

ADVANCES IN GERD

Current Developments in the Management of Acid-Related GI Disorders

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The Use of Peroral Endoscopic Myotomy for the Management of Achalasia



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G&H How is peroral endoscopic myotomy performed?

MK Peroral endoscopic myotomy (POEM) is performed using a high-definition upper endoscope with a clear cap at its tip and with carbon dioxide for insufflation. The main indication is achalasia, and other indications are evolving. POEM is a 4-step procedure. The first step is to create an incision in the mucosa. The second step is submucosal tunneling, followed by the endoscopic myotomy itself. The last step is to close the initial incision.

G&H What have studies reported regarding the safety and efficacy of POEM for the short- and long-term management of achalasia?

MK Multiple retrospective and prospective studies have evaluated the safety and efficacy of POEM. Data from these studies show that serious adverse events are extremely rare, which has been the experience at my institution as well. Clinical efficacy, meaning the resolution of symptoms of dysphagia, regurgitation, chest pain, and weight loss, is seen in approximately 90% of patients overall. Most of the retrospective and prospective studies investigated short-term efficacy, with an average follow-up of 1 year. My colleagues and I have published data on 2-year follow-up, and other authors have published data on the efficacy of POEM at up to 5 years. At the

recent Digestive Disease Week meeting in Washington, DC, my colleagues and I presented data on follow-up at 4 years. It appears that after a follow-up period of 4 to 5 years, POEM has an average efficacy rate of 85% to 90%, which speaks to the durability of the procedure.

G&H Is POEM effective for all 3 types of achalasia?

MK Yes. For the management of type I (minimal esophageal contractility) and type II (panesophageal pressurization) achalasia, POEM is associated with an efficacy of approximately 85% to 95%. Type III achalasia (spastic) is a little less responsive to any kind of treatment, including POEM; the procedure has an efficacy of approximately 80% to 85% for this subtype.

G&H How does POEM compare to laparoscopic Heller myotomy or other treatments for the management of achalasia?

MK Alternative treatments for achalasia include botulinum toxin injection, pneumatic dilation, and laparoscopic Heller myotomy. No head-to-head comparison has been made of POEM and botulinum toxin; however, with a short-term efficacy of 6 to 12 months maximum after injection, botulinum toxin should be reserved for patients who are not candidates for any other alternative treatment option. Furthermore, repeated injections of botulinum

toxin can result in significant submucosal fibrosis that may render subsequent myotomy more challenging (and occasionally impossible). A multicenter, randomized trial, the results of which were presented at Digestive Disease Week 2017, compared the clinical efficacy of POEM to pneumatic dilation at 1-year follow-up. The results of the trial demonstrated that POEM was significantly superior to pneumatic dilation by approximately 20%; however, POEM was associated with an increased risk of postprocedural acid reflux compared to pneumatic dilation. Multiple retrospective studies have compared POEM to laparoscopic Heller myotomy. In general, the efficacy and safety between the 2 procedures are comparable. The risk of reflux following either procedure varies and is dependent upon multiple factors, including the definition of reflux provided in each study. Some studies have suggested an equivalent risk of reflux between POEM and laparoscopic Heller myotomy, whereas other studies have shown an increased risk of reflux with POEM.

G&H What are the main benefits and limitations of POEM?

MK The 2 primary treatment options for achalasia are POEM and laparoscopic Heller myotomy. The main benefit of POEM is that it is a scarless and less invasive treatment modality. POEM also provides a quicker relief of dysphagia compared to laparoscopic Heller myotomy, which is routinely performed concomitantly with a partial fundoplication, resulting in up to 6 months of recovery from dysphagia. Lastly, POEM is typically performed in an outpatient setting and is associated with less postprocedural pain vs surgery. The main shortcoming of POEM is the potential increased risk of reflux as compared to surgery. Nonetheless, reflux can typically be easily managed with a once-daily proton pump inhibitor. Alternatively, endoscopic fundoplication (eg, transoral incisionless fundoplication [TIF]) is now possible and can be used to manage patients who continue to experience reflux symptoms despite medical therapy. TIF is also an option for patients who are interested in coming off all acid-suppressant therapies.

G&H What adverse events are associated with POEM?

MK Minor bleeding commonly occurs during the procedure and can be treated endoscopically. Delayed bleeding is very rare and is seen in less than 0.5% of cases. Symptoms include severe chest pain and hematemesis. Other complications include mucosotomy or perforation, which occurs in approximately 2% of patients and can be treated endoscopically using clips.

Pleuritic chest pain can also occur postprocedure and can be resolved with pain management. Mucosal tears, infections, mediastinitis, and leakage following the procedure occur in less than 1% of patients. Lastly, tension pneumomediastinum and pneumothorax are other rare adverse events that can be seen periprocedurally. Acid reflux is the main long-term adverse event that is associated with POEM, and can usually be treated with a proton pump inhibitor.

G&H In whom is POEM contraindicated?

MK Patients with a large hiatal hernia who are at risk of encountering severe reflux would benefit from undergoing laparoscopic Heller myotomy, during which a hernia repair surgery can be performed. Patients should also avoid POEM if they have advanced or end-stage achalasia with severe or late sigmoid changes. These patients might benefit instead from either a total esophagectomy or a laparoscopic Heller myotomy, with straightening of the esophagus to relieve the significant sigmoid changes in the lower esophagus.

G&H What follow-up is needed?

MK Patients should be seen 2 weeks following the procedure in order to have their symptoms assessed for improvement. By this time, patients should be eating a nonrestricted diet. Clinicians should check for symptoms of reflux and for any possible delayed complications such as bleeding and infection. Six months after the procedure, patients should undergo objective testing for reflux. Patients should cease antacid use and be tested for abnormal esophageal acid exposure, whether they have symptoms of reflux or not. It is important to study this patient population for abnormal esophageal acid exposure because it can predispose these patients to long-term complications, such as Barrett esophagus, esophageal adenocarcinoma, and esophageal stricture. Beyond that, clinicians should continue to assess patients for recurrence of symptoms during long-term follow-up.

G&H How significant is the learning curve to perform POEM?

MK Multiple authors have published literature on the learning curve for POEM, including my colleagues and me. Some data report that up to 100 cases is necessary to become an expert at performing POEM, but most clinicians agree that 40 cases is sufficient for therapeutic endoscopists or surgeons who are experts in endoscopy to independently perform the procedure safely and efficiently.

G&H Is POEM used in clinical practice, or is it reserved for centers of excellence or specialty centers?

MK POEM was initially performed at centers of excellence, but the procedure is rapidly expanding to clinical practices. Importantly, the procedure should be conducted in a hospital setting and not in ambulatory centers; complications can occur, and working in a hospital environment provides support from various departments, including thoracic surgery, anesthesia, and pulmonary.

G&H What are the priorities of research in this field?

MK One of the main priorities is to research the actual risk of reflux with POEM, as well as the steps that can be taken to prevent or minimize reflux. The long-term effects of reflux in these patients is also a topic of interest. It would be beneficial to have studies evaluating whether anterior or posterior POEM is the best technique. Lastly, more randomized, controlled trials are needed to

compare POEM to laparoscopic Heller myotomy and pneumatic dilation. Data from recently concluded trials are eagerly awaited.

Dr Khashab is on the medical advisory board for Boston Scientific and Olympus, and serves as a consultant for Boston Scientific, Olympus, and Medtronic.

Suggested Reading

Haito-Chavez Y, Inoue H, Beard KW, et al. Comprehensive analysis of adverse events associated with per oral endoscopic myotomy in 1826 patients: an international multicenter study. *Am J Gastroenterol*. 2017;112(8):1267-1276.

Khashab MA, Benias PC, Swanstrom LL. Endoscopic myotomy for foregut motility disorders. *Gastroenterology*. 2018;154(7):1901-1910.

Parsa N, Khashab MA. POEM in the treatment of esophageal disorders. *Curr Treat Options Gastroenterol*. 2018;16(1):27-40.

Patel KS, Calixte R, Modayil RJ, Friedel D, Brathwaite CE, Stavropoulos SN. The light at the end of the tunnel: a single-operator learning curve analysis for per oral endoscopic myotomy. *Gastrointest Endosc*. 2015;81(5):1181-1187.

Repici A, Fuccio L, Maselli R, et al. GERD after per-oral endoscopic myotomy as compared with Heller's myotomy with fundoplication: a systematic review with meta-analysis. *Gastrointest Endosc*. 2018;87(4):934-943.e18.

Teitelbaum EN, Dunst CM, Reavis KM, et al. Clinical outcomes five years after POEM for treatment of primary esophageal motility disorders. *Surg Endosc*. 2018;32(1):421-427.