Peroral Endoscopic Myotomy (POEM) for Esophageal Achalasia

Gastroenterological endoscopists at Penn Medicine are now performing incisionless Peroral Endoscopic Myotomy (POEM) to treat esophageal achalasia.

Achalasia is a rare idiopathic motility disorder that manifests as incomplete relaxation of the lower esophageal sphincter (LES) and aperistalsis of the esophageal body. Normally, these physiological events are mediated by intact myenteric neurons. Achalasia is the result of damage to these neurons. Impairment of smooth muscle function then leads to failure of bolus transit through the esophagus.

Diagnosis is based on endoscopy to exclude a structural cause for symptoms, barium radiography, which will typically reveal a "bird’s beak" appearance, and esophageal manometry which reveals failed relaxation of the lower esophageal sphincter accompanied by one of three patterns of contraction abnormalities: type I with absence of pressurization, type II with panesophageal pressurization and type III with spas tic contractions.

Following diagnosis, the standard surgical treatment is Heller myotomy, a procedure that involves cutting the muscles of the LES to open the valve and permit food and liquids to pass into the stomach. Laparoscopic multi-port Heller myotomies are now the preferred approach. Post-operative complications may include infection, bleeding and rarely, esophageal or gastric perforation. The Heller procedure is often combined with fundoplication to prevent gastroesophageal reflux.

Alternatives to surgery for the treatment of achalasia include balloon dilation to expand the contracted sphincter, and injections of botulinum directly into the esophagus to relax esophageal muscle contractions.

A more recent innovation, Peroral Endoscopic Myotomy (POEM) has been developed in Japan by Haruhiko Inoue, MD, PhD, who guided the introduction of the procedure at Penn Medicine. POEM involves the use of endoscopic tools to perform an intramural myotomy (as opposed to the extramural Heller procedure). A full description of the procedure can be found in the Case Study below.

In Dr. Inoue’s original series of 70 cases at Showa University Hospital, Yokohama, Japan, POEM resulted in significant reductions in LES pressure (elevated in most patients with achalasia) and subjective symptom score. Marked improvement was noted in esophageic appearance and esophageal emptying on barium swallow. Symptomatic post-POEM gastroesophageal reflux disease was observed in 11.4% of patients, but all were successfully treated with standard proton pump inhibitors. [1]

Case Study

Mr. Y., age 43 years, was referred to Penn Gastroenterology eight months after a botulinum toxin injection procedure for diagnosed achalasia at a hospital near his home in New Jersey.

Mr. Y’s symptoms at this time included protracted post-prandial pain, dysphagia to both solids and liquids and occasional vomiting. The botulinum toxin injection procedure provided some immediate relief, but within three to six weeks, his symptoms began a slow and progressive return. Mr. Y was in otherwise good health.

At Penn, a barium esophagram revealed esophageal dilatation and stenosis of the cardiac region of the esophagus with delayed evacuation of the barium meal (Fig. 1). After a consultation to discuss his options, it was agreed that Mr. Y would have a POEM procedure.

Mr. Y’s POEM was initiated by creating a 2 cm entry site into the mid-esophageal wall and then a tunnel in the submucosal space extending immediately beyond the esophagogastric junction to the lesser curve of the gastric cardia (Fig. 2).

Next, an inner circular muscle myotomy was performed by grasping and dividing the fibers. Following the myotomy, the endoscope was withdrawn from the submucosal tunnel and reinserted into the lumen to inspect the mucosa, ensure mucosal integrity and confirm easy passage of the endoscope through the LES consistent with an adequate myotomy. The mucosal entry site was then closed with endoscopic clips (Fig. 3).

Mr. Y was observed overnight in the Second-Stage Recovery Unit following his procedure. He received IV-hydration until post-operative day 1, when a barium esophagram was obtained. Noting no loss of mucosal integrity or leakage, Mr. Y was started on a liquid diet and discharged home. Two days later, he began a solid diet, and his recovery thereafter was unremarkable. At his six-month follow-up, he reported a complete resolution of symptoms.

Reference

Faculty Team

The Division of Gastroenterology at Penn Medicine is comprised of a multidisciplinary team of clinician specialists who treat a variety of digestive, liver and pancreatic disorders. Many Penn gastroenterologists are actively involved in clinical research, as well, pioneering advances within their fields to bring more options to the detection and management of inflammatory bowel disease, Crohn’s disease, celiac disease and gastroesophageal reflux disease and other gastrointestinal disorders. The genetics of gastroenterological disease are a particular focus of research at Penn, as are the effects of comorbid disease and other risk factors.

Performing Peroral Endoscopic Myotomy at Penn Medicine

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Enrolling Clinical Trials at Penn Gastroenterology

Expanding the Clinical Applications of Functional Luminal Imaging (EndoFLIP) in Esophageal Stenoses

The purpose of this study is to investigate the use of a functional luminal imaging probe to characterize benign esophageal luminal strictures before and after dilation and identify predictors of response to therapy. Patients will be evaluated during endoscopy using functional luminal imaging (EndoFLIP; Crospon Medical Devices, Galway, Ireland) to characterize the geometry of benign luminal esophageal narrowing before and after dilation. Contact Maureen DeMarshall, BSN, RN, at demarsham@mail.med.upenn.edu.

Preliminary Evaluation of Septin9 in Patients With Hereditary Colon Cancer Syndromes

This is an observational, case-control study evaluating the quantitative level of Septin9 in plasma pre- and post-colectomy in patients with hereditary colorectal cancer (CRC) syndrome, Familial Adenomatous Polyposis (FAP), Lynch syndrome (also known as HNPCC), and Multiple Adenomatous Polyposis (MAP, also known as MYK/MYH), with genetically related FAP-family members as controls and references. Contact Julie Starr at 215.349.8527, or jsstarr@mail.med.upenn.edu.

Familial Barrett’s Esophagus (FBE)

This is a multi-center study whose aim is to define the epidemiology and genetics of Barrett’s esophagus and adenocarcinoma. The researchers have studied families affected with Barrett’s esophagus and esophageal adenocarcinoma. They have found that Barrett’s and esophageal cancer occur at a younger age in these families, suggesting that familial Barrett’s esophagus is a genetically inherited disease. Contact Maureen DeMarshall, RN, at demarsham@mail.med.upenn.edu.