



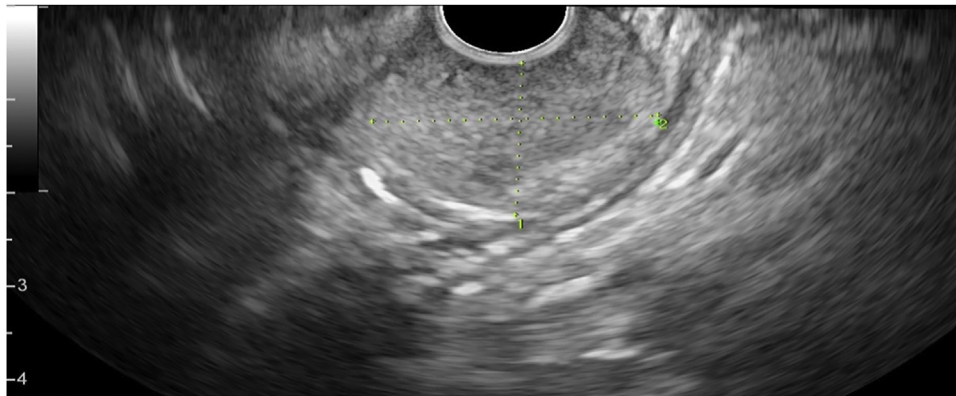
# Modified submucosal tunneling endoscopic resection for postcricoid esophageal subepithelial tumor

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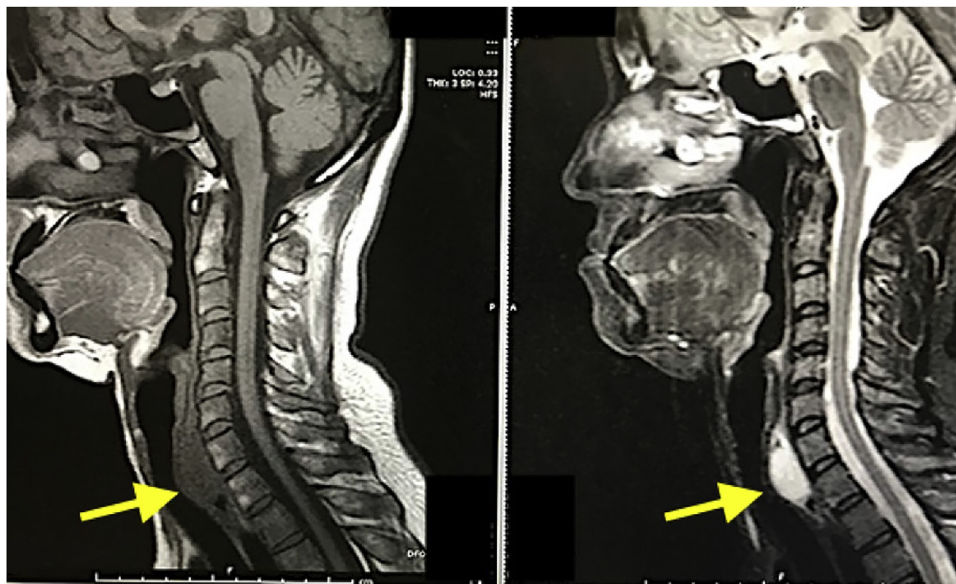
## INTRODUCTION

Submucosal tunneling endoscopic resection (STER) has been described as a technique for endoscopic resection of GI subepithelial tumors (SETs) arising from the muscularis

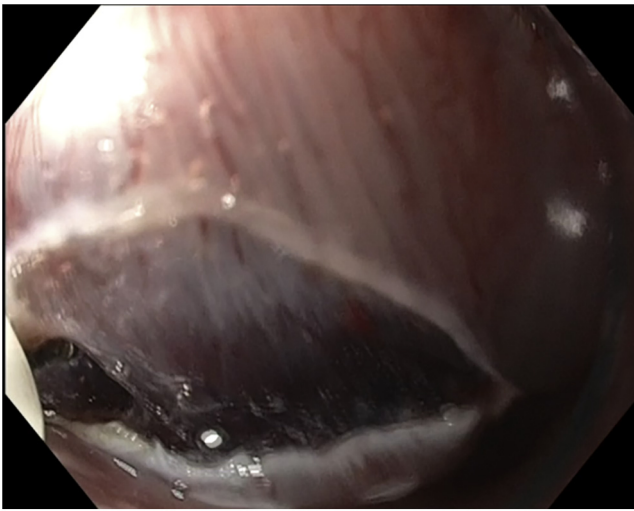
propria layer<sup>1</sup> and is an accepted treatment modality for these SETs.<sup>2</sup> The standard STER technique involves submucosal elevation 3 to 5 cm proximal to the SET along its longitudinal axis, mucosotomy, submucosal tunneling, dissection of the SET within the tunnel, enucleation from



**Figure 1.** Linear endoscopic ultrasound demonstrating a 2.3- × 1.6-cm, isoechoic, round, well-circumscribed mass arising from the muscularis propria.



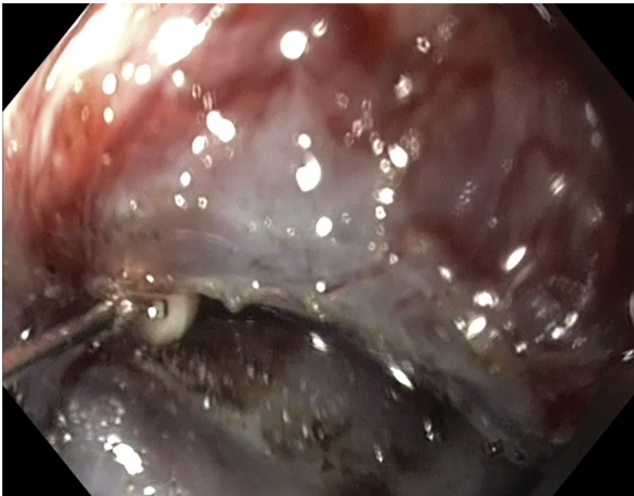
**Figure 2.** Magnetic resonance imaging with contrast of the neck demonstrating a postcricoid subepithelial tumor (*arrows*) without regional lymphadenopathy.



**Figure 3.** Horizontal mucosal incision just beyond the cricopharynx after surface marking and submucosal elevation using a Dual-J knife (Olympus, Tokyo, Japan).



**Figure 5.** Subepithelial tumor delivered into the esophageal lumen, with the short bridge of muscle fibers holding the tumor clearly visible.



**Figure 4.** Subepithelial tumor being enucleated from the muscularis propria layer using an insulated tip (IT2 knife, Olympus, Tokyo, Japan).



**Figure 6.** En bloc resected specimen of postcricoid subepithelial tumor with intact capsule (23 mm × 16 mm).

the deep muscle layer, and specimen delivery followed by mucosal closure.<sup>2</sup> 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.<sup>2-4</sup> STER has demonstrated excellent outcomes in a recent large meta-analysis.<sup>5</sup>

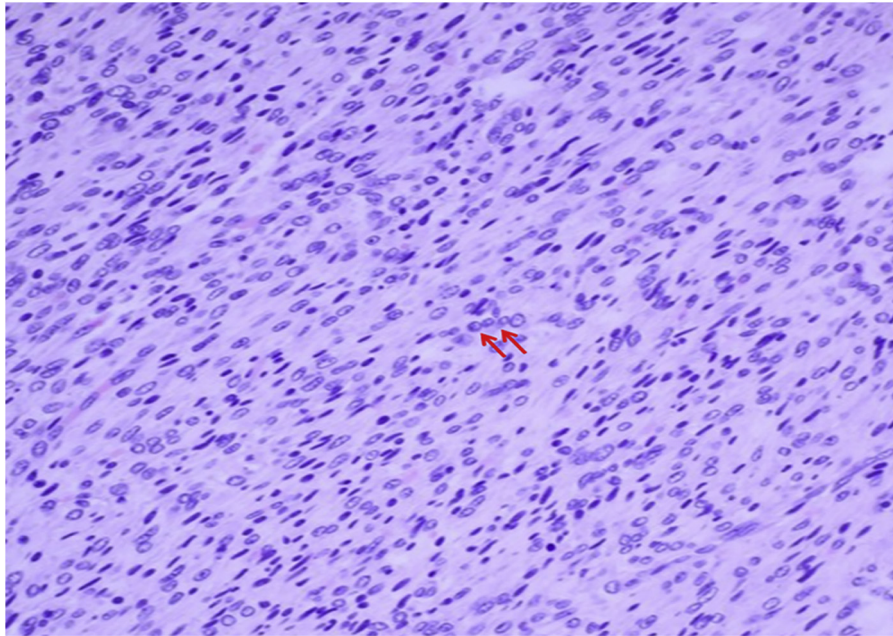
Postcricoid (PC) SETs can present exceptional technical challenges for STER because of their proximal location and constrained space in this region for tunneling and endoscope maneuverability. We report a video case of successful PC STER using certain technical modifications.

## CASE

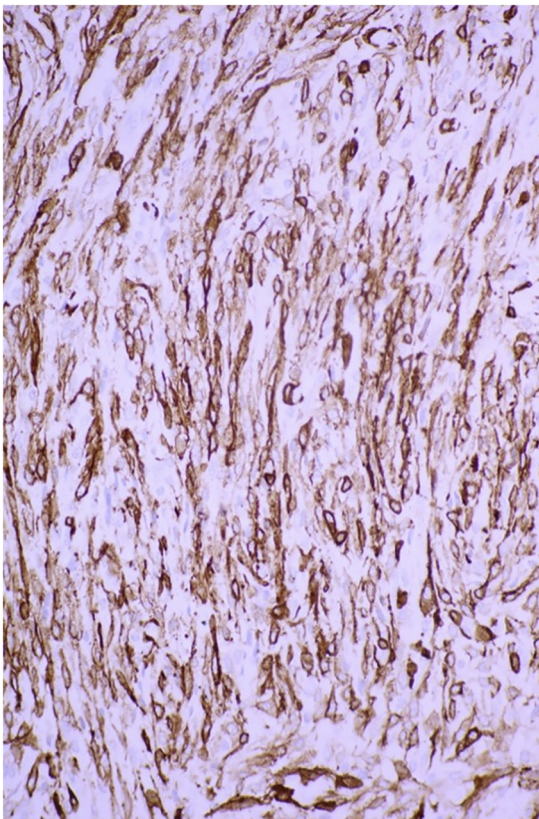
A 45-year-old woman presented with globus sensation on swallowing. EGD revealed a 2.5-cm esophageal SET in the PC region, 10 cm from the incisors. EUS confirmed SET with the muscularis propria as the layer of origin (Fig. 1). Contrast magnetic resonance imaging of the neck revealed a PC globular SET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

STER was performed with the patient under general anesthesia and in the supine position (Video 1, available online at [www.giejournal.org](http://www.giejournal.org)). A standard gastroscope





**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.

(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).

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.<sup>7,8</sup> 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.<sup>2,3</sup>

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.*

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