ORAL CAVITY

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- The gastrointestinal tract is a hollow tube consisting of:
- The esophagus.
- The stomach.
- The small intestine.
- Colon.
- Rectum.
- Anus.

ORAL CAVITY

- Pathologic conditions of the oral cavity can be broadly divided into diseases affecting the oral mucosa, salivary glands, and jaws.
- We will discuss:

- ORAL INFLAMMATORY LESIONS.
- PROLIFERATIVE AND NEOPLASTIC LESIONS OF THE ORAL CAVITY.
- DISEASES OF SALIVARY GLANDS.
- ODONTOGENIC CYSTS AND TUMORS.

ORAL INFLAMMATORY LESIONS.

- Aphthous Ulcers (Canker Sores)

These common superficial mucosal ulcerations affect up to 40% of the population. It may be associated disease (IBD), and Behçet disease. Lesions can be solitary or multiple; typically, they are shallow, hyperemic ulcerations covered by a thin exudate and rimmed by a narrow zone of erythema .In most cases they resolve spontaneously in 7 to 10 days but can recur.

- Herpes Simplex Virus Infections.

Oral Candidiasis (Thrush).

- Candidiasis is the most common fungal infection of the oral cavity.
- Candida albicans is a normal component of the oral flora and only produces disease under unusual circumstances.
- The three major clinical forms of oral candidiasis are pseudomembranous, erythematous, and hyperplastic. The pseudomembranous form is most common and is known as thrush.
- This condition is characterized by a superficial, curdlike, gray to white inflammatory membrane composed of matted organisms enmeshed in a fibrinosuppurative exudate .
- In mildly immunosuppressed or debilitated individuals, such as diabetics, the infection usually remains superficial, but can spread to deep sites in association with more severe immunosuppression, including that seen in organ or hematopoietic stem cell transplant recipients, as well as patients with neutropenia, chemotherapy-induced immunosuppression, or AIDS.

PROLIFERATIVE LESIONS OF THE ORAL CAVITY

- *Pyogenic granulomas* are pedunculated masses usually found on the gingiva of children, young adults, and pregnant women.
- These lesions are richly vascular and typically are ulcerated, which gives them a red to purple color.. However, histologic examination demonstrates a dense proliferation of immature vessels similar to that seen in granulation tissue.
- Pyogenic granulomas can regress, mature into dense fibrous masses, or develop into a peripheral ossifying fibroma.
- Complete surgical excision is definitive treatment

NEOPLASTIC LESIONS OF THE ORAL CAVITY

- Leukoplakia is defined by the World Health Organization as "a white patch or plaque that cannot be scraped off and cannot be characterized clinically or pathologically as any other disease."
- Leukoplakia includes a spectrum of histologic features ranging from hyperkeratosis overlying a thickened, acanthotic, but orderly mucosal lesions with marked dysplasia that sometimes merges with carcinoma in situ.
- The most severe dysplastic changes are associated with erythroplakia, and more than 50% of these cases undergo malignant transformation. With increasing dysplasia and anaplasia.
- A majority of oral cavity cancers are *squamous cell carcinomas*.
- Oral squamous cell carcinomas are classically linked

to tobacco and alcohol use, but the incidence of HPVassociated lesions is rising.

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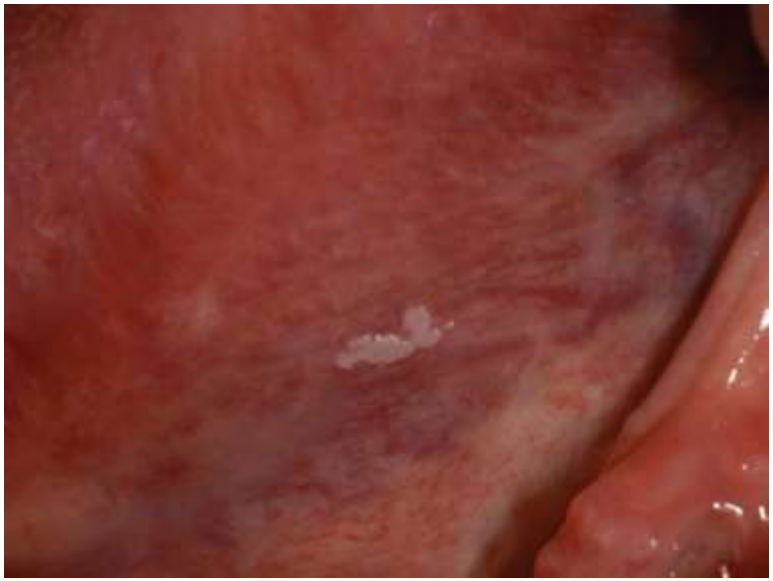
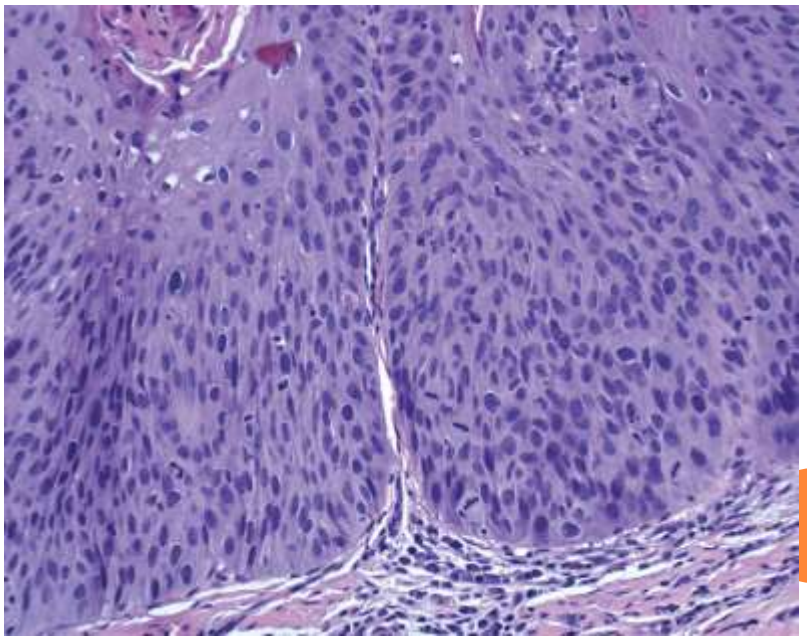
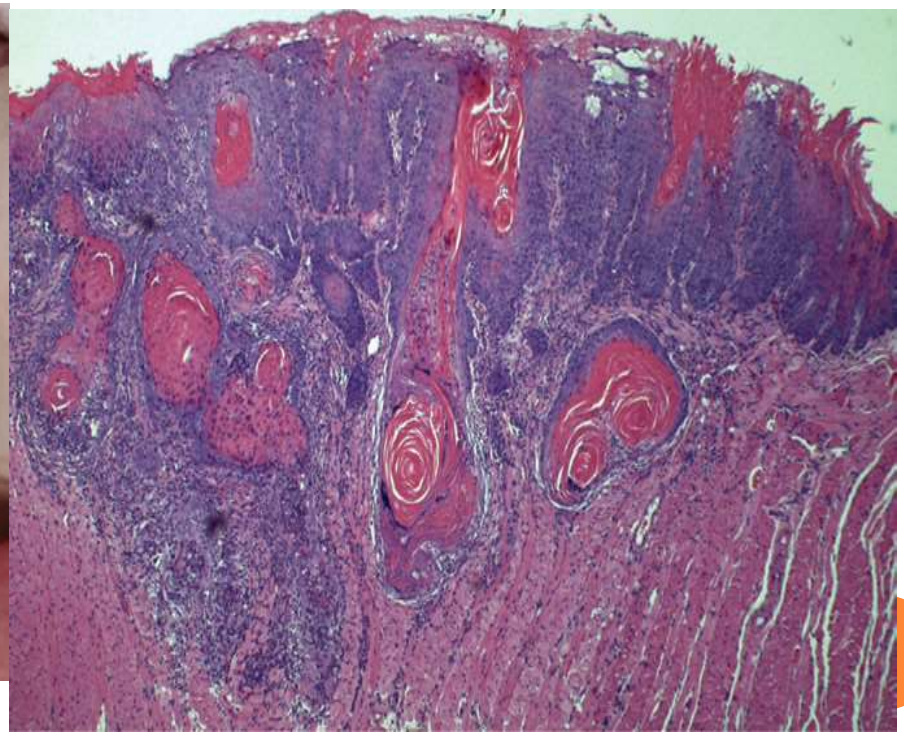
Leukoplakia. the lesion is smooth with well-demarcated borders and minimal elevation. B, Histologic appearance of leukoplakia showing dysplasia, characterized by nuclear and cellular pleomorphism and loss of normal maturation.





Clinical appearance demonstrating ulceration and induration of the oral mucosa. Histologic appearance demonstrating numerous nests and islands of malignant keratinocytes invading the underlying connective tissue stroma.



DISEASES OF SALIVARY GLANDS.

1- Xerostomia: is defined as a dry mouth resulting from a decrease in the production of saliva. It is caused by:

- It is a major feature of the autoimmune disorder Sjögren syndrome, in which it usually is accompanied by dry eyes. Radiation therapy. Medications. Complications of xerostomia include increased rates of dental caries and candidiasis, as well as difficulty in swallowing and speaking.

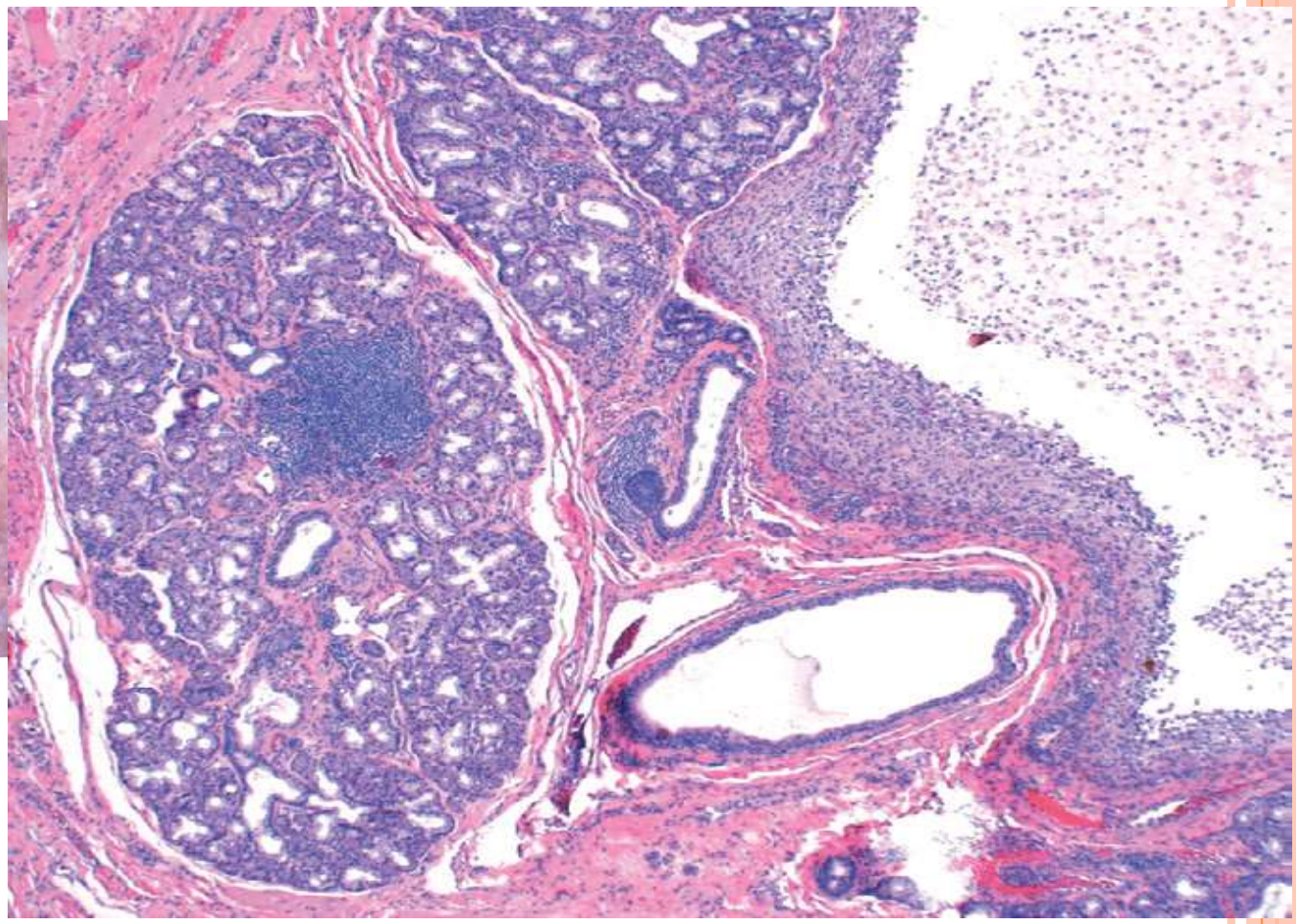
2- Sialadenitis, or inflammation of the salivary glands, may be induced by trauma, viral or bacterial infection, or autoimmune disease.

- The most common form of *viral sialadenitis is mumps,* which may produce enlargement of all salivary glands but predominantly involves the parotids. . While mumps in children is most often a selflimited benign condition, in adults it can cause pancreatitis or orchitis; the latter sometimes causes sterility.

3- Duct obstruction by stones (sialolithiasis)is a common antecedent to infection.

4-The mucocele is the most common inflammatory lesion of the salivary glands, and results from either blockage or rupture of a salivary gland duct.

Mucocele typically manifests as a fluctuant swelling of the lower lip.



Histologic examination demonstrates a cystlike space lined by inflammatory granulation tissue or fibrous connective tissue that is filled with mucin and inflammatory cells, particularly macrophages.

Salivary gland tumors

- Salivary gland tumors are relatively uncommon and represent less than 2% of all human tumors.
- Approximately 65% to 80% arise within the parotid, 10% in the submandibular gland. Approximately 15% to 30% of tumors in the parotid glands are malignant. 70% to 90% of sublingual tumors are cancerous.
- Salivary gland tumor is malignant is inversely proportional, roughly, to the size of the gland.
- Salivary gland tumors usually occur in adults, with a slight female predominance.

Table 14–1 Histopathologic Classification and Prevalence of the Most Common Benign and Malignant Salivary Gland Tumors

Benign	Malignant
Pleomorphic adenoma (50%)	Mucoepidermoid carcinoma (15%)
Warthin tumor (5%)	Acinic cell carcinoma (6%)
Oncocytoma (2%)	Adenocarcinoma NOS (6%)
Cystadenoma (2%)	Adenoid cystic carcinoma (4%)
Basal cell adenoma (2%)	Malignant mixed tumor (3%)

NOS, not otherwise specified.
Data from Ellis GL, Auclair PL, Gnepp DR: Surgical Pathology of the Salivary Glands, Vol 25: Major Problems in Pathology. Philadelphia, WB Saunders, 1991.

Pleomorphic Adenoma

- Pleomorphic adenomas present as painless, slow-growing, mobile discrete masses.
- They represent about *60% of tumors in the parotid*.
- Pleomorphic adenomas recur if incompletely excised:

Recurrence rates approach 25% after simple enucleation of the tumor, but are only 4% after wider resection.

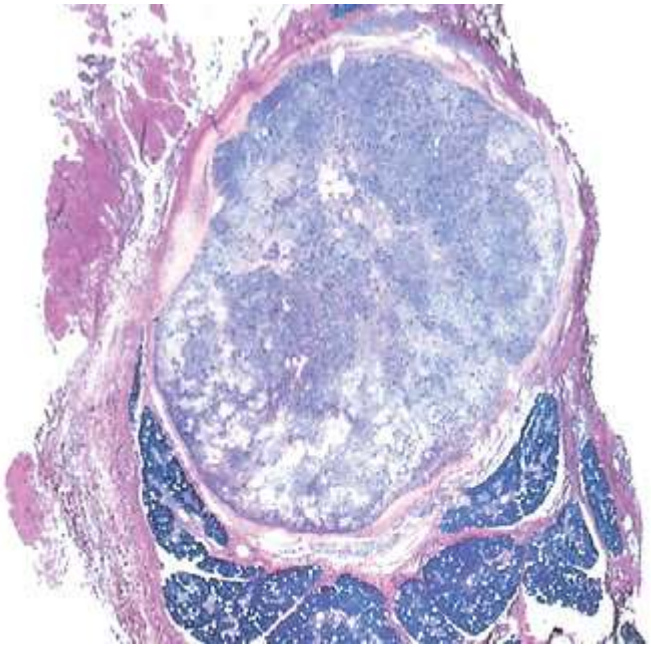
- Carcinoma arising in a pleomorphic adenoma is referred to variously as a *carcinoma ex pleomorphic adenoma* or *malignant mixed tumor*.

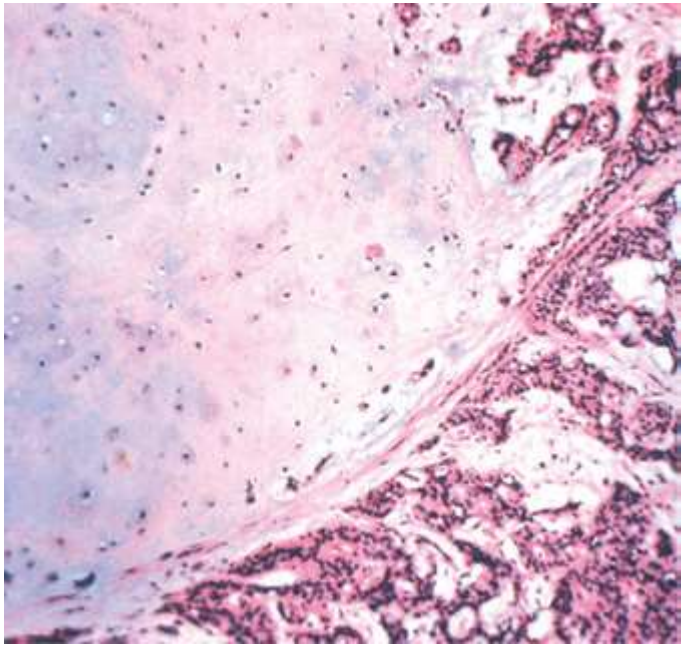
Macroscopically: Pleomorphic adenomas typically manifest as rounded, welldemarcated masses rarely exceeding 6 cm in the greatest dimension. The cut surface is gray-white and typically contains myxoid and blue translucent chondroid

(cartilage-like) areas.

Microscopically: The most striking histologic feature is their characteristic heterogeneity. Epithelial elements resembling ductal or myoepithelial cells are arranged in ducts, acini, irregular tubules, strands, or even sheets. These typically are dispersed within a mesenchyme-like background of loose myxoid tissue containing islands of chondroid and, rarely, foci of bone.. In other instances there may be strands or sheets of myoepithelial cells..

- Low-power view showing awell-demarcated tumor with adjacent normal salivary gland parenchyma. **B,** High-power view showing epithelial cells as well as myoepithelial cells within chondroid matrix material.





Mucoepidermoid Carcinoma

- These neoplasms represent about 15% of all salivary gland tumors, and while they occur mainly (60% to 70%) in the parotids.
- Mucoepidermoid carcinoma is the most common form

of primary *malignant* tumor of the salivary glands.

- Macroscopically: they lack well-defined capsules and often are infiltrative.The cut surface is pale gray to white and frequently demonstrates small, mucinous cysts.
- On histologic examination, these tumors contain **cords, sheets, or cysts lined by squamous, mucous, or intermediate cells.** The latter is a hybrid cell type with both squamous features and mucus-filled vacuoles, which are most easily detected with mucin stains.

- The jaws are a common site of epithelium-lined cysts derived from odontogenic remnants.
- The odontogenic keratocyst is locally aggressive, with a high recurrence rate.
- The periapical cyst is a reactive, inflammatory lesion associated with caries or dental trauma.
- The most common odontogenic tumors are ameloblastoma and odontoma.

Esophagus

- Diseases that affect the esophagus

1. Obstruction: mechanical or functional.
2. vascular diseases: varices.
3. Inflammation: esophagitis.
4. Tumours.

OBSTRUCTIVE DISEASES

- Mechanical Obstruction:

1-Stenosis most often is due to inflammation and scarring, which may be caused by chronic gastroesophageal reflux, irradiation, or caustic injury.

Esophageal stenosis

 Acquired>>>Congenital.

 Fibrous thickening of the submucosa & atrophy of the muscularis propria.

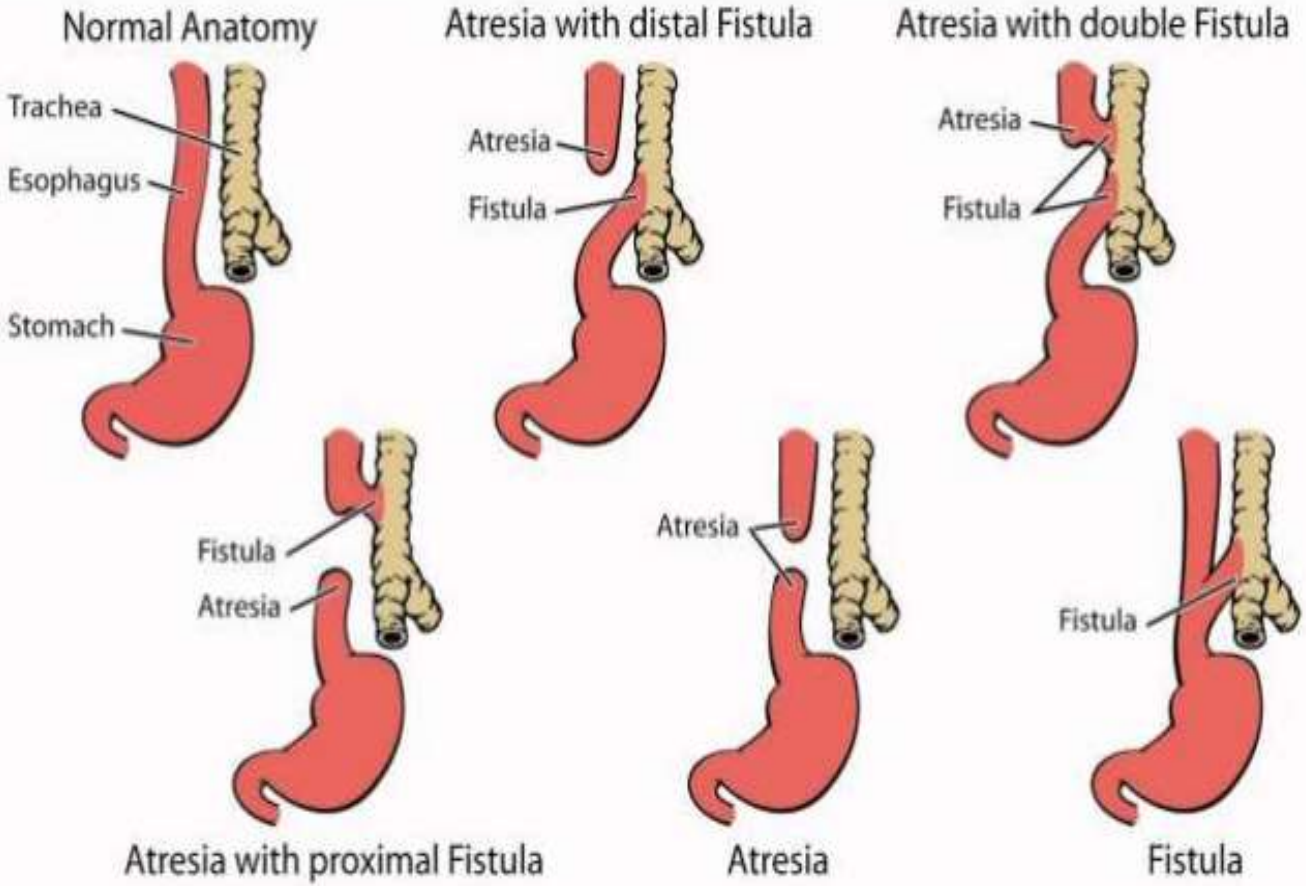
 Due to inflammation and scarring

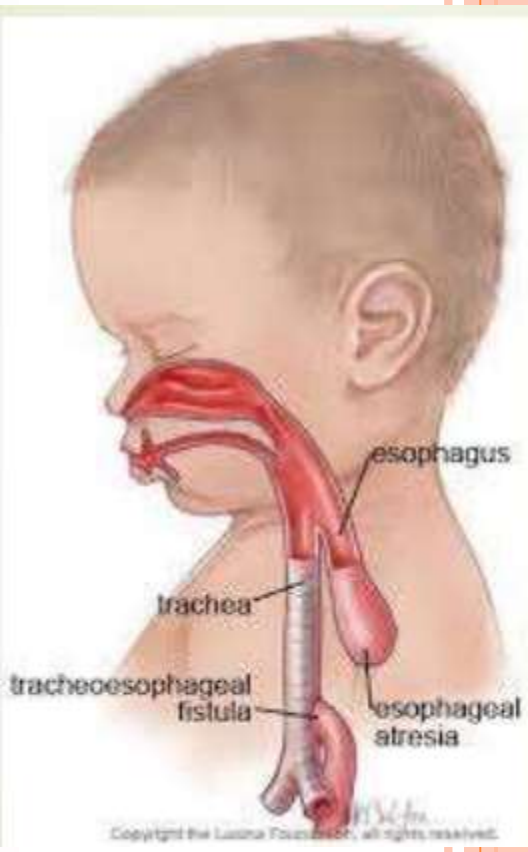
 Causes: Chronic GERD, Irradiation and Ingestion of caustic agents.

- **Clinical presentation :** Progressive dysphagia and difficulty eating solids that progresses to problems with liquids.

2- Absence, or agenesis, of the esophagus is extremely rare.

3- Atresia, in which a thin, noncanalized cord replaces a segment of esophagus. **Clinical presentation:** Shortly after birth: regurgitation during feeding Needs prompt surgical correction (rejoin). Complications if w/ fistula: Aspiration Suffocation Pneumonia Severe fluid and electrolyte imbalances.


Normal Anatomy
Trachea
Esophagus
Stomach
Atresia with distal Fistula
Atresia
Fistula
Atresia with double Fistula
Atresia
Fistula
Fistula
Atresia
Atresia with proximal Fistula
Atresia
Atresia
Fistula
Fistula


esophagus
trachea
tracheoesophageal fistula
esophageal atresia

Functional Obstruction:

 Efficient delivery of food and fluids to the stomach requires coordinated waves of peristaltic contractions.

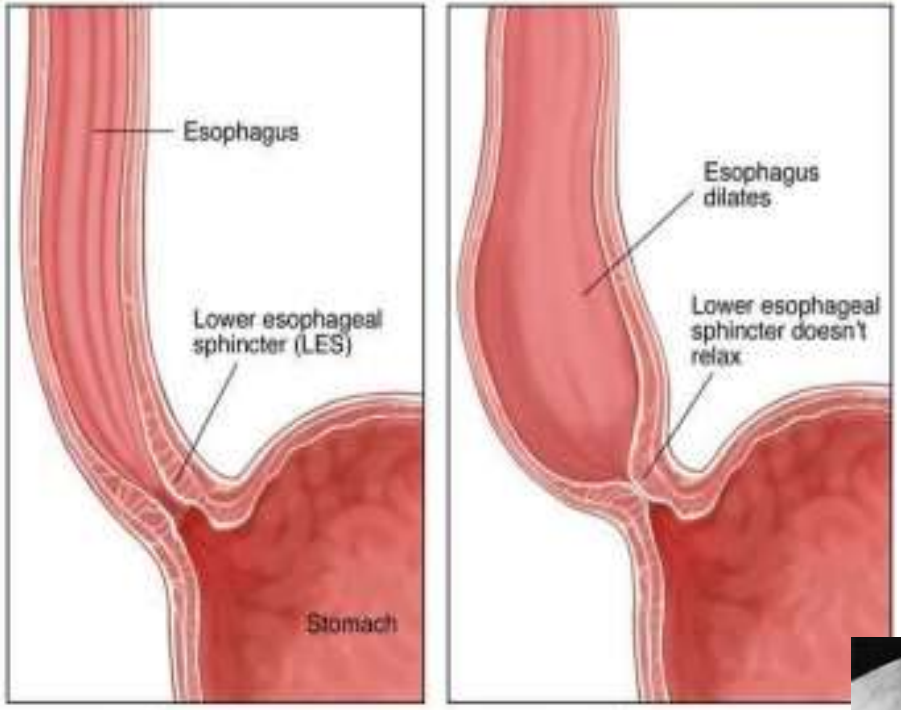
 Esophageal dysmotility: discoordinated peristalsis or spasm of the muscularis.

 Achalasia: the most important cause.

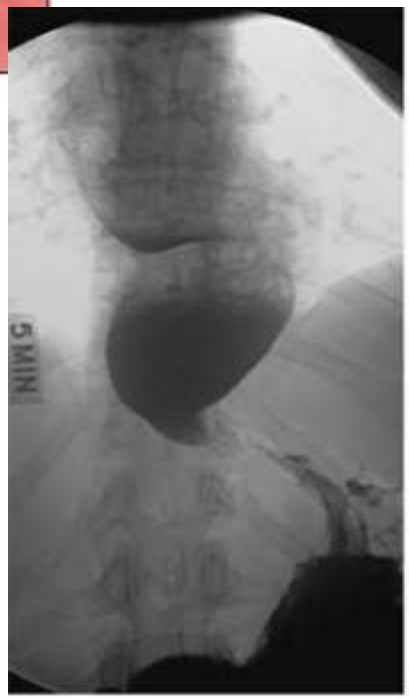
-Achalasia is characterized by the triad of incomplete LES relaxation, increased LES tone, and esophageal aperistalsis.

- Caused by Degenerative changes in neural innervation.

- Can be primary or secondary.
- Clinical presentation : Difficulty in swallowing, Regurgitation and sometimes chest pain



Normal **Achalasia**



Source: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J: *Harrison's Principles of Internal Medicine, 18th Edition*: www.accessmedicine.com

- Esophageal Varices

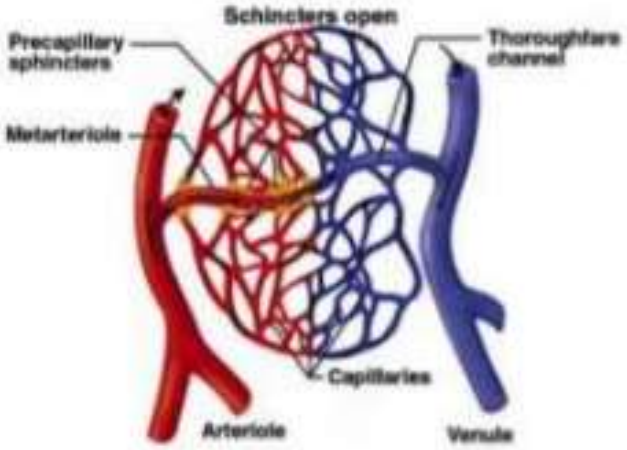
- Portal hypertension induces development of collateral channel that enlarge the subepithelial and submucosal venous plexi within the distal esophagus.

- Develop in 90% of cirrhotic patients, most commonly in association with alcoholic liver disease. Worldwide, hepatic schistosomiasis is the second most common cause of varices.

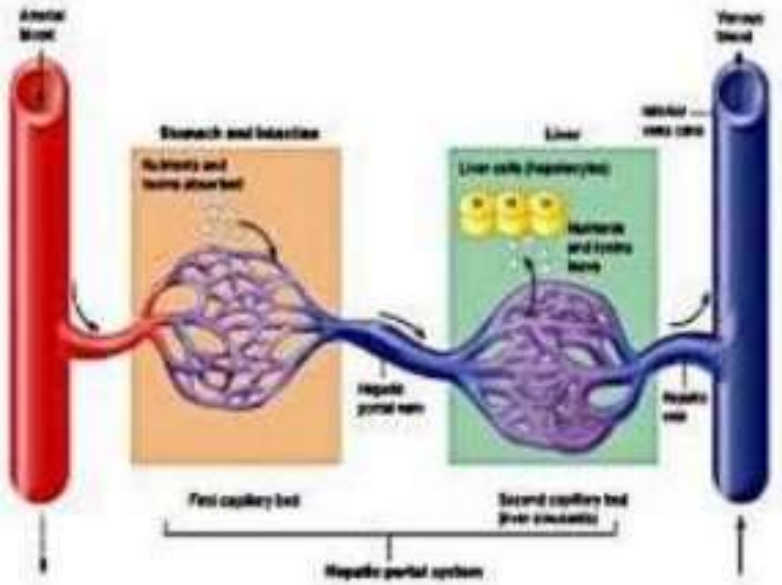
- Varices often are asymptomatic, but their rupture can lead to massive hematemesis and death.
- Diagnosis by: endoscopy or angiography.

Portal system

Usual circulation

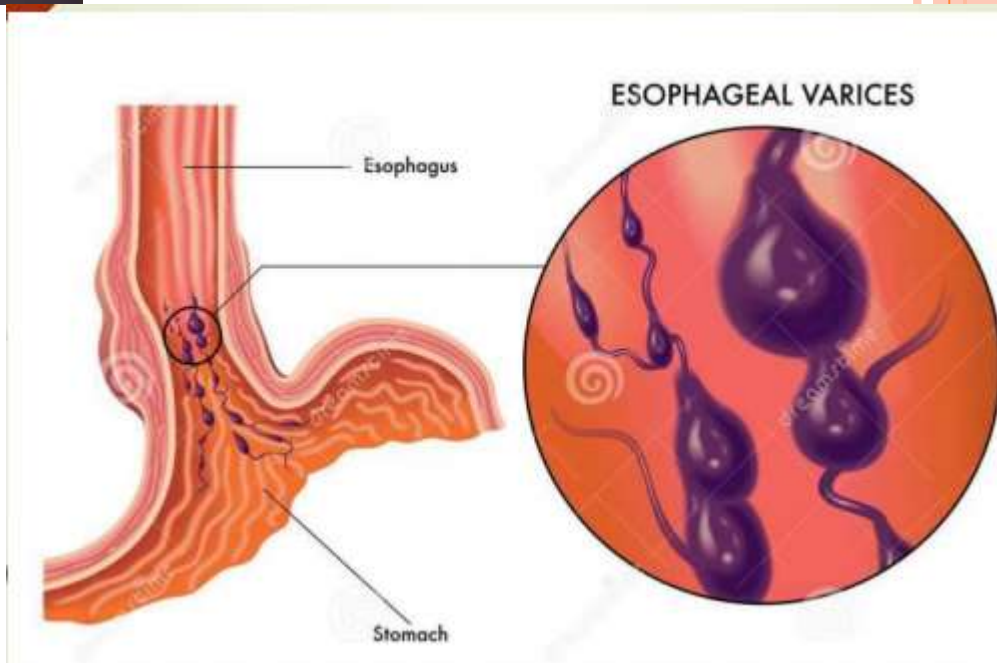


Portal circulation



Five sites of portal/systemic circulation :

1. Lower third of the Esophagu
2. Paraumbilical Area
3. Upper end of Anal canal
4. Retroperitonial
5. Bare area of liver


ESOPHAGEAL VARICES
Esophagus
Stomach

LACERATIONS

-The most common esophageal lacerations are *Mallory- Weiss tears,* which are often associated with severe retching or vomiting.

- By contrast, *Boerhaave syndrome,* characterized by transmural esophageal tears and mediastinitis, occurs rarely and is a catastrophic event. Linear lacerations longitudinally oriented, Cross the GEJ, Superficial and Heal quickly , no surgical intervention

ESOPHAGITIS

1- Chemical and Infectious Esophagitis

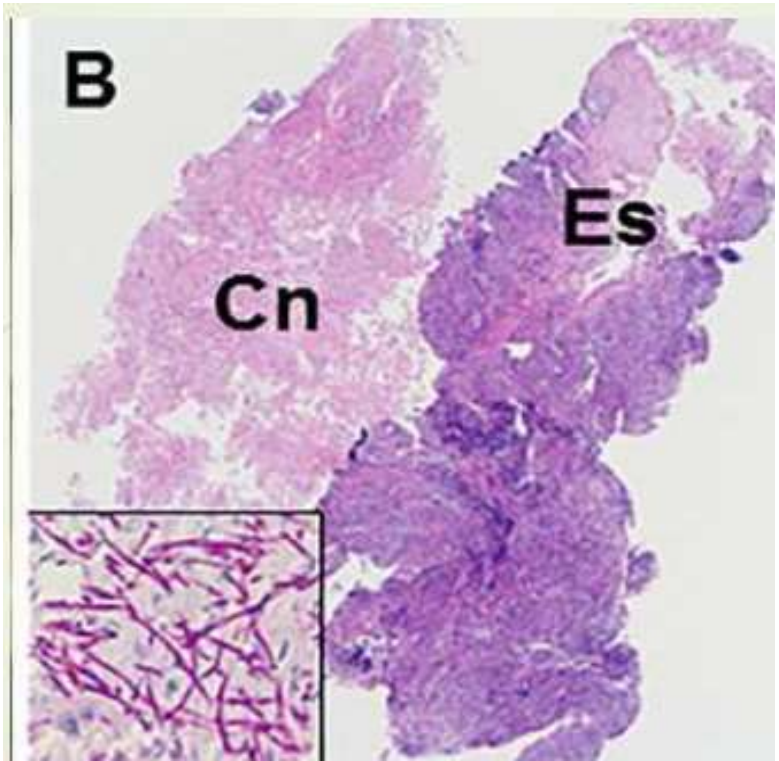
- Medicinal pills may lodge and dissolve in the esophagus, rather than passing into the stomach intact, resulting in a condition termed *pill-induced esophagitis*.
- Esophagitis due to chemical injury generally causes only

self-limited pain, particularly *odynophagia* (pain with swallowing). Hemorrhage, stricture, or perforation may occur in severe cases.

- Iatrogenic esophageal injury may be caused by cytotoxic *chemotherapy*, *radiation therapy*, or *graft-versus-host disease*.
- Candidiasis is characterized by adherent, graywhite

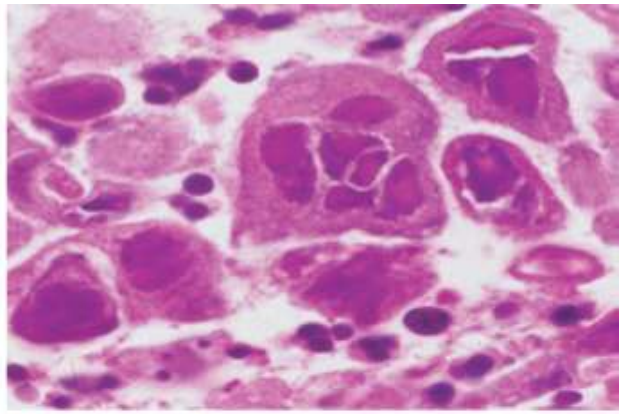
pseudomembranes composed of densely matted fungal hyphae and inflammatory cells covering the esophageal mucosa.

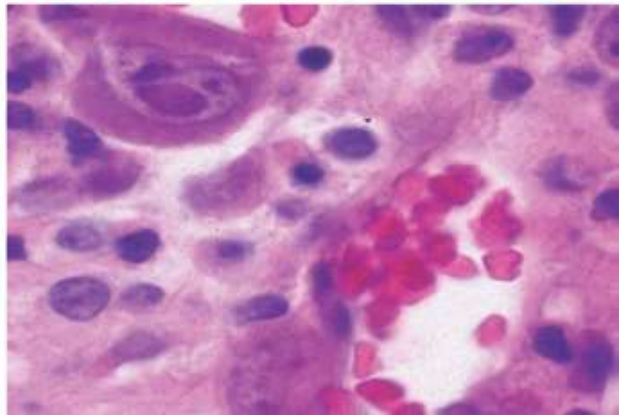

white-yellowish
patchy distribution


B
Cn
Es

Herpesviruses typically cause punched-out ulcers and histopathologic analysis demonstrates nuclear viral inclusions within a rim of degenerating epithelial cells at the ulcer edge).

CMV causes shallower ulcerations and characteristic nuclear and cytoplasmic inclusions within capillary endothelium and stromal cells.





Reflux Esophagitis AND *gastroesophageal reflux disease* (GERD)

- Reflux of gastric contents into the lower esophagus
- Most frequent cause of esophagitis
- Most common complaint by patients
- Gastroesophageal reflux disease, GERD
- Squamous epithelium is sensitive to acids
- Protective forces: mucin and bicarbonate, high LES Tone.

Pathogenesis

- Decreased lower esophageal sphincter tone (alcohol, tobacco, CNS depressants)
- Increase abdominal pressure (obesity,, pregnancy, hiatal hernia, delayed gastric emptying, and increased gastric volume)
- Idiopathic!!

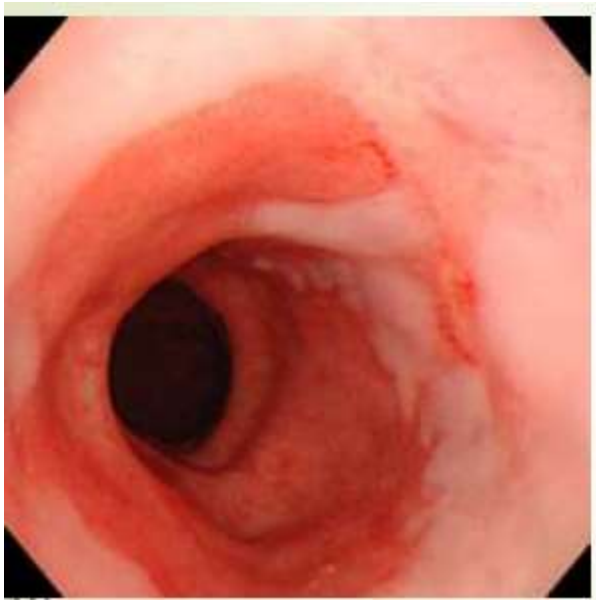
MORPHOLOGY

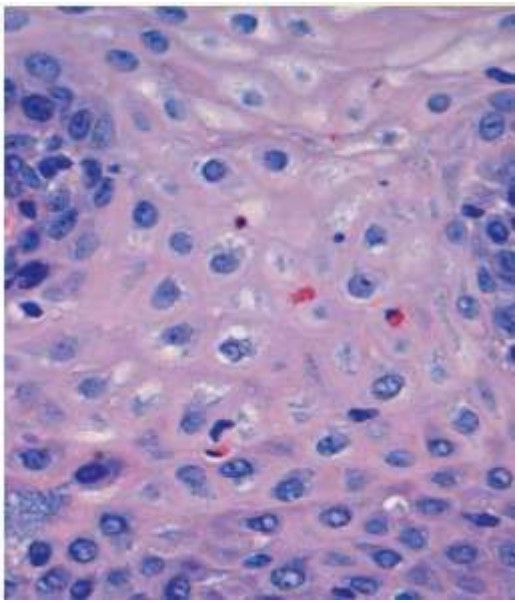
 Macroscopy (endoscopy)

Depends on severity (Unremarkable, Simple hyperemia (red)

 Microscopic:

- Eosinophils infiltration
- Followed by neutrophils (more severe).
- Basal zone hyperplasia
- Elongation of lamina propria papillae





Clinical Features

- Most common over 40 years.
- May occur in infants and children
- Heartburn , dysphagia,
- Regurgitation of sour-tasting gastric contents
- Rarely: Severe chest pain, mistaken for heart disease

- Tx: proton pump inhibitors

Complications

- Esophageal ulceration
- Hematemesis
- Melena
- Strictures
- Barrett esophagus (precursor of Ca.)

Hiatal hernia is characterized by separation of the diaphragmatic crura and protrusion of the stomach into the thorax through the resulting gap.

Eosinophilic Esophagitis

 Chronic immune mediated disorder

 Symptoms:

- Food impaction and dysphagia in adults
- Feeding intolerance or GERD-like symptoms in children

 Endoscopy:

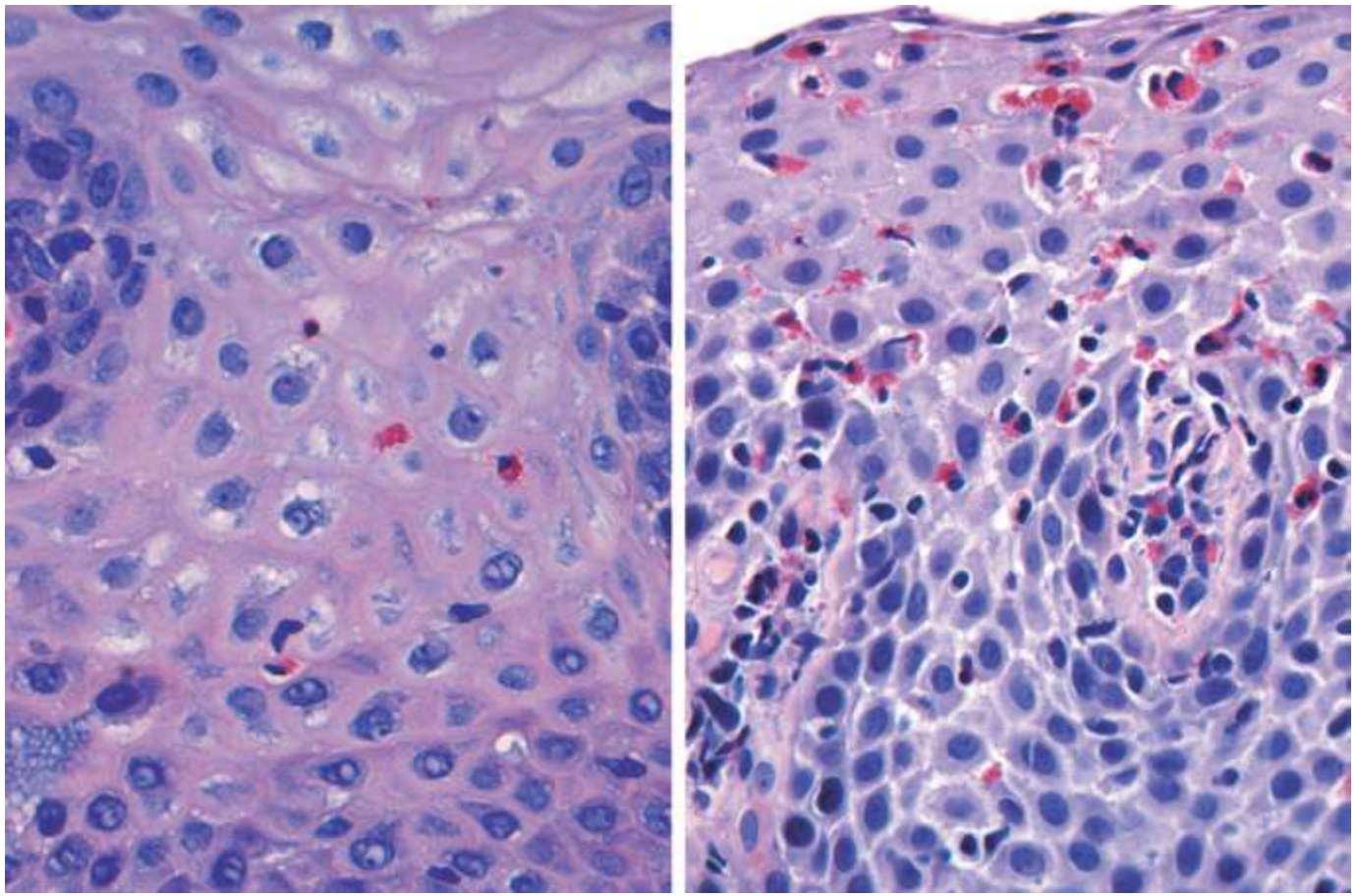
Rings in the upper and mid esophagus.

 Microscopic:

- Numerous eosinophils w/n epithelium
- Far from the GEJ.

- Most patients are: atopic (atopic dermatitis, allergic rhinitis, asthma) or modest peripheral eosinophilia.

- Tx: - Dietary restrictions(cow milk and soy products)
  - Topical or systemic corticosteroids.
  - Refractory to PPIs.



Barrett esophagus

- *Barrett esophagus* is a complication of chronic GERD that is characterized by *intestinal metaplasia within the esophageal squamous mucosa*.

- The incidence of Barrett esophagus is 10% of persons with symptomatic GERD. White males are affected most often and typically present between 40 and 60 years of age.

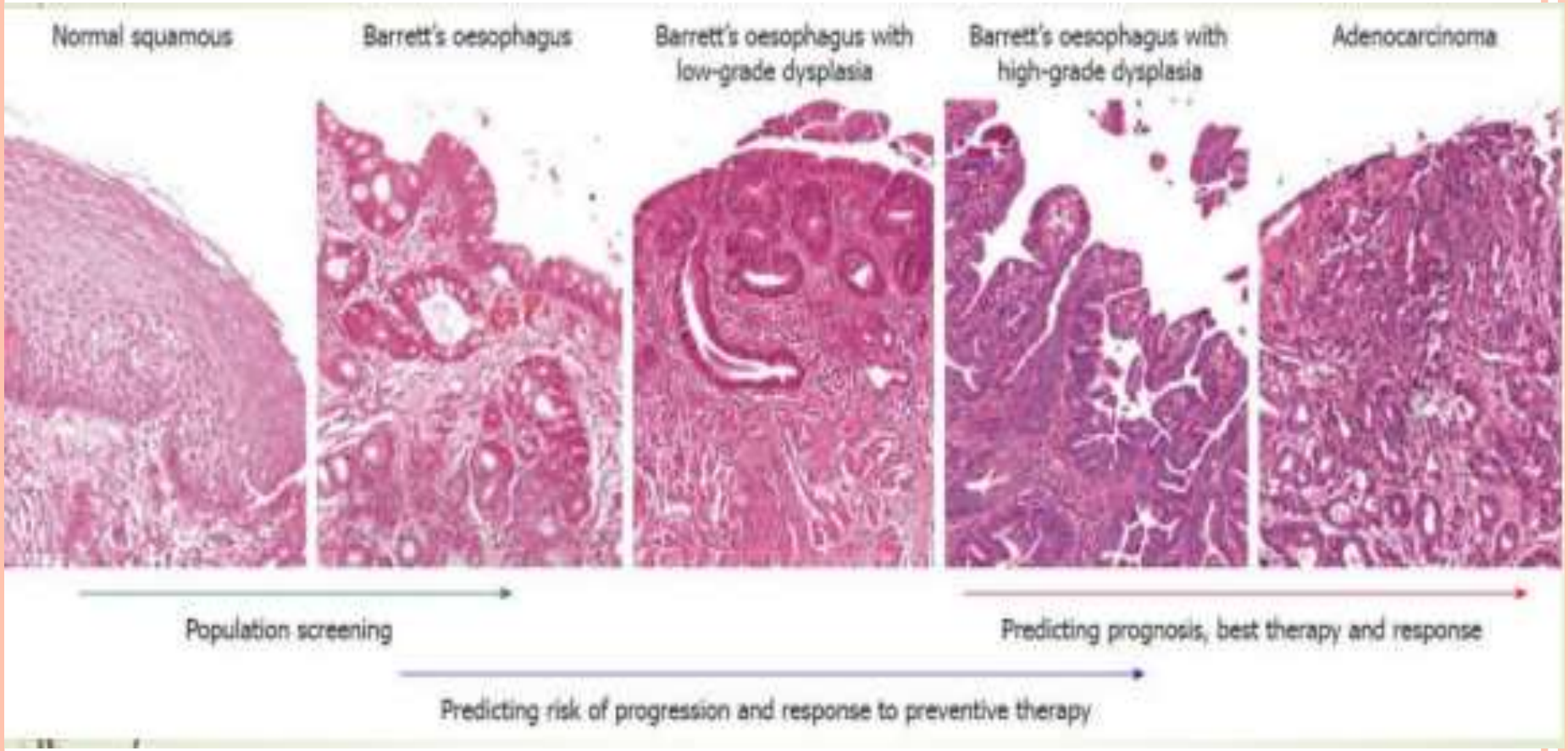
- Clinical Features Diagnosis of Barrett esophagus requires endoscopy and biopsy, usually prompted by GERD symptoms.

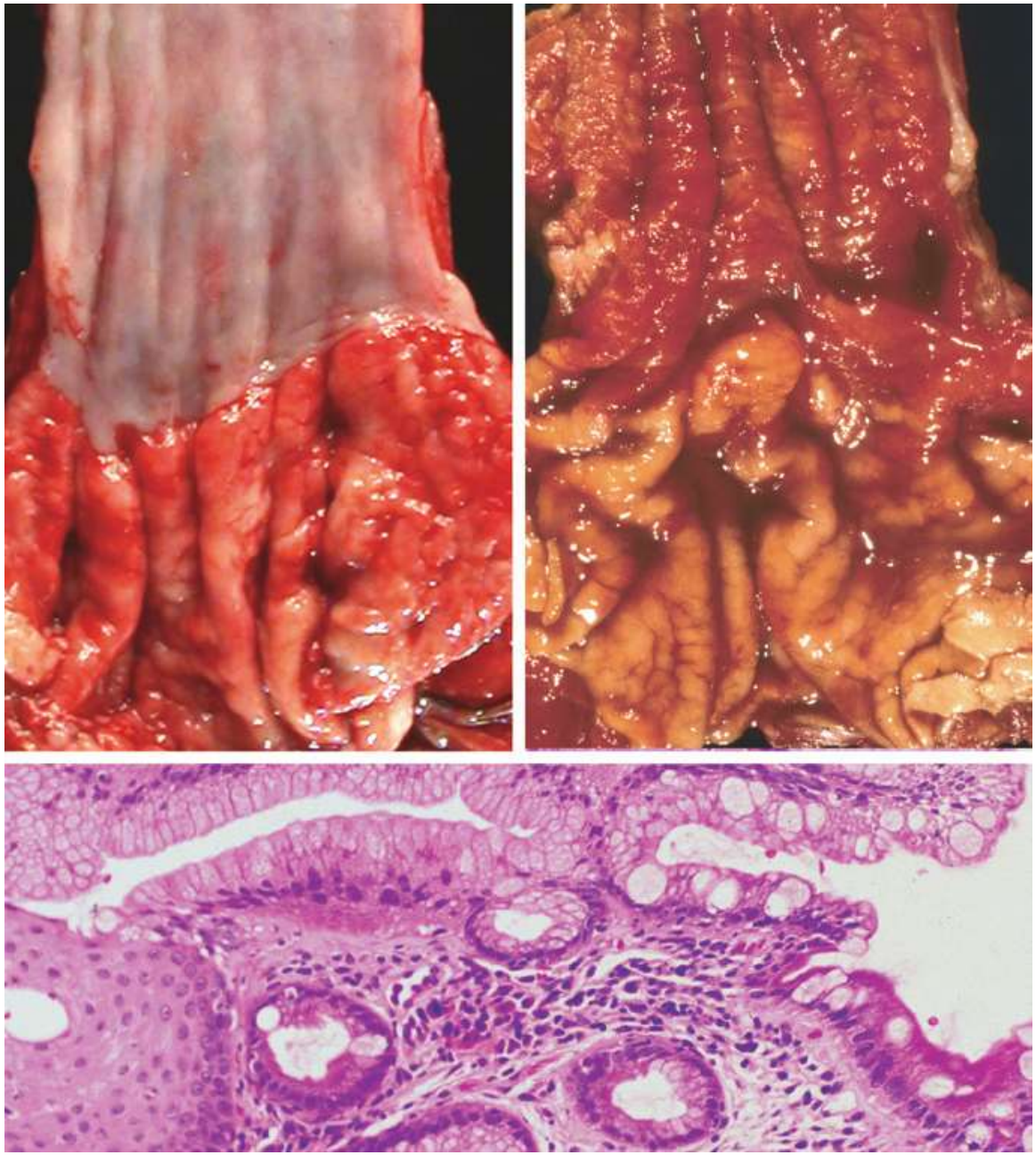
- Although the vast majority of esophageal adenocarcinomas are associated with Barrett esophagus, it should be noted that most persons with Barrett esophagus do not develop esophageal cancer.

- Barrett esophagus is recognized endoscopically as tongues or patches of red, velvety mucosa extending upward from the gastroesophageal junction.

- Histologically : documented gastric or intestinal metaplasia for diagnosis of Barrett esophagus. **Goblet cells**, which have distinct mucous vacuoles that stain pale blue by H&E and impart the shape of a wine goblet to the remaining cytoplasm.

- Dysplasia is classified as low-grade or high-grade on the basis of morphologic criteria. Intramucosal carcinoma is characterized by invasion of neoplastic epithelial cells into the lamina propria.


Normal squamous
Barrett's oesophagus
Barrett's oesophagus with low-grade dysplasia
Barrett's oesophagus with high-grade dysplasia
Adenocarcinoma
Population screening
Predicting prognosis, best therapy and response
Predicting risk of progression and response to preventive therapy



ESOPHAGEAL TUMORS

- Squamous cell carcinoma (most common worldwide)
- Adenocarcinoma (on the rise, half of cases

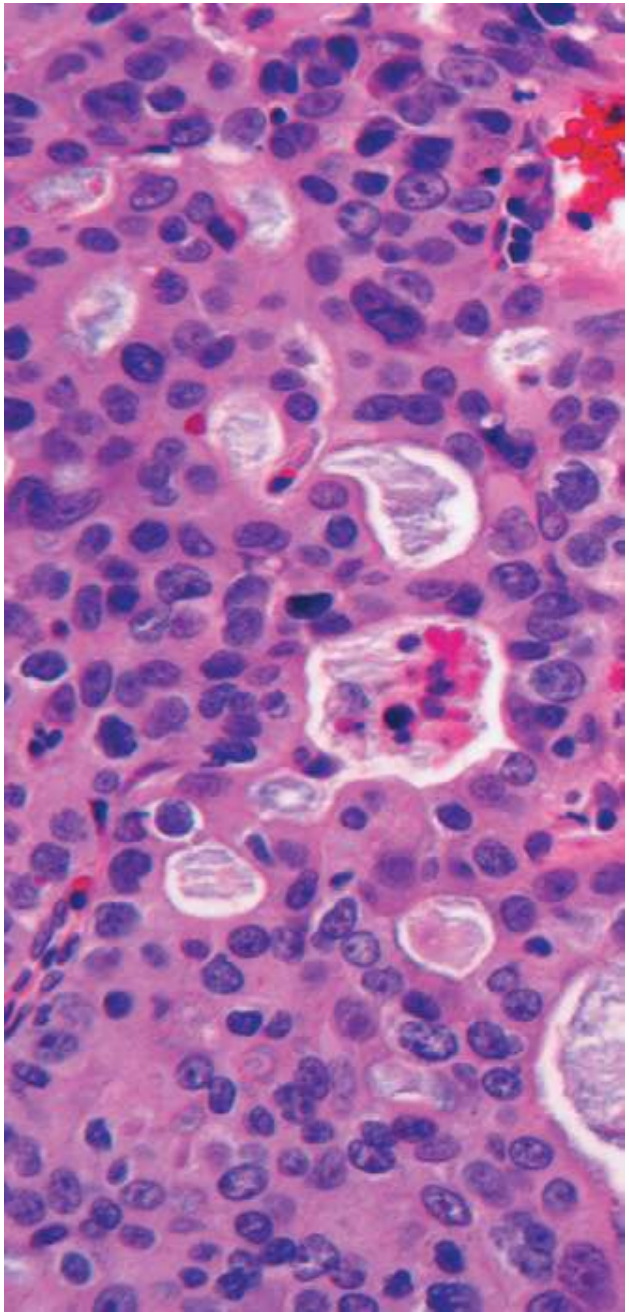
1- Esophageal adenocarcinoma typically arises in a background of Barrett esophagus and long-standing GERD.

- Risk of adenocarcinoma is tobacco use, obesity, and previous radiation therapy. Conversely, reduced adenocarcinoma risk is associated with diets rich in fresh fruits and vegetables.

- Esophageal adenocarcinoma occurs most frequently in whites and shows a strong gender bias, being seven times more common in men than in women.

- Esophageal adenocarcinoma usually occurs in the distal third of the esophagus and may invade the adjacent gastric cardia.While early lesions may appear as flat or raised patches in otherwise intact mucosa, tumors may form large exophytic masses, infiltrate diffusely, or ulcerate and invade deeply.

- It manifests with pain or difficulty in swallowing, progressive weight loss, chest pain, or vomiting.



- Exophytic infiltrative mass
- Microscopy:

Forms glands and mucin

2- squamous cell carcinoma of the esophagus

- It occurs in adults older than 45 years of age and affects males four times more frequently than females.

- Risk factors include alcohol and tobacco use, poverty, caustic esophageal injury, achalasia, Plummer-Vinson syndrome, frequent consumption of very hot beverages, and previous radiation therapy to the mediastinum.

- In contrast to the distal location of most adenocarcinomas, half of squamous cell carcinomas occur in the middle third of the esophagus.

- Clinical manifestations of squamous cell carcinoma of the esophagus begin insidiously and include dysphagia, odynophagia (pain on swallowing), and obstruction.

- Early lesions appear as small, gray-white plaquelike thickenings. Over months to years they grow into tumor masses that may be polypoid and protrude into and obstruct the lumen. Other tumors are either ulcerated or diffusely infiltrative lesions.

Squamous cell carcinoma composed of nests of malignant cells that partially recapitulate the stratified organization of squamous epithelium.