Esophageal Motility Disorders

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KEYWORDS

• High-resolution manometry • Esophageal motility • Achalasia
• Spastic motility disorder • Peristalsis • Fundoplication

KEY POINTS

- The esophageal motility study is an important component of the evaluation of patients presenting with thoracic dysphagia.
- The Chicago classification includes an algorithm for diagnosis of primary esophageal motility disorders, designed primarily to be more clinically relevant and identify motility disorders that are pathologic or not found in normal patients.
- High-resolution esophageal motility studies and the Chicago classification have clarified the definitions of spastic esophageal motility disorders; however, it is not clear if revised definitions of hypomotility disorders will or have affected surgical decision making.
- The esophageal motility disorder is still thought to be an essential part of the evaluation of any patient considered for antireflux surgery.
- Achalasia has a revised classification scheme that has a correlation with surgical and medical therapies.

INTRODUCTION: NATURE OF THE PROBLEM

The diagnosis of esophageal motility disorders has historically been closely linked to the development of technology, with diagnostic criteria changing at each technological breakthrough. For most of the modern era of laparoscopic foregut surgery, esophageal motility disorders were defined in terms of water-perfused catheters using a hydraulic capillary infusion system developed in 1977.[1] Careful manometric evaluation of the esophagus and the lower esophageal sphincter (LES) became an essential part of the preoperative evaluation before antireflux surgery and surgeons used the study of esophageal motility to guide which antireflux operation best suited their respective patients. Because more than 50% of patients presenting with dysphagia without signs of mechanical esophageal obstruction have been found to have abnormal esophageal motility, the esophageal manometry study (EMS) became an essential diagnostic test in the study of patients with esophageal origin chest pain and/or dysphagia.[2]

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Abbreviations

CDP	Contractile deceleration point
CFV	Contractile front velocity
DCI	Distal contractile integral
DES	Distal esophageal spasm
DL	Distal latency
EMS	Esophageal manometry study
EPT	Esophageal pressure topography
GEJ	Gastroesophageal junction
GERD	Gastroesophageal reflux disease
IEMD	Ineffective esophageal motility disorder
IRP	Integrated relaxation pressure
LES	Lower esophageal sphincter
POEM	Peroral endoscopic myotomy

With the exception of esophageal achalasia and scleroderma esophagus, disorders that are associated with distinct pathologic findings designating them as disease processes, all esophageal motility disorders are defined by the use of the EMS. Thus, the development of the high-resolution manometry study obligated the redefinition of all esophageal motility disorders. This article discusses esophageal motility disorders in the light of 2 important breakthroughs: high-resolution manometry studies and the diagnostic algorithm of the Chicago classification.[3]

Esophageal motility disorders have been classified as primary or secondary, or as hypocontractility, disordered contractility, or hypercontractility disorders. For the surgeon it is far more rational to group these in terms of the impact they have on surgical decision making, either as part of the evaluation for antireflux surgery or for planning operations for the relief of dysphagia. The author has grouped the esophageal motility disorders according to diagnostic criteria included in the Chicago classification.

HIGH-RESOLUTION MANOMETRY

The high-resolution manometry catheter is a solid state pressure detection system, with sensors closely spaced (1 cm or less) along the length of the catheter and radially, allowing simultaneous pressure readings of the lower and upper esophageal sphincters and the esophageal body. The high-resolution manometry systems allow pressures interpolated between measurement points to create a continuous 3-dimensional (time, distance down the axis of the esophagus, and pressure) graphic display called esophageal pressure topography (EPT).[4] Whereas water-perfused catheter systems reported esophageal pressures in terms of mm Hg of amplitude, analysis of high-resolution manometry is done by integrating the volume under the isobaric map for a given esophageal segment. Isobaric curves are created and, for ease of use, the color green is designated as 30 mm Hg pressure, based on the simultaneous video-radiographic and manometric data showing that ineffective bolus movement is associated with distal esophageal contraction amplitudes of less than 30 mm Hg.[5]

Aside from the diagnostic calculations, which must be done using a computer interface, the process of performing the study has been simplified by eliminating the need for multiple catheter manipulations (pull-throughs). Once the catheter has been placed through the gastroesophageal junction (GEJ) and into the intraabdominal stomach, the patient is placed supine and given 10 5 mL aliquots of fluid to swallow. The analysis of the study consists of evaluation (similar to water-perfused EMS) of the GEJ with measurement of LES pressure and length, assessment of

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