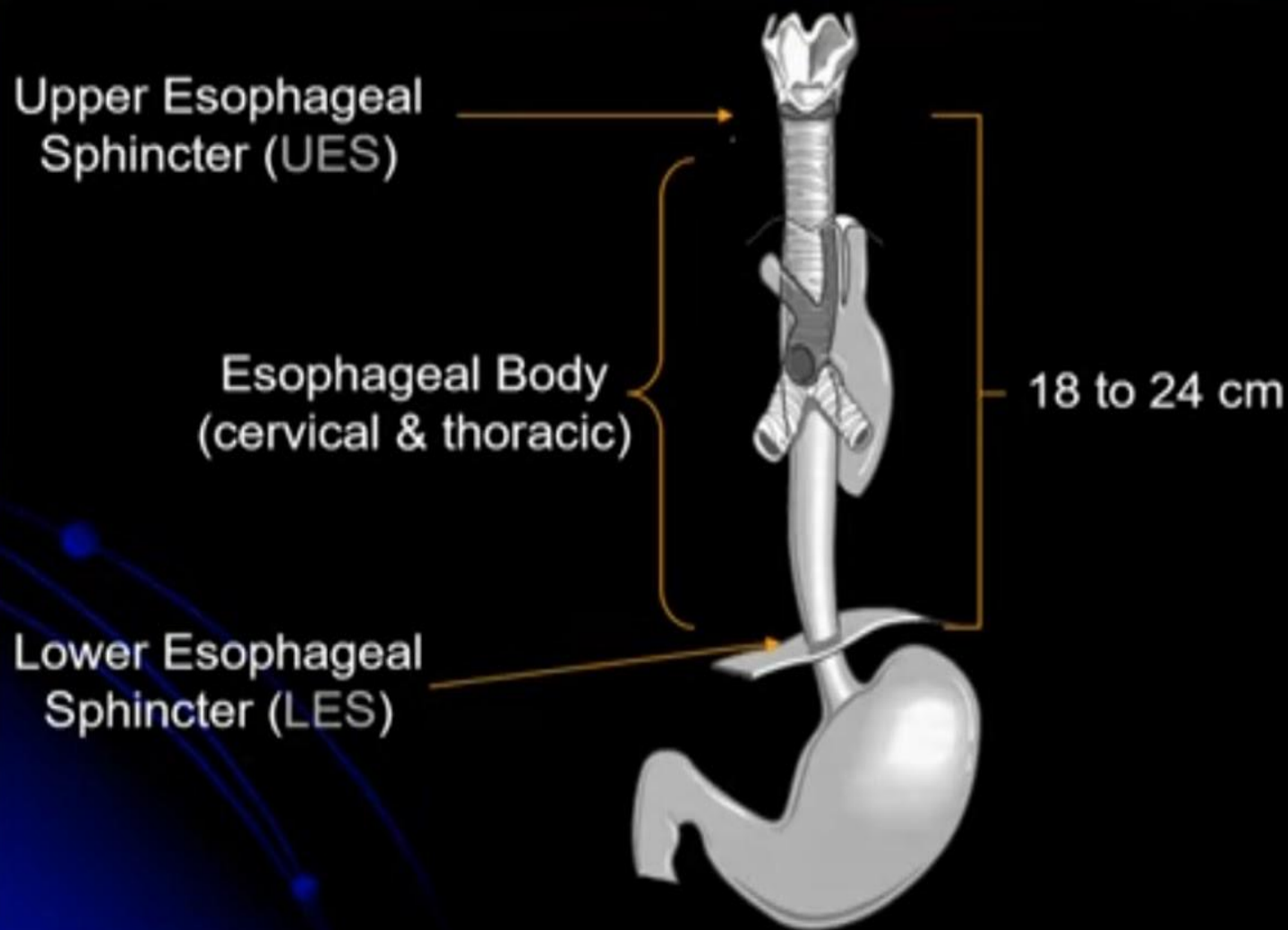


Esophageal Disorders

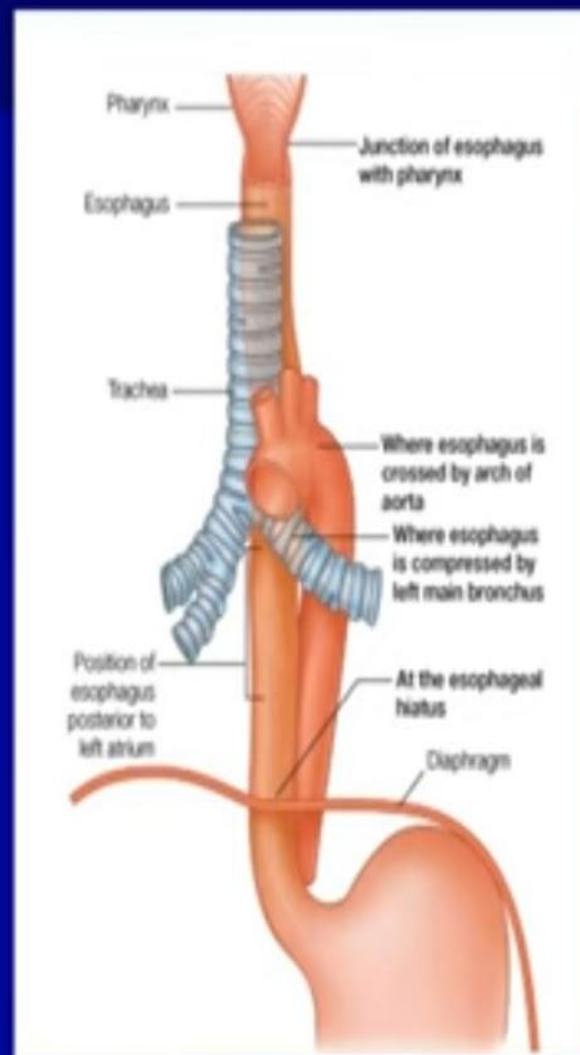
E J Arteen
FRCSI

Anatomy of esophagus



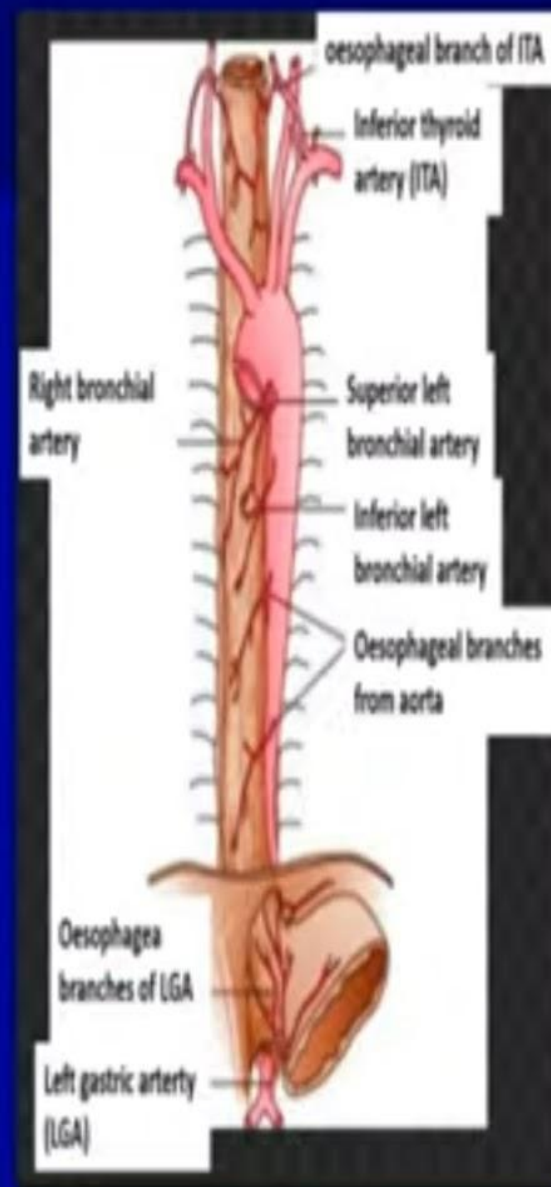
NARROW AREAS OF THE ESOPHAGEAL LUMEN

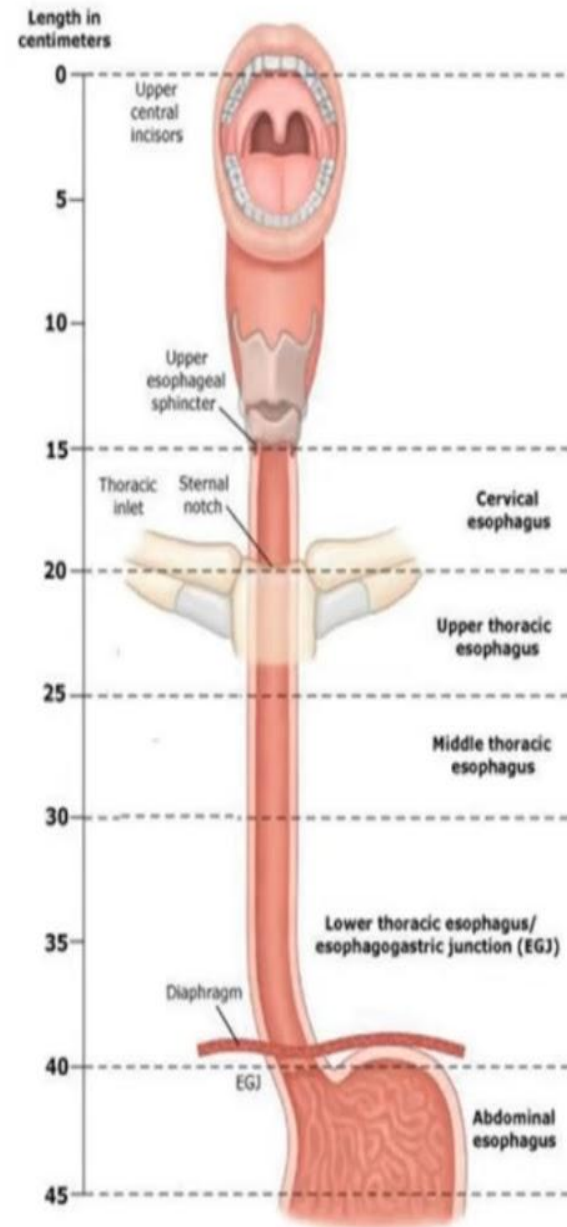
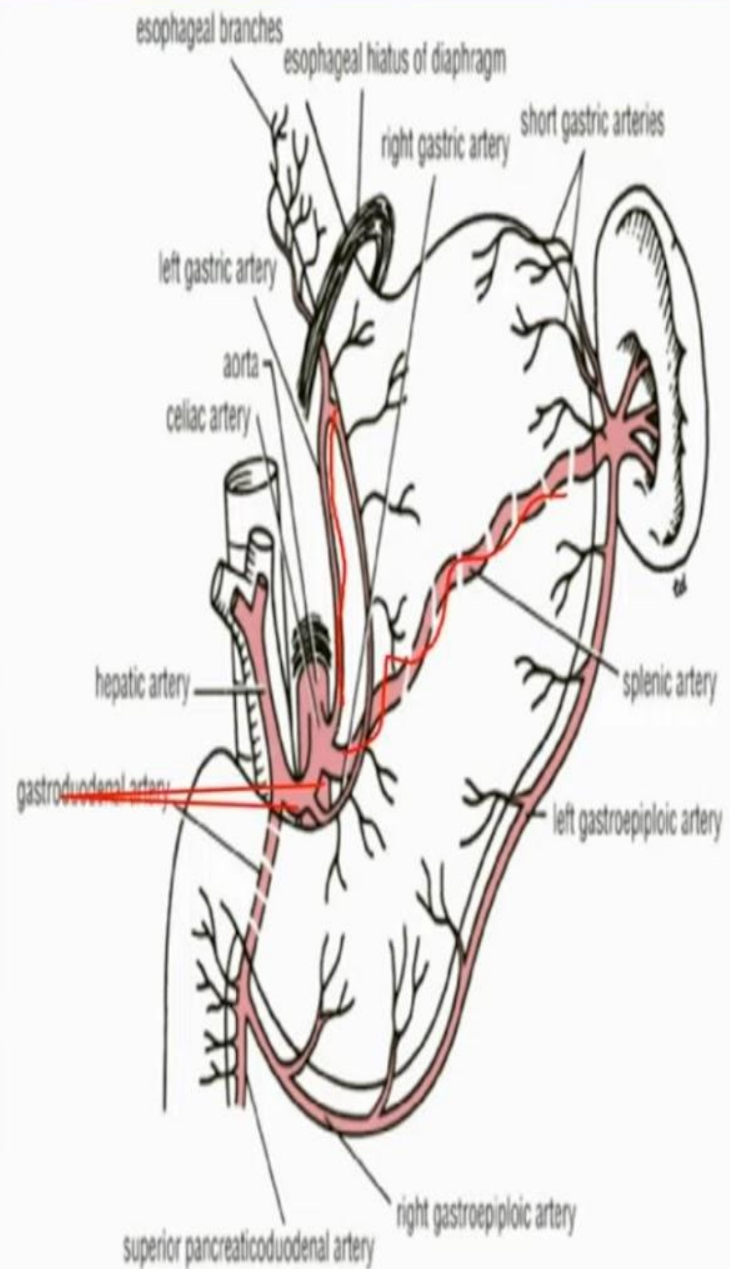
- The esophagus is narrowed at four sites: **7-9-11-15 inch** from incisor teeth.
- At the beginning, behind the cricoid cartilage of the larynx.
- Where it is crossed by arch of aorta in superior mediastinum.
- Where the left bronchus in posterior mediastinum cross the front of the esophagus.
- Where the esophagus enters the stomach.
- These three sites may offer resistance to the passage of a tube down the esophagus into the stomach.



ESOPHAGUS

- **Blood Supply** : *Segmental*
- **Cervical part** : Inferior thyroid artery.
- **Thoracic part**: Bronchial, and descending thoracic aorta.
- **Abdominal part**: Left gastric artery.
- Anterior LT and posterior RT *nerves* (vagi) and sympathetic branches of the thoracic part of the sympathetic trunk supply the esophagus.





Motility Disorders of esophagus

❖ **Primary**

■ **Esophageal Body**

- Achalasia.
- Diffuse esophageal spasm.
- Nutcracker esophagus.
- Nonspecific esophageal dysmotility.

■ **LES**

- Achalasia.
- Hypertensive LES.

❖ **Secondary** : Severe esophagitis ,Scleroderma , Diabetes , Parkinson's , Stroke.

Achalasia

- Achalasia means **“Failure to Relax”** Incomplete LES relaxation *with* aperistalsis of body of esophagus .
- First clinically recognized esophageal motility disorder.
- **Epidemiology**
 - 1-2 per 200,000 population.
 - usually presents between ages 25 to 60.
 - Male = female **“Bimodal Presentation”**.
 - Caucasians > others.
 - Average symptom duration at diagnosis: 2-5 years
 - Premalignant : cancer 8% after 20 years.

Achalasia



Clinical

- Dysphagia (solids, liquids)
- Difficulty belching
- Chest pain
- Regurgitation of undigested food
- Dyspepsia
- Aspiration

Etiology

- The pathological changes seen in achalasia consist of myenteric inflammation with injury and loss of ganglion cells and fibrosis of myenteric nerves.
- *Nitrous oxide synthetase enzyme deficiency* and reduction in the synthesis of nitric oxide and vasoactive intestinal polypeptide.
- The probable aetiology of the disease is thought to be an *autoimmune-Mediated Destruction* of inhibitory neurons.

Clinical presentation

- ***Classical triad:***
 - **Solid Dysphagia 90-100% (75% also with dysphagia to liquids).**
 - **Post-prandial regurgitation 60-90%.**
 - **Weight loss .**
- **Chest pain 33-50% .**
- **Heart burn 25-45% .**
- **Nocturnal cough and recurrent aspiration .**
- **Difficulty belching.**

Diagnosis

- Barium Esophagogram (swallow) .
- Oesophageal Manometry (Gold Standard).
- Upper Endoscopy OGD to exclude pseudo-achalasia arising from a tumour at the gastroesophageal junction.

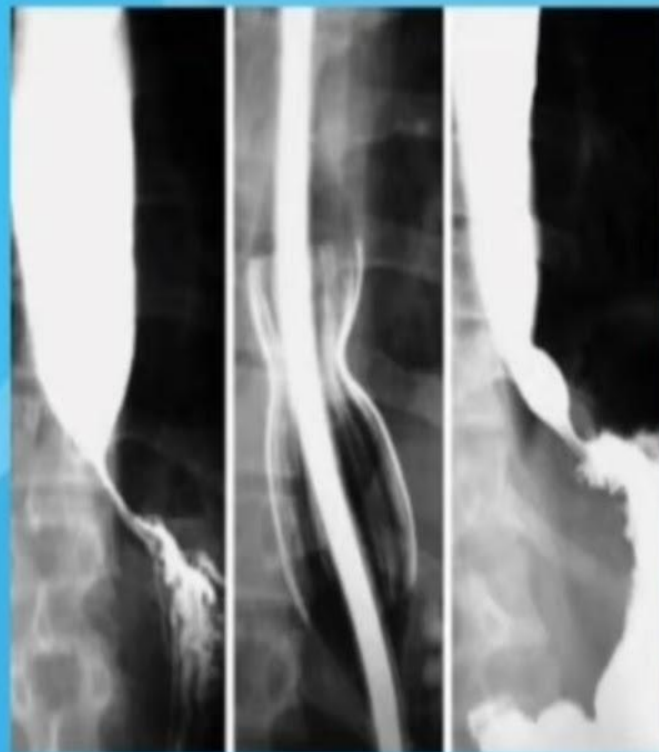
Treatment options

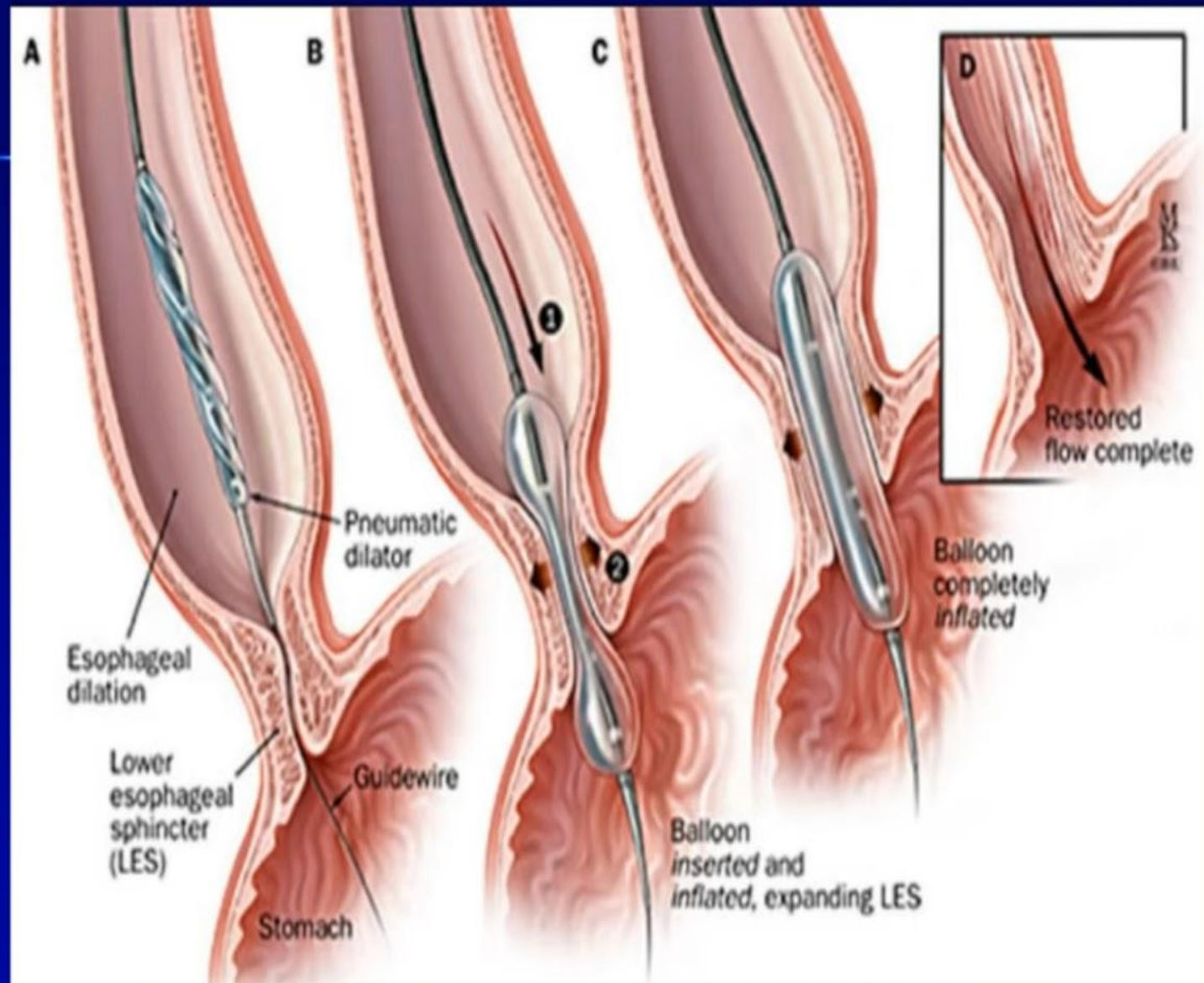
- *Pharmacotherapy*: *The goal of treatment for achalasia is the relief of the functional obstruction of the lower esophagus by relaxation of the LES.*
- *Calcium channel blockers and long acting nitrates sublingually.*
- Short duration of action, the incomplete symptom relief.
- Side-effects such as peripheral edema, headache, and hypotension occur in up to 30%.
- Only used in *early disease and short time* while waiting for surgery.

- Pneumatic balloon dilatation of the LES



- Lower esophageal
sphincter



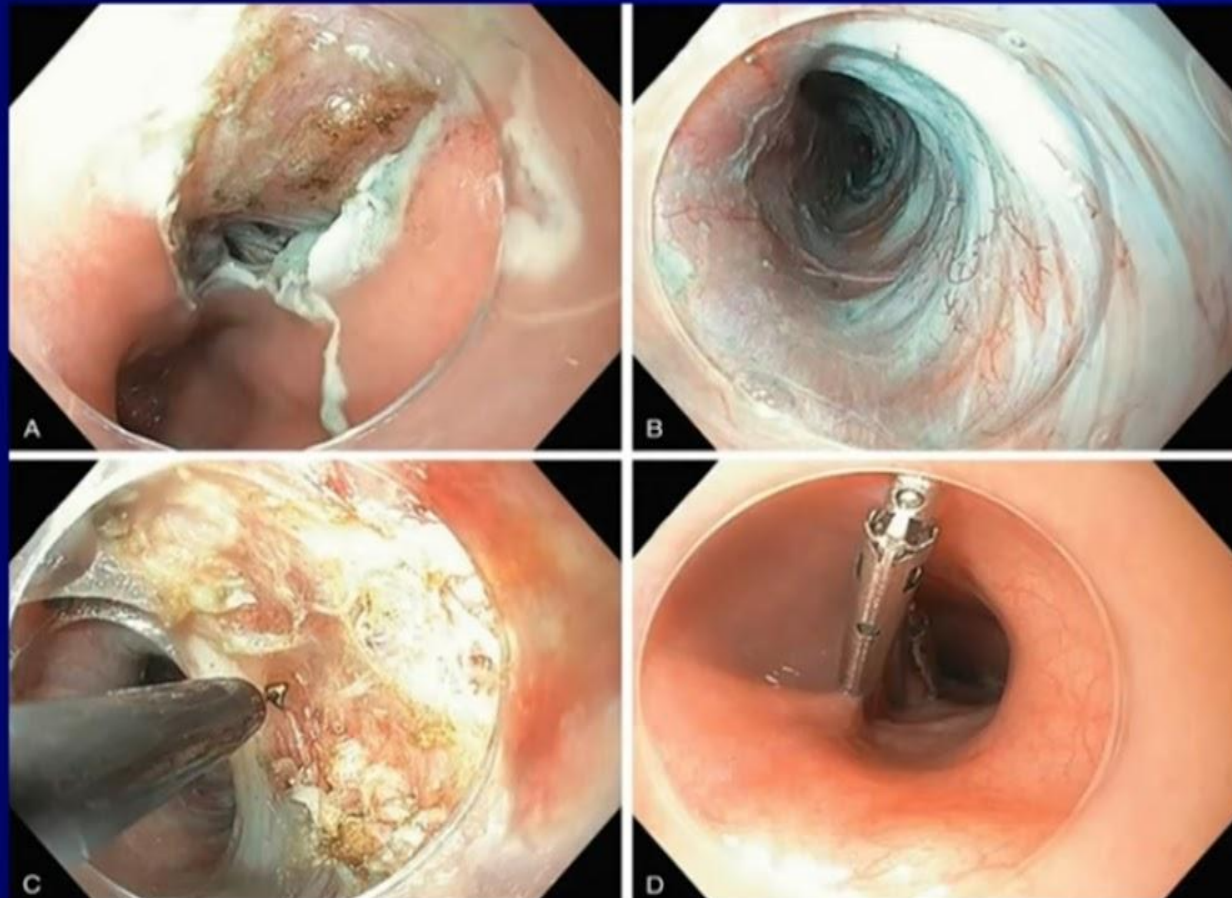


Pneumatic Dilatation

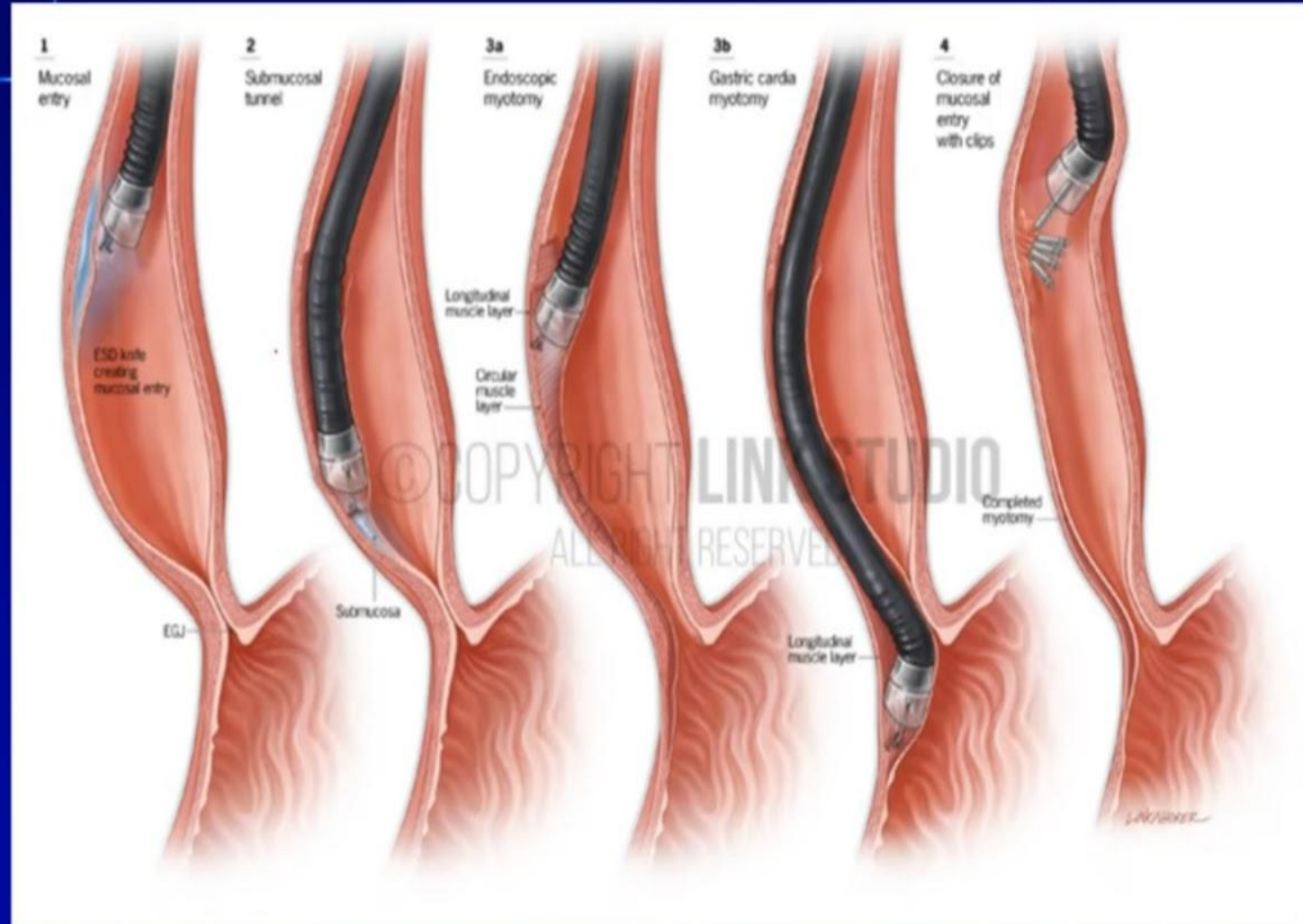
- Pneumatic Endoscopic Dilatation is currently considered the **Most Effective Nonsurgical Treatment For Achalasia.**
- Repeated dilatations.
- Better results in elderly.
- Patient benefit from first time will have better over all results .
- **Complications :** Include esophageal perforation, intramural hematoma, and gastroesophageal reflux.

POEM

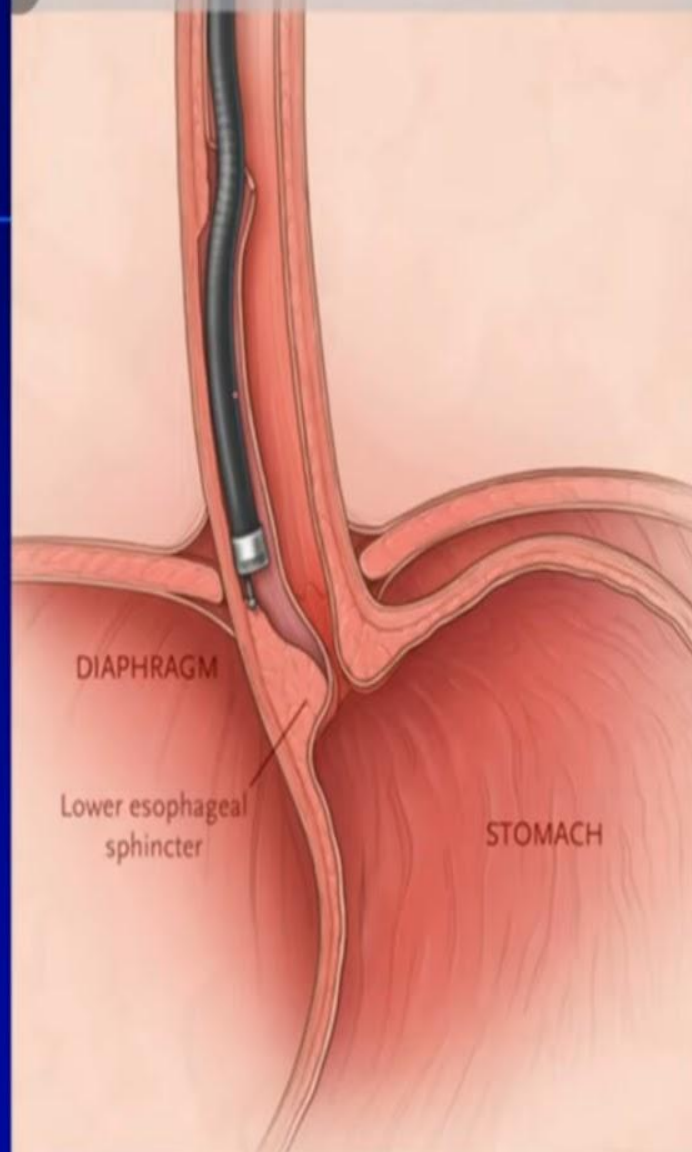
■ Per Oral Endoscopic Myotomy(POEM).



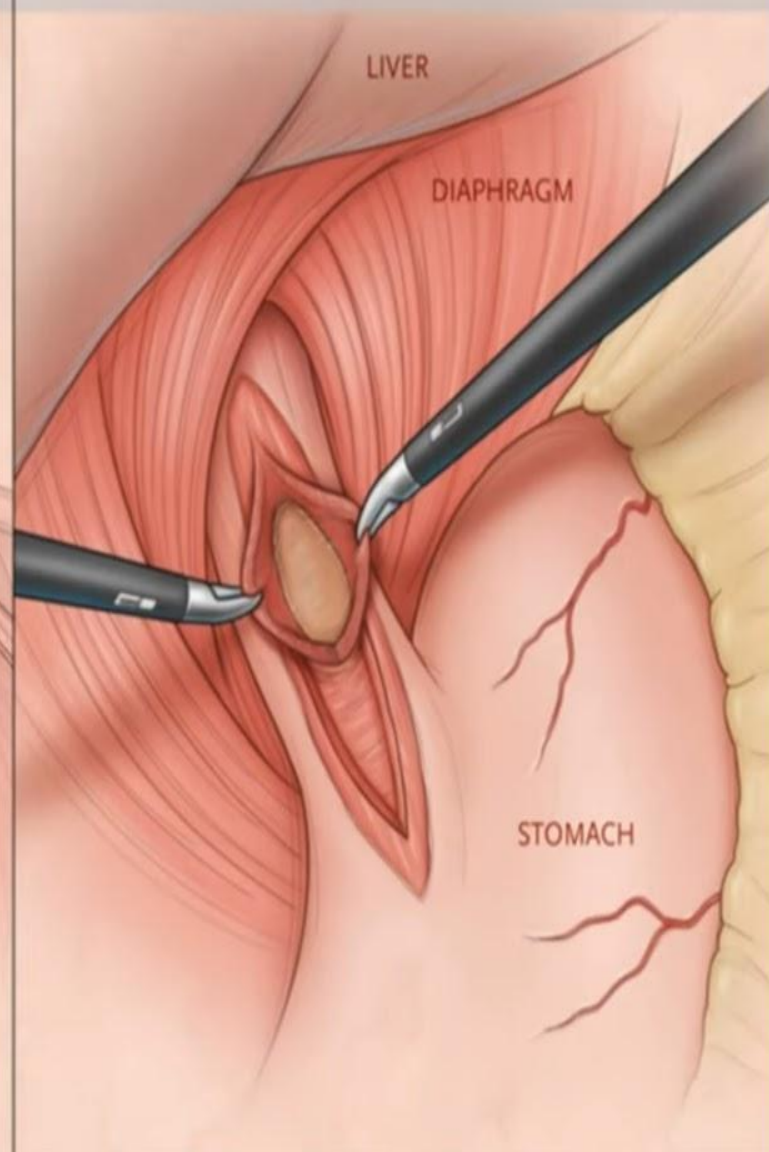
POEM



A POEM



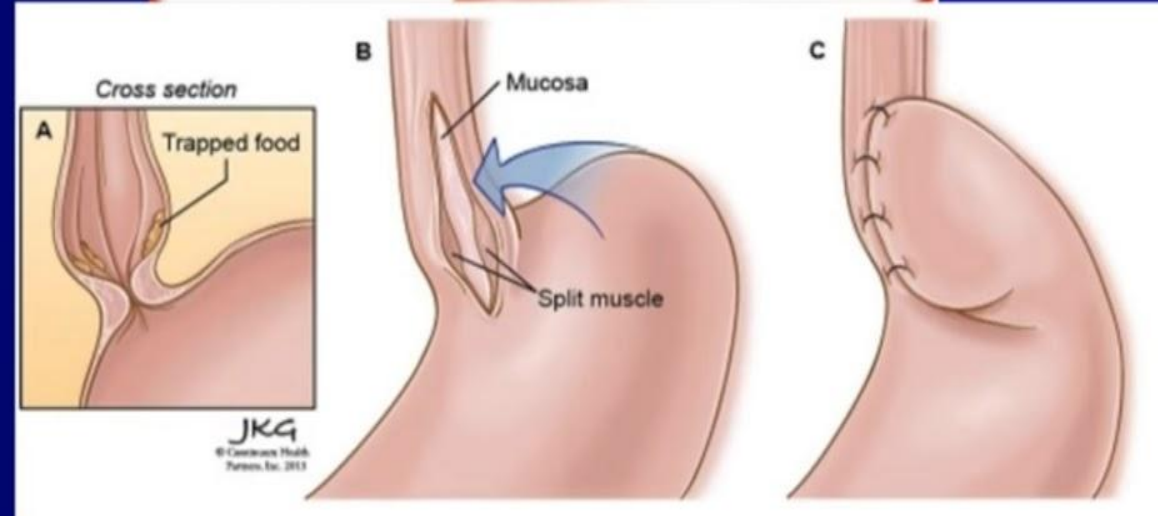
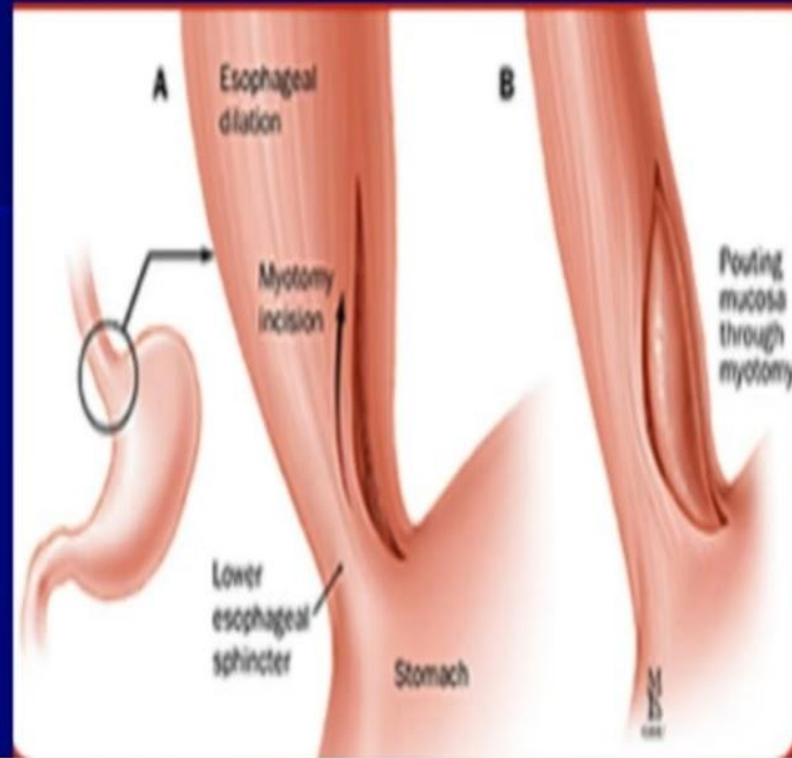
B LHM



Surgical Treatment of Achalasia

- The goal of surgery is to alleviate the distal oesophageal obstruction by division of the circular muscle fibers comprising the LES.
- Myotomy: Can be accomplished via laparotomy, thoracotomy, and laparoscopically and thoracoscopically.
- Myotomy should include partial fundoplication to decrease incidence of reflux.

Heller's pyloro - myotomy





Laparoscopic Redo Heller Myotomy



Gastroesophageal Reflux Disease

- **Definition of GERD :** " A Condition which develops when the reflux of stomach contents causes Troublesome Symptoms and/or Complications . "
- From a surgical perspective, GERD is the failure of the Anti-Reflux Barrier, allowing abnormal reflux of gastric contents into the oesophagus.
- The Anti-Reflux Barrier key components are the LES, The Diaphragmatic Crura, and the Phreno-Esophageal ligament .
- In Western countries it affects 10% to 20% of the population.
- Reflux may be daily weekly or monthly.

Symptoms

- *Typical (Esophageal) , Atypical (Extraesophageal).*
- *Typical :*
 - *Burning Chest Pain (Pyrosis) 80%.*
 - *Regurgitation of sour or tasteless fluid into the mouth (water brash) 55%.*
 - *Sensation of a lump, or tightness in the throat (Globus Sensation) .*
 - *Pain on swallowing (odynophagia).*
- *Atypical :* *Cough, Wheezing, Hoarseness, Sore throat, Postnasal drip, Dental erosion, and Ear pain.*
- *Silent Reflux.*
- *Alarming symptoms:* *Dysphagia wt loss ,hematemesis .*

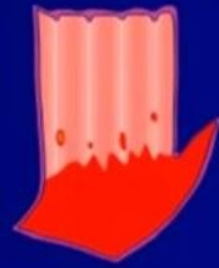
Diagnosis of GERD

- EGD: Is likely the one study that All patients should have preoperatively.
- PH-metry: Important for patients when the diagnosis of GERD cannot be confirmed on EGD or diagnostic uncertainty exists.
- Oesophageal manometry: Frequently performed before surgery.
- Barium swallow : Frequently obtained test for better delineation of the anatomy.
- Other preoperative tests: have been examined, such as gastric emptying studies .

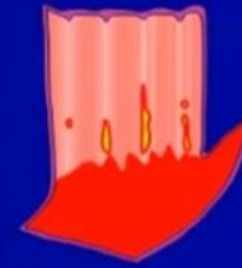


LA Classification

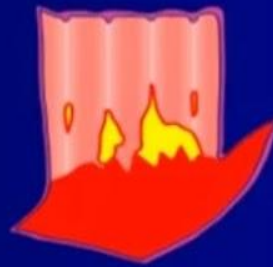
LA Grade A



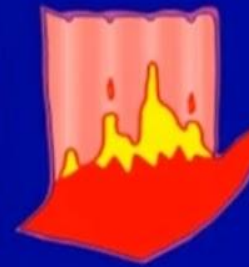
LA Grade B



LA Grade C



LA Grade D



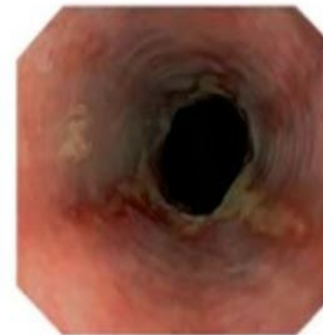
Grade A



Grade B



Grade C



Grade D

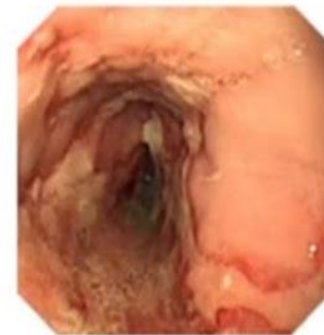
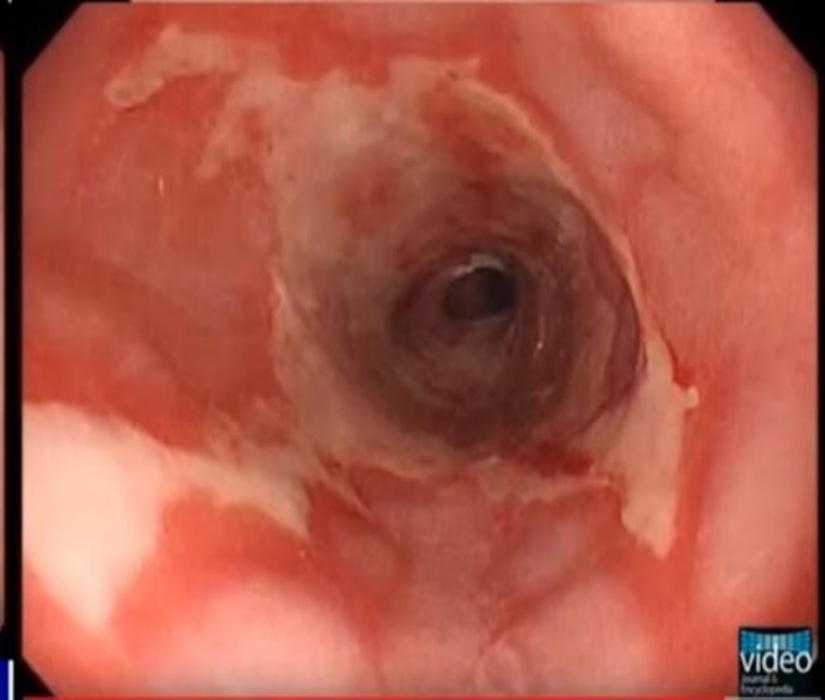


Figure 3: Los Angeles classification of reflux oesophagitis

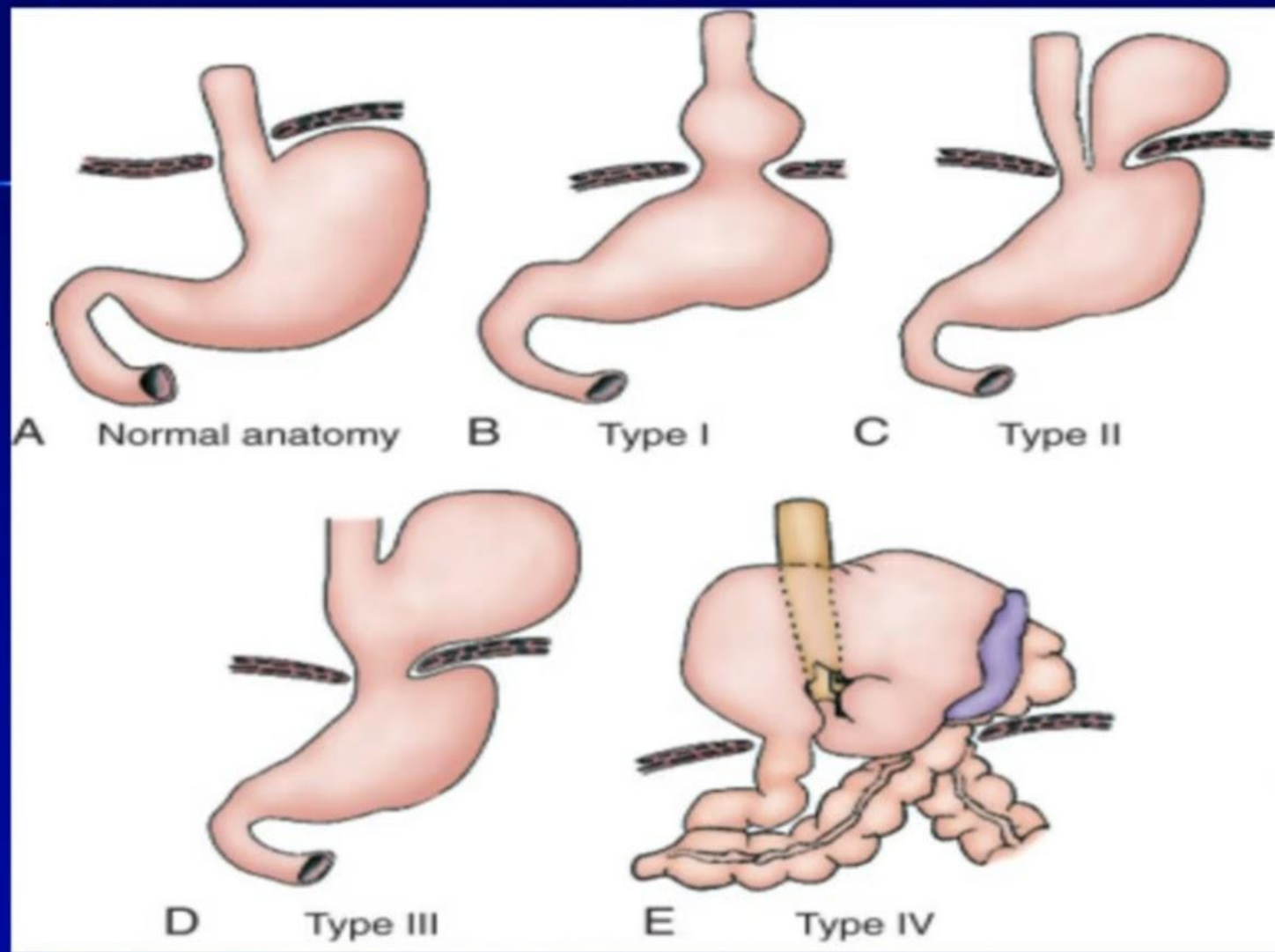


Hiatus Hernia

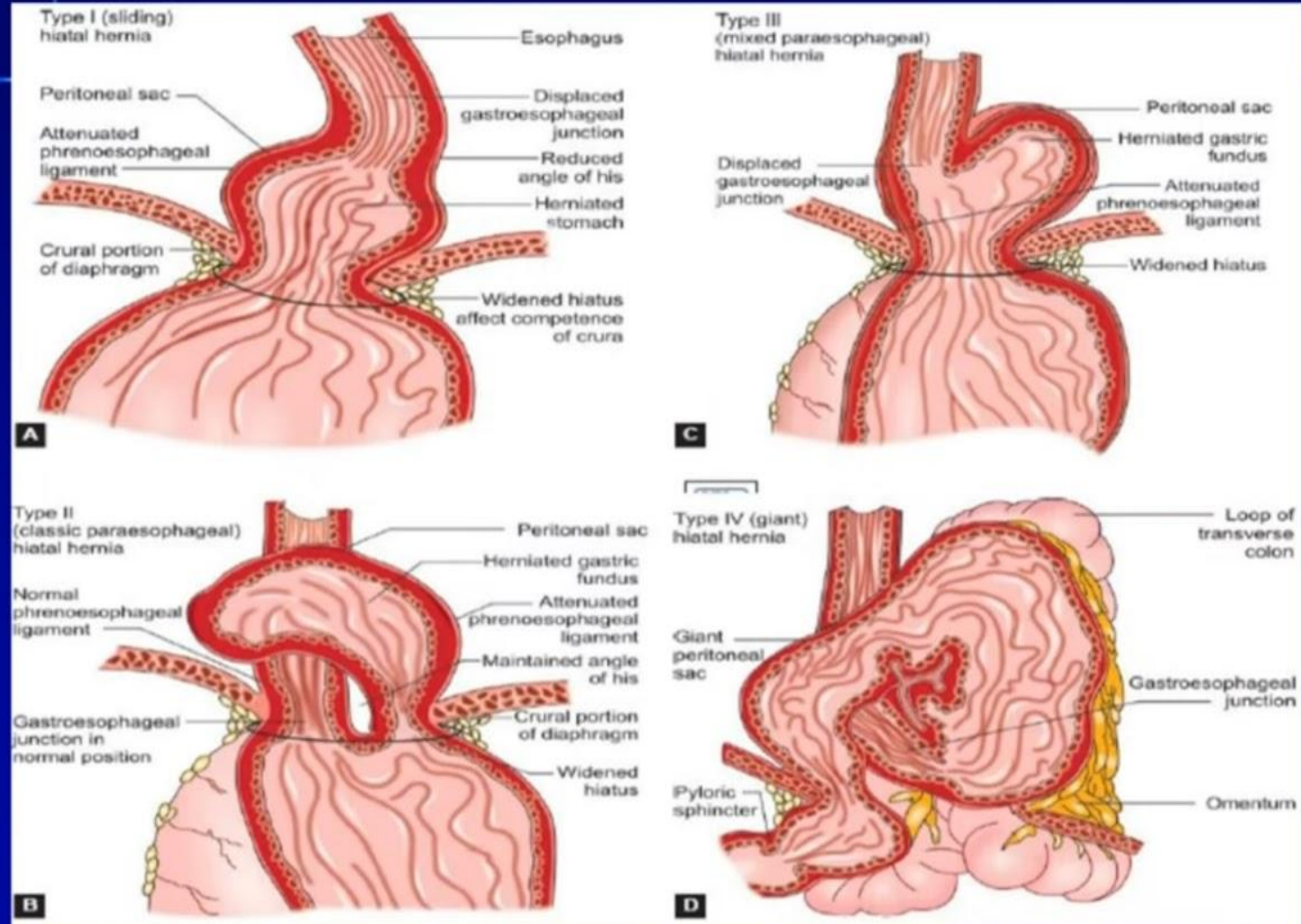
- **Definition:** HH is a type of hernia in which abdominal organs (typically the stomach) slip through the diaphragm into the middle compartment of the chest .
- Risk factor is Obesity and Old age .
- HH is called The "**Great Mimics**" as symptoms vary
 - Heart burn, regurgitation , belching , GERD.
 - Chest pain ,shortness of breath , palpitation.
 - Dysphagia
 - Bronchial asthma.
 - Distension
 - Taste of acid in back of mouth hoarseness of voice.

Types of HH

- Type I: Sliding HH 95%.
- Type II: Para esophageal "Rolling" HH 4.5%.
- Type III: Mixed type 0.4%.
- Type IV: Other organs 0.1%.
- NB : Para esophageal HH can have alarming symptoms leading to gastric perforation and volvulus of stomach.



Types of HH



Treatment

- Most are *Asymptomatic so No Treatment .*
- Change life style reduce weight.
- Avoid heavy lifting, and tight clothes .
- Avoid Smoking alcohol , spicy food .
- Avoid citrus juice , peppermint ,chocolate, fat .
- Raise head over two pillows .
- Small frequent meals less night food .
- Treat GERD , PPIS, H2 blockers .

Medical versus Surgical III

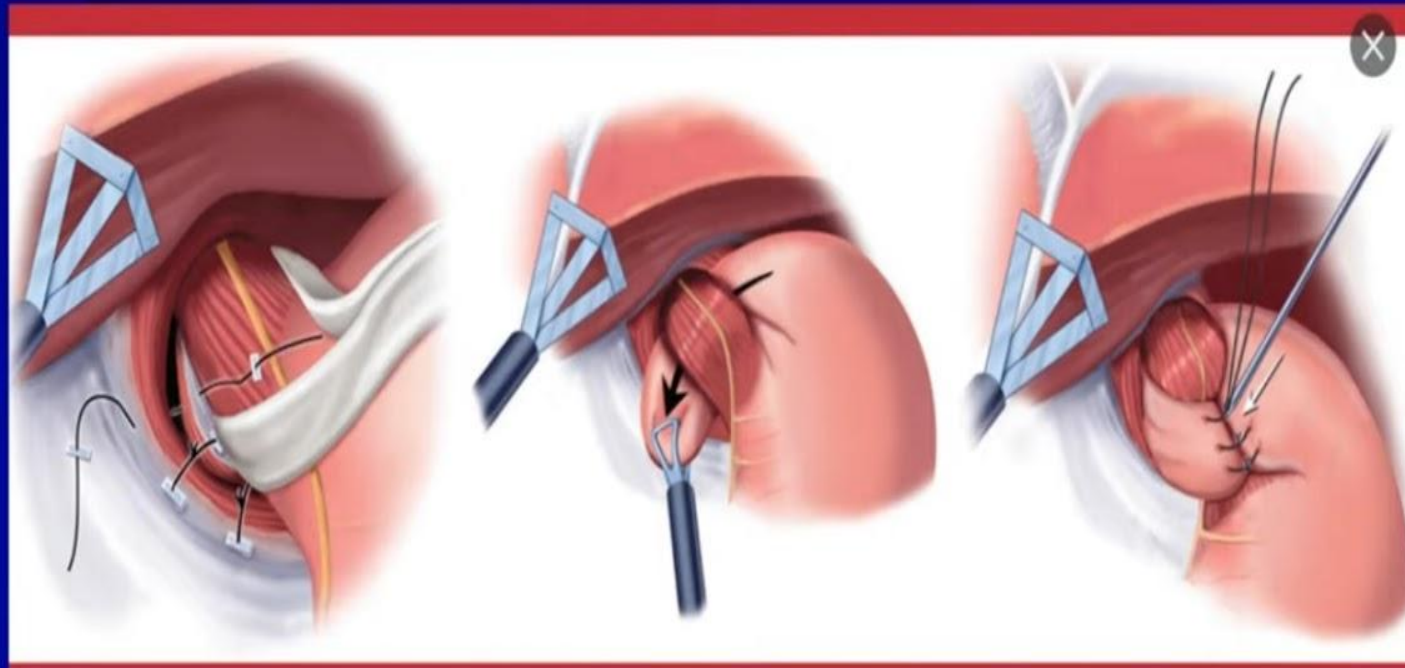
- *Surgical therapy for GERD is an equally effective alternative to medical therapy .*
- *Surgical therapy effectively addresses the mechanical issues associated with the disease and results in long-term patient satisfaction .*
- *For surgery to compete with medical treatment, it has to be associated with minimal morbidity and cost .*

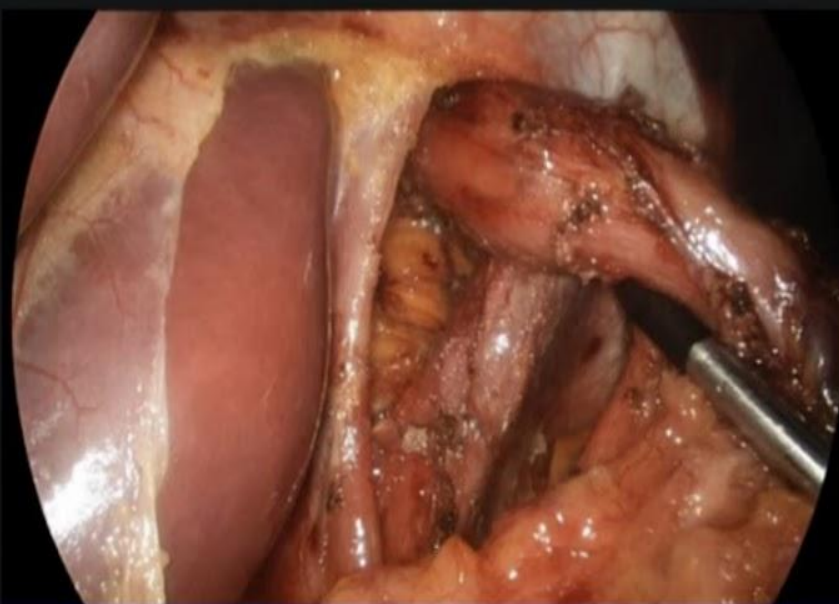
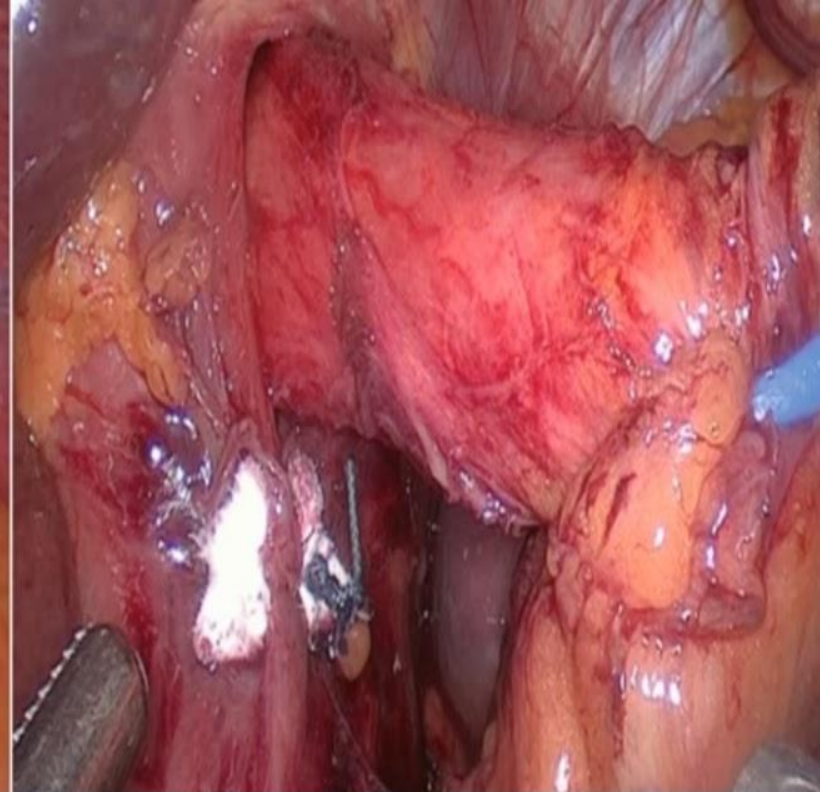
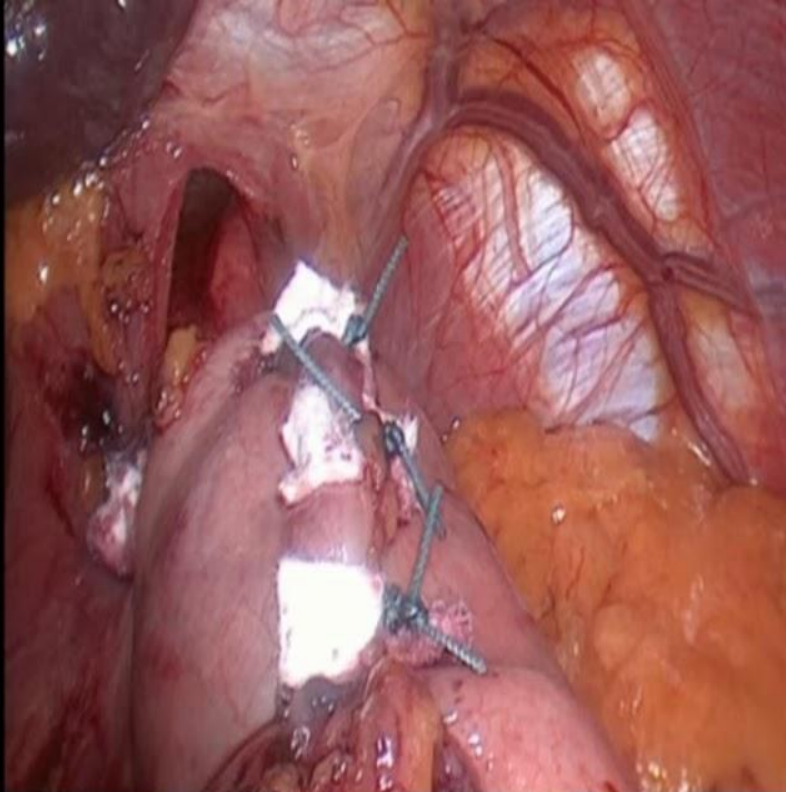
Indication for surgery

- **Have failed medical management .**
- **Opt for surgery despite successful medical management.**
- **Have complications of GERD (e.g., Barrett's**
■ **oesophagus, peptic stricture) .**
- **Have extra- esophageal manifestations (asthma, hoarseness, cough, chest pain, aspiration) .**

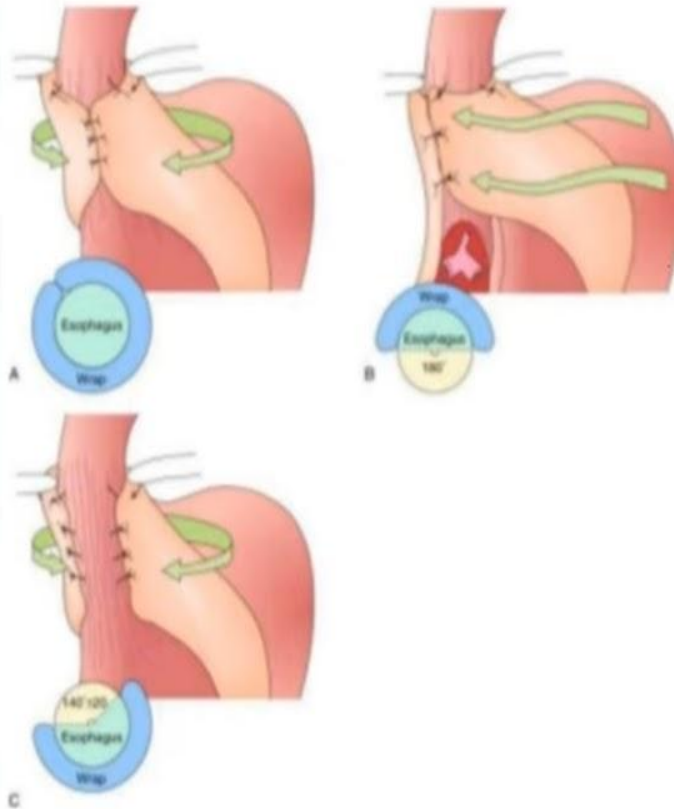
Surgical options

- Thoracic verses abdominal approach.
- Open verses laparoscopic approach.
- Complete or incomplete wrap.
- Mesh no Mesh.





Complete vs. partial fundoplication

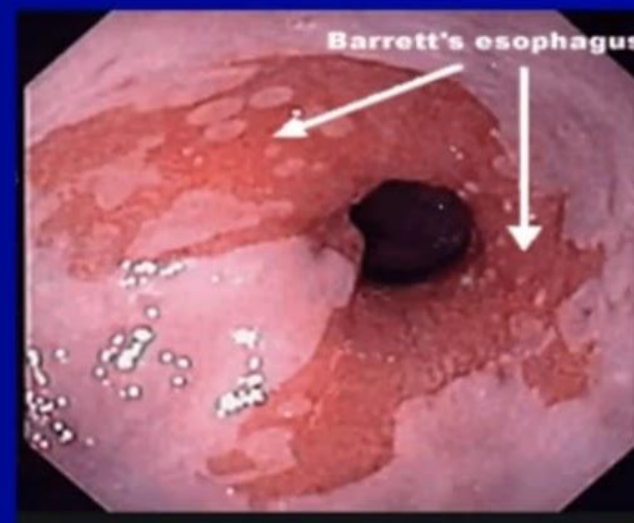


- Ant. partial fundoplication
→ Thal/Dor procedure

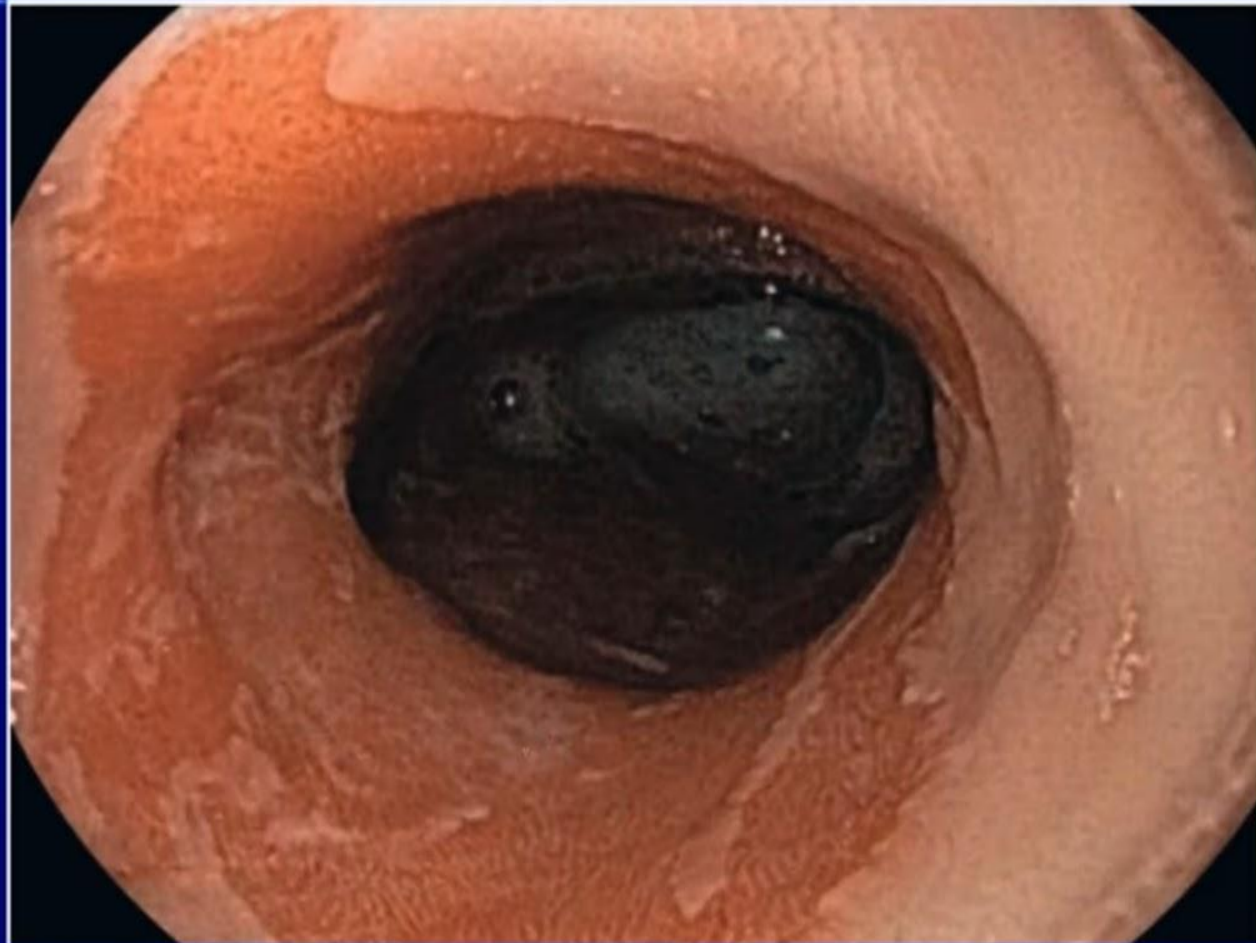
- Post. partial fundoplication
→ Toupet procedure

Barrett's esophagus

Barrett's esophagus: An abnormal (metaplastic) change in the mucosal cells lining the lower portion of the oesophagus, from normal stratified squamous epithelium to simple columnar epithelium with interspersed **Goblet cells** that are normally present only in the small intestine.



Barrett's esophagus



Esophageal cancer

- Common cancer in elderly (8th world wide).
- SCC , versus adenocarcinoma.
- Incidence of adeno-ca is rising .
- Male : Female 4:1.
- Tobacco all forms , and alcohol are risk factors .
- Achalasia increase risk of SCC of esophagus.
- GERD ,obesity, Barrett's increase risk of Adeno-ca.
- GEJ adenocarcinomas are staged and classified as oesophageal cancers.

Symptoms and signs

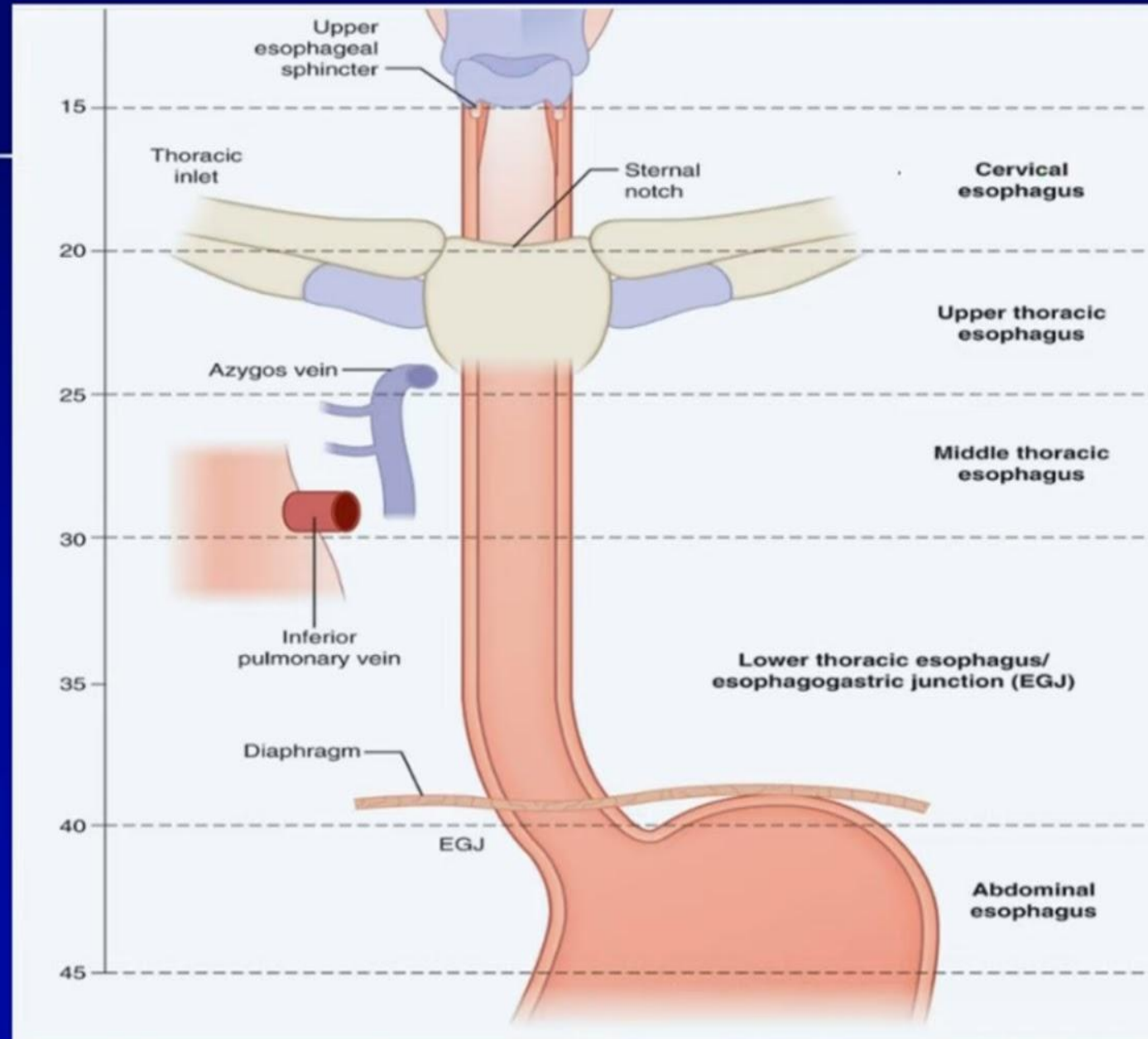
- Late presentation late symptoms.
- Dysphagia is the commonest symptom 75%.
- Long history of GERD ,HH.
- Loss of weight.
- Hoarseness of voice ,Hiccups.

Diagnosis

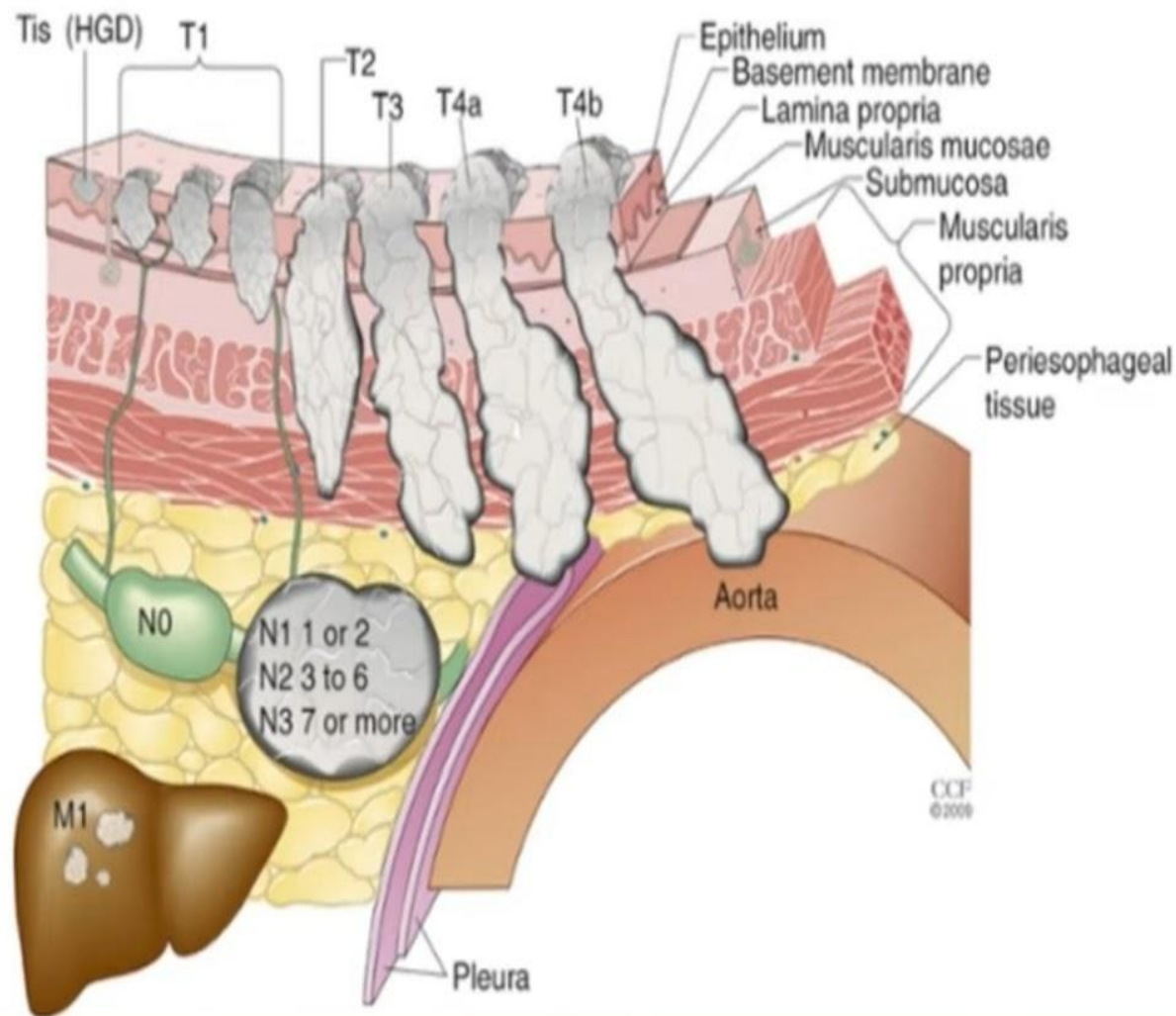
- Barium swallow.
- OGD and biopsy (*Gold standard*).
- CE CT ,PET CT EUS.



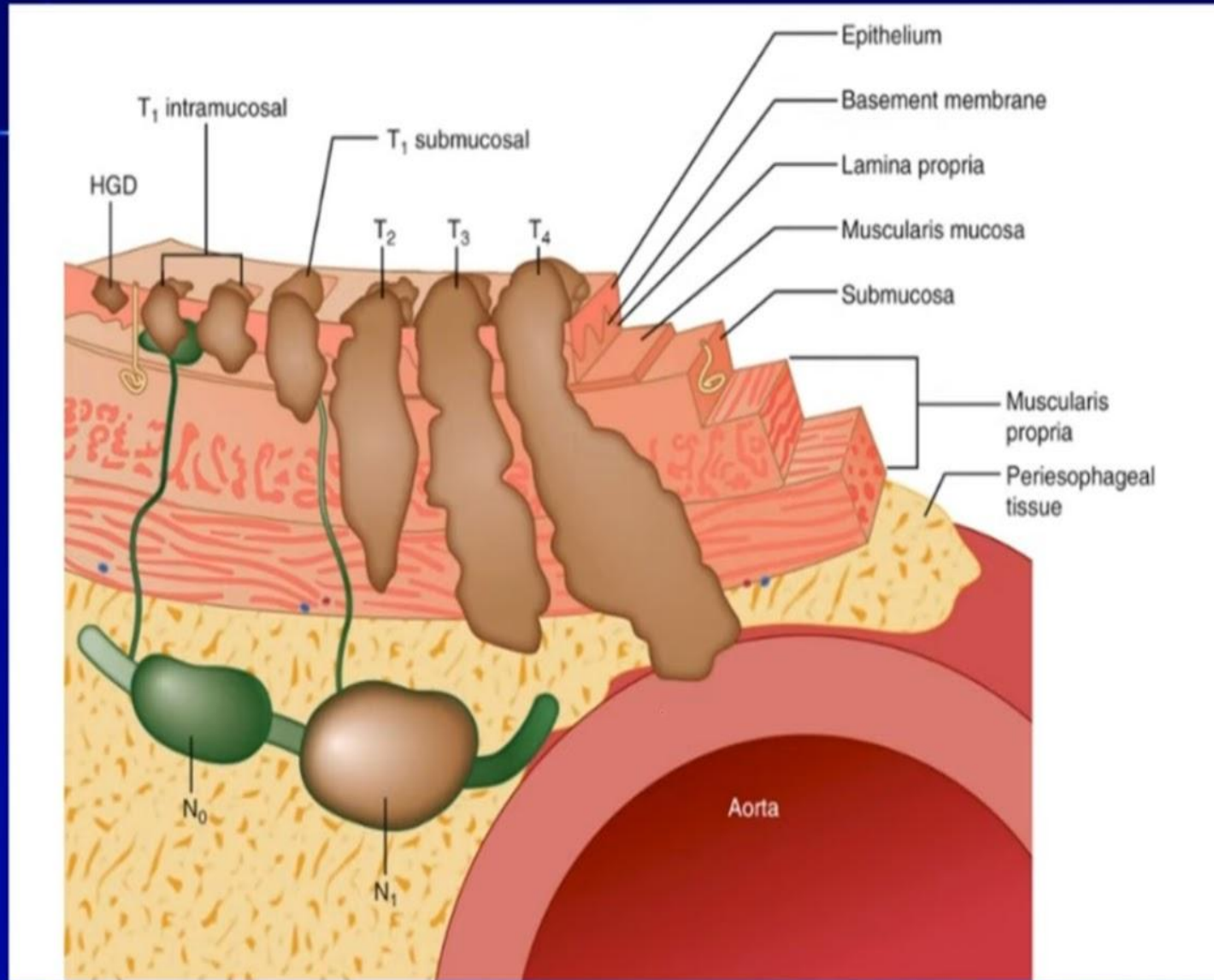
Location of esophageal ca

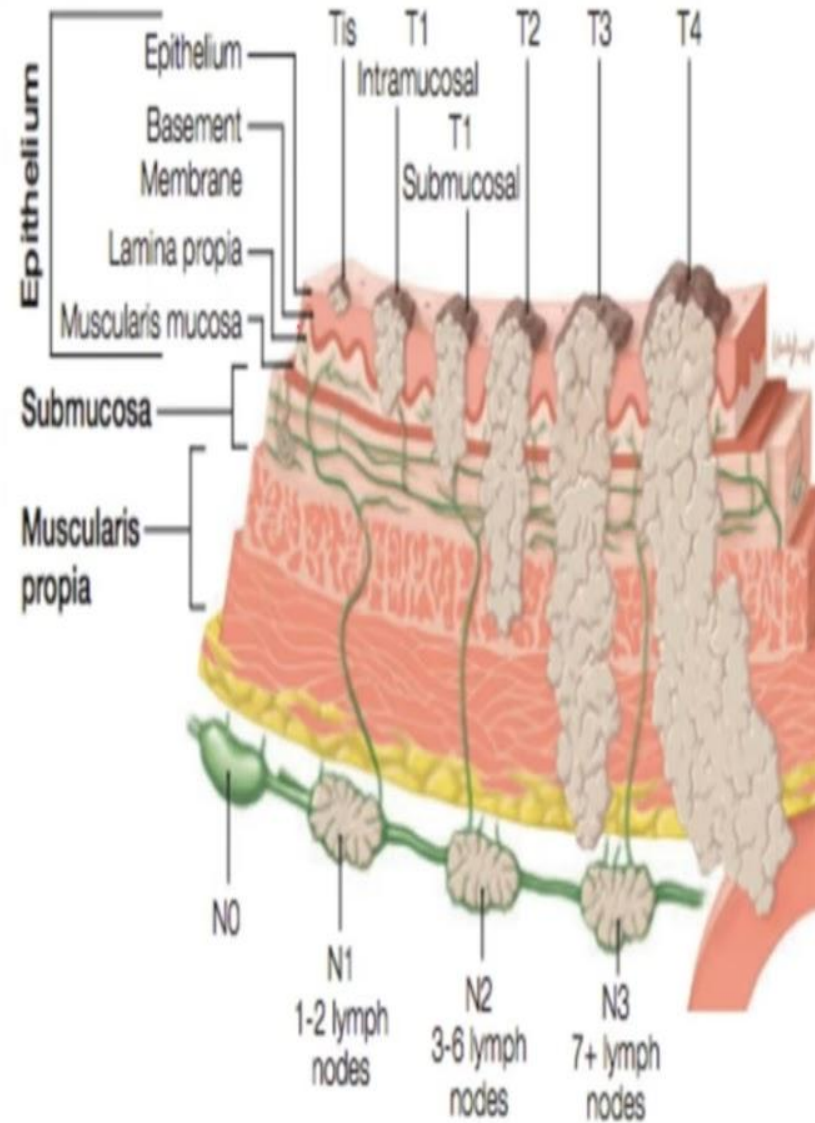


Staging for Adeno -Ca



Depth of Tumor





Primary Tumor (T)

TX	Tumor cannot be assessed
T0	No evidence of tumor
Tis	High-grade dysplasia
T1	Tumor invades the muscularis mucosa (T1a) or submucosa (T1b)
T2	Tumor invades into but not beyond the muscularis propria
T3	Tumor invades the adventitia
T4a	Tumor invades adjacent structures that are usually resectable (diaphragm and pericardium)
T4b	Tumor invades unresectable structures

Regional Lymph Nodes (N)

NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Metastasis in 1-2 regional lymph nodes
N2	Metastasis in 3-6 regional lymph nodes
N3	Metastasis in ≥ 7 regional lymph nodes

Distant Metastasis (M)

M0	No distant metastasis
M1	Distant metastasis

Histologic Grade

GX	Grade cannot be assessed—stage grouping as G1
G1	Well differentiated
G2	Moderately differentiated
G3	Poorly differentiated
G4	Undifferentiated—stage grouping as G3 squamous