Investigations and Nonoperative Management

Hubert J. Stein · Jörg Theisen

Introduction

A disturbed propulsive activity or dyscoordination between peristalsis within the body of the esophagus and relaxation of the lower esophageal sphincter are the hallmarks of primary esophageal motility disorders resulting in nonobstructive dysphagia (i.e., dysphagia in the absence of structural abnormalities), regurgitation and/or noncardiac chest pain. These symptoms are, however, neither specific nor sensitive enough to establish a diagnosis. Rather, objective tests are required in order to guide therapy [1–3].

Based on stationary esophageal manometry a number of primary esophageal motility disorders are usually classified as separate disease entities [1]. These include achalasia, diffuse esophageal spasm, the so-called nutcracker esophagus, and nonspecific esophageal motor disorders. With the introduction of more physiological and prolonged esophageal motility recording techniques the clinical utility of stationary esophageal manometry and the classification of primary esophageal motor disorders has, however, been questioned [2].

Current controversies focus on the objective tests required for an adequate diagnosis and classification of the primary esophageal motor disorders and the efficacy of nonoperative therapy in comparison to the newly established techniques of minimally invasive surgical intervention.

Diagnostic Tests for Esophageal Motor Disorders

Several diagnostic tests are available to examine patients with suspected esophageal motor disorders. These include endoscopy, endoscopic ultrasonography, contrast radiography, stimulation tests, transit scintigraphy, stationary esophageal manometry, and ambulatory 24-h esophageal manometry. Their diagnostic accuracy and clinical value varies widely.

Upper gastrointestinal endoscopy with biopsy usually constitutes the first examination in a patient complaining of dysphagia or regurgitation. Although endo-
Endoscopy with biopsy is superior to any other diagnostic test to identify structural abnormalities and epithelial alterations, it is a poor tool to identify motility disorders. Endoscopy in most instances thus only serves to exclude underlying disorders that may mimic esophageal motor abnormalities [2, 3].

**Endoscopic ultrasound** has been employed in patients with achalasia demonstrating a wall thickness in the area around the sphincter, but with a high rate of false-positive results [4]. Studies in patients with other motor disorders are scant. Endoscopic ultrasound is therefore currently not recommended as a routine tool in the diagnostic assessment of patients with motility disorders.

**Contrast radiography** of the esophagus is employed in many institutions as one of the first diagnostic techniques in patients with suspected esophageal motor disorders. Usually a video recording of at least five 10-cc swallows of barium is performed. To mimic a more realistic situation a barium-soaked hamburger bolus may be added, specifically in patients complaining of dysphagia for solids. Studies show a high sensitivity of video-esophagography in the evaluation of patients with achalasia, but sensitivity is low in patients with other forms of motor abnormalities [5].

**Stimulation or provocative tests** include the use of acid perfusion, administration of tensilon, or balloon distension to reproduce the patients’ symptoms. Based on recent data from the literature and the authors’ own experience, these tests are not very helpful since most of them have a low yield of symptom reproduction and the findings do not correlate with observations made during spontaneously occurring symptoms [2].

**Scintigraphy** with a fluid or semi-solid radiolabeled bolus allows the quantification and visualization of esophageal transport abnormalities. As is also the case with other stationary tests, scintigraphy lacks sensitivity and specificity for the diagnosis and classification of intermittently occurring esophageal motor disorders [2].

**Stationary or standard esophageal manometry** is widely accepted as the gold standard in the diagnosis and classification of esophageal motility disorders [1]. A typical pattern of motor abnormalities on a series of “wet swallows” on standard manometry has been the basis for the diagnosis of achalasia, diffuse esophageal spasm, “nutcracker esophagus” and nonspecific motor disorders. Recent studies show that stationary esophageal motility testing is particularly useful for evaluating patients with dysphagia but has little clinical utility in patients with noncardiac chest pain [6, 7]. This is because standard manometry is performed in a laboratory setting with the patient in the supine position and the analysis is normally based on five to ten water swallows only. Stationary manometry may thus miss intermittent motor abnormalities, particularly those occurring during meals only.

The technique of **ambulatory 24-h monitoring** of esophageal motor activity multiplies the number of esophageal motor events available for analysis. It thus provides an opportunity to assess esophageal motor function over a complete circadian cycle and correlate motor events with spontaneously occurring symptoms. This increases the accuracy and dependability of the measurement [8, 9]. The broad clinical application of this technology has provided new insights into esophageal motor function in health and disease under a variety of physiological conditions. Studies employing ambulatory motility monitoring show that patients with nonobstructive dysphagia show an increased prevalence of nonperistaltic and