

Hybrid endoscopic approach for submucosal tunneling septum division for Zenker's diverticulum

A 71-year-old man was referred for a symptomatic Zenker's diverticulum. The patient had undergone a stapled diverticulotomy 7 years ago. A barium esophagram revealed a 3-cm Zenker's diverticulum with evidence of staples (► **Fig. 1 a**). The decision was made to perform a peroral endoscopic myotomy of Zenker's diverticulum (Z-POEM).

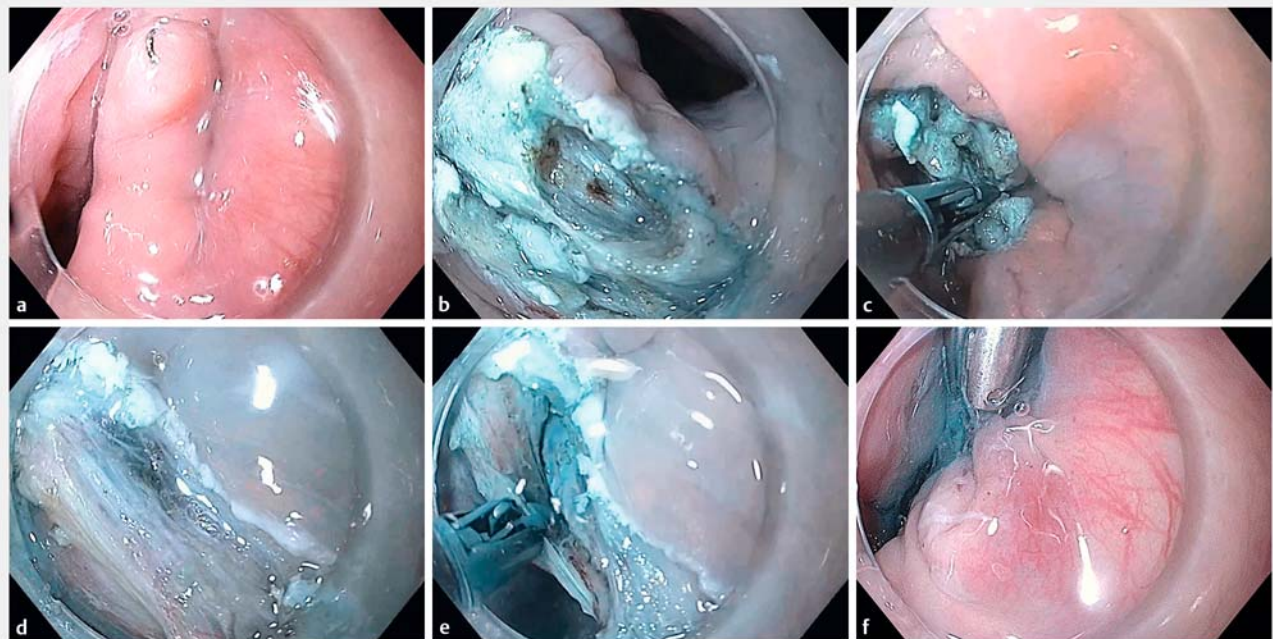
A submucosal injection was performed with the intention of creating a bleb above the septum using a combination of normal saline and methylene blue. However, the bleb could not be created because of submucosal scarring and fibrosis (► **Fig. 1 b**, ► **Video 1**). A mucosal incision was made with a triangle-tip knife (KD 640 L; Olympus, Center Valley, Pennsylvania, USA) using EndoCut Q current, effect 3, and staples were seen

through the incision. A clear submucosal layer could not be exposed because of extensive scarring and fibrosis, and thus tunneling was not possible. The decision was made to perform a standard septotomy (myotomy), which was started with a triangle-tip knife and then continued with a scissor-type endoscopic submucosal dissection (ESD) knife (SB knife, Olympus). A standard septotomy of 1.5 cm was performed using EndoCut Q current, effect 3, after which a clear submucosal layer was observed (► **Fig. 1 c, d**).

The procedure was continued using the Z-POEM technique to ensure complete exposure and dissection of the septum. Tunneling was performed along the esophageal and diverticular sides of the septum using a triangle-tip knife and spray coagulation mode, effect 2. Once

the cricopharyngeal muscle septum was completely exposed, it was dissected for 2 cm down to the bottom of the diverticulum with a scissor-type ESD knife and EndoCut Q current (► **Fig. 1 e**). The mucosal incision was closed using through-the-scope clips (MicroTech, Ann Arbor, Michigan, USA) (► **Fig. 1 f**). The patient was admitted overnight. An esophagram performed the next day showed no leakage, and the patient was discharged on a soft diet. At follow-up 3 months post-procedure, the patient had complete resolution of the symptoms with no residual symptoms while taking a full diet.

The standard approach to Z-POEM starts with a mucosal incision, submucosal tunneling, septum division (septal myotomy), and mucosal closure [1]. On the other hand, in patients with prior such



► **Fig. 1** Hybrid peroral endoscopic myotomy technique for Zenker's diverticulum (Z-POEM) in a symptomatic 71-year-old man. **a** A Zenker's diverticulum is identified with visible staples. **b** After mucosal incision, submucosal scarring was clearly visible. **c** A standard septotomy was done by using a scissor-type endoscopic submucosal dissection (ESD) knife. **d** After septotomy, the submucosal layer was visualized. **e** The septum was exposed after submucosal tunneling on both sides of the septum, followed by complete septotomy using the scissor-type knife. **f** The mucosal incision was closed using through-the-scope clips.



▶ Video 1 A symptomatic 71-year-old man with post-surgical fibrosis underwent peroral endoscopic myotomy for Zenker's diverticulum (Z-POEM) using a hybrid approach. Conversion to a hybrid Z-POEM technique when the standard method is found to be not initially possible is a reasonable and effective approach.

▶ Table 1 Peroral endoscopic myotomy for Zenker's diverticulum (Z-POEM): features and advantages of a hybrid approach.

- The standard Z-POEM technique may not be possible in patients who have had prior interventions
- Starting the procedure with a standard septotomy when Z-POEM is not initially possible and then switching to the Z-POEM technique is a reasonable and effective approach
- Once the submucosal layer can be delineated, this allows for further exposure and dissection of the septum
- The Z-POEM technique with the hybrid approach allows for a complete septotomy, which may reduce the risk of recurrence

interventions, a hybrid approach may be necessary. This hybrid approach consists of five steps: (i) mucosal incision, (ii) standard septotomy until a clear submucosal layer is visualized, (iii) submucosal tunneling, (iv) septum division, and (v) mucosal closure) (▶ **Table 1**).

In conclusion, the hybrid Z-POEM technique is safe and feasible in patients with symptomatic recurrent/residual Zenker's diverticulum and submucosal fibrosis from prior interventions. This is the first case to report the use of the Z-POEM technique with the hybrid approach in the case of post-surgical fibrosis.

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Competing interests

Mouen A. Khashab is a consultant for Boston Scientific, Medtronic, and Olympus. None of the other authors have any conflict of interest to declare.

The authors

Arunkumar Krishnan, Yervant Ichkhanian, Thomas M. Runge, Mouen A. Khashab
Division of Gastroenterology and Hepatology, Johns Hopkins Hospital, Baltimore, Maryland, USA

Corresponding author

Mouen A. Khashab, MD
Division of Gastroenterology and Hepatology, Johns Hopkins Hospital, Sheikh Zayed Building, 1800 Orleans Street, Suite 7125G, Baltimore, MD 21287, USA
Fax: +01-443-683-8335
mkhasha1@jhmi.edu

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Bibliography

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