

# Benign surgical diseases of the gastro-oesophageal junction

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## Abstract

This article discusses the investigation and management of gastro-oesophageal reflux disease, para-oesophageal hernias and achalasia.

**Keywords** Achalasia; fundoplication; gastro-oesophageal reflux; para-oesophageal hernia

## Oesophageal anatomy (Figure 1)

The oesophagus is a muscular tube, approximately 25 cm long extending from the pharynx to the gastro-oesophageal junction (GOJ). It is made up of striated muscle proximally and smooth muscle (arranged in inner circular and outer longitudinal layers) distally. The oesophagus is lined by non-keratinized stratified squamous epithelium up to the Z-line where it gives way to columnar epithelium. The lower oesophageal sphincter (LOS) extends over the lower 2–4 cm of the oesophagus as it enters the stomach. Together with the diaphragmatic crura and the oblique angle of entry of the oesophagus into the stomach this provides the lower oesophageal physical barrier to reflux.

## Gastro-oesophageal reflux disease (GORD)

Gastro-oesophageal reflux is a normal physiological process that occurs in all individuals. It is defined as pathological when chronic acid reflux causes unacceptable symptoms, or

pathological changes within the oesophagus (oesophagitis or Barrett's metaplasia). Gastro-oesophageal reflux disease (GORD) is the most common benign disease of the oesophagus with up to 25% of the population experiencing symptoms suggestive of GORD on a regular basis.<sup>1,2</sup> Box 1 lists the symptoms of GORD. The most common is heartburn, classically described as retro-sternal discomfort, often after eating, and in some individuals related to body position (lying flat or bending forward). A proportion of patients have atypical symptoms including cough, pharyngitis, voice change and tooth decay. There may also be an association with functional gastrointestinal disorders. Establishing a clear history for GORD is therefore not always straightforward.<sup>3</sup>

## Investigation of GORD

**Upper gastrointestinal (GI) endoscopy** is usually the first investigation undertaken in patients with GORD that has failed to resolve with simple measures. Endoscopy may demonstrate active oesophagitis or evidence of chronic reflux (strictures or Barrett's metaplasia) as well as identifying other pathology (evidence of dysmotility, malignancy or peptic ulcer disease) that may mimic symptoms. Box 2 lists the differential diagnosis for patients with symptoms of GORD.

**Manometry and pH-impedance studies (Figure 2):** confirmation of the diagnosis of GORD and the correlation of symptoms with reflux episodes is usual before proceeding to surgery. pH studies and manometry have been the gold standard test for confirming the diagnosis and excluding other conditions which can masquerade as GORD. High-resolution oesophageal manometry (HRM) is an advanced technique beyond conventional manometry.<sup>4</sup> It allows quicker and more intuitive analysis of oesophageal function and is more sensitive to oesophageal dysmotility and dysfunction including both functional (e.g. achalasia) and structural (e.g. stricture) outflow obstruction from the oesophagus. It can be combined with impedance measurements to allow simultaneous assessment of motility and bolus transport that can clarify the significance of subtle motility disorders.

Both tests involve the placement of a fine nasogastric probe to a point just distal to the gastro-oesophageal junction. The HRM probe has an increased number of sensors (approximately one per centimetre). Recordings of the pressures generated at different levels within the oesophagus are then measured during dry, wet and sometimes solid swallows to measure peristalsis, LOS function and response to physiological challenge. In addition, HRM facilitates accurate placement of pH probes for reflux monitoring.

After manometry has been performed a pH probe is placed 5 cm above the upper border of the LOS which detects acid reflux events and measures oesophageal acid exposure. Patients are required to retain the probe for a 24-hour period while maintaining their normal diet and performing their normal daily activities. A key part of this study is the reporting of reflux symptoms by patients during the monitoring period so that the association between reflux and symptoms can be established. Impedance monitoring is a relatively new technique that is complimentary to pH studies. It detects electrical resistance between a series of detectors within the oesophagus. These

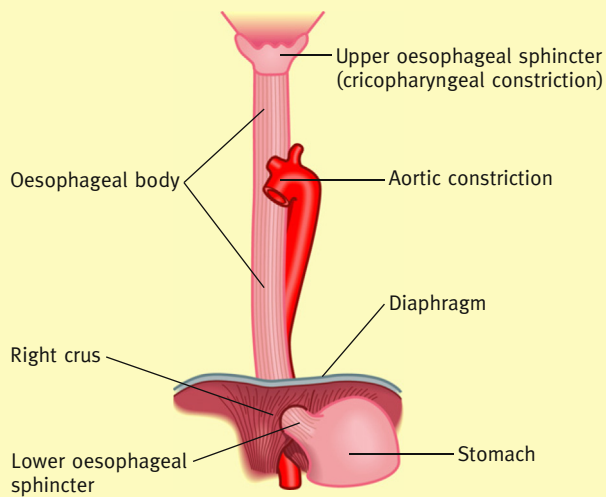
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### Anatomy of the oesophagus



**Figure 1**

measurements differentiate between gas and liquid contents and allow the detection of weakly acid and non-acid 'volume' reflux that are not detected by pH studies. This increases the number of reflux events that can be associated with patient symptoms especially regurgitation, belching and cough after meals that often do not contain much acid. In addition, for patients tested on

### Symptoms of gastro-oesophageal reflux disease

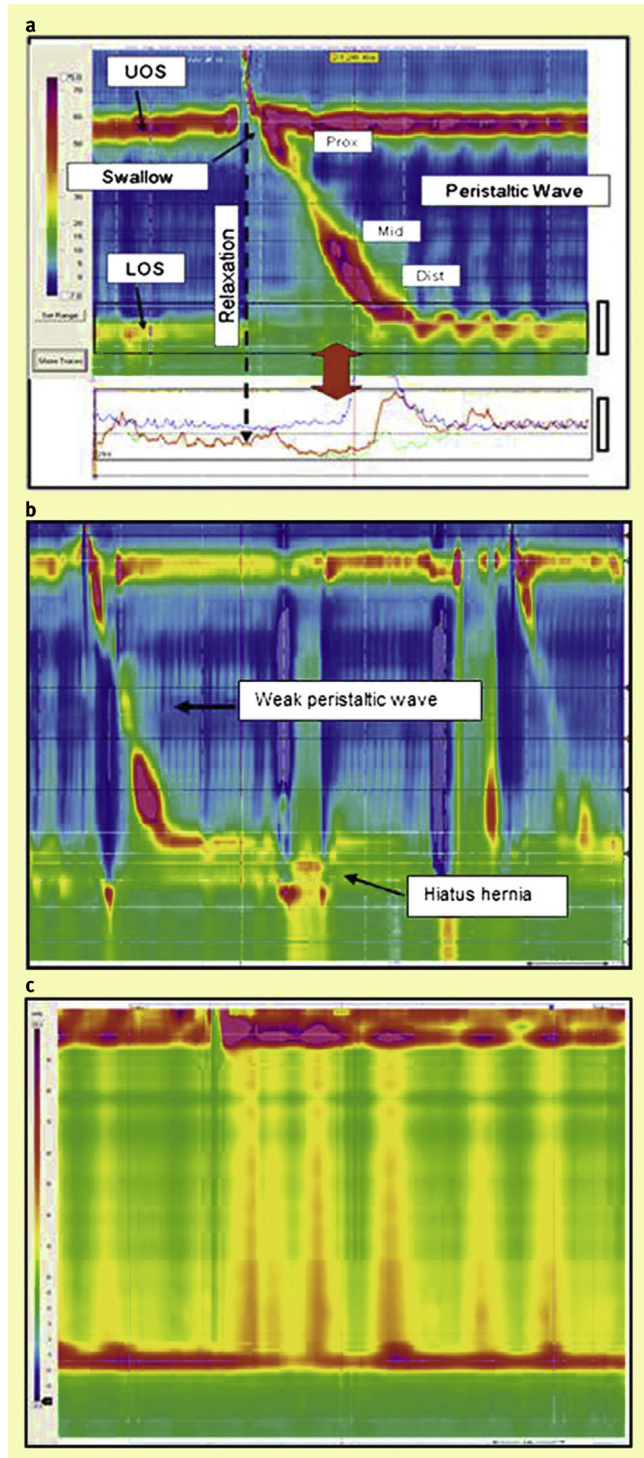
- Heartburn
- Epigastric or chest pain (masquerading as cardiac pain)
- Dysphasia
- Odynophagia (painful swallowing)
- Otagia
- Chronic nausea
- Regurgitation of food ('vomiting')
- Poor dentition and dental caries
- Halitosis
- Cough/wheeze/aspiration

#### Box 1

### Differential diagnosis of gastro-oesophageal reflux disease

- Carcinoma of the oesophagus
- Peptic ulcer disease
- Benign stricture of oesophagus
- Scleroderma
- Achalasia
- Non-gastrointestinal causes

#### Box 2



**Figure 2** (a) Normal high-resolution manometry spatiotemporal plot: Water swallow with normal peristalsis and appropriate lower oesophageal sphincter relaxation. (b) Gastro-oesophageal reflux disease: Hypotensive oesophageal peristalsis on swallowing and hiatus hernia present. 24-hour pH recording confirmed prolonged acid exposure. (c) Achalasia (type II): no lower oesophageal sphincter relaxation on swallowing and pan-oesophageal pressurization. LOS, lower oesophageal sphincter; UOS, upper oesophageal sphincter.

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