



The cliff descending method to facilitate parallel view during endoscopic submucosal dissection in the gastric fornix

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INTRODUCTION

Endoscopic submucosal dissection (ESD) has become standard of care for treatment of early gastric cancers worldwide. As procedural expertise grows, the locations and types of lesions that can be endoscopically resected have expanded. The gastric fornix is considered one of the most challenging locations because of the pooling of fluid and blood over the lesion, poor maneuverability of the endoscope, and en face position of the muscle wall during dissection in retroflexion. Dissection in a forward view is often impossible because of the severe angulation at the gastroesophageal junction (GEJ). As the endoscope is advanced from the esophagus, a cliff-like downward angle is encountered on the way to the fundus. We present the novel “cliff descending” method combining multi-bending endoscopes and traction to create a safe and manageable dissection plane for these difficult lesions (Video 1, available online at www.videogie.org).

A patient in their 70s was referred to our department for management of an early gastric cancer detected on screening. The location was in the gastric fornix. Dissection was started in retroflexion. This proved to be challenging, as the muscle was completely perpendicular to the knife. To complete the circumferential incision, a multi-bending endoscope was required, but the procedure remained technically difficult. It was decided to change to an anterior approach, facilitated by a line-and-sheath-type traction device (Figs. 1 and 2). This combination maintained a parallel orientation of the muscle layer throughout dissection, even down the cliff-like angulation at the GEJ (Fig. 3). The total procedure time was 151 minutes, with 68 minutes spent after starting the cliff descending method. A final inspection was performed, and the defect was left open

Abbreviations: ESD, endoscopic submucosal dissection; GEJ, gastroesophageal junction.

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given the limited evidence for closure in the stomach and lack of high-risk features. No antibiotics were required. Final histologic review confirmed a 15-mm early gastric adenocarcinoma (pT1a) with clear vertical and horizontal margins and no lymphovascular invasion (Fig. 4). Given the curative resection, a follow-up endoscopy will be performed in 1 year. The patient was discharged without issue, and no delayed adverse events have arisen.

We present this novel technique as another tool when performing ESD in this difficult location. Usually, the cliff-like angulation from the GEJ into the fundus prevents a forward-viewing approach. By using full down-angulation with a multi-bending scope (Fig. 5), the plane can be kept parallel to the knife in forward view, creating a safe dissection environment. A line-and-sheath-type traction device can provide adequate counter-traction using the “crane” effect, which can further help lift the tissue away from the muscle layer.¹ The traction device has a premade lasso at the end, which can be fastened to an endoscopic clip and secured by tightening the line, which closes the loop. The device is then brought outside the scope and attached to the mucosal flap. By adjusting the direction of traction via manipulation of the plastic sheath and changing the degree of tension by relaxing or tightening the line, the submucosa can be exposed even when traversing a sharp angle and descending the “cliff face.”

Because it is challenging to perform ESD in this location, various strategies have been developed. Multi-bending endoscopes appear to have been helpful in multiple cases,^{2,3} usually used in retroflexion. However, it is acknowledged that not all centers have access to this type of specialty endoscope. Procedures in this location have also been completed with conventional endoscopes with the assistance of an insulated-tip knife (IT-2 knife; Olympus, Tokyo, Japan),^{4,5} a change in the patient position to right lateral decubitus,⁵ and usage of the pocket-creation method.⁶ Some centers have also used loop traction in lieu of line-and-sheath traction, although with this method, the ability to easily adjust the direction of traction is lost.³ Thus, the cliff descending method remains an attractive option to safely complete ESD in a forward view for lesions in the gastric fornix.

DISCLOSURE

Dr Toyonaga receives royalties from TOP and Fujifilm. The other authors did not disclose any financial relationships.

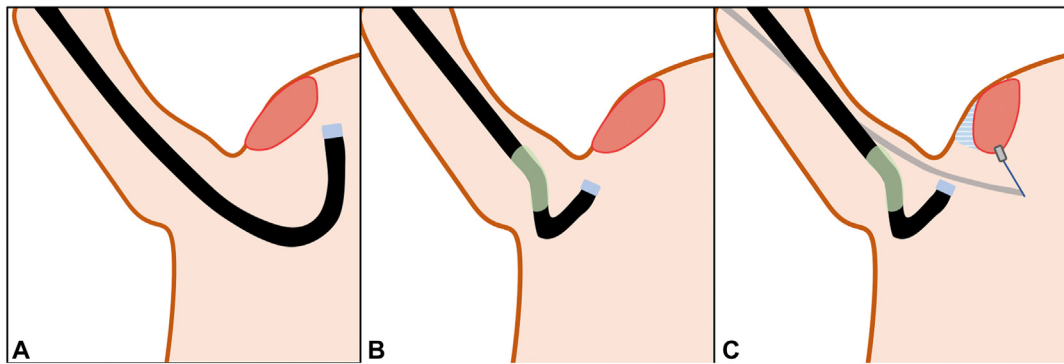


Figure 1. **A**, Illustration of conventional approach using a regular endoscope in retroflexion. The muscle layer remains en face during dissection. **B**, Multi-bending endoscope, with multi-bend portion highlighted in green. Full tip-down angulation is used to remain parallel to the muscle. **C**, Application of a line-and-sheath traction device more easily exposes the submucosal plane.

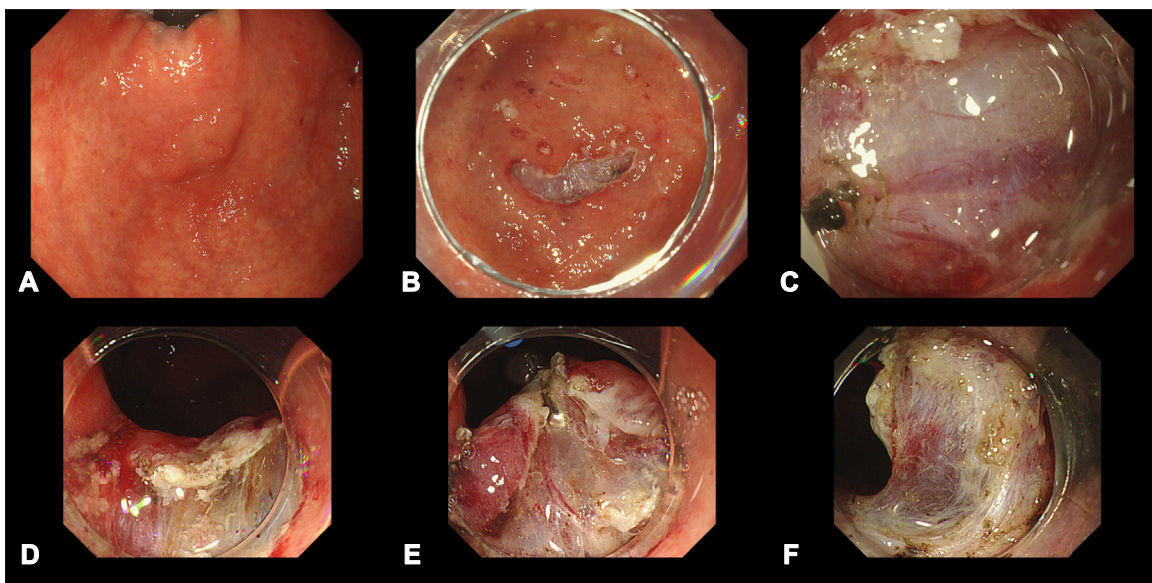


Figure 2. **A**, Lesion located in the gastric fornix. **B and C**, Retroflexed views rendered the muscle layer en face during resection. **D**, Switching to the multi-bending scope allowed for a parallel plane of dissection. **E and F**, The application of line-and-sheath traction further improved the views.

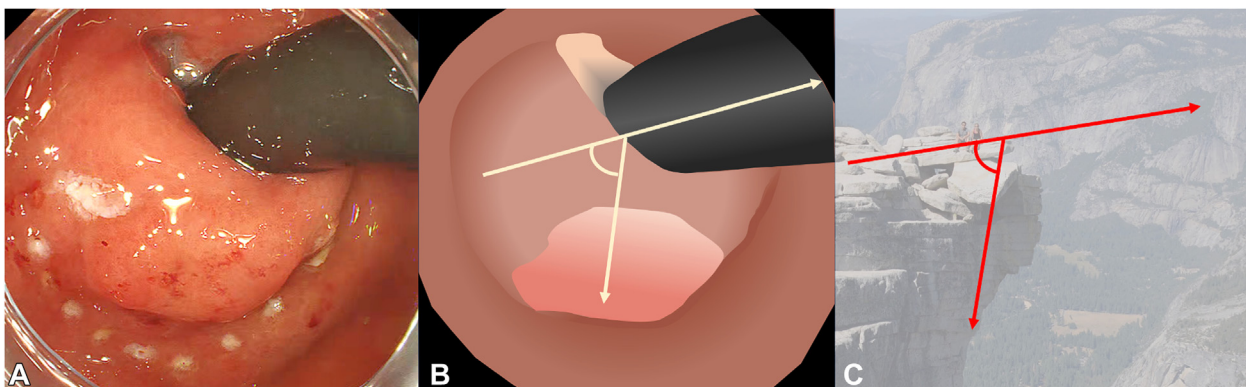


Figure 3. **A**, Lesion viewed in retroflexion. **B**, Illustration of the severe angle at the gastroesophageal junction, which required maintaining a parallel dissection plane in forward view. **C**, Comparison of the angle to an image of the authors sitting on a cliff face.

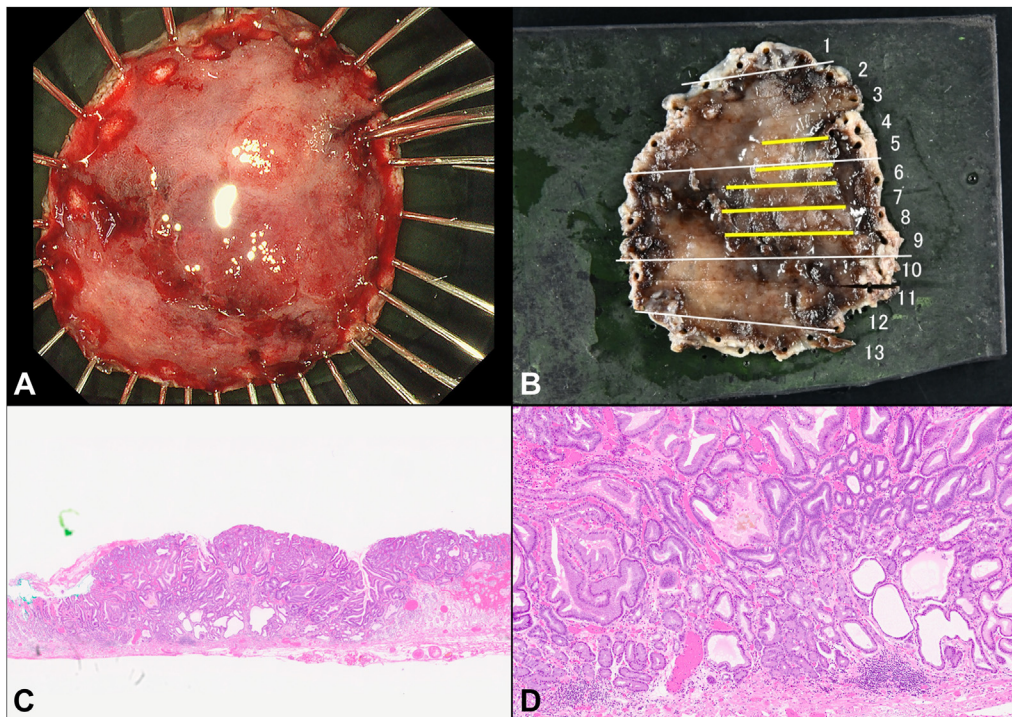


Figure 4. **A**, Specimen after resection. **B**, Neoplastic areas of the specimen. **C** (H&E, orig. mag. $\times 0.4$) and **D** (H&E, orig. mag. $\times 5$), Histopathology showing adenocarcinoma without muscular invasion.

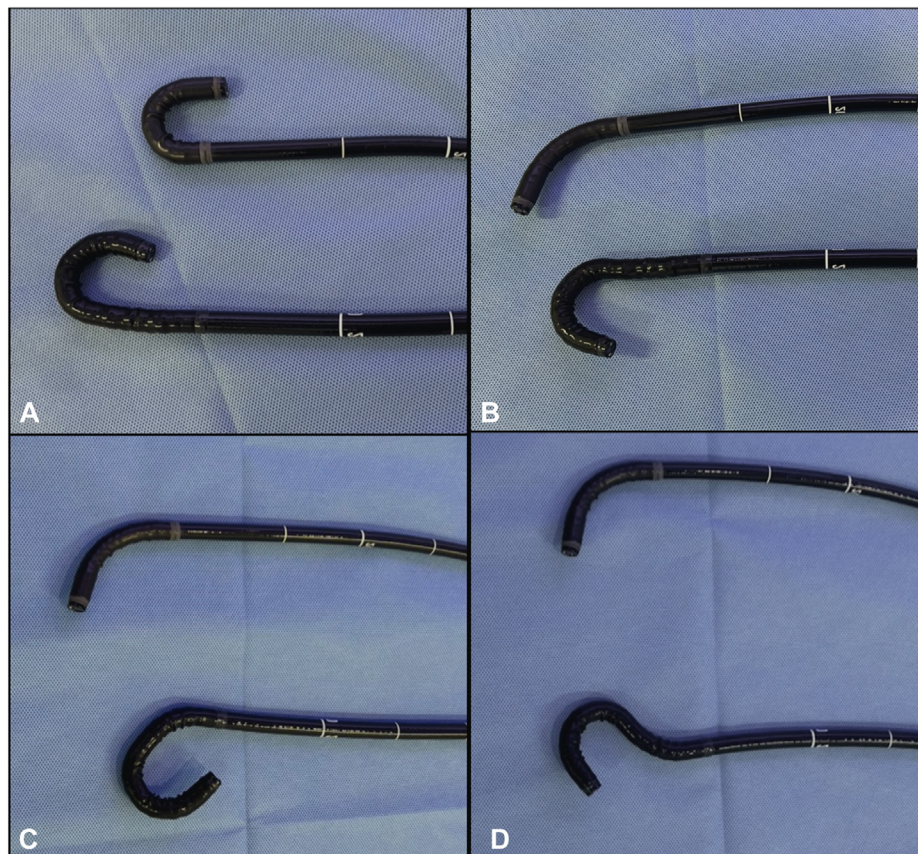


Figure 5. **A**, Full upward angulation of the multi-bending scope (*bottom*) and conventional gastroscop (*top*). **B**, Full downward angulation of multi-bending scope (*bottom*) and conventional gastroscop (*top*). **C and D**, Full downward angulation, plus usage of the extra bending segment in the multi-bending scope (*bottom*).

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