



Endoscopic submucosal dissection for a laterally spreading tumor involving the colon diverticulum using a knife with water supply function

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The development of colonic endoscopic submucosal dissection (ESD) expanded the use of endoscopic therapy regardless of the tumor's size, location, or degree of fibrosis. However, lesions involving diverticula in the colon are considered a contraindication for endoscopic treatment because of the absence of muscle layers.

We successfully resected a laterally spreading tumor involving a diverticulum of the colon. This ESD procedure was performed without perforation by using a knife with water-supply function.

A 90-year-old man presented with a laterally spreading tumor 50 mm in diameter (Paris 0-IIa) in the ascending colon that involved the diverticulum on the oral side of the tumor (Fig. 1A and B). The diverticulum was in contact with the oral side of the tumor and extended into the tumor. The tumor was classified as partially involving type¹ (the tumor reached and entered the diverticular orifice and invaded one-third of the circumference of the diverticulum); the diverticulum size was 7 mm. We decided to use the ESD strategy to resect the tumor except for the portion in contact with the diverticulum.

The portion of the tumor near the diverticulum was to be resected by using gravity adjustment and a knife with water-supply function to maintain the submucosal space of the diverticulum (Video 1, available online at www.VideoGIE.org). The mucosal incision was initiated on the side closest to the diverticulum (oral side). A single-channel scope (PCF-Q260JI; Olympus, Tokyo, Japan) was used to visualize the procedure, and carbon dioxide insufflation was used to promote distention of the lumen. ESD was performed by using a 2-mm Flush Knife BT-S (Fujifilm, Tokyo, Japan) and a small-caliber tip transparent hood (DH-29CR; Fujifilm). A VIO300D electrosurgical generator (ERBE, Tübingen, Germany) was used during the procedure.

After the mucosal incision on the oral side of the tumor was complete, mucosal incision and submucosal dissection were performed as far as possible from the

anal side. Hyaluronic acid solution was injected to obtain a good submucosal elevation and view. After we identified the diverticulum with lack of muscle layer, we resected the tumor except for the part in contact with the diverticulum (Fig. 1C).

When resecting the portion of the tumor near the diverticulum, it was important to maintain the submucosal space under the diverticulum and avoid touching the side of the muscle layer defect. To maintain the submucosal space, we changed the postural position to obtain better gravity (because this tumor was so large, we could gain effective gravity traction because of its weight), expanded the submucosal layer, and dissected the middle of the submucosal space (Fig. 1D). The Flush Knife was used to maintain the submucosal space during administration of local injections (Fig. 1E). The Flush Knife has the advantage of allowing smoother injection into the submucosa because its water-supply lumen (1.1 mm) is larger than that of other knives (eg, Dual Knife, Hybrid Knife).

Finally, we encountered a large vessel, and setting the Flush Knife to a lower power (forced coagulation effect 1, 10W; F1-10) was very useful in preventing shrinkage of the submucosal layers compared with using hemostatic forceps.² The tumor was resected en bloc without perforation (Fig. 1F). The procedure time was 135 minutes.

The area surrounding the muscle defect was closed with 5 clips to prevent delayed perforation (Fig. 1G). Pathological examination revealed adenocarcinoma with a negative margin, and the tumor size was 40 × 50 mm (Fig. 1H). The patient was discharged 5 days after ESD with no medical adverse events.

Use of gravity traction and knives with a water-supply function is easier than use of other traction devices. However, this method has a limitation: the heavier the tumor, the more effective the diverticulum traction; however, if traction is insufficient, we need to use additional traction methods.^{3,4}

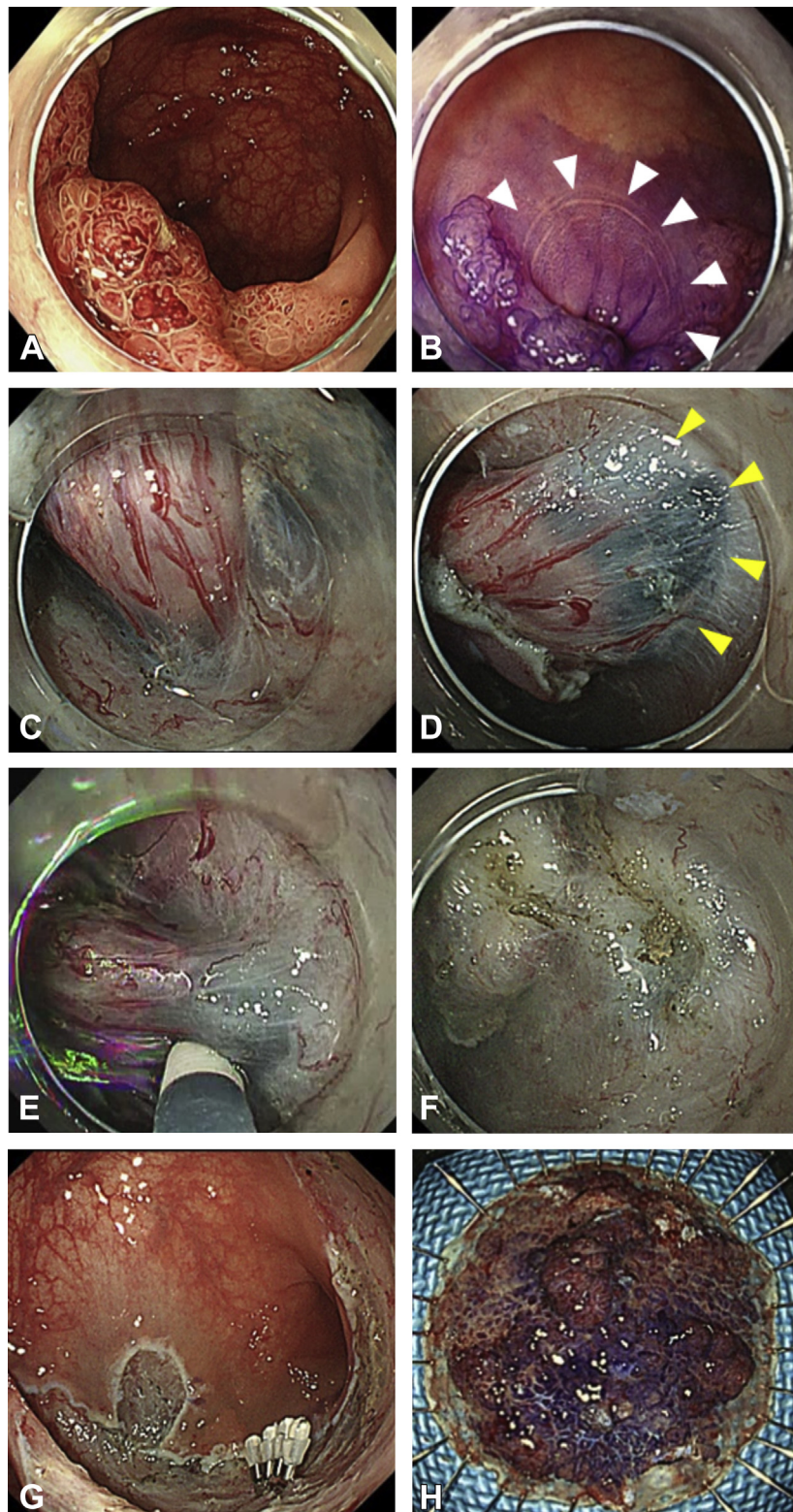


Figure 1. **A, B,** Laterally spreading tumor (50 mm in diameter) located in the ascending colon and extending into a diverticulum located on the oral side of the tumor (*white arrows*). **C,** Colon diverticulum. **D,** Changing the postural position for better gravity in the submucosal space (*yellow arrows* show defects in the muscle layer). **E,** Injecting water into the submucosal space using the knife's water-supply function. **F,** Wound after endoscopic submucosal dissection without perforation. **G,** Complete closure of the defect in the muscle layer by using clips. **H,** Resection specimen.

DISCLOSURE

All authors disclosed no financial relationships relevant to this publication.

Abbreviations: ESD, endoscopic submucosal dissection.

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