Hybrid resection of GI stromal tumor with endoscopic submucosal dissection and the full-thickness resection device

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GI stromal tumors (GISTs) typically arise from the muscularis propria layer and are commonly seen in the stomach, although they can occur anywhere along the GI tract. Lesions larger than 2 cm should undergo surgical resection, although endoscopic resection can be considered for gastric GISTs 2 to 4 cm in size without high-risk features.[1,2] Smaller lesions are monitored conservatively with surveillance EUS examinations, or endoscopically resected in patients who prefer to avoid frequent examinations.[3]

Endoscopic management of GISTs and other subepithelial lesions (SELs) remains challenging. Several techniques derived from endoscopic submucosal resection (ESD) have been described, including submucosal tunneling endoscopic resection and exposed endoscopic full-thickness resection. The main limitations of these techniques are the expertise required and long procedure duration.[4] Alternatively, the Full-Thickness Resection Device (FTRD; Ovesco Endoscopy, Tuebingen, Germany) may be used to remove small SELs that can be retracted into the 1.8-mm-diameter cap.[5,6] However, complete SEL retraction into the FTRD cap may be complicated by the presence of overlying mucosa. Exposing the lesion with ESD or EMR may reduce the risk of incomplete resection. In our experience, ESD may achieve superior tissue exposure when compared to EMR for this purpose. We present a hybrid endoscopic resection of a gastric GIST using ESD to expose the lesion prior to FTRD.

A previously healthy 70-year-old woman was referred to our institution after an endoscopy showed a gastric SEL. Pathology from a prior biopsy was consistent with GIST. All options were discussed with the patient, including surgical resection, observation, and endoscopic resection. The patient opted for endoscopic resection because of reluctance to undergo long-term endoscopic surveillance.

An upper endoscopy was performed with the patient under general anesthesia with endotracheal intubation. Prophylactic intravenous antibiotics were administered at the start of the procedure. A 12-mm SEL was found on

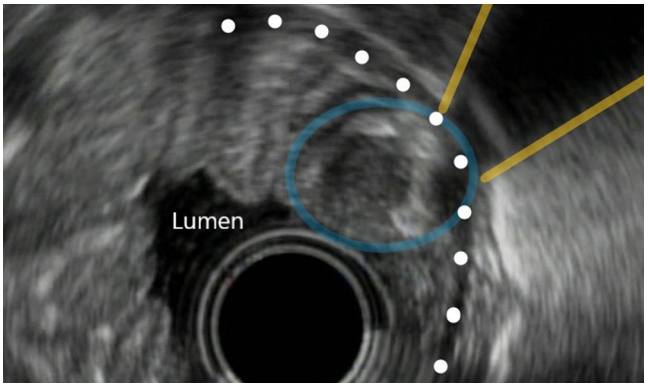

Figure 1. Echo-endoscopic view of calcified subepithelial lesion (*blue*) casting acoustic shadow (*yellow*). *Dotted line* indicates muscularis propria layer (*white*).

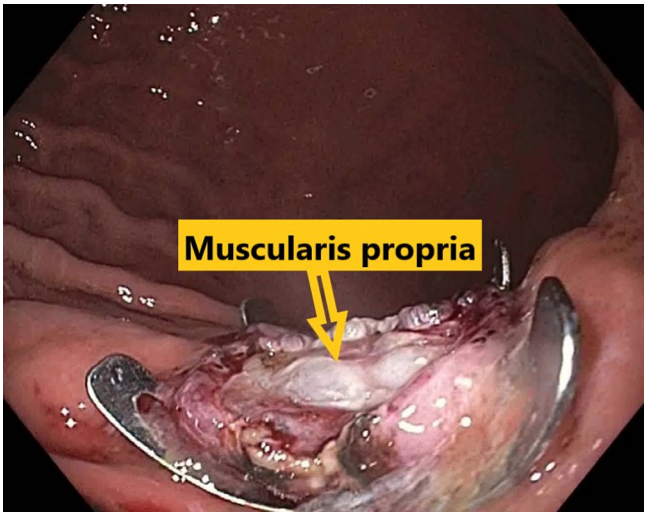

Figure 2. Full-Thickness Resection Device clip in appropriate position and exposed muscularis propria seen above the clip.

Abbreviations: ESD, endoscopic submucosal dissection; FTRD, Full-Thickness Resection Device; GIST, GI stromal tumor; SEL, subepithelial lesion.

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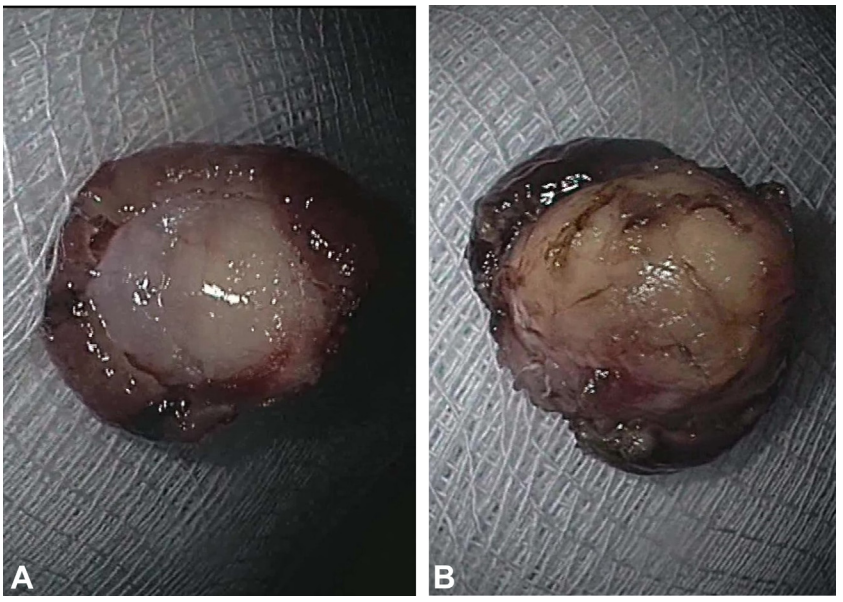

Figure 3. Gastric subepithelial GI stromal tumor resected with endoscopic submucosal dissection and Full-Thickness Resection Device, shown with deep aspect **(A)** and mucosal aspect **(B)**.

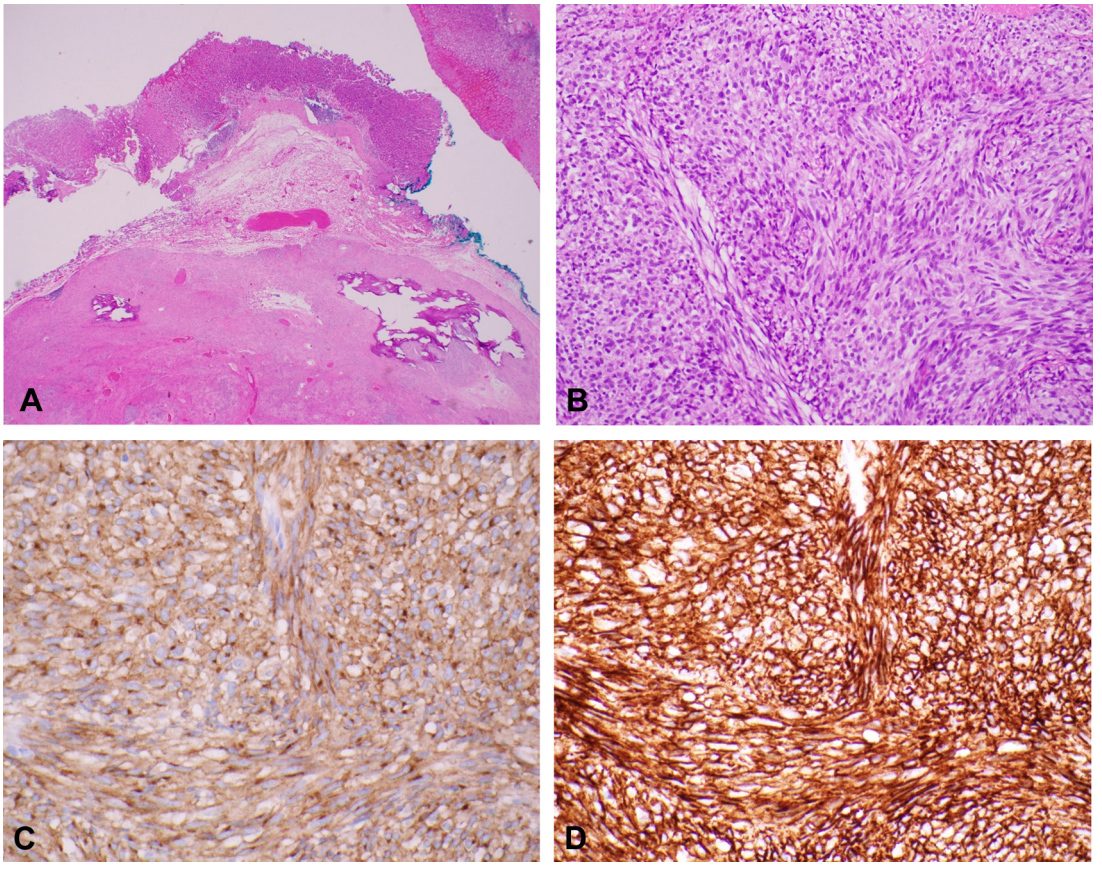

Figure 4. Histologic features of spindle-type GI stromal tumor. **A,** Fragment of gastric oxyntic mucosa overlying a well-circumscribed submucosal nodule (H&E, orig. mag. ×20). **B**, Aggregates of spindled cells with eosinophilic and focally vacuolated cytoplasm (H&E, orig. mag. ×400). **C**, CD117/c-kit IHC stain positive (orig. mag. ×400). **D**, DOG-1 IHC stain positive (orig. mag. ×400).

the greater curvature of the stomach. EUS examination showed a hypoechoic round lesion with well-defined superficial and lateral borders. Dense calcifications were found along the lesion base, so accurate EUS assessments of lesion size and depth were challenging. However, it resided primarily in the submucosa with suggestion of origin from the muscularis propria (Fig. 1). Next, thermal marking was performed to delineate the borders of the lesion. Methylene blue dye diluted in saline solution was injected to the submucosa, and an electrocautery knife was used to dissect the mucosa. Once the lesion was adequately exposed, the FTRD was passed to the stomach. After carefully identifying lesion borders and positioning the device, the lesion was grasped with forceps and entirely retracted into the cap. Finally, the clip and snare were deployed, and the lesion was resected with electrocautery. Upon inspection of the resection site, exposed muscularis propria was seen above the appropriately placed clip, indicating full-thickness resection (Fig. 2). There were no adverse events during the 117-minute procedure. The histologic lesion size was confirmed to be 12 mm (Fig. 3), and immunohistochemical (IHC) positivity for both CD117 and DOG with a low mitotic index confirmed the diagnosis of low-grade GIST (Fig. 4). The deep margin was positive; however, FTRD often results in SEL enucleation with minimal marginal tissue, precluding histologic analysis.

Hybrid resection with ESD and FTRD is a promising new technique for resection of small GISTs and other SELs. Use of ESD to expose the underlying tumor may aid in effective use of FTRD. Further studies are needed to evaluate the efficacy and safety of this new technique (Video 1, available online at www.giejournal.org).

DISCLOSURE

Dr Buxbaum is a consultant for Boston Scientific and Olympus. Dr Sahakian is a consultant for Cook Medical, Boston Scientific, Olympus, and Noah Medical. All other authors disclosed no financial relationships.

REFERENCES

1. Sharzehi K, Sethi A, Savides T. AGA clinical practice update on management of subepithelial lesions encountered during routine endoscopy: expert review. Clin Gastroenterol Hepatol 2022;20:2435-43.e4.
2. Draganov PV, Wang AY, Othman MO, et al. AGA institute clinical practice update: endoscopic submucosal dissection in the United States. Clin Gastroenterol Hepatol 2019;17:16-25.e11.
3. Deprez PH, Moons LMG, O'Toole D, et al. Endoscopic management of subepithelial lesions including neuroendocrine neoplasms: European Society of Gastrointestinal Endoscopy (ESGE) Guideline. Endoscopy 2022;54:412-29.
4. Aslanian HR, Sethi A, Bhutani MS, et al. ASGE guideline for endoscopic full-thickness resection and submucosal tunnel endoscopic resection. VideoGIE 2019;4:343-50.
5. Meier B, Schmidt A, Glaser N, et al. Endoscopic full-thickness resection of gastric subepithelial tumors with the gFTRD-system: a prospective pilot study (RESET trial). Surg Endosc 2020;34:853-60.
6. Hajifathalian K, Ichkhanian Y, Dawod Q, et al. Full-thickness resection device (FTRD) for treatment of upper gastrointestinal tract lesions: the first international experience. Endosc Int Open 2020;8:E1291-301.