

Esophageal Disease

 Team leaders: Alanoud Almansour, Ghaida Al Musma , Moath Alhamoud and Mohammed Alqwaifli

 Done by:
Tamim Alwahibi , Alanoud Bin Methem,
Munira Alhadlg, Mohammed Alhassan

 Revised by: Aseel Badukhon

Color Index:

● Important

● Doctor's Notes

● Extra

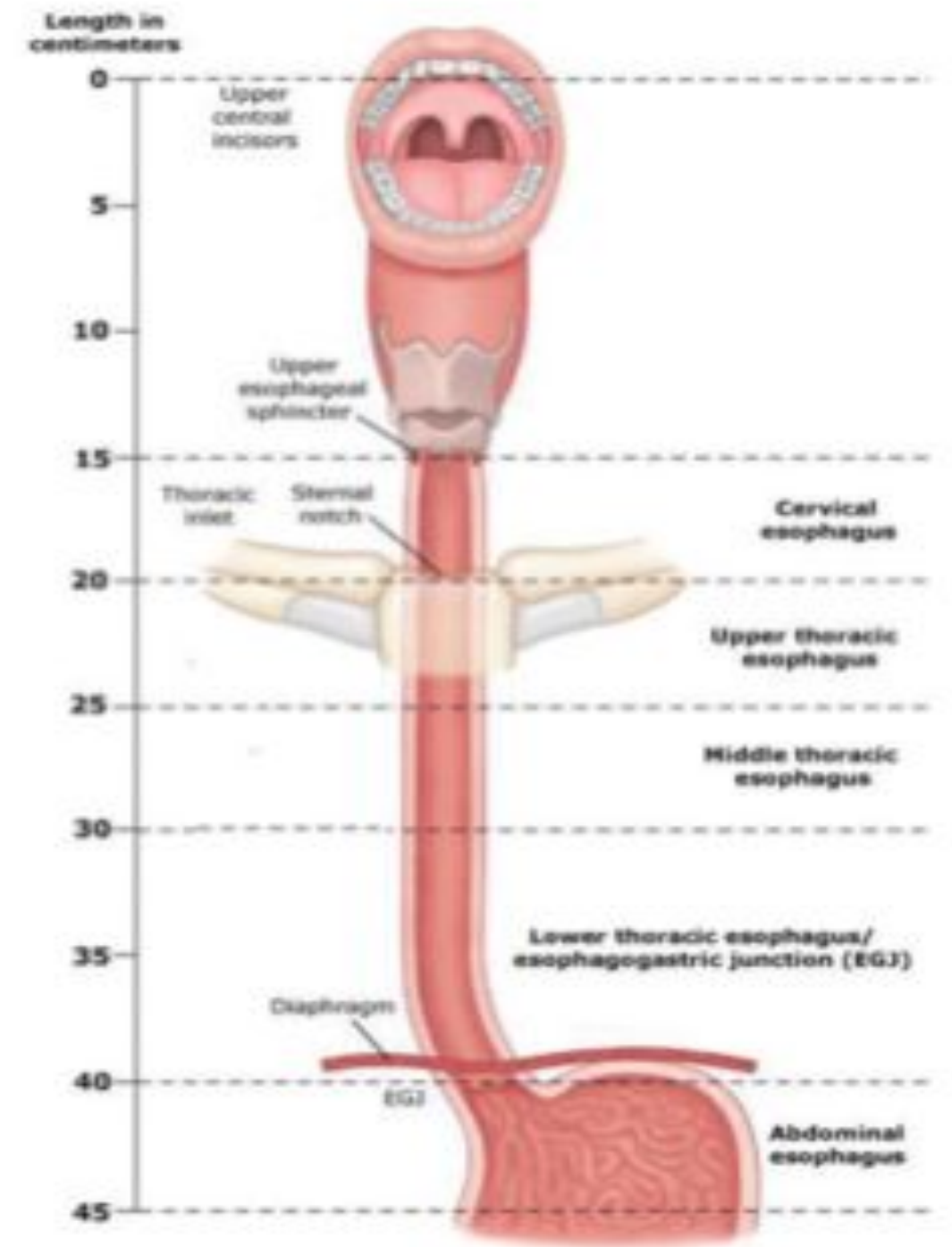
● Davidson's

[Editing File](#) / [Feedback](#)

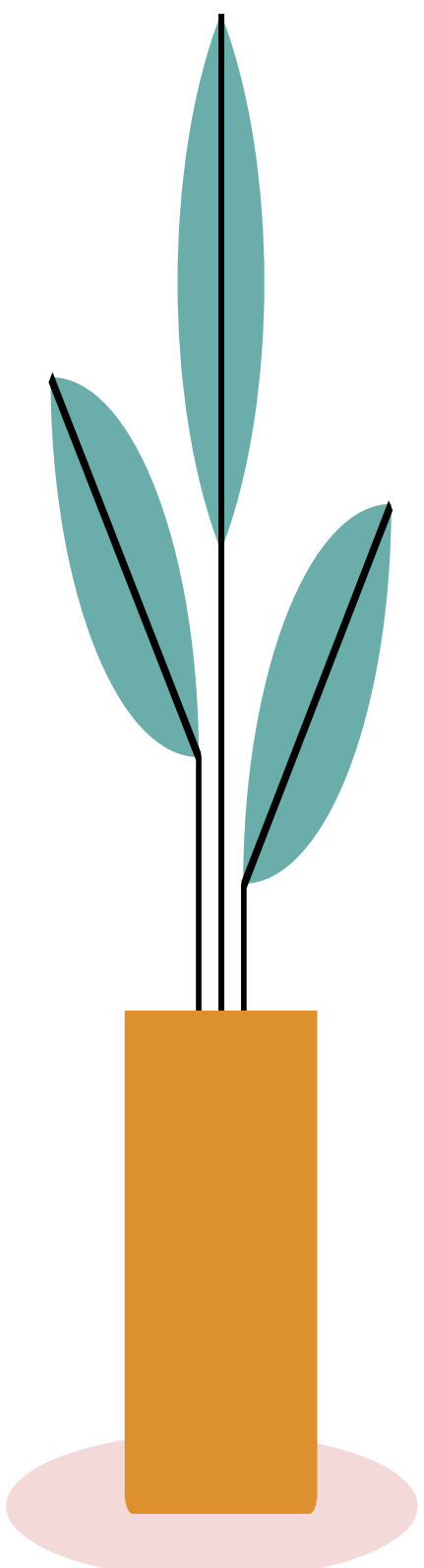
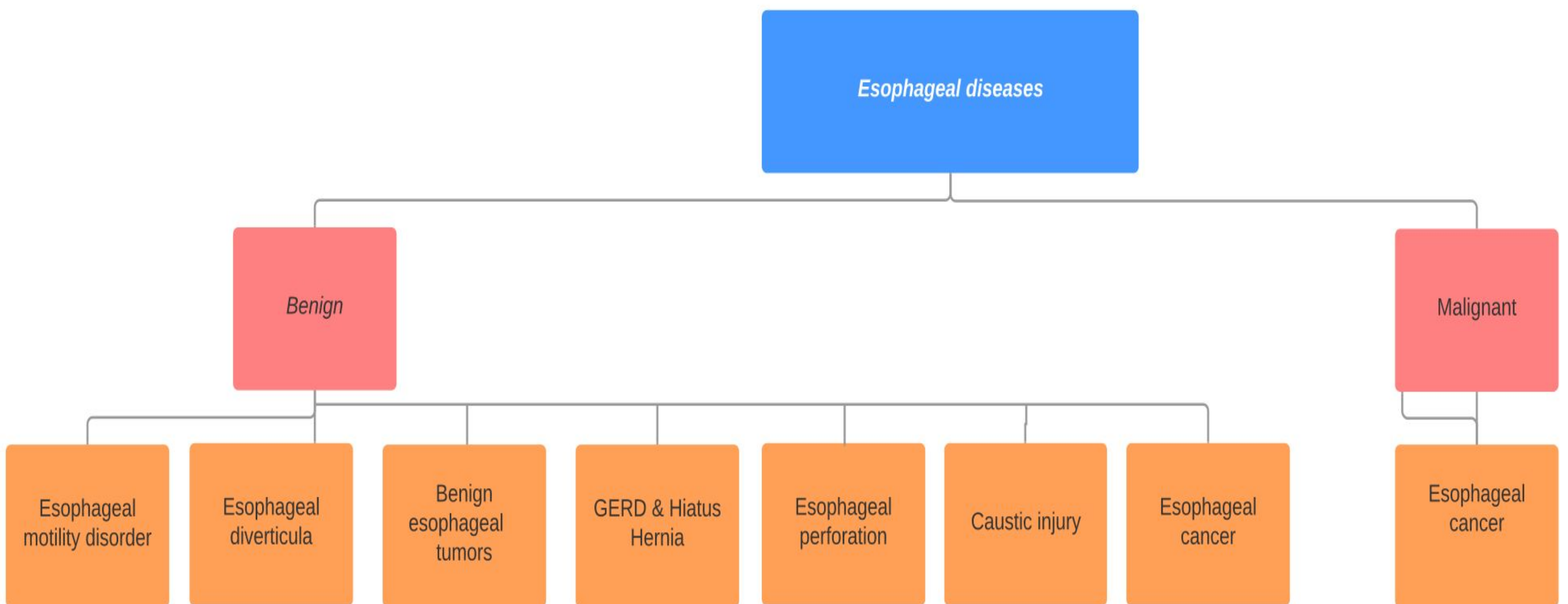


Overview

- **Anatomy**
- Fibromuscular tube (25cm) long.
- Posterior mediastinum.
- 4cm of esophagus below the diaphragm
- Lined by squamous epithelium.



- **Esophageal Diseases:**



GASTROESOPHAGEAL REFLUX DISEASE

Definition:

It is often a chronic and relapsing condition characterized by symptoms OR mucosal damage produced by abnormal reflux of gastric contents into the esophagus when pressure of the high-pressure zone in the distal esophagus is too low to prevent gastric contents from entering the esophagus. Lower esophageal sphincter (LES) has the primary role of preventing reflux (the most common esophageal disease).

- GERD is often associated with a hiatal hernia

Epidemiology:

- About 44% of the US adult population have heartburn at least once a month.
- 14% of Americans have symptoms weekly.
- 7% have symptoms daily.

b/c of their unhealthy lifestyle (obesity). Obesity increases intra-abdominal pressure that increase incidence of acid reflux

Clinical Presentations of GERD

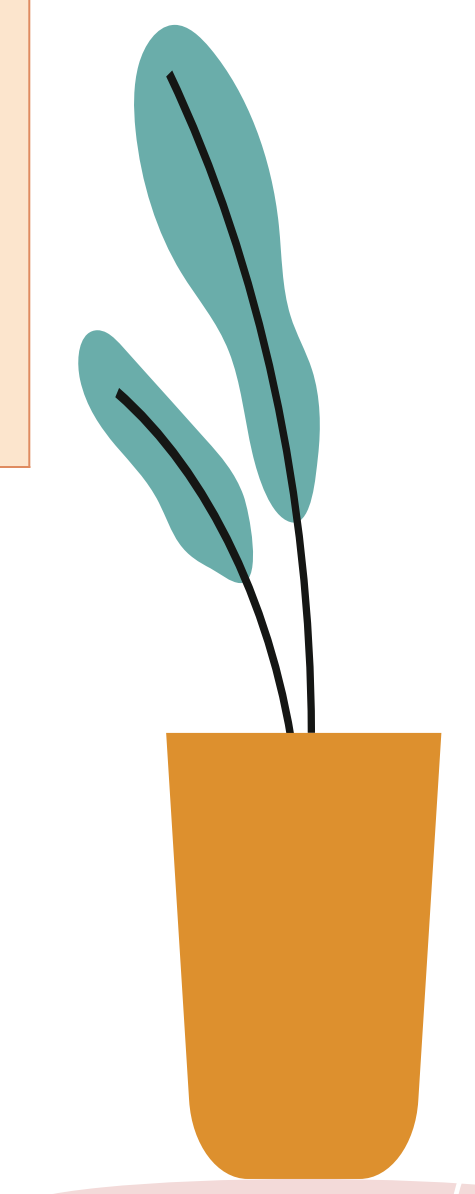
- Patients who **lack typical** symptoms you may see the following complications:
 - **Asthma** → caused by aspiration of acid.
 - **Hoarseness** → caused by irritation of vocal cords caused by acid reflux.

"Classic" GERD	Extraesophageal Manifestations of GERD		
	Pulmonary	ENT	others
-Substernal Heartburn and/or regurgitation - Postprandial pain - Aggravated by change of position. - Prompt relief by antacid. - Can be relieved also by drinking milk.	<ul style="list-style-type: none"> •Asthma. •Aspiration pneumonia. •Chronic bronchitis. •Pulmonary fibrosis. 	<ul style="list-style-type: none"> • Hoarseness.(can be only hoarseness without reflux, it called silent gerd) • Chronic cough. • Laryngitis. • Pharyngitis. • Globus Sensation. • Dysphonia. • Sinusitis. • Subglottic Stenosis. • Laryngeal Cancer. 	<ul style="list-style-type: none"> • Nausea • Occasional vomiting • Waterbrash (hypersalivation) • Epigastric pain • Chest Pain • Dental Erosion.

Typical symptoms: Heartburn, Regurgitation (of small particles of food), Chest discomfort.

Atypical symptoms: Cough (acid go up to throat then get aspirated to trachea causing irritation ending up with coughing), Voice change, SOB, Dry throat(especially in the morning due to acid reflux), Globus sensation

Alarm Symptoms: Weight loss and dysphagia

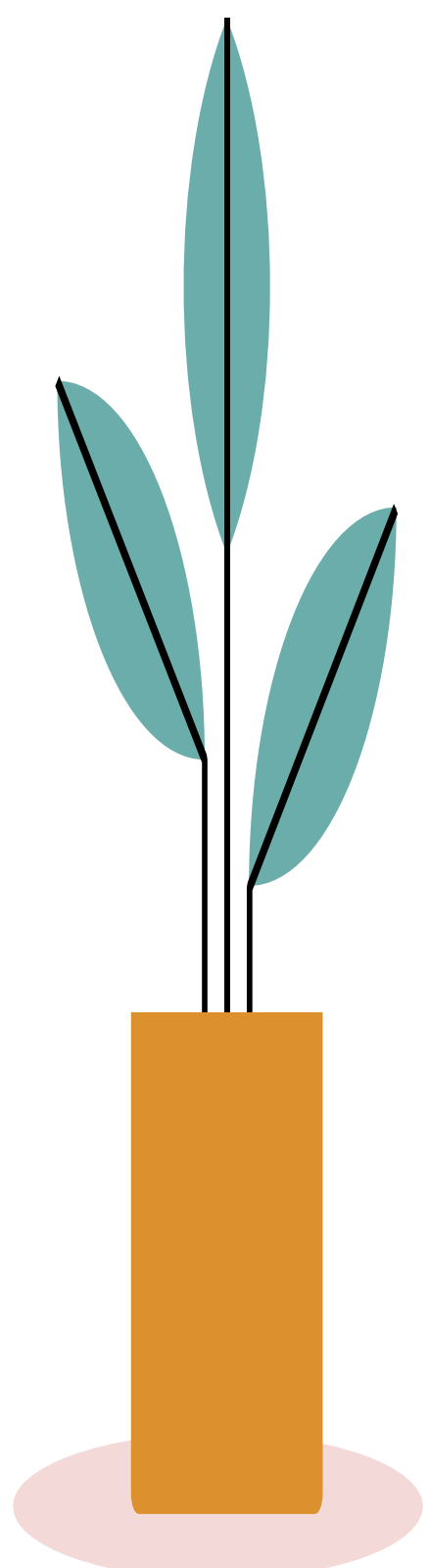
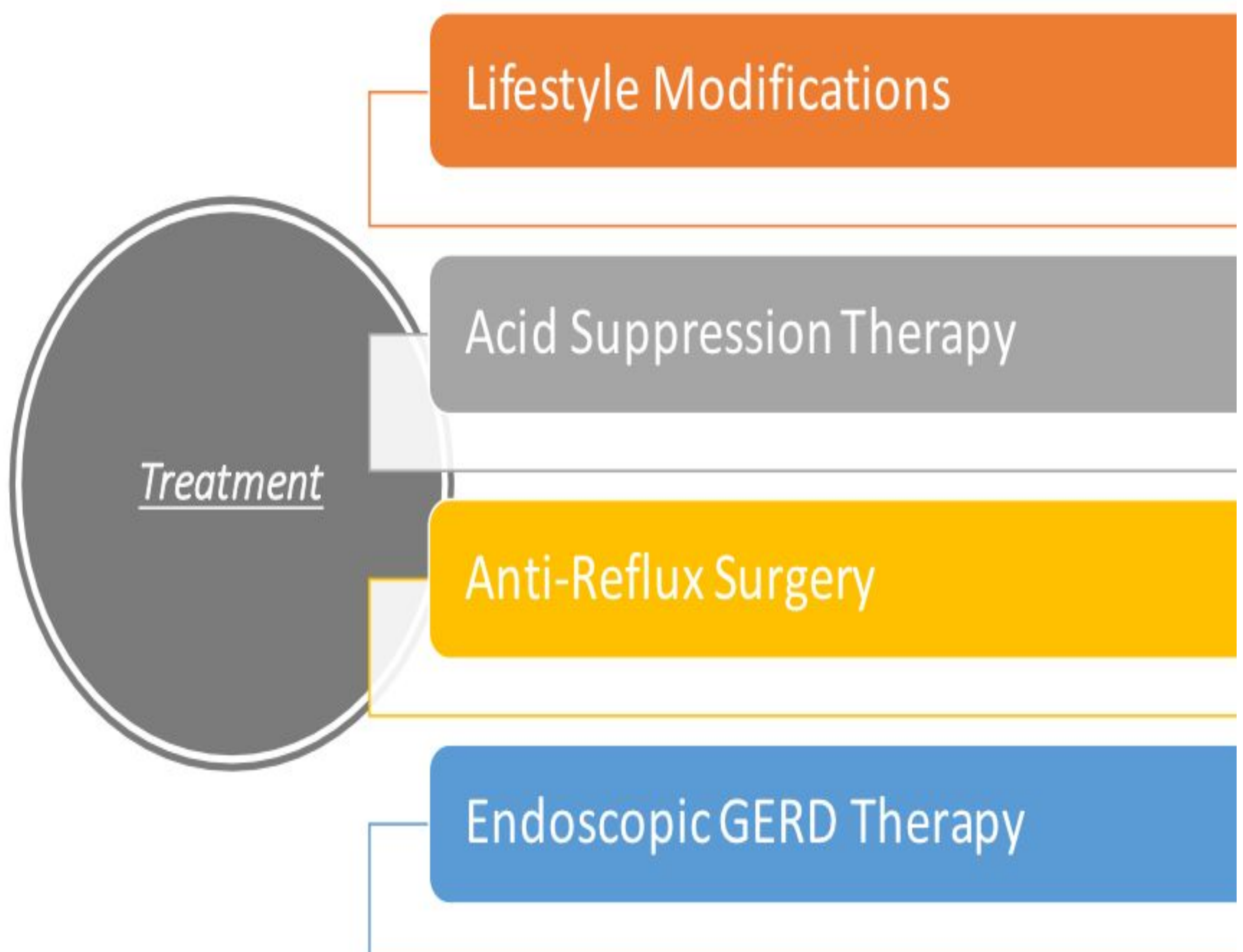


Complicated GERD (RARE)

- **Dysphagia:** difficulty swallowing (food sticks or hangs up, mainly caused by strictures)
- **Odynophagia** : retrosternal pain with swallowing (caused by ulcers in the esophagus)
- **Bleeding.** In ulcers
- **Barrett's esophagus** (columnar metaplasia with goblet cells): metaplasia without goblet cells is not BE.

Diagnostic tests for GERD

- **Barium swallow** :
We give the patient a contrast to drink and we do an X-ray on supine position, then we lift the patient a little bit to see if the contrast will reflux on the esophagus.
- **Endoscopy.** (To see if there is sign of esophagitis, ulceration, strictures, masses)
- **Ambulatory pH manometry "most diagnostic"** :
24-hour-pH monitor.
To confirm that there is a relationship between acid reflux and his symptoms. b/c some pt. Have heartburn related to stress(not real reflux). Pts. with heartburn related to stress won't improve with PPI.
- **Esophageal manometry**
to know the motility of the esophagus usually done before surgery.
- CXR is normal unless it's complicated.



Treatment

1- Lifestyle Modifications (The most important):

- Elevate head of bed 4-6 inches.
- Avoid eating within 2-3 hours of bedtime.
- Lose weight if overweight.
- Stop smoking.
- Modify diet
 - Eat more frequent but smaller meals.
 - Avoid fatty/fried food, peppermint, chocolate, alcohol, carbonated beverages, coffee & tea.
- OTC (over-the-counter) medications prn (as needed).

2- Acid Suppression Therapy for GERD:

H2 Receptor Antagonists (H2RAs)	Proton Pump Inhibitors (PPIs) "more effective"
Cimetidine (Tagamet®) Ranitidine (Zantac®) Famotidine (Pepcid®) Nizatidine (Axid®)	Omeprazole (Prilosec®) Lansoprazole (Prevacid®) Rabeprazole (Aciphex®) Pantoprazole (Protonix®) Esomeprazole (Nexium®)
<small>mnemonic from basic science نزار أنقذ حياة ران وسحب سم العقرب يفمو</small>	<small>mnemonic from basic science لا نسو شكلهم إني ينت أمي وبحسبون مالي رب</small>

3- Anti-Reflux Surgery: "Indications for Surgery"

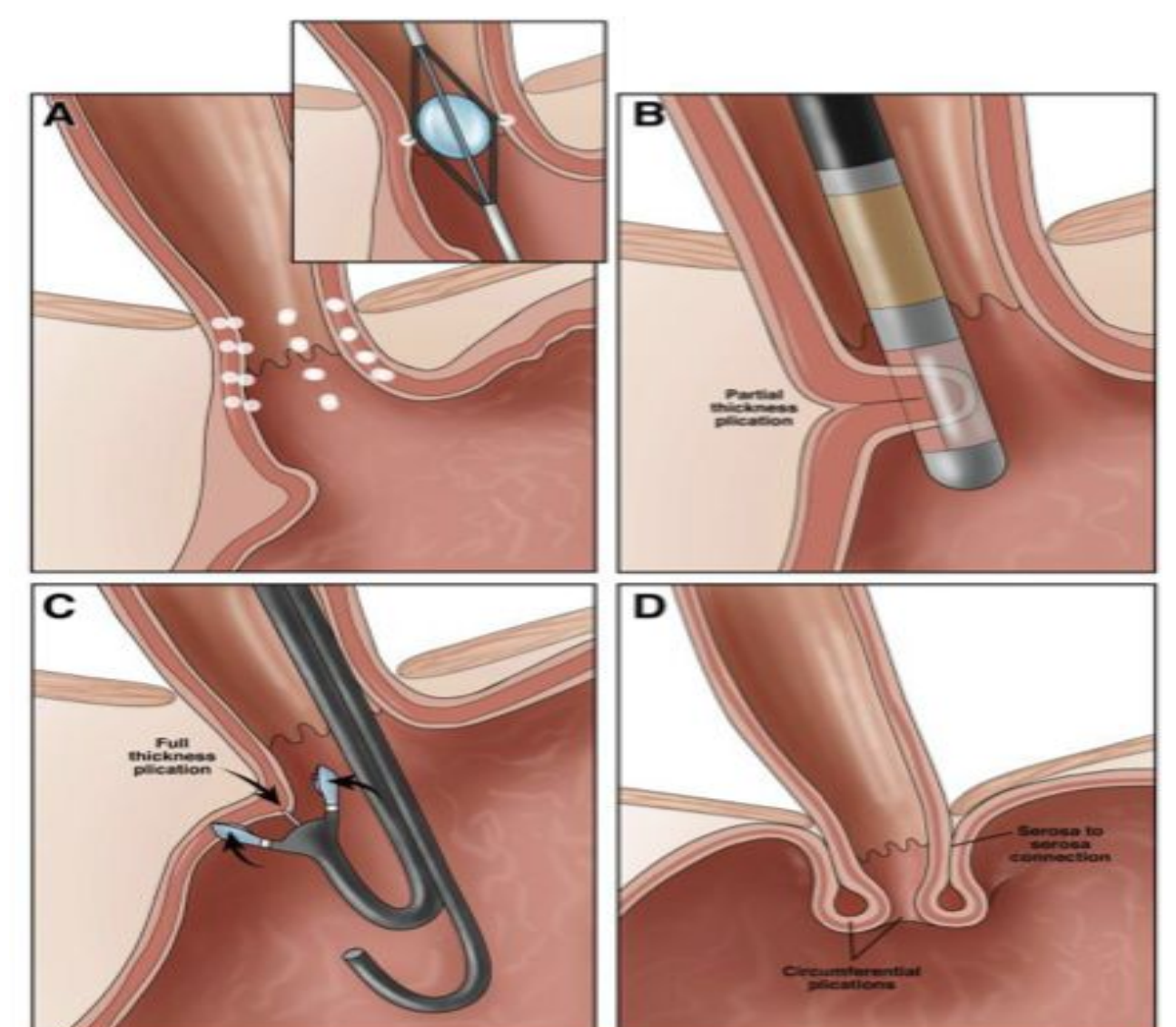
- Failed medical therapy.
- Patient desire.
- Complications of GERD (e.g. Barrett's esophagus; grade III or IV esophagitis).
- Medical complications attributable to a large hiatal hernia. (e.g. bleeding, dysphagia).
- "Atypical" symptoms and reflux documented on 24 hour pH monitoring

4- Endoscopic GERD Therapy:

- Stretta procedure radiofrequency heating of GE junction
- Endoscopic plication TIF
- Enteryx

Surgical treatment:

- Fundoplication
- LINX®
- EndoStim



A. **Stretta procedure:** Radiofrequency energy delivered to the LES.

B. **Endoscopic plication TIF:** Suture ligation of the cardia.

C. **Enteryx:** Submucosal implantation of inert material in the region of the lower esophageal sphincter.

D. **Nissen fundoplication "most common":** Gastric fundus wrapped around the lower esophageal sphincter.

Achalasia

• Definition

Achalasia is an uncommon disease. However, it is the most common type of esophageal motility disorders.

It is characterized by partial or complete degeneration of the myenteric plexus of Auerbach that innervate LES and esophageal body.

The main feature is failure of relaxation of the lower esophageal sphincter.

• Pathogenesis :

Primary vs. secondary

- Primary achalasia:

autoimmune?

Viral?

Genetics ?

- Secondary achalasia:

Chagas' disease is a parasitic infection caused by *Trypanosoma cruzi* which can cause secondary achalasia

Pseudoachalasia:

The most concerning secondary etiology is cancer which can present as achalasia through mechanical obstruction of the GEJ.

• Clinical features

• Common in (young patients) **in the age of 20s and 60s (2 peaks)** | males = females

• Most common presenting symptoms **(in order):**

1. Progressive dysphagia (main symptom): to both solids & liquids at the same time
[If dysphagia occurs for solids first and then liquids → carcinoma]

2. Regurgitation is the second most common symptom occurring in 60% of patients.

it may get aspirated causing pneumonia or abscess

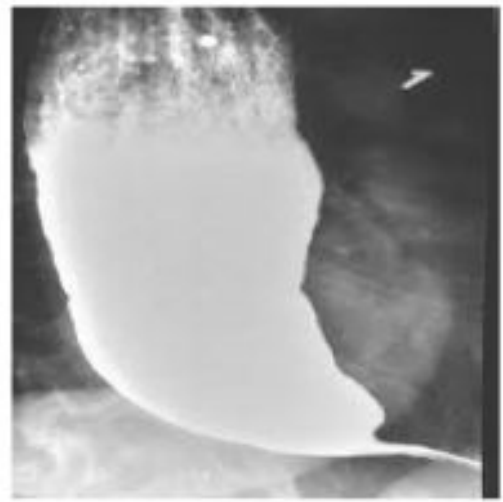
- nocturnal regurgitation of esophageal contents → nighttime cough & aspiration.

3. Others: chest pain : 20% to 60% of patients , Heartburn : 30% of achalasia patients

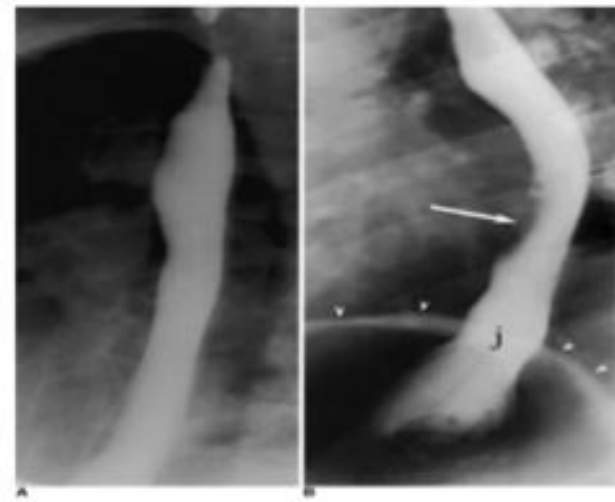
- may be related to direct irritation of the esophageal lining by retained content , or acidic by-products of bacterial metabolism of retained food.

● Diagnosis

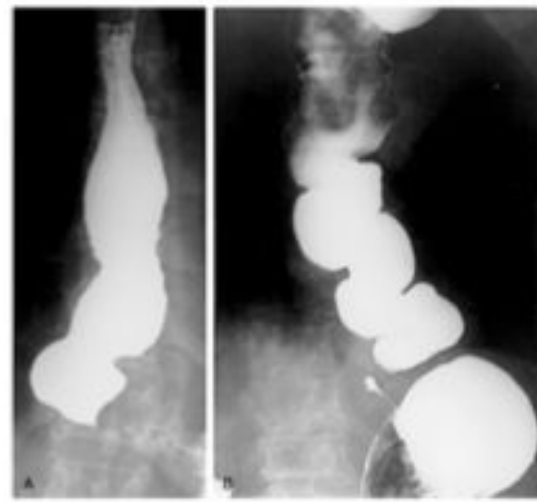
- **CXR:** may show air-fluid level.
- **Barium study :** (1) **classic finding bird's beak** (gradual tapering at the end of the esophagus) It also shows (2) dilated esophagus (3) air-fluid level .∴ may be secondary to retained secretions.
- **Upper endoscopy** is the NEXT diagnostic test in a patient with suspected achalasia or dysphagia (rule out other causes of dysphagia).
 - **Findings:** (1) Dilated esophagus with retained food or secretions. (2) Normal in ≈44% of patients.
 - Difficulty traversing the GEJ (Gastroesophageal junction) → suspicion of **pseudoachalasia due to neoplastic infiltration of the distal esophagus.**



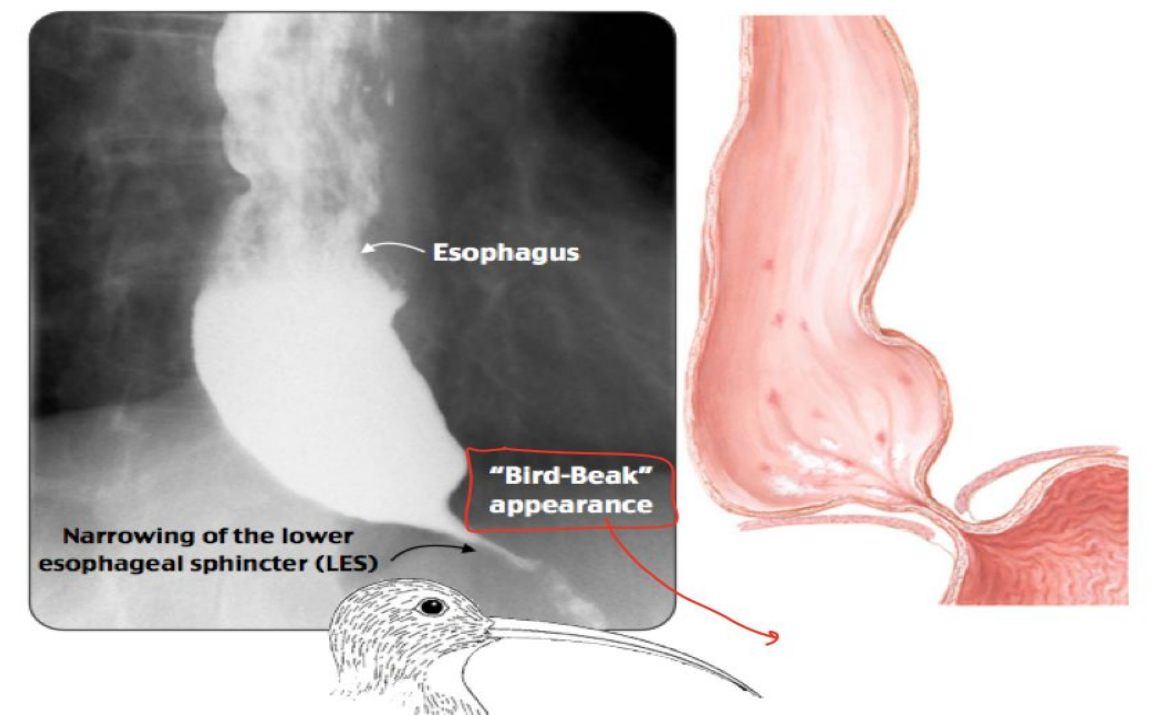
Bird's beak



Normal Esophagram



Nutcracker Esophagus(DES)



- **Esophageal manometry** [has the highest sensitivity (**Most accurate**) for achalasia diagnosis]:
 - Aperistalsis of the distal esophageal body.
 - Incomplete or absent LES relaxation with swallowing.
 - Hypertensive LES.
- **Manometric variants of achalasia** vigorous achalasia (best known)
 - Defined by the presence of normal to high amplitude esophageal body contractions in the presence of a nonrelaxing LES.
 - May represent an early stage of achalasia.

● Treatment

The main goal is to relieve symptoms not to fixing achalasia

- **Primary therapeutic goal:** to reduce LES basal pressure.
- **Primary desired outcome:** symptoms relief, particularly of dysphagia.
- **Treatment options :** medical therapy, botulinum toxin injection, pneumatic dilation, and surgical myotomy.

1- Medical Therapy: used in pts. who can't tolerate surgery

- Inconvenient, only partially effective, and frequently associated with side effects , it is reserved for patients awaiting or unable to tolerate invasive treatment modalities.
 - Pharmacologic therapies attempt to decrease the LES pressure by causing smooth muscle relaxation
 - **Nitrates** were first recognized as an effective treatment of achalasia.
 - Their systemic vasodilatory effects and headaches limit their tolerability by patients.
 - **Calcium channel blocker** have a better side-effect profile when compared with nitrates
 - 30% of patients report adverse side effects (peripheral edema, hypotension, and headache)
- Efficacy of Nitrates and CCB is extremely poor

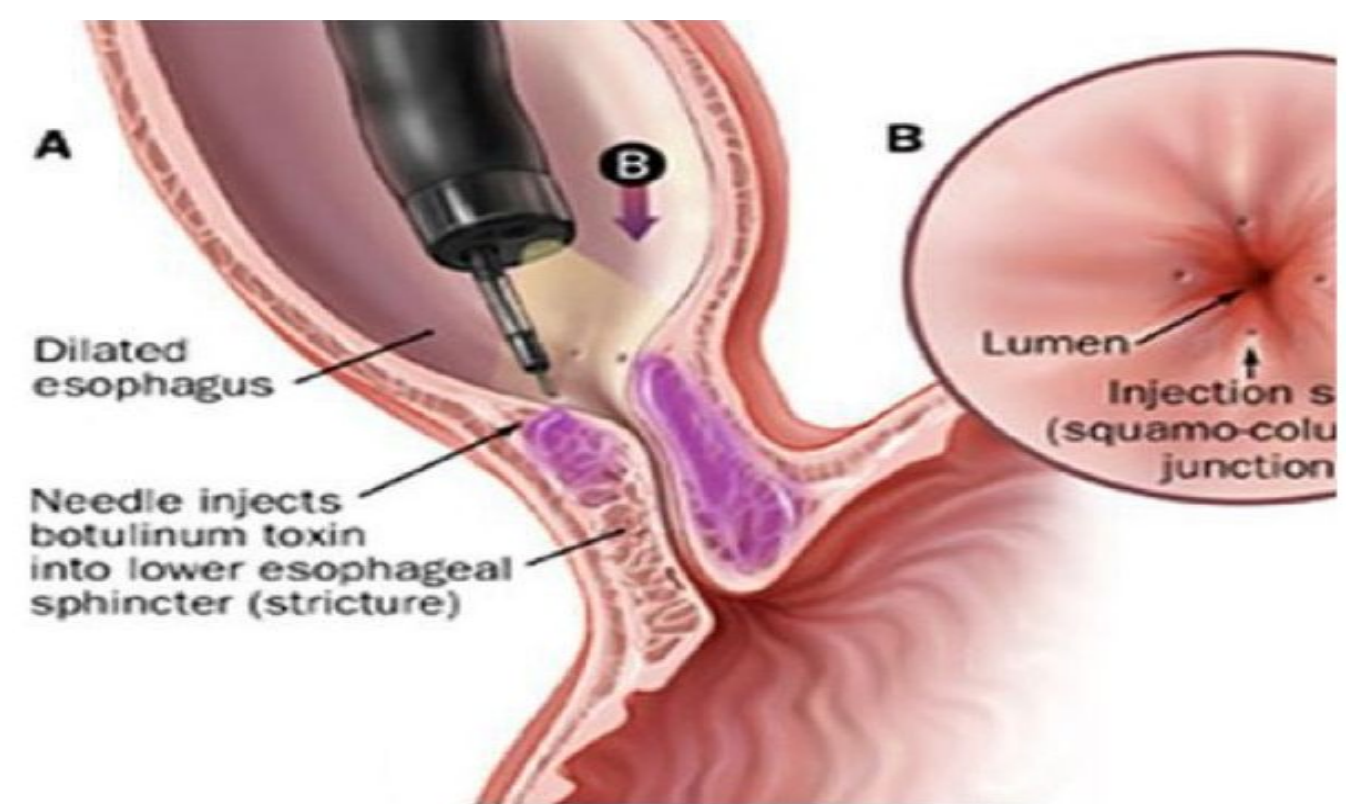
2- Botulinum Toxin Injection: (endoscopically)

Reserved for use in patients:

- Not candidates for more invasive treatments.
- Refuse surgical intervention.

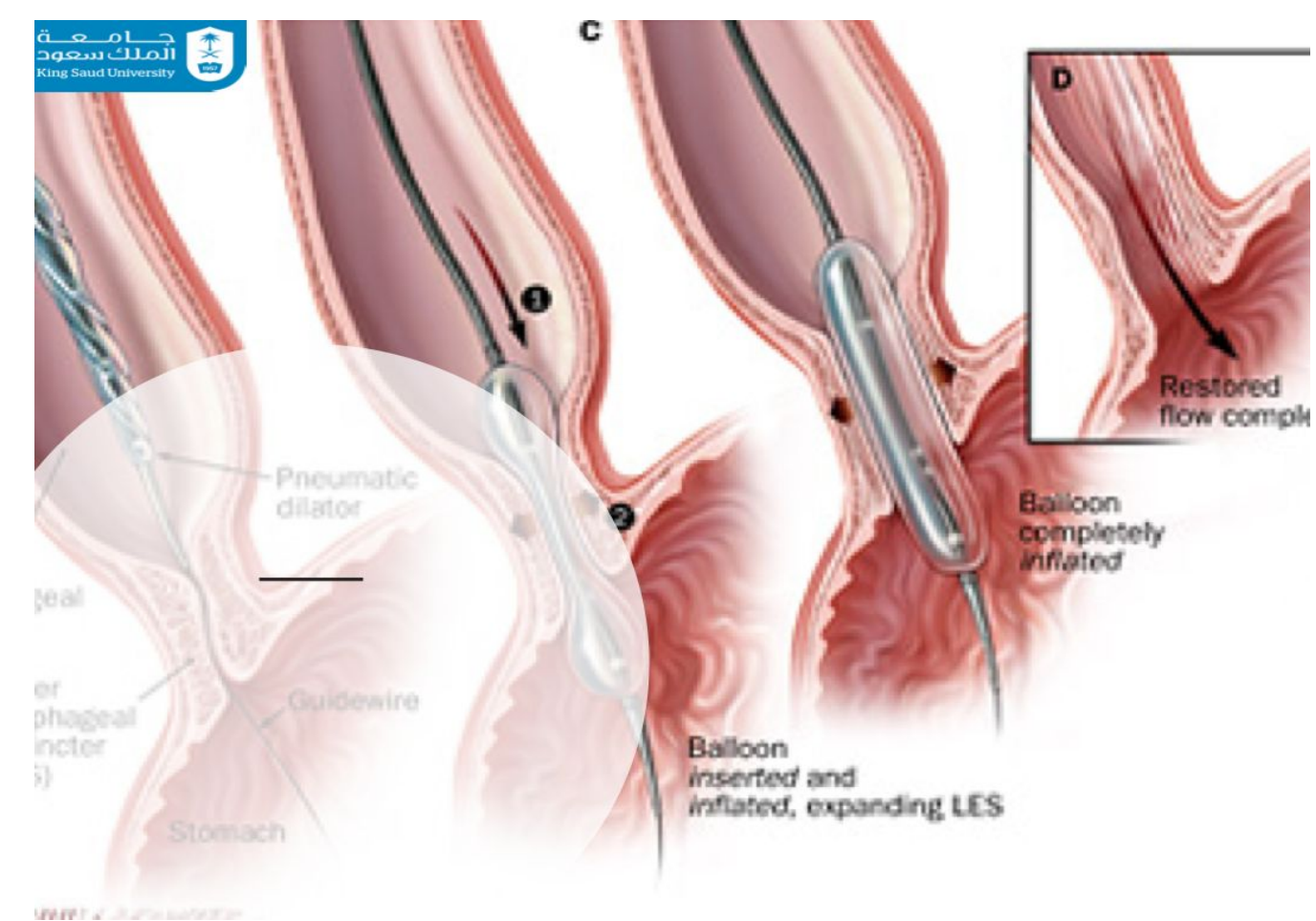
Efficacy up to 6-12 months

It require re-injection every 6 months



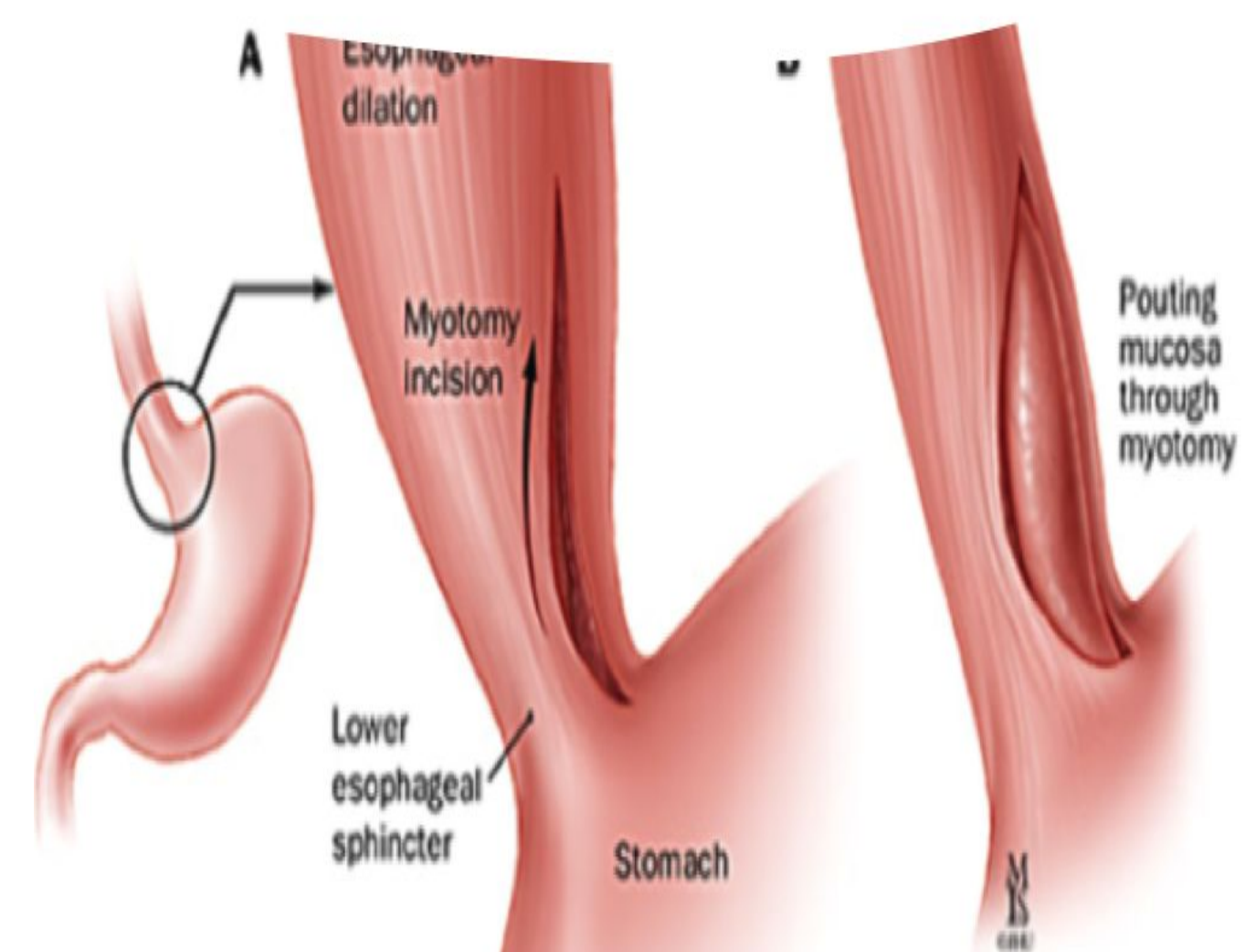
3- Pneumatic Dilator: "first-line"

- A balloon is insufflated at the level of the gastroesophageal junction to rupture the muscle fibre.
- Success rate 70-80%.
- 50% will require more than 1 dilation session.
- Complications of pneumatic dilation exist
 - Gastroesophageal reflux 25-35%
 - Esophageal perforation 3 %



4- Surgical Therapy: "best treatment" (We cut the muscles of the sphincter to reduce the pressure)

- has success rates in excess of 90%
- Heller myotomy: muscles of the cardia (lower esophageal sphincter or LES) are cut, allowing food and liquids to pass to the stomach | high success rates | hospital stays only for few days.
- Laparoscopic Heller myotomy (the best treatment for patients who having achalasia) shows excellent results 98% symptomatic improvement at 5.3 years
- Complications:
 - Acid exposure .



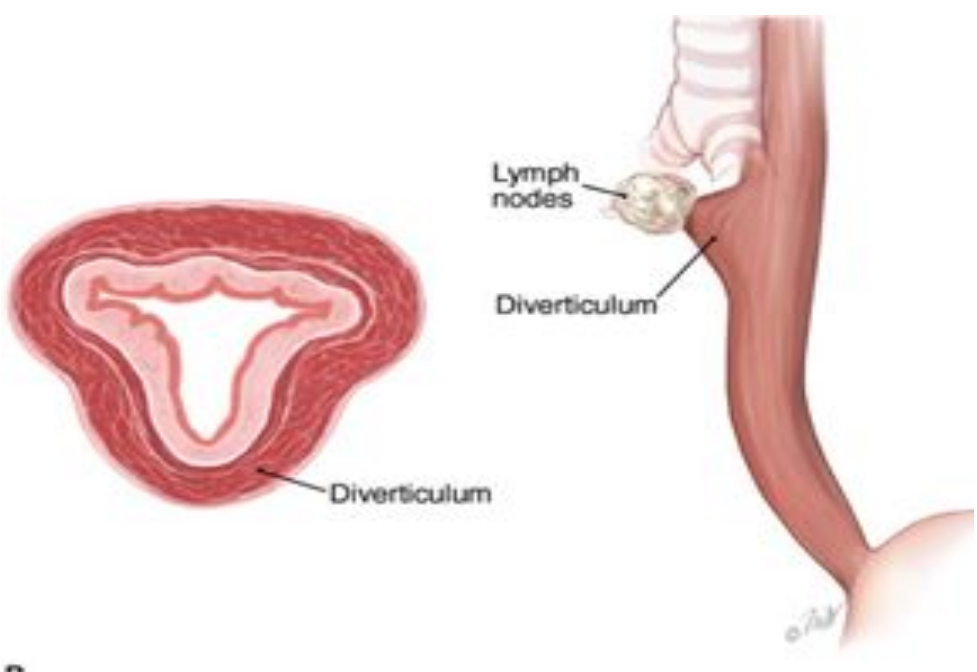
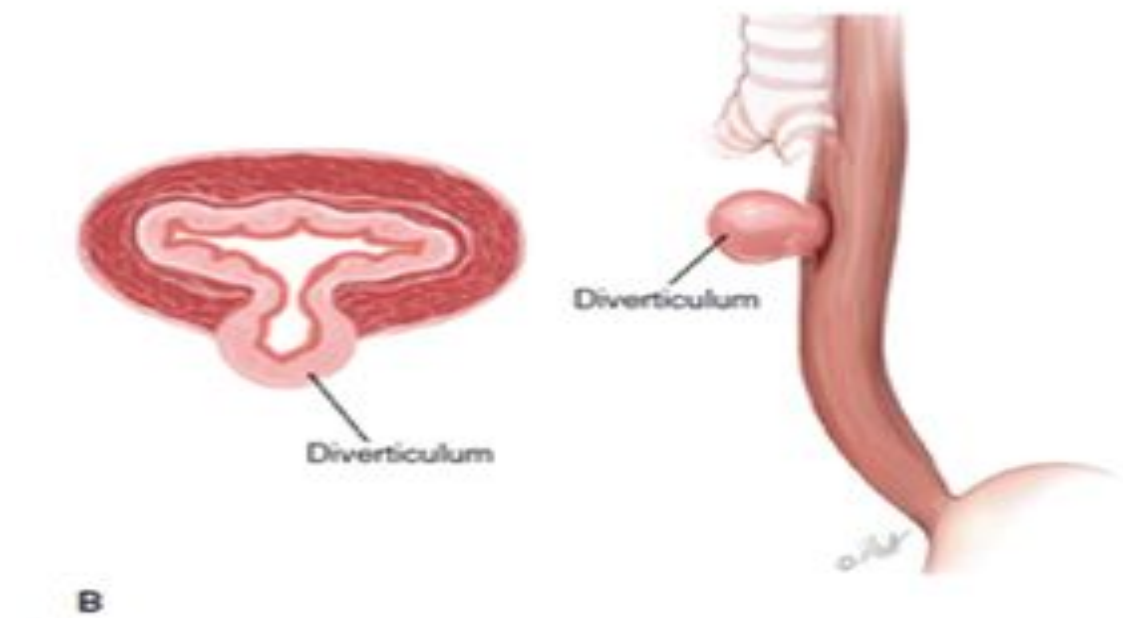
Complications of achalasia

- Primary complications: progressive malnutrition and aspiration. (related to the functional obstruction caused by the nonrelaxing LES)
- Secondary complications (uncommon but important):
 - Formation of epiphrenic diverticulum
 - Esophageal cancer (most commonly squamous cell carcinoma).

ESOPHAGEAL DIVERTICULA

- Can occur in several places along the esophagus. The three most common sites:
 - **Pharyngoesophageal (Zenker's).** Most common
 - Peribronchial (mid-esophageal).
 - Epiphrenic.

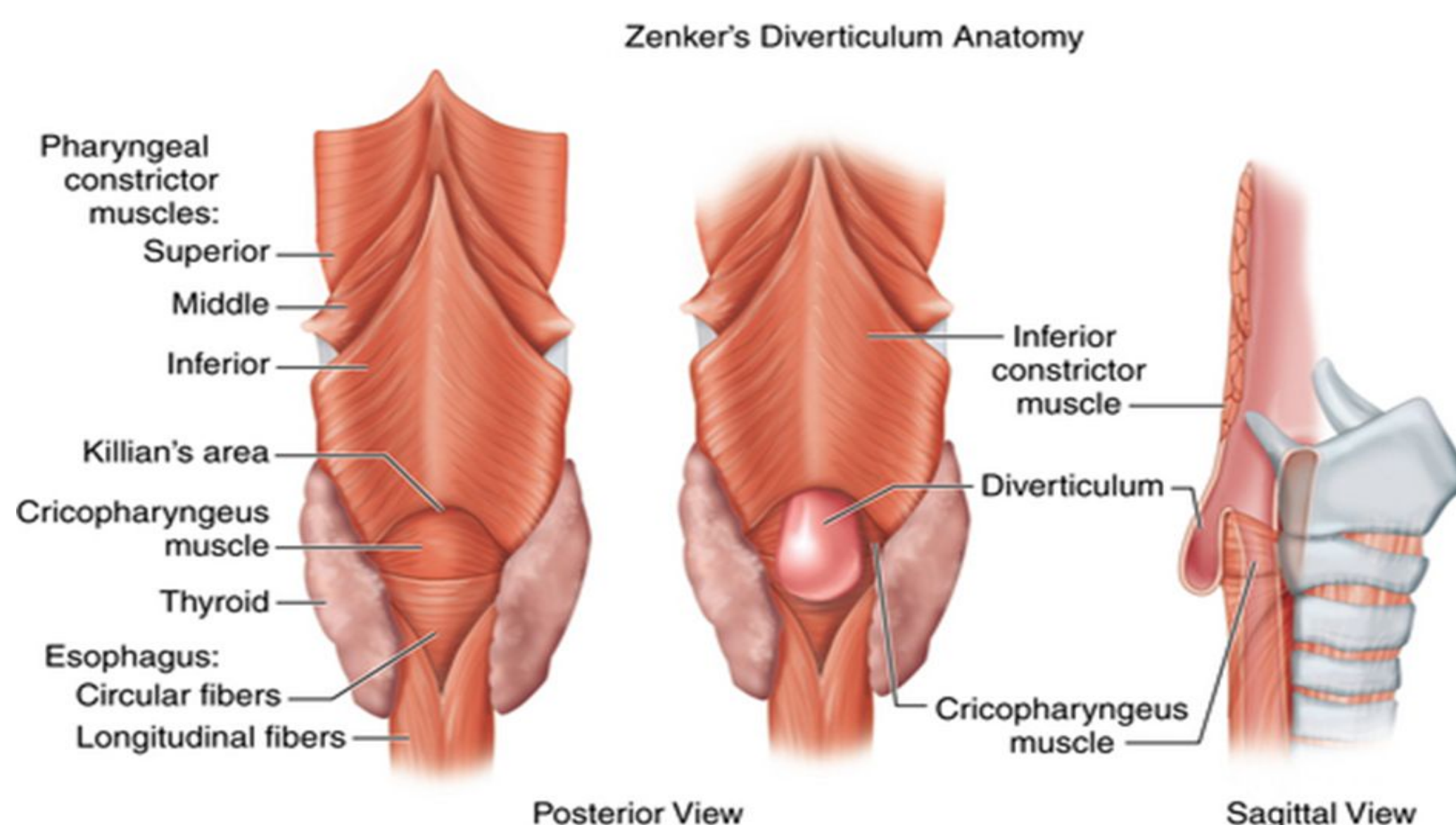
VERY IMPORTANT

True diverticulum	False diverticulum
ALL LAYERS of esophageal wall (mucosa - submucosa - muscularis)	Mucosa and submucosa ONLY
<p>True diverticulum (Traction) Results from: External inflammatory mediastinal lymph nodes adhering to the esophagus.</p> <p>The best example is : Meckel's Diverticulum</p> 	<p>False (Pulsion) diverticula: Caused by elevated intraluminal pressures; generated from abnormal motility disorders. It includes: Zenker's & epiphrenic diverticulum</p> 

Pharyngoesophageal (Zenker's) Diverticulum:

- Most common | usually in **older** male patients | 7th decade of life.
- Found herniating into **Killian's triangle** (between the oblique fibers of the thyropharyngeus muscle and the horizontal fibers of the cricopharyngeus muscle). Incoordination of swallowing and failure of relaxation of the cricopharyngeus muscle cause the herniation.

Killian's triangle is a very weak point and when pt. Has abnormal motility mucosal wall will bulge producing False diverticulum



Symptoms & Diagnosis:

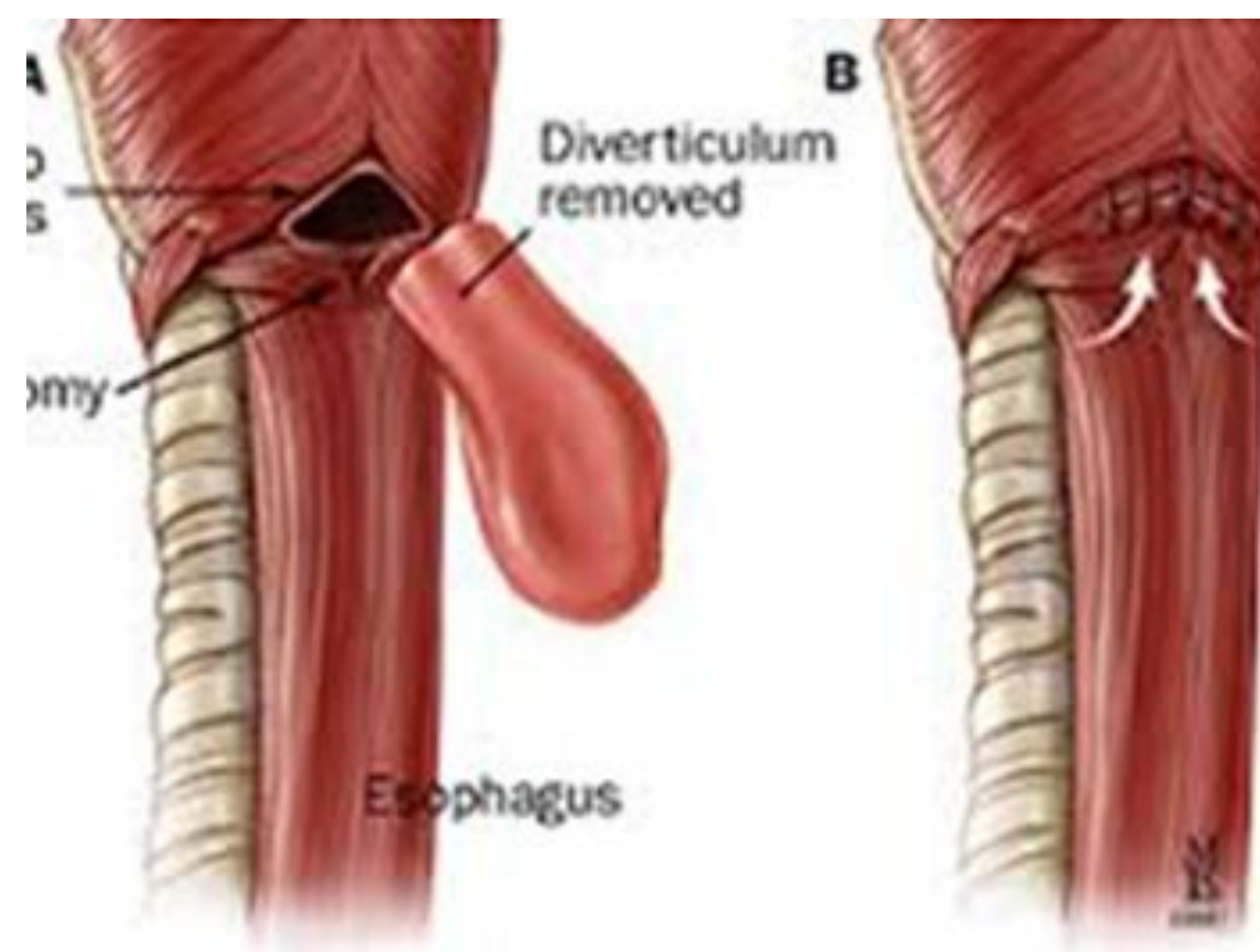
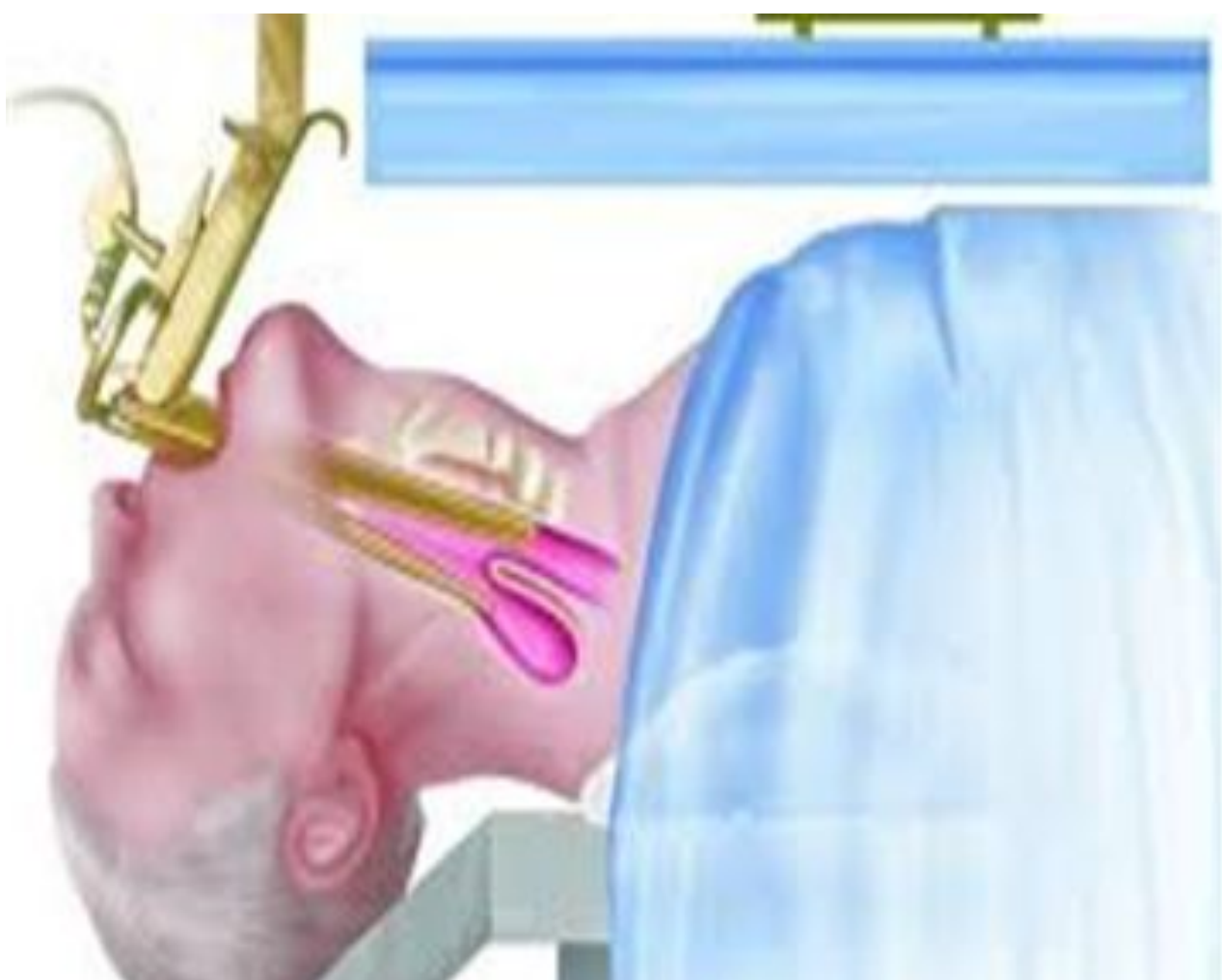
- **Common:** patients complain of a **sticking** (gurgling) **in the throat**.
 - **Especially common in elderly:** **Halitosis** | voice changes | retrosternal pain | respiratory infections.
 - **Signs of progressive disease:** nagging **cough** | hypersalivation | intermittent **dysphagia**.
 - As the sac increases in size regurgitation of foul-smelling & undigested material is common.
 - **The most serious complication** from an untreated Zenker's diverticulum is **aspiration pneumonia or lung abscess**.
- * A lump in the neck might be seen (pharyngeal pouch) | might be asymptomatic.
- **Diagnosis is made by barium esophagram** (best modality) (which demonstrates pouch + uncoordinated swallowing).

Esophageal manometry and endoscopy are **NOT** needed to make a diagnosis. Endoscopy rather confirms the diagnosis. It must be performed with care to avoid accidental perforation of the pouch.



Treatment:

- Surgical or endoscopic repair of a Zenker's diverticulum **is the gold standard of treatment**.
- **Open surgical repair:** (myotomy + resection of pouch) "gold standard of treatment"
 - Myotomy of proximal & distal thyropharyngeus and cricopharyngeus muscles. (We do the myotomy to prevent the recurrence).
 - Pouch resection: diverticulectomy /diverticulopexy through an incision in the left neck.
- Endoscopic repair is an alternative to open surgical repair: endoscopic Dohlman procedure (also known endoscopic Zenker's diverticulotomy): by dividing the common wall between the esophagus & 16 diverticulum using a laser or stapler.



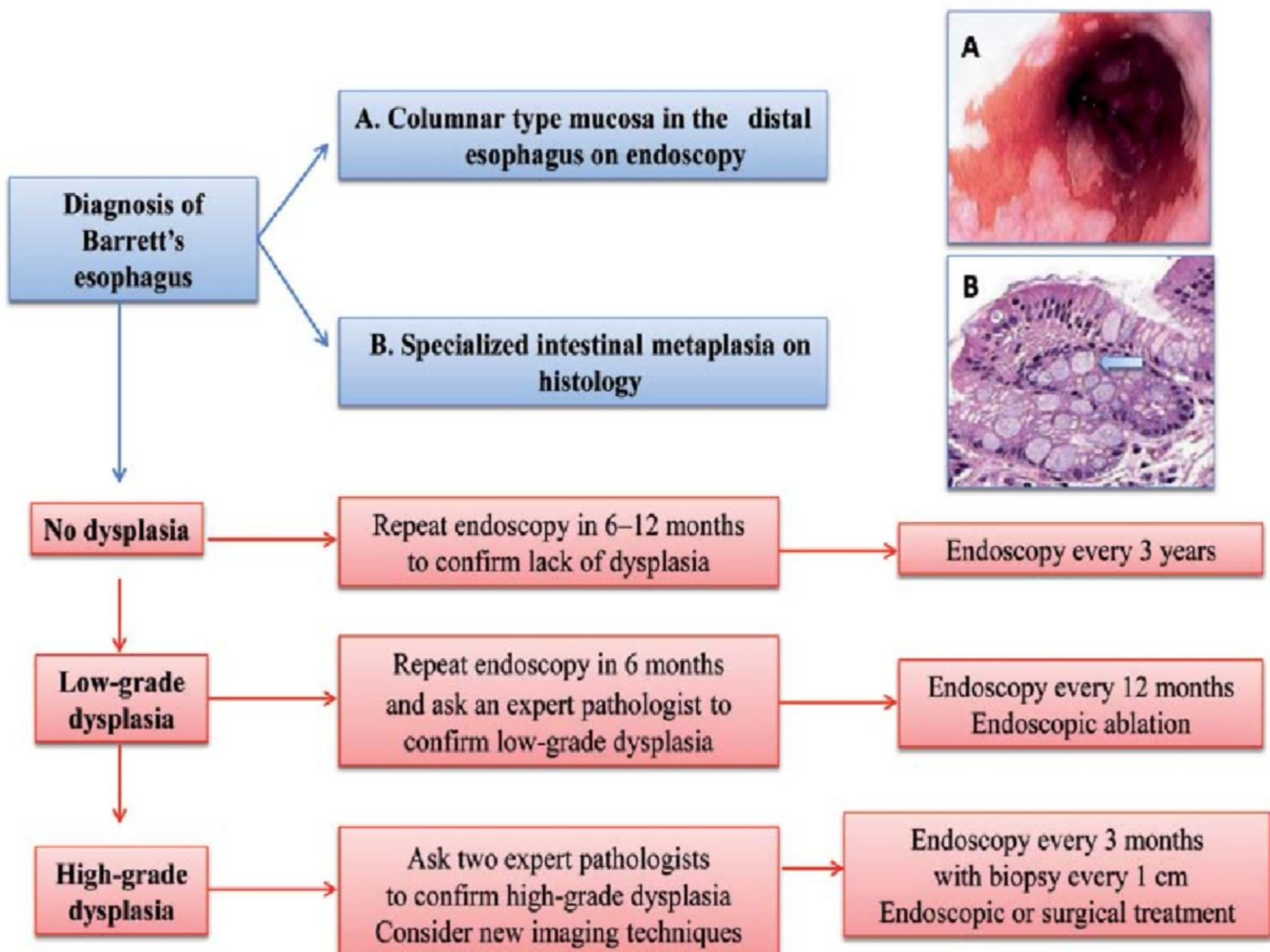
Barrett's esophagus

Definition	<p>A condition whereby an intestinal , columnar epithelium replaces the stratified squamous epithelium that normally lines the distal esophagus (intestinal metaplasia). Surface epithelium of Barrett's esophagus: columnar epithelium WITH goblet cells! If you don't see goblet cells the it is Just METAPLASIA.</p>
Risk Factors	<ul style="list-style-type: none">• Chronic GERD:<ul style="list-style-type: none">- Injury of squamous epithelium → promotes repair through columnar metaplasia.- Metaplastic cells may be more resistant to injury from reflux and are more prone to malignancy.- With continued exposure to the reflux disease, metaplastic cells undergo cellular transformation to low- and high-grade dysplasia.- these dysplastic cells may evolve to cancer [continuous exposure to GERD (esophagitis + hyperplasia) → Barrett's esophagus (intestinal metaplasia) → dysplasia -low or high- → adenocarcinoma (neoplasia)]- 10% of patients with GERD develop Barrett's esophagus.• 40-fold <u>increase risk</u> for developing esophageal carcinoma in patients with Barrett's esophagus
Symptoms	<ul style="list-style-type: none">• Many patients harboring intestinal metaplasia in their distal esophagus are asymptomatic.• Most patients present with symptoms of GERD: Heartburn, regurgitation, acid or bitter taste in the mouth,excessive belching , and indigestion.• Recurrent respiratory infections, adult asthma, & infections of head & neck are common complication
Diagnosis	Diagnosis is made by: Endoscopy & pathology (histopathology)

• Treatment

• Barrett's esophagus

- Yearly surveillance endoscopy** is recommended in all patients with a diagnosis of Barrett's Esophagus (BE).
 - Patients are placed on acid suppression medication and monitored for changes in their reflux symptoms.
- Photodynamic therapy (PDT)** is the most common ablative method used to treat BE.
 - Benefits of antireflux surgery are controversial in patients with BE.
 - **Surgery renders the LES competent and restores the barrier to reflux.**
 - Studies have demonstrated regression of metaplasia to normal mucosa up to 57% of the time in patients who have undergone antireflux surgery
- Esophageal resection for Barrett's esophagus is recommended only for patients in whom high-grade dysplasia is found
- Pathologic data on surgical specimens demonstrate a 40% risk for adenocarcinoma within a focus of high-grade dysplasia



CAUSTIC INJURY لمح انها ما تجي ,JUST READ IT

- Best cure for this condition is prevention.
- In children, ingestion of caustic materials is accidental and tends to be in small quantities.
- In teenagers and adults, however, ingestion usually is suicide attempts, and much larger quantities of caustic liquids are consumed.
- Alkali ingestion is **more common** and much **more devastating** than acid ingestion because of its lack of immediate symptoms and almost always lead to significant destruction of the esophagus.

Three Phases of Tissue Injury From Alkali Ingestion

Phase	Tissue injury	Onset	Duration	Inflammatory response	Symptoms
1	Acute necrosis.	1-4 days	1-4 days	-Coagulation of intracellular proteins. -Inflammation.	*Oral and substernal pain *Hypersalivation *Odynophagia & dysphagia *Vomiting & Hematemesis
2	Ulceration & granulation	3-5 days	3-12 days	-Tissue sloughing. -Granulation of ulcerated tissue bed.	Symptoms may disappear
3	Cicatrization & scarring	3 weeks	1-6 months	-Adhesion formation. -Scarring	Dysphagia reappears; as fibrosis and scarring begin to narrow the esophagus.

Symptoms & Diagnosis:

Other symptoms	Physical examination	Investigations
<ul style="list-style-type: none"> • Symptoms respiratory distress: hoarseness, stridor, and dyspnea → suggest upper airway edema and are usually worse with acid ingestion. • Pain: chest & back → may indicate perforation of mediastinal esophagus , abdominal → may indicate abdominal visceral perforation. 	<ul style="list-style-type: none"> • Diagnosis is initiated with a physical exam specifically evaluating the mouth, airway, chest and abdomen • Evaluation of: mouth, airway, chest, and abdomen. • Careful inspection of: lips, palate, pharynx, and larynx. • Abdomen is examined for signs of perforation. 	<p>1.Early endoscopy is recommended 12 to 24 hours after ingestion to <u>identify the grade of the burn.</u></p> <p>First degree: Mucosal hyperemia, edema</p> <p>Second degree: Limited hemorrhage, exudates,ulcerations,pseudomembrane formation.</p> <p>Third degree: Mucosal sloughing, deep ulcerations,massive hemorrhage, complete luminal obstruction, charring, perforation</p> <p>2.Questionable chest and abdominal exams → Serial chest and abdominal radiographs are indicated</p>

Treatment:(The best cure for this condition is an ounce of prevention)

- Management of the acute phase is aimed at limiting and identifying the extent of the injury.
- It begins with **neutralization** of the ingested substance:
 1. **Alkalis** (including lye) are neutralized with half-strength vinegar or citrus juice.
 2. **Acids** are neutralized with milk, egg whites, or antacids.
- Emetics and sodium bicarbonate need to be **avoided** because they can increase the chance of perforation.

First-Degree Burn	Second-Degree Burns	Third-Degree Burns
<ul style="list-style-type: none"> • 48 hours of observation. • Oral nutrition can be resumed when a patient can painlessly swallow saliva. • A repeat endoscopy and barium esophagram are done in follow-up at intervals of 1, 2, and 8 months. • Acid suppression. 	<ul style="list-style-type: none"> • Aggressive resuscitation. • The patient is monitored in the ICU. • NPO with IV fluids I IV antibiotics • Fiberoptic intubation (if needed) • Acid suppression. PPIs are started. 	<ul style="list-style-type: none"> • Fiberoptic intubation (if needed) • Inhaled steroids.

Benign Esophageal Tumor

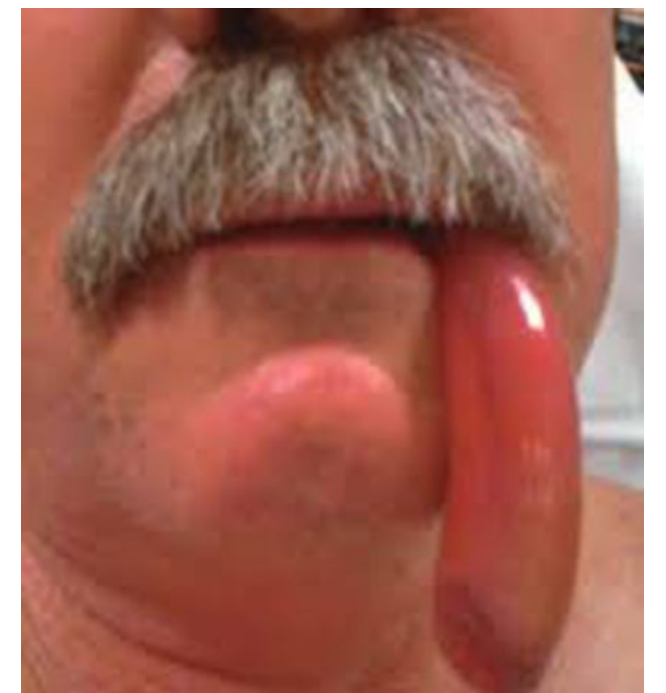
- Benign tumors are rare (< 1 %)
- **Classified in two groups :**
 - Mucosal
 - Extramucosal (intramural)
- More useful classification:
 - 60% of benign neoplasms are leiomyomas
 - 20% are cysts
 - 5% are polyps
 - Others (< 2 percent)

Esophageal Cysts

- Arise as diverticula of the embryonic foregut
- 3/4 of this cyst present in childhood.
- 60% are located along the right side of the esophagus.
- 60% present in the first year of life with either respiratory or esophageal symptoms.
- Cyst found in the **upper third** of the esophagus present in **infancy** while **lower third** lesions present **later in childhood**.

Pedunculated Intraluminal Tumors (Polyps)

- Rare.
- Occur in older men and may cause **intermittent Dysphagia** .
- Easily missed with barium swallow and esophagoscopy.

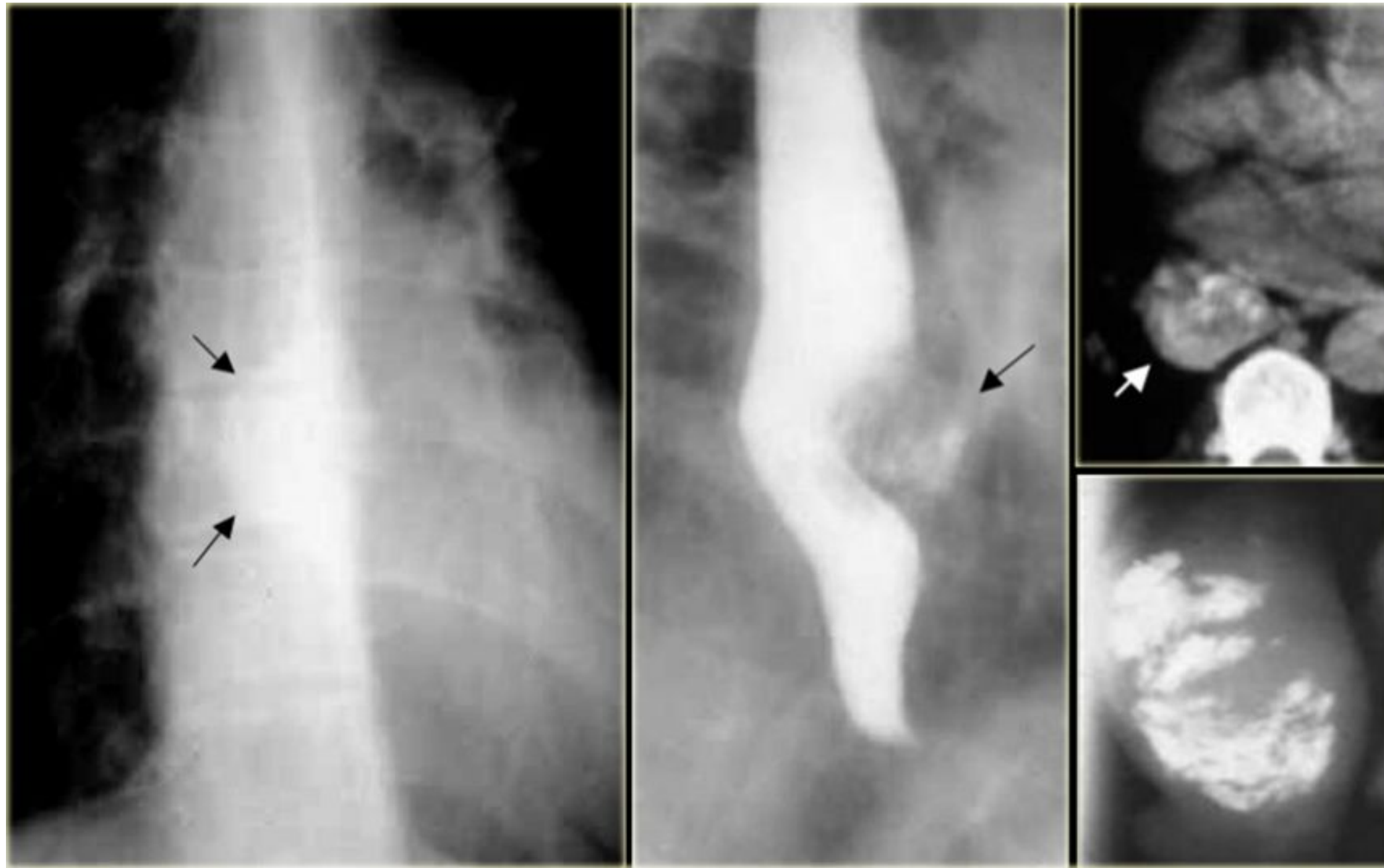


Leiomyoma:

- 60% of all benign esophageal tumors.
- Found in men slightly more than women.
- Present in the 4th and 5th decades.
- They are found in the distal two thirds of the esophagus more than 80% of the time.
- They are usually solitary and remain intramural, causing symptoms as they enlarge.
- Recently, they have been classified as a gastrointestinal stromal tumor (GIST).
- GIST tumors are the most common mesenchymal tumors of the gastrointestinal tract and can be benign or malignant.
- Nearly all GIST tumors occur from mutations of the **c-KIT oncogene**, which codes for the expression of **c-KIT (CD117)**.
- All leiomyomas are benign with malignant transformation being rare

Symptoms and Diagnosis

- Many leiomyomas are asymptomatic.
- **Dysphagia**, bleeding and **pain** are the most common symptoms (can result from even the smallest tumors).
- A chest radiograph is NOT usually helpful to diagnose leiomyomas, but on **barium esophagram**, a leiomyoma has a characteristic appearance.
- During endoscopy, extrinsic compression is seen, and the overlying mucosa is noted to be intact
- Diagnosis also can be made by an endoscopic ultrasound (EUS), which will demonstrate a hypoechoic mass in the submucosa or muscularis propria.



Treatment:

- Leiomyomas are slow-growing tumors with rare malignant potential that will **continue to grow and become progressively symptomatic with time**.
- Although observation is acceptable in patients with small (<2 cm) asymptomatic tumors or other significant comorbid conditions, in most patients, surgical resection is advocated.
- Surgical enucleation of the tumor remains the standard of care and is performed through a thoracotomy or with video or robotic assistance.
- The mortality rate is less than 2%, and success in relieving dysphagia approaches 100%.

CARCINOMA OF THE ESOPHAGUS

Squamous cell carcinoma

- Accounts for most esophageal cancers diagnosed.
- Arise from the squamous mucosa that is native to the esophagus and is found in **upper and middle third of esophagus** 70% of the time.
- **Smoking and alcohol** both increase the risk for f cancers by 5-fold. Combined.
- **Food additives:** nitrosamines (found in pickled), smoked foods and long-term ingestion of hot liquids.
- **Caustic ingestion, achalasia, bulimia, tylosis** (an inherited autosomal dominant trait), Plummer-Vinson syndrome, external-beam radiation, and **esophageal diverticula all have known associations with squamous cell cancer.**
- **Survival based on the stage of the Disease:**
 - 5 year survival
 - 70% with polypoid lesions.
 - 15% with advanced tumors.

Adenocarcinoma

- There are a number of factors that are responsible for this shift in cell type:
 - Increasing incidence of **GERD**.
 - **Western diet** → **obesity**
 - Increased use of acid-suppression medications.
- **Intake of caffeine, fats, acidic and spicy foods** → decreased tone in LES and → increase in reflux → increase risk of Barrett's metaplasia.

Symptoms:

Symptoms appear when 75% of esophagus is occluded by tumor.

- **Early-stage cancers may be asymptomatic** or mimic symptoms of GERD.
- Most patients with esophageal cancer present with progressive **dysphagia** and **weight loss**.
- Because of the distensibility of the esophagus, a mass can obstruct two thirds of the lumen before symptoms of dysphagia are noted.
- **Signs of advanced disease:**
 - **Ominous signs of advanced disease:** choking, coughing, aspiration from a tracheoesophageal fistula, and hoarseness (vocal cord paralysis from direct invasion into the recurrent laryngeal nerve)
 - **Systemic metastases:** to liver (jaundice), bone (Excessive pain) , and lung (respiratory symptoms).

Diagnosis:

- There is a plethora of modalities available to diagnose and stage esophageal cancer.
- Radiologic tests (**Barium swallow**), endoscopic procedures, and minimally invasive surgical techniques all add value to a solid staging workup in a patient with esophageal cancer.

Esophagram

- A barium esophagram is **recommended** for any patient presenting with dysphagia.
- **Differentiate:**
 - **Intra-luminal vs. intramural lesions**
 - **Intrinsic vs. extrinsic compression**
- The classic finding of an apple-core lesion in patients with esophageal cancer is recognized easily.



Endoscopy	Computed Tomography	Positron Emission Tomography	Endoscopic Ultrasound:
<p>Allow:</p> <ul style="list-style-type: none"> • Direct visualization • Determine the location of the tumor • Biopsies. 	<p>CT scan of the chest and abdomen and pelvis :</p> <ul style="list-style-type: none"> • assess the length of the tumor • thickness of the esophagus and stomach • regional lymph node status • distant disease to the liver and lungs <p>CT is for staging, to roll out metastasis</p>	<p>PET scan evaluates:</p> <ul style="list-style-type: none"> • The primary mass • Regional lymph nodes • Distant metastasis 	<ul style="list-style-type: none"> • EUS is the most critical component of esophageal cancer staging. <p>Determine:</p> <ul style="list-style-type: none"> • Invasion depth of the tumor • Lymph nodes involvement. <p>Used to know penetration</p>





Treatment:

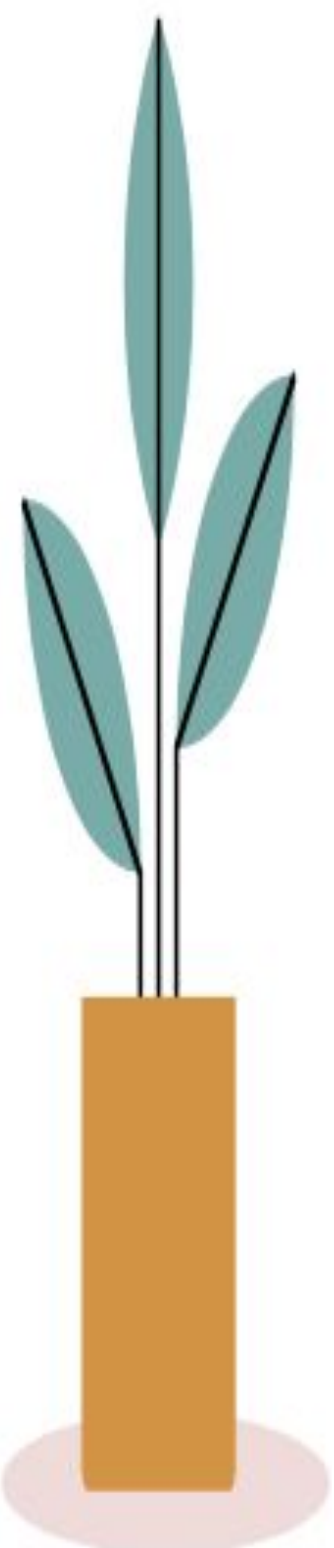
- Depend on the clinical stage.
- Usually combined multimodality therapy.
- Chemotherapy + radiotherapy +/- surgery



Extra

Hiatal Hernia

Types of hiatal hernias			
Type I (Important)	Type II	Type III	Type IV
Sliding Hiatal Hernia	Rolling (paraesophageal) Hernias (10%)		
Most common (90%)	No acid reflux	May be associated with GERD	
<p>1. Portion of the stomach cardia slides through the diaphragmatic hiatus.</p> <p>2. Gastroesophageal junction lay within chest cavity resulting in negative pressure in the chest.</p> <p>3. Pressure will keep LES opened → reflux of acid</p> <p>(Strong association with GERD) .</p>	<p>Localized defect in the phrenoesophageal membrane while the gastroesophageal junction remains fixed to the preaortic fascia and the median arcuate ligament. The gastric fundus then serves as the leading point of herniation.</p> <p>(may have dysphagia and/or chest pain because a part of the stomach is constricted).</p>	<p>Have elements of both types I and II hernias.</p> <p>Symptoms will include both of them.</p>	<p>Associated with a large defect in the phrenoesophageal membrane, allowing other organs, such as colon, spleen, pancreas and small intestine to enter the hernia sac.</p>
 <p>Type I</p>	 <p>Type II</p>	 <p>Type III</p>	 <p>Type IV</p>



Summary:

Disease	Clinical presentation	diagnosis	treatment	Complications	Other notes:
GERD	<p>Classic GERD: substernal burning or regurgitation.</p> <p>Atypical GERD: cough, dyspnea, change in voice, dry mouth.</p> <p>Complicated GERD: dysphagia, weight loss, odynophagia, bleeding</p>	<p>-Barium swallow</p> <ul style="list-style-type: none"> - Endoscopy - Ambulatory pH monitoring - Esophageal manometry 	<ul style="list-style-type: none"> -Lifestyle modification -Acid suppression therapy -Anti-reflux surgery: -Fundoplication (the only treatment for GERD with hiatal hernia) -Endoscopic GERD therapy 	Barrett's esophagus	-
Achalasia	The most common symptom is Dysphagia	<ul style="list-style-type: none"> - Barium swallow: dilated esophagus and birds beak appearance. - Confirmed by esophageal manometry. 	<p>The goal is symptom relief.</p> <ul style="list-style-type: none"> -medical therapy - botulinum toxin injection - pneumatic dilation - surgical myotomy : Laparoscopic Heller's myotomy with partial fundoplication. 	<p>Primary : progressive malnutrition and aspiration.</p> <p>Secondary: epiphrenic diverticula and esophageal squamous cell carcinoma.</p>	<p>Etiology can be:</p> <ul style="list-style-type: none"> - primary (autoimmune, viral, genetics) - secondary : Chaga's disease caused by Trypanosoma Cruzi - pseudoachalasia : cancer
Esophageal diverticula	<ul style="list-style-type: none"> - Regurgitation of foul-smelling (Halitosis) , undigested materials. 	Barium Esophagram	Surgical or endoscopic repair.	<ul style="list-style-type: none"> - Aspiration pneumonia - Lung abscess 	<ul style="list-style-type: none"> - True diverticula : involves all layers - False diverticula: mucosa and submucosa only
Barrett's esophagus	Asymptomatic or Symptoms of GERD	Endoscopy and Pathology	<ul style="list-style-type: none"> - Yearly Surveillance endoscopy. - Esophageal resection for Barrett's esophagus with high grade dysplasia. 	esophageal adenocarcinoma	-
Leiomyoma	Asymptomatic or Dysphagia and pain.	<ul style="list-style-type: none"> - Barium esophagram - Endoscopic ultrasound: hypoechoic mass 	Surgical enucleation of the tumor	-	-
Malignant Esophageal Tumors	Most patients present with dysphagia and weight loss.	<ul style="list-style-type: none"> - Barium esophagram: apple-core lesion - Endoscopy - CT - Positron Emission Tomography - Endoscopic Ultrasound (most critical component of esophageal cancer staging) 	<p>Treatment is based on TNM stage.</p> <p>Any N: chemoradiation, then restage.</p> <p>T1N0: surgery</p> <p>T2N0: chemoradiation</p> <p>T3, T4 ... : chemoradiation</p>	-	<p>REMEMBER!</p> <p>GERD -> Barrett's esophagus -> Adenocarcinoma</p> <p>Achalasia -> squamous cell carcinoma</p> <p>Survival is based on the stage.</p>

Questions:

1- "Bird's beak" appearance on a barium swallow is indicative of which of the following conditions?

- A- GERD
- B- Esophageal diverticulum
- C- Achalasia
- D- Barrett's esophagus

2- A 35 year old male recently travelled to south america and developed sudden onset fever , fatigue, and enlarged lymph nodes. Blood smear showed the presence of *Trypanosoma cruzi*. Which of the following chronic complications is likely to develop in this patient?

- A- Zenker's diverticulum
- B- Barrett's esophagus
- C- Achalasia
- D- esophageal adenocarcinoma

3- Which of the following is the best method to diagnose Zenker's diverticulum?

- A- esophageal manometry
- B- endoscopy
- C- barium esophagram
- D- chest X-ray

4- a patient complaining of chronic substernal burning and regurgitation underwent endoscopy that revealed columnar type mucosa in the distal esophagus and specialized intestinal metaplasia on histology with low- grade dysplasia. What is the proper management of this patient?

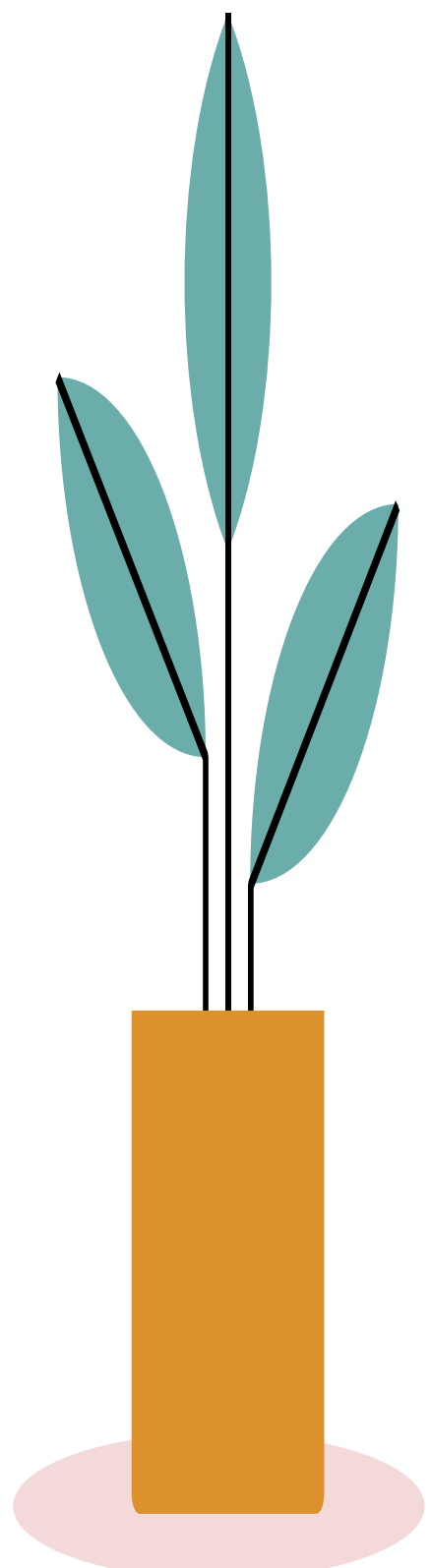
- A- surveillance with endoscopy every 3 years
- B- repeat endoscopy in 6 months to confirm then surveillance with endoscopy every 3 years
- C- repeat endoscopy in 6 months to confirm then surveillance with endoscopy every 12 months
- D- immediate esophageal resection

5- which of the following is a complication of Achalasia?

- A- esophageal adenocarcinoma
- B- Barrett's esophagus
- C- Zenker's diverticulum
- D- esophageal squamous cell carcinoma

6- which of the following modalities is the most critical component of esophageal cancer staging?

- A- Endoscopic ultrasound
- B- Computed Tomography
- C- Positron Emission Tomography
- D- Esophagram



7- A 45 year old man complaining of dysphagia and weight loss. His barium esophagram revealed obstruction and "apple-core" sign. What is the likely diagnosis of this patient?

- A- Esophageal adenocarcinoma
- B- Achalasia
- C- esophageal polyp
- D- traction diverticulum

8- a 35 years old male with GERD associated with a large type I hiatal hernia ,ulcers and bleeding . What is the best management for this patient?

- A- lifestyle modification and Acid suppression therapy
- B- Stretta procedure
- C- Fundoplication
- D- Laparoscopic Heller's myotomy

9- Halitosis is most commonly associated with which of the following esophageal conditions?

- A- GERD
- B- achalasia
- C- pharyngoesophageal diverticulum
- D- esophageal polyps

10- which of the following management options for achalasia has the highest success rate?

- A- Botulinum toxin injections
- B- pharmacological therapy with smooth muscle relaxants
- C- pneumatic dilation
- D- Laparoscopic Heller's myotomy with partial fundoplication

Answers:

1-C

2-C

3-C

4-C

5-D

6-A

7-A

8-C

9-C

10-D