



A case of laparoscopy and endoscopy cooperative surgery for circumferential superficial nonampullary duodenal epithelial tumor

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Endoscopic treatment is often recommended for superficial nonampullary duodenal epithelial tumors (SNADETs) because of its minimally invasive nature and the associated low incidence rate of lymph node metastasis.¹ However, endoscopic treatment of SNADETs is the most challenging digestive tract procedure owing to the associated technical difficulties and high risk of adverse

events, such as perioperative perforation and bleeding. The severe adverse events associated with delayed perforation are well known; they often occur as a result of exposure to bile and pancreatic enzymes.^{1,2}

Laparoscopy and endoscopy cooperative surgery (LECS) is safe and feasible for the resection of SNADETs. Specifically, LECS involves endoscopic submucosal dissection

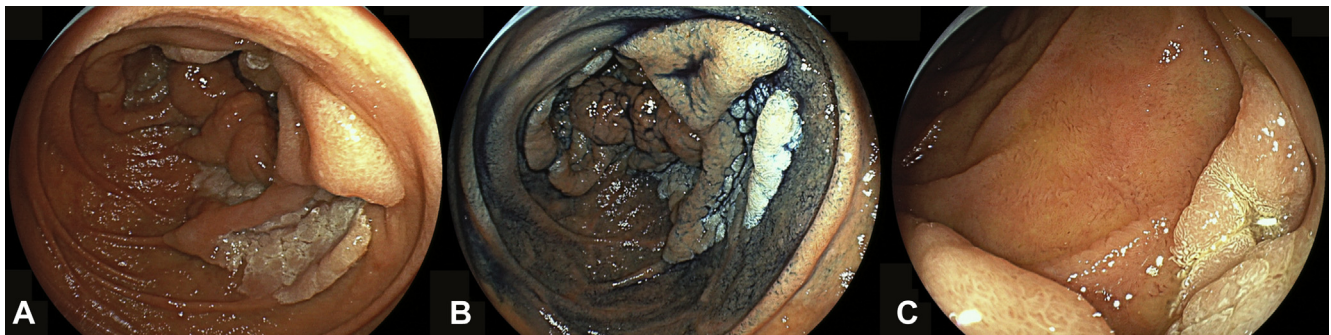


Figure 1. Endoscopic views. **A**, Forward view of a circumferential tumor more than 10 cm in size on the second and third parts of the duodenum. The tumor's morphologic type was 0-IIa+I. **B**, The tumor was clearly recognized using chromoendoscopy with indigocarmine. **C**, The anal side of the lesion was located at the third portion of the duodenum.

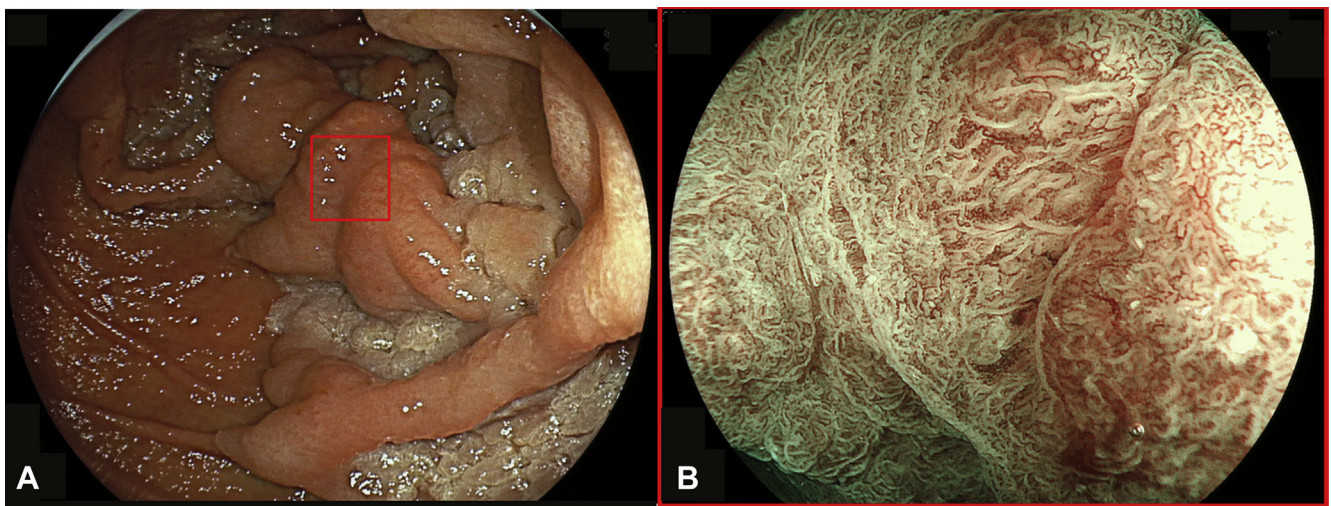


Figure 2. Magnified endoscopy with blue-light imaging. **A**, Distant view of the lesion. A slightly elevated nodule was detected. **B**, Magnified view of the red box in (A). Irregular microsurface and microvascular patterns were revealed.

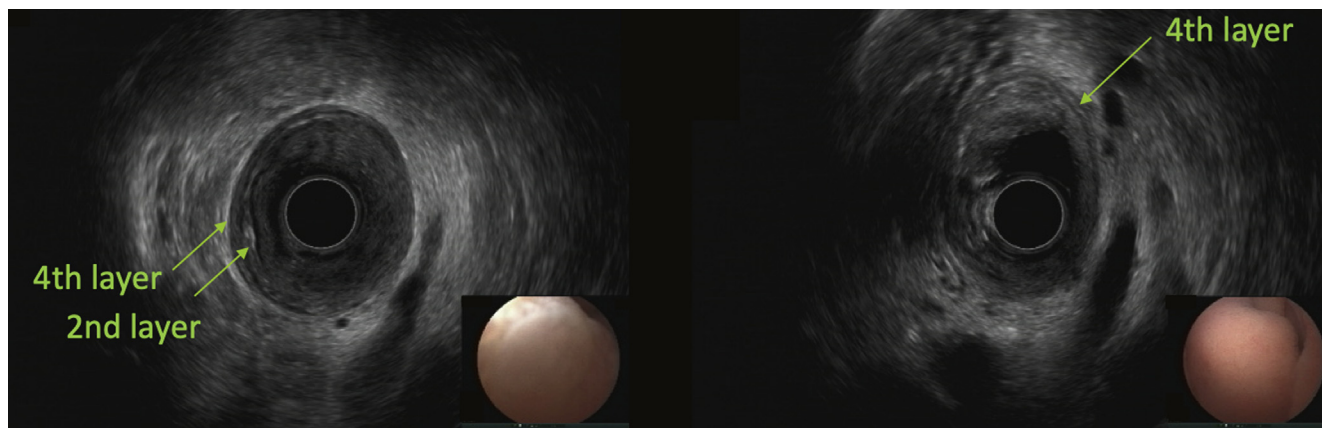


Figure 3. Endoscopic ultrasonography. The depth of the tumor was mainly limited to the intramucosal layer.



Figure 4. Upper GI series. The lesion had an irregular surface, and the duodenum was well dilated by air insufflation.

(ESD) followed by a full-thickness suture at the ESD ulcer site using a laparoscopic approach.³ Here, we report a case of circumferential SNADET resected using LECS.

An 84-year-old woman underwent EGD to determine the cause of her anemia. A circumferential SNADET was sporadically detected during the EGD. The initial histologic diagnosis based on the biopsy specimens was tubular adenocarcinoma. The patient was referred to our hospital for treatment. The circumferential tumor was approximately 12 cm in size and was located in the second and third parts of the duodenum (Fig. 1).

A slightly elevated and nodular part of the lesion was detected. Magnifying endoscopy revealed an irregular micro-surface and microvascular patterns in the area (Fig. 2) corresponding to the site of an adenocarcinoma noted on the initial EGD. EUS revealed that the depth of tumor invasion was limited mainly to the intramucosal layer (Fig. 3). EUS was performed using a radial echoendoscope rather than a high-frequency catheter-based EUS probe. An upper GI series showed that the lesion had an irregular surface, and the duodenum was well dilated by air insufflation (Fig. 4). Considering the

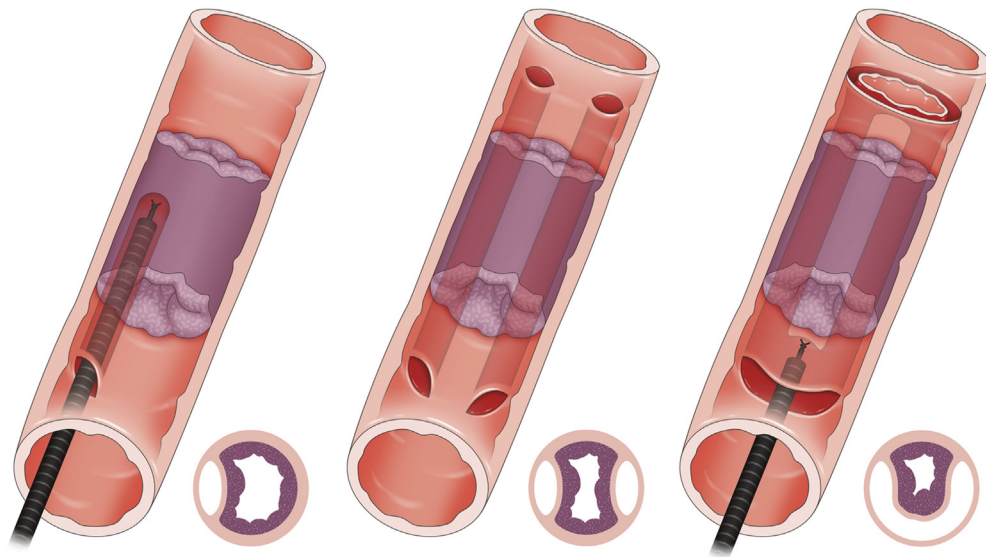


Figure 5. Schematic of endoscopic submucosal dissection using the pocket creation method. We created 2 oral-to-anal submucosal tunnels on the sides of the anterior and posterior walls. Dissection between the 2 tunnels was then performed.

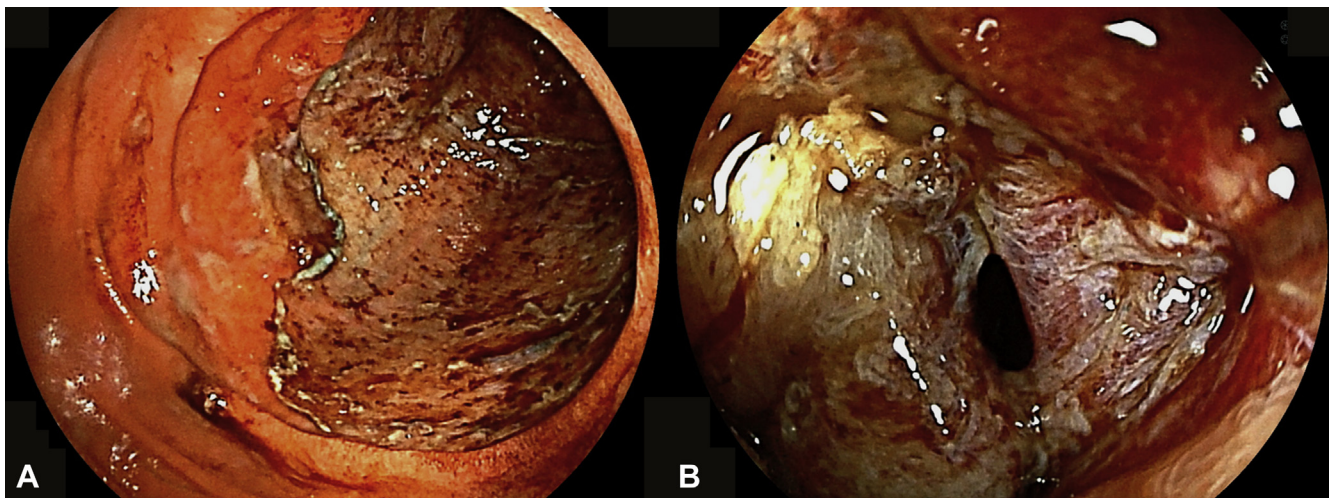


Figure 6. Endoscopic views during laparoscopy and endoscopy cooperative surgery. **A**, After endoscopic submucosal dissection of the ulcer. The ulcer was approximately 15 cm in size. **B**, Endoscopic views after laparoscopic suturing for reinforcement. The endoscope could not pass the site sutured during the laparoscopic surgical procedure.

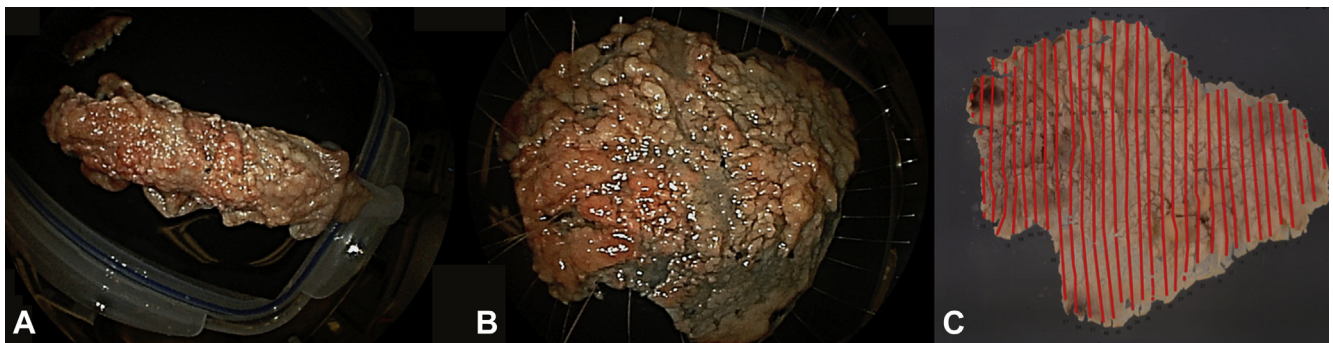


Figure 7. Resected specimen (diameter: 142 × 117 mm). **A**, En bloc resection was completed. **B**, The resected specimen, stretched with care on a board with small pins. **C**, The pathologic diagnosis was intramucosal tubular adenocarcinoma with negative horizontal and vertical margins.

patient's advanced age, her preferences, and the surgical risks of pancreatoduodenectomy, we elected to perform LECS to remove the SNADET (Video 1, available online at www.VideoGIE.org).

First, we performed endoscopic resection using the ESD technique with the patient under general anesthesia. We incised the mucosa and dissected the submucosal layer using the pocket-creation method with a scissors-type knife (Clutch Cutter; Fujifilm Co, Ltd, Tokyo, Japan), as described previously.⁴ We created 2 oral-to-anal submucosal tunnels on the sides of the anterior and posterior walls (Fig. 5).

After completing the circumferential mucosal incisions on both the oral and anal sides, we performed submucosal dissection between the 2 tunnels and achieved en bloc resection. The length of the mucosal defect was approximately 15 cm; it was easily identified from the serosal side. A circumferential full-thickness hand-sewn suture laparoscopically reinforced the duodenal wall to prevent delayed perforation.

In general, sutures and anastomosis in the GI tract should be performed along the short axis to prevent stenosis; thus, laparoscopic sutures were used along the short axis in this case. However, circumferential suture could not be performed because of the presence of a mucosal defect adjacent to the pancreas. Circumferential and long mucosal defects were reported as risk factors of stenosis after esophageal and colorectal ESD.^{5,6} We performed gastrojejunostomy because duodenal stenosis after suturing the mucosal defect was expected to occur as a result of scarring of the remaining mucosal defect (Fig. 6).

The patient had a good postoperative clinical course and experienced no adverse events. The pathologic diagnosis was intramucosal tubular adenocarcinoma with negative horizontal and vertical margins (Fig. 7), and resection was determined to be curative. The patient experienced no obstruction or recurrence 6 months after the operation.

In conclusion, LECS can be considered an effective option for the resection of circumferential SNADETs.

DISCLOSURE

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Abbreviations: ESD, endoscopic submucosal dissection; LECS, laparoscopy and endoscopy cooperative surgery; SNADETs, superficial nonampullary duodenal epithelial tumors.

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