

# ADVANCES IN GERD

Current Developments in the Management of Acid-Related GI Disorders

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## Surgical Options for Treatment of Esophageal Motility Disorders

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### **G&H** What specific conditions are encompassed by the term “esophageal motility disorders?”

**BO** Among the conditions encompassed by esophageal motility disorders, there is a dichotomy between achalasia and the other motility disorders, which include diffuse esophageal spasm, nutcracker esophagus, and hypertensive lower esophageal sphincter. Achalasia is more prevalent and straightforward, at least from the standpoint of surgery. The other esophageal conditions are more esoteric, and consequently, fewer data are associated with them, as well as more opinion and controversy.

### **G&H** What are the typical presenting symptoms of esophageal motility disorders?

**BO** The two main presenting symptoms are dysphagia and chest pain. Several esophageal motility disorders (eg, nutcracker esophagus) have manometric findings that are often associated with gastroesophageal reflux disease (GERD), causing these disorders to potentially overlap with GERD. Nevertheless, the main symptoms remain dysphagia and chest pain.

### **G&H** How is a diagnosis made for esophageal motility disorders?

**BO** These disorders are usually suspected based on symptoms and imaging modalities (esophagogastroduodenoscopy or upper gastrointestinal radiography), but most of these motility disorders are diagnosed, defined,

and labeled based on manometric findings. However, the diagnosis by manometry must be correlated with the presentation when deciding therapy. With the exception of achalasia, many patients may be asymptomatic or may present with symptoms that are not classically associated with their manometric abnormalities. Therefore, if a physician intends to treat, and certainly if he or she intends to consider surgery for these patients, the patients must have not only the manometric findings but also the clinical and radiologic findings to support the condition before treatment. Unfortunately, I see many patients who have been labeled and treated based on their manometric findings alone and not their presentation, leading to treatment that usually has negative consequences. The most common example is a patient with GERD who has a manometric examination in the work-up of heartburn or another GERD symptom and is found to have a tracing consistent with nutcracker esophagus. In this case, treatment should be directed either medically or surgically at their GERD and not at the motility disorder.

### **G&H** What are the main surgical options for esophageal motility disorders? How are they performed?

**BO** The main procedure is a Heller myotomy. In the past, the Heller myotomy was mainly performed through a left thoracotomy. Currently, the myotomy is usually approached laparoscopically, as this method is less invasive and, in some ways, more efficacious. The myotomy is performed by making five small incisions in the abdomen and then dividing the muscle fibers overlying the mucosa of the esophagus and the proximal stomach or the cardia, leaving the submucosa and mucosa intact. The exact length and dimensions of the division can be controversial

and is frequently debated. Based on the research we have conducted at the University of Washington, we normally divide the muscle on the proximal 3 cm of the stomach and the distal 6 cm of the esophagus in one direct line, usually on the anterior surface of the esophagus and stomach. Three centimeters is the dimension that our research has shown to provide maximum improvement in dysphagia, especially with achalasia. We believe that this is likely to hold true for other motility disorders that cause dysphagia and, therefore, routinely make a similar incision for those patients. However, not all surgeons follow the same dimensions for this procedure.

The other main procedure is the extended Heller myotomy. There are two common methods for performing an extended Heller myotomy. The more traditional route begins with a left thoracotomy to reach the level of the gastroesophageal junction and then goes up to the level of the aortic arch, where a long esophageal myotomy, rather than a long gastric myotomy, is performed. The approach that my colleagues and I subscribe to, especially in patients who present with dysphagia, is to use the approach that is least invasive and that we believe is most likely to help the patient first. Thus, we generally approach the extended myotomy in stages. First, we perform a laparoscopic Heller myotomy with a 3-cm gastric myotomy and take the esophageal myotomy as far proximally as possible to perform a 10–12 cm myotomy. Then, we see how the patient responds. If the patient still has a physiologic and symptomatic problem with the more proximal esophagus, we then perform a thorascopic procedure on the right chest, carrying the esophageal myotomy through the right chest all the way to the thoracic inlet, to perform a nearly complete myotomy that encompasses almost all of the esophagus.

### **G&H** Are there any other surgical options for the treatment of esophageal motility disorders?

**BO** The standard and extended Heller myotomies are the major procedures. Currently, an esophagectomy is only used in extremely rare cases of end-stage disease in any motility disorder, including achalasia, that has failed all other therapies and in which the patient is experiencing severe symptoms of sequelae or experiencing severe peptic strictures due to reflux caused by standard or extended myotomy.

Another surgical scenario in cases of esophageal motility disorders is epiphrenic diverticulum. The typical presentation is dysphagia, regurgitation, and halitosis from poor esophageal clearance. A symptomatic epiphrenic diverticulum is a surgical condition that usually requires resection of the diverticulum and an esophageal myotomy, which usually may be performed laparoscopically. How-

ever, if the epiphrenic diverticulum is quite large and/or proximally located, a thoracic approach is required.

### **G&H** What have studies reported about the efficacies of standard and extended Heller myotomies?

**BO** The efficacies of the procedures depend on the presenting symptoms of the patient. For a standard Heller myotomy, most reports have shown that patients presenting with achalasia demonstrate a 95% improvement in dysphagia, the main presenting symptom, in the long term (defined as 5 years and beyond). For chest pain associated with achalasia, standard myotomy demonstrates a little less efficacy (approximately 70%).

In terms of other motility disorders, such as diffuse esophageal spasm and hypertensive lower esophageal sphincter, the efficacy of standard myotomy is thought to be lower (70–80% for dysphagia and even lower for relief of chest pain and spasm). The effectiveness is difficult to define, as most reports are limited to small case series that do not report outcomes in a standardized manner. However, the available efficacy data demonstrate that, as with achalasia, the efficacy generally depends on the presenting symptoms of the patient. Accordingly, standard Heller myotomy for these disorders is more efficacious if the patient presents with dysphagia than when the patient complains of chest pain. Thus, regardless of the esophageal motility disorder, the efficacy of the standard myotomy increases in patients with dysphagia as opposed to patients with chest pain. Better and more consistent results are available in achalasia than in the other motility disorders.

Studies have also shown that the greater the correlation of clinical symptoms of esophageal motility disorders with radiographic findings (usually via upper gastrointestinal or barium-swallow testing), the greater the likelihood that a myotomy, or any other treatment for that matter, will work.

### **G&H** Can you expand on the medical and endoscopic alternatives to surgery in the treatment of esophageal motility disorders?

**BO** Currently, for patients with achalasia, a standard Heller myotomy is used as first-line therapy frequently, but not exclusively. Other first-line therapy options for patients with achalasia include endoscopic pneumatic dilation or botulinum toxin (Botox, Allergan) injection. Presently, medical therapy is rarely used for treatment of achalasia.

In contrast, for patients with esophageal motility disorders other than achalasia, myotomy is usually reserved

for only a certain subset of medical and/or endoscopic treatment failures. Standard treatment of these motility disorders begins by ruling out GERD by empiric treatment with proton pump inhibitors. Once GERD is ruled out, different classes of smooth muscle relaxants are commonly used, including nitrates, calcium channel blockers, or phosphodiesterase inhibitors such as sildenafil (Viagra, Pfizer). Occasionally, cytotoxic medications (eg, trazodone) are used. Endoscopic therapies such as botulinum toxin injection may be used for these disorders for diagnostic or, occasionally, therapeutic uses. Pneumatic dilations are sometimes performed but generally are not effective in nonachalasia motility disorders.

### **G&H** Are there significant contraindications, complications, or postoperative mortality rates associated with standard or extended Heller myotomies?

**BO** The major contraindications for standard myotomies are the usual patient medical factors associated with high risk of general anaesthesia. There is a waning relative contraindication of end-stage achalasia (for example, with those with a dilated sigmoid esophagus). I would, even in patients with a sigmoid esophagus, perform a standard myotomy because it can be approached laparoscopically and there is little to lose. We have found that standard myotomy is often efficacious and allows us to avoid the other surgical option for these patients: esophageal resection. Approximately 20% of patients who undergo Heller myotomy demonstrate subsequent gastroesophageal reflux and that is even with the incorporation of fundoplication into the surgery. The other potential risk is perforation. The mortality rate for the laparoscopic myotomy is well under 1%.

The contraindications, complications, and mortality risks are no different for the extended myotomy, with the only caveat being that whenever the chest is entered, the morbidity and complications from single-lung ventilation, including pneumonia and other problems, increase.

### **G&H** Are repeat procedures or other therapies usually required in the long term for any of the procedures?

**BO** We have found, at least for achalasia, that with an extended gastric Heller myotomy, the need for other procedures is rare, although the literature suggests that

approximately 5–19% of patients will require some other form of therapy, usually endoscopic therapy (pneumatic dilation or botulinum toxin injection) and rarely, a repeat operation (either myotomy or esophagectomy).

### **G&H** What is the role of partial fundoplication in Heller myotomy? Which types work best?

**BO** For the majority of standard Heller myotomies, most surgeons perform some type of partial fundoplication because an effective operation will obliterate the lower esophageal sphincter mechanism, which provides protection against reflux. If partial fundoplication is not used, a vast majority of patients will develop significant GERD. A total fundoplication, however, is not desirable with myotomy, as it completely recreates the competency of the lower esophageal sphincter and likely results in dysphagia. Although there are one or two studies in the literature refuting this premise, it is nearly universally accepted. The inclusion of partial fundoplication does not appear to decrease the efficacy of relieving dysphagia in the majority of these patients. The only exception, in my mind, is a patient with a very dilated or tortuous esophagus, in which the orientation of the junction between the esophagus and the stomach is often disrupted. Furthermore, because of the dilation of the esophagus, a fundoplication does not make much sense. With all other patients, fundoplication is usually efficacious.

It is unclear whether a Dor or a Toupet fundoplication is better. Surgeons are more or less split evenly between them. My colleagues at the University of Washington and I are currently part of an ongoing, randomized trial in the United States examining patients with achalasia receiving Dor or Toupet fundoplication to determine which is more efficacious.

### **Suggested Reading**

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