

An effective method for removing surgical staples during endoscopic submucosal dissection for early gastric cancer on the suture line of remnant stomach



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INTRODUCTION

There have been several reports on the safety and efficacy of endoscopic submucosal dissection (ESD) for gastric cancer in a remnant stomach.¹⁻⁴ ESD for residual gastric cancer in the suture line poses some specific technical difficulties owing to the limited working space, severe fibrosis in the suture line or anastomosis, and the presence of staples.

Given that staples in the suture line pose a risk of perforation, most surgeons aim to dissect directly above the staples. However, a shallower dissection layer can damage the specimen, leaving behind tumor remnants. On the other hand, dissecting below the staples poses a risk of perforation. Furthermore, dissection in the layer containing the staples results in a continuous flow of current through the staple, increasing the time required for the dissection or possibly increasing the risk of delayed perforation. For

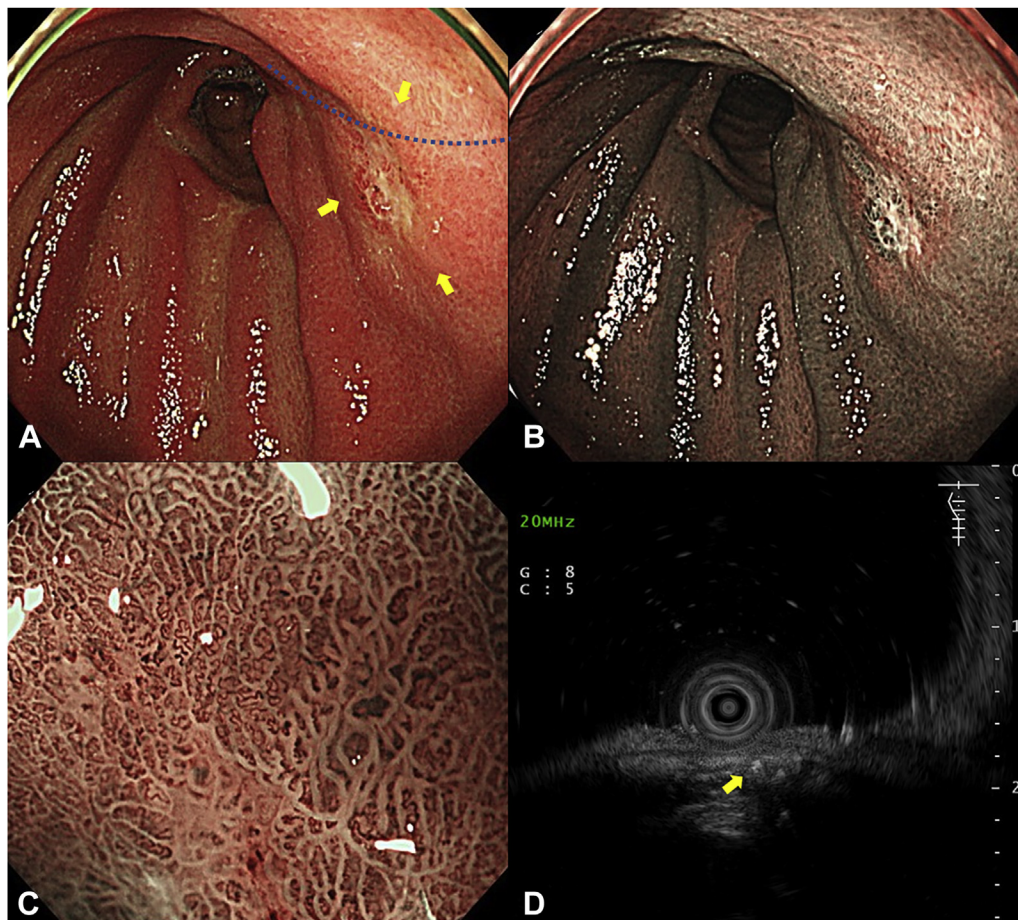


Figure 1. Endoscopic findings. White-light endoscopy (A), narrow-band image (NBI) (B), and magnified endoscopy with NBI (C) revealed the presence of early gastric cancer in the lesser curvature of the remnant stomach (yellow arrows). The lesion was located on the suture line of the remnant stomach (blue dotted line). D, EUS confirmed disruption of the submucosal layer and the presence of staples on the right side below the lesion (yellow arrows).

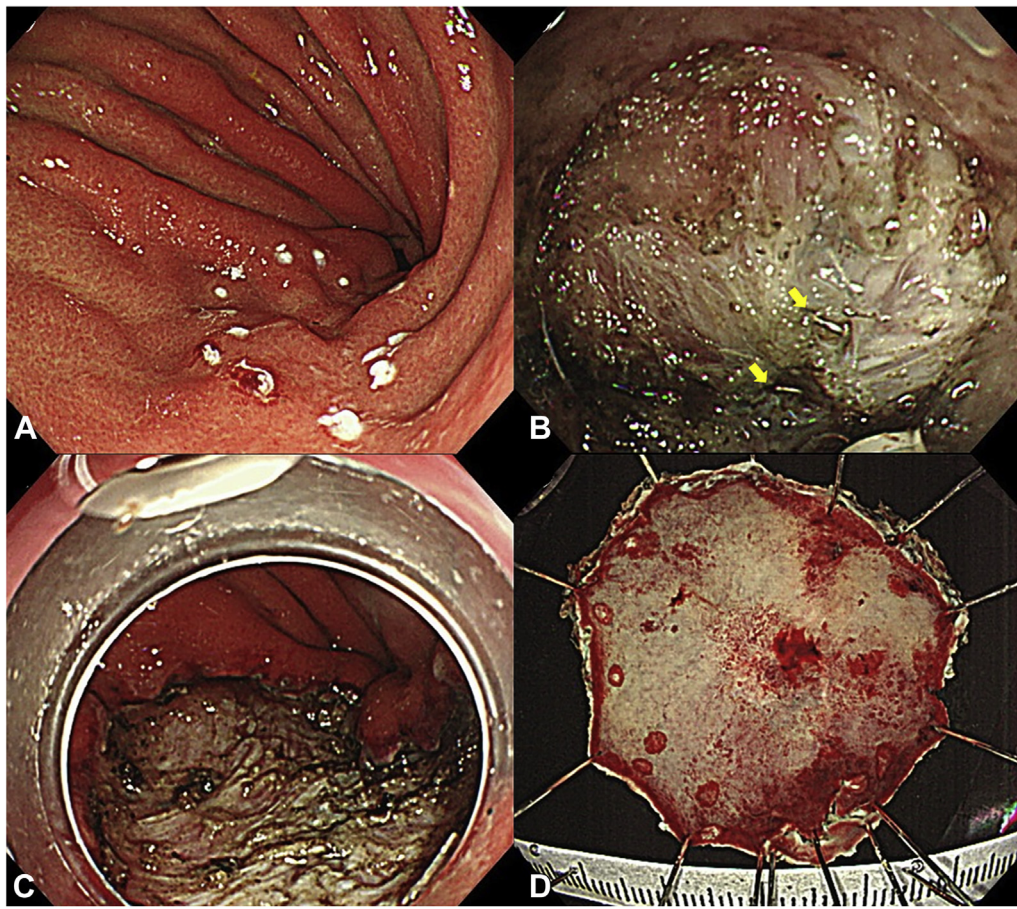


Figure 2. The ESD procedure. **A**, Representative image of a remnant stomach tumor confirmed at the suture line. Marking dots are placed on the normal mucosa at approximately 5 mm from tumor margin. **B**, The extensive fibrosis and surgical staples (*yellow arrows*) were found during ESD. **C and D**, The lesion was resected en bloc.

these reasons, staples may need to be removed using a tip-type knife to expose the exfoliated layer during ESD.

CASE REPORT

The patient in this case was a 68-year-old man who had undergone distal gastrectomy with Billroth I reconstruction 21 years earlier. Routine surveillance gastroscopy revealed a 10-mm depressed lesion in the lesser curvature of the remnant stomach, which was confirmed to be adenocarcinoma on biopsy.

The lesion was located on the suture line of the remnant stomach, and EUS confirmed disruption of the submucosal layer and the presence of staples on the right side below the lesion (Fig. 1A-C). The muscular layer lay flat under the staples (Fig. 1D). Preoperative CT revealed no lymph node metastasis, so we decided to perform ESD with the patient under general anesthesia (Video 1, available online at www.giejournal.org).

The ESD procedure was performed using a Dual Knife (KD650Q; Olympus Medical Systems Corp, Tokyo, Japan). A VIO 300D system (ERBE, Tübingen, Germany) was used

as the electro-surgical unit. During the dissection, extensive fibrosis and staples were found in the suture line. The staples were removed one by one using the knife in EndoCut mode while pulling out the staple so that it could be removed immediately (Fig. 2A-D). There was no perforation or bleeding due to electrification of the staples. The lesion was resected en bloc in 160 minutes with a total operating time of 180 minutes. ESD was completed without adverse events. The post-ESD defect did not close after the procedure, and the patient was discharged on postoperative day 6 after satisfactory wound examination results.

Histopathology evaluation showed a poorly differentiated adenocarcinoma (por) and signet ring cell carcinoma (sig) with a moderately differentiated adenocarcinoma (tub2) component (por > sig > tub2) measuring 15 × 13 mm without lymphovascular invasion or pathologic ulceration. The depth of tumor invasion was pT1a, and the surgical margins were clear, indicating that complete en bloc resection had been achieved. We evaluated the ESD site at 8 weeks postoperatively and have performed follow-up gastroscopy and CT at 6-month intervals. At the time of writing, the patient is well without local recurrence or distant metastases.

DISCUSSION

Suturing methods for gastrectomy include varus suture and valvus suture. In the case of a valvus suture, it is common to perform the serosal muscular suture from the outside, so it is theoretically possible to remove staples if the surgical procedure is confirmed in advance of ESD and the staples are confirmed to be on the lumen side of the muscular layer by EUS.

The Dual Knife was used to conduct EndoCut electro-surgical current into the staple. The current through the staple results in an EndoCut effect on the tissue that is in contact with the staple, which will then release the staple if some tension is placed. This could have also been achieved by grasping the suture with coagulation forceps or any other knife (eg, hook knife: KD-620QR; Olympus) while applying EndoCut current. Removal of the staples allowed us to secure a better endoscopic view and more reliable ESD, which resulted in safer treatment.

This technique has some limitations. It may be necessary to refrain from removing staples by electrifying the knife because scar formation is often not complete until a few months after surgery.

Removing staples by electrifying the Dual Knife in EndoCut mode is a technique that facilitates ESD on the suture line of the remnant stomach.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviation: ESD, endoscopic submucosal dissection.

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