Optimization of traction-device length and traction force during gastric endoscopic submucosal dissection

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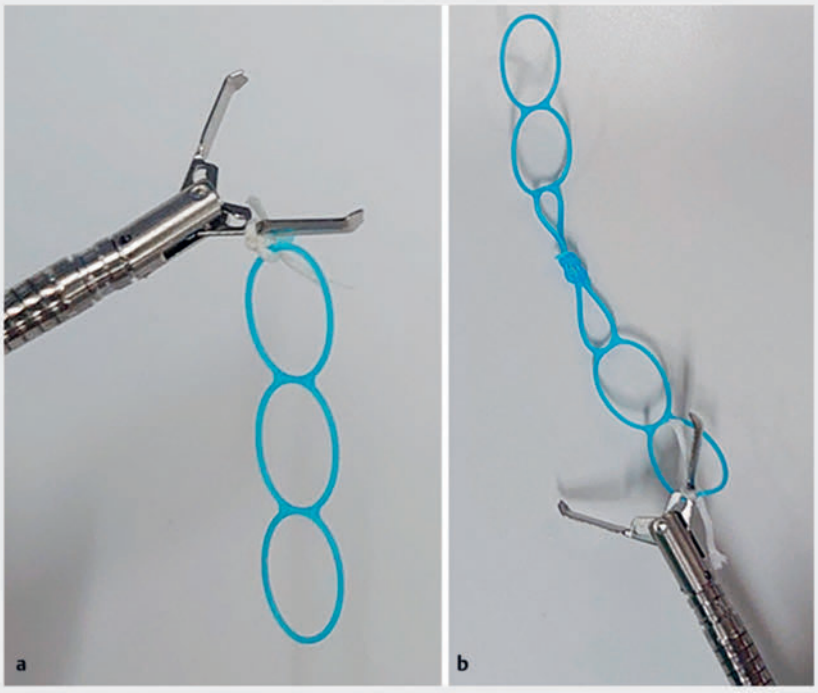
Various traction methods, including intraluminal traction for endoscopic submucosal dissection (ESD), have proven useful [1,2]. Due to the stomach's complex shape, devices providing only longitudinal traction externally are less effective [3]. The multi-loop traction device (MLTD; Boston Scientific, Marlborough, Massachusetts, United States), which enables traction-assisted ESD by anchoring the loop to the lumen of the other side with an endoscopic clip, allows for easy adjustment of traction direction and removal, demonstrating its effectiveness [4]. However, in the wide lumen of the stomach, a single short MLTD would result in excessive traction force and muscle-layer traction. Therefore, we report a safer gastric ESD technique using two connected MLTDs to optimize traction force and prevent excessive muscle-layer traction.

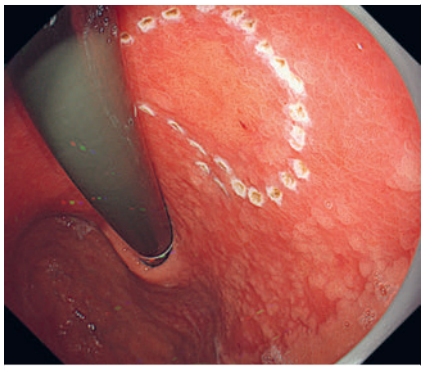
In Case 1, a single MLTD (triple loop) (▶ **Fig. 1a**) was used. The lesion (19×16 mm, 0–IIc) was in the lesser curvature of the middle stomach (▶ **Fig. 2**). ESD was performed using a DualKnife J (KD-655L; Olympus, Tokyo, Japan; ▶ **Video 1**), and an MLTD was applied after a circumferential incision. Although traction improved submucosal visibility, the muscle layer was also tractioned, making the procedure difficult (▶ **Fig. 3**).

In Case 2, two MLTDs connected by a cow-hitch knot were used (six loops) (▶ **Fig. 1b**). The lesion (10×6 mm, 0–IIa) was on the posterior wall of the midbody (▶ **Fig. 4**). After making a full circumferential incision, traction with two MLTDs provided clear submucosal visibility without excessive muscle-layer traction (▶ **Fig. 5**). ESD was safely completed using devices of appropriate length for the wide lumen. Distant anchoring can pull the muscle layer even with two MLTDs; therefore, the best site is slightly mouthward on the contralateral side.

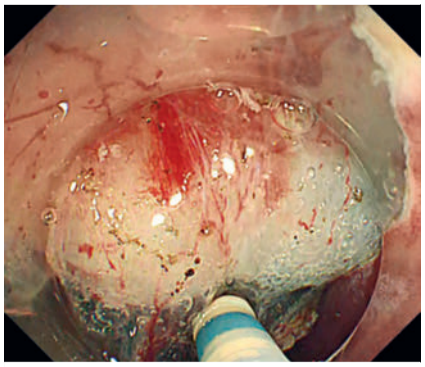


▶ **Fig. 1** Multi-loop traction device. **a** Single multi-loop traction device (triple loops). **b** Two multi-loop traction devices connected by a cow-hitch knot (six loops).

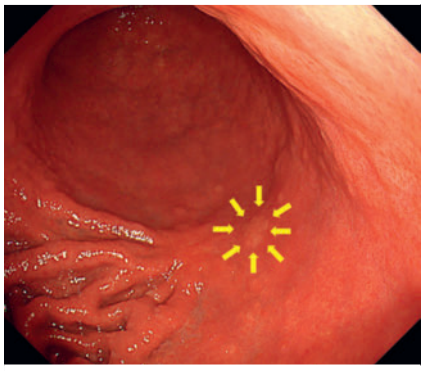
VIDEO



▶ **Fig. 2** Case 1. A 19×16-mm 0–IIc lesion in the lesser curvature in the middle body of the stomach.

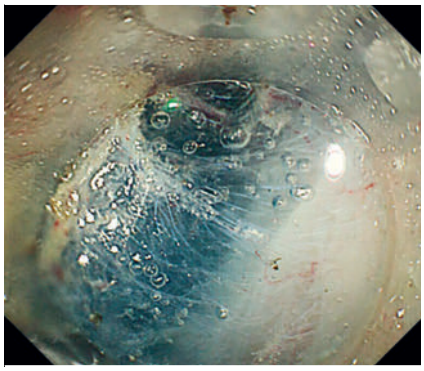


▶ **Fig. 3** Traction with a single multi-loop traction device (triple loop). Although traction improved the visibility of the submucosa, the muscle layer was also tractioned, which made the procedure difficult.



▶ **Fig. 4** Case 2. A 10×6-mm 0–IIa lesion on the posterior wall of the midbody of the stomach (yellow arrows).

For traction-assisted ESD of the stomach, which has an extensive and complex geometry, our findings suggest that setting the appropriate traction-device length and traction force is necessary for improving safety.



▶ **Fig. 5** Traction with two connected multi-loop traction devices (six loops). The traction allowed for better visibility of the submucosal layer and for endoscopic submucosal dissection to be performed with a safe field of view without traction of the muscle layer.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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