ORIGINAL ARTICLE

Open Zenker's-peroral endoscopic myotomy: novel treatment for Zenker's diverticulum

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INTRODUCTION

Zenker's diverticulum (ZD) is an acquired pulsion type of false diverticulum caused by diminished compliance of the upper esophageal sphincter.[1] The principle of treatment is to disrupt the integrity of the diverticulum by way of a cricopharyngeal (CP) myotomy. Traditional treatment is open surgical myotomy with excision of the diverticulum.[2] Lately, however, the standard of care has shifted to minimally invasive endoscopic alternatives like endoscopic septotomy, or more recently, Zenker's-peroral endoscopic myotomy (Z-POEM). Endoscopic division of the septum may leave behind the lowermost part of the muscle, leading to a recurrence in up to one-third of patients. Z-POEM, in contrast, involves submucosal tunneling on the sides of septum and division of the CP muscle.[3] However, approximately 10% of patients may still have recurrence as a result of the remnant mucosal flap. The advantage of additional mucosotomy has been described recently.[4] We describe a technique of open Z-POEM (OZ-POEM), which combines both approaches and simplifies the technique itself. In OZ-POEM, additional mucosotomy is performed to mitigate recurrence, and no clip-closure of the flap is required. Here we present a case of OZ-POEM for large ZD.

CASE

A 70-year-old man presented with dysphagia to both solids and liquids, regurgitation, and halitosis for the last 10 years, with recent-onset worsening of symptoms. His Dakkak and Bennett Score was 4/4 at presentation. He also reported significant weight loss of approximately 8 kg over the prevoius 6 months. Endoscopy revealed a large ZD that measured about 5 cm in axial length, and the esophagus was pushed anteriorly and indented by septum of the ZD (Fig. 1). A noncontrast CT scan of the neck showed a large ZD arising from midline of posterior wall of distal pharynx, measuring 5.1 × 4.4 cm (Fig. 2). A preprocedural antibiotic prophylaxis was given, with piperacillin and tazobactam. Figure 3 shows an illustration of steps of the OZ-POEM procedure, with key technical differences from standard Z-POEM and modified Z-POEM procedures. Direct mucosal injection and incision of the septum led to an easy submucosal entry. A submucosal tunnel was extended on both sides of the septum and mucosal side of esophageal muscle (Fig. 4) until the base of the ZD was reached. The septum, which contained CP muscle (Fig. 5) and esophageal muscle (Fig. 6), was dissected with an T-type knife using spray coagulation (effect 2, 50 W) until the base of the diverticulum was encountered. Esophageal myotomy was not extended beyond the end point of CP myotomy. The buccopharyngeal fascia and adventitia were left intact.

At the end of the procedure, we could see complete division of septum without any remnant mucosa (Fig. 7) on the bottom of the diverticulum. Fluoroscopy at end of procedure revealed free transit of contrast from the hypopharynx into the esophagus without any leak (Fig. 8). Procedural time was 54 minutes. The patient was discharged on oral antibiotics after 48 hours. His postoperative course was uneventful except mild throat pain. The patient's follow-up at 1 and 6 months after the procedure reported resolution of dysphagia (Dakkak and Bennett Score 0/4) and other symptoms along with weight gain of 8 kg.

CONCLUSIONS

OZ-POEM resulted in visually evident improvement in the luminal diameter of the esophageal inlet on endoscopy in this patient immediately and 4 weeks after the procedure (Video 1, available online at www.videogie.org). Immediate and next-day postprocedure esophagogram showed free passage of contrast into the esophagus without any leak. This case demonstrates the feasibility of OZ-POEM to treat ZD. It allows deep muscular dissection and septotomy to

Abbreviations: CP, cricopharyngeal; OZ-POEM, open Z-peroral endoscopic myotomy; ZD, Zenker's diverticulum; Z-POEM, Z-peroral endoscopic myotomy.

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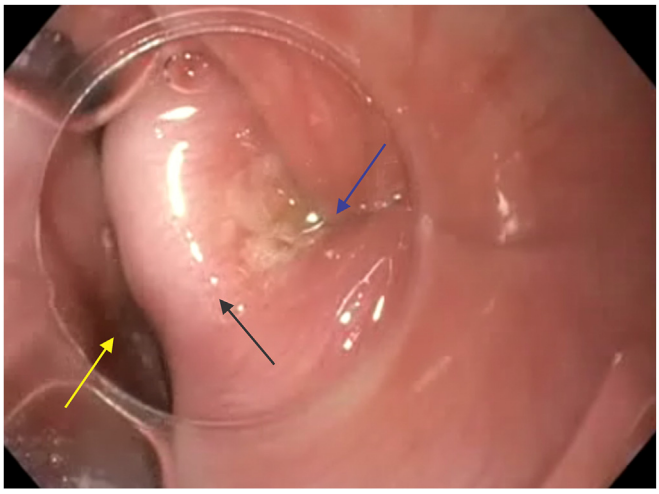

Figure 1. Endoscopy shows esophageal inlet (*blue arrow*) is pushed anteriorly and appears indented by septum (*black arrow*) and Zenker's diverticulum (*yellow arrow*) seen in line with the hypopharynx.

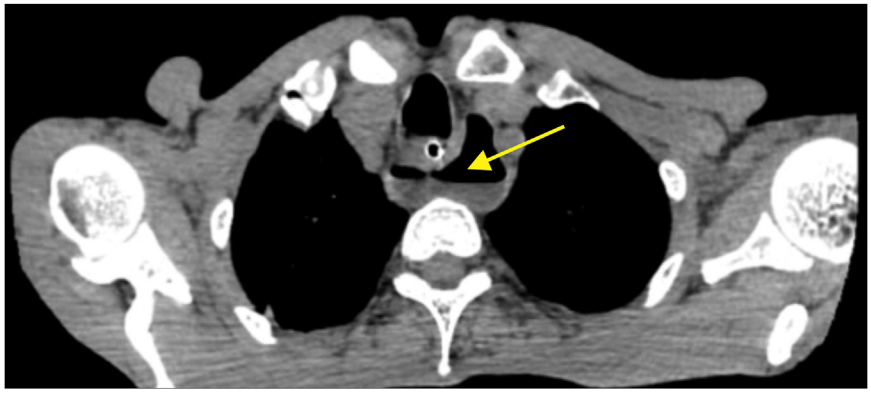

Figure 2. Noncontrast CT scan of the neck shows large Zenker's diverticulum (*yellow arrow*) arising from the midline of posterior wall of distal pharynx.

the base of the diverticulum compared with traditional septotomy. Additional mucosotomy prevents recurrence caused by remnant mucosal flap as compared with standard Z-POEM. It also avoids closure of incision and clipping of mucosal flap, which can be tricky sometimes, and expedites procedure time. However, nonclosure can be risky and sometimes may lead to leak, abscess, and fistula formation. Hence, dissection should be careful and limited to the posterolateral aspects of ZD, where the buccopharyngeal fascia is lying as an additional safeguard. Immediate contrast esophagogram should be taken for detection of leaks, and the procedure should be reserved for large ZD in which the long mucosal flap may lead to recurrence in standard Z-POEM and in which closure appears difficult at the end of the procedure after mucosotomy. Large sample size studies are needed to evaluate the clinical efficacy and safety of OZ-POEM.

PATIENT CONSENT

The patient in this article has given written informed consent to publication of their case details.

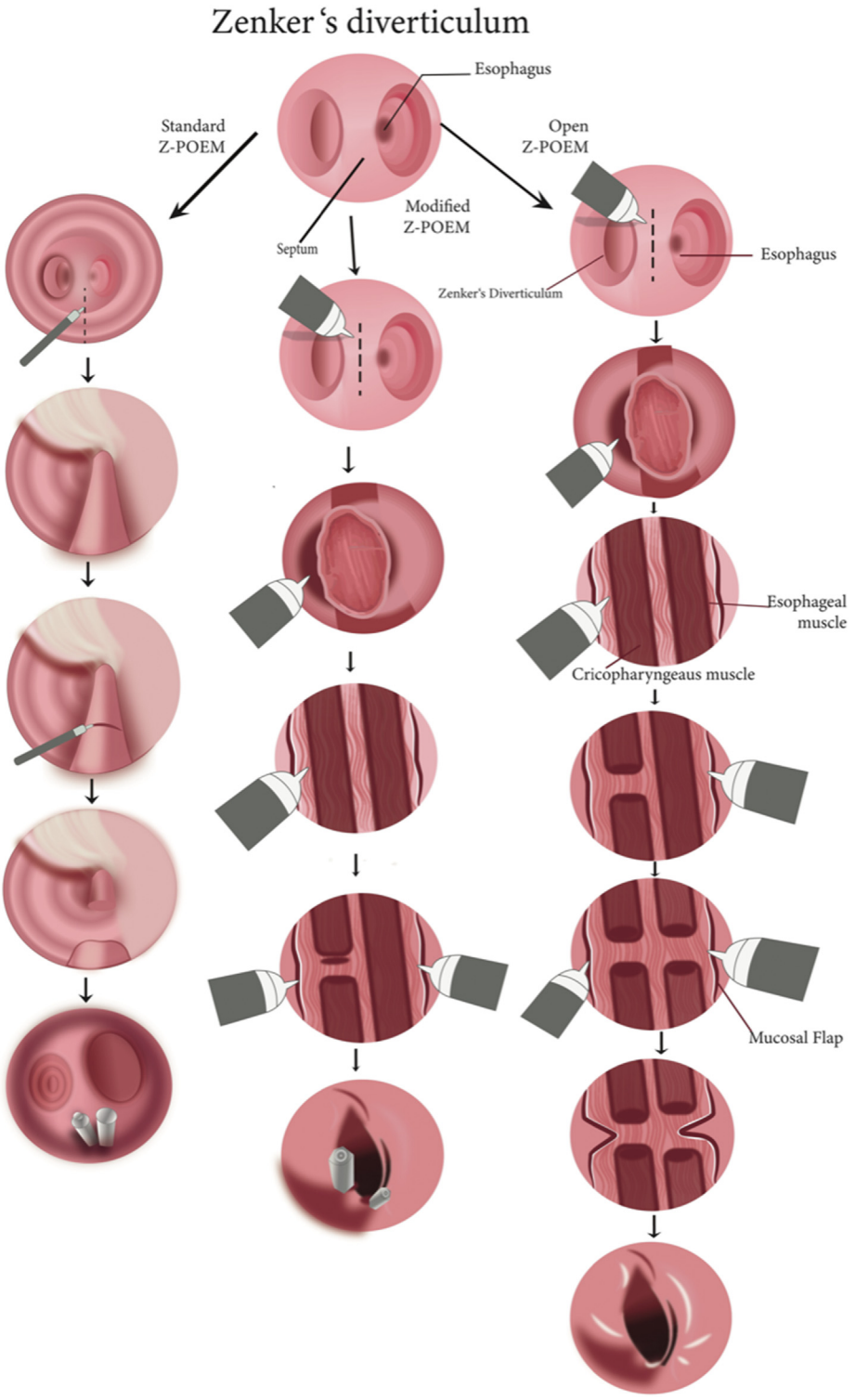

Figure 3. Illustration shows the steps of OZ-POEM with key technical differences from standard Z-POEM and modified Z-POEM. *OZ-POEM*, Open Zenker's-peroral endoscopic myotomy; *Z-POEM*, Zenker's-peroral endoscopic myotomy.

Figure 4. Submucosal tunneling.

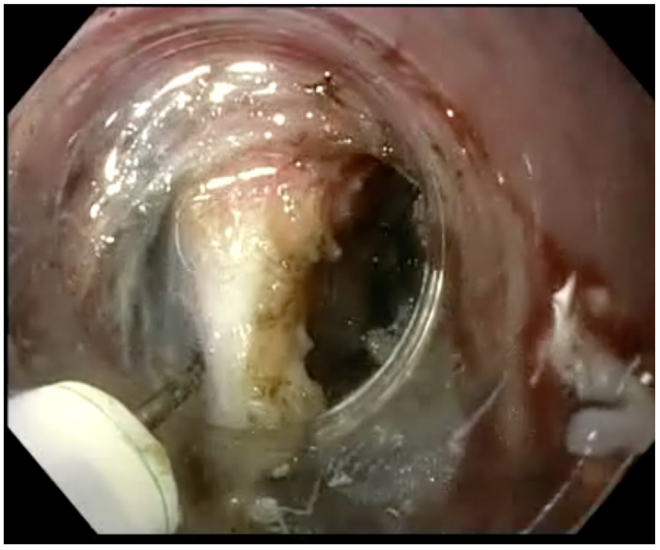

Figure 5. Cricopharyngeal muscle myotomy.

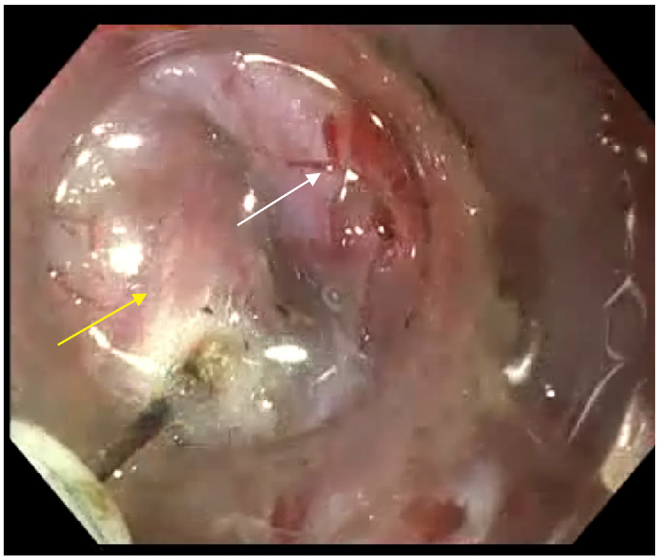

Figure 6. Esophageal muscle myotomy (*yellow arrow*) with remnant mucosal flap (*white arrow*).

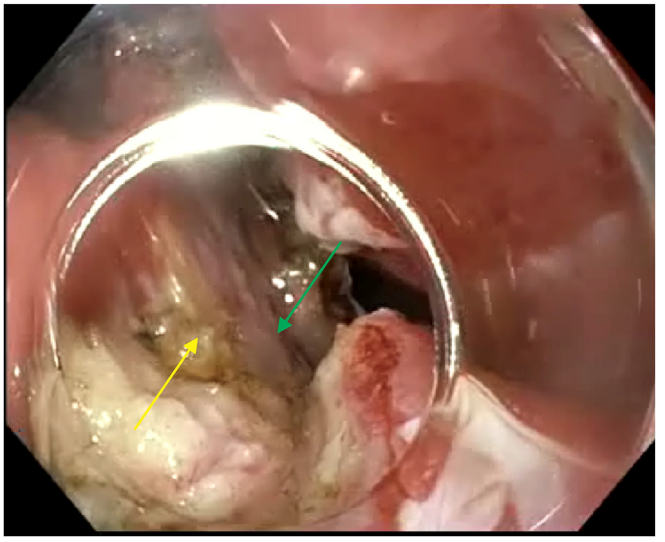

Figure 7. Complete division of septum without any remnant mucosa on the diverticulum side (*yellow arrow*) and esophageal side (*green arrow*).

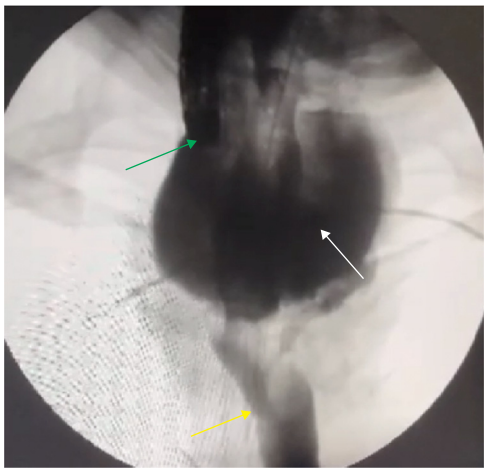

Figure 8. Fluoroscopy shows free passage of contrast into esophagus without any leak (endoscope tip is marked by *green arrow*, diverticulum by *white arrow*, and esophagus by *yellow arrow*).

DISCLOSURE

All authors disclosed no financial relationships.

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