

A modified method of endoclip-and-snare to assist in endoscopic submucosal dissection with mucosal traction in the upper GI tract

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There are several methods of assisting gastric endoscopic submucosal dissection (ESD) through mucosal traction, but they have some limitations.¹⁻⁵ The clip-with-line method can achieve only unidirectional traction, and the firmness and strength of traction seem to be limited.¹ Using the external forceps method, it is difficult to deal with lesions at the cardia, lesser curvature, and posterior wall of the upper gastric body.² Methods like the magnetic anchor and robot-assisted methods need special adjuvant devices.^{3,4} The percutaneous-traction method is invasive.⁵ Considering these limitations, our team explored a modified method of assisting gastric ESD with the application of endoscopic snare and endoclips (SC-ESD) (Video 1, available online at www.VideoGIE.org).

DESCRIPTION OF TECHNOLOGY

After the gastric mucosa is circumferentially incised along the premarked dots, a snare is fixed to 1 or more sides of the incised mucosa with endoclips, and the mucosa fixed on the snare is pulled or pushed by pulling or pushing the snare to expose the submucosa for dissection (Figs. 1A-C). Any side of the incised mucosa can be fixed on the snare with endoclips, which contributes to adjusting the traction position in real time. With some lesions for which the submucosa cannot be effectively exposed in this way, a method of internal traction has been devised (Figs. 1D-F). The snare is fixed with endoclips to the target mucosa intended for dissection and also to the gastric wall on the

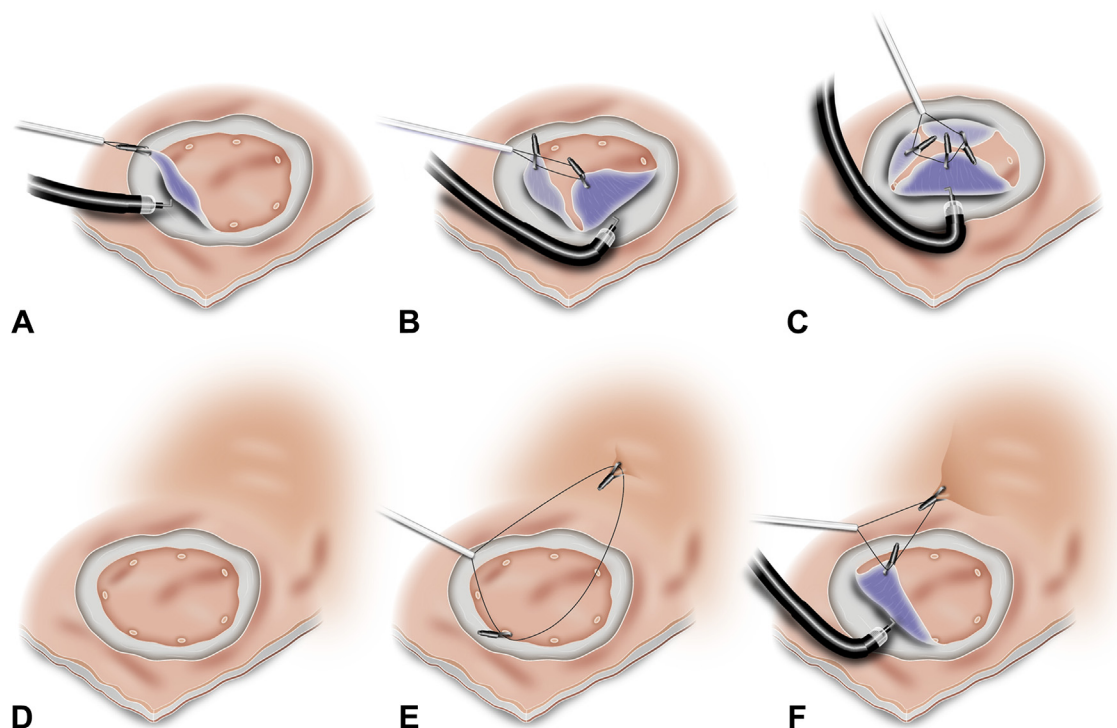


Figure 1. The key procedures. **A, B, C,** The traction method of pulling or pushing the snare. **A,** After a snare is fixed to 1 side of the incised mucosa with endoclips, the incised mucosa is pulled through the snare to expose the submucosa for dissection. **B, C,** The snare is fixed with endoclips to the target mucosa intended for further dissection. **D, E, F,** The method of internal traction. **D,** The mucosa is circumferentially incised. **E,** A snare is fixed to the target mucosa with endoclips and also to the gastric wall on the opposite side with endoclips. **F,** The snare is tightened up to pull the target mucosa.

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

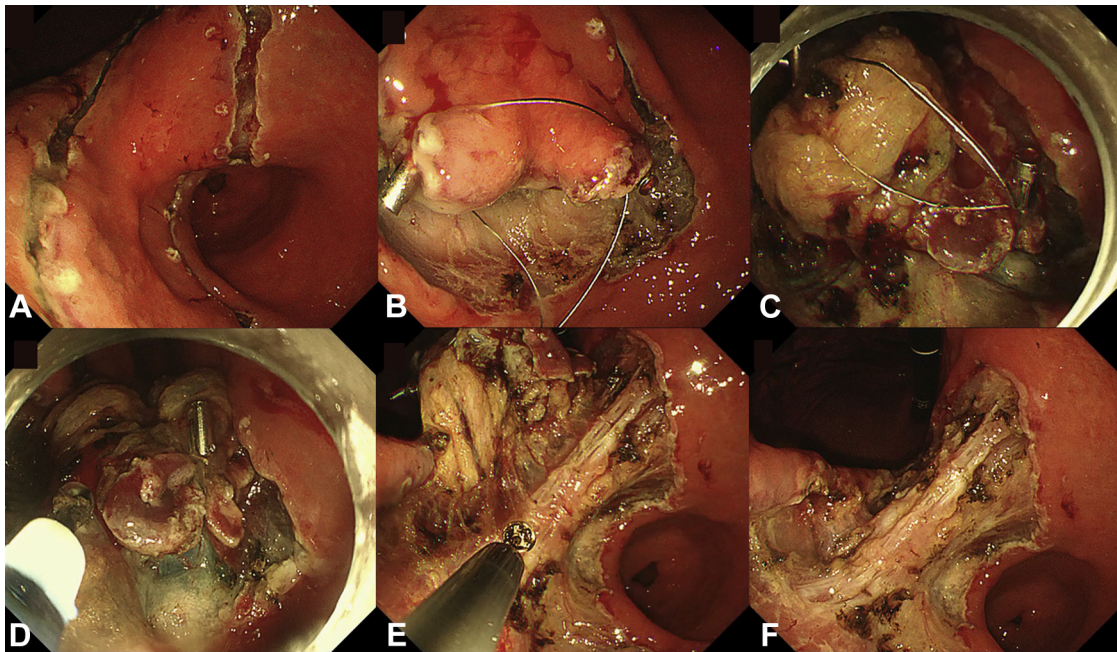


Figure 2. Resection of a mucosal lesion with endoscopic snare and endoclips. **A**, The lesion is circumferentially incised. **B**, The snare is fixed to 2 sides of the incised mucosa with 2 endoclips to assist in dissecting the submucosa there. **C**, During dissection, the snare is fixed to the third side of target mucosa with another endoclip to assist in dissecting the submucosa there. **D**, **E**, The mucosae fixed on the snare are pulled by pulling the snare to dissect the submucosa with a clear field of vision. **F**, The wound.

opposite side (Fig. 1E). Then, the snare is tightened up to draw the endoclips closer, which pulls the target mucosa and exposes the submucosa for dissection (Fig. 1F). Furthermore, efficient delivery of the snare to the target mucosa is accomplished by this method: The snare is strained to hitch one of the arms of the endoclip, and the right position for the endoclip is reached to fix the snare to the target mucosa (Supplementary Fig. 1, available online at www.VideoGIE.org).

A snare with a maximum insertion portion diameter of 1.8 mm (Model No. SD-221L-25, Olympus, Tokyo, Japan) and endoclips (HXROCC-D-26-195-C, Micro-tech, Nanjing City, China) were selected for this study. Endoclips that could be opened and closed repeatedly were recommended because it was easier for operators to clamp the snare to move and fix it to the target mucosa. The snare was inserted into the stomach through the mouth under endoscopic guidance. Intravenous anesthesia was selected for patients undergoing SC-ESD.

CASE SERIES

Case 1

A mucosal lesion, 11 cm × 7 cm, was identified at the gastric angle and the anterior wall of the antrum-to-body junction. The mucosa was circumferentially resected around the lesion (Fig. 2A). The snare was fixed to the incised mucosa at the anterior wall of the antrum-to-body junction with 2 endoclips, where the mucosal traction was selected first (Fig. 2B). For further dissection, the snare was fixed

to the target mucosa at the posterior part of the gastric angle with another endoclip (Fig. 2C) to expose the submucosa there by pulling the snare; thus, good visualization for dissection was achieved (Fig. 2D). The lesion was dissected by SC-ESD, which took 2 hours. The pathologic diagnosis was high-grade intraepithelial neoplasia.

Case 2

A submucosal tumor, 4 cm × 3 cm, was identified at the gastric antrum, involving the anterior wall and the pylorus. The tumor was dissected from the oral side to the anal side. In this case, the internal traction method was applied. A snare was fixed with endoclips to the oral side mucosa of the tumor and to the gastric wall on the opposite side (Supplementary Fig. 2A, available online at www.VideoGIE.org). The mucosa was pulled to effectively expose the submucosa by tightening up the snare (Supplementary Figs. 2B and C, available online at www.VideoGIE.org). The lesion was removed successfully by SC-ESD, which took 1 hour. The pathologic diagnosis was chronic inflammation with hyperplasia of submucosal fibrous granulation tissue.

Case 3

A laterally spreading tumor, 4.5 cm × 3.5 cm, was identified at the duodenal bulb. The mucosa was circumferentially resected along the margin of the lesion. A snare was fixed with endoclips to the incised mucosa close to the pylorus. The mucosa was pulled to effectively expose the submucosa by pulling the snare; then the submucosa was dissected (Supplementary Figs. 3C and D, available online at www.VideoGIE.org). In

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