



Endoscopic full-thickness resection with through-the-scope suture closure for gastrointestinal stromal tumor

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INTRODUCTION

Gastrointestinal stromal tumors (GISTs) greater than 2 cm are considered for resection.¹ Those with muscularis propria (MP) involvement, as seen on endoscopic ultrasound and/or radiology, require full-thickness resection (FTR), surgery, or a combined laparoscopic/endoscopic approach.² Dedicated endoscopic FTR (EFTR) devices are available but limited to lesions less than 2 cm.^{3,4} We present a GIST resected by EFTR and through-the-scope suture (TTSS) defect closure (Video 1, available online at www.giejournal.org).

CASE DESCRIPTION

A 49-year-old man elected to undergo endoscopic resection for a 2.5-cm gastric fundus GIST, seen to arise from the MP on an EUS (Fig. 1). The procedure was performed with the patient under general anesthesia using a single-channel therapeutic gastroscope with a disposable distal attachment. The lesion was identified in retroflexion and marked with an endoscopic submucosal dissection knife (DualKnife J; Olympus America, Center Valley, Pa, USA). Submucosal injection was performed using a hetastarch, methylene blue, and dilute adrenaline mixture (Fig. 2). A hemircumferential mucosal incision was performed. The overlying mucosa was then resected with a snare to expose the lesion and mucosal planes (Fig. 3). Circumferential submucosal dissection was

performed around the tumor using an insulated-tip knife (ITknife2; Olympus America) until a wide muscle attachment was exposed necessitating an intentional and controlled full-thickness dissection. At this point a 14F Veress needle attached to a fluid-filled syringe open to the atmosphere (creating a 1-way water seal valve) was placed for prophylactic release of capnoperitoneum as further procedure time was anticipated. Dissection was performed until a narrow attachment remained. A double-channel therapeutic gastroscope was then used to allow passage of both grasping forceps and snare. The grasping forceps were passed through the open snare, used to pull the lesion into the gastric cavity. The lesion was resected en bloc with the snare and retrieved through the mouth. Attention was then turned to defect closure, which contained a 10-mm-wide full-thickness component (Fig. 4). Given the retroflexed access, difficulty was anticipated with over-the-scope closure modalities. Thus, TTSS (X-Tack Apollo Endosurgery, Austin, Tex, USA) was used. The first system was placed in a Z-formation with near complete defect closure (Fig. 5). However, given the full-thickness defect, a second system was placed in a figure-8 formation to overlap the first. The total procedure time was 158 minutes. The patient was admitted for observation and given a 5-day course of antibiotics. An upper GI series the following day confirmed the absence of any leak, and the patient was discharged home on a soft diet. There were no adverse events. Histological assessment confirmed a 2.7-cm low-grade GIST.

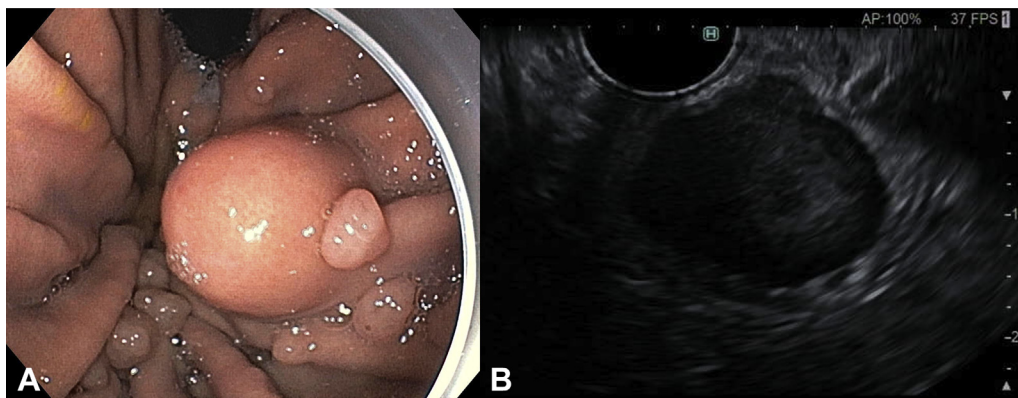


Figure 1. Gastric fundus subepithelial lesion. **A**, Endoscopic view. **B**, Endoscopic ultrasound view.



Figure 2. Borders of the lesion marked and submucosal injection performed with a mixture of hetastarch, methylene blue, and dilute adrenaline.

DISCUSSION

Endoscopic resection of subepithelial lesions arising from the MP should undergo FTR. This can be completed via submucosal tunneling endoscopic resection (STER) or EFTR. In STER, the lesion is retrieved via a submucosal tunnel, which can be difficult for lesions with limited access to tunnel proximally. Here, we successfully resected a gastric fundus GIST by EFTR. The key steps were to remove the overlying mucosa to expose the tumor and submucosal planes, expose

the muscular attachment, control full-thickness dissection, gain traction with forceps/snare to avoid specimen loss into the peritoneum, and finally, secure the defect closure. Importantly, the operator should have extensive third-space experience. Insufflation should always be with carbon dioxide and the full-thickness incision should be delayed until only the muscular attachment remains to minimize leakage of gastric fluids. Although full-thickness closure is recommended for nontunneled exposed EFTR,⁴ in this case, the full-thickness defect was small, and reinforced TTSS allowed effective closure despite a retroflexed position.

DISCLOSURE

Dr Khashab is a consultant for Boston Scientific, Olympus, Medtronic, Apollo Endosurgery, and GI supply. All other authors disclosed no financial relationships.

Abbreviations: EFTR, endoscopic full-thickness resection; FTR, full-thickness resection; GIST, gastrointestinal stromal tumor; MP, muscularis propria; STER, submucosal tunneling endoscopic resection; TTSS, through-the-scope suture.

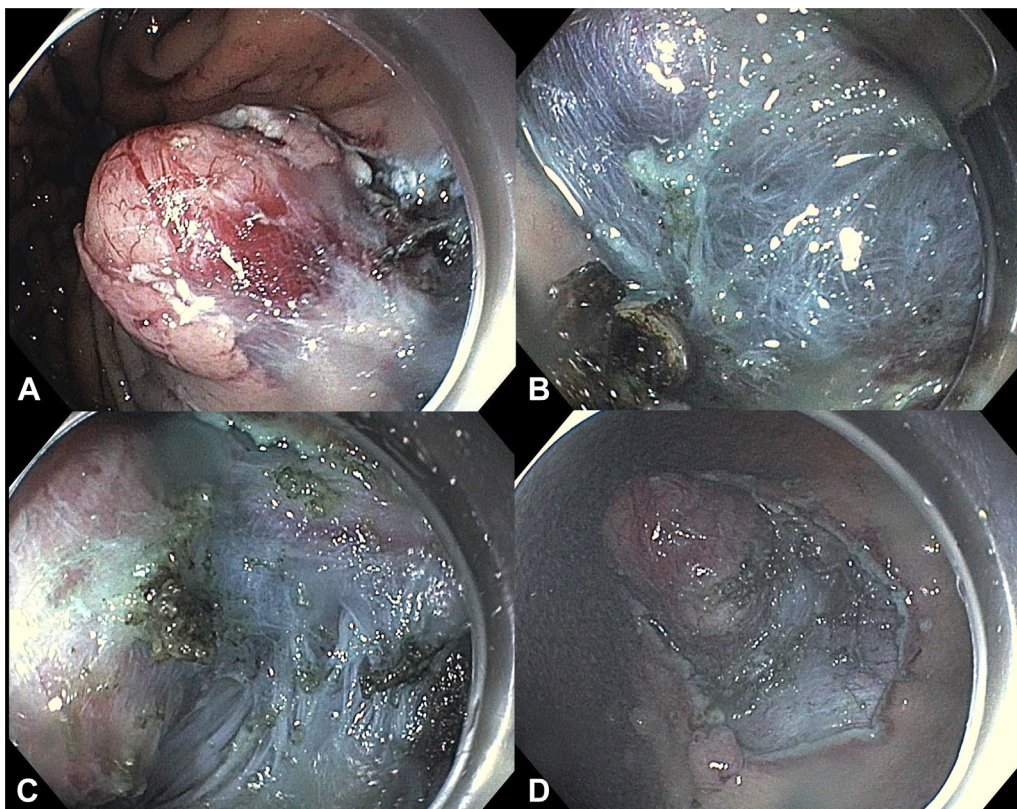


Figure 3. A, Exposed lesion. B, Submucosal dissection. C, Muscular attachment. D, Submucosal tissue dissected until muscular attachment remained.

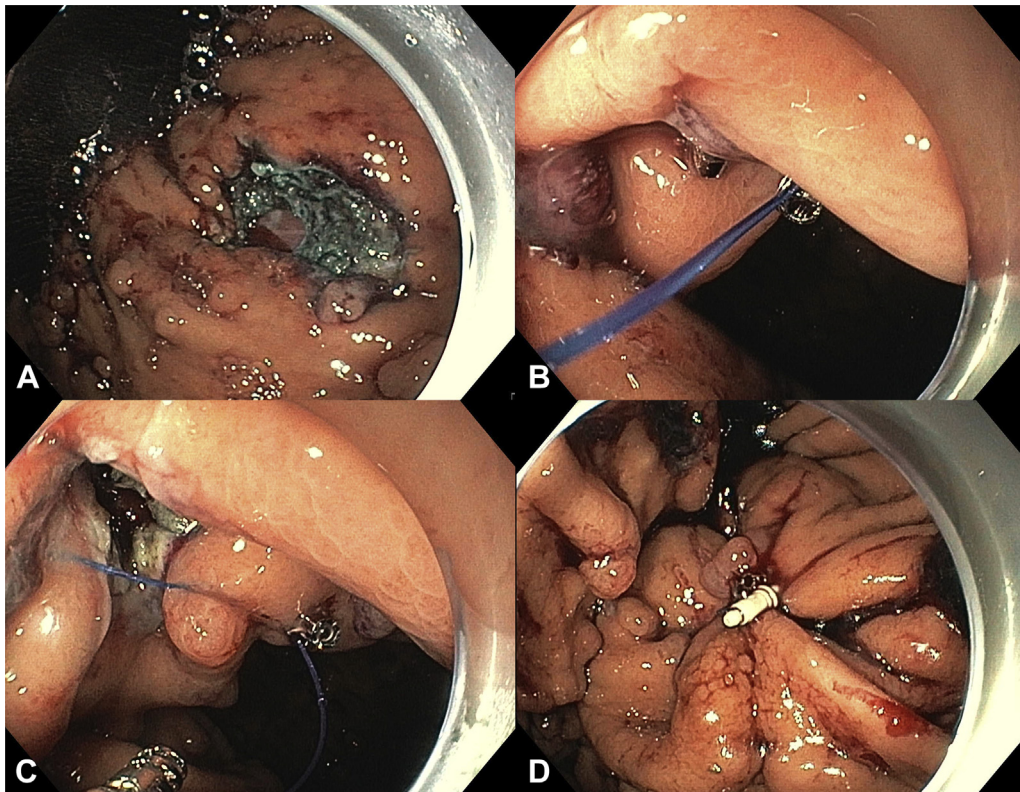


Figure 4. Defect closure. **A**, Defect with visible perforation. **B**, The helix is placed in normal mucosa 5 to 10 mm from the defect margin. **C**, All 4 tacks are sequentially placed. **D**, The tacks are cinched and a suture cinch deployed.

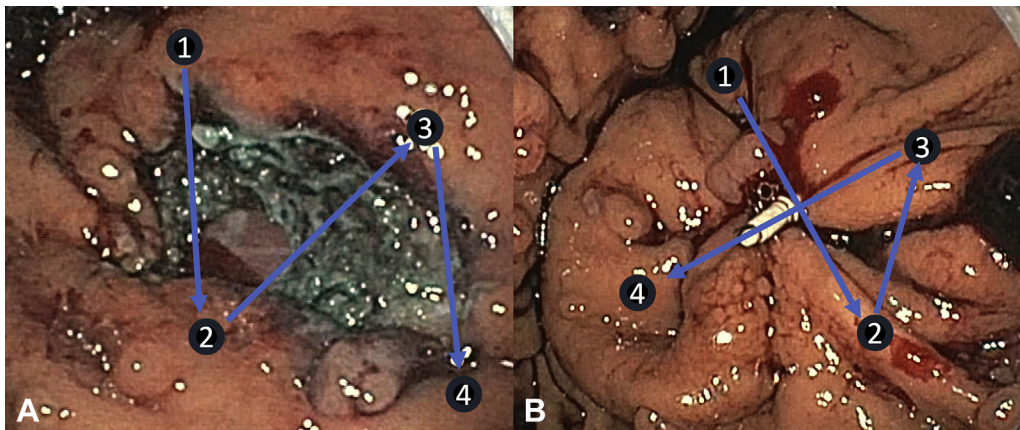


Figure 5. **A**, A Z-pattern is used to close the defect initially. **B**, A figure-8 pattern is then used to overlap a small residual defect at the left-most aspect and the previously closed area.

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