



GIS

PATHOLOGY

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■ **Esophagus:**

- ↳ Esophagus: is a hollow, highly distensible muscular tube, with central lumen that extends from the epiglottis to the gastroesophageal junction GEJ, located just above the diaphragm.
 - › This junction represents a physiological sphincter which possess a thick layer of smooth muscle.
 - › Once food reaches this junction it opens to allow food passage into the stomach and then quickly closes to prevent backflow into the esophagus.
 - › Normally, the esophagus is lined by **stratified non-keratinized squamous epithelium**.
 - › As other parts of GIT, the esophagus contains four layer the **mucosa, submucosa, muscular layer, and connective tissue layer**.

■ **Diseases of the esophagus:**

1. Obstruction:

- › Mechanical (can be seen with naked eyes like atresia, stenosis, or tumors).
- › Functional (most of the time related to abnormality in the innervation affecting the motility of the esophagus).

2. vascular diseases: varices.

3. Inflammation: esophagitis.

4. Tumors.

■ **Mechanical Obstruction:**

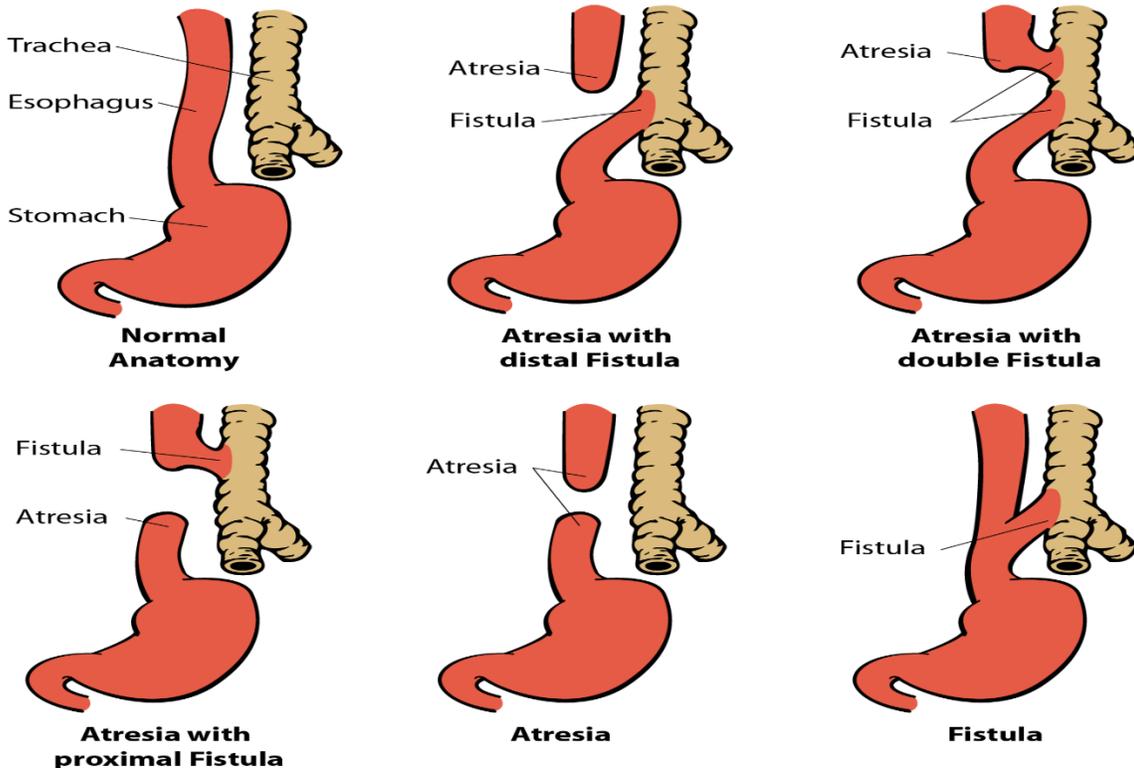
- ↳ These conditions may be congenital or acquired.
 - › Atresia, fistulas, duplications (a rare condition of **double-lumen** esophagus), agenesis (esophagus is absent) and stenosis are conditions that fall under this category.
 - › Stenosis may be congenital or more commonly acquired.

■ **Atresia:**

- ↳ A condition in which thin, noncanalized cord replaces a segment of esophagus, so the formation of a continuous esophageal tube is interrupted. therefore, whatever passes through the esophagus would result in an obstruction.
 - › It occurs most frequently at or near the tracheal bifurcation.

- Usually associated with a fistula (connection between two hollow spaces) connecting the upper or lower esophageal pouches to a bronchus or to the trachea.

- **Variants of esophageal atresia and tracheoesophageal fistula:**



- ↻ The tracheoesophageal (TEF) fistula can lead to breathing problems (aspiration pneumonia) if saliva from the mouth or stomach contents enter the trachea and lungs.
- ↻ Neonates with TEF or esophageal atresia are unable to feed properly. Once diagnosed, prompt surgery is required to allow the food intake and to prevent the previously-mentioned complications.

- **Clinical presentation:**

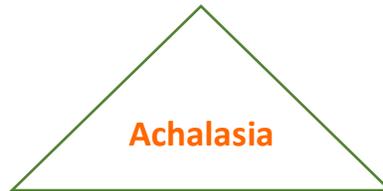
- Shortly after birth: regurgitation during feeding (milk cannot pass and start to regurgitate).

- › Esophageal dysmotility: discoordinated peristalsis or spasm of the muscularis.

- **Achalasia: the most important cause of functional obstruction.**

↪ Achalasia is characterized by a triad:

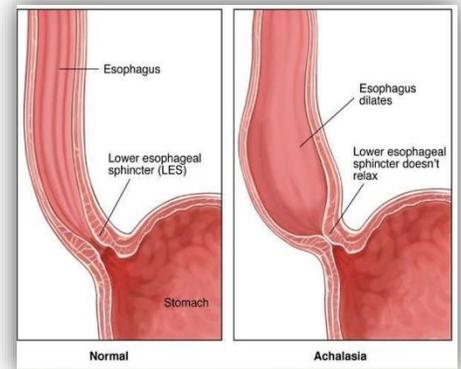
Incomplete Lower esophageal relaxation



Esophageal aperistalsis

Increased LES tone

1. Incomplete LES relaxation (when food reaches the LES, the sphincter must relax to permit the passage of food to the stomach, in achalasia the sphincter would take longer duration to relax).
2. Increased LES tone (in the resting state, when there is no food, increased tone of the sphincter is detected).
3. Esophageal aperistalsis (no peristaltic waves, so when food enters the esophagus it passes under the effect of gravity only).



↪ Food enter the esophagus → accumulate in the esophagus → dilatation of the esophagus.

- **Primary achalasia (most common):**

↪ Caused by failure of distal esophageal inhibitory neurons and is, by definition, idiopathic.

- **Secondary achalasia:**

↪ Degenerative changes in neural innervation, either intrinsic to the esophagus or within the extraesophageal vagus nerve or the dorsal motor nucleus of the vagus, may lead to secondary achalasia.

- › This occurs in Chagas disease, in which *Trypanosoma Cruzi* infection causes destruction of the myenteric plexus, failure of LES relaxation, and esophageal dilatation.

▪ **Diagnosis:**

1. Manometric study: measures the pressure and muscle tone across the gastroesophageal sphincter.
2. barium swallow: a test that may be used to determine the cause of dysphagia, hematemesis, ...
 - > Barium Sulfate is a metallic compound that shows up on X-ray and is used to help see abnormalities in the esophagus and stomach. When taking the test, the patient drinks a preparation containing this solution. The X-rays track its path through the digestive system.

> **Achalasia:**

1. Normal peristaltic movement is not seen.
2. LES and the GEJ are narrowed, producing **“bird’s beak”** appearance.
3. The esophagus above the narrowing is often dilated (enlarged) as the esophagus is gradually stretched over time.



▪ **Treatment:**

↪ Treatment options essentially focus on relaxing the LES with swallowing so that food can pass into the stomach.

Endoscopic balloon dilatation of LES (pneumatic dilation), aims to disturb the muscle fibers of the LES in order to decrease the pressure. A specially designed balloon is inserted through the LES and inflates it. Some patients

may have to undergo repeated dilation treatments in order to achieve symptom improvement. **Clinical presentation:** Difficulty in swallowing, regurgitation and sometimes chest pain.



- **Achalasia-like disease:**

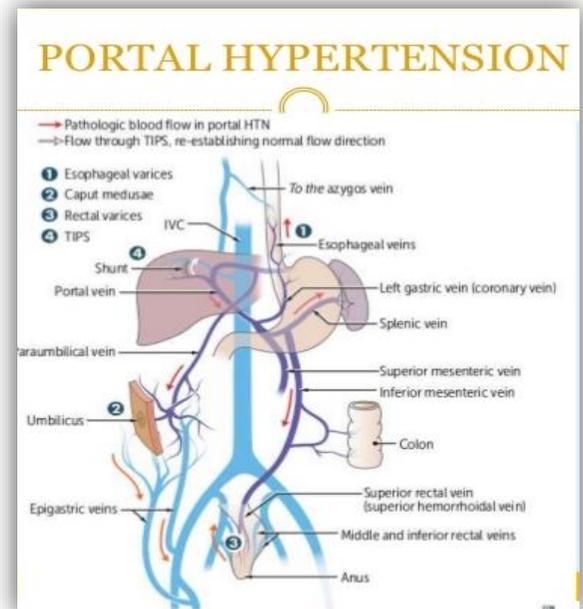
- ↗ If one of the triad arms is absent, we cannot diagnose the condition as achalasia instead it is called “**achalasia-like disease**”. A lot of conditions could result in achalasia-like symptoms.
- The most common cause is **Diabetic autonomic neuropathy**.
- ↗ Other causes include (not common):
- Infiltrative disorders like malignancy, amyloidosis, or sarcoidosis.
- Dorsal motor nuclei lesions (produced by **polio** or surgical ablation).

- **Vascular diseases, Esophageal Varices:**

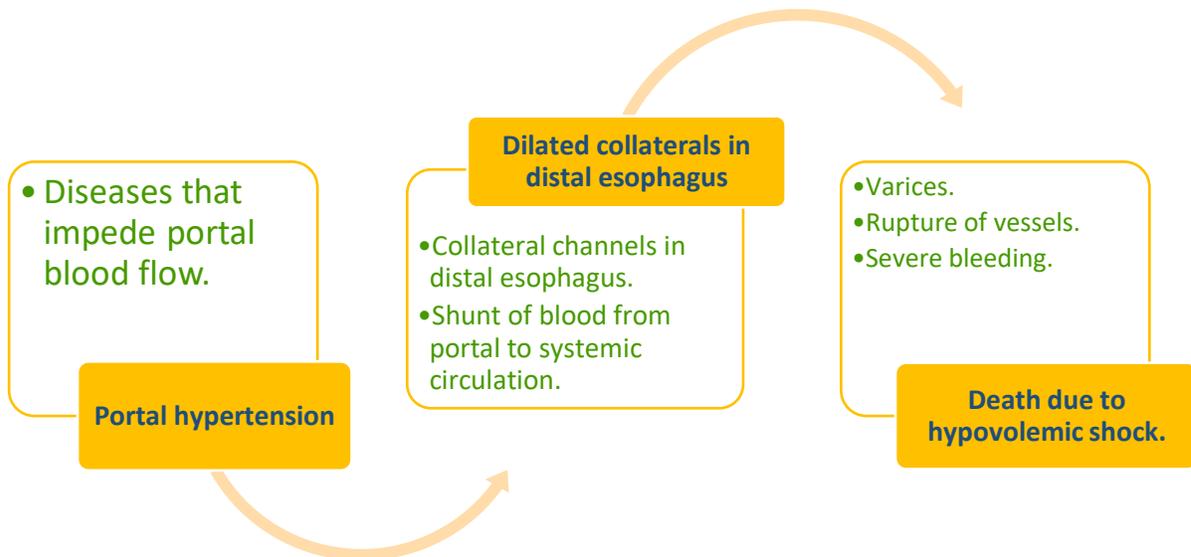
- ↗ Venous blood from the GIT empty into the hepatic portal vein, which carries the blood to the liver before entering the general circulation. After passing through the **portal circulation**, the venous blood from the digestive system empties into the vena cava and returns to the heart to be distributed throughout the body.

- ↗ **Pathogenesis:**

- Diseases that impede portal blood flow cause portal hypertension, which can lead to the development of **esophageal varices** (dilated, tortuous veins within the submucosa of the distal esophagus and proximal stomach (gastroesophageal junction) beneath **intact mucosa**).
- Why distal esophagus? There is a specific type of anastomosis that occurs between the veins of the portal circulation and those of the systemic circulation called **Porto-systemic anastomosis**, the distal end of the esophagus and the superior part of the rectum are potential sites of a harmful anastomosis because these anastomoses become congested and form venous dilatations, such dilatation can lead to esophageal varices, anorectal varices (hemorrhoids), and at the level of the umbilicus (caput medusae).



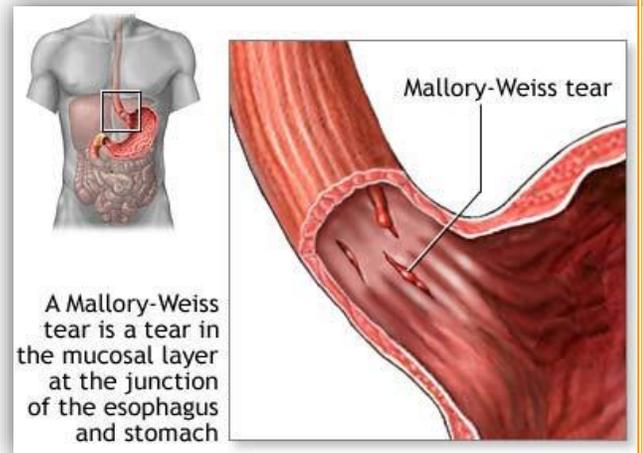
- **Clinical features:**
 - › Esophageal varices usually don't cause signs and symptoms unless they bleed. But their rupture can lead to massive hematemesis and death. Therefore, variceal rupture constitutes a medical emergency.
 - › Despite intervention as many as half of the patients die from the first bleeding episode due to: hemorrhage, hepatic coma, and hypovolemic shock.
 - › Once the first bleeding occurs the risk of another bleeding episode greatly increases. Among those who survive, additional episodes of hemorrhage, each potentially fatal, occur in as many as 20% of cases.
- **Diagnosis by:** endoscopy or angiography.
- **Worst case scenario:**



- **ESOPHAGITIS:**
 - ↳ Inflammation or irritation of the esophagus.
 - Common causes include:
 - › Esophageal Lacerations.
 - › Mucosal Injury.
 - › Infections (viral, fungal, and rarely bacterial).
 - › Reflux Esophagitis.
 - › Eosinophilic Esophagitis.

▪ **Esophageal Lacerations:**

- ↳ Mallory-Weiss syndrome.
- › Refers to bleeding from a laceration in the mucosa at the gastroesophageal junction. This is usually caused by severe/violent vomiting and retching, forceful vomiting causes tearing of the mucosa at the junction due to failure of gastroesophageal musculature to relax prior to antiperistaltic contraction associated with vomiting. Gastric contents cause the esophageal wall to stretch and tear.
- ↳ The lacerations are roughly **linear** and **longitudinally** oriented crossing the gastroesophageal junction.
- › Patients usually present with hematemesis (vomiting up blood).
- › Vomited blood is usually fresh (bright red blood) which indicates acute esophagitis in contrast to coffee-ground vomiting that is associated with exposure of blood to gastric acid. This reaction causes the vomitus to look like ground coffee.
- › These superficial tears generally heal quickly without surgical intervention.



▪ **Chemical Esophagitis:**

- ↳ The stratified squamous mucosa of the esophagus may be damaged by a variety of irritants including:
 - › Alcohol.
 - › Corrosive acids or alkalis.
 - › Excessively hot fluids.
 - › Heavy smoking.
 - › Medicinal pills (doxycycline and bisphosphonates) these pills may adhere to the esophageal lining and dissolve in the esophagus

rather than passing immediately into the stomach, resulting in **pill-induced esophagitis**.

- Iatrogenic (illness caused by medical treatment).
 1. Chemotherapy.
 2. Radiotherapy.
 3. GVHD.

▪ **Clinical symptoms and morphology:**

- ↳ The morphologic changes consist of ulceration and acute inflammation.
 - Esophagitis due to chemical injury generally causes only self-limited pain, particularly odynophagia (pain with swallowing).
 - Hemorrhage, stricture, or perforation may occur in severe cases.

GOOD LUCK ♥