VIDEO CASE REPORT

Modiﬁed submucosal tunneling endoscopic resection for postcricoid esophageal subepithelial tumor

Jay Bapaye, MD,1 Ashish Gandhi, MD, DNB,2 Rapat Pittanyanon, MD,3 Pradermchai Kongkam, MD,3 Amol Bapaye, MD (MS), FASGE, FJGES2

INTRODUCTION

Submucosal tunneling endoscopic resection (STER) has been described as a technique for endoscopic resection of GI subepithelial tumors (SETs) arising from the muscularis propria layer1 and is an accepted treatment modality for these SETs.2 The standard STER technique involves submucosal elevation 3 to 5 cm proximal to the SET along its longitudinal axis, mucosotomy, submucosal tunneling, dissection of the SET within the tunnel, enucleation from

Figure 1. Linear endoscopic ultrasound demonstrating a 2.3- \( \times \) 1.6-cm, isoechoic, round, well-circumscribed mass arising from the muscularis propria.

Figure 2. Magnetic resonance imaging with contrast of the neck demonstrating a postcricoid subepithelial tumor (arrows) without regional lymphadenopathy.
the deep muscle layer, and specimen delivery followed by mucosal closure.\textsuperscript{2} STER is usually recommended for SETs $<3.5$ cm in the mid or distal esophagus or cardia or along the greater curvature of the gastric body. STER for larger SETs ($>3.5$ cm) or for lesions in challenging locations is technically difficult; thus, surgical resection is usually recommended.\textsuperscript{2-4} STER has demonstrated excellent outcomes in a recent large meta-analysis.\textsuperscript{5}

Postcricoid (PC) SETs can present exceptional technical challenges for STER because of their proximal location and constrained space in this region for tunneling and endoscope maneuverability. We report a video case of successful PC STER using certain technical modifications.

**CASE**

A 45-year-old woman presented with globus sensation on swallowing. EGD revealed a 2.5-cm esophageal SET in the PC region, 10 cm from the incisors. EUS confirmed SET with the muscularis propria as the layer of origin (Fig. 1). Contrast magnetic resonance imaging of the neck revealed a PC globular SET without regional lymphadenopathy (Fig. 2). STER was planned, and preprocedural consent was obtained.\textsuperscript{6}

STER was performed with the patient under general anesthesia and in the supine position (Video 1, available online at www.giejournal.org). A standard gastroscope...
(GIF-H190, Olympus [Tokyo, Japan]) with a distal transparent attachment was used. The mucosa overlying the proximal (oral) margin of the SET was marked using a Dual knife-J (Olympus). The mucosa was incised horizontally very close to the proximal margin of the SET (Fig. 3). Limited endoscope maneuverability owing to the firm globular tumor and anteriorly placed larynx made dissection difficult. Therefore, dissection was continued using a Dual knife-J (short 1.5-mm cutting tip and inbuilt injection port). The tumor was freed from the mucosal aspect and then enucleated from the muscle layer (Fig. 4). The tumor was delivered into the esophageal lumen before division of the final muscle attachment (Fig. 5). En bloc resection with an intact capsule was achieved (Fig. 6). Final histopathology and immunohistochemistry revealed low-grade fibrosarcoma with clear surgical and pathological margins and a deep surgical margin <1 mm from the tumor capsule (Figs. 7 and 8).

Figure 7. Hematoxylin and eosin staining of resected subepithelial tumor showing the presence of atypical cells (red arrows).

Figure 8. Microscopy with immunohistochemistry of the resected specimen showing atypical cells staining positive for smooth muscle actin and negative for CD117, DOG1, S100, desmin, and caldesmon, making fibrosarcoma the most likely diagnosis.

The procedure time was 150 minutes. The patient was electively ventilated for 20 hours after STER to prevent postsurgical laryngeal edema-related airway compromise. Her diet was resumed the following day. The length of stay was 3 days. No adverse events were encountered. Positron emission tomography scan 3 months after STER revealed no residual lesion. The patient remains well 1 year later without any GI symptoms and has been recommended annual positron emission tomography scan surveillance.
DISCUSSION

This video highlights several important points. Surgical resection of this PC SET could include surgical neck exploration with esophagotomy and/or enucleation or esophagectomy with reconstruction. Successful STER in this location avoided major surgical resection with its associated morbidity. STER outcomes are comparable to those of thoracoscopic enucleation for en bloc resection and adverse events and are superior for shorter procedural time and length of hospital stay.

Several technical modifications in the standard STER technique should be addressed. Prior marking of the proximal margin of the SET helped us to position the mucosal incision precisely at the desired location distal to the cricopharynx. Horizontal incision prevented it from extending over the SET, thereby maintaining the integrity of the mucosal flap valve and protecting against perforation or leak. Using a Dual knife-J instead of the longer triangular-tip TT-knife facilitated precise dissection in the limited available space. Delivering the SET into the esophageal lumen helped in the final stages of the dissection by aiding visualization.

In conclusion, this video case demonstrates successful STER for a PC esophageal SET and highlights technical modifications that could be used for such cases.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviations: PC, postcricoid; SET, subepithelial tumor; STER, submucosal tunneling endoscopic resection.

REFERENCES

1. Xu MD, Cai MY, Zhou PH, et al. Submucosal tunneling endoscopic resection: a new technique for treating upper GI submucosal tumors originating from the muscularis propria layer (with videos). Gastrointest Endosc 2012;75:195-9.
2. Bapaye A, Korrapati SK, Dharamsi S, et al. Third space endoscopy: lessons learnt from a decade of submucosal endoscopy. J Clin Gastroenterol 2020;54:114-29.
3. Li QY, Meng Y, Xu YY, et al. Comparison of endoscopic submucosal tunneling dissection and thoracoscopic enucleation for the treatment of esophageal submucosal tumors. Gastrointest Endosc 2017;86:485-91.
4. Parikh MP, Gupta NM, Sanaka MR. Esophageal third space endoscopy: recent advances. Curr Treat Options Gastroenterol 2019;17:63-75.
5. Lv XH, Wang CH, Xie Y. Efficacy and safety of submucosal tunneling endoscopic resection for upper gastrointestinal submucosal tumors: a systematic review and meta-analysis. Surg Endosc 2017;31:49-63.
6. Du C, Chai NL, Ling-Hu EQ, et al. Submucosal tunneling endoscopic resection: an effective and safe therapy for upper gastrointestinal submucosal tumors originating from the muscularis propria layer. World J Gastroenterol 2019;25:245-57.
7. Nguyen NT, Reavis KM, El-Badawi K, et al. Minimally invasive surgical enucleation or esophagogastrectomy for benign tumor of the esophagus. Surg Innov 2008;15:120-5.
8. Shin S, Choi YS, Shin YM, et al. Enucleation of esophageal submucosal tumors: a single institution’s experience. Ann Thorac Surg 2014;97:454-9.

Department of Internal Medicine, Rochester General Hospital, Rochester, New York (1), Shivanand Desai Centre for Digestive Disorders, Deenanath Mangeshkar Hospital and Research Centre, Pune, India (2), Department of Medicine, Faculty of Medicine, Chulalongkorn University and King Chulalongkorn Memorial Hospital, the Thai Red Cross, Bangkok, Thailand (3).

If you would like to chat with an author of this article, you may contact Dr Bapaye at amolbapaye@gmail.com.

Copyright © 2022 American Society for Gastrointestinal Endoscopy. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

https://doi.org/10.1016/j.vgie.2021.12.008