ORIGINAL ARTICLE

Pushing the boundaries: circumferential endoscopic submucosal dissection in distal duodenum

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Endoscopic submucosal dissection (ESD) is an effective and safe technique enabling en bloc removal of premalignant and early-stage malignant lesions. Here in this text, we present a circumferential lesion located in the distal duodenum treated with ESD.

CASE

A 67-year-old female patient with nausea and vomiting underwent endoscopy, and a circumferential lesion of 10 cm located in the duodenum distal to the ampulla of Vater was noted (Figs. 1 and 2; Video 1, available online at www.videogie.org). Biopsy revealed high-grade dysplasia. Further imaging did not reveal any metastasis. Our multidisciplinary cancer board proposed the Whipple procedure, but the patient declined, given her potential morbidity and mortality risk, and picked ESD. Written consent was obtained. With the patient under general anesthesia, the ESD procedure was performed. An en bloc resection was achieved using multiple tunnel,[1] snare traction,[2] and water-pressure techniques (WPTs).[3] Submucosal injection was applied distal to the lesion with a sclerotherapy needle (Needle Master; Olympus, Tokyo, Japan) with hydroxyethyl starch solution (Voluven 6%; Fresenius Kabi, Bad Homburg, Germany) containing indigo carmine dye. Subsequently, mucosal incision was made with a dual knife (Olympus) under Pulsecut-Slow 40 W effect of 2 and power coagulation 40 W effect of 2 (ESG300; Olympus). WPT was used to enter the submucosal area. Then, 2 opposite tunnels at each side were opened. A triangle knife (Olympus) with high injection capacity and durability was used under the same currents. Subsequently, the remaining area was dissected using the snare-traction method. The lesion was removed and fixed on styrofoam. The resection area was closed with the overstitch system and hemostatic clips (Figs. 3 and 4; Video 1). Perioperative antibiotics were administered, and the patient was on nasojejunal feeding by the fourth hour. Oral feeding was started on the third day after a contrast-enhanced CT scan showed no leakage. Pathology confirmed tubular adenoma with high-grade dysplasia and negative margins (Fig. 5; Video 1). The specimen size was 151 × 116 mm, with the procedure duration being 207 minutes. No adverse events were observed. A follow-up endoscopy at the fourth month showed no recurrence, and the patient did well (Fig. 6).

ESD is a minimally invasive approach for treating circumferential premalignant superficial nonampullary duodenal epithelial tumors. Duodenal ESD is challenging, given the thin wall and limited maneuverability. WPT facilitates entry into the submucosal area, providing a time advantage and possibly preventing accidental muscular damage. The multiple tunnel technique facilitates orientation and bleeding control; it reduces submucosal injection by providing traction, and it reduces risk of muscular damage by keeping the

Abbreviations: ESD, endoscopic submucosal dissection; WPT, water-pressure technique.

2468-4481
https://doi.org/10.1016/j.vgie.2024.02.012

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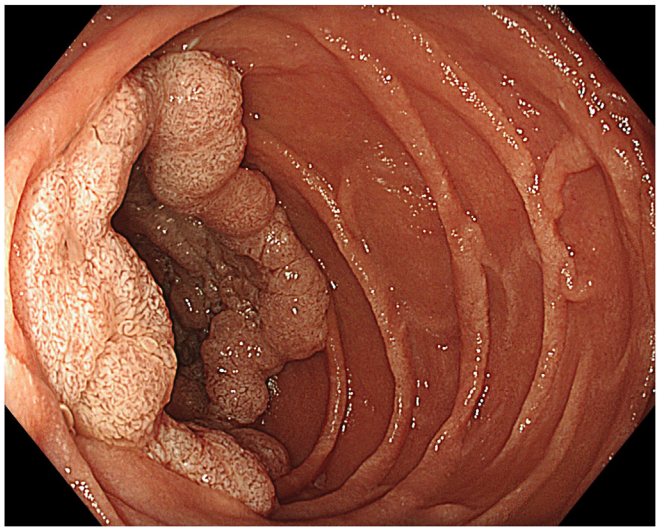

Figure 1. Endoscopic view with white-light imaging of circumferential duodenal adenoma.

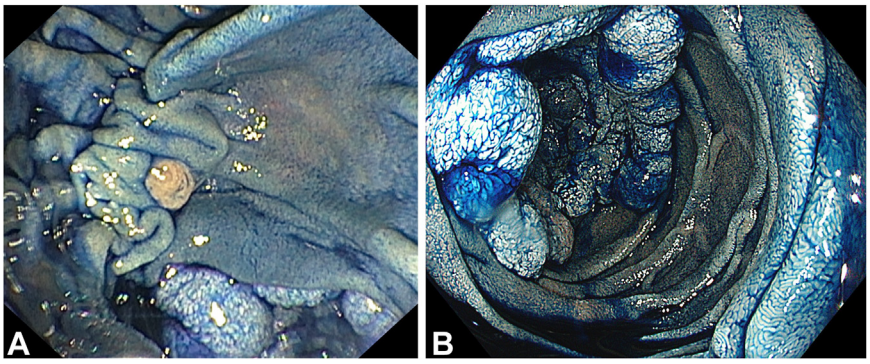

Figure 2. A, Distance of the adenoma to the papilla after indigo carmine dye (approximately 4 cm). **B,** Endoscopic view with indigo carmine dye of circumferential duodenal adenoma.

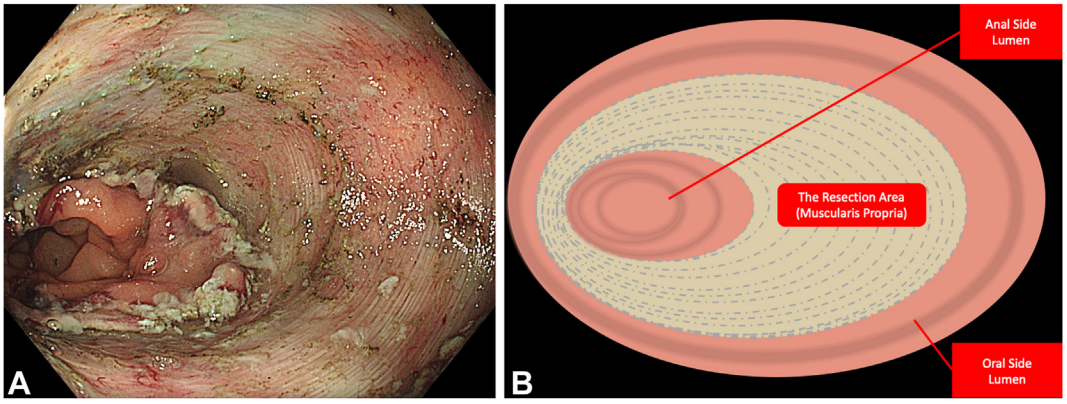

Figure 3. A, View of the resection area after endoscopic submucosal dissection. **B,** Diagrammatic view of the resection area after endoscopic submucosal dissection.

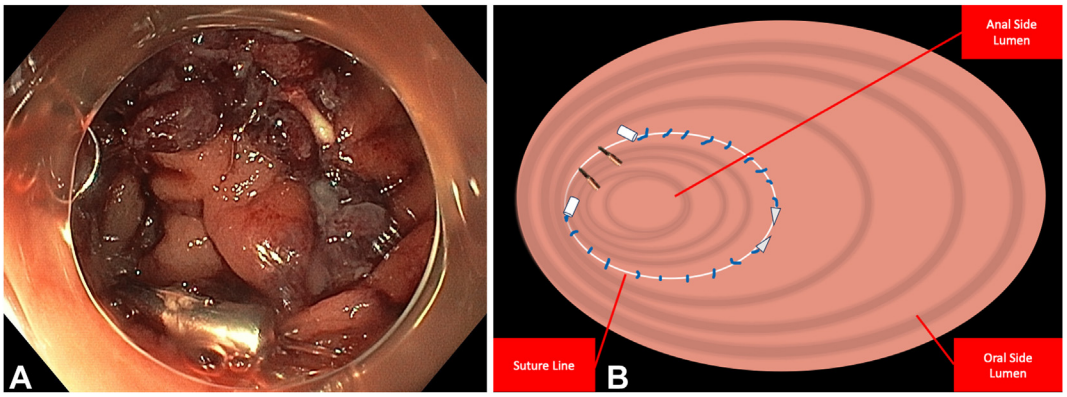

Figure 4. A, Endoscopic view of the closed resection area with overstitch and hemostatic clips. **B,** Diagrammatic view of the resection area after endoscopic submucosal dissection.

endoscope parallel to muscle. Despite repeated submucosal injections, adequate elevation may not always be achieved, and the procedure duration can be prolonged. To overcome these challenges in this particular case, the procedure was completed with the snare traction method. Large vessels were faced and coagulated with hemostatic forceps, which might lead to thermal damage and delayed perforation. In duodenal ESD, the risk of delayed perforation may additionally be high due to bile and pancreatic fluid, which renders endoscopic closure mandatory. Plus, with closure, a lower

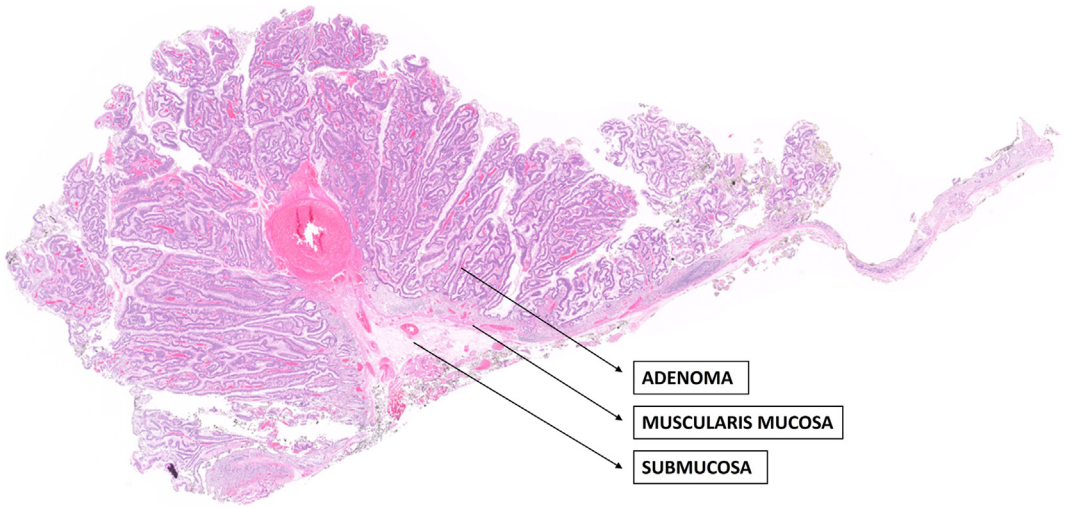

Figure 5. The histologic examination revealed an adenoma of intestinal type (H&E, orig. mag. × 2).

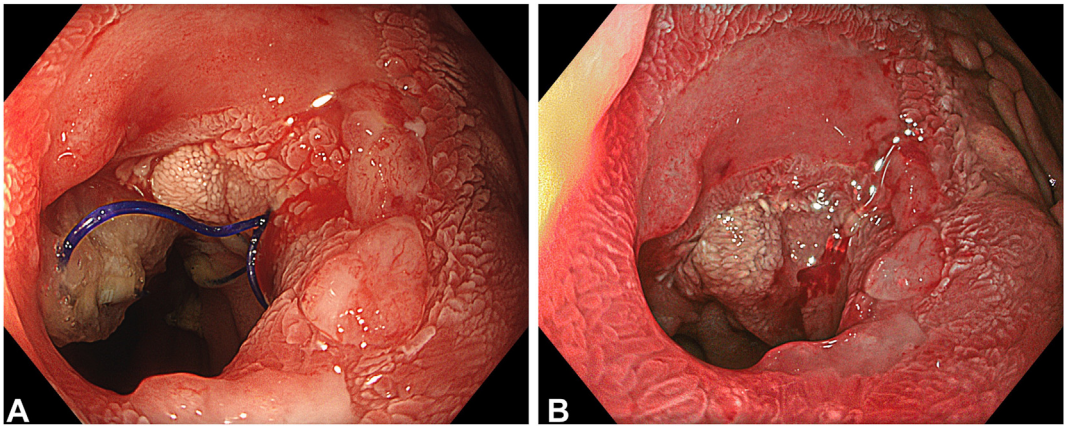

Figure 6. A, Cicatricial area with remaining Prolene suture after 4 months. **B,** Texture and color enhancement imaging view of the cicatricial area.

degree of neovascularization and fibroblast formation is expected to happen, enabling a lower stricture risk.[4] No stricture was noted in follow-up.

Although duodenal ESD is a high-risk procedure, experienced hands can successfully perform it as a minimally invasive technique. En bloc resection can successfully be achieved by combining new ESD techniques. As new suture devices are invented, the risk of adverse events can be prevented.

DISCLOSURE

The authors disclosed no financial relationships relevant to this publication.

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