

THE ESOPHAGUS

Surgical Anatomy

The esophagus extends from the cricoid cartilage (at the level of vertebra C6) to the gastric cardia and is 25 cm long. It has cervical, thoracic and abdominal portions. The esophagus has an upper sphincter, the cricopharyngeus, and a lower sphincter that cannot be defined anatomically but is a 3-5 cm high pressure area located in the region of the esophageal hiatus of the diaphragm.

Symptoms of esophageal disorders

Dysphagia: is defined as difficulty in swallowing. It is a serious symptom and requires assessment.

Pain: heart pain is a retrosternal burning sensation, and is associated with reflux of acid into the mouth. Retrosternal chest pain can be a symptom of esophageal carcinoma, esophageal perforation and esophageal spasm.

Odynophagia is a pain on swallowing.

Regurgitation: this is an effortless process whereby food is regurgitated into the mouth. It is associated with achalasia, hiatus hernia and esophageal pouches.

Impacted foreign bodies

Swallowed foreign bodies are particularly common in children after accidental ingestion, and obstruction of the oropharynx and tracheal opening by large food bolus can be fatal. The obstruction can usually be removed by asking patients cough or giving them sharp blow on the back, or alternatively by using Heimlich maneuver.

Investigation

A chest X-ray may show the foreign body if it is radio-opaque and/or there are signs of perforation. A water soluble contrast swallow can provide confirmation. Endoscopy will allow direct visualization of the foreign body and also removal of it.

Esophageal Perforation

The etiological factors are classified according to the site

Intraluminal

This is caused by foreign body or removal of a foreign body during instrumentations, especially rigid esophagoscope.

Outside the wall

This is caused by penetrating injuries (rare).

Spontaneous

This follows episodes of violent vomiting (Boerhaave's syndrome). A tear to the esophageal mucosa only, following vomiting, is known as a Mallory-Weiss tear and tend to cause hematemesis.

Clinical features

If the perforation in the cervical region, the patient complains of pain in the neck and local tenderness, and surgical emphysema is present. Perforation of the thoracic esophagus causes retrosternal chest pain and dysphagia.

Perforation in this area can lead to mediastinitis and septic shock.

Perforation of abdominal esophagus can lead to peritonitis and rigid abdomen.

Investigations

Erect chest X-ray

This may show surgical emphysema with gas in the soft tissue of mediastinum, and if the pleural cavity has also been ruptured, there is hydropneumothoracic.

Contrast swallow

This confirms the diagnosis and also demonstrates whether the perforation is localized to mediastinum or open to the pleural or peritoneal cavities.

Management

Perforation of the cervical esophagus can be treated with intravenous fluid, withdrawal of oral fluid and diet, and the administration of antibiotics. If an abscess develops in the superior mediastinum, this will require surgical drainage.

Perforation of thoracic esophagus has much higher morbidity and mortality. This will usually require thoracotomy, drainage and surgical repair.

Achalasia

This disorder affects the whole esophagus. The main feature is failure of relaxation of the lower esophagus sphincter, this will lead to esophageal dilatation and peristalsis becomes uncoordinated.

Clinical features

There is progressive dysphagia over several years, often for both solids and liquids. Other common symptoms include weight loss, regurgitation of undigested food, which can lead to aspiration pneumonia. In the long term, achalasia can predispose to squamous cell carcinoma of the esophagus.

Investigations

Chest X-ray might demonstrate a widened mediastinum, produced by dilated esophagus. A barium swallow will show dilatation of the esophagus, leading to tapered narrowing at the lower end (bird beak sign)

Endoscopy is essential to exclude other causes of lower esophageal narrowing, in particular carcinoma.

Management

Treatment involves either balloon dilatation of the lower esophageal sphincter or surgical myotomy by Heller's operation (division of the muscles over the lower esophagus and proximal stomach).

Plummer-Vinson syndrome

This is characterized by a post-cricoid web that results in dysphagia. The web is related to iron deficiency anemia.

Clinical features

Patients are commonly middle aged women. Dysphagia is the main presenting complaint, but there may also be symptoms and signs of anemia.

Investigation

A full blood count will show hypochromic microcytic anemia. Barium swallow demonstrate a narrowing of the upper esophagus with a web in the anterior wall. This can be confirmed by endoscopy.

Management

The web is dilated endoscopically and biopsies should also be taken, as there is an association with post cricoid carcinoma. The iron deficiency status is corrected by oral iron therapy.

Gastro esophageal reflux

Gastro esophageal reflux is the most common cause of dyspepsia, affecting up to 30% of the population. It is caused by the retrograde flow of gastric acid through an incompetent lower esophageal sphincter into the lower esophagus.

Clinical features

The reflux of acid causes inflammation and ulceration to the esophageal mucosa, which manifests as:

- *Heart burn*, which is a retrosternal burning pain, radiating to the epigastrium and through to the back
- *Regurgitation* of acid stomach contents to the mouth

- *Dysphagia* from benign strictures or the development of non specific motility disorders, both of which follow chronic reflux esophagitis.

Investigations

A barium study might demonstrate hiatus hernia, benign stricture and reflux of contrast from stomach into esophagus in the head down position. Endoscopy will confirm reflux if esophagitis is seen and biopsies can be taken.

Management

Pharmacological treatment is extremely effective; it involves H₂ receptor antagonists or proton pump inhibitors to reduce gastric acid production, anti acid to coat the esophagus, and metaclopramide to improve the lower esophageal muscle tone and promote gastric emptying.

Surgery involves reduction of the hiatus hernia, if present, approximation of the crura around the lower esophagus, and some form of fundoplication.

Hiatus hernia

Is an abnormal protrusion of the stomach through the esophageal hiatus into the thoracic. There are 2 types: sliding (90%) and rolling (10%). A sliding hernia occurs when the stomach slides so that the gastro esophageal junction lies within the chest cavity. A rolling hernia is formed when the stomach rolls up anteriorly through the hiatus so that the cardia remains in its normal position below the diaphragm.

Clinical features

Hiatus hernias are often asymptomatic, but can produce some or all the following symptoms:

- *Heart burn and regurgitation*
- *Esophagitis*
- *Epigastric and lower chest pain*
- *Palpitation and hiccups*

The diagnosis confirmed by barium study and endoscopy

Management

Treatment is as for gastro esophageal reflux disease, however, surgical repair of rolling hernia to prevent strangulation should always be considered in patients who are symptomatic.

Carcinoma of the esophagus

The important risk factors for adenocarcinoma of the esophagus are reflux and obesity. Risk factors for squamous cell carcinoma include alcohol, smoking, achalasia, and consumption of pickled vegetables.

Clinical features

Dysphagia that progresses from solid to liquids is one of the most presentations. Retrosternal pain on swallowing, regurgitation, and aspiration pneumonia are other forms of presentation.

Occasionally, patients may present with metastatic disease, including enlarged cervical lymph nodes, jaundice, hepatomegaly, hoarseness of voice, and chest pain from mediastinal invasion.

Investigations

Even if the diagnosis is made initially by barium swallow, it must be always confirmed by endoscopy and biopsy. Lymph node involvement and distant metastasis can be assessed with chest X-ray, abdominal US and CT of the chest and abdomen.

Management

The aim of treatment is to cure those with potentially curable disease and restore swallowing in the remainder. Unfortunately, about 70 % of patients are not operable at the time of diagnosis. Patients with disease confined to the esophagus and who are fit for surgery should be considered for resection. Palliative treatment is used for patients with extensive disease and in those who are unfit for surgery. Treatment is aimed to relieve dysphagia, and this involves endoscopic dilatation, and stent insertion using expandable metal or rigid plastic stents.