# DYSPHAGIA

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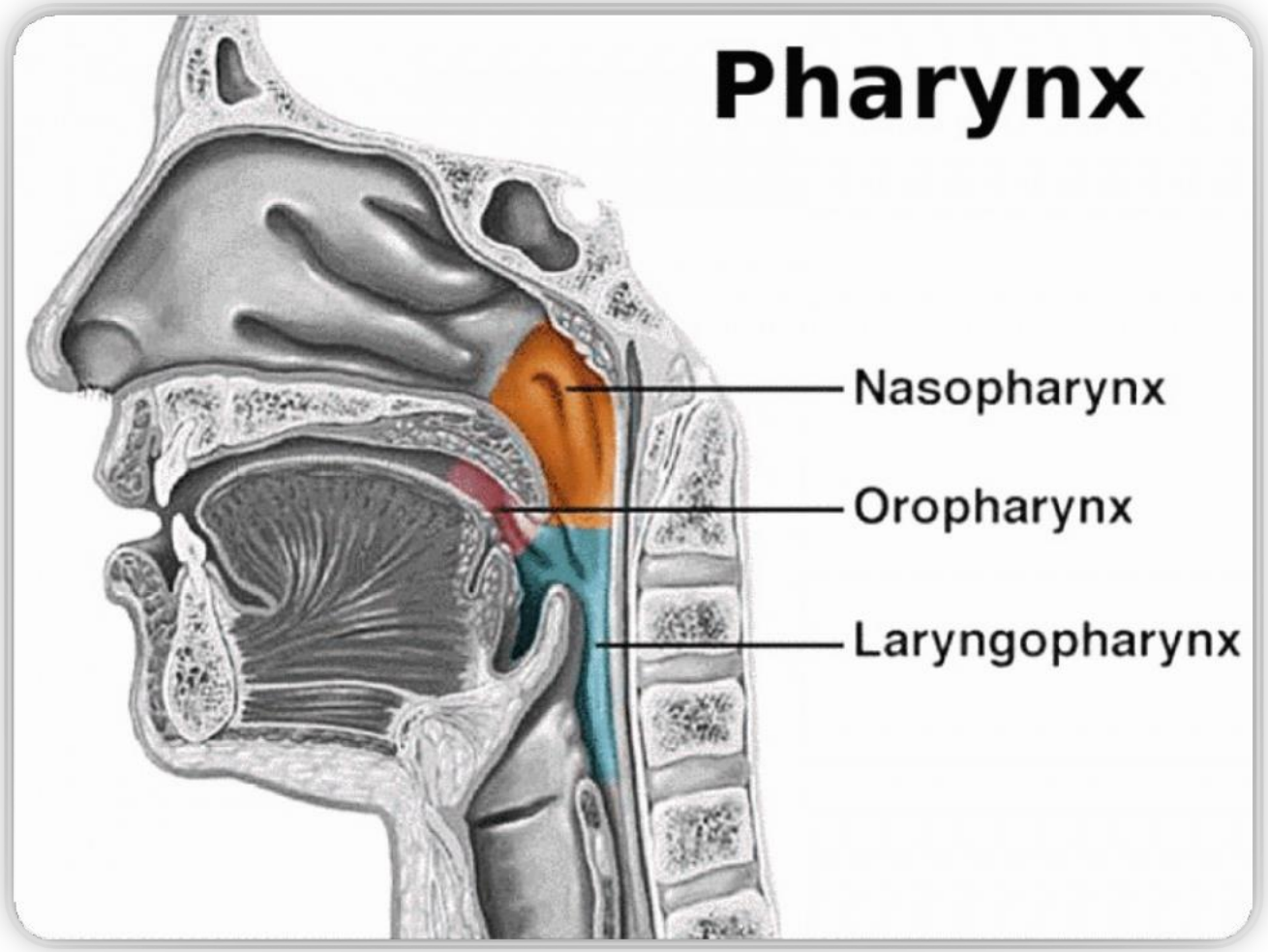
# pharynx

The pharynx, more commonly known as the **(throat)**, is a 12-14 cm, or 5 inch, long tube

behind the nasal and oral cavities until the voice box (larynx) and the esophagus.



# Muscles of the pharynx:

-Layers of the pharynx:

1 Buccopharyngeal fascia
2-Muscle coat (6 muscles)
3-Pharyngeobasilar fascia
4- Mucosa

-3 outer circular (constrictor) muscles:

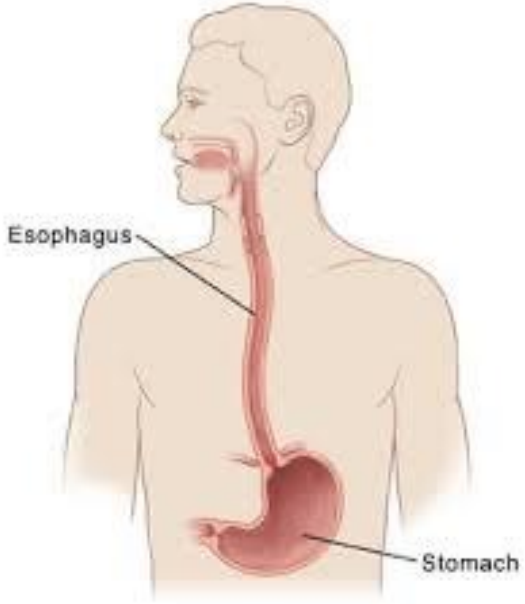
1 Superior constrictormuscle
2 Middle constrictor muscle
3 Inferior constrictor muscle

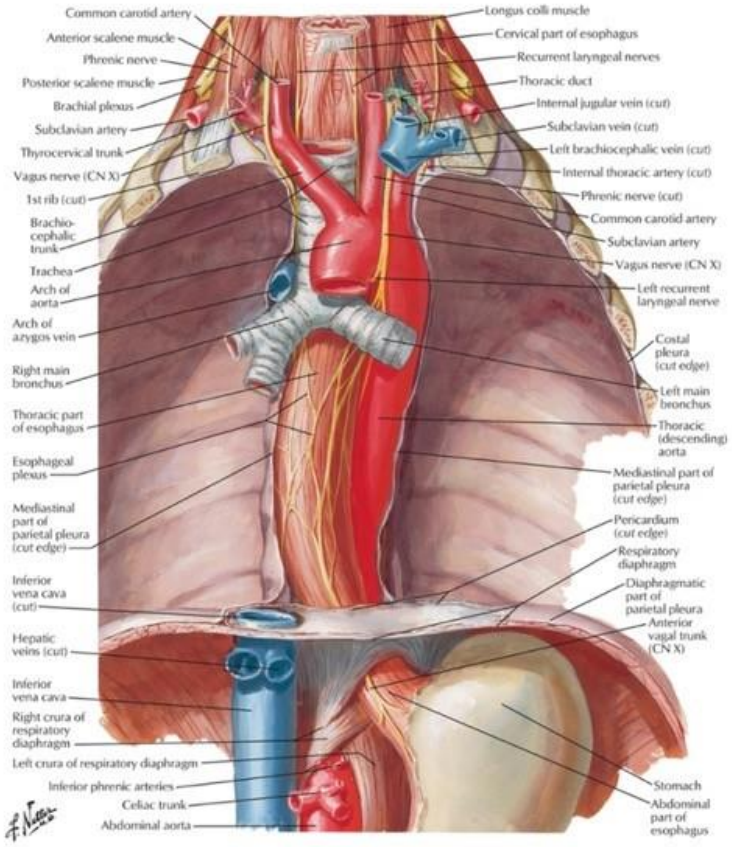
-3 inner longitudinal muscles:

- Stylopharyngeus muscle
- Salpingopharyngeus muscle
- Palatopharyngeus muscle

# ESOPHAGUS

The esophagus (oesophagus) is a 25 cm long fibromuscular tube extending from the pharynx (C6 level) to the stomach (T11 level). It consists of muscles that run both longitudinally and circularly, entering into the abdominal cavity via the right crus of the diaphragm at the level of the tenth thoracic vertebrae(T10). It actively facilitates the passage of the food bolus into the stomach under precise nervous regulation. Therefore, it is part of the digestive system.



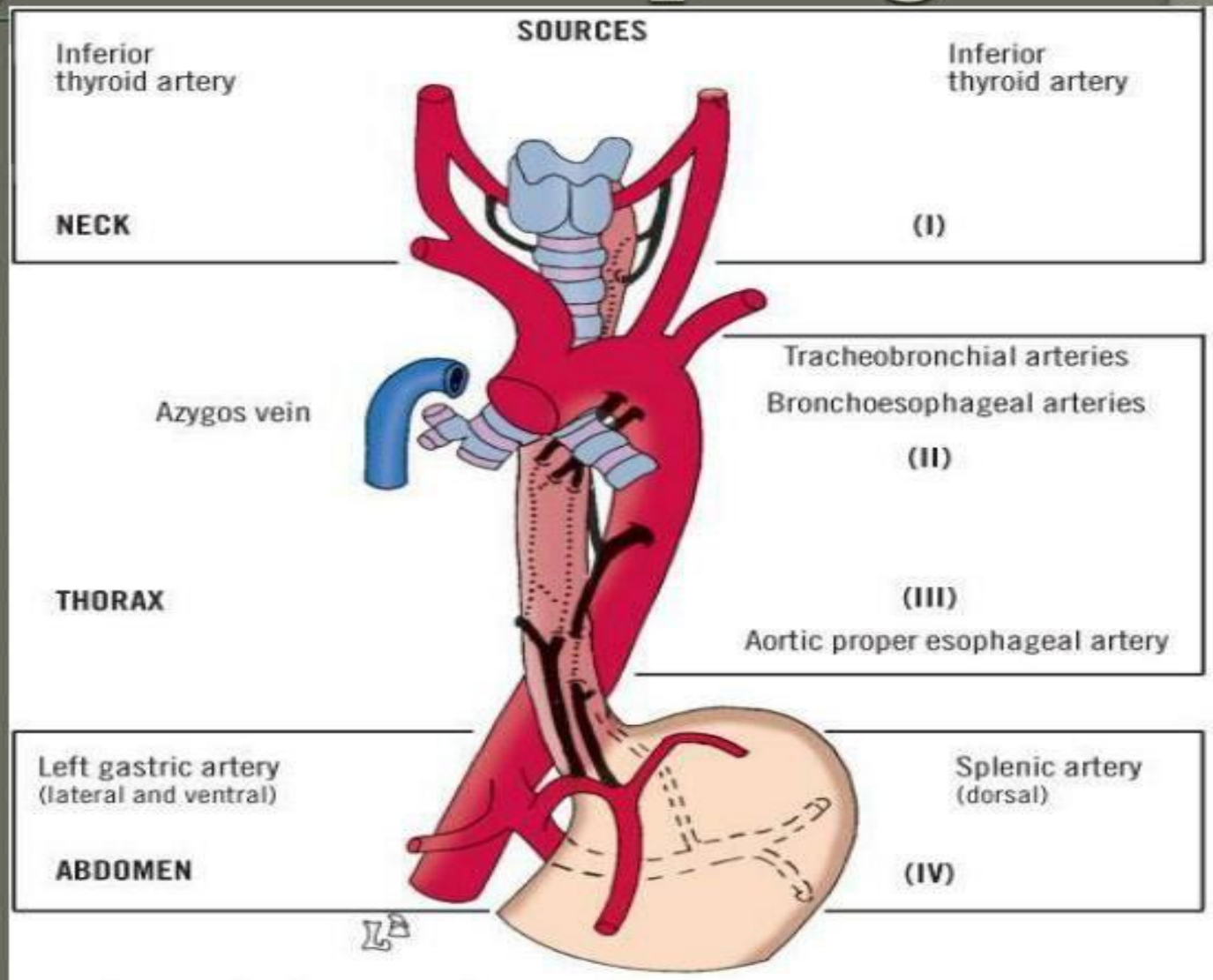
# Anatomy:

Three normal areas of esophageal narrowing are evident on the barium esophagogram or during esophagoscopy:

- The uppermost narrowing is located at the entrance into the esophagus and is caused by the cricopharyngeal muscle
- The by the middle narrowing is due to an indentation of the anterior and left lateral esophageal wall caused crossing of the left main stem bronchus and aortic arch.
- The lowermost narrowing is at the hiatus of the diaphragm and is caused by the gastroesophageal sphincter mechanism

# Blood Supply of the Esophagus

- The upper third of the esophagus is supplied by the inferior thyroid artery,
- the middle third by branches from the descending thoracic aorta,
- and the lower third by branches from the left gastric artery
- The veins from the upper third drain into the inferior thyroid veins, from the middle third into the azygos veins, and from the lower third into the left gastric vein, a tributary of the portal vein.



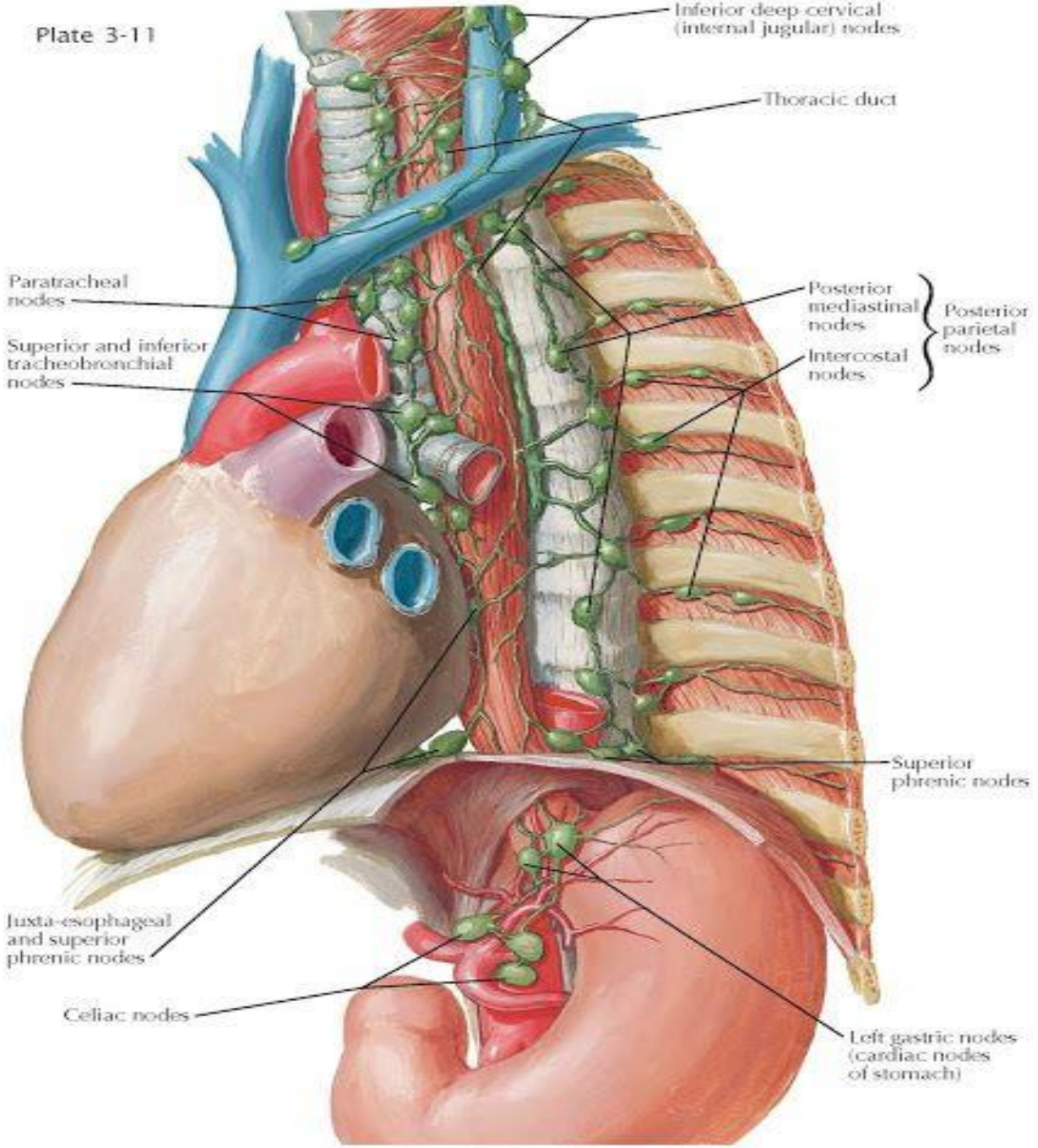
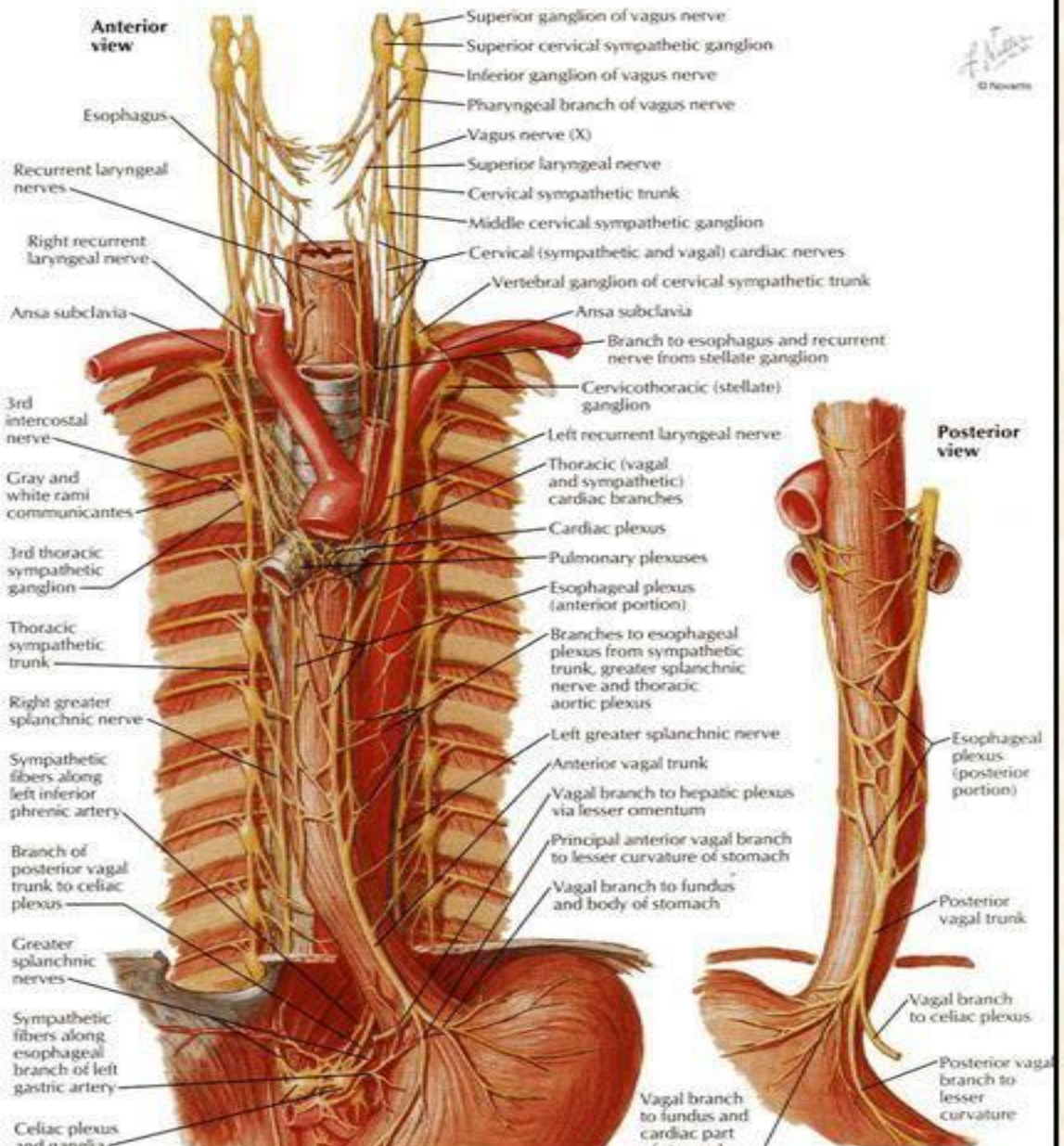


Plate 3-11
Inferior deep cervical (internal jugular) nodes
Thoracic duct
Paratracheal nodes
Superior and inferior tracheobronchial nodes
Posterior mediastinal nodes
Intercostal nodes
Posterior parietal nodes
Superior phrenic nodes
Juxta-esophageal and superior phrenic nodes
Celiac nodes
Left gastric nodes (cardiac nodes of stomach)

# NERVE SUPPLY




- It is supplied by sympathetic fibers from the sympathetic trunks.
- The parasympathetic supply comes form the vagus nerves.
- Inferior to the roots of the lungs, the vagus nerves join the sympathetic nerves to form the esophageal plexus.
- The left vagus lies anterior to the esophagus.
- The right vagus lies posterior to it.

# Swallowing

**Swallowing**, or deglutition, is a complex reflex mechanism by which **food is pushed from the oral cavity into the esophagus and then pushed to the stomach.**

# Swallowing phases

Oral phase: food moistens with saliva and chewed forming bolus , tongue push the food backward to the pharynx.

Pharyngeal phase: food bolus stimulate involuntary neuromuscular swallow reflex which leads to closure of the oral cavity and the nasopharynx by the tongue and soft palate respectively , **epiglottis closes trachea preventing food from entering the lungs.**

Esophageal phase: food bolus propelled down the esophagus by peristalsis to reach stomach.

**Dysphagia**: sensation of difficulty or abnormality of swallowing or transferring food from the mouth to the stomach.

**Odynophagia**: pain during swallowing

# Types of dysphagia

## Oropharyngeal dysphagia.

•**Oropharyngeal dysphagia** ("high" dysphagia) occurs when a person has difficulty in starting the swallowing process or moving food or liquid from the mouth to the throat. This is typically caused by a neurological problem that has weakened the nerves and muscles.

## Esophageal dysphagia.

•**Esophageal dysphagia** ("low" dysphagia) occurs when food or liquid stops in the esophagus, usually because of a blockage or irritation.

Many conditions can produce both oropharyngeal and esophageal dysphagia.

# Oropharyngeal dysphagia

## A . Neuromuscular disorders :

- **CVA (cerebral vascular accedant) :** interruption in the flow of blood to cells in the brain (stroke)
- **MI**
- **Myasthenia gravis :**which is a chronic autoimmune, neuromuscular disease that causes weakness in the skeletal muscles

**Poliomyelitis :** life-threatening disease caused by the poliovirus

**Primary myositis :** is a rare group of diseases characterized by inflamed muscles

**Oculopharengeal muscular dystrophy :** a rare genetic condition that causes weakness in the muscles around the upper eyelid and throat, which leads to palpebral ptosis and oropharyngeal dysphagia

## B. Mechanical or obstructive lesions :

- **Inflammatory(pharyngitis , abscess)**
- **Neoplastic** The most common neoplasms that cause oropharyngeal dysphagia are the ones located in the upper part of the gastrointestinal system, such as the esophagus and stomach
- **Plummer-vinson syndrome** classic triad of dysphagia, iron-deficiency anemia and esophageal webs. Even though the syndrome is very rare nowadays, its recognition is important because it identifies a group of patients at increased risk of squamous cell carcinoma of the pharynx and the esophagus
- **Extrinsic compression (goiter , cervical osteophytes)**
- **Disorder of upper esophageal sphincter.**

# Esophageal dysphagia

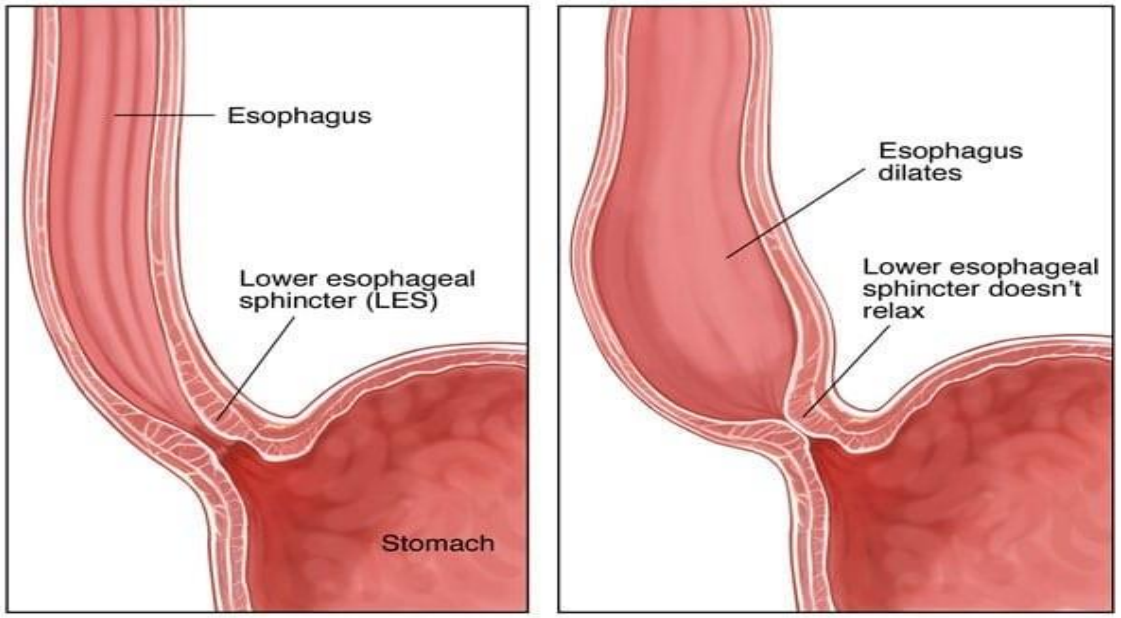
## A. Neuromuscular disorders :

- **Achalasia:** an esophageal smooth muscle motility disorder that occurs due to a failure of relaxation of the lower esophageal sphincter, the esophagus also has a marked absence of peristalsis, which will result in dilatation of distal esophagus
- **Diffuse esophageal spasm :** characterized by, simultaneous, uncoordinated or rapidly propagated contractions accompanied by dysphagia
- **Nutcracker esophagus:** esophagus with high-amplitude peristaltic contractions and is the most common of all esophageal hypermotility disorders.
- **Hypertensive lower esophageal sphincter**
- **Scleroderma:** Autoimmune disease that causes scar tissue to form in the esophagus. which prevents the muscles from squeezing to move food towards the stomach

## B. Mechanical or obstructive :

- **Disorders of wall (esophageal stricture , diverticula)**
- **External compression(hiatus hernia , mediastinal growth)**
- **Luminal obstruction (foreign bodies , esophageal webs, carcinoma esophagus , schatzki rings )**

**Schatzki's ring :** is a circular ring in the distal esophagus, The core of the ring consists of variable amounts of fibrous tissue and cellular infiltrate, It is often associated with a hiatal hernia, Oftentimes individuals with a Schatzki ring will be asymptomatic, or without symptoms, particularly if their Schatzki ring is larger than 25 millimeters in diameter. In contrast, if their Schatzki ring is under 13 millimeters in diameter. individuals will almost certainly experience symptoms, like dysphagia.




Esophageal Achalasia

**Hiatus Hernia :** It is a condition that occurs when the lower part of the esophagus and the cardia of the stomach or other organs move up in the chest through the hiatus of the diaphragm.

# Approach:

- HISTORY
- EXAMINATION
- INVESTIGATION

# HISTORY

* Age of patient:

- Children: foreign body or congenital malformations.
- Middle aged patient: reflux esophagitis , hiatus hernia , anemia or achalasia.
- Elderly patient : malignancy , strictures, motility disorders ass. With aging and neurological disorders.

# HISTORY:

*Difficulty in initiating swallow → Oropharyngeal dysphagia

*Food stuck after swallow in chest → Esophageal dysphagia

(-we need to know the level where the food is felt to stick in this case )

*Dysphagia related to solid food → Obstructive

*Solid and liquid → neuromuscular

## Onset:

Progressive dysphagia → Neuromuscular , carcinoma

Sudden dysphagia → Foreign body , esophagitis

Intermittent dysphagia → Rings and webs , diffuse esophageal spasm

## Ass. Symptoms:

aspiration,drooling or nasopharyngeal regurgitation → Oropharyngeal dysphagia

Weight loss: In elder patient → Carcinoma

Coughing or choking with swallowing → Neuromuscular cause

# HISTORY:

| | | |
|---|---|---|
| Pain after swallowing | → | Esophagitis |
| Regurgitation of old food with halitosis | → | Zenker's diverticulum |
| History of heartburn, hoarseness of voice and regurgitation of food | → | GERD |

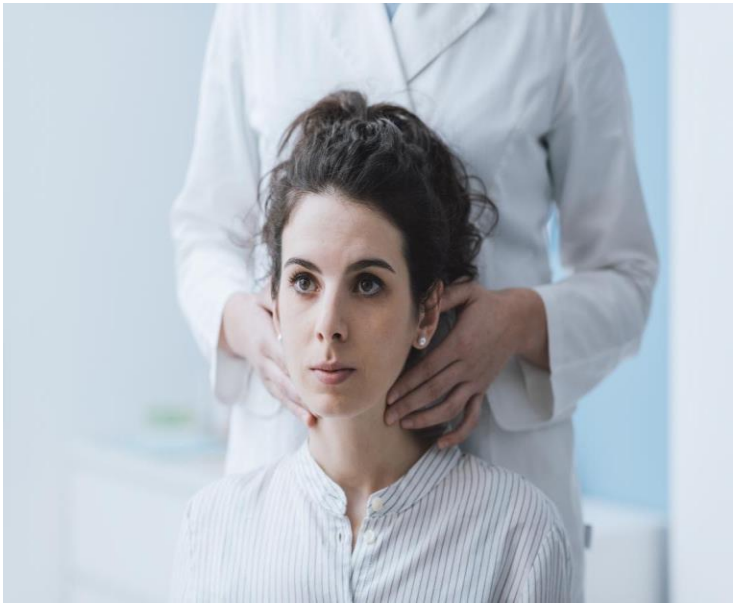
- **Surgical hx :** history of endoscopic treatment or esophageal surgery
- **medical hx :** GERD, Barrett esophagus, hiatal hernia
- **Drug hx :** including alendronate, tetracycline or other antibiotics, NSAIDs

**Zenkers diverticulum :** A type of diverticulum that develops in the hypopharynx, typically between the cricopharyngeus (CP) muscle and the inferior pharyngeal constrictor muscle. It only involves the mucosa and submucosal layers and does not involve the muscular layer, hence making it a false diverticulum .

# Physical Examination:

- General inspection:
- Cranial nerve examination
- Neurological examination
- Oral cavity examination

# Physical Examination:

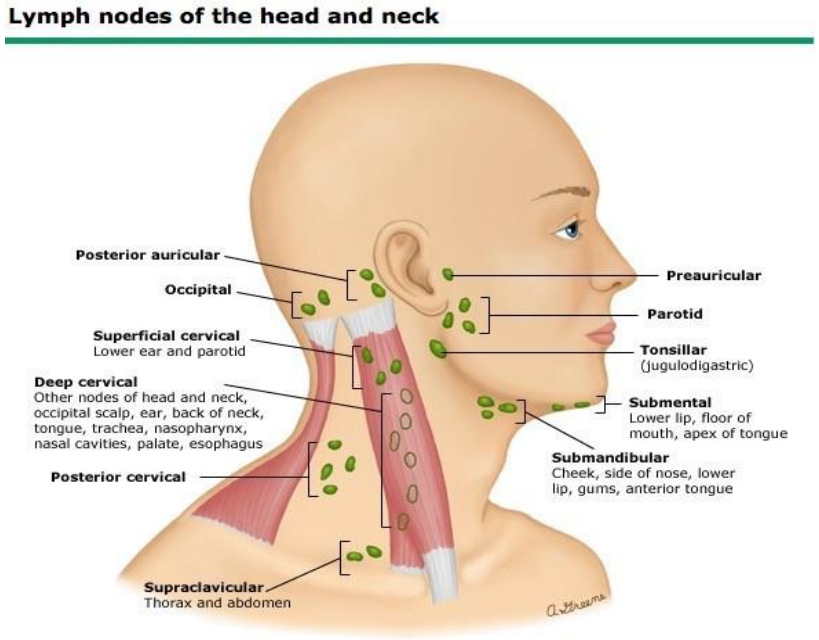


## Neck examination:

I. Lymph node enlargement

II. Neck mases

III. Thyroid enlargement



## ❑ Radiographic studies:

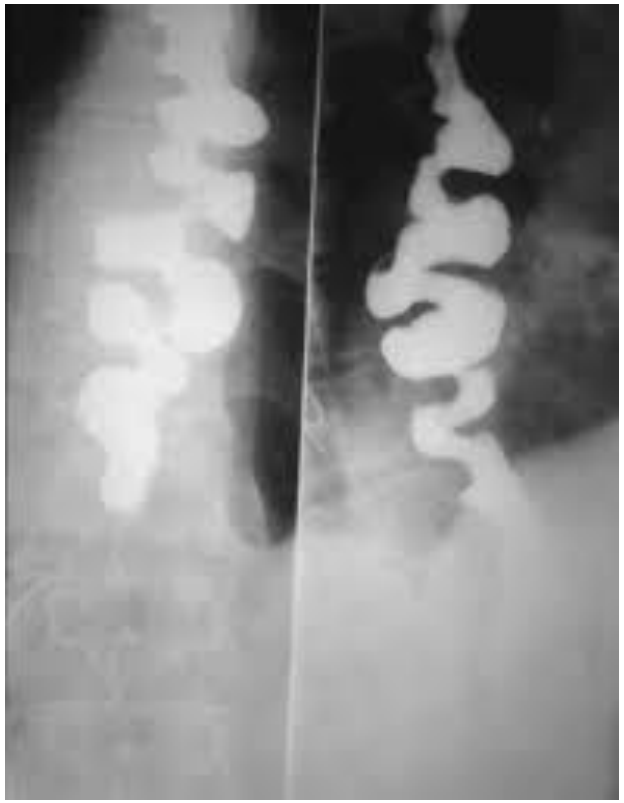
- Plain X-ray
- Barium esophagus
- Modified barium swallow(gold standard)
- MRI
- CT

## ❑ Lab tests:

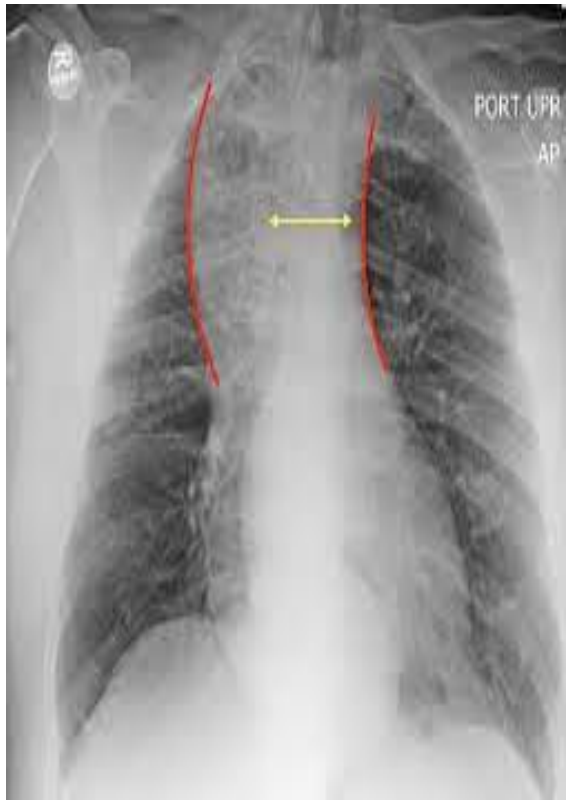
.LFT, KFT, CBC, Thyroid function.

## ❑ **fluoroscopy**:

nutcracker



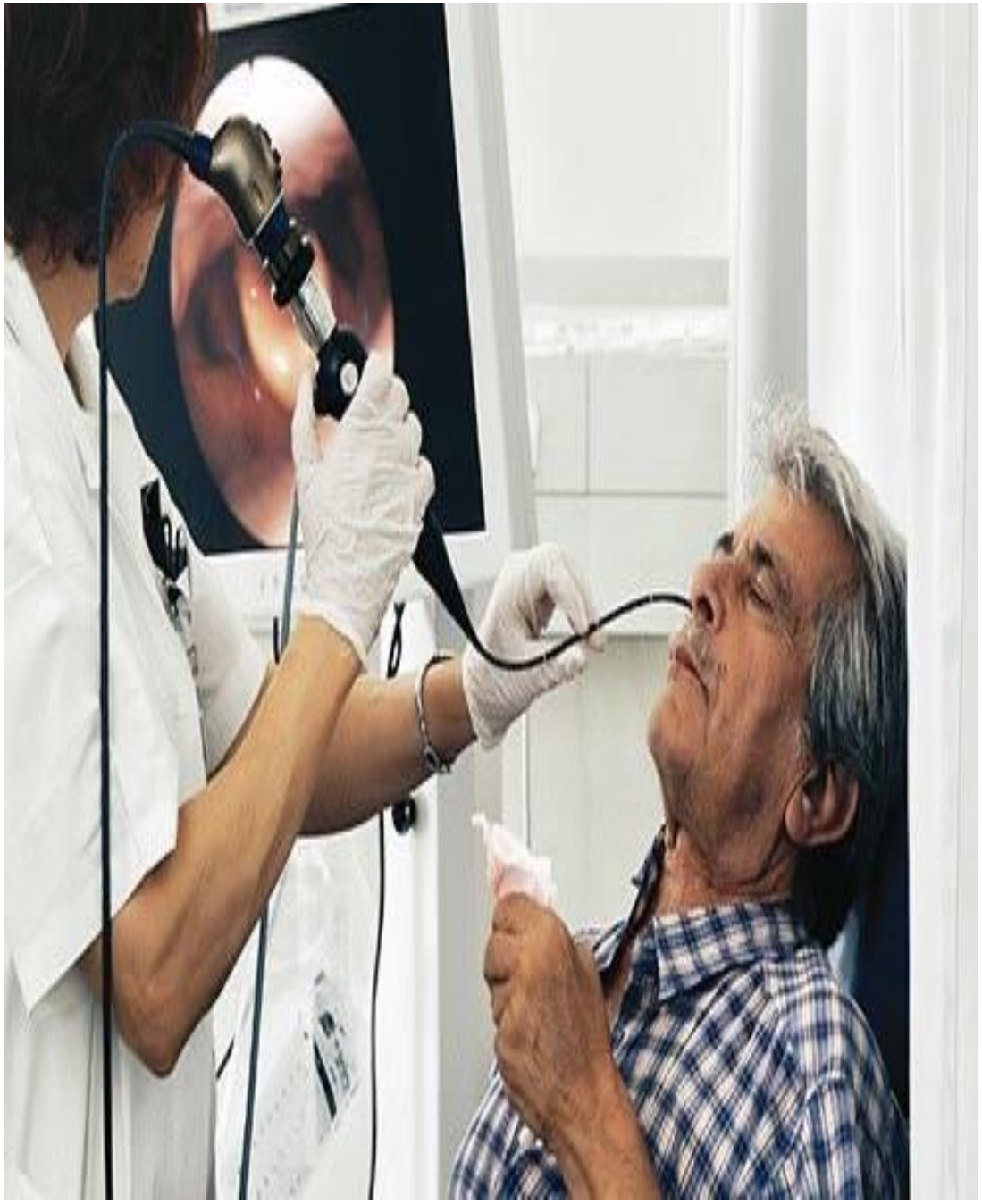
achalasia



# Endoscopy:

- Rigid
- flexible

1. Diagnostic:
   - Visual
   - Biopsy
2. Therapeutic:
   - Foreign body dissipation.
   - Stenting
   - dilatation



# ❑ Manometry:

❖ Indications:

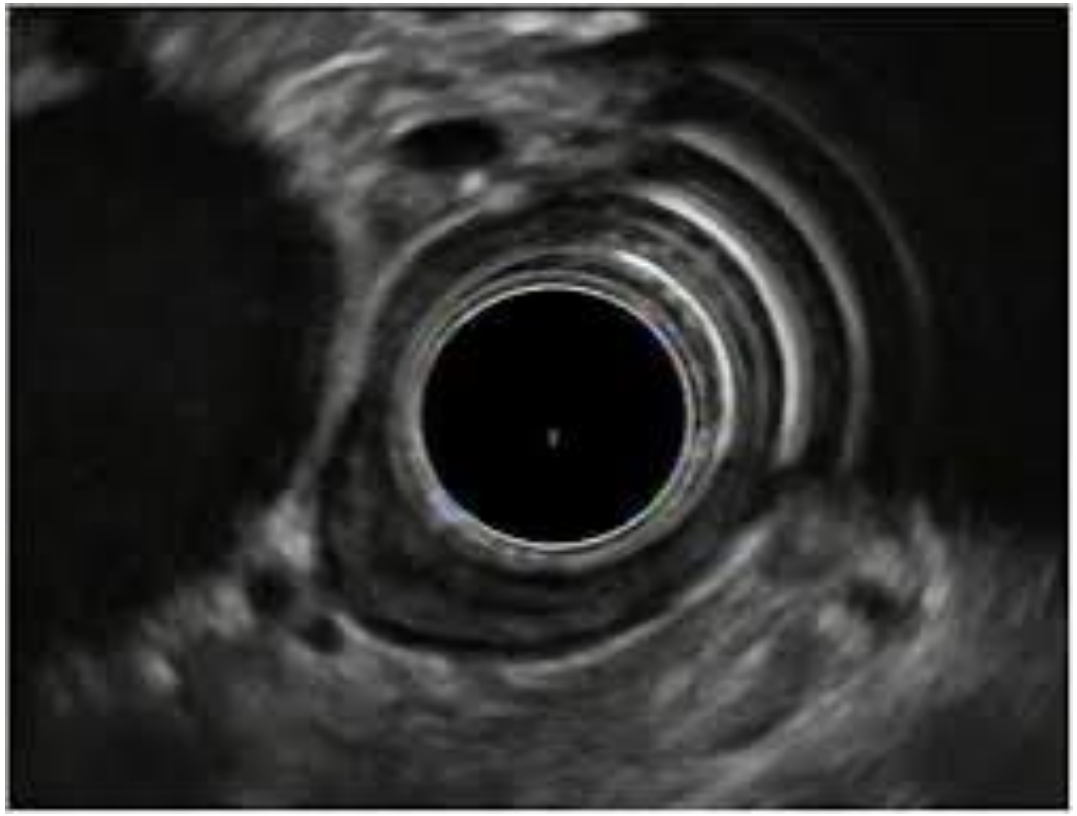
❑ Achalasia of the cardia

❑ diffuse esophageal spasm

❑ Hypertensive esophageal sphincter

## ❑ Endoscopic ultrasound:

- ✓ Used for dysphagia due to carcinoma
- ✓ Biopsy can also be taken



# Achalasia

Achalasia is a rare swallowing disorder that affects the esophagus (the tube between the throat and the stomach). In people with achalasia, the esophagus muscles do not contract properly and do not help propel food down toward the stomach. At the same time, the ring of muscle at the bottom end of the esophagus, called the lower esophageal sphincter (LES), is unable to relax to let the food into the stomach

Symptoms:

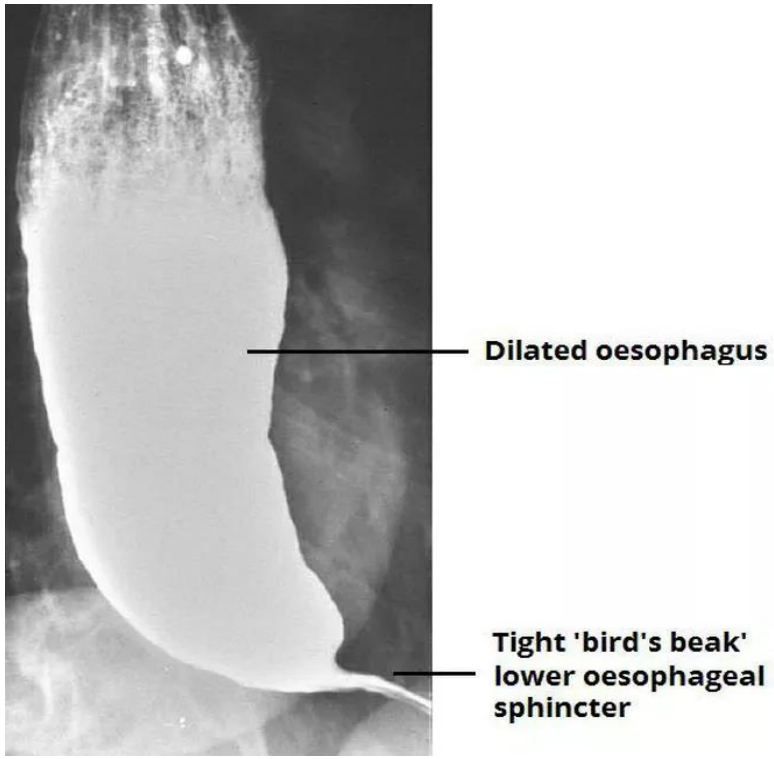
- Dysphagia can be progressive from solids to solids and liquids
- **Regurgitation**
- Heartburn
- Weight loss
- **Pulmonary issues, recurrent aspirations**

## Investigations :

- **Barium swallow (bird's beak), shows narrowed LES and dilated esophagus above the narrowed region**
- **Upper GI endoscopy, rules out other diagnoses**
- **Manometry: assesses the contraction of the LES**

## Management

- **Food eating changes increased amount of chewing)**
- **Medications such as calcium channel blockers**
- **Botox injection during endoscopy**
- **Esophageal dilation ( pneumatic balloon )**
- **Surgery; heller myotomy**



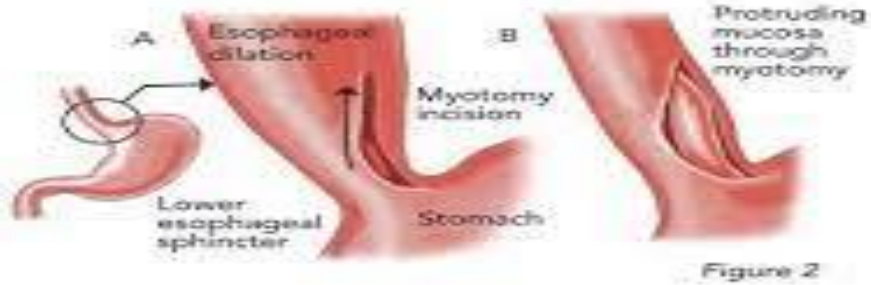
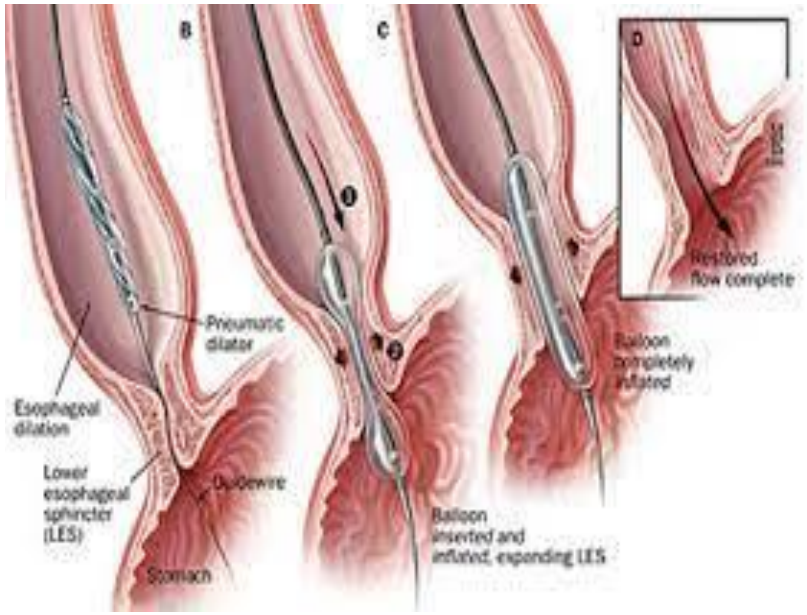
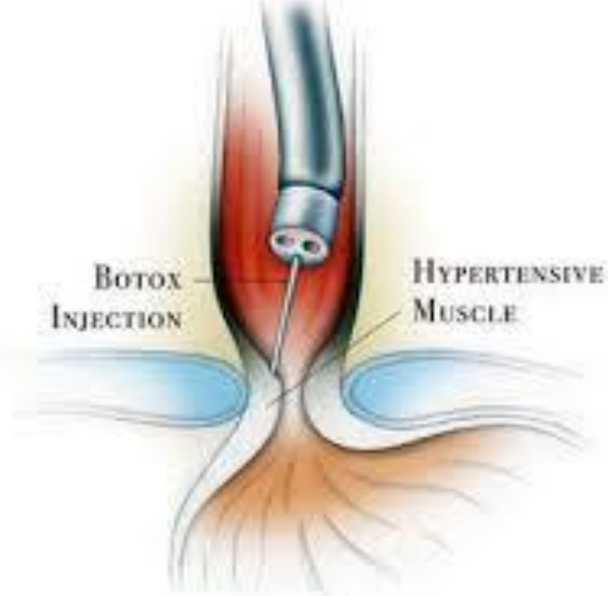



Figure 2

Figure 3



# Diffuse Esophageal Spasm

Esophageal spasms are abnormal muscle contractions in the esophagus (the tube that connects your throat to your stomach). These spasms make it harder for food to reach your stomach. They can be painful

**Symptoms**: DES can cause a range of symptoms, which may include:

•Chest pain or discomfort, often resembling angina (heart-related chest pain).

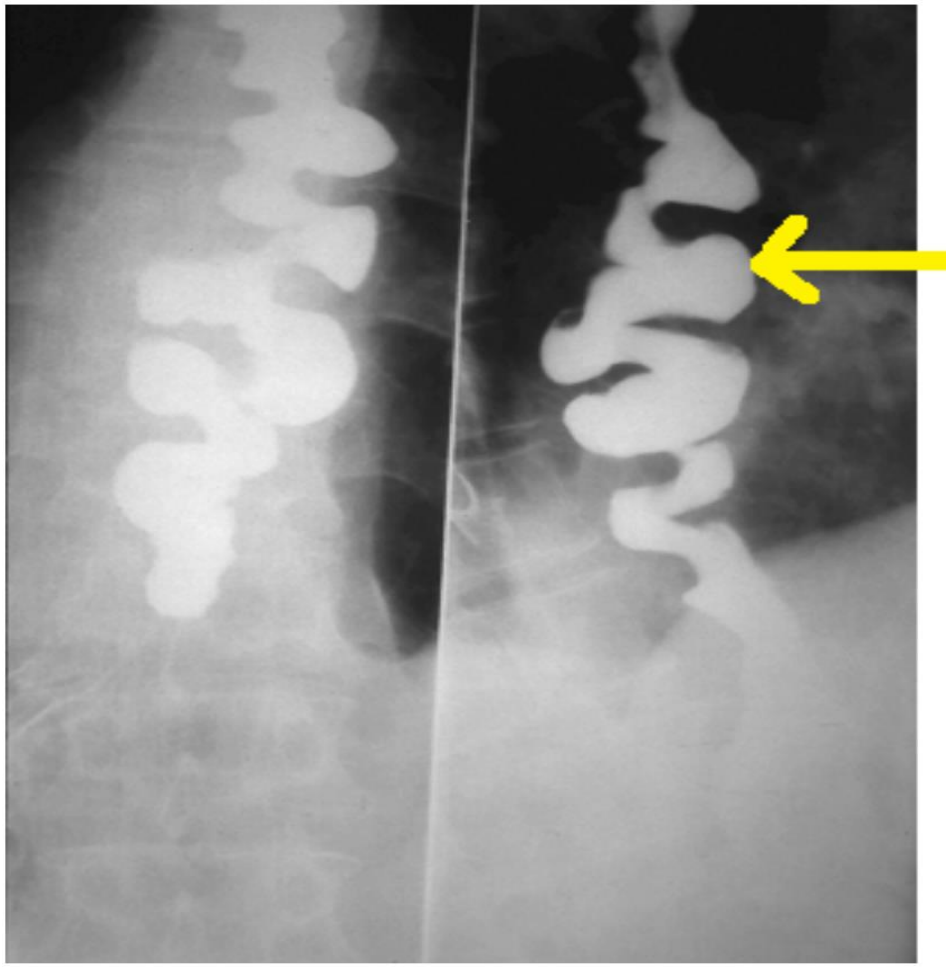
•Difficulty swallowing (dysphagia) or the sensation of food getting stuck in the throat.

•Regurgitation of food or liquids.

•Heartburn or acid reflux (though this is less common in DES compared to gastroesophageal reflux disease, or GERD)

**1.Diagnosis**: Diagnosing DES typically involves a combination of tests, which may include:

1. **Barium swallow**
2. **Esophageal manometry**
3. **Endoscopy**



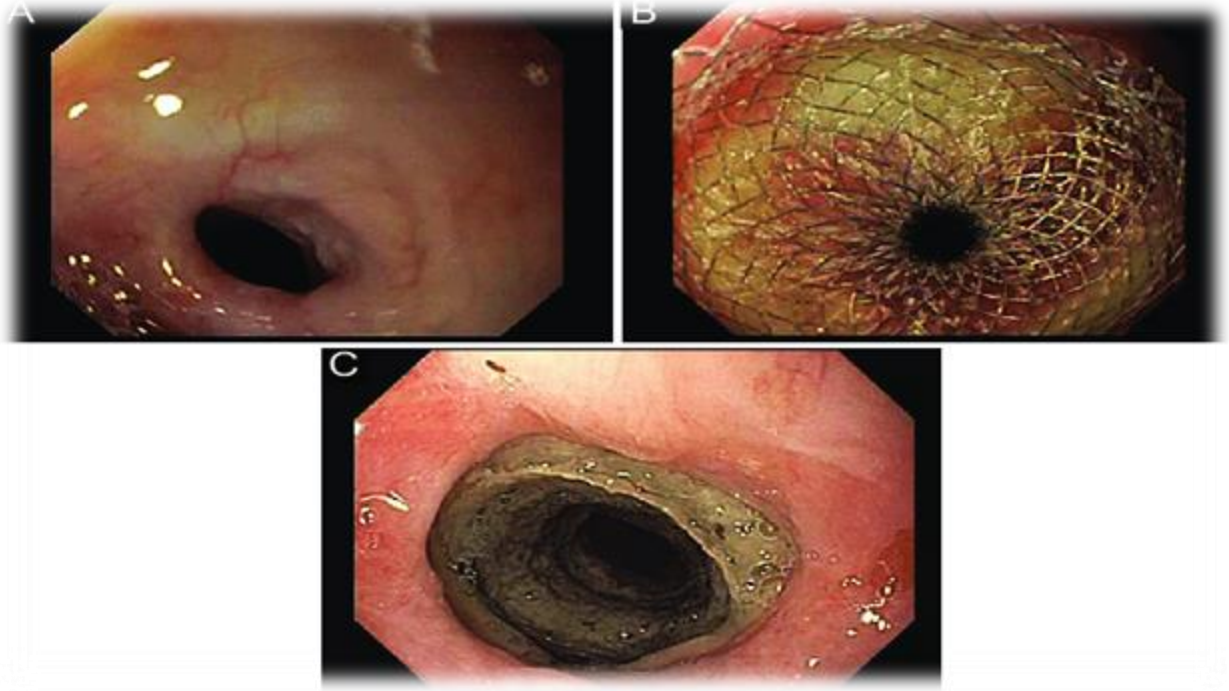
**1.Management :**

- there is no completely effective therapy, treatment failure rates are high
- Medications such as **nitrates**
- Esophagomyotomy is usually not performed

# Benign esophageal stricture:

**Definition**: narrowing of the esophagus, occurs when stomach acid and other irritants
damage the lining of the esophagus, over time this leads to inflammation (esophagitis) and
scar tissue which causes the esophagus to narrow.

**Causes :** * GERD, also known as acid reflux (the most common cause)
* Radiation damage
* Corrosive exposure




**Symptoms** :
- Dysphagia
- Regurgitation
- Heartburn

**Investigations** :
• Barium swallow
• Upper GI endoscopy
• Esophageal pH monitoring

**Management**:
• Diet of liquids or soft food
• Mechanical dilation of the esophagus (esophageal bougienage)
• PPIs such as : omeprazole or antacids
• Surgical; esophageal stent placement (can help in keeping a blocked esophagus open so the patient can swallow food and liquids

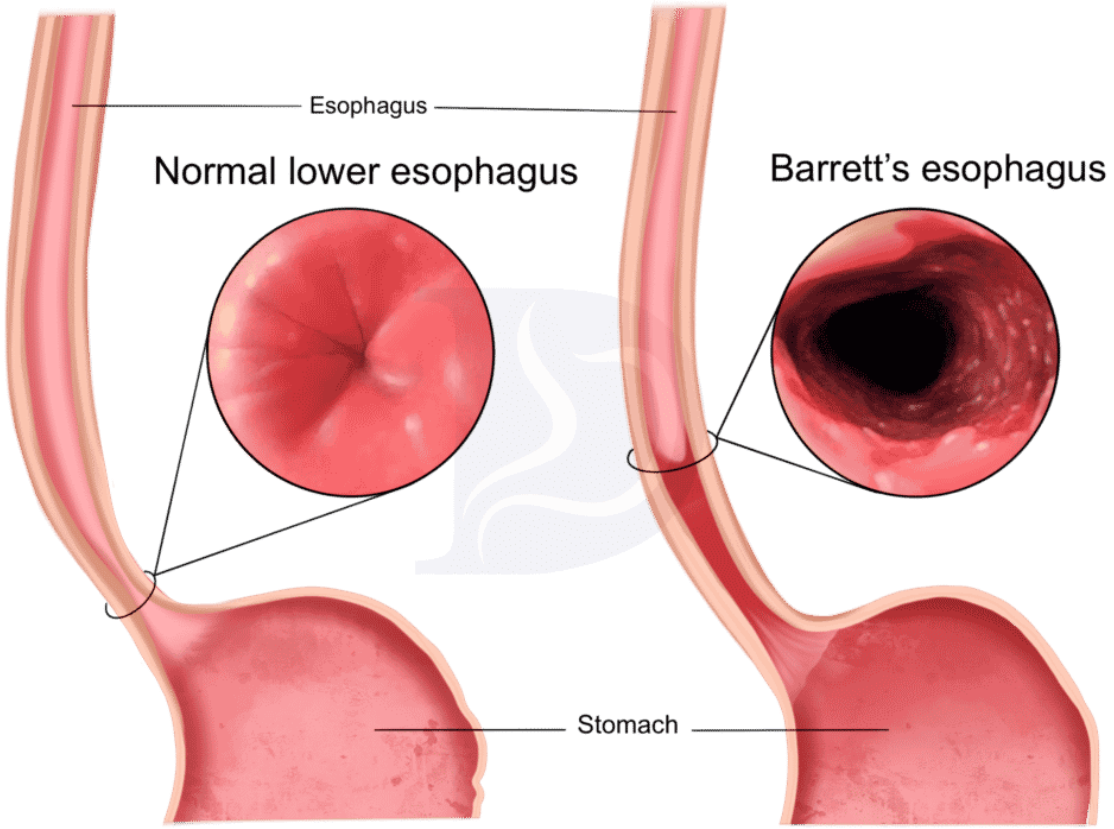
# Esophageal cancer

**Pathology**

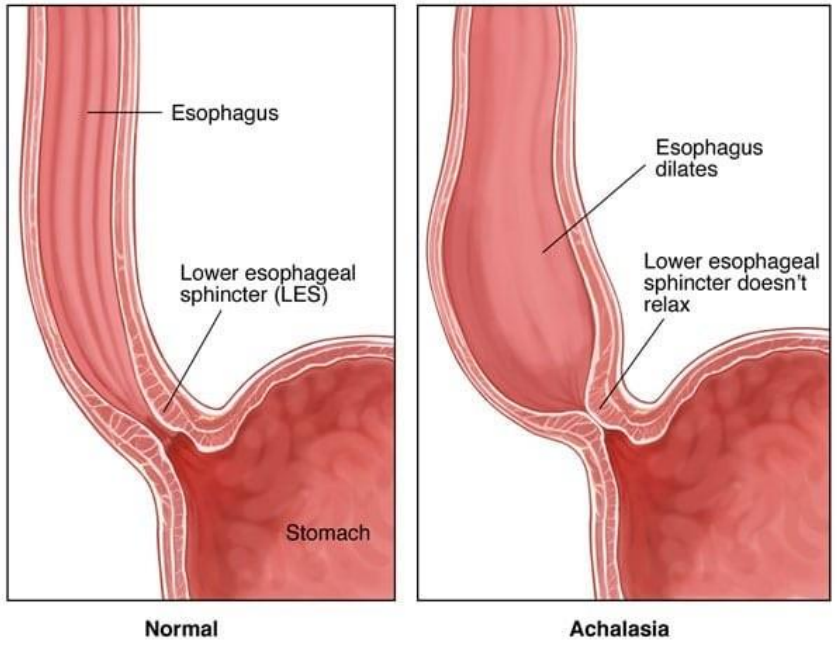
- **Age:old age >50 years**
- **Sex:males >females**
- **Predisposing factors:**
- **1. Barrets esophagus (most important)**
- **2.achalasia**
- **3.long standing reflux esophagitis.**

**4. Corrosive Stricture of the esophagus**
**5. Plummer Vinson syndrome**
**6. Spicy food,smoking, alcohol.**

# Barret`s Esophagus

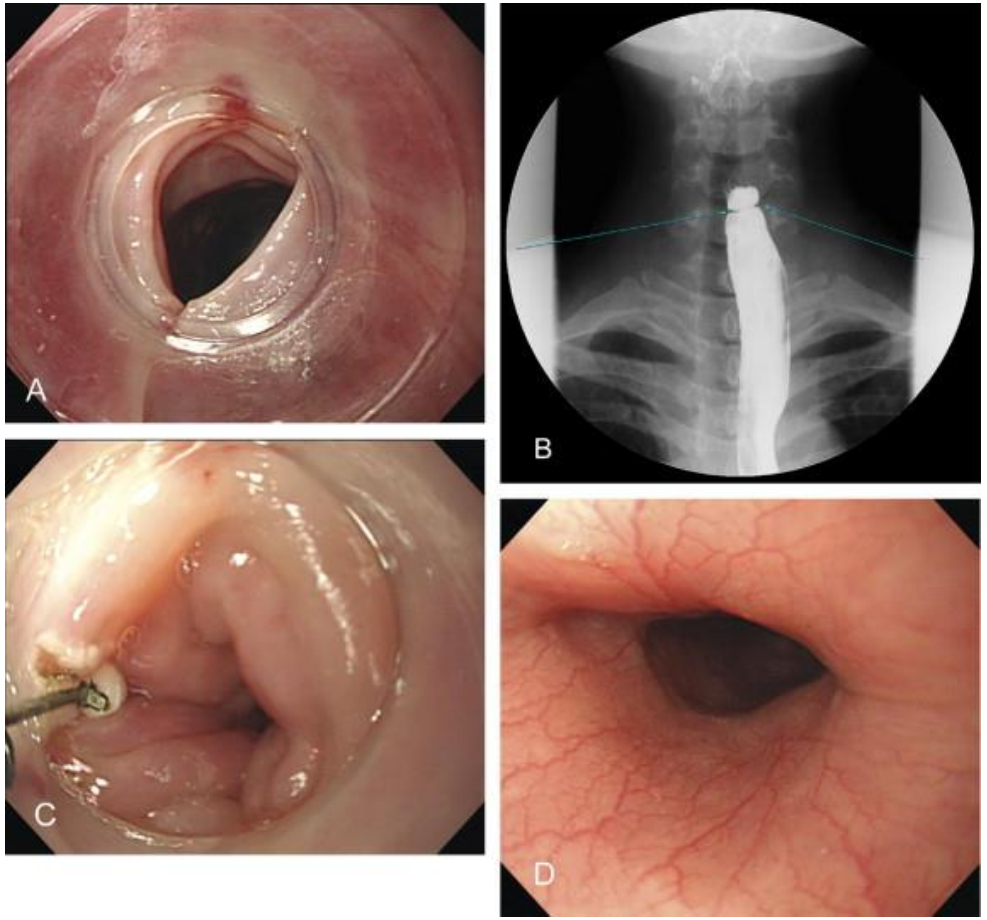



# Achalasia

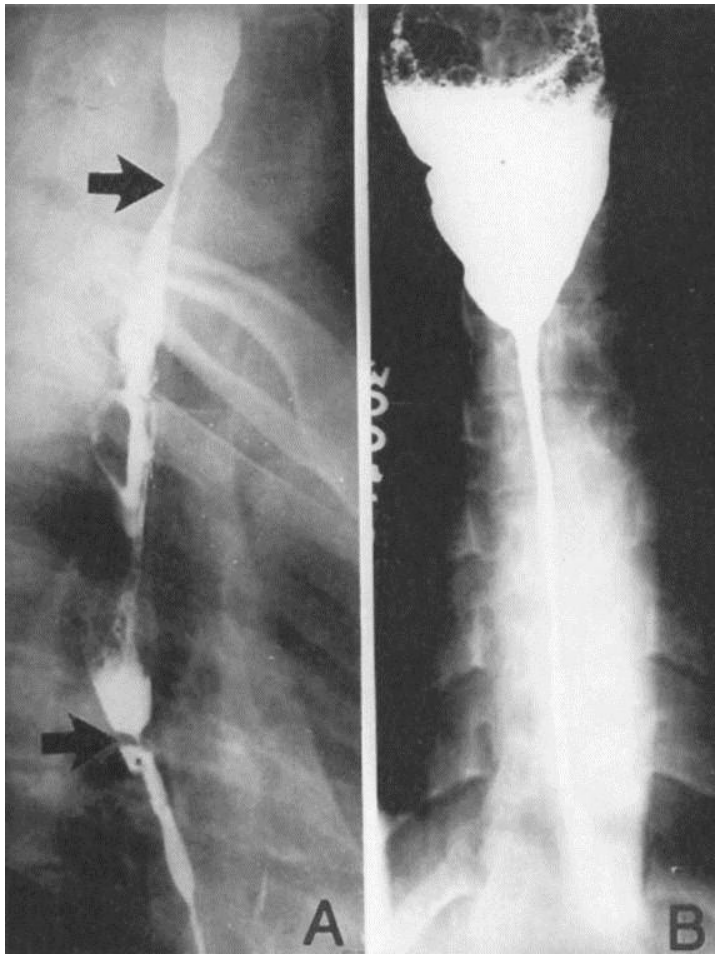



Esophageal Achalasia

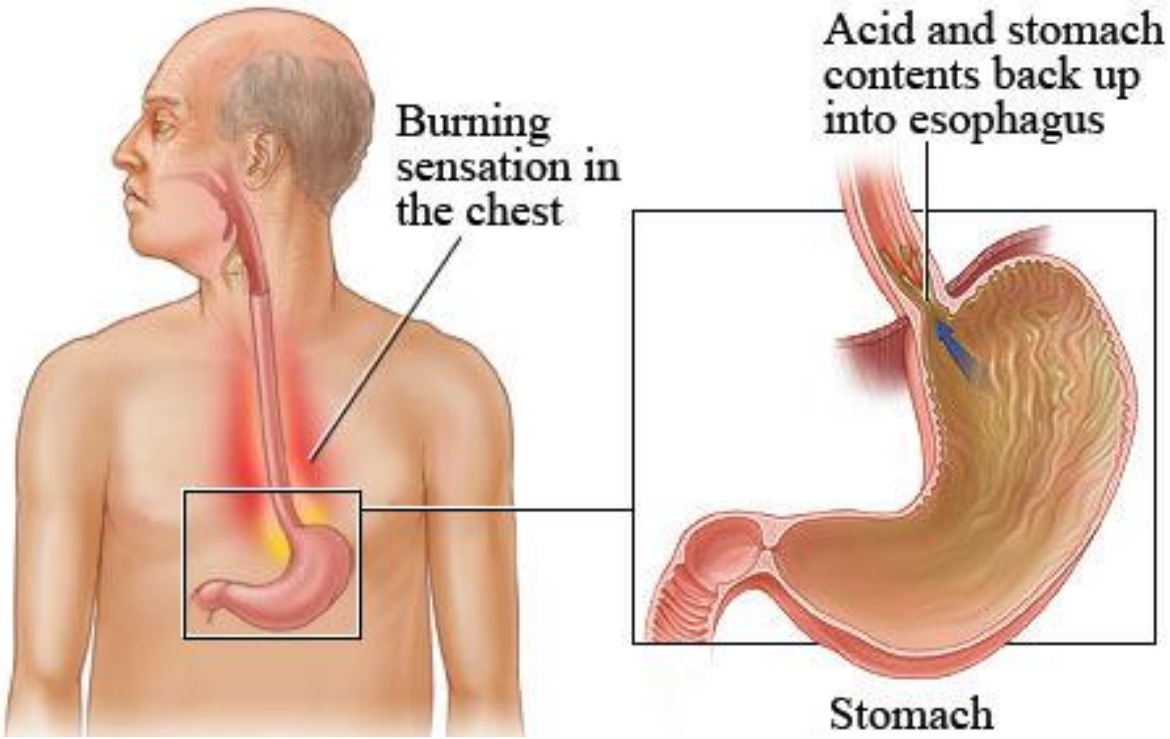
## Esophageal web resolved by endoscopic incision in a patient with Plummer-Vinson syndrome

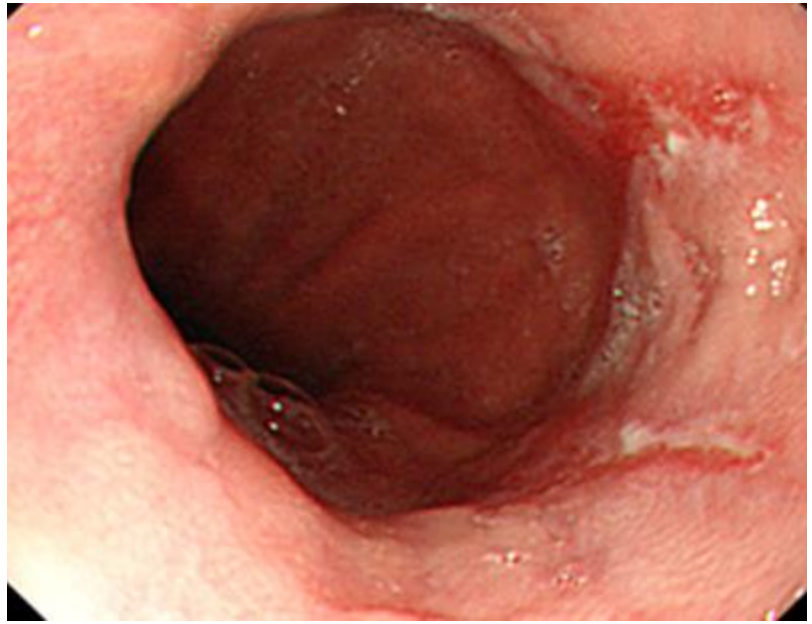



## Corrosive Stricture of the esophagus



# Reflux Esophagitis



# Microscopic pictures:

**Site:**
**1.Middle 1/3**
**→50%(commonest)**
**2. Lower 1/3→33%**
**3. Upper 1/3 →15%**

**Gross appearance:**
**Ulcer.**
**Fungating mass.** **Stricture.**

**1.Squamous cell carcinoma : the most common (middle esophageal**

**2. Adenocarcinoma:**
**On top of baretts esophagus**
**And upward spread from gastriccrcinoma**

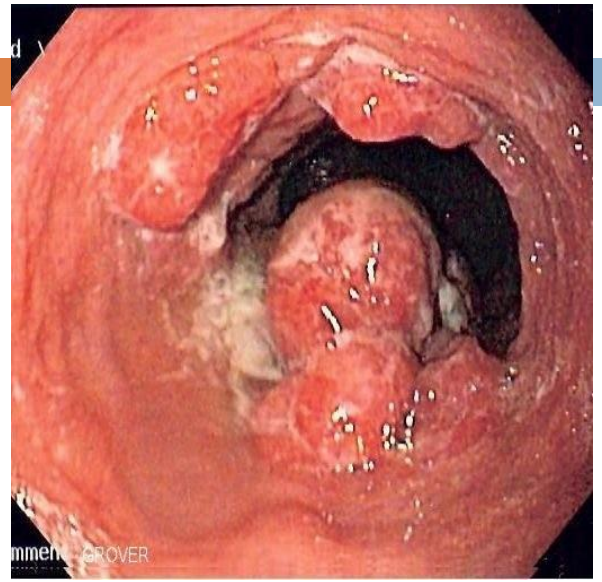
# Esophageal Cancer/ Symptoms

- **Progressive dysphagia is most common**
- **Initially with meat, then soft foods and liquids**
- Dysphagia present late only when more than 60% of the esophageal circumference is infiltrated with cancer. With tumors of the cardia, anorexia and weight loss usually precede the dysphagia
- **- Pain develops late**
- **Substernal, epigastric, or back area Increases with swallowing**
- **asymptomatic**
- **nonspecific upper GI symptoms**
- **stridor, tracheoesophageal fistula** and **coughing**, **choking**, and **aspiration pneumonia** :Extension of the primary tumor into the tracheobronchial tree
- **severe bleeding :** from the primary tumor or from erosion into the aorta or pulmonary vessels occurs
- Vocal cord paralysis

# DIAGNOSTIC TESTING & findings

- we should start with barium swallow for prescence then followed by endoscope for diagnosis.
- Findings:
- Early esophageal cancers appear endoscopically as superficial plaques, nodules, or ulcerations .
- Advanced lesions appear as strictures , ulcerated masses , circumferential masses , or large ulcerations

# DIAGNOSTIC TESTING



# Staging

- Computed tomographic (CT)
- positron emission tomography (PET)
- Endoscopic ultrasonography
- Laparoscopy and thoracoscopy

# Treatment

*Therapy of esophageal cancer is dictated by the stage of the cancer at the time of diagnosis and (age, health, tumor location and extent):

- Stage I: resection of the tumor with adjacent lymph nodes.
- Stage II&III: resection with adjuvant/ neoadjuvant chemotherapy.
- Stage IV: palliative therapy, for dysphagia(endoscopic placement of an expandable stent)

*Surgery must be done with thoracoscope(VATS) or thoracotomy.

*It's preferred by surgeons to do trans hiatal esophagectomy for all tumor locations


There is nothing we can do