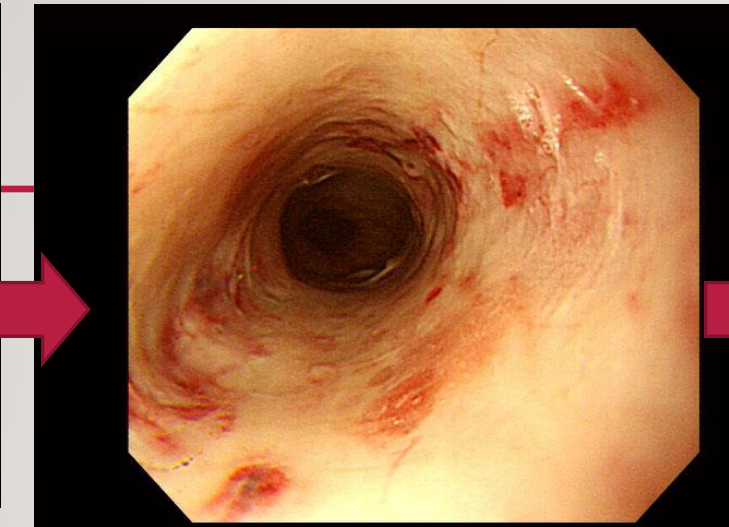
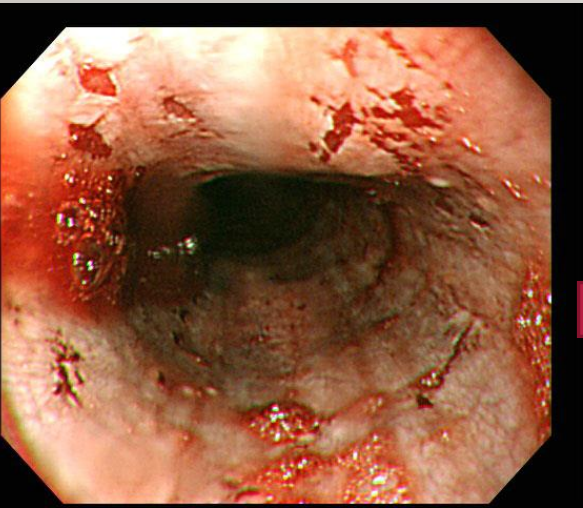
Esophageal cancer

• Operations

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



CASES (ACID)



I. 행위 급여 목록 [식도]

- 식도부지법 Bougination of Esophagus
- 식도우회재건술 Esophageal Bypass Reconstruction
 - 가. 경복부 접근 나. 흉복부 접근 다. 경흉복부 접근
- 단순식도절제술 Simple Esophagectomy
 - 가. 경복부접근 나. 흉복부접근 다. 경흉복부 접근
- 식도절제후 재건술 Esophageal Reconstruction after Resection

(주: 단순식도절제술 또는 식도양성종양 근치수술과 동시에 실시한 경우 소정점수를 각각 산정한다.)

- 가. 피판성형 with Patch 나. 위이용 with Stomach 다. 공장이용 with Jejunum
- 라. 유리공장이식 Jejunal Free Flap 마. 대장이용 with Colon



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	2015	2016	2017	2018	2019
• 단순식도절제술(경북부접근)	24-	19-	7-	7-	9
• 단순식도절제술(홍북부접근)	19-	28-	13-	40-	35
• 단순식도절제술(경흥북부접근)	12-	9-	12-	10-	12
• 식도부지법	180	197	172	173	174
• 식도우회재건술(경북부접근)	22-	28-	36-	28-	31
• 식도우회재건술(홍북부접근)	4-	3-	2-	5-	12
• 식도우회재건술(경흥북부접근)	5-	5-	3-	4-	9



진료행위 청구건수(심사년도 15-19, 건수)

	2015	2016	2017	2018	2019
• 식도절제후재건술(피판성형)	2-	1-	1-	2-	4
• 식도절제후재건술(위이용)	735-	834-	712-	813-	742
• 식도절제후재건술(공장이용)	20-	27-	20-	27-	18
• 식도절제후재건술(유리공장이식)	18-	12-	22-	21-	19
• 식도절제후재건술(대장이용)	53-	57-	41-	33-	47



IV. CONGENITAL DISEASE

선천성 식도질환

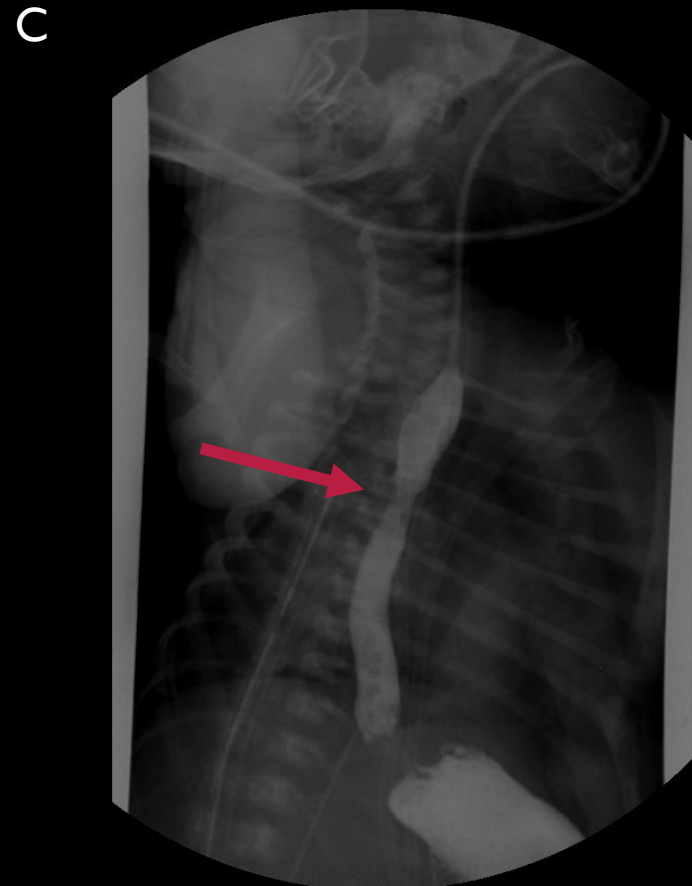
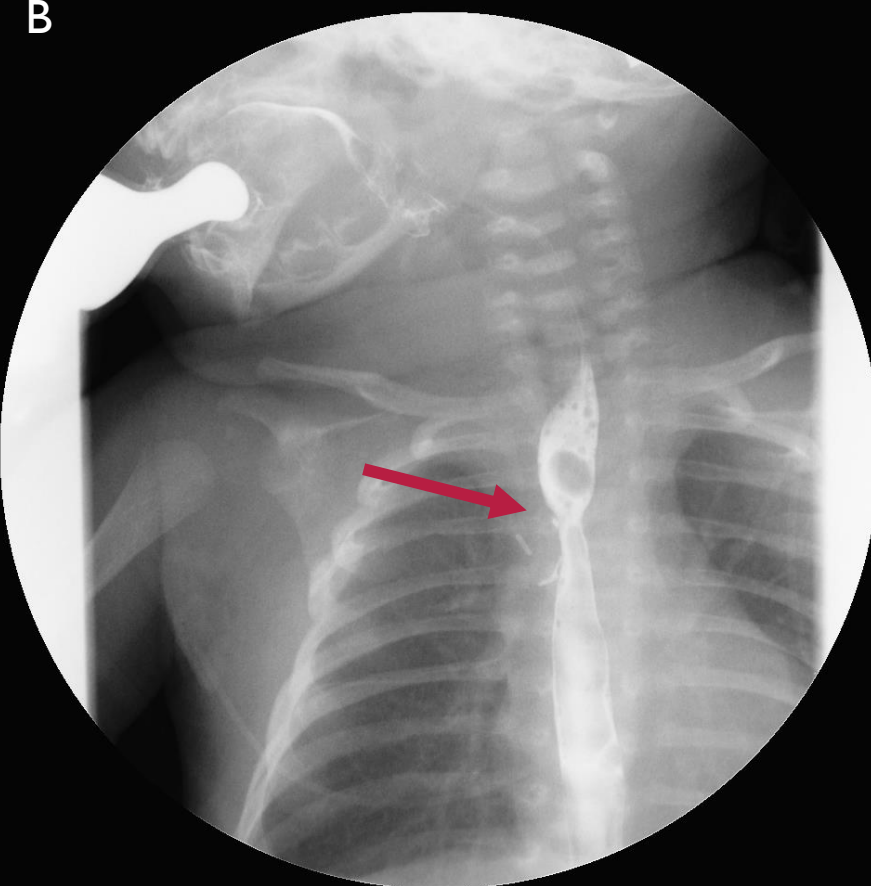
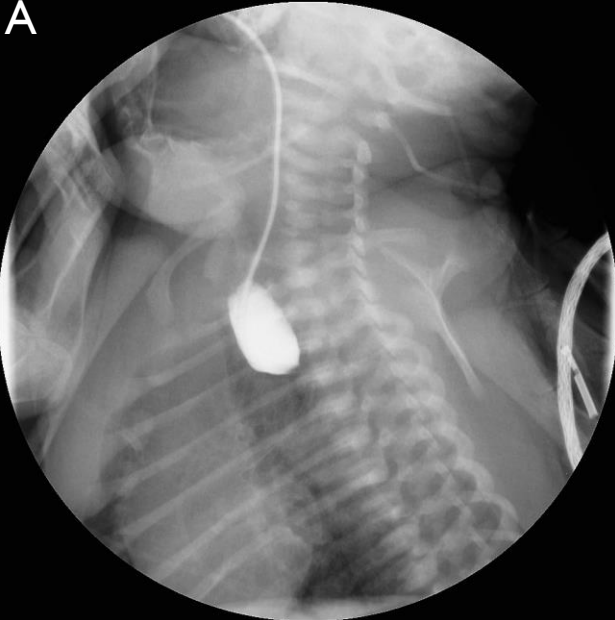


식도 폐쇄 및 기관식도루

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



CASE



PEDIATRIC SURGERY

- VATS repair
- Extra-pleural approach
- Telescope method or Reconstruction using colon graft: Long gap type



진료행위 청구건수(심사년도 15-19, 건수)

	2015	2016	2017	2018	2019
• 선천성식도무공증수술 (식도문합)	12-	9-	9-	10-	4
• 선천성식도무공증수술 (기관식도루제거)	21-	10-	14-	13-	8
• 선천성식도무공증수술 (식도문합과 기관식도루제거 동시에)	47-	55-	47-	70-	46

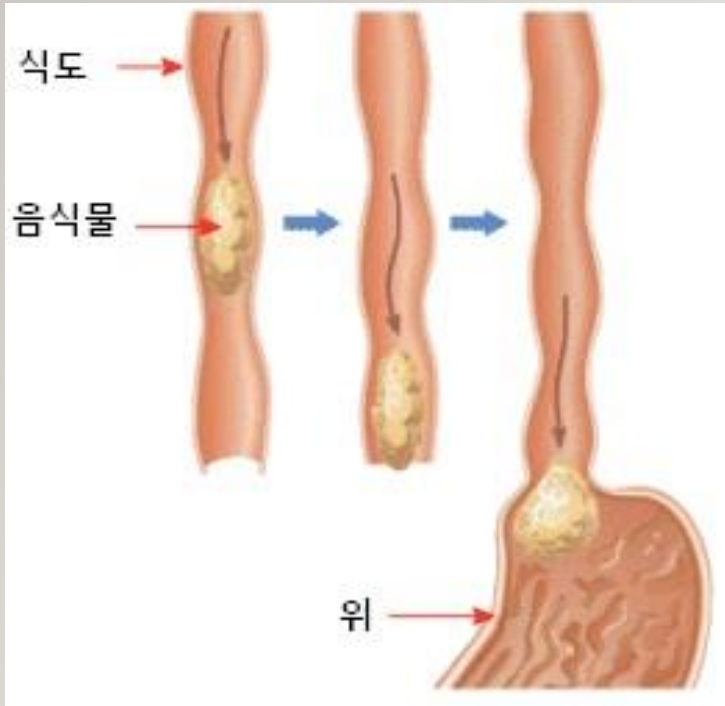


V. MOTILITY DISORDER

운동장애 질환



LOCATION OF ESOPHAGEAL MOTILITY DISORDERS



상부 식도

괄약근 운동장애

체부 및 하부 식도

괄약근 운동장애

- Zenker's diverticulum

- Achalasia

- Diffuse esophageal spasm

- Nonspecific esophageal motor dysfunction

- Secondary motor dysfunction

- Epiphrenic diverticulum



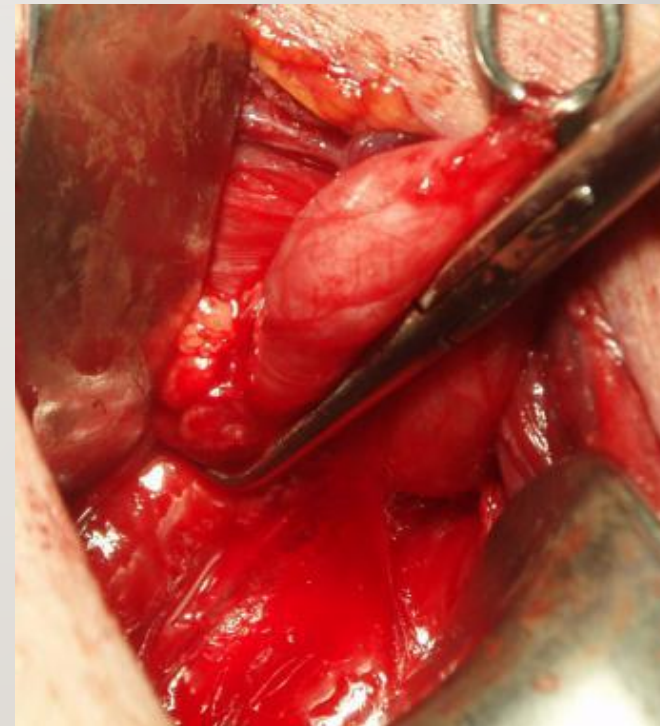
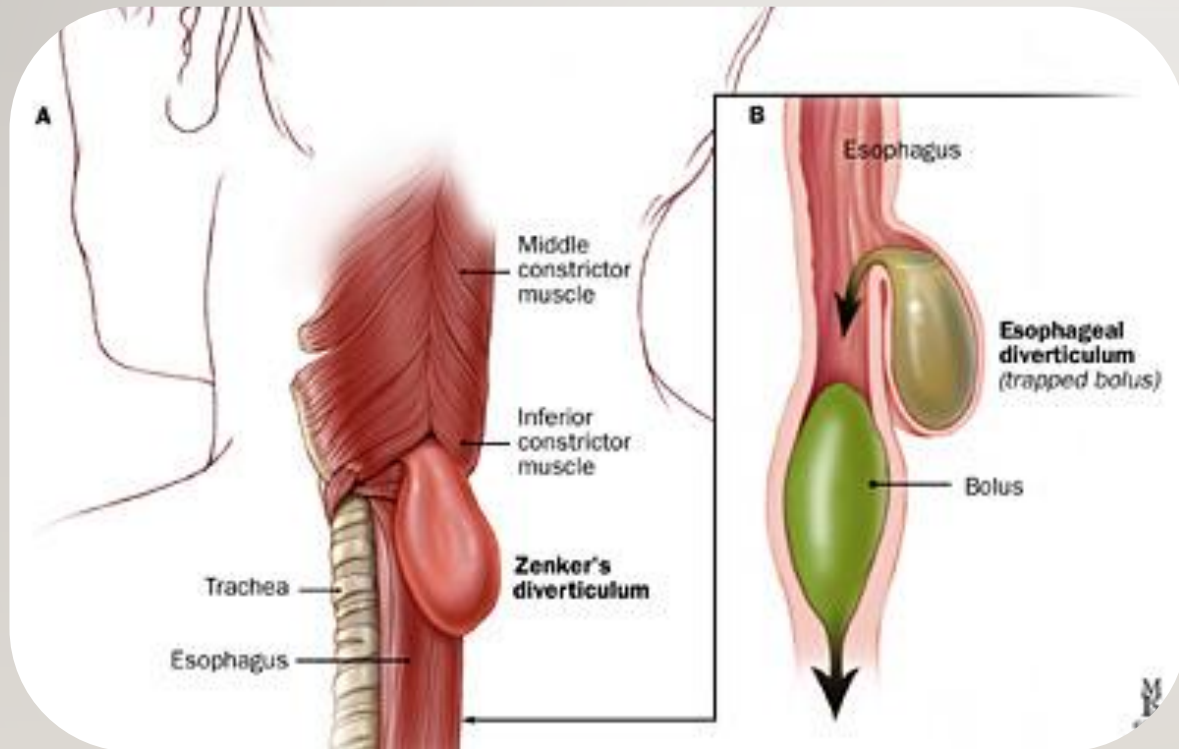
ZENKER'S DIVERTICULUM

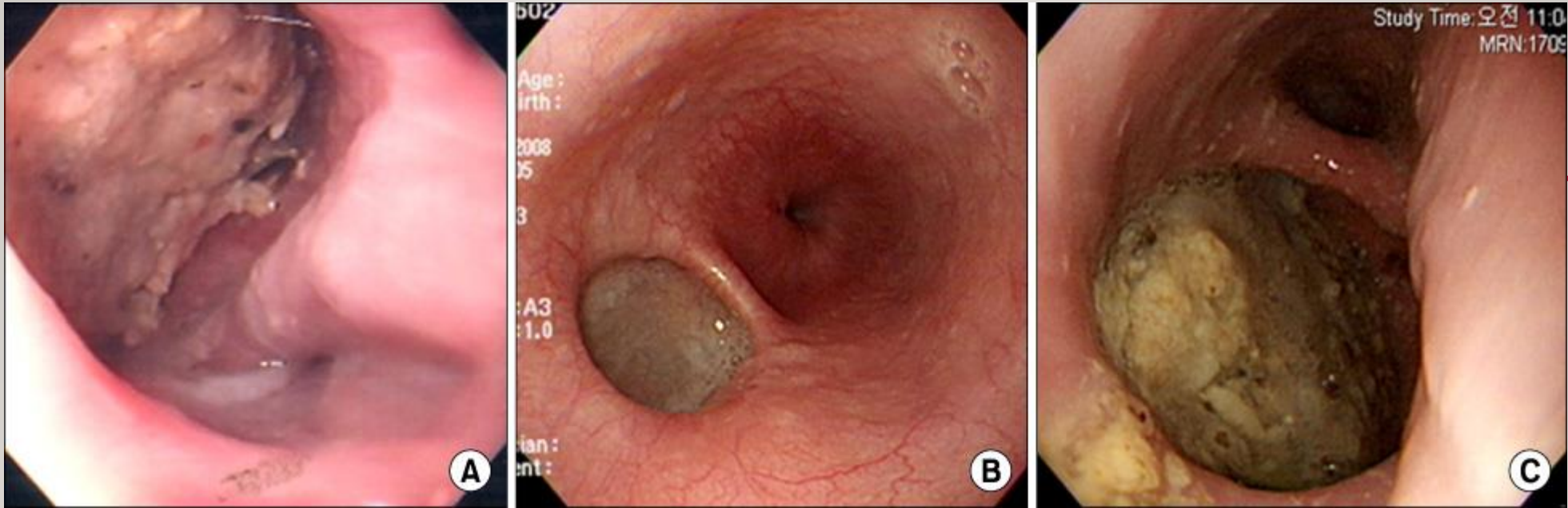
- 27 cases described in 1877 by Zenker and Ziemssen
- **Most common** esophageal diverticulum
- Killian's triangle, C6,7 Vertebra level
- Pathogenesis: UES incomplete opening -> **pulsion** explanation favored (increase pressure in lumen forces tissue through weak spot in muscle layer)
- Location: hypopharynx 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





(A) Pharyngoesophageal,

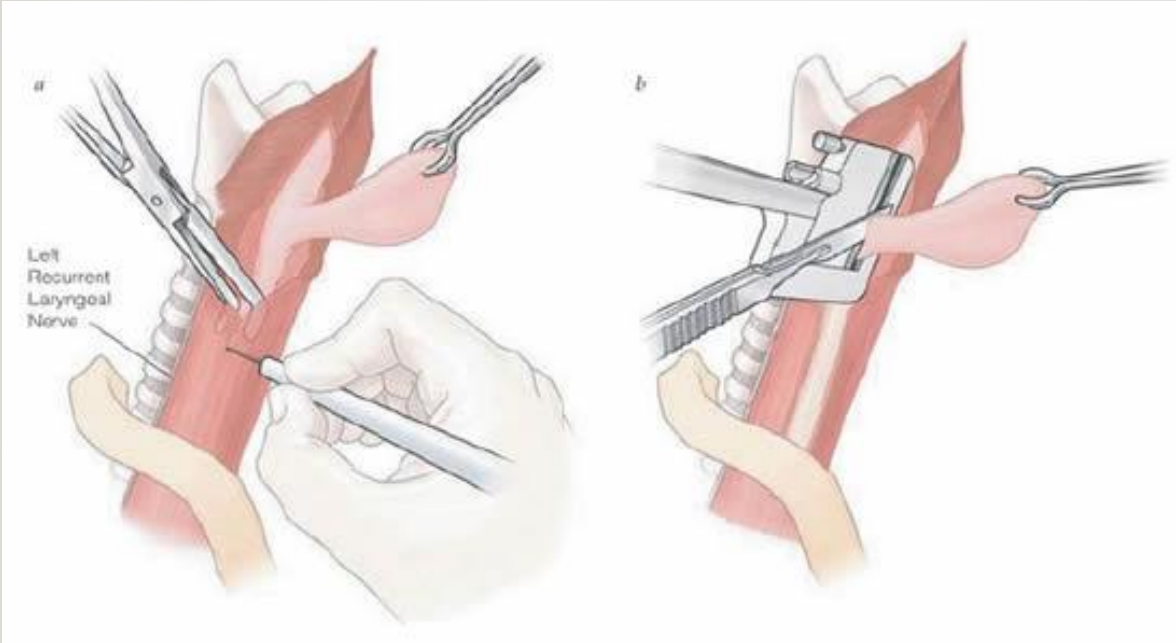
(B) Mid esophageal

(C) Epiphrenic esophageal diverticula.

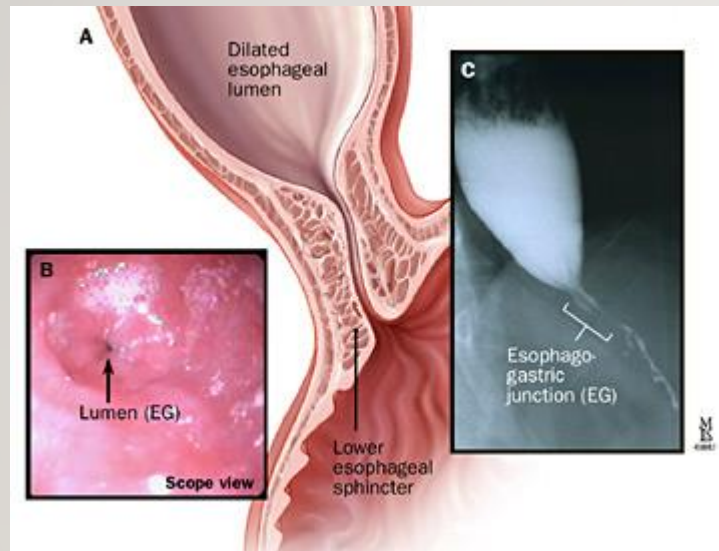




ZENKER'S DIVERTICULUM -DIVERTICULECTOMY



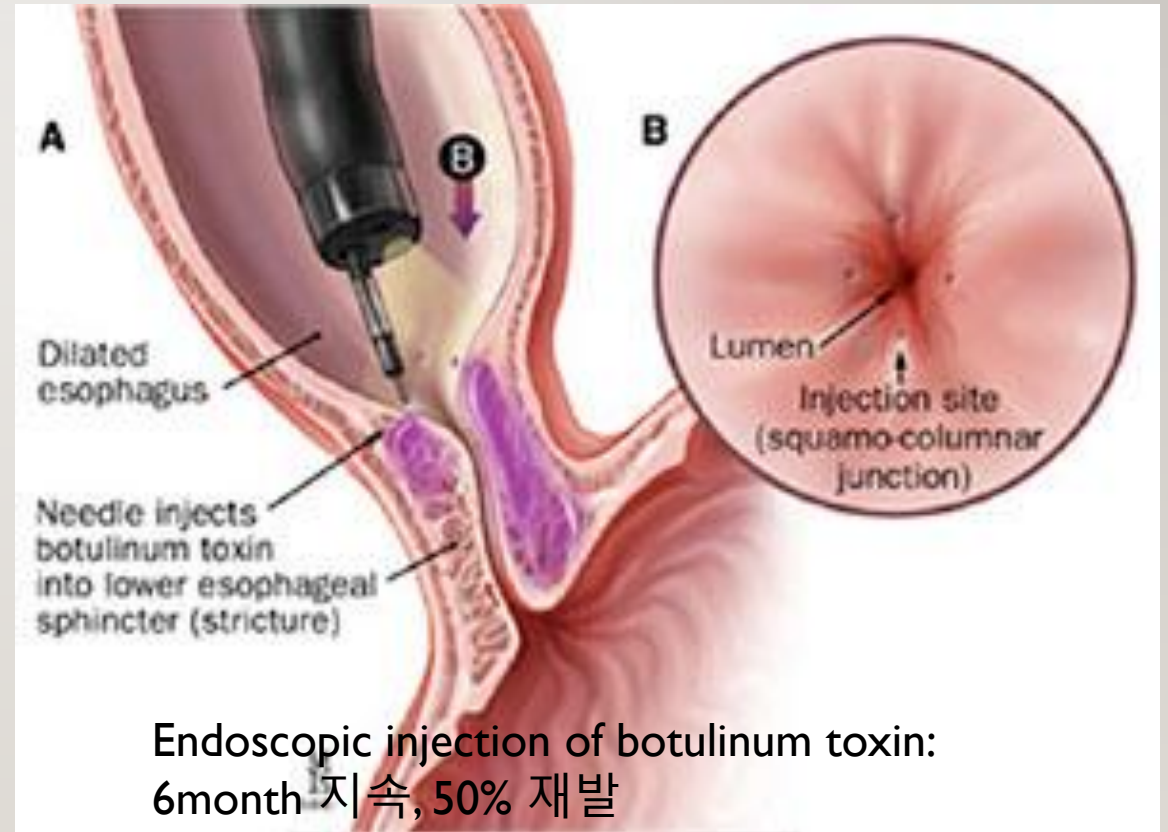
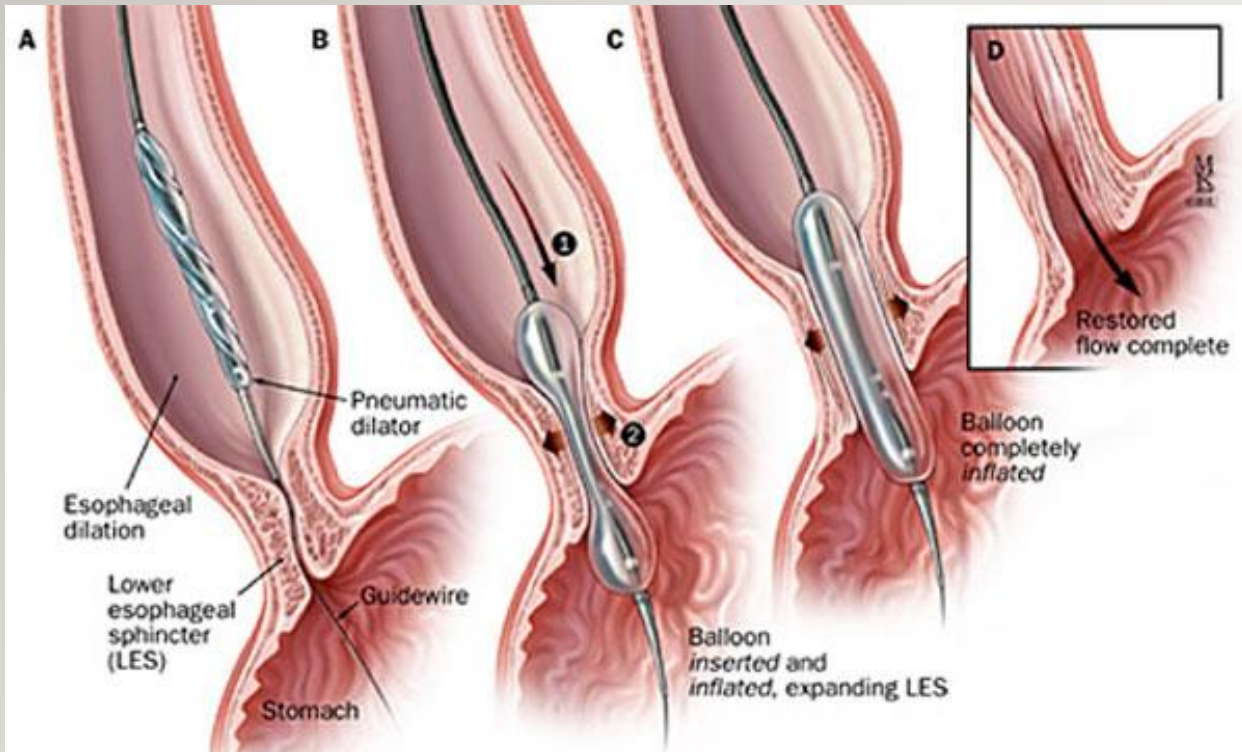
ACHALASIA



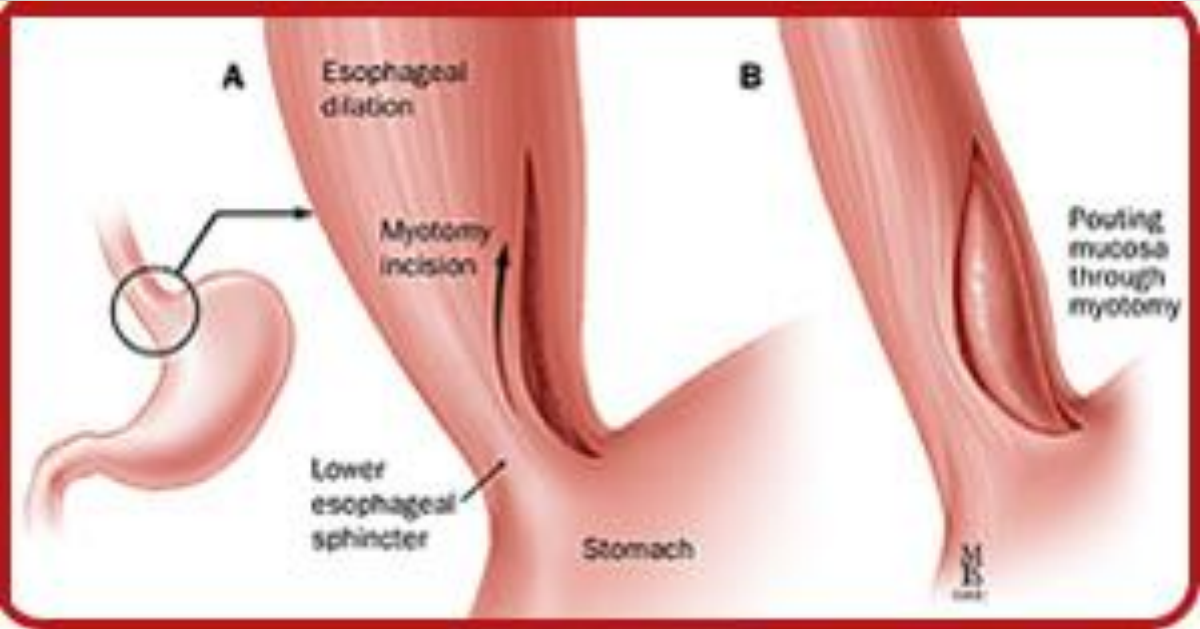
- Absence of peristalsis and failure of relaxation of LES.
- T-cell mediated destruction of Myenteric neural plexus



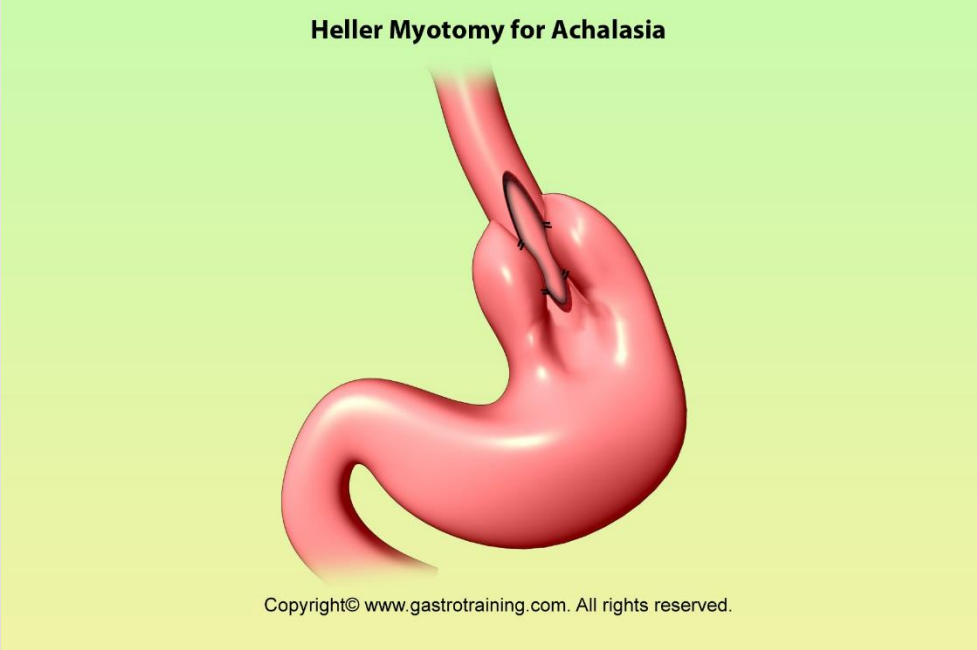
INTERVENTION FOR ACHALASIA



SURGERY FOR ACHALASIA



Heller's myotomy



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



I. 행위 급여 목록 [식도]

- 식도분문수술 Operation of Achalasia
 - 가. 식도근절개술 [헬러술식] Esophagomyotomy
 - (1) 흉부접근
 - (2) 복부접근
 - 나. 식도항역류수술 Esophageal Antireflux Operation
 - (1) 흉부접근
 - (2) 복부접근
 - 다. 기타 분문성형술 Other Esophagocardioplasty
 - (1) 흉부접근
 - (2) 복부접근
 - 라. 식도 게실 절제술 Esophageal Diverticulectomy
 - (1) 경부접근
 - (2) 흉부접근

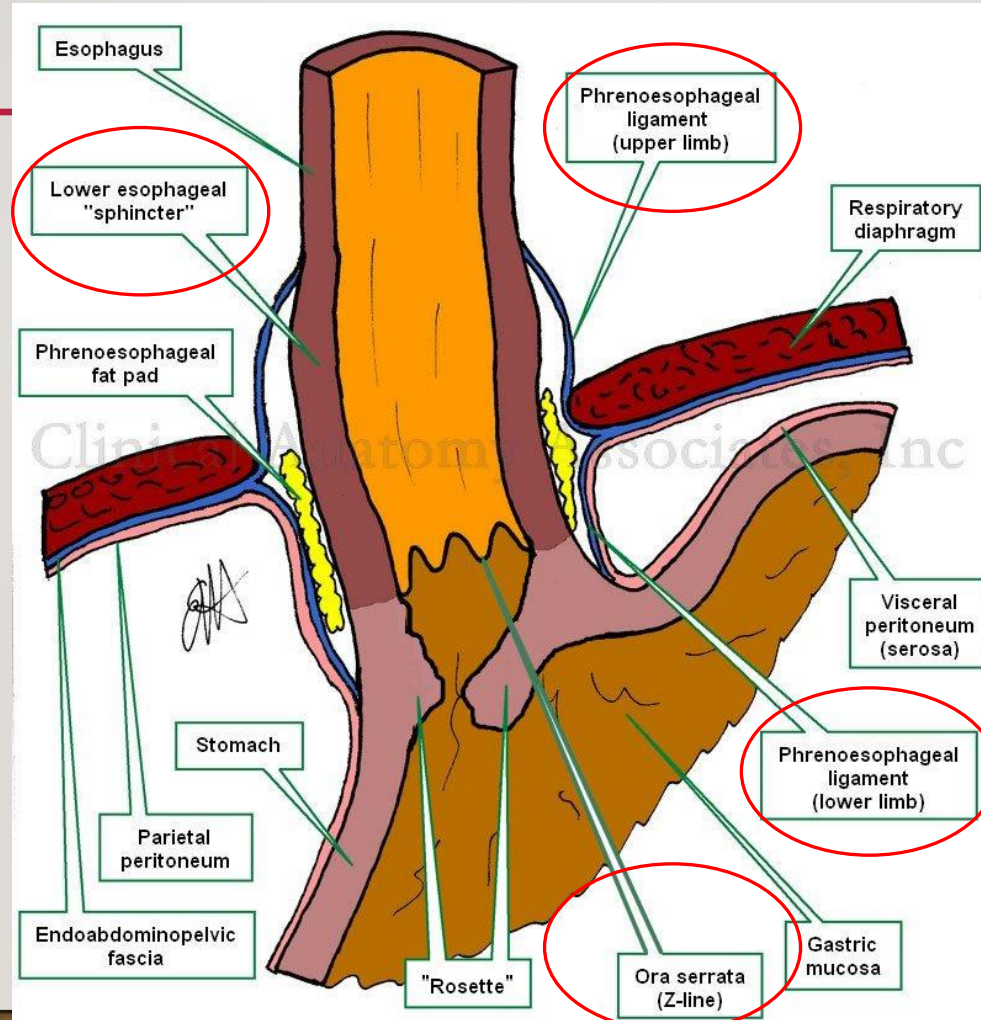


VI. HIATAL HERNIA AND GERD

식도열공허니아 및 위식도역류성질환



PHRENOESOPHAGEAL MEMBRANE(LIGAMENT)

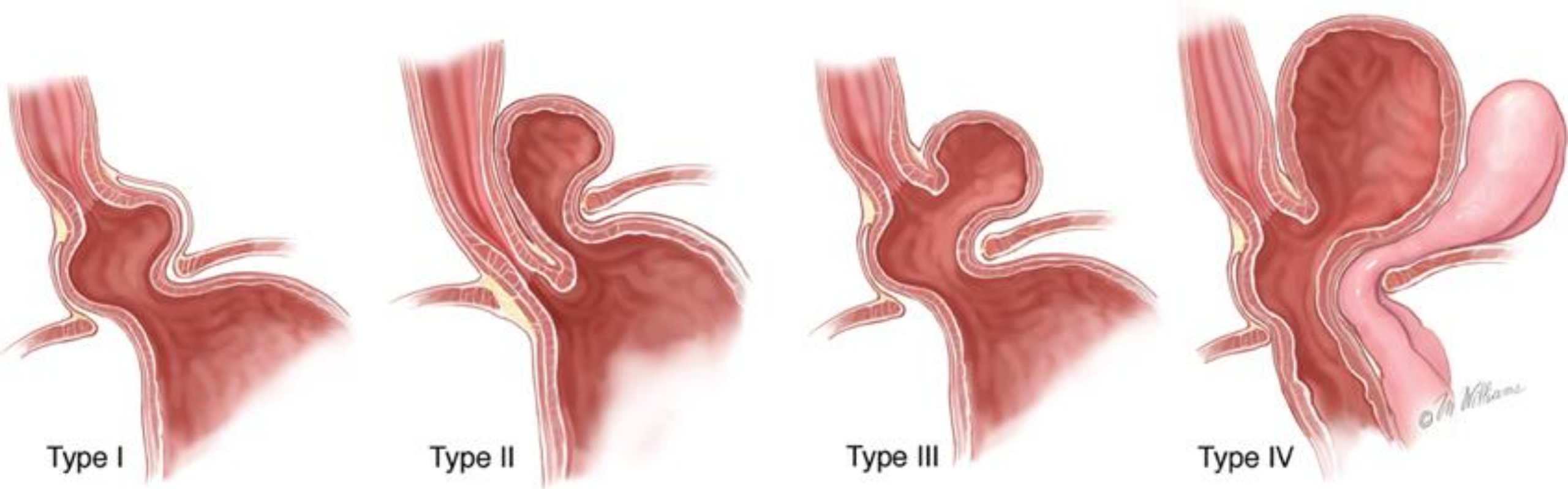


I. **Sliding hiatal hernia:** GEJ > 2cm above hiatus: > 95% of all hernia

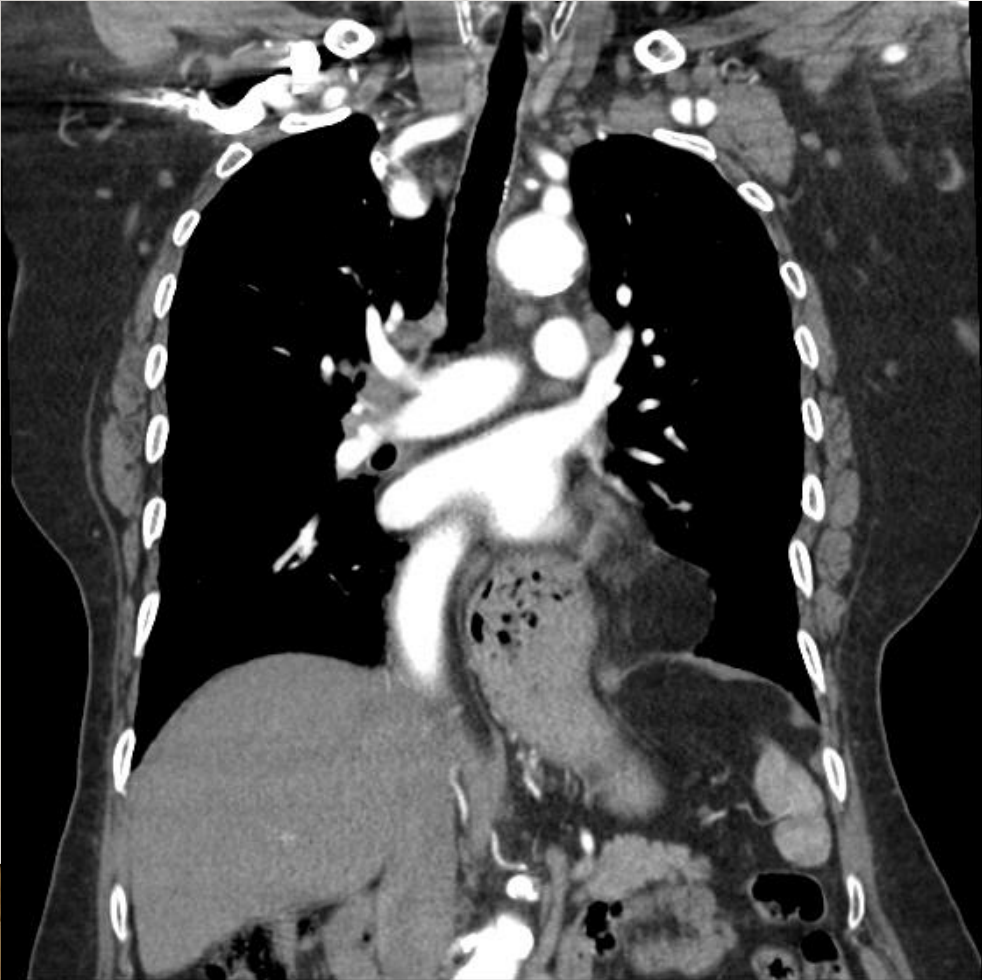
II. **Paraesophageal hiatal hernia:** GEJ remain below diaphragm, fundus protrusion through hiatus

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

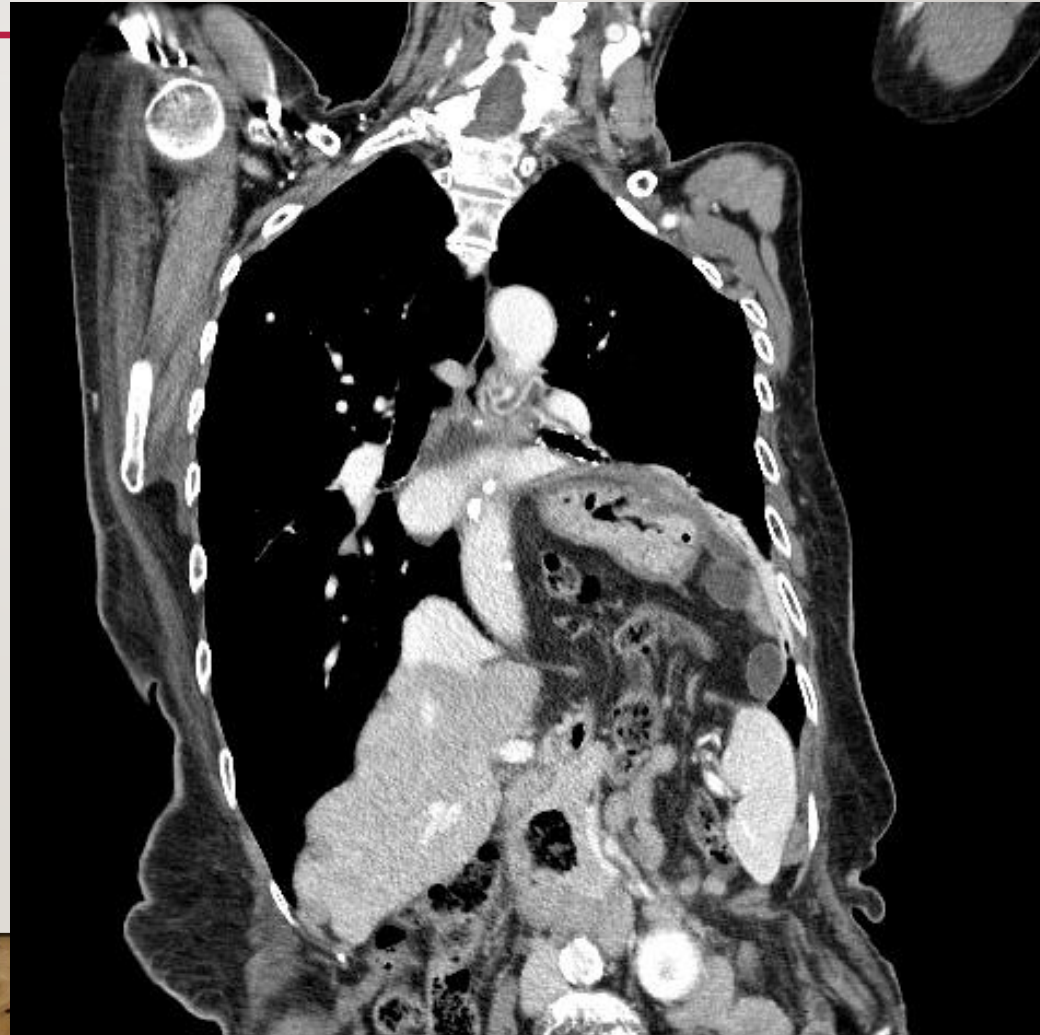
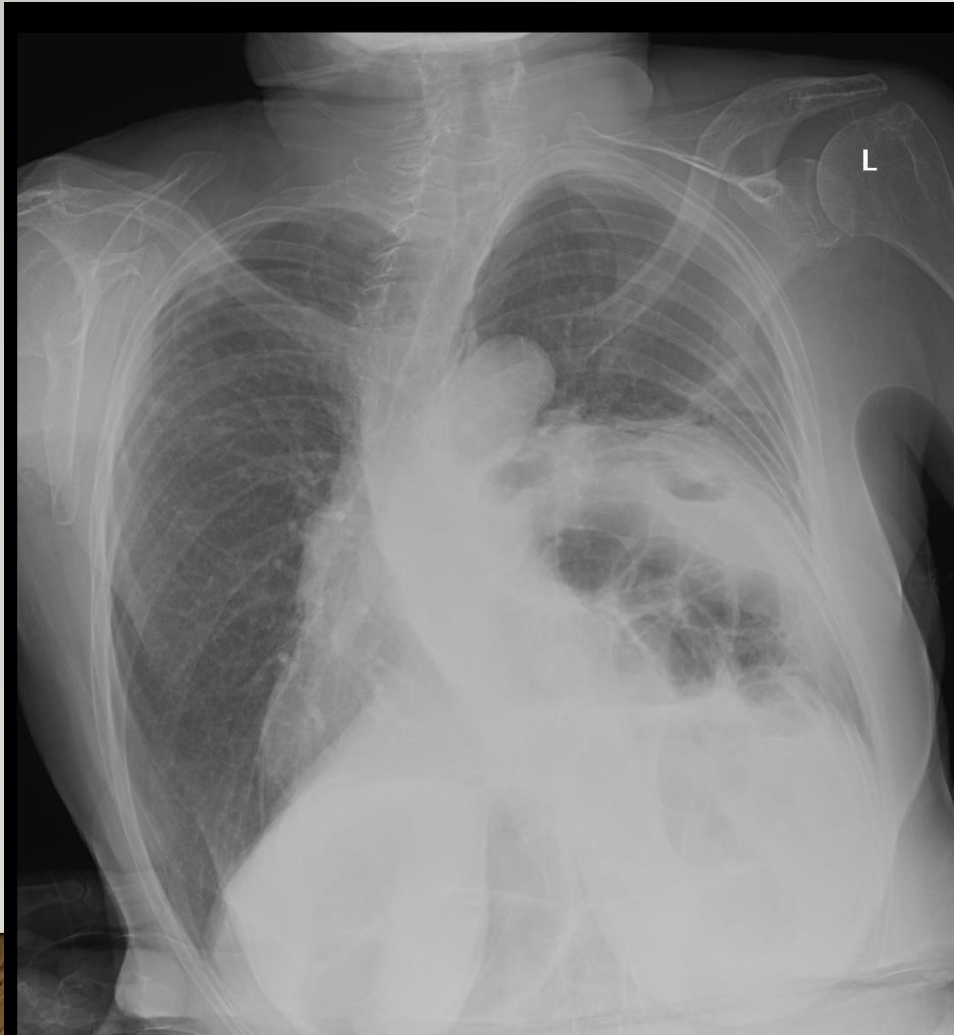
IV. **Multi-organ hiatal hernia**



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.
Preservation of Vagus nerve



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 SUMMARY

- Nissen fundoplication (1956) : 360°
- Collois (1957): gastropasty
- Dor (1962): anterior
- Toupet repair(1963) : 270° posterior
- Transthoracic Belsey Mark IV repair (1967) :270 ° anterior
- Hill's posterior gastropexy (1967)



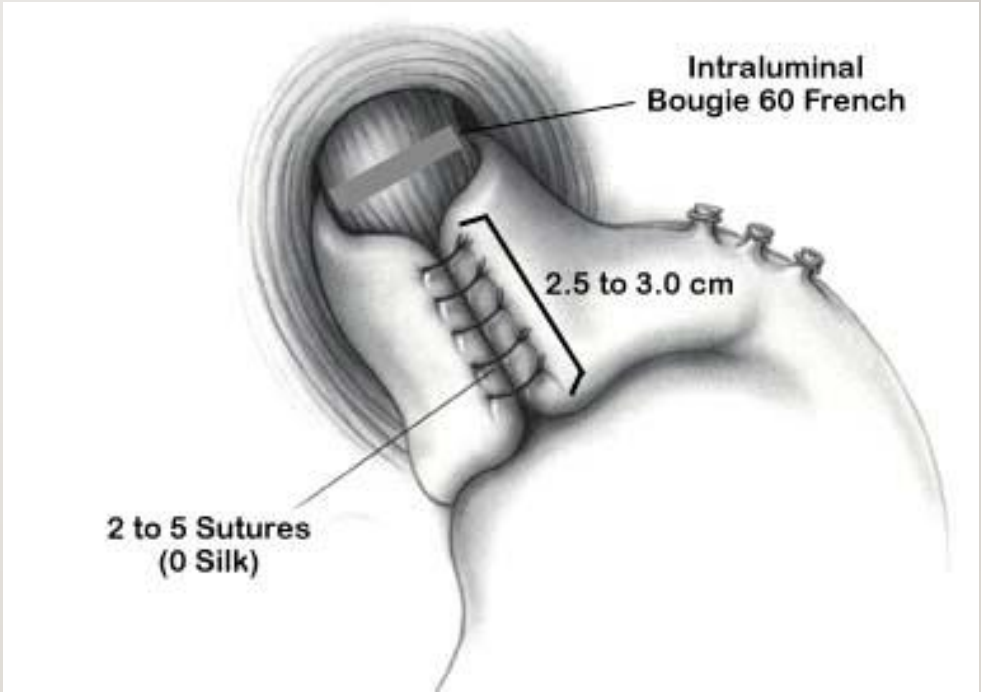
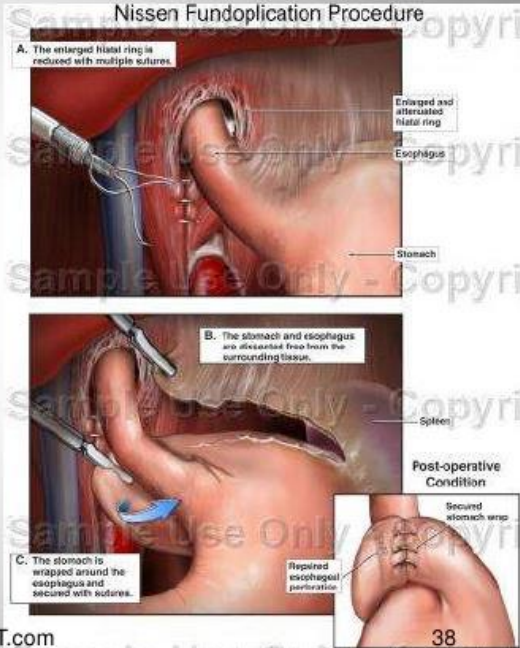
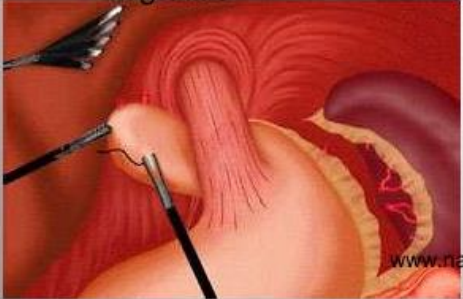
NISSEN FUNDOPLICATION

Surgery

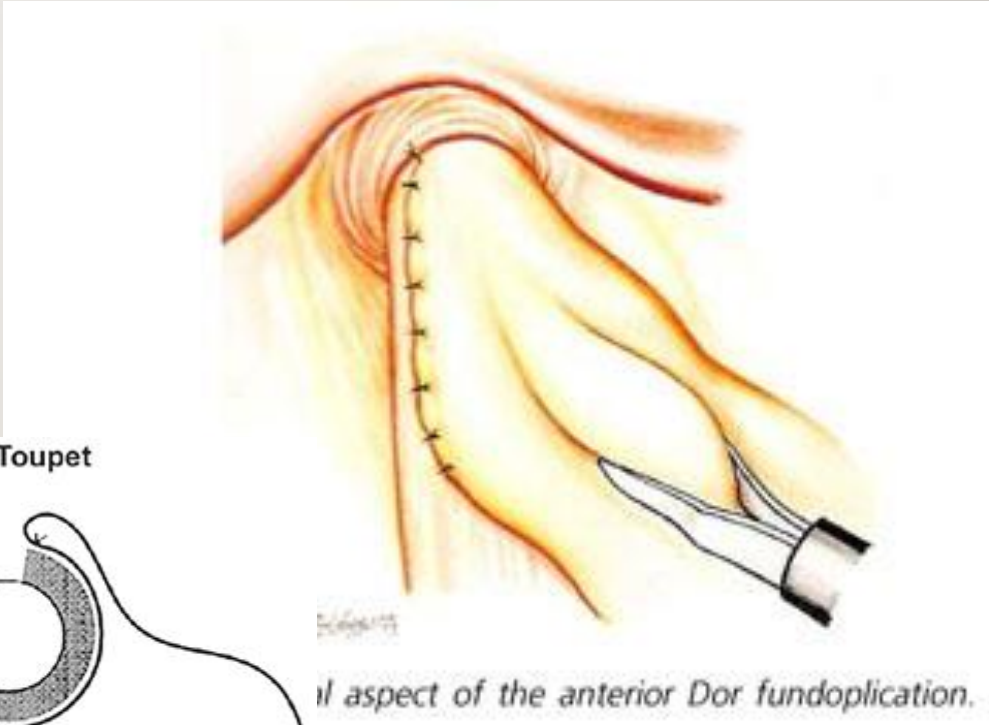
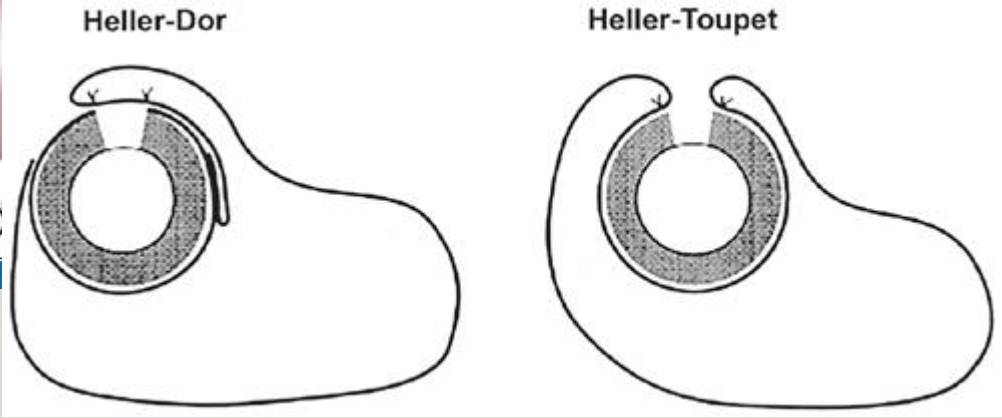
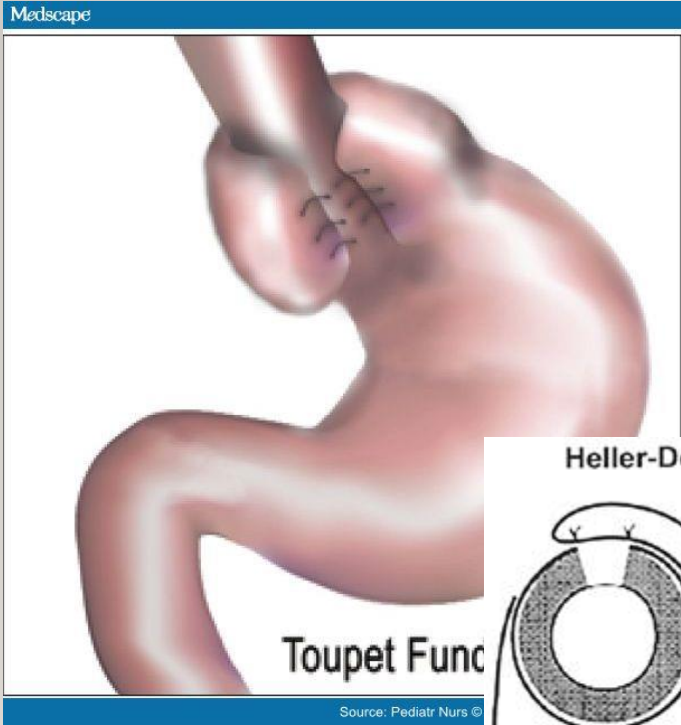
Laparoscopic Nissen Fundoplication

- Indications
 - Failed drug treatment
- Complications

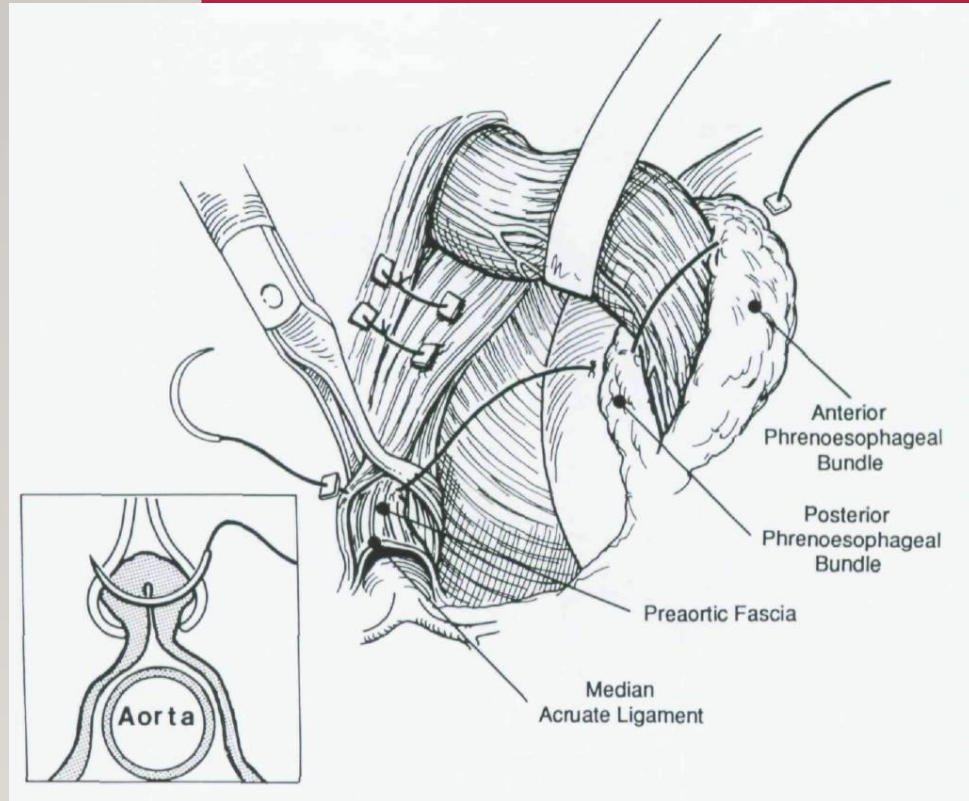
- Goal
 - Restore natural integrity of LES & maintain normal deglutition



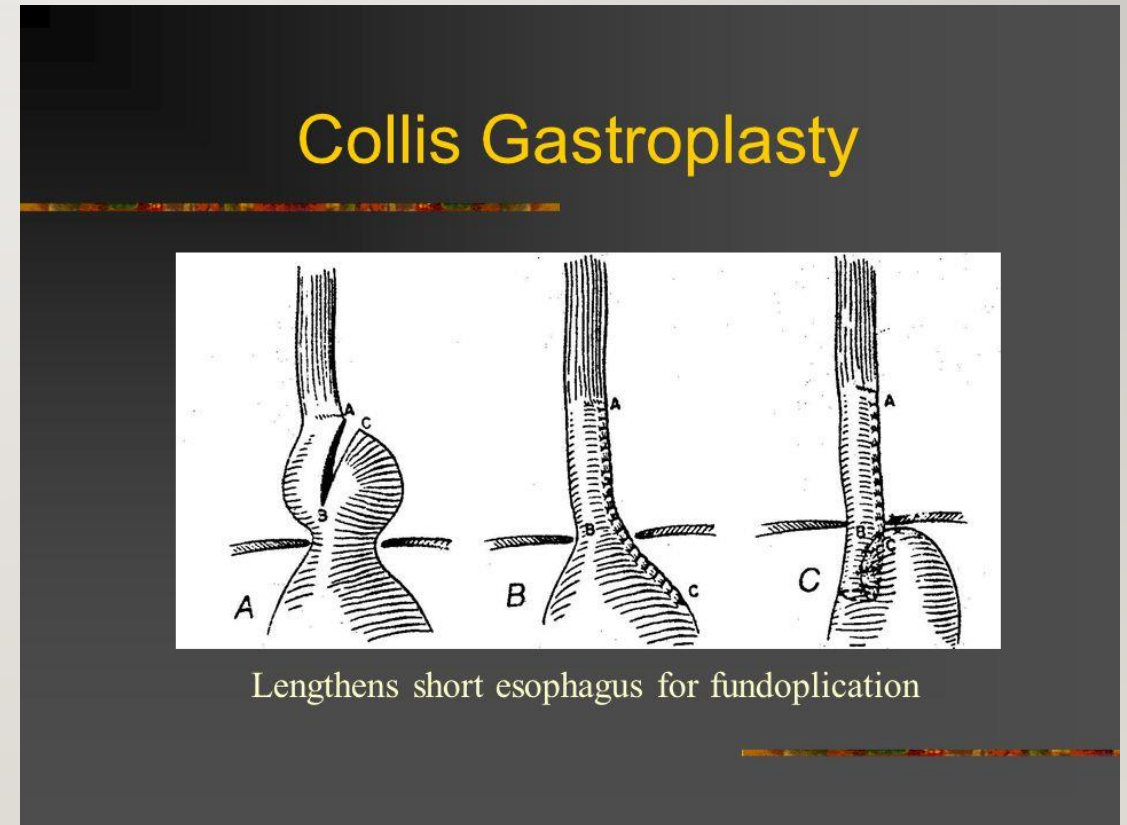
TOUPET VS DOR FUNDOPPLICATION



- Hill's gastropexy

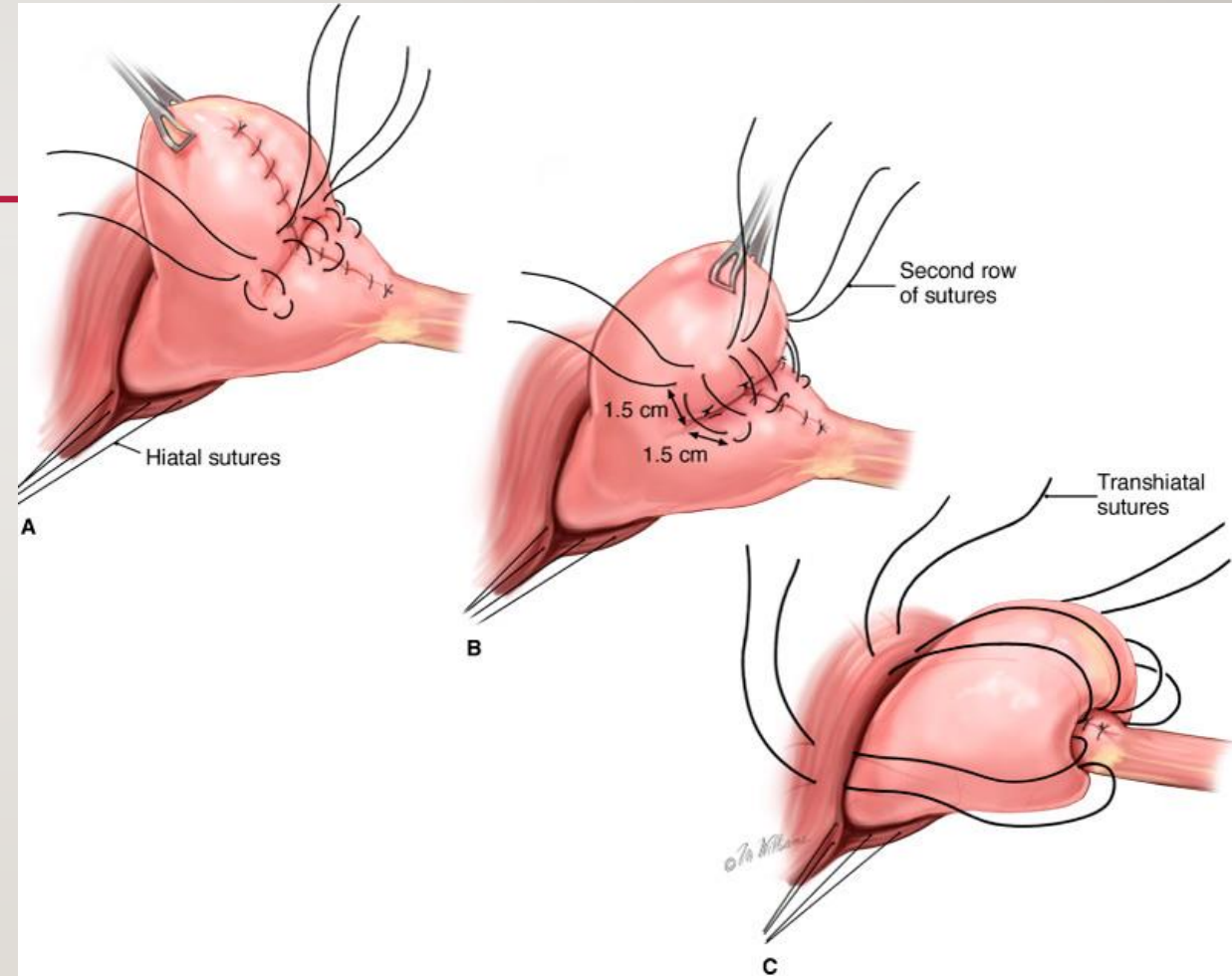


Collis gastroplasty



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>

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진료행위 청구건수(심사년도 15-19, 건수)

	2015	2016	2017	2018	2019
• 식도분문수술-식도근절개술 [헬러술식]-흉부접근.	1-	4-	4-	9	6
• 식도분문수술-식도근절개술 [헬러술식]-복부접근.	12-	13-	12-	12-	11
• 식도분문수술-식도항역류수술-흉부접근	2-	3-	2-	4-	2
• 식도분문수술-식도항역류수술-복부접근	186-	223-	230-	293-	316
• 식도분문수술-기타 분문성형술-흉부접근	1-	0-	1-	0-	0
• 식도분문수술-기타 분문성형술-복부접근	4-	3-	6-	3-	3



진료행위 청구건수(심사년도 15-19, 건수)

	2015	2016	2017	2018	2019
• 식도열공탈장정복술(흉부접근)	7-	4-	9-	7-	3
• 식도열공탈장정복술(복부접근)	148-	148-	175-	216-	298



Thank You!

