Diseases of the digestive system

ORAL CAVITY

Diseases of the oral cavity can be divided into two groups:-

1- those affecting the soft tissues (including the mucosa and salivary glands) .

2- those that involve the teeth .

A-Ulcerative and inflammatory lesions

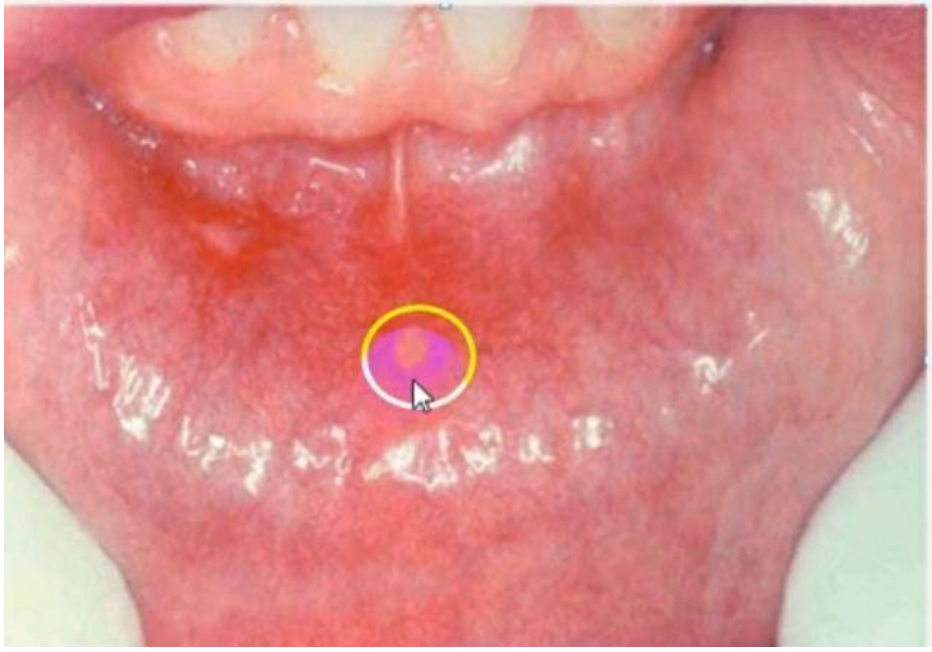
1- Aphthous Ulcers (Canker Sores)

- These lesions are common, small ,painful, shallow ulcers. Characteristically, they take rounded , superficial erosions , often covered by a gray-white exudate and having an erythematous rim.

- The lesions appear on the nonkeratinized oral mucosa, particularly the soft palate, buccolabial mucosa, floor of the mouth, and lateral borders of the tongue.

- They are caused by exposure to stress, fever, ingestion of certain foods .

- The canker sores are self-limited and usually resolve within a few weeks, but they may recur in the same or a different location in the oral cavity.



2- Herpesvirus Infection

Herpetic stomatitis is an extremely common infection caused by herpes simplex virus (HSV) type 1. The pathogen is transmitted from person to person, most often by kissing .

- The primary infection with virus is asymptomatic, but the virus persists in a dormant state within ganglia about the mouth (e.g., trigeminal ganglia).

- The reactivation of the virus is by (trauma, allergies, exposure to ultraviolet light, upper respiratory tract infections, pregnancy, immunosuppression, and exposure to extremes of temperature).

- Solitary or multiple small vesicles containing clear fluid. They occur most often on the lips or about the nasal orifices and are well known as **cold sores or fever blisters**. They soon rupture, leaving shallow, painful ulcers that heal within a few weeks, but recurrences are uncommon.

Histology

The vesicles begin as an intraepithelium as intercellular and intracellular edema. The infected cells become ballooned and develop **intranuclear acidophilic viral inclusions.** Sometimes adjacent cells fuse to form giant cells known as **multinucleated Polykaryons**

herpes simplex virus (HSV) type 2 is transmitted sexually and produces vesicles on the genital mucous membranes and external genitalia.

3- Oral Candidiasis

Candida albicans is a normal inhabitant of the oral cavity . it causes disease only when there is some impairment of the usual protective mechanisms.

The three major forms of oral candidiasis are pseudomembranous , erythematous, and hyperplastic.

Pseudomembranous candidiasis (thrush, moniliasis) is the most common fungal infection of the oral cavity among persons with:-

- diabetes mellitus .
- anemia.
- antibiotic or glucocorticoid therapy , immunodeficiency , disseminated cancer.

Morphology

oral candidiasis takes the form of an adherent white , curdlike, circumscribed plaque anywhere within the oral cavity . The pseudomembrane can be scraped off to reveal an underlying granular erythematous inflammatory base .

histologically Pseudomembranes is composed of a myriad of fungal organisms attached superficially to the underlying mucosa.

Candidiasis may spread in to the esophagus ,especially when nasogastric tube has been introduced , or it may produce widespread visceral lesions when the fungus gain entry in to blood stream.

Oral candidiasis ("thrush"). A white plaquelike membrane coats the gingival mucosa of the left lower jaw

B- Proliferative and neoplastic lesions of the oral cavity

*LEUKOPLAKIA AND ERYTHROPLAKIA

Leukoplakia refers to a whitish , well-defined mucosal patch or plaque caused by epidermal thickening or hyperkeratosis .

- They appear as localized , multifocal or diffuse , smooth or roughened , white , discrete areas of mucosal thickening in lower lip, tongue , buccal mucosa , the hard and soft palates, and less frequently on the floor of the mouth .

- On microscopic evaluation they vary from banal hyperkeratosis without underlying epithelial dysplasia to mild to severe dysplasia bordering on carcinoma in situ .

- Only histologic evaluation distinguishes these lesions.

- The lesions are strong association with :-

- The use of tobacco, particularly pipe smoking and smokeless tobacco (chewing).

- Chronic friction , as from ill-fitting dentures or jagged teeth .

- Alcohol abuse; and irritant foods .

- Oral leukoplakia is an important because undergo transformation to squamous cell carcinoma .


A

Erythroplakia is less common but more ominous than leukoplakia. it is refers to red, velvety, eroded area that is flat or slightly depressed relative to the surrounding mucosa .

Histologically , erythroplakia invariably reveals marked epithelial dysplasia (malignant transformation) so recognition of this lesion is more important than oral leukoplakia .

- Erythroplakia is greater risk to malignant transformatoin than leukoplakia

- Leukoplakia or erythroplakia may be seen in adults at any age (between 40 and 70 years of age with a 2:1 male : female .

- The most common risk factor for leukoplakia and Erythroplakia is tobacco use (cigarettes, pipes, and chewing tobacco).

Salivary gland diseases

Sialadenitis

Inflammation of the major salivary glands may be of traumatic, viral, bacterial, or autoimmune origin.

1- mumps : infectious viral disease which may produce enlargement of all the major salivary glands but predominantly the parotids .

Caused by a paramyxovirus

- Childhood mumps is self-limited

- Mumps in adults may be accompanied by pancreatitis or orchitis ; the latter sometimes causes permanent sterility .

2-*Bacterial sialadenitis* most often occurs secondary to ductal obstruction , may also arise after retrograde entry of oral cavity bacteria under conditions of severe systemic dehydration such as the postoperative state .

- The most common bacteria causing the infection are *Staphylococcus aureus* and *Streptococcus viridans* .

3- *autoimmune sialadenitis* which is almost invariably bilateral

childhood mumps infectious viral disease caused by a paramyxovirus

Salivary Gland Tumors

- About 80% of tumors occur within the parotid glands and most of the others in the submandibular glands .

- In the parotids 70% to 80% of these tumors are benign, whereas in the submaxillary glands only half are benign.

1- Benign *pleomorphic adenoma* is The dominant tumor arising in the parotids which is sometimes called a mixed tumor of salivary gland origin .

2- Much less frequent is *papillary cystadenoma lymphomatosum (Warthin tumor)*

Pleomorphic Adenoma (Mixed Tumor of Salivary Glands)

- This tumor accounts for more than 90% of benign tumors of the salivary glands .

- It is a slow-growing, well-demarcated, apparently encapsulated lesion .

- Most often arising in the superficial parotid .

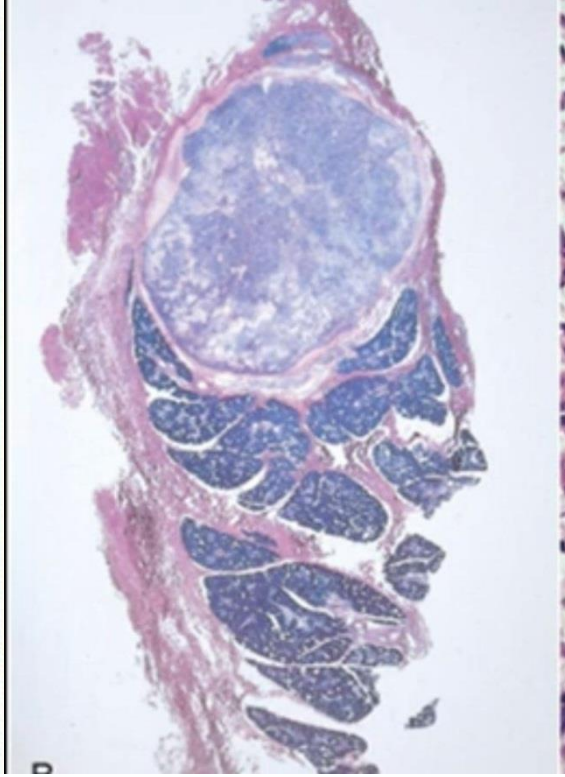
Morphology

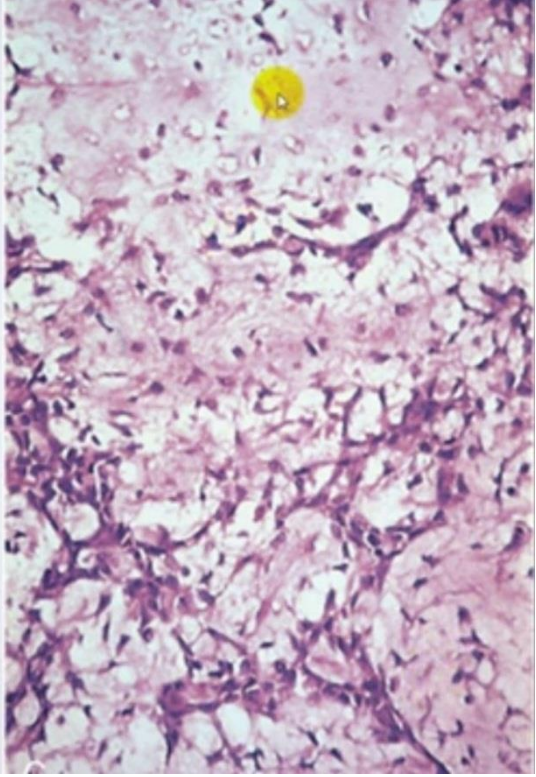
- histologic feature of pleomorphic adenoma is heterogeneity .

- The tumor cells form ducts, acini , tubules, strands, or sheets of cells.

- These epithelial elements are intermingled with a loose, often myxoid connective tissue stroma sometimes containing islands of apparent cartilage or, rarely, bone.

- When primary or recurrent benign tumors are present for many years the transformation may occur referred to as malignant mixed salivary gland tumor .





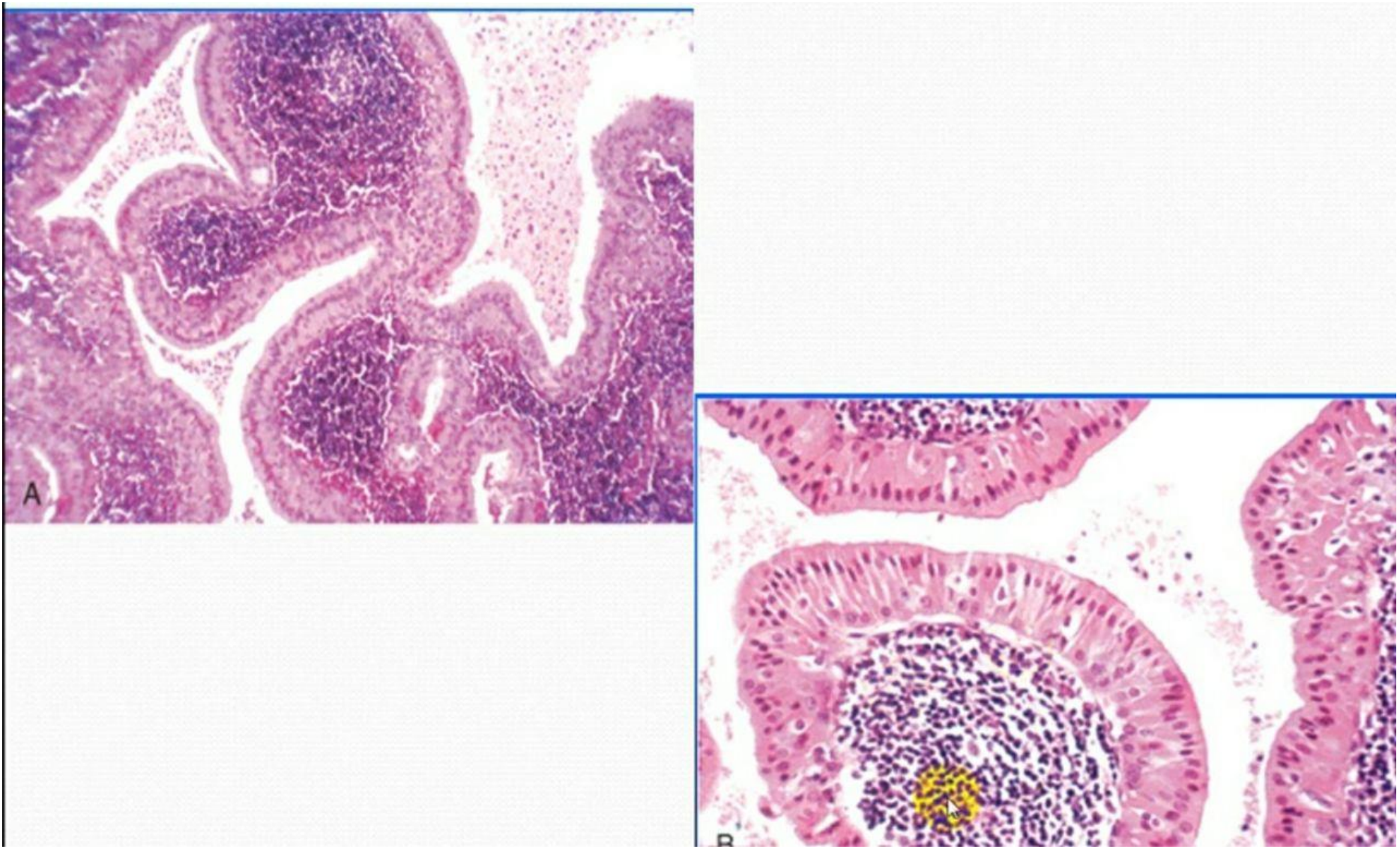
Pleomorphic Adenoma

Warthin Tumor (Papillary Cystadenoma Lymphomatosum, Cystadenolymphoma)

This infrequent benign tumor occurs virtually only in the region of the parotid gland and is thought to arise from heterotopic salivary tissue **trapped** within a regional lymph node during embryogenesis .

Microscopically

it exhibits two characteristic features: (1) a two epithelial layer lining the branching, cystic, or cleftlike spaces; and (2) well-developed lymphoid tissue sometimes forming germinal centers .



a two epithelial layer lining the branching, cystic, or cleftlike spaces; and subjacent, well-developed lymphoid tissue sometimes forming germinal centers

Esophagus

Lesions of the esophagus range from bland esophagitis to highly lethal cancers, they evoke a similar and remarkably limited symptoms . All produce **dysphagia**, **Heartburn** (retrosternal burning pain). **Hematemesis** (vomiting of blood) and **melena** (blood in the stools) are evidence of severe inflammation, ulceration, or laceration of the esophageal mucosa.

A- Anatomic and motor disorders

1- Hiatal hernia

Hiatal hernia is separation of the diaphragmatic crura and widening of the space between the muscular crura and the esophageal wall permits a dilated segment of the stomach to protrude above the diaphragm .

Two anatomic patterns are recognized :-

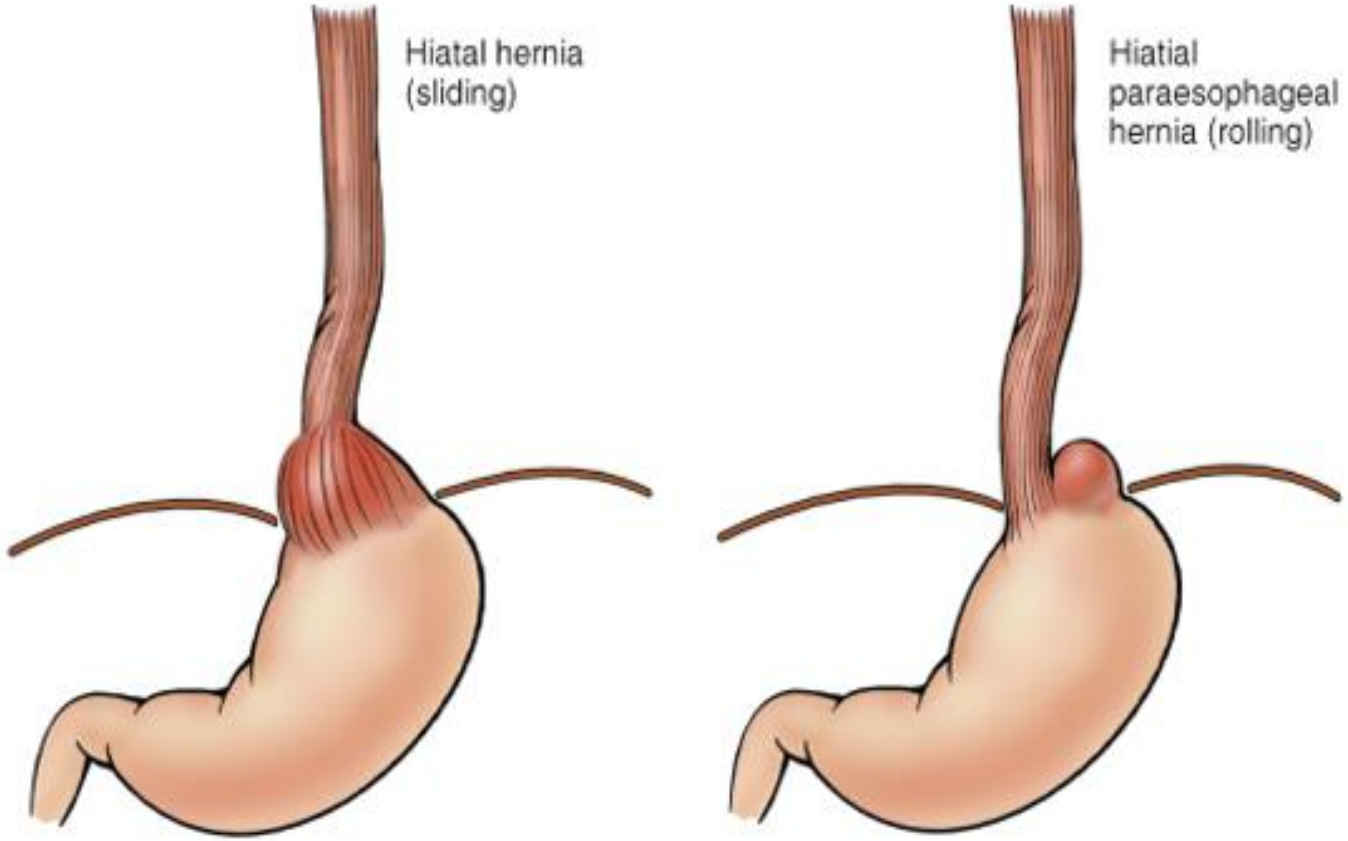
1- The axial or *sliding hernia :-* constitutes 95% of cases; protrusion of the stomach above the diaphragm creates a bell-shaped dilation, bounded below by the diaphragmatic narrowing .

2- non axial or *paraesophageal hernias*:- **a** separate portion of the stomach, usually along the greater curvature, enters the thorax through the widened foramen.

The cause of this deranged is obscure.

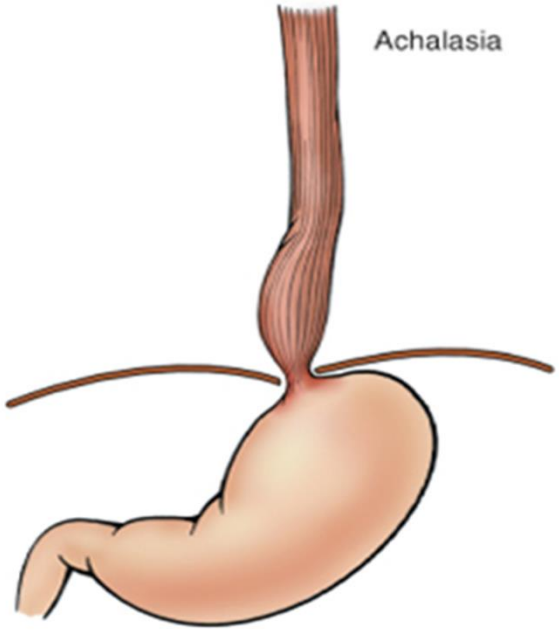
Clinical Presentation

In adult with progressive dysphagia to solids and eventually to all foods; heartburn or regurgitation of gastric juices into the mouth.



2- Achalasia

The term ***achalasia*** means "**failure to relax**," or **incomplete relaxation of the lower esophageal sphincter in response to swallowing.** This produces functional obstruction of the esophagus, with consequent dilation of the more proximal esophagus .



Three major abnormalities in achalasia:

(1) defect in peristaltic contractions (aperistalsis) .

(2) partial or incomplete relaxation of the lower esophageal sphincter with swallowing.

(3) Increase resting tone of the lower esophageal sphincter .

Etiology

Types of achalasia

A- Primary achalasia there is loss of intrinsic inhibitory innervation of the lower esophageal sphincter and smooth muscle of the esophageal body .

B- Secondary achalasia may arise from pathologic processes that impair esophageal function .

The classic example is **Chagas disease**, caused by *Trypanosoma cruzi*, which causes destruction of the **myenteric plexus** of the esophagus, duodenum, colon, and ureter.

Morphology

- dilation of esophagus above the level of the lower esophageal sphincter
- The myenteric ganglia are usually absent from the body of the esophagus
- Inflammation in the location of the esophageal myenteric plexus is pathognomonic of the disease.

Achalasia is characterized clinically by progressive dysphagia and inability to completely convey food to the stomach. Nocturnal regurgitation and aspiration of undigested food may occur.

Complication: is the hazard of developing esophageal squamous cell carcinoma, occur in about 5% of patients than in those without achalasia.

3- Lacerations (Mallory-Weiss Syndrome)

it's a **longitudinal tears** in the esophagus at the esophagogastric junction .

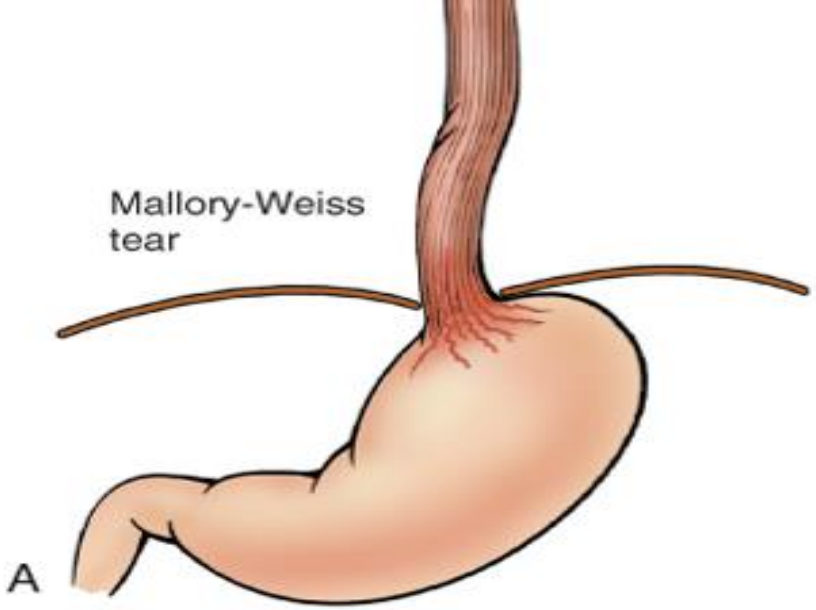
Etiology: They are encountered in chronic alcoholics after a bout of severe retching or vomiting, but they may also occur during acute illnesses with severe vomiting .

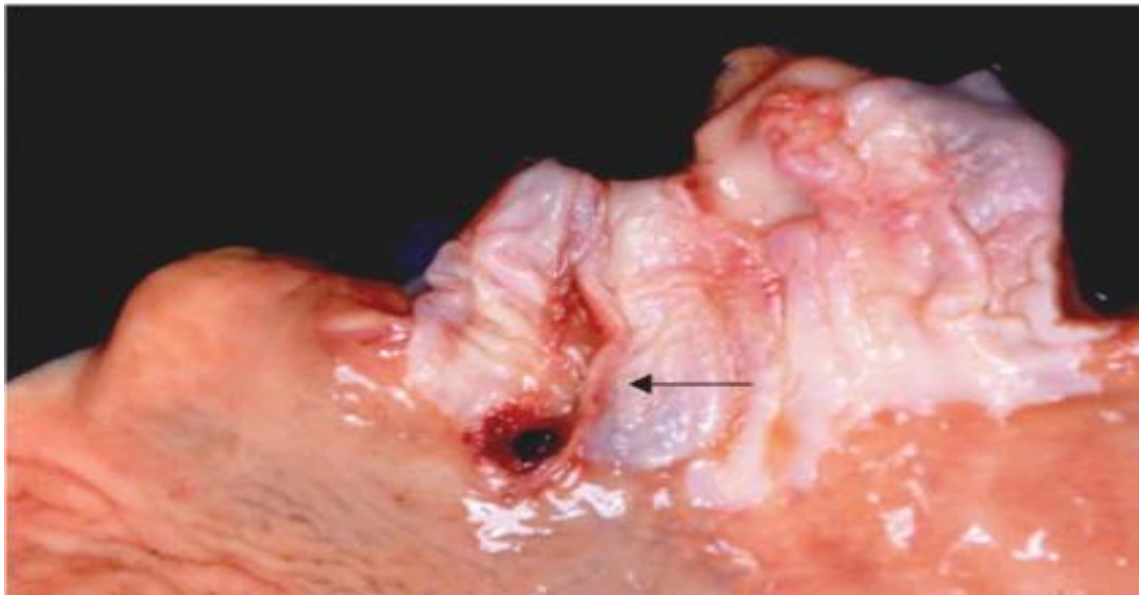
Pathogenesis

Is may be due to inadequate relaxation of the musculature of the lower esophageal sphincter during vomiting , with stretching and tearing of the esophagogastric junction at the moment of propulsive expulsion of gastric contents.

Morphology

Tears may involve only the mucosa or may penetrate the wall of esophagus





A, Longitudinal tears in the esophagogastric junction. **B,** Gross photograph demonstrating longitudinal lacerations oriented in the axis of the esophageal lumen

4- Varices

- One of the potential sites for communication between the intra-abdominal splanchnic circulation and the systemic venous circulation is through the esophagus.
- Varices occur when portal venous blood flow into the liver is impeded by cirrhosis or other causes, the resultant portal hypertension induces the formation of collateral bypass channels wherever the portal and systemic systems communicate .

- Portal blood flow is diverted through the stomach veins into the plexus of esophageal subepithelial and submucosal veins, then into the azygos veins and the inferior vena cava. The increased pressure in the esophageal plexus produces dilated tortuous vessels called **varices**.

Morphology

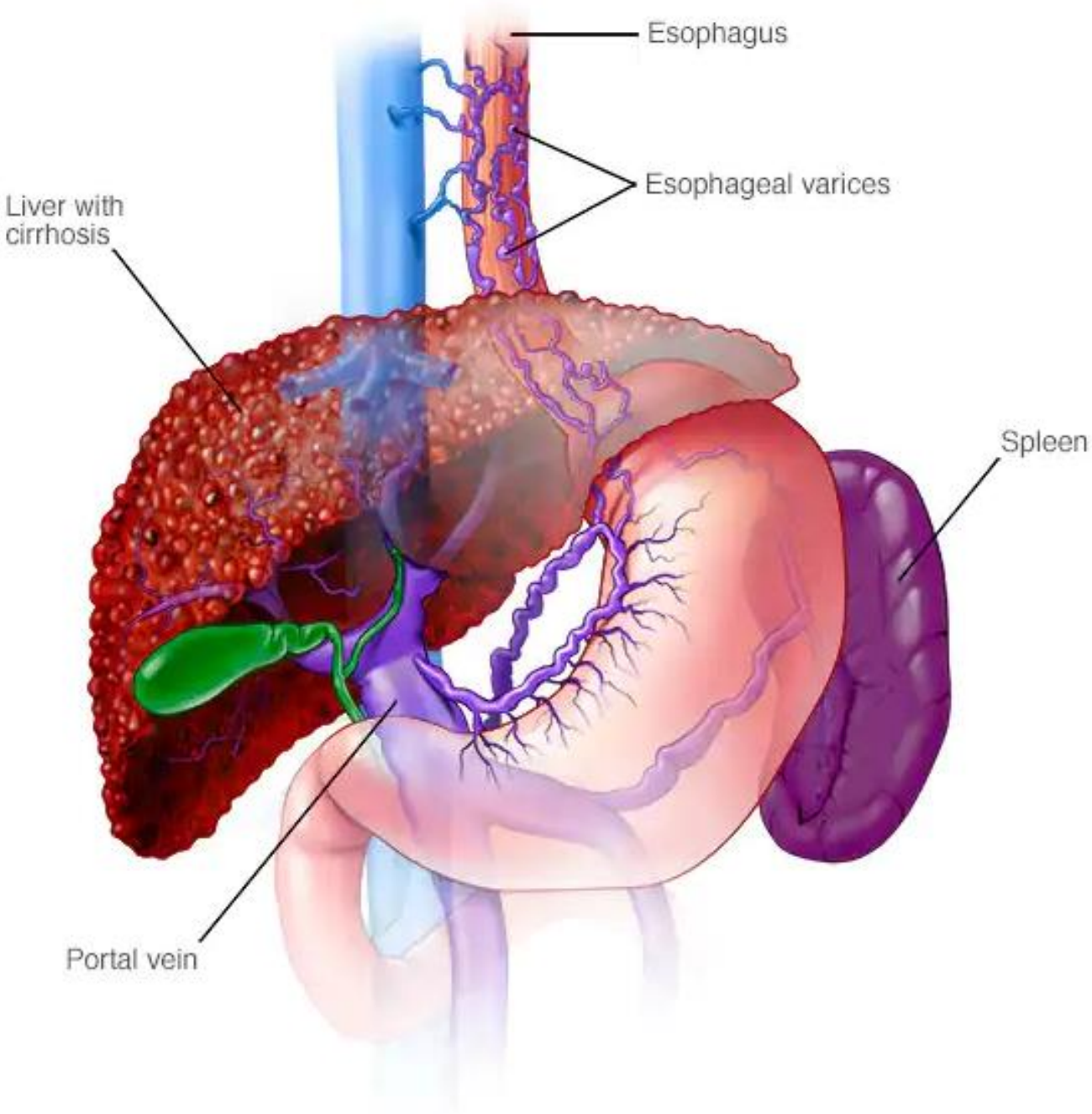
- Varices appear as **tortuous dilated veins** lying primarily within the submucosa of the distal esophagus and proximal stomach .

- The effect is irregular protrusion of the overlying mucosa into the lumen of esophagus

- Varices produce no symptoms until they rupture (asymptomatic).

Complication

- Variceal rupture produces massive hemorrhage into the lumen and death , as well as suffusion of blood into the esophageal wall.


Esophagus
Esophageal varices
Liver with cirrhosis
Spleen
Portal vein

Esophageal varices

B - INFLAMMATORY DISORDERS

1- ESOPHAGITIS

- is inflammation of esophageal mucosa.

- This inflammation caused by prolonged gastric intubation, alcohol, corrosive acids or alkalis, excessively hot fluids, and heavy smoking .

-The esophageal mucosa may also be injured when medicinal pills lodge and dissolve in the esophagus rather than passing into the stomach , a condition termed **pill-induced esophagitis**.

- Some cases are attributable to reflux of gastric contents (**reflux esophagitis**).

- Macroscopically **mild esophagitis** may appear as simple hyperemia, with virtually no histologic abnormality.

- In contrast, **in severe esophagitis** the mucosa shows confluent epithelial erosions or ulceration into the submucosa .

Reflux esophagitis

Is the esophagitis caused by reflux of gastric contents into the lower esophagus .

Causes

Decrease esophageal sphincter tone or increase abdominal pressure , alcohol and tobacco use, obesity, central nervous system depressants, pregnancy, hiatal hernia and increased gastric volume .

Symptoms

- The dominant symptom of reflux disease is heartburn, dysphagia , sometimes regurgitation of sour-tasting gastric contents .

- Chronic symptoms are punctuated by attacks of severe chest pain mimicking a heart attack .

Complications

include esophageal ulceration, hematemesis, melena, and Barrett esophagus , a precursor lesion to esophageal carcinoma.

2- BARRETT ESOPHAGUS

- Barrett esophagus is defined as the replacement of the **normal** distal stratified squamous mucosa by **metaplastic** columnar epithelium containing goblet cells.

- It is a complication of chronic gastroesophageal reflux .

- Prolonged and recurrent gastroesophageal reflux is thought to produce inflammation and eventually ulceration of the squamous epithelial lining of lower esophagus .

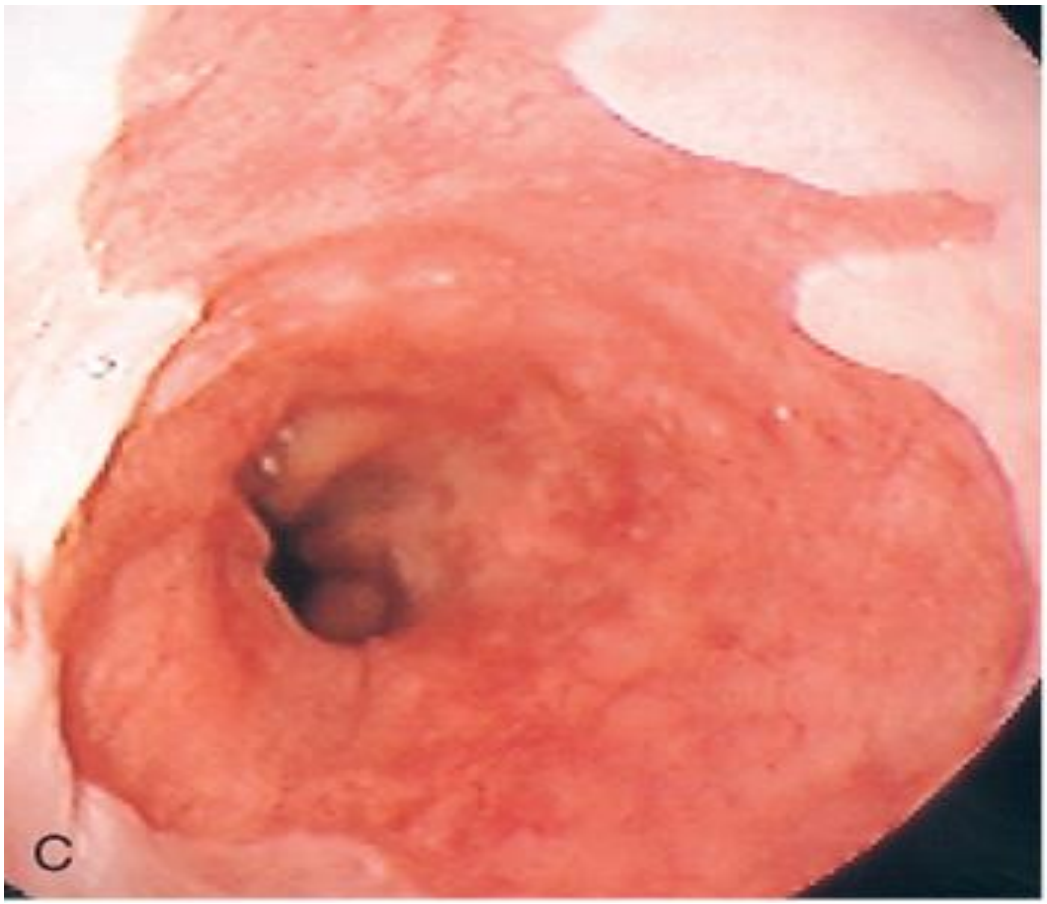
- Healing occurs by ingrowth of progenitor cells and re-epithelialization. abnormally low pH caused by acid reflux in the distal esophagus, the cells differentiate into columnar epithelium.

- Metaplastic columnar epithelium is thought to be more resistant to injury caused by refluxing of gastric contents .

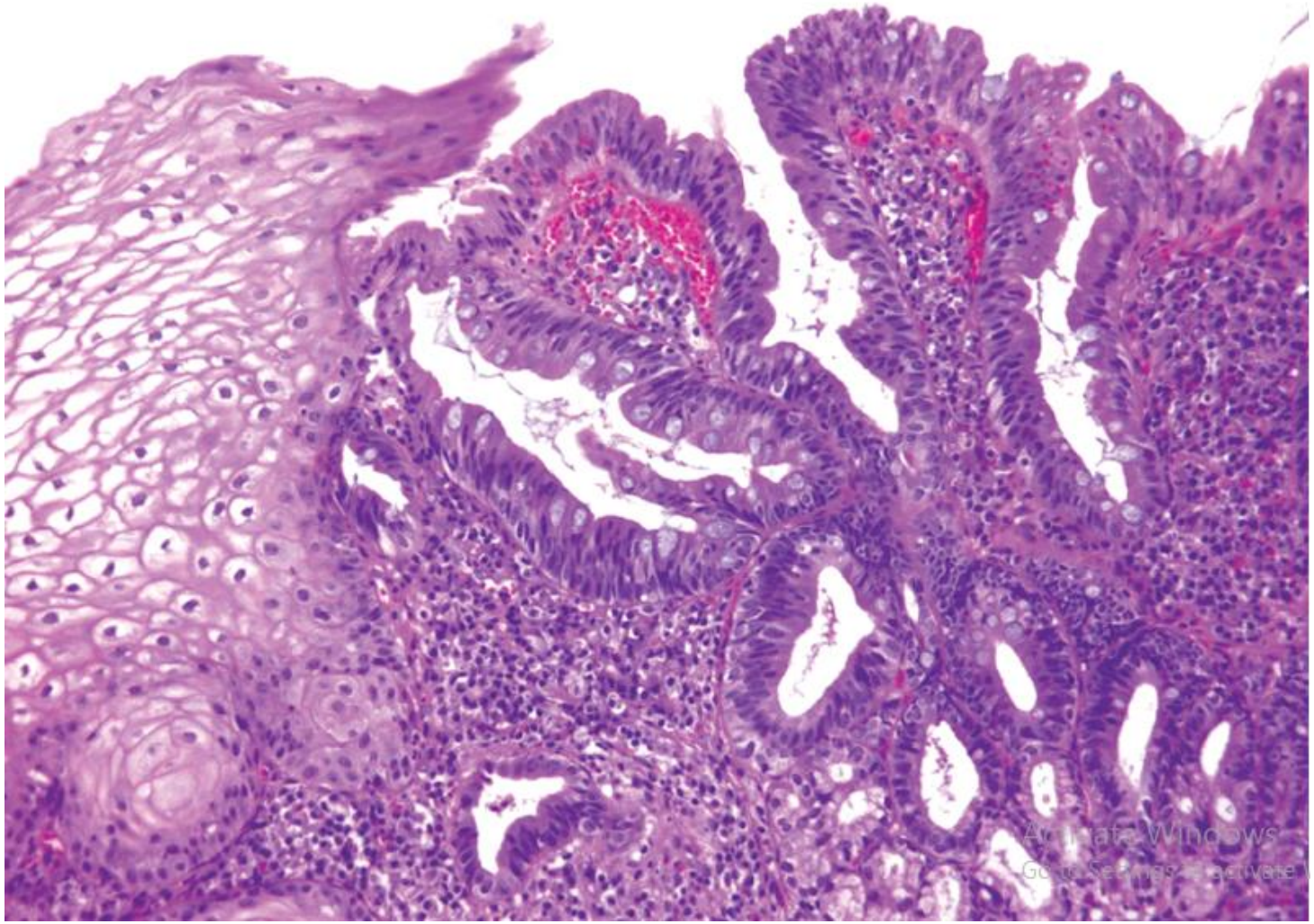
- The chief clinical significance of Barrett esophagus is the risk for the development of **adenocarcinoma.**

morphology

patches of red, velvety mucosa extending upward from the gastroesophageal junction .



Endoscopic view showing red velvety gastrointestinal-type mucosa extending from the gastroesophageal orifice



Barrett esophagus show replacement of esophageal squamous epithellium by metaplastic columnar epithelium

ESOPHAGEAL CARCINOMA

there are two types:-

1- squamous cell carcinomas:- occur in any side of esophagus but mostly in upper and middle third .

2-adenocarcinomas : - occur in lower third .

Etiology and pathogenesis of SCC

- Risk factors include alcohol and tobacco use ,

achalasia , frequent consumption of very hot beverages, and previous radiation therapy to the mediastinum.

- mutagenic compounds, such as those found in fungus-contaminated foods.

- There also strong association with human **papilloma virus** is noted in high-incidence areas .

- The molecular pathogenesis of esophageal squamous cell carcinoma remains incompletely defined.

Morphology

A- Squamous cell carcinomas

lesions appear as small, gray-white, thickenings or elevations of the mucosa .

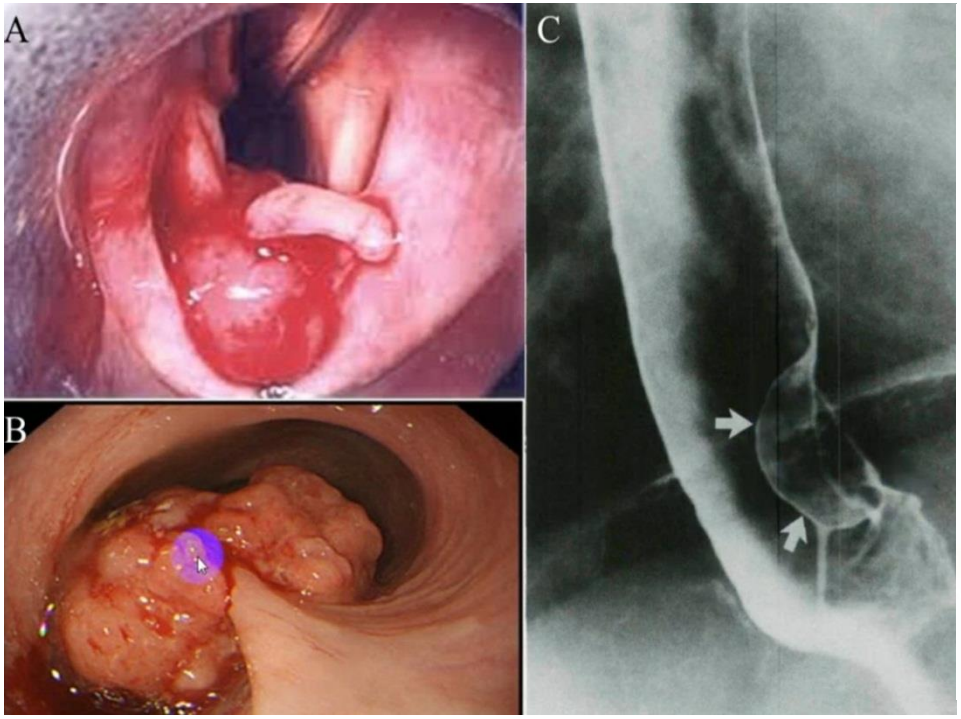
These lesions taking one of three forms:

(1) polypoid exophytic masses that protrude into and obstruct the lumen.

(2) necrotizing cancerous ulcerations

(3) diffuse infiltrative neoplasms that cause thickening and rigidity of the wall and narrowing of the lumen.

These cancers may invade surrounding structures including the respiratory tree ; the aorta, mediastinum and pericardium.


A
B
C

B- Adenocarcinomas

arises as complication of Barrett esophagus and long standing GastroEsophageal Reflex Disease **(GERD)**

Gross

- they are usually in the distal one-third of the esophagus and may invade the adjacent gastric cardia

Initially lesions may appear as flat or raised patches on an intact mucosa, they may develop into large exophytic masses , deeply ulcerative, or diffusely infiltrate.

microscopic

Tumors produce mucin and form glands.

Clinical Features

- Esophageal carcinoma is insidious in onset and produces dysphagia and obstruction gradually and late. Weight loss, anorexia, fatigue, and weakness , followed by pain related to swallowing.

- Because these cancers extensively invade the esophageal lymphatic network and adjacent structures , surgical excision is rarely curative .

- Esophageal cancer confined to the mucosa or submucosa is amenable to surgical treatment.