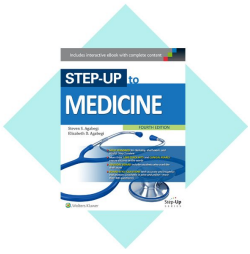
Esophageal diseases

- Objectives:
- Know the definition of dysphagia.
- Recognize the causes and types of dysphagia.
- Diagnose the important esophageal diseases like GERD, Achalasia & its major clinical presentations and complications.
- Understand the pathway of investigating patients with dysphagia.
- List the management outline for achalasia, GERD and Ca esophagus .

[Color index : Important | Notes | Extra]

[Editing file | Feedback | Share your notes | Shared notes | Twitter]

- Resources:
- 435 slides

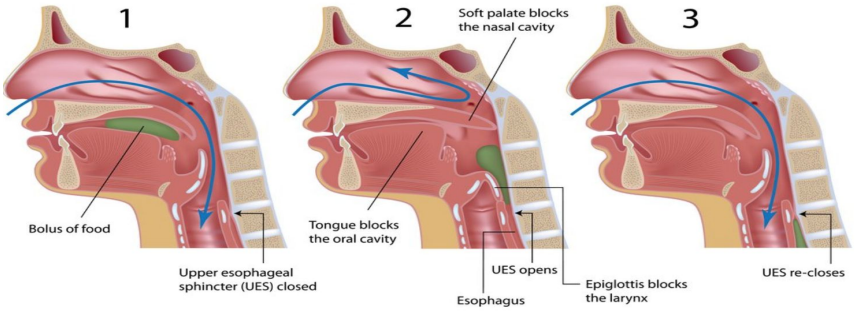


- Done by: Mana Almuhaideb & Zaki Alwatban
- Team sub-leader: Jwaher Alharbi
- Team leaders: Khawla AlAmmari & Fahad AlAbdullatif
- Revised by: Ahmad Alyahya & Luluh Alzeghayer

Know the definition of dysphagia

- First, Swallowing occurs through three phases:

1/Oral phase 2/Pharyngeal phase 3/Esophageal phase



- The esophagus is a fibromuscular tube (upper third is composed of skeletal muscles, and the rest is composed of smooth muscles)
- It has two sphincters (UES: upper esophageal sphincter , LES: lower esophageal sphincter)
- Esophagus has two main functions: 1- Transport of food by peristalsis 2- Prevention of gastric regurgitation by LES/UES
- It is supplied by the vagus nerve & sympathetic trunk
- **Dysphagia** is difficulty in swallowing and suggests an abnormality in the passage of liquids or solids from the oral cavity through the esophagus and into the stomach, has mechanical and neuromuscular causes.
- **Odynophagia** is painful swallowing.
- Both dysphagia and odynophagia will result in weight loss ,eventually.

Recognize the causes and types of dysphagia.

Dysphagia can be either **oropharyngeal** or **esophageal**:

<table>
<tr><th>Oropharyngeal dysphagia</th><th colspan="2">Esophageal dysphagia</th></tr>
<tr><td rowspan="3">- Also called: transfer dysphagia
- Arises from abnormalities of muscles, nerves or structures of the
1-Oral cavity
2-Pharynx
3-Upper esophagus
4-Upper esophageal sphincter.
- Seen in cases of:
CVA (cerebrovascular accident), Motor neuron disease, polymyositis, myasthenia gravis, or striated muscle disease,</td><td colspan="2">- Arises from abnormalities in:
1-The esophageal body
2-Lower esophageal sphincter
3-Cardia (part of the stomach where the esophagus enters)</td></tr>
<tr><td colspan="2">Classified into mechanical and motor:</td></tr>
<tr><td>Mechanical dysphagia, may be due to:
1-Large food bolus
2-Intrinsic narrowing:
A- Esophagitis B- Webs/rings
C- Tumor D- Strictures
3-Extrinsic compression:
a- Enlarged thyroid b- Diverticulum c- Left atrial enlargement</td><td>Motor dysphagia:
-Smooth muscle disorders:
1- Scleroderma
2- Achlasia
3- Esophageal spasm</td></tr>
</table>

- Clinically, dysphagia is considered an alarming symptom and the cause should be identified.
- If no cause can be identified, then it is considered functional dysphagia.

- **History of dysphagia :** Always ask about the location of dysphagia!

Make sure to ask the following 4 cardinal questions in history of dysphagia:

1. **Oropharyngeal** (failure in initiating swallowing + food might leave through the nose + choking & coughing) or **esophageal** (initiate swallowing but food gets stuck later)?
2. **Solid** (mechanical dysphagia) **or solid and liquid** (motor dysphagia)?
3. **Intermittent or progressive?** (progressive dysphagia indicates benign or malignant esophageal stricture) (patients with rings have difficulty in swallowing solids and intermittent dysphagia)
4. Associated symptoms? (Heartburn indicates GERD, Loss of weight indicates tumor)
5. **Do you have medical problems?** such as diabetes mellitus, scleroderma, Sjorgen syndrome, overlap syndrome, AIDS, neuromuscular disorders (stroke, Parkinson's, myasthenia gravis, muscular dystrophy, multiple sclerosis), cancer, Chagas' disease or others?
6. Previous surgery indicates strictures or Radiation therapy
7. Some medications (Chloride, alendronate, ferrous sulfate, quinidine, ascorbic acid, tetracycline, aspirin and NSAIDs) may cause pill esophagitis

- **Physical Examination:**

Look for signs of:

1. Bulbar palsy (1)
2. Dysarthria
3. Ptosis (Myasthenia gravis)
4. Cerebrovascular accident
5. Goitre (mechanical dysphagia)
6. Changes in skin (connective tissue disease , eg, scleroderma)

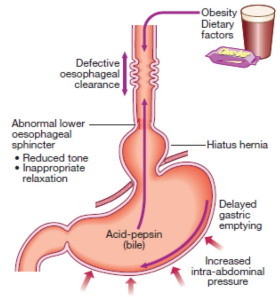
(1)which refers to a range of different signs and symptoms linked to impairment of function of the cranial nerves IX, X, XI and XII, which occurs due to a lower motor neuron lesion in the medulla oblongata or from lesions of the lower cranial nerves outside the brainstem.

Diagnose the important esophageal diseases like GERD, Achalasia & its major clinical presentations and complications.

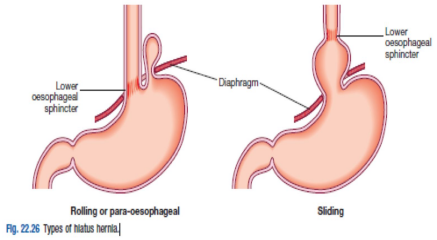
1-Achalasia:

Characteristics	It is characterized by a hypertonic LES (lower esophageal sphincter), which fails to relax during swallowing, and failure of peristalsis (main diagnostic feature , detected by manometry) which leads to progressive dilatation. - There is idiopathic loss of intramural neurons of LES and esophageal body - Most of cases are of unknown etiology. - A very small number can be from Chagas disease, gastric carcinoma, or diseases that can infiltrate into the area, such as lymphoma. - Usually occurs in young females
Clinical Presentation	- Presents with progressive dysphagia to both solids and liquids simultaneously. - Achalasia has no relationship with alcohol or tobacco use - Heartburn is absent, but some patients experience severe chest pain due to oesophageal spasm - As dysphagia progresses, nocturnal pulmonary aspiration develops. - Achalasia predisposes to squamous carcinoma of the oesophagus.
Diagnosis	A- Esophagogastroduodenoscopy (EGD) is done for alarm symptoms (to rule out cancer): 1. Onset after age 60 2. Anemia 3. Heme-positive stools, 4. >6-month duration of symptoms, 5. Weight loss. B- CXR shows: - Absent gastric bubble - Wide mediastinum (due to dilatation of esophagus) - Fluid level - Barium esophagography is very accurate and shows dilation of the esophagus, which narrows into a "bird's beak" at the distal end. C- The most accurate test overall (gold standard) is esophageal manometry. Manometry shows increased lower esophageal (LES) resting pressure, with no or partial relaxation, low amplitude contraction, no propagating (simultaneous). .
Management (There is no cure)	- **Endoscopic dilatation (pneumatic dilation)**: Dilatation of the esophageal sphincter using a fluoroscopically positioned balloon improves symptoms in 80% of patients (treatment of choice). - **Botulinum toxin injections** into the LES are used in those patients not willing to undergo pneumatic dilation, or in whom it has failed. - **Surgical myotomy**: Performed either laparoscopically or as an open operation, this is extremely effective. - Both dilatation and myotomy may be complicated by GERD, and for this reason myotomy is often augmented by an anti-reflux procedure and a PPI is given. - Drugs: Antimuscarinic agents / Nitroglycerin / Calcium channel blockers. (for patients who can't tolerate the aforementioned procedures)

2-Gastro-esophageal reflux disease:

Characteristics	- Gastro-esophageal reflux causing in heartburn affects approximately 30% of the general population - Occasional episodes of gastro-esophageal reflux are common in healthy individuals. - Reflux is normally followed by: esophageal peristaltic waves > clear the gullet, alkaline saliva neutralizes residual acid > symptoms do not occur - Gastro-esophageal reflux disease develops when the **esophageal mucosa** is exposed to **gastroduodenal contents** for prolonged periods of time, resulting in symptoms and, in a proportion of cases, esophagitis[1] We produce excessive salivation (alkaline medium) to fight reflux (patients with Sjogren's syndrome don't produce much saliva > increased propensity to develop GERD) **Damage depends on:** - Refluxed Material - Duration of reflux/Material  Fig. 22.25 Factors associated with the development of gastro-oesophageal reflux disease.

- **Factors involved in GERD:**

1-Abnormalities of LES: **This sphincter made by** **1) Muscle contraction within esophagus** **2) Diaphragm**	The lower esophageal sphincter is tonically contracted under normal circumstances and relaxes only during swallowing (could be transient lower esophageal sphincter relaxation or sustained loss in case of scleroderma and surgical resection) - Dietary fat, chocolate, alcohol and coffee > relax LES and provoke symptoms
2-Hiatus hernia:	- **Hiatus hernia**(GERD is particularly associated with sliding hiatal hernia) **causes reflux because of:** a-The loss of pressure gradient between the abdominal and thoracic cavities. When LES herniates into thoracic cavity the pressure in negative > dilation of esophagus b-the oblique angle between the cardia and esophagus disappears. - **Features of hiatus hernia:** 1-Herniation of the stomach through the diaphragm into the chest 2-Occurs in 30% of the population over the age of 50 years 3-Often asymptomatic 4-Heartburn and regurgitation can occur 5-Gastric volvulus may complicate large para-esophageal hernias  Fig. 22.26 Types of hiatus hernia. - **the relationship between the presence of a hernia and symptoms is poor:** a-Hiatus hernia is common in individuals who have no symptoms b-some symptomatic patients have only a very small or no hernia - **Most of the who have Hiatus hernia develop** A-esophagitis b-Barrett's esophagus c-Peptic strictures

[1]Reflux esophagitis: Damaged esophageal mucosa by reflux of gastric content

3-Delayed esophageal clearance (aperistalsis):	- Defective esophageal peristaltic activity is commonly found in patients who have esophagitis. - It is a primary abnormality, since it persists after esophagitis has been healed by acid-suppressing drug therapy. - Poor esophageal clearance leads to increased acid exposure time.
5-Delayed gastric emptying:	- Mechanical > obstruction (pyloric stenosis, gastric outlet obstruction) - Motor (Diabetes) - Gastric emptying is delayed in patients with gastroesophageal reflux disease. (reason is unknown).
6-Increased intra-abdominal pressure:	- Pregnancy and obesity are established predisposing causes. - Weight loss may improve symptoms
7-Reduced saliva	- Patients with Sjogren's syndrome

- **Clinical features of GERD:**

The major symptoms are

1- **Heartburn** and regurgitation, often provoked by bending, straining or lying down.
2- 'Water brash', which is salivation due to reflex salivary glands stimulation as acid enters the gullet, is often present.
3- Patient is often overweight.
4- Waking at night by choking as refluxed fluid irritates the larynx.
5- Odynophagia (pain during swallowing)
6- **Dysphagia is a complication of GERD which happens due to stricture formation or edema**
7- **Atypical chest pain** which may be severe and can mimic angina, and may be due to reflux-induced esophageal spasm.
8- Hoarseness ('acid laryngitis')
9- Recurrent chest infections
10- Chronic cough
11- Asthma

The true relationship of these features to gastro-esophageal reflux disease remains unclear.

- **Complications: not mentioned in our slides!**

Esophagitis:	- A range of endoscopic findings: A- ranges from mild to severe redness B- bleeding C- Ulceration with stricture formation D- although appearances may be completely normal; There is a poor correlation between **symptoms** and **histological** and **endoscopic findings**.
Bleeding	-
Barrett's esophagus :	Barrett's esophagus is a pre-malignant condition, in which the normal squamous lining of the lower esophagus is replaced by columnar mucosa (columnar with goblet cells lined esophagus) that may contain areas of **intestinal metaplasia**. Barrett's esophagus is an adaptive response to chronic gastro-esophageal reflux and is found in 10% of patients undergoing gastroscopy for reflux symptoms.

	it is often asymptomatic until discovered when the patient presents with esophageal cancer - risk of esophageal cancer is 40–120-fold increased - The prevalence is increasing, and it is more common in: A- men (especially whites) B- obese and those over 50 years of age C- Smoking Diagnosis requires multiple systematic biopsies to detecting intestinal metaplasia and/or dysplasia. Management: treatment is only indicated for symptoms of reflux or complications, such as strictures and follow up 1-Endoscopic therapies, such as: ● radiofrequency ablation or photodynamic therapy used only for those with dysplasia or intraconal cancer like patients with CLO without dysplasia should undergo endoscopy at 3–5-yearly intervals ● **low-grade dysplasia** at 6–12-monthly intervals 2- esophagectomy or endoscopic therapy with a combination of endoscopic resection (ER) ● For those with **high-grade dysplasia** (HGD) or intraconal carcinoma.
Anemia:	- Iron deficiency anemia can occur because of occult blood loss from long-standing esophagitis. - Most patients have a large hiatus hernia and bleeding can stem from subtle erosions in the neck of the sac ('Cameron lesions'). - hiatus hernia is very common and other causes of blood loss, particularly colorectal cancer, must be considered in anemic patients, even when endoscopy reveals esophagitis.
Benign esophageal stricture:	Fibrous strictures can develop because of longstanding esophagitis, especially in: ● Elderly ● Those who have poor peristaltic activity Present with: A- **dysphagia (typical presentation)** that is worse for solids than for liquids B- Bolus obstruction following ingestion of meat causes absolute dysphagia C- heartburn is common but not invariable; many elderly patients presenting with strictures have no preceding heartburn. Diagnosis: is by endoscopy, when biopsies of the stricture can be taken to exclude malignancy. Endoscopic balloon dilatation is helpful. Treatment: long-term therapy with a PPI drug at full dose should be started to reduce the risk of recurrent esophagitis and stricture formation The patient should be advised to chew food thoroughly, and it is important to ensure adequate dentition
Gastric volvulus:	Occasionally, a massive intrathoracic hiatus hernia may twist upon itself, leading to a gastric volvulus. This gives rise to complete esophageal or gastric obstruction and the patient presents with: A- severe chest pain B- vomiting C- dysphagia

	Diagnosis: CXR (air bubble in the chest) and barium swallow. Most cases spontaneously resolve but recurrence is common, and surgery is usually advised after the acute episode has been treated by nasogastric decompression **Investigations:** Young patients who present with typical symptoms of gastro-esophageal reflux, without worrying features such as (dysphagia, weight loss, anemia) can be treated empirically without investigation Investigation is advisable for patients who present with: 1- age of 50–55 years 2- symptoms are atypical 3- Complication or present of suspected Endoscopy is the investigation of choice. Because it excludes other upper gastrointestinal diseases that can mimic gastro-esophageal reflux and to identify complications. - A normal endoscopy > Twenty-four-hour pH monitoring is indicated if the diagnosis is unclear or surgical intervention is under consideration. This involves tethering a slim catheter.

- **Diagnosis:**

-Endoscopy and barium swallow
-24 hour pH monitoring and motility

- **Management:**

1-Lifestyle advice, including:	2-Medication:	3- laparoscopic anti-reflux surgery
A- weight loss **B-** avoidance of dietary items that the patient finds worsen symptoms **C-** elevation of the bed head in those who experience nocturnal symptoms **D-** avoidance of late meals **E-** giving up smoking, should be recommended	**A-** PPIs, which are usually **effective in resolving symptoms** and **healing esophagitis** ADRS of long-term use of PPI: 1- associated with reduced absorption of iron, B12 and magnesium 2- increased risk of osteoporosis and fractures 3- predispose to enteric infections with Salmonella, Campylobacter and possibly Clostridium difficile 4- increases the risk of Helicobacter-associated progression of gastric mucosal atrophy **B-** domperidone, when dysmotility features are prominent, can be helpful **C-** antacids and alginates can also provide symptomatic benefit **D-** H2-receptor antagonist drugs also **help resolving symptoms without healing esophagitis**	Rarely we resort to surgery.

3-Esophageal Cancer disease of elderly >50 years old.

Characteristics	- There are two pathologic types. In the past, squamous cell carcinoma (SCC) accounted for up to 90% of cases. However, the incidence of adenocarcinoma has increased dramatically in the United States, and it now accounts for up to 50% of new cases. - 15% affect the upper ⅓ , 45% affect the middle ⅓ , 40% affect the lower ⅓
A. SCC	- Incidence is higher in African-American men than in other groups. - Most common locations are the upper- and midthoracic esophagus. About one-third may be in distal 10 cm of esophagus. - Risk factors are **alcohol and tobacco use,** diet (nitrosamines, betel nuts, chronic ingestion of hot foods and beverages such as tea), human papillomavirus, achalasia, Plummer–Vinson syndrome"esophageal web", caustic ingestion, and nasopharyngeal carcinoma.
B. Adenocarcinoma	- More common in Caucasians and men (5:1 over women). - Most common in distal third of the esophagus/gastroesophageal junction (in 80% of cases). - Risk factors: **GERD and Barrett's esophagus** are main risk factors; alcohol and tobacco may not be as important as in SCC. - **The prognosis is poor:** Five-year survival rate is about 30% to 40% if locoregional disease, but only 5% if distant metastasis present at diagnosis. 3. Staging (not mentioned by the doctor)! a. Stage I—tumor invades lamina propria or submucosa; nodes negative b. Stage IIa—tumor invades muscularis propria or adventitia; nodes negative c. Stage IIb—tumor invades up to muscularis propria; positive regional nodes d. Stage III—tumor invades adventitia (positive regional nodes) **or** tumor invades adjacent structures (positive or negative nodes) e. Stage IV—distant metastasis
Clinical features	1. Dysphagia—most common symptom (initially solids only, then progression to liquids) 2. Weight loss—second most common symptom 3. Anorexia 4. Odynophagia (pain with swallowing)—a late finding that suggests extraesophageal involvement (mediastinal invasion) 5. Hematemesis, hoarseness of voice (recurrent laryngeal nerve involvement) 6. Aspiration pneumonia, respiratory symptoms due to involvement of tracheobronchial tree 7. Tracheoesophageal or Broncho-esophageal fistula 8. Chest pain
Diagnosis	1. Barium swallow useful in evaluation of dysphagia. A presumptive diagnosis can be made. 2. Upper endoscopy with biopsy and brush cytology is required for definitive diagnosis. It confirms the diagnosis in 95% of cases. 3. Transesophageal ultrasound helps determine the depth of penetration of the tumor and is the most reliable test for staging local cancer. 4. Full metastatic workup (e.g., CT scan of chest/abdomen, CXR, bone scan).
Treatment	1. Palliation is the goal in most patients because the disease is usually advanced at presentation. 2. Surgery (esophagectomy) may be curative for patients with disease in stage 0, 1, or 2A. 3. Chemotherapy plus radiation before surgery has been shown to prolong survival more than surgery alone.

4-Infectious Esophagitis: found in immunocompromised patients.

- Viral esophagitis (could be caused by HSV, CMV , or Varicella Zoster)
- Bacterial
- Fungal
- Presents with Dysphagia, Odynophagia and bleeding
- Diagnosed by barium swallow, endoscopy and biopsy

5-Diverticula (outpouching of the wall of the esophagus):

- Zenker diverticulum (upper esophagus)
- Epiphrenic diverticulum (lower esophagus)
- Usually asymptomatic, or could present with regurgitation of the food consumed several days ago (patient spills out undigested food) and dysphagia

5-Diffuse Esophageal Spasm (corkscrew esophagus)

- DES is a hypermotility disorder of the esophagus

● Seen most often in women and is often found in patients with multiple complaints.

● The basic pathology is related to a motor abnormality of the esophageal body that is most notable in the lower two thirds of the esophagus

● the esophageal contractions are repetitive, simultaneous, and of high amplitude

Symptoms and Diagnosis

● The clinical presentation of DES is typically that of chest pain and dysphagia

● These symptoms may be related to eating or exertion and **may mimic angina.**

● Patients will complain of a squeezing pressure in the chest that may radiate to the jaw, arms, and upper back.

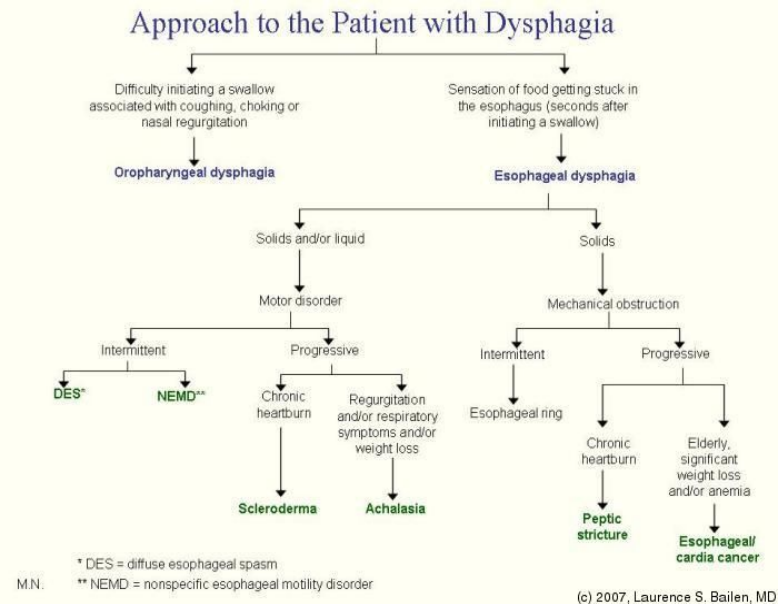
● The symptoms are often pronounced during times of heightened emotional stress

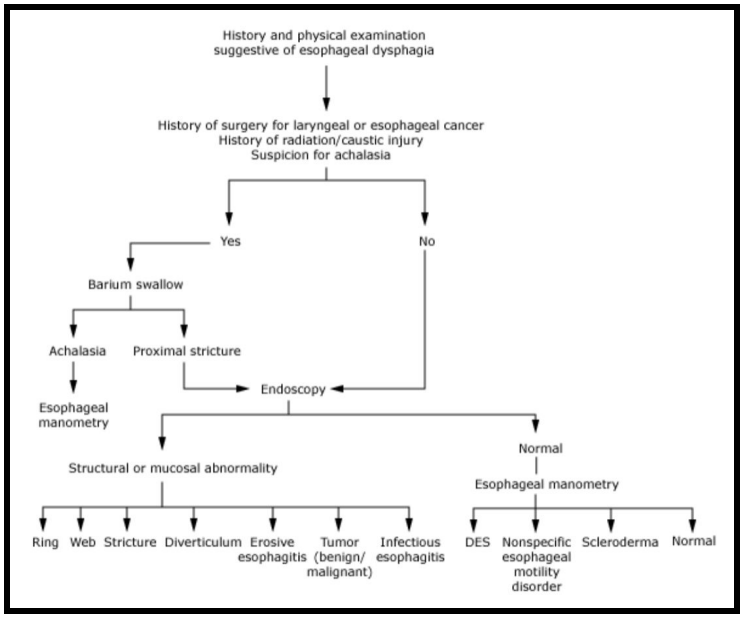
● Regurgitation of esophageal contents and saliva is common, but acid reflux is not

● acid reflux can aggravate the symptoms, as can cold liquids

● irritable bowel syndrome and pyloric spasm, may accompany DES, whereas other gastrointestinal problems, such as gallstones, peptic ulcer disease, and pancreatitis, all trigger DES

● The diagnosis of DES is made by an esophagram and manometric studies





Questions

1. A 47-year-old woman presents to your clinic with a three-month history of dysphagia. There is no history of drastic weight loss and the patient experiences symptoms when swallowing solids but not liquids. Which of the following is not an obstructive cause of dysphagia?

A. Pharyngeal carcinoma
B. Oesophageal web
C. Retrosternal goitre
D. Peptic stricture
E. Achalasia

2. You see a 48-year-old lorry driver, who presents to you with a three-month history of heartburn after meals which has not been settling with antacids and PPIs. You suspect that the patient has a hiatus hernia. The most appropriate investigation for diagnosing a hiatus hernia is:

A. Computer tomography (CT) scan
B. Chest x-ray
C. Upper GI endoscopy
D. Barium meal
E. Ultrasound

3. You see a 56-year-old man who was admitted for an elective upper GI endoscopy due to longstanding GERD which has failed to improve on antacids and PPIs. Your registrar suspects that this patient may have Barrett's oesophagus and asks you to define what this is. The most appropriate description of Barrett's oesophagus is:

A. Metaplasia of the squamous epithelium of the lower third of the oesophagus to columnar epithelium
B. Metaplasia of the columnar epithelium of the upper third of the oesophagus to squamous epithelium
C. Metaplasia of the columnar epithelium of the lower third of the oesophagus to squamous epithelium
D. Metaplasia of the squamous epithelium of the upper third of the oesophagus to columnar epithelium
E. Metaplasia of the squamous epithelium of the middle third of the oesophagus to columnar epithelium

4. A 65-year-old woman with a complex medical history (including diabetes, hypertension, coronary artery disease, gastroesophageal reflux disease, and ongoing use of alcohol and tobacco) presents with increasing midsternal chest discomfort predominantly when swallowing solid food. Recently, even liquids are becoming problematic. She has not noted blood in her stool or melena, weight loss, or change in her energy level. What is the most likely cause of her dysphagia?

A. Esophageal cancer
B. Peptic esophageal stricture
C. Achalasia
D. Zenker diverticulum
E. Polymyositis

Answers

1. **E.** Answers A–D are all termed obstructive causes of dysphagia. The causes can be categorized into:

- Obstructive
    - Oesophageal carcinoma
    - Peptic strictures (D)
    - Oesophageal web/ring (B)
    - Gastric carcinoma
    - Pharyngeal carcinoma (A)
    - Extrinsic pressure from, for example, lung carcinoma, retrosternal goitre (C)
- Oesophageal motility disorders
    - Achalasia(E)
    - Systemic sclerosis
    - Stroke
    - Myasthenia gravis
    - Neurological degenerative conditions, e.g. motor neurone disease, Parkinson's disease

- Others
  • Oesophagitis
  • Pharyngeal pouch
  • Oesophageal candidiasis

2. **D** All the above investigations have been shown to be useful in the diagnosis of a hiatus hernia. However, upper GI barium meals/swallows (D) have been shown to be the most definitive modality in diagnosing hiatus hernias. Chest x-rays (B) may be normal, but in some cases may show an air fluid level above the level of the left hemi-diaphragm. Upper GI endoscopy (C) is commonly used to assess symptoms of dyspepsia and has not been shown to be as sensitive as barium studies in the detection of hiatus hernias. In the UK, CT scanning (A) is not routinely used for the investigation of hiatus hernias, but the latter are incidentally detected on scanning of the abdomen for the investigation of other pathology. Compared to the barium study, CT scanning delivers relatively high levels of radiation. Positive results obtained with ultrasound scanning (E) may lead to inconsistent and false-positive/negative results due to the operator- associated variability regarding technical experience.

3. **A** Barrett's oesophagus occurs as a result of chronic inflammation of the oesophagus, usually secondary to GORD. Typically, the lower third of the oesophagus is affected whereby the squamous cells are subjected to longstanding acid reflux from the stomach. This gives rise to chronic inflammation of the lower third of the oesophagus and results in metaplastic change of the squamous cells to columnar type which is thought to be an adaptive mechanism in withstanding the erosive action of the stomach acid. This metaplasia is described as a premalignant state and increases the risk of adenocarcinoma of the oesophagus. Diagnosis is made via upper GI endoscopy and biopsy.

4. **B**. Peptic strictures due to chronic, persistent acid reflux cause 80% of esophageal strictures. Diagnostic esophagogastroduodenoscopy followed by dilation is necessary to relieve the dysphagia; the procedure may need to be repeated from time to time as symptoms recur. A patient with esophageal cancer is likely to have weight loss. Patients with achalasia often regurgitate undigested food; achalasia is less common than peptic stricture. A Zenker diverticulum is an outpouching in the posterior wall of the hypopharynx, which allows food retention, causing halitosis, recurrent aspiration, and pneumonia. While patients with polymyositis often have dysphagia, they would typically display weakness of the proximal muscles in addition to dysphagia.

5. **B**. The barium swallow shows the dilated baglike proximal esophagus and tapered distal esophageal ring characteristic of achalasia. This is a motor disorder of the esophagus and classically produces dysphagia to both solids and liquids. Structural disorders such as cancer and stricture usually cause trouble swallowing solids as the first manifestation. In achalasia, manometry shows elevated pressure and poor relaxation of the lower esophageal sphincter. In classic achalasia the contractions of the esophagus are weak, although a variant called vigorous achalasia is associated with large-amplitude prolonged contractions. Medications (nitrates, calcium channel blockers, botox injections into the LES) or physical procedures (balloon dilatation or surgical myotomy) that decrease LES pressure are the recommended treatments. Squamous cell carcinoma would not cause esophageal dilation and would be associated with ratty rather than smooth tapering of the esophagus. Achalasia is not associated with gastroesophageal reflux disease. Although anxiety can cause dysphagia and a globus-like sensation in the cricoid region, it would not cause the anatomical changes seen on this barium swallow.