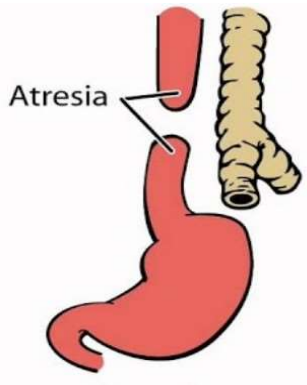
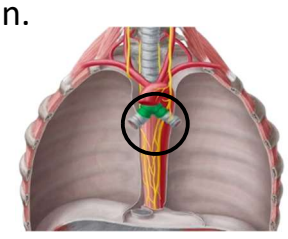
Diseases of the esophagus

1.Obstruction (mechanical or functional)

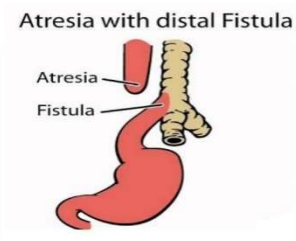
Atresia (mechanical)

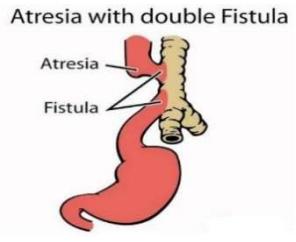


- Definition: A condition in which thin noncanalized cord replaces a segment of esophagus, so whatever passes through the esophagus would result in an obstruction.
- Congenital disease.
- Most common location: at or near the tracheal bifurcation.



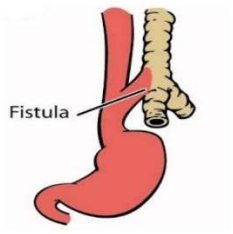
- Usually associated with a fistula (connection between two hollow spaces) connecting the upper or lower esophageal pouches to a bronchus or to the trachea.





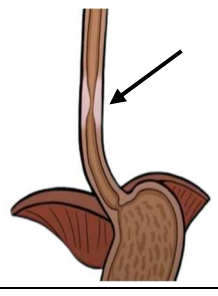
- Clinical presentation: regurgitation during feeding.
- Complications if it with fistula: Aspiration, Suffocation, Pneumonia, Severe fluid and electrolyte imbalances (severe dehydration).
- Treatment: surgical correction (rejoin).

Fistula (mechanical)



- opening between two hollow organ
- Example: Tracheoesophageal fistula (TEF).
- Tracheoesophageal fistula (TEF) fistula can lead to breathing problems (aspiration pneumonia) if saliva from the mouth or stomach contents enter the trachea and lungs.
- Treatment: surgical correction.

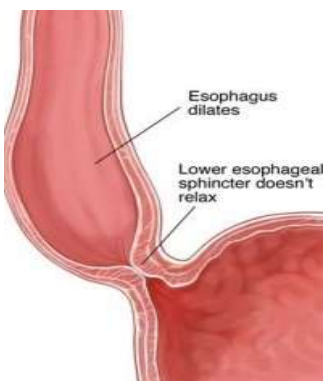
Esophageal Stenosis (mechanical)



- Acquired>>>Congenital
- Acid and other irritants damage the lining of the esophagus → inflammation →scarring → Fibrous thickening of the submucosa & atrophy of the muscularis propria → narrowing of the esophagus lumen
- Causes: Chronic GERD/ Irradiation (cancer patients treated with radiotherapy)/ Ingestion of caustic agents (chemicals, alkaline or acidic material)
- Clinical presentation:
  - Progressive dysphagia (difficulty in swallowing)
  - Difficulty eating solids typically occurs long before problems with liquids

Achalasia (functional)

The most important cause of functional obstruction



- It is characterized by a triad:

1-Incomplete LES relaxation.
2-Increased LES tone (in the resting state the muscle will be spastic).
3-Esophageal aperistalsis.

- Primary achalasia (most common):

Caused by failure of distal esophageal inhibitory neurons + Idiopathic (unknown cause)

- Secondary achalasia:

- Degenerative changes in neural innervation, (Intrinsic/ Vagus nerve / Dorsal motor nucleus of vagus).
- One of the causes is Chagas disease: it's an infection by Trypanosoma Cruzi that causes destruction of the myenteric plexus → failure of LES relaxation → esophageal dilatation (due to accumulation of food and fluid)

- Diagnosis: barium swallow then the X-rays
- Clinical presentation:

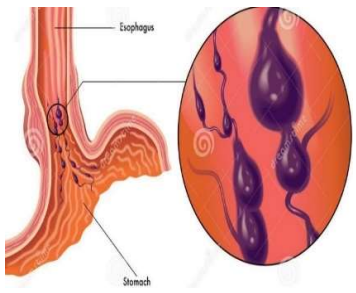
- Dysphagia.
- Regurgitation or aspiration complicated by pneumonia.
- Sometimes chest pain.

- Treatment: balloon dilatation of LES (pneumatic dilation) or surgical correction.

Other examples of mechanical Obstruction: Duplications (double-lumen esophagus), Agenesis (esophagus is absent, very rare)

2-vascular diseases

Esophageal Varices



- Definition: Tortuous dilated veins within the submucosa of the distal esophagus (lower third) and proximal stomach.
- Why distal esophagus? Because it is the site of Porto-systemic anastomosis.
- Pathogenesis: Diseases that impede portal blood flow →Portal hypertension → collateral channels in distal esophagus → shunt of blood from portal to systemic circulation → dilate collaterals in distal esophagus → varices
- Causes of portal hypertension:

1.Cirrhosis is the most common cause.

2. Hepatic schistosomiasis 2nd most common cause.

- Clinical Features:

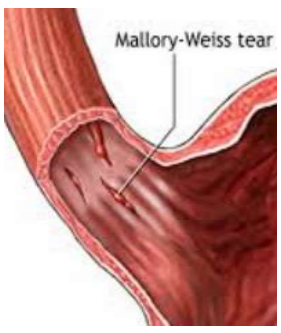
* Asymptomatic → mild form
*Rupture leads to massive hematemesis (vomiting blood) and death
*Death due to hemorrhage, hepatic come, and hypovolemic shock.
*50% of patients die from the first bleed despite interventions
*20% of people who survive from first bleeding they can rebleed again

Extra notes about Porto-systemic circulation

Provide alternative routes of venous blood circulation when there is a blockage in the liver or portal vein. Ensure that venous blood from the GIT still reaches the heart through the inferior vena cava without going through the live. In portal hypertension, as in the case of cirrhosis of the liver, the anastomoses become congested and form venous dilatations. Such dilatation can lead to esophageal varices and hemorrhoids. Caput medusae can also result

3- Inflammation (Esophagitis)

Esophageal Lacerations



- Mallory-Weiss tears.
- pathogenesis: failure of gastroesophageal musculature to relax prior to antiperistaltic contraction→ retching, forceful vomiting → Gastric contents cause the esophageal wall to stretch and tear of the mucosa → bleeding of laceration.
- Site: at the gastroesophageal junction.
- Clinical features: hematemesis (fresh blood vomiting).
- Morphology: Superficial, linear and longitudinally oriented crossing the GEJ.
- Heal quickly, without any surgical intervention.

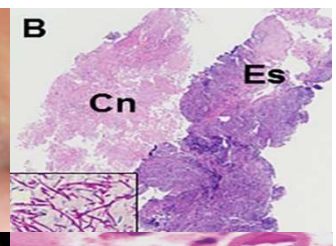
Chemical Esophagitis

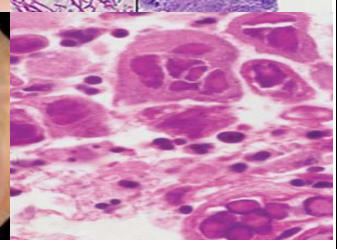
- Damage of the stratified squamous mucosa of the esophagus by a variety of irritants
- Causes: ingestion of Corrosive acids or alkalis/ Alcohol/ Excessively hot fluids/ Heavy smoking/ Medicinal pills like doxycycline and bisphosphonates (pill-induced esophagitis)/ Iatrogenic (Chemotherapy, Radiotherapy, GVHD)
- Morphology: Ulceration + acute inflammation.
- Clinical features: odynophagia (pain with swallow)
- In severe causes→ Hemorrhage (may present with hematemesis), stricture and stenosis, or perforation
- Only self-limited pain

Infectious Esophagitis

- Mostly in debilitated or immunosuppressed.
- FUNGAL

*Candida >>> mucormycosis & aspergillosis.
*Candida is part of normal flora.
*Macroscopically: Adherent /Gray white pseudomembranes
*Microscopically: Composed of matted fungal hyphae and inflammatory cells.



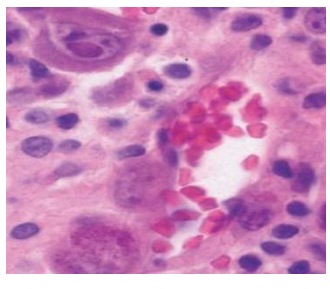


- VIRAL

 # HERPES VIRUSES (HSV)

*Infect epithelial cells.
*Macroscopically: Presence of punched out (deep, heated-up rounded edges) ulcers
*Microscopically: Multinucleated epithelial cells/ Degenerating epithelial cells ulcer edge/ Nuclear viral inclusions.

 # CYTOMEGALO VIRUS (CMV)

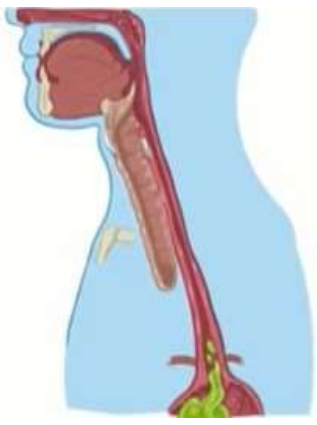


*Infects the stromal fibroblasts and the endothelial cells lining the capillaries under the mucosa.
*Macroscopically: Presence of shallow ulcers (very superficial)
*Microscopically: nuclear and cytoplasmic inclusion

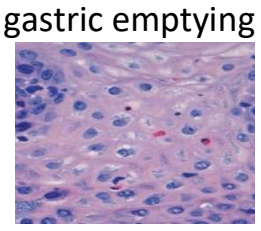
- BACTERIAL: 10%

Reflux Esophagitis

Most frequent cause of esophagitis (GERD)



- Definition: Reflux of gastric contents into the lower esophagus /common over age of 40 years
- The normal lining of esophagus → Squamous epithelium (sensitive to acids)
- Protective forces: mucin and bicarbonate, high LES tone → acid affect them.
- Pathogenesis:
  1. Decreased lower esophageal sphincter tone (causes: alcohol, tobacco, CNS depressant)
  2. Increase abdominal pressure (obesity, pregnancy, hiatal hernia, delayed gastric emptying and increased gastric volume, tumors, ascites).
  3. Idiopathic.



*Macroscopically: Redness(hyperemia) depends on severity.
*Microscopically: Eosinophils infiltration/ Followed by neutrophils (more severe)/ Basal zone hyperplasia / Elongation of lamina propria papillae.

- Clinical Features: Heartburn (Most frequent symptom)/ dysphagia/ Regurgitation of sour-tasting gastric contents/ severe chest pain(rare) mistaken for heart disease.
- Treatment: proton pump inhibitors.
- Complications: Esophageal ulceration/ Hematemesis/ Melena (black colored stool due to upper GI bleeding) Strictures/ Barrett esophagus (precursor of Cancer).

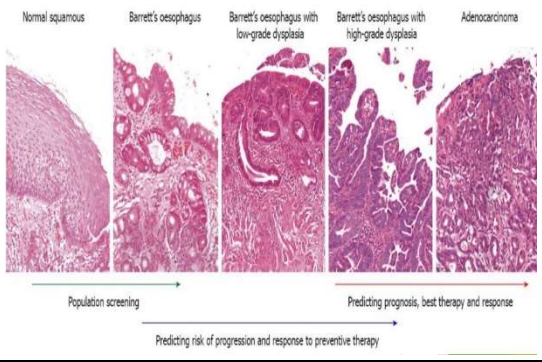
Barrett Esophagus

Complication of chronic GERD.

- Direct precursor of esophageal adenocarcinoma
- Males>>females, 40-60 yrs.
- Pathogenesis: metaplasia in squamous epithelium (which is very fragile and can't handle acidity) transforms into columnar epithelium that is more resistant to acid (glandular epithelium that can be gastric type or intestinal type epithelium)

Metaplasia → dysplasia → adenocarcinoma

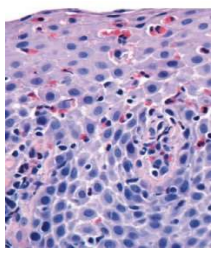
*Macroscopically: red tongues extending upward from the GEJ.
*Microscopically: Gastric or intestinal metaplasia/ Presence of goblet cells (intestinal type epithelium)/+ -Dysplasia: low-grade or high-grade/ Intramucosal carcinoma: invasion into the lamina propria



- Management:
  1. Periodic surveillance endoscopy with biopsy to screen for dysplasia (Barrett is reversible and can regress with treatment).
  2. High grade dysplasia & intramucosal carcinoma needs interventions (surgical resection for example).

Eosinophilic Esophagitis

- Definition: Chronic immune mediated disorder.
- Symptoms: Food impaction and dysphagia in adults/ Feeding intolerance or GERD-like symptoms in children.



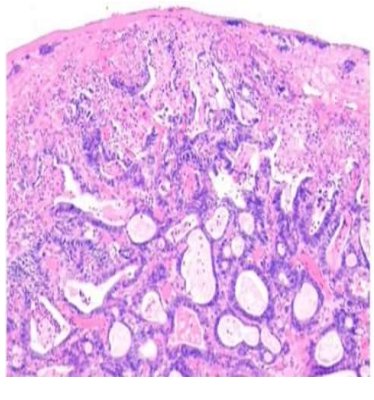
*Macroscopically: Rings in the upper and mid esophagus.
*Microscopically: numerous eosinophils within epithelium, far from the GEJ.

- Mostly allergic in nature and can happen in children &adults.
- Treatment:
  1. Dietary restrictions (cow milk and soy products).
  2. Topical or systemic corticosteroids.
  3. Refractory to PPIs (يعني المريض ما بتحسن عليهم).

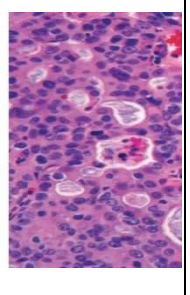
4-Esophageal tumors

Adenocarcinoma

At Distal third of the esophagus



- Background of Barrett esophagus and long-standing GERD.
- Risk factors: dysplasia associated Barrett, smoking, obesity, radiotherapy.
- Geographic & racial variation (developed countries more affected)/ Male>>>Female
- Pathogenesis:
  1. Barrett>>dysplasia>>adenocarcinoma
  2. Acquisition of genetic and epigenetic changes
  3. Chromosomal abnormalities and TP53 mutation (most common mutation)



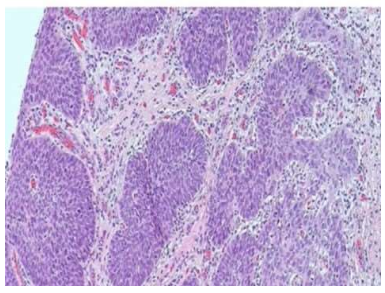
*Macroscopically:
  - Early lesion: flat or raised patches
  - Later lesion: exophytic (project to lumen large mass) infiltrative masses

*Microscopically: Forms glands and mucin.

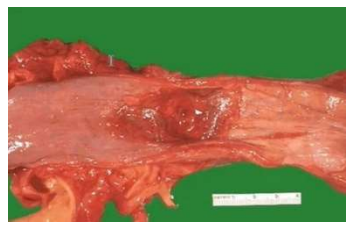
- Clinical Features: Pain or difficulty swallowing/Progressive weight loss/ Chest pain/ Vomiting.

Squamous cell carcinoma (SCC)

At middle third of the esophagus



- Underdeveloped countries more affected/ males>>females
- Risk factors: Alcohol/ Tobacco/ Poverty/ Caustic injury/ Achalasia/ Plummer-Vinson syndrome (Associated with iron deficiency and anemia) /Vinson syndrome/ Frequent consumption of very hot beverages/ Previous radiation Tx.
- Pathogenesis:
  1. In western: alcohol and tobacco use.
  2. Other areas: polycyclic hydrocarbons, nitrosamines, fungus-contaminated foods
  3. HPV infection implemented in high-risk regions



*Macroscopically:

- Polypoid, ulcerated or infiltrative
- Wall thickening, lumen narrowing
- Invade surrounding structures (bronchi, mediastinum, pericardium, aorta).

*Microscopically:

- Pre-invasive: Squamous dysplasia & CIS (precursors of squamous cell carcinoma).

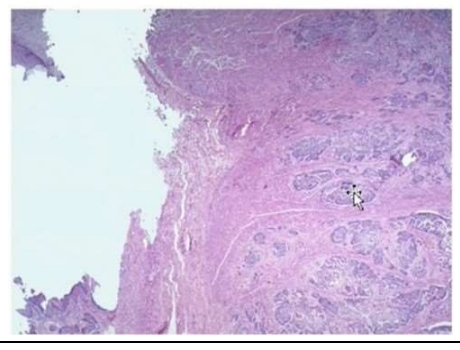
starts as squamous dysplasia which turn into squamous cell in situ (carcinoma in situ)

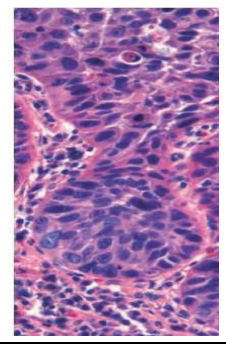
- Well to moderately differentiated invasive SCC.
- Intramural tumor nodules.
- No gland and mucin.
- Lymph node metastases:

1. Upper 1/3 (location of the tumor): cervical lymph nodes
2. Middle 1/3: mediastinal, paratracheal and tracheobronchial lymph nodes.
3. Lower 1/3: gastric and celiac lymph nodes

- Clinical Features: Dysphagia/ Odynophagia/ Obstruction/Weight loss and debilitation/ Impaired nutrition & tumor associated cachexia/Hemorrhage and sepsis if ulcerated/ u Aspiration via a tracheoesophageal fistula.

Invasive SCC





PAST PAPERS

1.the most common tumor of the esophagus is:

a. leiomyoma

b. polyps

c. gastrointestinal stromal tumor GIST

d. adenocarcinoma

e. squamous cell carcinoma

ANSWER: e

2.which of the following is wrong about esophageal varices?

a. found in the distal esophagus or proximal stomach

b. cirrhosis is a cause of esophageal varices

c. ruptured esophageal varices are treated with iron supplements

d. esophageal varices are asymptomatic

e. all of the above are correct

ANSWER: c

3.which microorganisim responsible for Gray-white pseudomembranes

a. HSV

b. CMV

c. all the above

d. Candidiasis

ANSWER: d

4.Barret esophagus is Direct precursor of esophageal adenocarcinoma

a. True

b. False

ANSWER: a

5.regurgitation during feeding

a. esophageal atresia

b. esophagus stenosis

c. achalasia

d. none of the above

ANSWER: a

6.all of the following are true about achalasia except

a. Incomplete LES relaxation

b. Increased LES tone

c. decrease LES tone

d. Esophageal aperistalsis

ANSWER: c

7. risk of adenocarcinoma of esophagus

a. Barret

b. GERD

c. all the above

d. none of the above

ANSWER: c

8. SCC esophagus lymph node metastases

a. Upper 1/3: cervical LNs

b. Lower 1/3: gastric and celiac LNs

c. Middle 1/3: mediastinal, paratracheal and tracheobronchial LNs

d. all the above

ANSWER: d

9. Which one of the following in the usual cause of heart burn man with history of smoking?

a. GERD

b. Myocardial infarction

c. Gastroenteritis

d. Inguinal hernia

ANSWER: a

10. A 70-yr-old women presented with difficulty in swallowing & weigh loss endoscopy revealed irregular narrowing of the lower third of esophagus a biopsy showed markedly atypical cuboidal cells lining irregular gland like structure the most likely diagnosis is?

a. Adenocarcinoma

b. Achalasia

c. Barret esophagus

d. Esophageal spasms

ANSWER: a

11. A 60-year-old Caucasian man with a 5-year history of gastroesophageal reflux disease (GERD) presents with persistent pyrosis (heartburn) and acid regurgitation. He has had similar symptoms for the past 5 years. Because this patient has a long history of GERD, an esophagogastroduodenoscopy is performed to screen for Barrett esophagus, a well-known complication of long-standing GERD. Results reveal that Barrett esophagus is indeed present. Which of the following is true of Barrett esophagus?

a. A biopsy will show a histologic finding of

b. columnar-to-squamous metaplasia

c. It is a known precursor of adenocarcinoma of the esophagus.

d. It is a known precursor of carcinoma of the stomach.

e. It is a known precursor of squamous cell carcinoma of the esophagus

ANSWER: c

12. 60-year-old man with long standing portal hypertension, developed severe hematemesis, followed by severe hypotension and shock then admitted to intensive care unit (ICU), the most likely cause of his bleeding is

a. Gastric ulcer

b. Esophageal varices

c. Viral esophagitis

d. Gastroesophageal reflux disease

e. Achalasia

ANSWER: b

13. A 65-year-old man presents with dysphagia, weight loss, and anorexia. Physical examination is normal. Esophagogastroduodenoscopy with biopsy of an esophageal lesion is performed, revealing squamous cell carcinoma. Which of the following is true regarding this cancer?

a. Cigarette smoking and chronic alcohol use are associated risk factors.

b. Gastroesophageal reflux disease and Barrett esophagus are associated risk factors

c. Histologic findings include disordered, back-to back submucosal glands.

d. It most frequently arises in the lower third of the esophagus

e. This cancer is characterized by an indolent course, and long survival is common

ANSWER: a

14. The best management plan for Mallory Weiss tear of the esophagus is:

a. Endoscopy with cautery.

b. Will heal spontaneously with no intervention.

c. Surgical correction.

d. Proton pump inhibitors.

e. Antibiotic treatment.

ANSWER: b

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