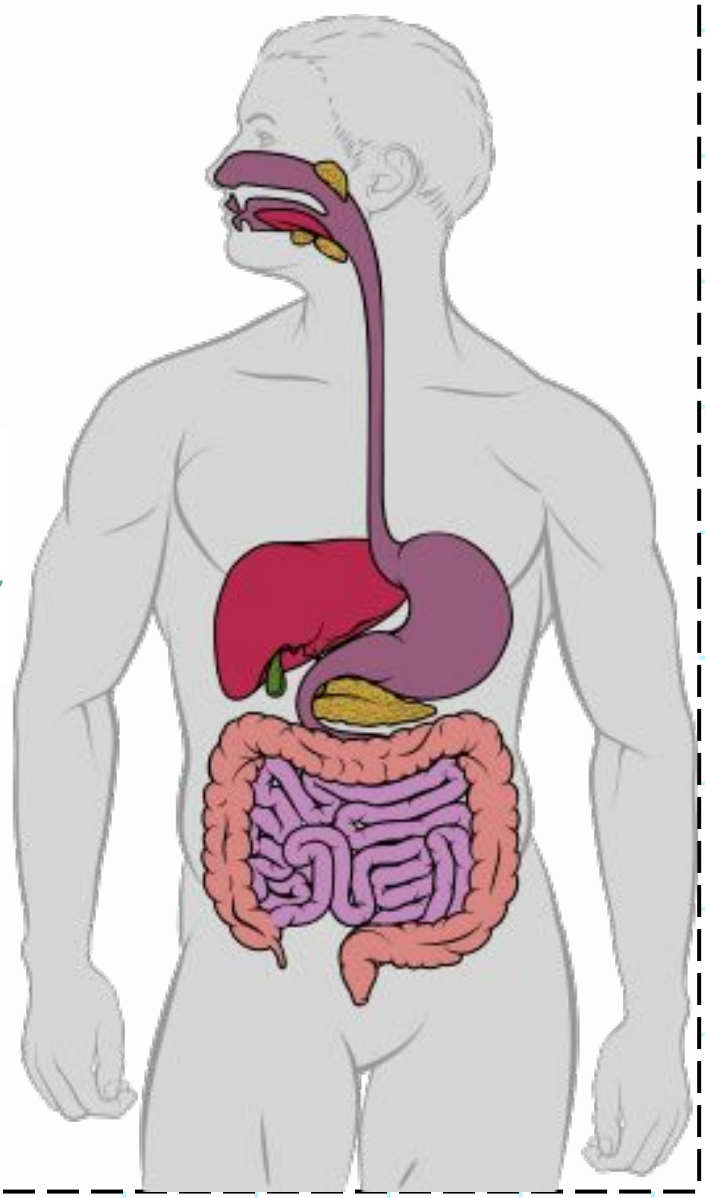
Gastroesophageal Reflux Disease



GNT BLOCK

Mohammed AlEssa
Abdulaziz AlFuhayd
Reviewed by
Lama AlMutairi

MED 443
King Saud University

Pathology Teamwork
MED 443

Editing File

Color index :
Main text (black)
Female Slides (Pink)
Male Slides (Blue)
Important (Red)
Dr's note (Green)
Extra Info (Grey)

OBJECTIVES

- Define reflux esophagitis its pathogenesis, gross and microscopic features, clinical features and its complications

- Be familiar with Barrett's esophagus. Its definition, main cause, pathological gross and microscopic features along with its complications (dysplasia and adenocarcinoma)

THIS LECTURE WAS PRESENTED BY DR.MAHA ARAFAH & DR.AHMED ALHUMAIDI

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IF YOU WANT TO READ THE LECTURE FROM FIRST AID

IF YOU WANT TO WATCH NINJA NERD EXPLANATION

NEED NINJA NERD BOARD ? CLICK HERE

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Female Slides

Reflux Esophagitis

Definition

According to the American College of Gastroenterology (ACG):
Symptoms OR mucosal damage (inflammation or ulceration) produced by the abnormal reflux of gastric contents into the esophagus.
-Often chronic and relapsing.
-may see complications of GERD in patients who lack typical symptoms.

Epidemiology of GERD

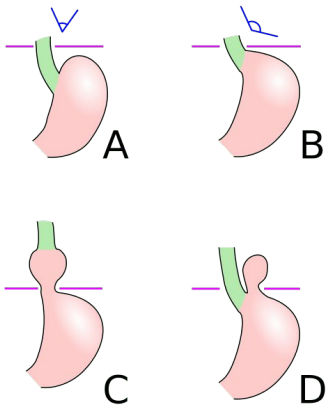
- About 44% of the US adult population have heartburn at least once a month
- 14% have symptoms weekly
- 7% have symptoms daily
- Approximately 80% of pregnant women have GERD
- Hiatal hernia present in ~70% of people with GERD.

Hiatal hernia under X Ray

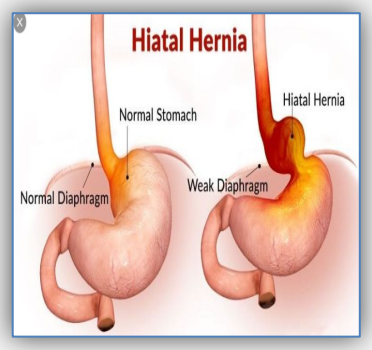
Risk Factors

Factors

- Smoking, alcohol
- Caffeine, fatty foods. chocolate
- Hiatal hernia
- Pregnancy, obesity



Hiatal hernia: Herniation of a portion of the stomach into the lower thorax.



Schematic diagram of different types of hiatal hernia. A: Normal anatomy. B: Pre-stage. C: Sliding hiatal hernia. D: Paraesophageal hiatal hernia

Reflux Esophagitis

Difference

Gastroesophageal reflux	Reflux is a normal physiologic phenomenon experienced intermittently by most people, particularly after a meal.
Gastroesophageal reflux disease (GERD)	Occurs when the amount of gastric juice that refluxes into the esophagus exceeds the normal limit, causing **symptoms** with or without associated esophageal **mucosal injury.**

Types

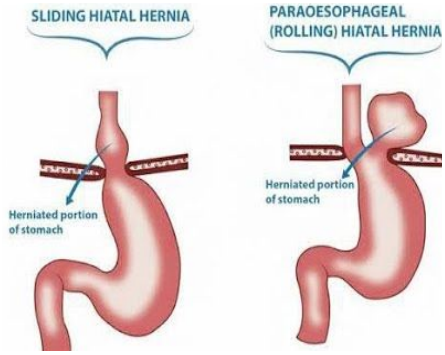
Female Slides

- Esophagitis is rarely caused by agents other than reflux
- Acute Esophagitis may be caused by:

Infective agents	Bacterial infection is very rare, but fungal, infection (mainly by Candida albicans) is common. Viral infections of the esophagus (particularly by herpes simplex and cytomegalovirus) are seen in AIDS patient
Physical agents	Irradiation
Chemical agents	Ingestion of caustic agents, chemotherapy
Immunological agents	Eosinophilic esophagitis, Crohn's disease

Physiologic vs Pathologic

Physiological	Pathological
Asymptomatic	symptomatic
Short lived	Mucosal injury
No nocturnal symptoms	Nocturnal symptoms
Postprandial (After a meal)	-

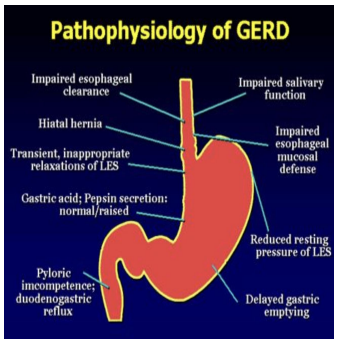


Reflux Esophagitis

Pathophysiology Of GERD

A. Abnormal lower esophageal sphincter (LES)	B. Increase abdominal pressure
The <u>most common</u> cause of GERD: -Functional: frequent transient LES relaxation. -Mechanical: hypotensive LES.	-Obesity -Pregnancy -Increased gastric volume -Delayed gastric emptying
Decrease LES pressure: -Foods: coffee, smoking, alcohol. -Meds: calcium channel blockers (relax SM in HTN so it'll relax the sphincter as well) -Location: hiatal hernia (x ray shows gas behind the heart)	

Primary barrier to gastroesophageal reflux is the lower esophageal sphincter. LES normally works in conjunction with the diaphragm. If barrier disrupted, acid goes from stomach to esophagus



Clinical presentations

Clinical Manifestations

Atypical symptoms

- Wheezing (Asthma) and chest pain
- Coughing (nocturnal) Because the patient is lying down thus increase the reflux

Most common symptoms

- **Heartburn:** retrosternal burning discomfort and chest pain
- **Regurgitation:** effortless return of gastric contents into the pharynx without nausea, retching or abdominal contractions

Age: Older than 40 years but also occurs in infants and children.

Reflux Esophagitis

Diagnostic Evaluation

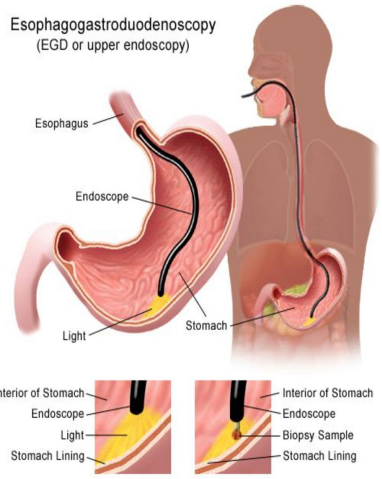
If classic symptoms of heartburn and regurgitation exist, in the absence of alarm symptoms the diagnosis of GERD can be made clinically and treatment can be initiated.

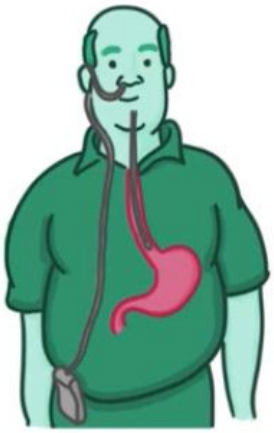
Endoscopy (EGD)

Esophagogastroduodenoscopy (with biopsy if needed):
-In patients with unusual alarm signs/ symptoms. (nocturnal asthma)
-Those who fail a medication trial.
-Those who require long term treatment.

pH

24-hour pH monitoring:
- Accepted standard for establishing or excluding presence of GERD for those patients who do not have mucosal changes.
-Trans-nasal catheter or a wireless capsule shaped device.



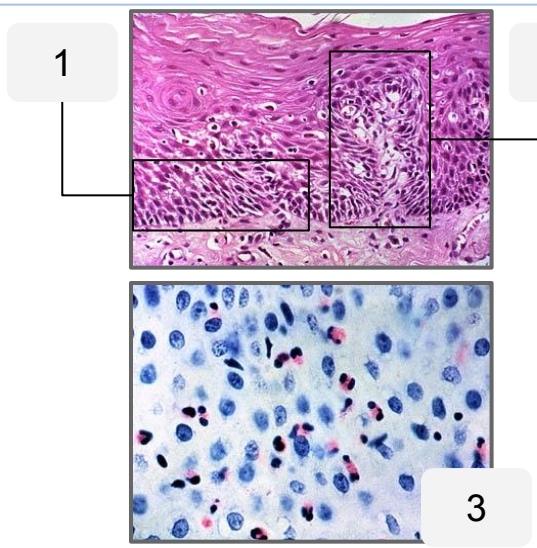


Clinical Note

X-Ray with barium can be used to identify complications like ulcer or stenosis with being careful that is contraindicated in patients with renal diseases

Reflux Esophagitis

Morphology

Grossly	Microscopically
Simple hyperemia: redness	1. basal zone hyperplasia 2. Elongation of lamina propria papillae 3. Eosinophils and neutrophils
	

Treatment

01 H 2 receptor Blockers

02 Proton pump inhibitors

03 Antireflux surgery to make more tension in the sphincter

Clinical Note

Surgical intervention include :

- Nissen fundoplication : upper part of the stomach wrapped around LES : strengthens the sphincter
- LINX reflux management system : titanium beads with magnetic cores wrapped around weak native LES : attractive force between beads closing the sphincter & force peristaltic wave causes by swallowing can be transiently open beads

Reflux Esophagitis

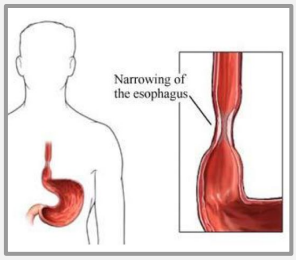
Complications

Complications GERD

Melena
Passing black stool because of bleeding

Stricture (fibrosis)

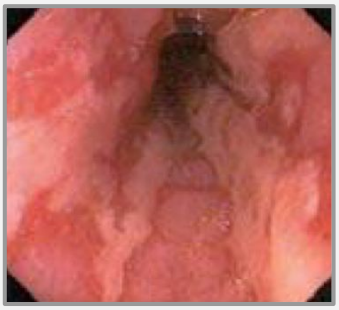
- Result of healing of erosive esophagitis
- May need dilation



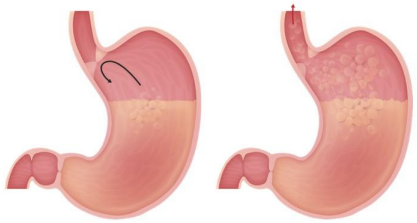
Barrett esophagus

Erosive esophagitis and ulceration

- Responsible for 40-60% of GERD symptoms
- Severity of symptoms often fail to match severity of erosive esophagitis
- Red mucosa with erosions and ulceration in severe cases with hematemesis and melena



Hematemesis



Deep Focus Question

What is one recommendation for the conservative management of GERD?

A. Increasing coffee intake
B. Avoiding eating within three hours of bedtime
C. Eating a large breakfast
D. Antacid medication
E. Maintaining weight

Answer: B

Deep Focus Question

What is a surgical technique used to manage GERD?

A. Whipple
B. Fundoplication
C. Gastroduodenal ligament suspension
D. Gastric bypass
E. Gastrohepatic ligament suspension

Answer: B

Barrett esophagus

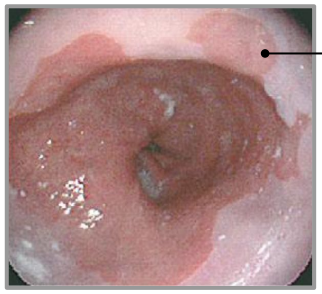
Definition

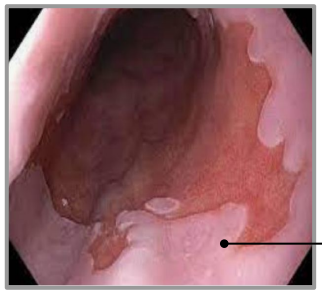
In 8-15% of cases is a complication of chronic GERD that is characterized by intestinal metaplasia within the esophageal squamous mucosa

Epidemiology

Female Slides

- The incidence of Barrett esophagus is rising
- Occur in 10% of individuals with symptomatic GERD
- Most common in white males and typically presents between 40 and 60 years
- Barrett esophagus can only be identified through endoscopy and biopsy, due to GERD symptoms





Patches of red area , you would see the intestinal metaplas ia here

Pathophysiology

1

Acid damages lining of esophagus and causes chronic esophagitis

2

Damaged area heals in a metaplastic process and abnormal columnar cells replace squamous cells

3

Associated with the development of dysplasia and adenocarcinoma (Barrett esophagus is a precursor lesion to cancer)

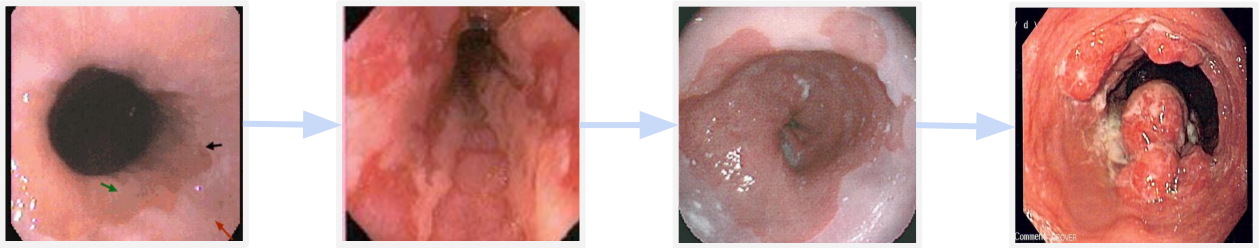
4

Molecular studies suggest that Barrett epithelium may be more similar genetically to adenocarcinoma than to normal esophageal epithelium

Female Slides

Barrett esophagus

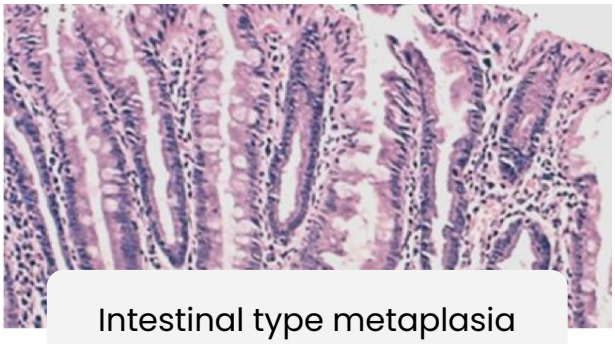
- Epithelial dysplasia, a preinvasive change, develops in 0.2% to 1% of individuals with Barrett esophagus each year
- The presence of dysplasia is associated with prolonged symptoms, longer segment length, increased patient age and Caucasian race.



Hyperemia | Erosions | Metaplasia | Adenocarcinoma

+ Morphology

Many patients with Barrett's are asymptomatic

Grossly	Microscopically
Endoscopic image of Barrett's esophagus: An area of red mucosa	**Barrett's esophagus** is marked by the presence of **columnar epithelium** with **goblet cells** in the **lower esophagus,** replacing the **normal squamous epithelium.**
	 Intestinal type metaplasia

Low-grade dysplasia: Cytological changes e.g. nuclear stratification, hyperchromasia and increased nuclear-to-cytoplasmic ratio.
High-grade dysplasia: Architectural irregularities, including gland-within-gland, or cribriform pattern in addition to cytological changes.

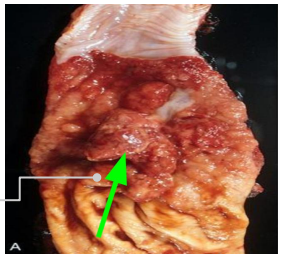
Female Slides

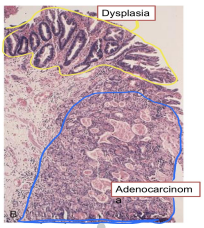
Barrett esophagus

Complications

Complications Of Barrett esophagus

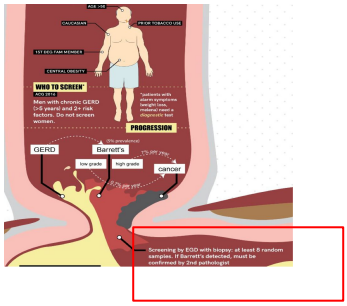
- adenocarcinoma
- Dysplasia





The most common malignant tumors of the esophagus are squamous carcinomas and adenocarcinomas

The prognosis for both types of carcinoma is poor



Adenocarcinoma	Esophageal squamous cell carcinoma
• Most esophageal Adenocarcinomas arise from **Barrett's esophagus.** • Other risk factors include: tobacco use and radiation exposure. • Risk is reduced by diets rich in fresh fruits and vegetables. • **Morphology:** Occurs in the **distal third** of the esophagus and may invade adjacent gastric cardia. • **Microscopically**: well to poorly differentiated adenocarcinoma. • Present with pain or difficulty in swallowing, progressive weight loss, hematemesis, chest pain, or vomiting • Prognosis depends on the stage	• Most common in the middle and lower esophagus. • Mostly develop in men who are heavy alcohol drinkers or heavy smokers, and may be preceded by epithelial dysplastic changes. • Benign -> Dysplasia —> Cancer. • **Not related to GERD** 

Summary

GERD → Barrett esophagus (specialised intestinal metaplasia of esophagus) → Barrett Esophagus with high grade dysplasia → Adenocarcinoma

Keywords

GERD	• smoker , pregnant • Lower esophagus • Hiatal hernia • Heartburn • Retrosternal burning pain • Epigastric discomfort • Regurgitation • Nocturnal Coughing • Chest pain • Wheezing • Gross view : Simple hyperemia • Microscopic view : Eosinophils and neutrophils , Basal zone hyperplasia (Barrett's esophagus) , Elongation of lamina propria papillae • Erosive esophagitis and ulceration • Melena • Stricture (fibrosis) • Barrett's esophagus • Adenocarcinoma
Barrett's esophagus	• columnar epithelium with goblet cells in the lower esophagus • Replacement of normal squamous epithelium • Basal zone hyperplasia
Adenocarcinoma	• in distal third of the esophagus • well to poorly differentiated

IF YOU WANT A SUMMARY CLICK HERE

DR. MAHA CASE & QUESTIONS CLICK HERE

YOU Vs MCQs

1

What is the primary barrier to gastroesophageal reflux?

A- LES

B- Diaphragm

C- Stomach contents

D- Lamina propria

2

Which symptom is most commonly associated with GERD?

A- Wheezing

B- Dysphagia

C- Regurgitation

D- Coughing

3

Which of the following is a risk factor for the development of GERD?

A- Regular exercise

B- Low body mass index (BMI)

C- Obesity

D- Consumption of spicy foods

4

Barrett's esophagus is a complication of chronic GERD that is associated with the development of?

A- Squamous cell carcinoma

B- Adenocarcinoma

C- Dysplasia

D- Hiatal hernia

1-A / 2-C / 3-C / 4-B

YOU Vs MCQs

5

Which of the following is not a complication of reflux esophagitis?

A- Hematemesis

B- Melena

C- Barrett's esophagus

D- Hiatal hernia

6

What is the most common cause of GERD in pregnant women?

A- Hiatal hernia

B- Hormonal changes

C- Increased abdominal pressure

D- Dietary factors

7

Which of the following is a specific histopathological feature of Barrett's esophagus?

A- simple hyperemia

B- Basal zone hyperemia

C- Aplasia

D- Goblet cells

8

What will be the changes in a patient with GERD?

A- Eosinophils

B- Macrophages

C- Hypoemia

D- ماعرفت وش احط

1-D / 2-C / 3-D / 4-A

YOU VS CASES

1. A 45-year-old man presents with long-standing heartburn and dyspepsia. An X-ray film of the chest shows a retrocardiac, gas-filled structure. This patient most likely has which of the following conditions?			
A.Boerhaave syndrome	B.Esophageal varices	C.Esophageal webs	D.Hiatal hernia
2.A 70-year-old woman presents with difficulty swallowing and a 9-kg (20-lb) weight loss over the past several months. Endoscopy reveals irregular narrowing of the lower third of the esophagus. A biopsy shows markedly atypical cuboidal cells lining irregular gland-like structures. Which of the following is the most likely diagnosis?			
A.Adenocarcinoma	B.Esophageal stricture	C.Leiomyosarcoma	D.Squamous cell carcinoma
3.A 50-year-old obese man (BMI = 32 kg/m2) comes to the physician complaining of indigestion after meals, bloating, and heartburn. Vital signs are normal. A CT scan of the abdomen reveals a hiatal hernia of the esophagus. Endoscopic biopsy shows thickening of the basal layer of the squamous epithelium, upward extension of the papillae of the lamina propria, and an increased number of neutrophils and lymphocytes. Which of the following is the most likely diagnosis?			
A.Esophageal varices	B.Mallory-Weiss syndrome	C.Reflux esophagitis	D.Squamous cell carcinoma
4.A 30-year-old man with AIDS complains of severe pain on swallowing. Upper GI endoscopy shows elevated, white plaques on a hyperemic and edematous esophageal mucosa. Which of the following is the most likely diagnosis?			
A.Candida esophagitis	B.Herpetic esophagitis	C.Reflux esophagitis	D.Squamous cell carcinoma in situ

1-D / 2-A / 3-C / 4-A

NEED EXPLANATION ? CLICK HERE

YOU Vs CASES

EXTRA CASES MAY REQUIRE EXTRA INFO

1.A 42-year-old man presents to the emergency department with a 2 month history of chest pain and cough. The patient reports he frequently wakes up coughing with a substernal burning sensation. He has no significant past medical history but reports a 20-pack-year smoking history. Temperature is 37°C (98.6°F), pulse is 68/min, respirations are 14/min and blood pressure is 130/82 mmHg. Physical examination shows faint end-expiratory wheezing bilaterally on chest auscultation. Initial troponin level is normal, and an ECG reveals normal sinus rhythm. Which of the following best describes the mechanism of action of the medication used to treat this patient's condition?

A.Stimulates angiogenesis and the formation of granulation tissue	B.Dilatation of large coronary arteries and arterioles	C.Beta-2 agonist of bronchial smooth muscle cells	D.Inhibition of the parietal cell H+/K+ ATP pump

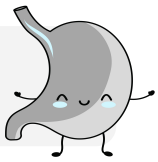
2.A 46-year-old man presents to the primary care physician with a 6 month history of worsening retrosternal burning pain and coughing after eating. The patient reports he has had similar symptoms over the past 10 years but states they have never been this severe. The patient has smoked 1 pack of cigarettes daily for 30 years. The patient's family history is significant for esophageal adenocarcinoma in his older brother. An esophagogastroduodenoscopy is performed, and an image of the gastroesophageal ju[illegible] biopsy of this lesion is most likely to demonstrate which of the following pathological changes?

A.Columnar epithelium with cilia	B.Columnar epithelium with goblet cells	C.Transitional epithelium	D.Non-keratinized squamous epithelium

1-D / 2 - B

Pathology Team

Leader زياد العتيبي



Leader لمى العتيبي

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الدانة عبدالله	رغد المصلح	ليان الرويلي
ريما المطيري	فيصل الشويعر	ريماز المحمود
زياد حكمي	سلطان البقمي	عروب المحمود
خالد الرشيد	عبدالله الضويحي	الجوهرة الوهيبي
لؤي الحديثي	هيا الزير	عبدالله الكودري
محمد السلامه	معاذ الحضيف	إيلاف معتبي
يوسف بادغيش	ساره العجاجي	يزيد ال طلحه
أفنان الأحمري	رند ابا الخيل	رزان السطيحي
هدى بن جدعان	منصور العتيبي	زياد السويلم
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