



The suture pulley countertraction method for challenging rectal endoscopic submucosal dissection

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Densely fibrotic lesions pose special challenges in colorectal endoscopic submucosal dissection (ESD). Submucosal fibrosis can be encountered in lesions with prominent tattoos and in the resection of prior polypectomy scars.¹ By obscuring the submucosal dissection plane, dense fibrosis not only raises the technical difficulty and procedure time of ESD but may increase the risk of adverse events.

Multiple strategies have been proposed to facilitate ESD of densely fibrotic lesions. They include the pocket creation method,² the rubber band method,³ the dental floss method,⁴ and large countertraction devices.⁵ The suture pulley countertraction method was originally described in 2011 in an animal experiment⁶ and was shown in an ex vivo study to facilitate ESD when performed by an expert.⁷ Recently, a prospective randomized ex vivo study demonstrated that the suture pulley method reduces the procedure time and technical demands of ESD among endoscopists of all skill levels who were new to ESD.⁸

The method uses an endoscopic suturing device (Overstitch; Apollo Endosurgery Inc, Austin, Tex, USA). The first bite (fulcrum) is taken at the opposite wall from the lesion. The second bite (anchor) is placed several millimeters within the margin of the isolated mucosal flap. To avoid involving the muscularis propria and potential issues with tumor seeding,⁹ the second bite should be selectively taken at the edge of the mucosal flap in a submucosa-to-mucosa direction. The T-tag anchor is deployed to serve as the lifting retainer. The suture tail is then brought out of the patient carefully to prevent the anchor from tearing off the mucosa. An assistant can adjust the amount of countertraction to suit the needs of the resection simply by varying the amount of tension on the suture.

The method was originally described to facilitate gastric ESD.¹⁰ However, it can also be adapted for use in colorectal ESD. Here, we demonstrate the use of the suture pulley countertraction method for ESD of a challenging fibrotic rectal lesion (Fig. 1; Video 1, available online at www.VideoGIE.org).

CASE DESCRIPTION

A 54-year-old woman underwent a screening colonoscopy, and a 10-mm rectal polyp was removed in piecemeal

fashion. Histopathologic analysis demonstrated grade 1 well-differentiated neuroendocrine tumor, with positive lateral and deep margins. She was initially referred for a colorectal surgery consultation at our institution for transanal resection. Given the pathologic features and location of the lesion, she was given the option of close interval surveillance versus definitive excisional biopsy of the polypectomy scar. She elected to undergo excisional biopsy, and therefore ESD was recommended.

Endoscopically, a fibrotic polypectomy scar was visualized, with a prominent central tattoo. Submucosal lifting was performed with a 6% hetastarch solution. An injectable needle-type knife (DualKnife-J; Olympus America, Center Valley, Pa, USA) was used to create a mucosal incision, and ESD was started by use of the pocket creation method. Dense submucosal fibrosis and large deposits of tattoo ink were encountered, which fully obscured the dissection plane. A change in strategy was necessary to avoid perforation. A full circumferential mucosal incision was completed, and the suture pulley method was used. The suture pulley was positioned in such a manner that traction force was directed toward the opposite side of the dissection plane. By the application of tension to the suture tail, the dissection plane was adequately exposed, allowing en bloc resection without perforation. The patient was discharged home after the procedure and had an uneventful recovery. The specimen measured 37 × 25 mm. Histopathologic examination showed no residual neuroendocrine tumor, therefore providing definitive confirmation of curative resection without a requirement for further close surveillance.

In conclusion, ESD often demands creativity and strategy in addition to technical ability. Although numerous countertraction strategies have been described, ranging from simple to highly complex, the suture pulley method represents a valuable addition to the endoscopic resectionist's toolbox and can be considered during resection of challenging fibrotic lesions.

DISCLOSURE

Dr Aihara is a consultant for Boston Scientific, Olympus America, and Fujifilm Medical Systems. All other

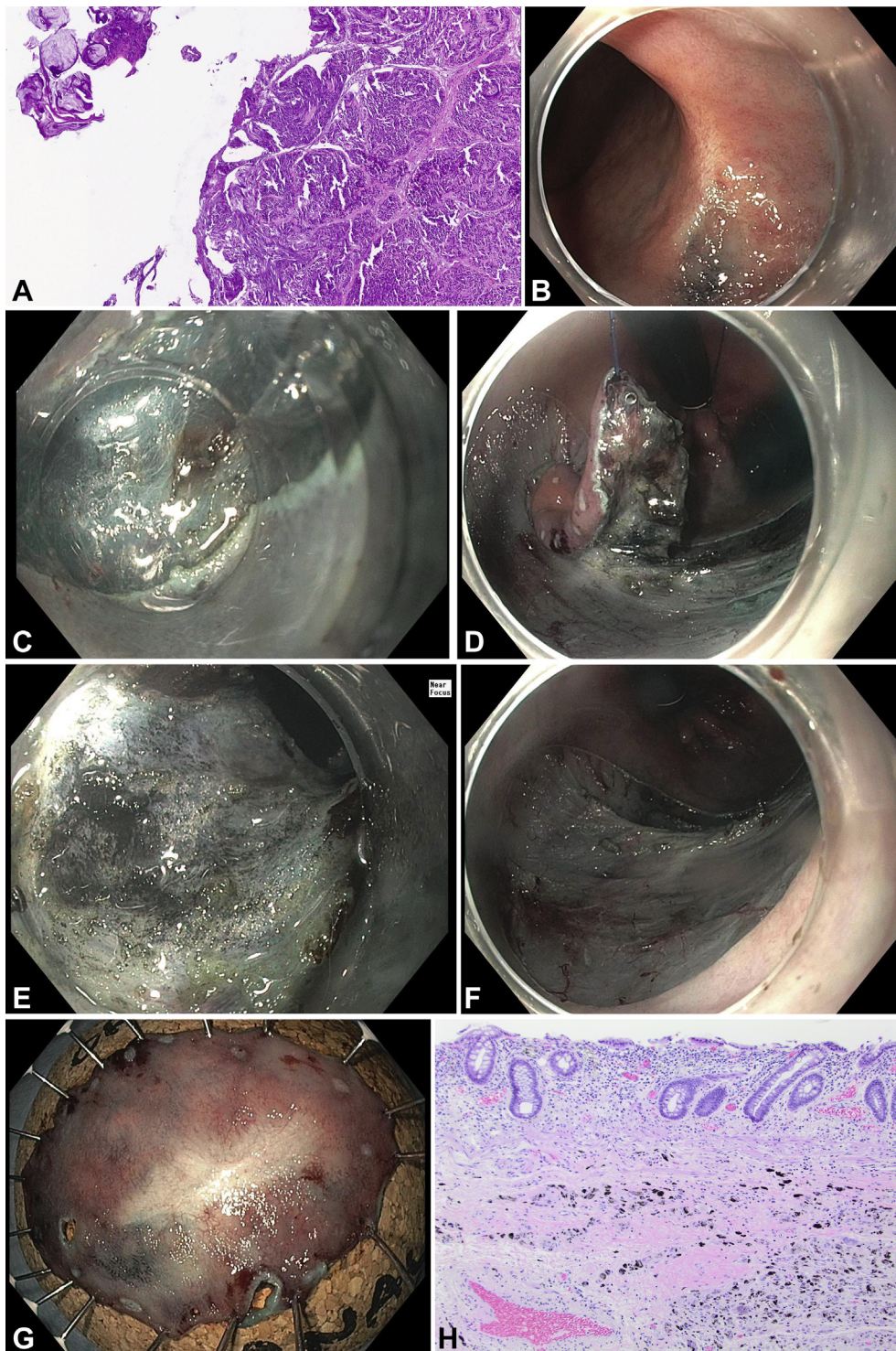


Figure 1. Use of the suture pulley countertraction method for endoscopic submucosal dissection (ESD) of a challenging fibrotic rectal lesion. **A**, Histopathologic view of a well-differentiated neuroendocrine tumor with positive lateral and deep margins, in a patient who underwent piecemeal removal of a 10-mm polyp (hematoxylin and eosin stain, 8× magnification). **B**, Endoscopic appearance of a densely fibrotic scar with central tattoo. **C**, During ESD, dense submucosal fibrosis and large deposits of tattoo ink were noted, fully obscuring the submucosal dissection plane. **D**, The suture pulley method was used, with the fulcrum placed at the opposite wall and the anchor placed near the mucosal edge. **E**, Using the suture pulley method, we visualized the dissection plane despite extensive tattoo ink and submucosal fibrosis. **F**, Endoscopic appearance of resection defect. **G**, Specimen after en bloc resection. **H**, Histopathologic view showing benign mucosa with fibrosis and deposits of tattoo ink, with no evidence of residual neuroendocrine tumor (hematoxylin and eosin stain, 4× magnification).

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Abbreviation: ESD, endoscopic submucosal dissection.

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