A 63-year-old woman with a long history of a symptomatic, large, epiphrenic diverticulum (Eckardt Symptom Score 10 [dysphagia 3, regurgitation 3, chest pain 2, weight loss 2])\(^1\) was admitted for surgical resection. Preoperative upper endoscopy, high-resolution manometry, and contrast esophagogram revealed a previously undiagnosed additional motility disorder (Figs. 1 and 2), suggestive of a coincident type I achalasia, although the Chicago criteria\(^2\) were not completely met.

According to published reports, 75% to 100% of all epiphrenic diverticula develop in an underlying esophageal motility disorder, eg, achalasia, resulting in a contractile discoordination between the distal esophagus and the lower-esophageal sphincter with outpoucing of the mucosal and submucosal layers in the latter course.\(^3\) Whereas historically surgical treatment consisted of a lateral thoracotomy or a thoracoscopic approach, currently the treatment of choice is a less invasive laparoscopic approach.
longitudinal transection of the diverticulum in combination with a cardiomyotomy and a partial fundoplication.

Similar to what we know from laparoscopic Heller myotomy in spastic motility disorders of the esophagus, eg, type III achalasia or jackhammer esophagus, application of a laparoscopic transhiatal approach is also limited in patients with larger diverticula, a long distance between the neck of the diverticulum and the hiatus, and the presence of dense adhesions between the diverticulum and the adjacent mediastinal structures, making the dissection, application of the stapler, and approximation of the muscle layers more difficult. Myotomy is usually done contralateral to the diverticulotomy. Leakage of the staple line after diverticulotomy with the development of abscesses.

Figure 2. High-resolution manometry (HRM) after endoscopic positioning of the probe: integrated relaxation pressure (IRP) with 23.2 mm Hg (<15 mm Hg) slightly elevated and reduced relaxation rate of the lower esophageal sphincter (LES = “UOS”) with 59% (>60%). However, the Chicago criteria for achalasia are not totally met. IBP, intra-bolus pressure; DL, distal latency; DCI, distal contraction integral; PCV/PCP, proximal contraction wave velocity/pressure; DCV/PCV, distal contraction wave velocity/pressure.

Figure 3. A, Myotomy (red) and septotomy (yellow) are completely performed. B, Endoscopic view of submucosal tunnel and diverticulum after complete myotomy of the proper muscle layer and the septum.
formation and sepsis is the major adverse event and is frequently observed in patients without a simultaneous myotomy, with a significant rate of morbidity and mortality of up to 33% and 10%, respectively.3

Since the advent of per-oral endoscopic myotomy (POEM) of the esophagus in 2009, this promising technique has been shown to be effective and safe in short-term and midterm follow-up studies for the treatment of esophageal motility disorders and to not be inferior to a surgical approach.1 Moreover, POEM seems to be established as the treatment of first choice in spastic motility disorders like type III achalasia and jackhammer esophagus. Two case reports by Demeter et al12 and Nabi et al13 have shown that POEM is also feasible for myotomy in patients with achalasia in the presence of an epiphenric diverticulum when carried out at the contralateral side.

Available data are not quite consistent as to whether or not diverticulectomy is mandatory. Some studies suggest that myotomy alone is sufficient, whereas others recommend diverticulectomy, with a major concern about the risk of food retention and regurgitation and consequent aspiration.3 There is also 1 case report of effective symptom control of achalasia after successful endoscopic creation of an esophagogastric bypass anastomosis through an epiphenric diverticulum by use of a lumen-apposing covered metal stent.7

We present a video case report (Video 1, available online at www.VideoGIE.org) of the aforementioned highly symptomatic patient with achalasia and large epiphenric diverticulum, which we treated with POEM and a simultaneous endoscopic diverticuloseptotomy in a tunneling technique, similar to endoscopic treatment of a Zenker diverticulum (Fig. 3A). Both myotomies were performed from the same submucosal tunnel that had been created from a longitudinal posterior entry mucosotomy in a 6 o’clock position (diverticular orifice at 2 to 5 o’clock), starting 9 cm above the oral margin of the diverticulum (2-cm mucosotomy length, 2-cm safety margin in submucosal tunnel, 5-cm myotomy above the diverticulum, resulting in a 10-cm esophageal myotomy) and distally extended 3 cm beyond the esophagogastric junction (EGJ) to the stomach. At the level of the neck of the diverticulum, the tunnel—passing the diverticulum at 6 o’clock—was horizontally extended toward 2 o’clock until the gap in the proper muscle layer with the penetrating mucosal sleeve was exposed.

As a first step, conventional myotomy of the proper muscle layer starting from 5 cm above the diverticulum was performed and extended 3 cm beyond the EGJ. In a second step, we performed an additional complete myotomy of the muscle layer that forms the septum between the diverticulum and the esophageal lumen, resulting in a wider opening of the diverticulum (Fig. 3B). The final result of endoscopy and contrast esophagogram showed a large opening of the EGJ and a collapsed diverticulum (Fig. 4), resulting in an excellent immediate short-term clinical effect with reduction of the patient’s Eckardt Symptom Score from 10 to 2. Although a small mucosal ridge of the diverticulum was still visible on endoscopic examination and contrast esophagogram, the combination of the septotomy—facilitating a better emptying of the diverticulum—with a transhiatal myotomy in this patient with impaired relaxation of the lower esophageal sphincter resulted in sufficient esophageal clearance and excellent symptom control.

POEM seems to be safe and effective also in the presence of a large epiphenric diverticulum. Myotomy and diverticuloseptotomy could be performed in 1 endoscopic approach and were effective for symptom control. Because most of the epiphenric diverticula develop in underlying...
motility disorders, and myotomy seems to be mandatory for a safe and effective treatment, this new, less invasive technique has the potential to replace surgery in a many patients in the future.

**DISCLOSURE**

Dr Beyna is a consultant and lecturer for Olympus, Boston Scientific, and Medtronic, and a lecturer for the Falk Foundation. Dr Neuhaus is a consultant and lecturer for Olympus, Boston Scientific, Medtronic, and Cook Medical and a lecturer for the Falk Foundation. The other author disclosed no financial relationships relevant to this publication.

**Abbreviations:** EGJ, esophagogastric junction; POEM, per-oral endoscopic myotomy.

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