Benign surgical diseases of the gastro-oesophageal junction

Andrew GN Robertson

Simon Paterson-Brown

Abstract

Benign surgical conditions of the oesophago-gastric junction (OGJ) are important causes of morbidity and in some cases mortality for patients. This chapter discusses both elective and emergency benign disorders of the OGJ, their investigation and management. Elective conditions include gastro-oesophageal reflux disease (GORD), giant para-oesophageal hiatal herniae (GPHH), achalasia and other motility disorders. These conditions are now usually all managed laparoscopically when operative intervention is required. Emergency conditions include acute presentations of giant para-oesophageal hiatal herniae and OGJ perforations including Boerhaave's syndrome. These conditions present diagnostic and management challenges to the surgeon and are associated with significant morbidity and mortality. Varices, gastro-intestinal stromal tumours (GISTS), ulcers and bleeding are not discussed in this chapter.

Keywords Achalasia; gastro-oesophageal reflux disease; giant para-oesophageal hiatal herniae; laparoscopic fundoplication; oesophageal motility disorders

Introduction

The oesophago-gastric junction is the anatomical region between the oesophagus and the stomach. Its primary functions are to relax to allow food and liquid to enter the stomach and also to allow belching and vomiting. In the resting state it prevents gastro-oesophageal reflux.

Disorders of the oesophago-gastric junction can cause significant morbidity, and on occasion mortality, for patients. Elective conditions include gastro-oesophageal disease (GORD), giant para-oesophageal hiatal herniae (GPHH), achalasia and other motility disorders. Emergency conditions include the acute presentations of giant para-oesophageal hiatal herniae and Boerhaave's syndrome (see *Oesophageal Injury* on pages 00–00 of this issue).

Assessment

History and examination

Common symptoms of oesophago-gastric junction disorders include dysphagia, heartburn, regurgitation, waterbrash or weight loss and of course extra-oesophageal manifestations may occur. Heartburn and regurgitation are synonymous with GORD, dysphagia is a common symptom with achalasia and motility disorders, as is chest pain. Paraoesophageal herniae may present with chest pain, reflux, dysphagia, early satiety or breathlessness. Examination findings are often limited but key findings are nutritional status and general fitness to plan surgical intervention.

Investigations

Patients are initially investigated for oesophago-gastric junction disorders with oesophagogastroduodenoscopy (OGD). One of its main functions is to exclude oesophagogastric malignancy or a stricture. Detailed examination may also reveal achalasia, oesophagitis, Barrett's oesophagus or a paraoesophageal hernia and endoscopy allows histological samples to be taken as required. Subsequent investigations include oesophageal physiology tests, contrast studies and computed tomography (CT).

Oesophageal physiology testing consists of manometry and pH and/or pH-impedance studies. They are almost always required in the elective assessment of GORD and motility disorders if surgery is being considered.

Oesophageal manometry: oesophageal manometry assesses lower oesophageal sphincter function and oesophageal peristalsis. Manometry can be performed with a water-perfused, solid state or high resolution catheter. High-resolution manometry (HRM) has now replaced tradition manometry as it is easy to perform, interpret and gives more information. Technology has allowed a large number of closely placed ports in the catheter, permitting detailed assessment of oesophageal peristalsis, as well as lower and upper oesophageal sphincter activity. The data can be represented as a two-dimensional 'Clause plot' with colour representing pressure akin to a geography map (Figure 1).

Essentially the HRM catheter (connected to a computer) is placed via the nares into the oesophagus. Ten wet swallows of 5 ml of water are performed and the trace is analysed for lower oesophageal sphincter relaxation and peristaltic activity.[1,2]

Ambulatory pH testing: ambulatory pH monitoring plays an important role in the assessment of GORD as it is standardized, cheap and readily available. It is relatively easy to perform and data are now clear to interpret (Figure 2). Measurements are based on the time that the pH of the oesophagus is less than 4, detected by applying a probe via the nares to lie 5 cm above the manometrically measured lower oesophageal sphincter. The probe placement allows a 24-hour trace to be obtained. It has been recognized for a long time that 'some' reflux is physiological, with an oesophageal acid exposure of <4.2% being considered normal. Reflux severity can be further analysed using the DeMeester score, which is a GORD severity score based on six parameters: total reflux, supine reflux, upright reflux, longest episode, number of reflux episodes and number of reflux episodes longer than 5 minutes. A score greater than 14.72 is abnormal.[1,3]

Several other methods have now been developed to measure/assess acid reflux. To remove the technical difficulties of nasal catheterization, the Bravo Capsule® (Medtronic, Minneapolis,

Andrew G N Robertson *BSc(Hons) MBChB(Hons) FRCS(Ed) PhD MFSTEd is a Surgical Registrar at the Royal Infirmary of Edinburgh, UK. Conflicts of interest: none declared.*

Simon Paterson-Brown *MBBS FRCS MPhil MS is a Consultant General and Upper Gastrointestinal Surgeon at the Royal Infirmary of Edinburgh and a Honorary Senior Lecturer, University of Edinburgh, UK. Conflicts of interest: none declared.*

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MN, USA) has been developed. This is a wireless pH probe which is attached to the lower oesophageal mucosa during endoscopy or using a dedicated catheter. Its advantages are its tolerability and the fact it allows recording for over 24 hours. Its main disadvantage is the increased cost. The Bilitec 2000® (Medtronic, Minneapolis, MN, USA) device only measures bile reflux and is now rarely used clinically.[1,3]

Combined oesophageal pH-impedance improves on standard pH monitoring. The direction and the proximal extent of liquid and gas reflux events can be accurately measured by multichannel intraluminal impedance (MII). Impedance is inversely proportional to electrical conductivity and the cross sectional area of the lumen. It is studied using a catheter with multiple spaced pairs of cylindrical metal rings connected in circuits to the lumen of a tubular organ (e.g. the oesophagus). Each paired ring circuit has a voltmeter outside the body. As boluses pass, there are changes in impedance recordings. Gases cause a sharp rise in impedance. Fluids decrease impedance by connecting circuits between electrode. Before a fluid or food bolus passes, the oesophagus is empty and the impedance is intermediate. When a fluid bolus passes, impedance is low. After it has passed, impedance is again intermediate. These changes in impedance occur when the bolus is between a pair of electrodes. Impedance allows detailed evaluation of refluxate as well as patients who are still on proton-pump inhibitor therapy.

In practice, pH monitoring is a more useful first-line investigation as it is cheaper, easy to analyse and long-term data are available. pH/impedance is more costly, takes longer and requires specialist analysis. Its use lies as a second-line investigation to assess proximal reflux and as a research tool.[1,3]

In the elective setting, barium swallow is used to assess hold up, swallowing function and anatomy. Achalasia and other motility disorders can be detected this way but water soluble fluoroscopic swallows are more often used in an emergency with or without CT, primarily to assess for oesophageal perforations.

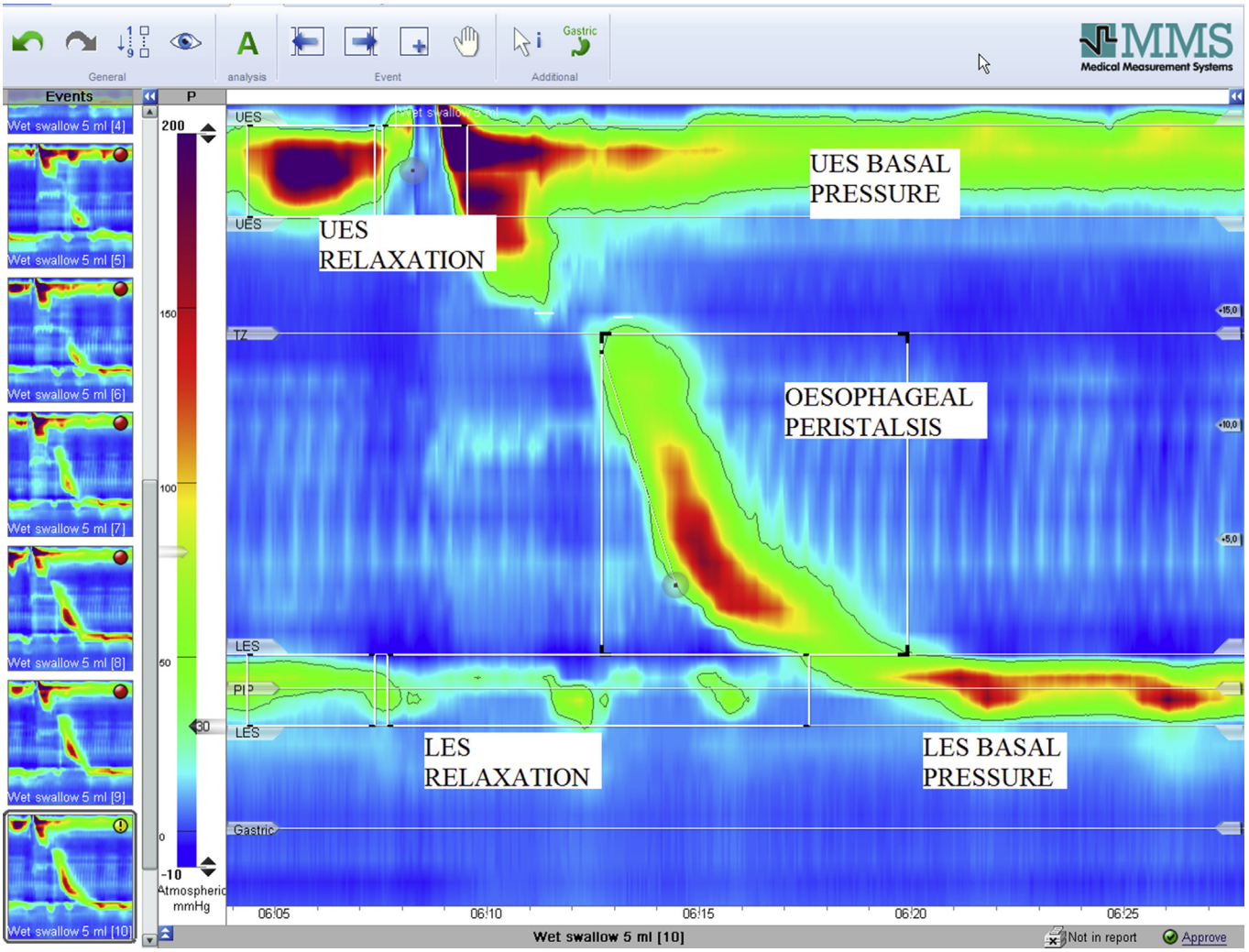

Figure 1 High resolution manometry trace of a normal swallow. Essentially the upper oesophageal sphincter relaxes (UES RELAXATION), followed by lower oesophageal sphincter relaxation (LES RELAXATION) and oesophageal peristalsis. Areas with basal resting upper and lower oesophageal sphincter pressures are shown by UES BASAL PRESSURE and LES BASAL PRESSURE. The Clause (Contour) plot is shown by blue representing low pressure, green areas moderate pressure and red and purple areas high pressure.

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