



Successful duodenal endoscopic submucosal dissection using multiple clip-and-thread traction for a large tumor located in the duodenal bulb

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Clip-and-thread traction-assisted endoscopic submucosal dissection (ESD) is useful for treating GI lesions and offers shortened operative times and a reduced risk of perforation.¹⁻⁴ Duodenal ESD is technically challenging; large tumor size and poor endoscopic maneuverability particularly contribute to technical difficulties and intraoperative perforation.⁵ Herein, we report a technically difficult duodenal ESD that was performed successfully within a short time using multiple clip-and-thread traction.

Written informed consent was obtained from the patient after the risks and benefits of the treatment had been fully explained before the dissection.

A 74-year-old man was referred to our institute for treatment of a large, flat-elevated tumor (diameter, 50 mm) in the duodenal bulb (Fig. 1A). Endoscopic examination revealed that the proximal side of the tumor was located just behind the pyloric ring. We selected ESD for the en bloc resection of the lesion, and the patient underwent

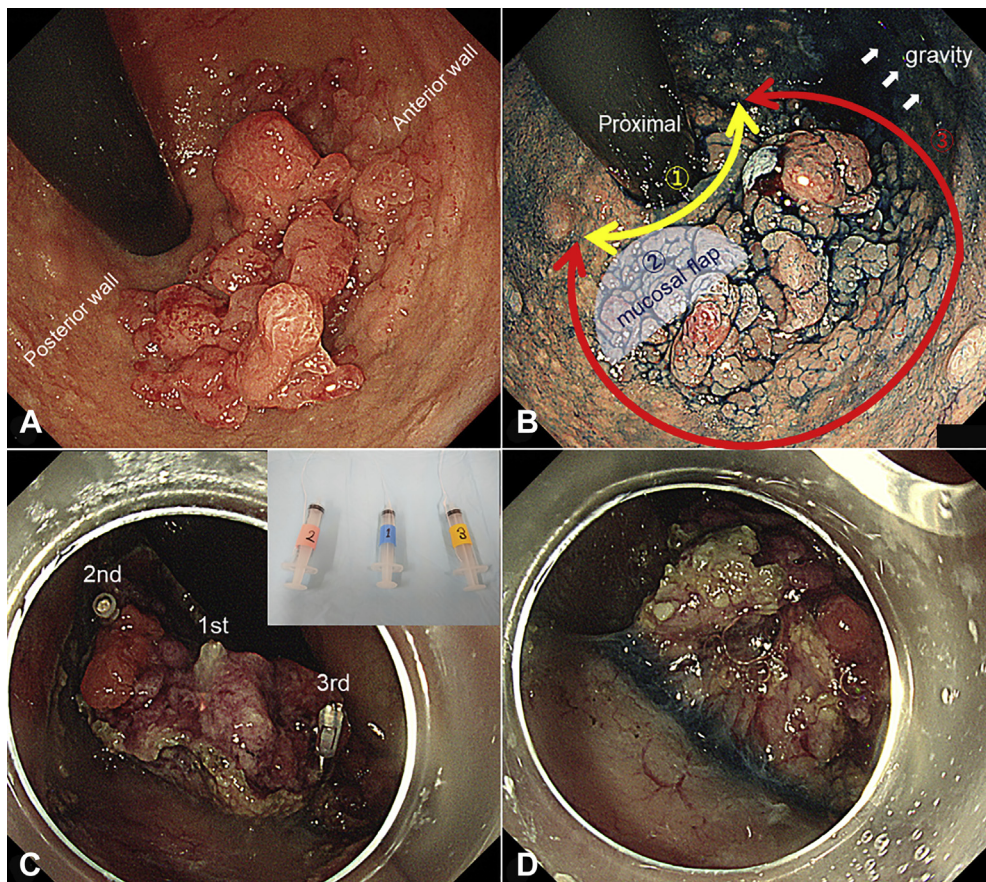


Figure 1. **A**, A large, flat-elevated tumor located in the duodenal bulb (retroflexed view). **B**, Endoscopic submucosal dissection strategy before traction. 1: Mucosal incision on the proximal side of the tumor (yellow arrows). 2: Submucosal dissection of the posterior wall side of the tumor and creation of a mucosal flap (highlighted in blue). 3: Circumferential mucosal incision is completed (red arrows). **C**, Three clip-and-threads were deployed to the distal edges of the specimen (each numbered threads with syringes). **D**, Excellent visualization of the submucosal layer is achieved.

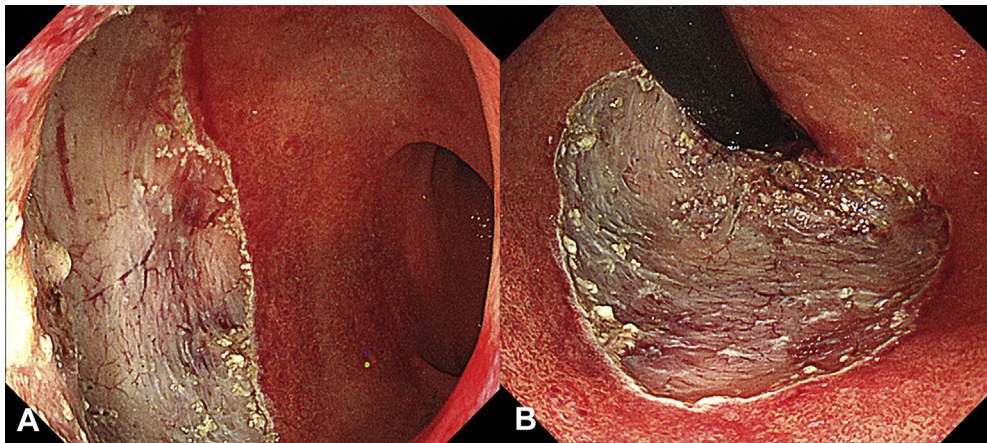


Figure 2. Mucosal defect without perforation. Forward (A) and retroflexed (B) views.

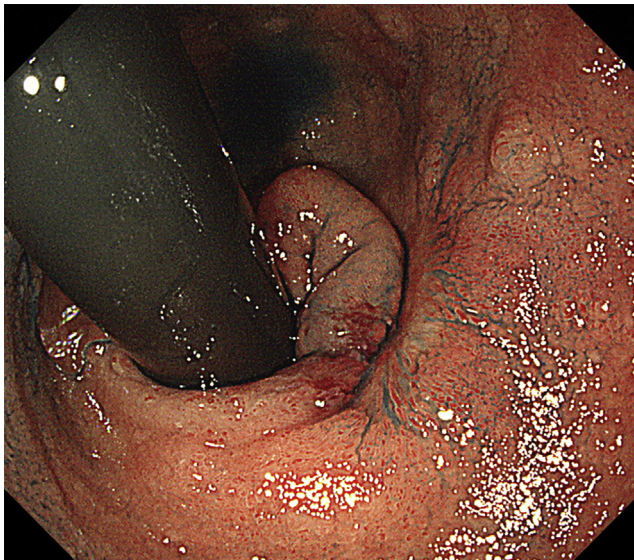


Figure 3. The mucosal defect was completely scarred over within 1 month.

the procedure under general anesthesia. The procedure was performed using a therapeutic endoscope (GIF-H290T; Olympus Medical Systems Co, Tokyo, Japan).

After injecting hyaluronic acid, we made an initial mucosal incision and performed slight submucosal dissection on the proximal side of the tumor in the forward view using a DualKnife J (1.5-mm cutting knife; KD655Q, Olympus). We then performed a submucosal dissection of the tumor's posterior wall side (ie, on the pylorus side) in the forward view using a Clutch Cutter (3.5-mm knife; DP2618DT-35-; Fujifilm Co, Tokyo, Japan) to create a mucosal flap. Reaching and dissecting the anterior wall side of the tumor in the forward view was unfeasible because of poor endoscope maneuverability. Therefore, we switched to the retroflexed view and made

a circumferential incision. A slight submucosal dissection was performed continuously using the DualKnife (Fig. 1B). Subsequently, a clip (HX-610-090; Olympus) and thread (waxed dental floss, Reach; Johnson & Johnson K.K., Tokyo, Japan) were deployed to the center of the tumor's distal edge for traction. The thread outside the patient's body was pulled proximally, and submucosal dissection was performed continuously. However, as the tumor was gradually dissected, we discovered that a single point of traction was insufficient for maintaining good visualization of both edges of the submucosal layer at the tumor site. Therefore, 2 additional clip-and-threads were deployed to the right and left distal edges of the specimen, which allowed for safe submucosal dissection with accurate visualization (Fig. 1C and D). We maintained traction by using the syringe weight or by gently pulling each thread proximally. The tumor was completely removed in 65 minutes. The mucosal defect extended nearly two-thirds of the way along the duodenal bulb circumferentially (Fig. 2 and Video 1, available online at www.giejournal.org).

In duodenal ESD, the risk of delayed perforation is increased owing to exposure of the post-ESD mucosal defect to pancreatic juice and bile acid. Therefore, complete closure of the mucosal defect is crucial in preventing delayed perforation.⁶ However, in the present case, we anticipated that mucosal defect closure would be difficult because of the large size of the defect and poor maneuverability of the endoscope. Therefore, instead of closing the defect, we decided to conduct a careful observation after tumor resection. Starting from the day of the procedure, proton-pump inhibitors were administered for 2 weeks.

The patient did not develop any adverse events and was discharged on day 6 after ESD. The mucosal defect was completely scarred within 1 month (Fig. 3). Pathologically, the tumor was an intramucosal tubular

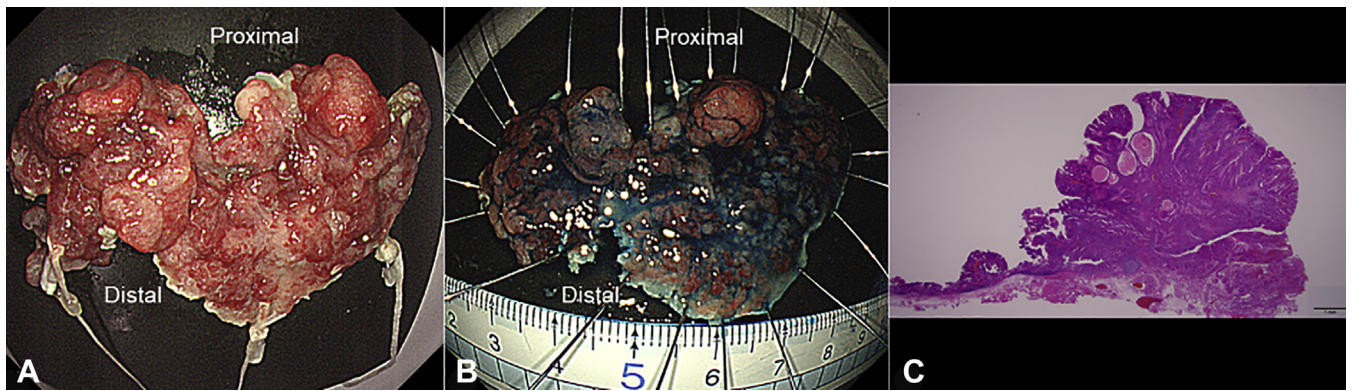


Figure 4. **A**, Resected specimen with 3 clip-and-threads. **B**, Resected specimen (60 × 35 mm). **C**, Pathologically, the tumor is an intramucosal tubular adenocarcinoma with negative margins and no lymphovascular invasion (H&E, orig. mag. ×12.5).

adenocarcinoma with negative margins and no lymphovascular invasion (Fig. 4).

In conclusion, we found that multiple clip-and-thread traction-assisted ESD is suitable for the excision of large tumors in the duodenal bulb; however, further studies are recommended.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviation: ESD, endoscopic submucosal dissection.

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