ORIGINAL ARTICLE

Traction-Assisted Closure with Tissue Inverted Clipping Strategy (TACTICS): a novel, full-layer closure method

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BACKGROUND

Endoscopic treatments initially developed as therapeutic approaches for superficial epithelial tumors have transitioned into techniques known as deeper-layer dissection for subepithelial lesion (SEL), such as endoscopic muscularis dissection, endoscopic subserosa dissection, and endoscopic full-thickness resection.[1,2] This deeper-layer dissection for SEL remains challenging and lacks a consensus on established methodologies.[3] Among some pivotal steps in this treatment procedure, one of the most crucial is the closure method for defects after the resection. In cases involving full-layer resections, inadequate closure of the defect may cause delayed perforation or peritonitis, potentially leading to serious adverse events. Therefore, to achieve a secure full-layer closure of the defect, we have recently used the Traction-Assisted Closure with Tissue Inverted Clipping Strategy (TACTICS). In this study, we present a case in whom TACTICS was efficient and effective as a full-layer closure method.

CASE

A 60-year-old man was referred to our institution for endoscopic resection of a gastric SEL. EGD revealed an SEL of 20 mm in size arising from the greater curvature of the lower gastric body, and CT scan of the abdomen showed an intraluminal growth without any signs of metastasis (Fig. 1A). EUS showed a low-echoic lesion arising from the third layer, and tissue was obtained by EUS fine-needle biopsy, which revealed findings suspected as GI stromal tumor (GIST) (Fig. 1B). After obtaining written consent, we decided to perform endoscopic full-thickness resection.

Procedure

The procedure can be viewed in Video 1 (available online at www.videogie.org). A therapeutic endoscope (H290T; Olympus, Tokyo, Japan) was used with a supersoft hood attached at the top of the endoscope. A Triangle Tip Knife J (KD-645L: Olympus) and IT-nano knife (KD-612; Olympus) were the main electrical device during this procedure. This treatment procedure was performed in an operating room. Marks were made around the lesion (Fig. 1C). To facilitate clear identification of the end point, first a circumferential incision was made (Fig. 1D), and the lesion was dissected before applying traction with a snare (SD-210L-25; Olympus). This snare-traction technique, known as multipoint traction, involves fixing the distal end of the resected specimen and the snare at multiple points with clips (RC30411; Microtech, Cheshire, Conn, USA) (Fig. 1E).[4,5] After the snare was attached to the lesion with clips, it was used to grasp the lesion. The strengths of this method include multipoint fixation, which makes it difficult for the traction to become loose, and the ability to change the direction of the traction by pressing and pulling the snare. The application of this traction improved visibility of a deeper layer, facilitating easier dissection (Fig. 1F). As the dissection proceeded, the defect became larger, prompting the application of the "loop 9" suturing method for partial closure (Fig. 1G).[6] A loop made of suture resembling the number 9 was placed around the defect and secured at 2 points of the ulcer margin with clips. Subsequently, the thread was pulled into the outer sheath to partially close the defect. Then, resection and suturing were alternatively performed. Because the lesion was pulled strongly by snare traction, serosa of the defect was inverted into the gastric cavity (Fig. 1H), enabling full-layer closure with the use of Mantis clips (Boston Scientific, Natick, Mass, USA) (Fig. 1I). As a result, upon completion of resection, the defect was nearly closed with clips and required only 1 additional clip to conclude the treatment (Fig. 1J), with the overall procedure time of 185 minutes. The postoperative course was uneventful, and the patient was discharged on postoperative day 5, with the pathology results indicating GIST with low risk and negative margin, achieving R0 resection.

Abbreviations: GIST, GI stromal tumor; SEL, subepithelial lesion; TACTICS, Traction-Assisted Closure with Tissue Inverted Clipping Strategy.

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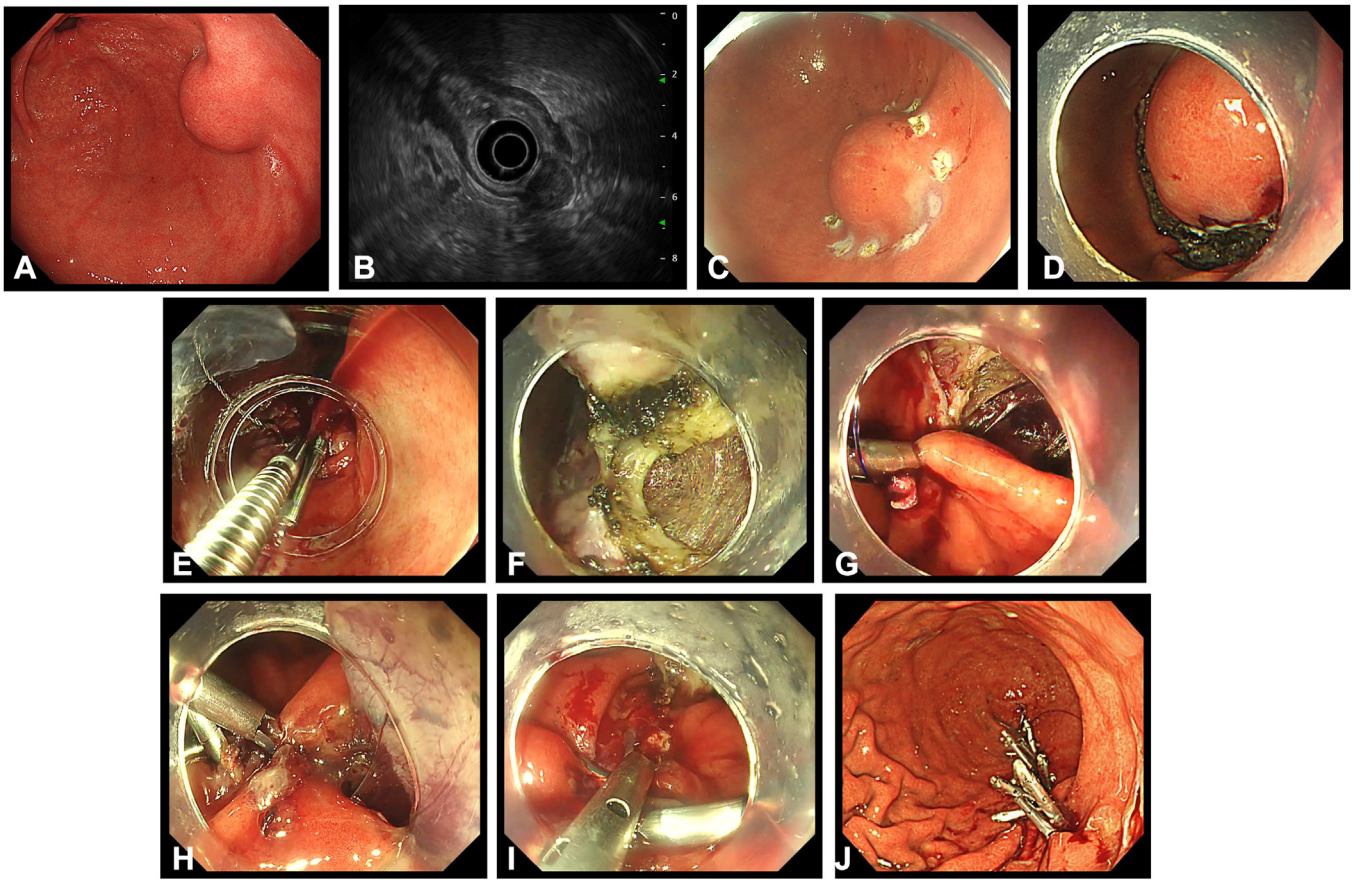

Figure 1. A, The SEL was located at the greater curvature of the lower gastric body, measuring 20 mm in size. **B**, EUS shows low-echoic lesion located in the muscular propria. **C**, Marks were made around the lesion. **D**, A circumferential incision was made. **E**, This snare-traction technique, known as multi-point traction, involves fixing the distal end of the resected specimen and the snare at multiple points with clips. **F**, The application of this traction improved visibility of a deeper layer, facilitating easier dissection. **G**, As the dissection proceeded, the defect became larger, prompting the application of the "loop 9" suturing method for partial closure. **H**, Because the lesion was strongly pulled by snare traction, serosa of the defect was inverted into the gastric cavity. **I**, Full-layer closure was achieved with the use of Mantis clips (Boston Scientific). **J**, The full-layer defect was completely closed.

DISCUSSION

TACTICS possesses 3 distinctive features. The first is that resection and suturing was alternatively performed. This approach minimizes the leakage of air into the abdominal cavity even during full-thickness resections. The second feature lies in the use of snare traction. Unlike single-point traction such as a clip and thread method, multiple-point snare traction ensures a more secure grip, enabling robust traction on the specimen. As a result, the field of view is dramatically improved, making it possible to achieve free margin resection and reduce the risk of rupture and

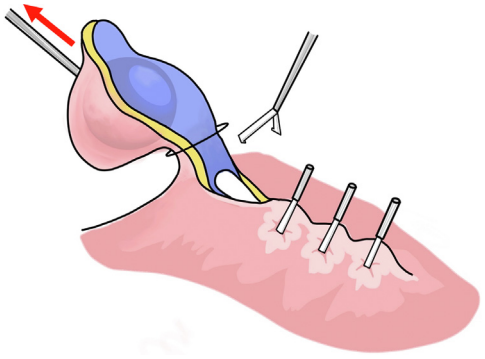

Figure 2. The illustration depicting the TACTICS technique. TACTICS involves applying powerful traction, causing the serosa at the defect site to invert into the gastric cavity. By using Mantis clips for closure, a robust full-layer closure can be achieved.

peritoneal seeding caused by the endoscopic procedure. The third, and arguably the most pivotal, aspect involves applying powerful traction, causing the serosa at the defect site to invert into the gastric cavity (Fig. 2). By using Mantis clips for closure, a robust full-layer closure can be achieved.

However, it is essential to perform this treatment in an operating room. In addition, until more cases are accumulated, this technique should be performed by expert endoscopists in high-volume centers. In conclusion, this novel TACTICS approach presents an efficient and effective method, suggesting its potential to become a new standard procedure for deeper layer dissection.

PATIENT CONSENT

Informed consent was received from the patient.

DISCLOSURE

Dr Inoue is an advisor of Olympus Corporation and Top Corporation. He has also received education grants from the Olympus Corporation. The other authors have no conflicts of interest to disclose.

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