

# Novel approaches to minimize intraoperative bleeding during endoscopic submucosal dissection of a large rectal lateral spreading tumor extended to the dentate line with internal hemorrhoids



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## INTRODUCTION

Endoscopic treatment of rectal lateral spreading tumors (LSTs) extending to the dentate line with hemorrhoids is a challenging procedure because of the risk of bleeding and the reduced visual field caused by the dilated venous packages and the narrow anal lumen. Although a few Japanese reports have described the safety and efficacy of endoscopic submucosal dissection (ESD) for these tumors,<sup>1,2</sup> technical approaches to reduce intraoperative bleeding are not fully described. We present a successful ESD of a large rectal LST that extended to the dentate line with large internal hemorrhoids and describe novel approaches to minimize intraoperative bleeding.

## CASE

A 65-year-old woman with hematochezia was diagnosed with a hemicircumferential granular LST in the lower rectum that measured 65 mm in diameter and extended to the dentate line and over large internal grade I hemorrhoids (Fig. 1A and B).<sup>3</sup> Indigo carmine chromoendoscopy demonstrated no large nodules, ulcer, or converging folds (Fig. 1C).<sup>4</sup> EUS revealed a noninvasive T1 lesion, and biopsy revealed a tubulovillous adenoma with high-grade dysplasia. The estimated depth of invasion was intramucosal, and the patient was scheduled for ESD.

## TECHNIQUE

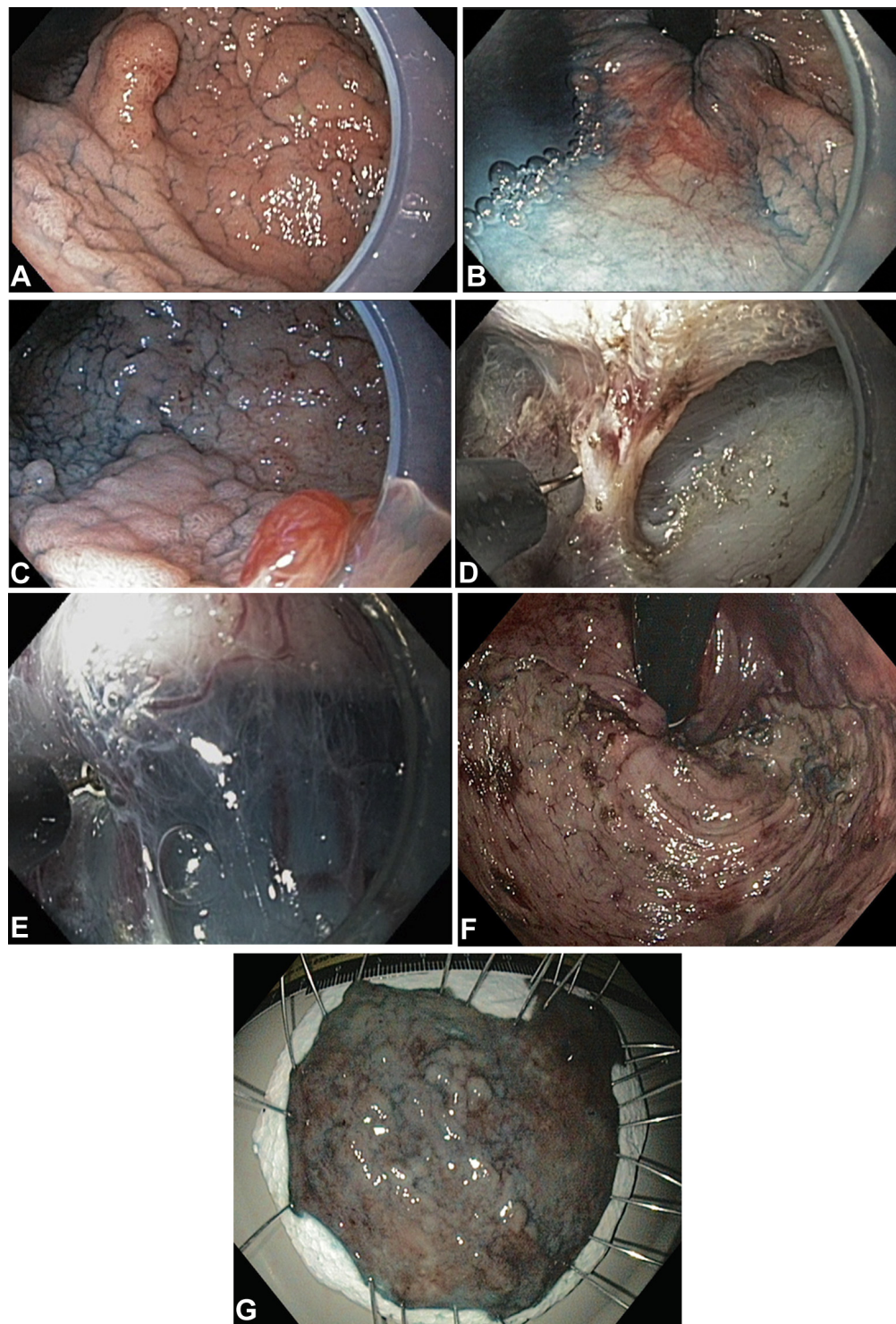
The procedure was performed using an Evis Exera II video processor, an H180 gastroscope (Olympus, Japan), and carbon dioxide insufflation with the patient under intravenous sedation. An electrosurgical generator ICC 200 (ERBE, Tübingen, Germany) was set to endocut mode, 40 W for submucosal (SM) dissection, and soft coagulation mode at 30 W for hemostasia. A mixed solution of normal saline solution, hyaluronic acid, indigo carmine, and epinephrine was used for SM injection.

The procedure was carried out in the retroflex view from the proximal tumor margin to circumvent contact with hemorrhoids. After a shallow mucosal incision was made with a conventional needle knife, the SM layer was superficially dissected to avoid bleeding from large SM vessels using an IT-knife nano (KD-612L, Olympus, Tokyo, Japan)<sup>5</sup> and a soft distal cap. The patient's position was modified occasionally so that gravity pulled down and opened the dissected mucosa, improving visualization.

Vessels were selectively approached to minimize the risk of bleeding. Small vessels were coagulated directly with the IT-nano, mainly by using the disc at the back of the insulated tip. In contrast, a stepwise dissection technique was used for larger vessels. First, the vessel was exposed by dissecting the surrounding SM layer at the left and right sides using the long blade of the IT-nano and by blunt dissection of the surrounding tissue at the vessel's posterior aspect using a Hook knife (KD-620LR, Olympus, Tokyo, Japan) (Fig. 1D).<sup>6</sup> Next, double-vessel sealing was performed at the rectal wall and tumor sides using a hemostatic forceps (FD-411QR/U, Olympus, Tokyo, Japan). Last, the vessel was transected between sealed segments using the IT-nano. No bleeding was noted.

When the SM layer was halfway dissected, the level of dissection was deeply oriented above the muscular propria to shut off blood supply to hemorrhoids by penetrating vessels (Fig. 1E). Mild fibrosis was seen when the dissection was near the dentate line,<sup>7</sup> and en bloc resection was achieved in 240 minutes (Fig. 1F). The size of the specimen was 85 × 80 mm, corresponding to an area of 5340 mm<sup>2</sup> (Fig. 1G) and a dissection speed of 22.3 mm<sup>2</sup>/min.<sup>8</sup>

The postoperative course was uneventful. The patient had no anal pain, and therefore analgesics were not administered. Histology revealed a tubulovillous adenoma with high-grade dysplasia with multiple dilated venous formations of up to 1525 μm in size (Fig. 2A). Negative horizontal margin with squamous epithelium was observed at the specimen's distal end (Fig. 2B). Surveillance colonoscopy 5 months after ESD revealed a scar with no local recurrence and no hemorrhoids.

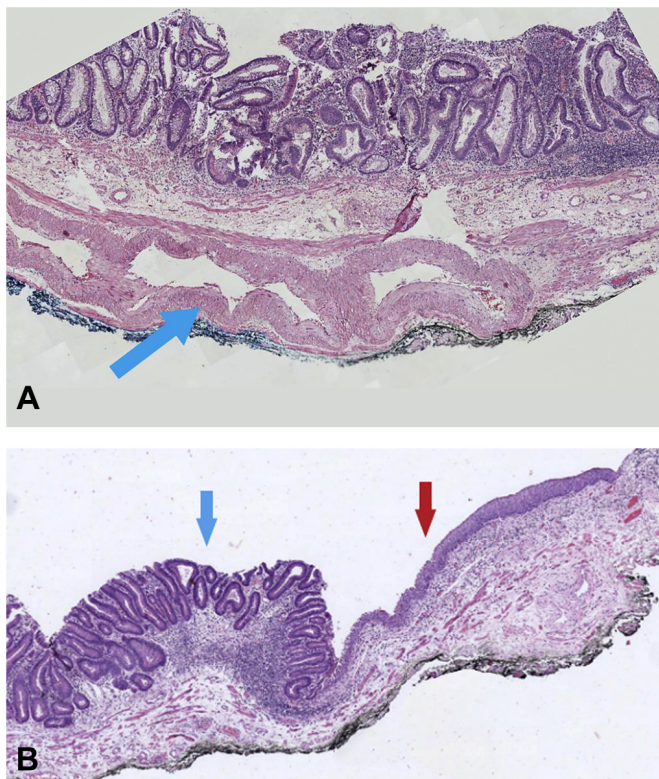


**Figure 1.** Endoscopic submucosal dissection for a large granular lateral spreading tumor extending to the dentate line with hemorrhoids. **A**, Hemicircumferential granular lateral spreading tumor, 65 mm in diameter, in the lower rectum. **B**, The lesion extends to the dentate line and over large internal grade I hemorrhoids. **C**, Indigo carmine revealed no large nodules and no ulcer or converging folds. **D**, Large vessels are exposed by lateral dissection, blunt dissected, and doubled sealed at the tumor and rectal wall sides. **E**, Direct coagulation of penetrating vessels to shut off blood supply to hemorrhoids. **F**, Ulcer after endoscopic submucosal dissection. **G**, A specimen of 85 mm in size is fixed before immersion in formaldehyde.

## SUMMARY

Novel techniques to minimize the risk of intraoperative bleeding during ESD of large rectal LSTs that extend to the

dentate line with large internal hemorrhoids are described. First, the retroflex view approach enables dissection of the SM layer from the proximal tumor margin, avoiding contact with hemorrhoids. A differential level of SM dissection



**Figure 2.** Histopathologic analysis. **A**, Histopathology revealed a tubulovillous adenoma with multiple dilated venous formations in the submucosal layer corresponding to internal hemorrhoids of up to 1525  $\mu\text{m}$  (blue arrow). **B**, A panoramic view demonstrates intramucosal adenoma with high-grade dysplasia (blue arrow) and squamous epithelium of the anal canal at the distal margin of the lesion free of tumor (red arrow).

prevents inadvertent bleeding—shallow first to avoid large SM vessels, and then deeper above the muscular layer at the end to shut off blood supply to hemorrhoids by penetrating hemorrhoidal vessels. Last, we used a selective approach to vessels, with direct coagulation using the IT-nano for small vessels and with lateral exposure, posterior blunt dissection, double-vessel sealing, and transection between sealed segments for larger vessels (Video 1, available online at [www.giejournal.org](http://www.giejournal.org)).

## DISCLOSURE

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*Abbreviations: ESD, endoscopic submucosal dissection; LSTs, lateral spreading tumors; SM, submucosal.*

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