Usefulness and safety of a scissors-type knife in endoscopic submucosal dissection for nonampullary duodenal epithelial tumors

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Duodenal endoscopic submucosal dissection (ESD) is considered challenging because of poor endoscopic operability. Furthermore, the muscle layer of the duodenum is thinner than that of any other site in the GI tract, resulting in higher reported perforation rates of up to 30%.[1-3] To prevent the risk of adverse events (especially perforations) associated with the use of a conventional knife in ESD for nonampullary duodenal epithelial tumors (NADETs), we used a scissors-type knife, a stag beetle (SB) Knife Jr (Sumitomo Bakelite Co, Tokyo, Japan), which maintains an adequate dissection layer and a controlled cut that prevents unexpected muscular layer injuries.[4,5] We used the SB Knife Jr rather than the other 2 SB knives available because the other 2 are too large to perform duodenal ESD. The short SB knife is suitable for esophageal ESD, whereas the standard SB knife is suitable for gastric ESD. The SB Knife Jr has already been approved by the U.S. Food and Drug Administration, and it was released in the United States in May 2017.

We describe 2 cases of duodenal ESD in which the SB Knife Jr was used (Video 1, available online at www.VideoGIE.org). The ESD procedure was performed as

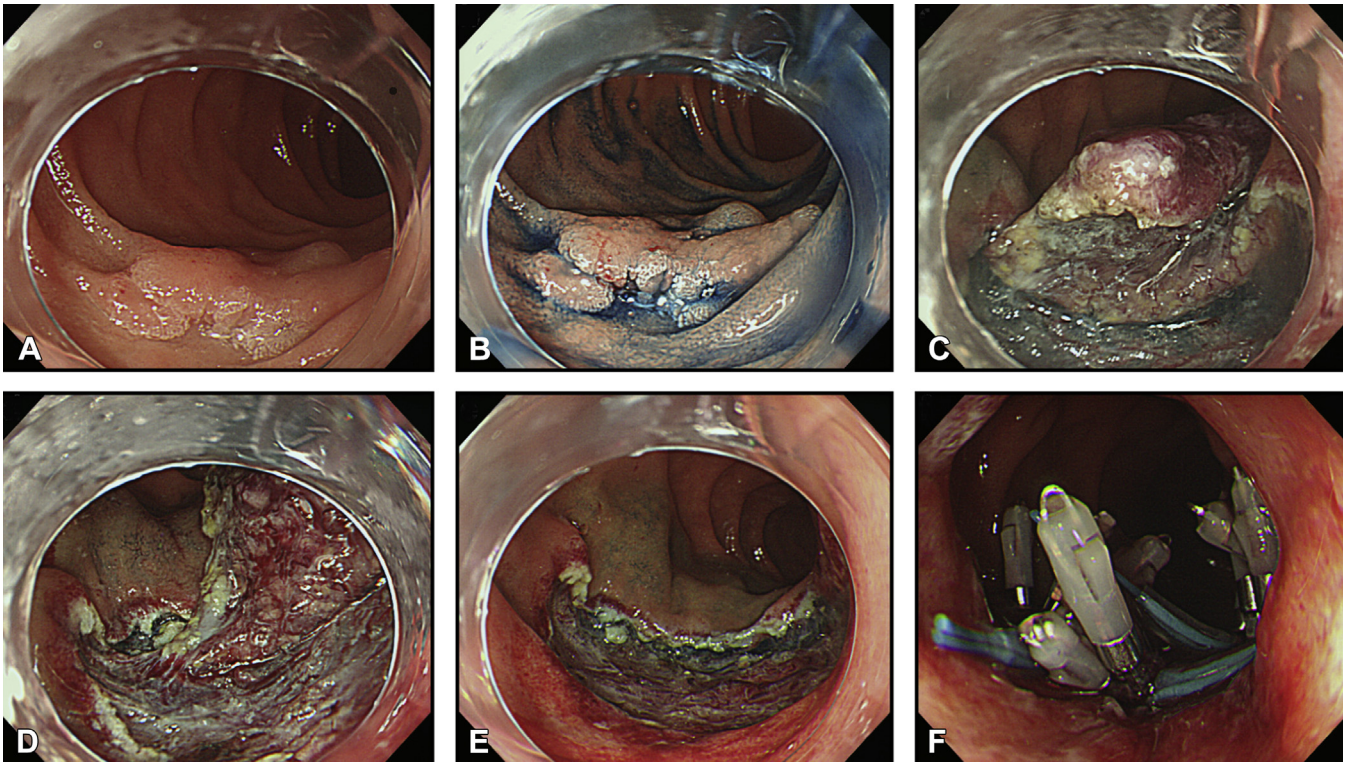

Figure 1. Surgical procedure in the first case. **A, B,** A flat elevated neoplasm (0-IIa) in the second part of the duodenum is approximately 4.0 cm in diameter. **C, D,** Endoscopic submucosal dissection is performed with the SB Knife Jr without any adverse events. **E, F,** The resection surface is completely closed with several clips and 3 detachable snares.

Written transcript of the video audio is available online at www.VideoGIE.org.

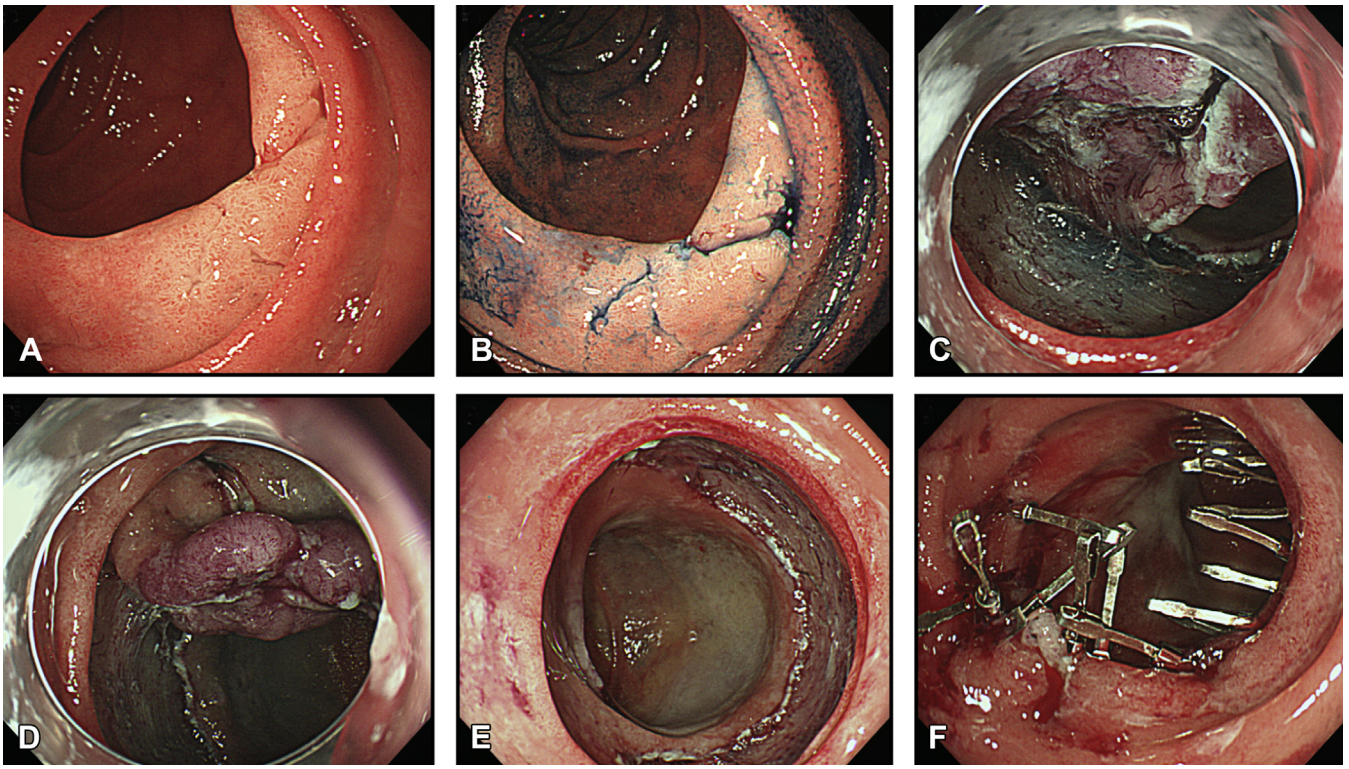

Figure 2. Surgical procedure in the second case. **A, B,** A flat elevated neoplasm (0-IIa) in the second part of the duodenum is approximately 3.0 cm in diameter. **C, D,** Endoscopic submucosal dissection is performed with the SB Knife Jr without any adverse events. **E, F,** The resection surface is completely closed with clips.

follows: step 1, we injected hyaluronic acid and indigo carmine into the submucosa to elevate the lesion; step 2, a circumferential incision was made from the oral side with the SB Knife Jr, and after several incisions, the endoscope was slipped under the mucosal layer and moved for submucosal dissection; step 3, the submucosal layer was grasped and pulled slightly, and a high-frequency electrical current was applied; step 4, the circumferential incision was extended, followed by repetitive submucosal dissection until the entire lesion was resected; and step 5, the resection surface was completely closed with clips. We used a high-frequency generator (ESG-100, Olympus, Tokyo, Japan) with the following settings: pulse cut first mode (30 W) for mucosal incision and submucosal dissection, and soft coagulation mode (40 W) for hemostasis.

Our first patient was a 72-year-old man with a flat elevated neoplasm (0-IIa) in the second part of the duodenum, approximately 3.0 cm in diameter (Fig. 1). We performed ESD with the SB Knife Jr by en bloc resection. The resection surface was too large to be closed using the normal clip technique; therefore, 2 clips at the edge of the surface were connected with a detachable snare, and then the surface was closed completely with additional clipping. The resection surface was completely closed with several clips and 3 detachable snares. Histopathologic examination identified intramucosal moderately differentiated tubular adenocarcinoma. The resected tumor was 3.0 × 2.0 cm, and the procedure time was 115 minutes.

The second patient was an 83-year-old man with a flat elevated neoplasm (0-IIa) in the second part of the duodenum, approximately 4.0 cm in diameter (Fig. 2). We also performed ESD with the SB Knife Jr by en bloc resection. The resection surface was completely closed with clips. Histopathologic examination revealed intramucosal well-differentiated tubular adenocarcinoma. The resected tumor was 4.0 × 1.5 cm, and the procedure time was 175 minutes.

The lesions were completely resected safely without any immediate or delayed adverse events, and no recurrence occurred in either case. The SB Knife Jr allowed us to grasp the target tissue, facilitating controlled safe dissection even under poor endoscopic operability. In conclusion, ESD for NADETs with the SB Knife Jr is technically feasible and safe.

DISCLOSURE

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Abbreviations: ESD, endoscopic submucosal dissection; NADETs, nonampullary duodenal epithelial tumors; SB, stag beetle knife.

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