

Novel non-injection non-tunnel technique for peroral endoscopic myotomy of Zenker diverticulum

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BACKGROUND

Flexible endoscopic therapy of performing cricopharyngeal myotomy is currently used to treat symptomatic Zenker diverticulum.¹ Safe and clear access to the cricopharyngeal muscle with the right set of accessories permits a selective and effective myotomy. Conventional endoscopic septotomy involves full-thickness incision of the mucosa, submucosa, and muscular layer that form the diverticular septum. A major concern with this approach is the potential for incomplete septotomy given the risk of perforation if the myotomy is extended beyond the fundus of the diverticulum.² Conversely, incomplete septotomy is associated with high recurrence rate. Zenker peroral endoscopic myotomy (Z-POEM) was developed to overcome these potential limitations. However, during a Z-POEM, submucosal injection and the mucosectomy are performed at the hypopharynx above the diverticulum, which by itself is a narrow space limiting effective device control and use. This space is even more restricted after the submucosal injection.^{3,4} The traditional Z-POEM technique also requires submucosal tunneling on both sides of the muscle septum prior to myotomy, which can be difficult and time consuming. In a multicenter study on 24 patients with a mean diverticulum size of 4 cm, the average procedure time for a Z-POEM was 51 minutes.⁵ In this video (Video 1, available online at www.giejournal.org), we describe a novel modified Z-POEM technique, NiZ-POEM (non-injection non-tunnel technique for peroral endoscopic myotomy of Zenker diverticulum), using a scissor-type knife that does not require submucosal injection or tunneling.

Abbreviations: NiZ-POEM, non-injection non-tunnel technique for peroral endoscopic myotomy of Zenker diverticulum; Z-POEM, Zenker peroral endoscopic myotomy.

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PROCEDURE DESCRIPTION

The procedure is performed with an insulated type of scissor-type knife (Clutch Cutter DP2618DT; Fujifilm Medical, Tokyo, Japan). Following identification of the diverticular septum, the jaws of the scissor-type knife are aligned perpendicularly to the muscular septum. A superficial mucosal incision is then performed, allowing exposure of the underlying muscular septum (Fig. 1). Using gentle traction with the distal cap, we exposed the underlying muscular septum and the scissor-type knife is advanced to selectively grasp the muscle without further extending the initial mucosal incision or need for submucosal dissection (Fig. 2). The inner teeth of the knife is the only cutting surface, and the outer edge and the tip are insulated, preventing inadvertent mucosal damage. Complete myotomy is then effectively performed. Once completed, the initial mucosal incision can be adequately closed with endoscopic clips. We performed the procedures with the patient under general anesthesia, and no peri-procedural antibiotics were given. The ERBE generator (ERBE, Tübingen, Germany) settings were Endocut 1 with Effect 1 for cutting current and forced coagulation with Effect 1.5 for vessel coagulation. No adverse events were noted, and a liquid diet was started post-procedurally and advanced to a solid diet in the next 24 hours.



Figure 1. Exposed muscle septum after the initial mucosal incision.



Figure 2. Selective grasping of the muscle septum with the scissor-type knife.

CASE DISCUSSION

Case 1

A 76-year-old man with known Zenker diverticulum presented with progressive dysphagia, failure to thrive, and inability to handle his secretions. On endoscopy, the patient was noted to have a large 5-cm Zenker diverticulum. Flexible endoscopic septotomy using the NiZ-POEM technique was successfully performed. The total procedure time was 30 minutes. A CT scan of the esophagram on postoperative day 1 showed no contrast extravasation, and the patient was discharged without immediate adverse events. The patient continued to do well with improvement of symptoms up to their 6-week follow-up.

Case 2

A 78-year-old woman presented with worsening dysphagia and regurgitation of food and pills. Barium esophagram confirmed the presence of a large Zenker diverticulum. During the endoscopy, a 2-cm Zenker diverticulum was identified. She underwent successful NiZ-POEM with a total procedure time of 20 minutes. The patient did well postprocedurally

and was discharged the same day from the endoscopy unit. No adverse events were noted.

No swallowing scores were obtained before or after the procedures for both patients.

CONCLUSION

We present a novel non-injection non-tunnel Zenker peroral endoscopic myotomy technique (NiZ-POEM). Using this technique, we were able to safely access and perform an effective complete myotomy of the cricopharyngeal muscle. This technique obviates the need for submucosal injection and tunneling, commonly performed during a Z-POEM, thereby potentially reducing procedural time and difficulty. Additional studies are needed to further corroborate the use of this modified technique.

DISCLOSURE

Dr Yang is a consultant for Olympus, Fujifilm, Medtronic, Apollo Endosurgery, and Microtech. Dr Draganov is a consultant for Boston Scientific, Olympus, Fujifilm, Cook, Microtech, and Medtronic. Dr Gorrepati disclosed no financial relationships.

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