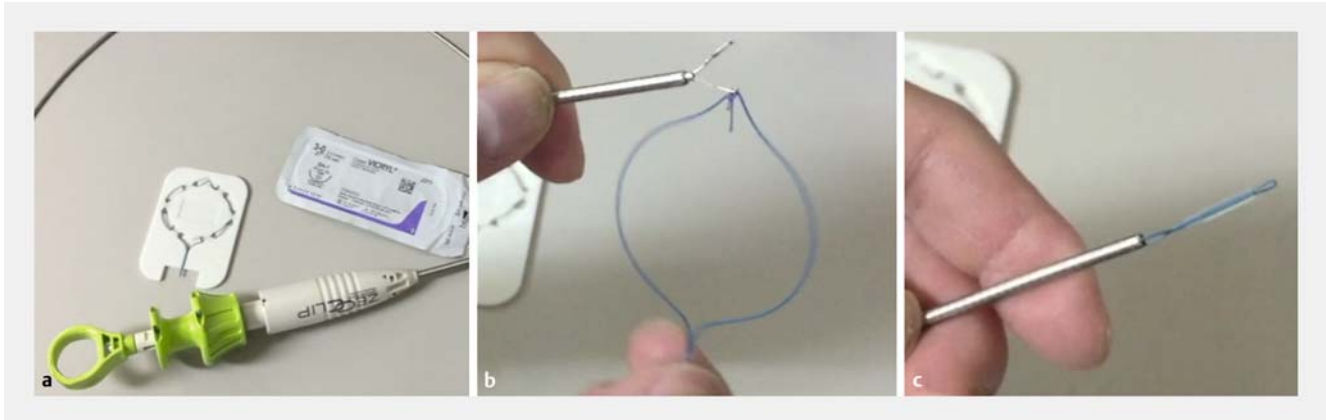


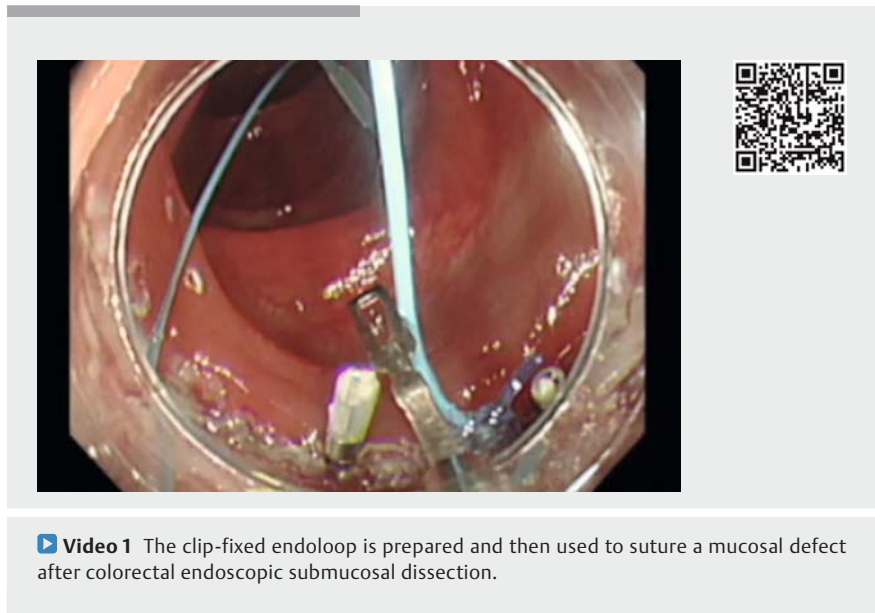
## Clip-fixed endoloop: an efficacious new method for mucosal defect closure



► **Fig. 1** Photographs of the clip-fixed endoloop. **a** The device consists of a clip, clip applicator, endoloop, and surgical thread. **b** The tip of the endoloop is fixed to the clip's teeth with surgical thread. **c** The clip-fixed endoloop is housed in the outer sheath of the clip by moving the outer slider distally.

Endoloop suturing of a mucosal defect using a two-channel scope has been shown to be efficacious [1,2]. Recently, methods of simple, useful endoloop suturing with a single-channel scope have also been reported [3,4]. However, fixing the first clip to determine the position of the endoloop is cumbersome. We have developed a new and efficient suturing method, the clip-fixed endoloop, that fixes the endoloop to the clip in advance.

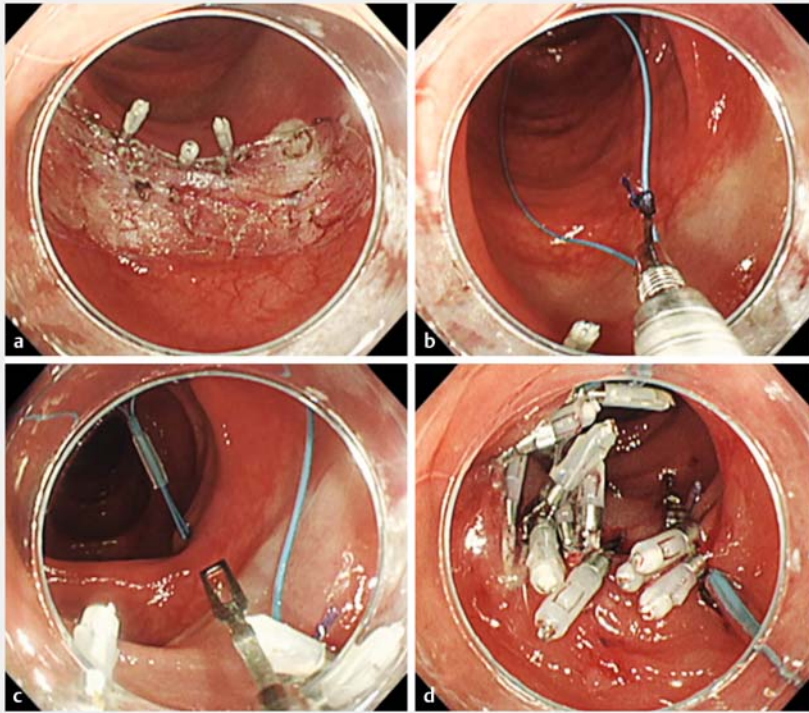
The clip-fixed endoloop consists of the clip (ZEOCLIP ZP-CH; Zeon Medical Inc.), a clip applicator (ZP-S-195S; Zeon Medical Inc.), an endoloop (MAJ254; Olympus), and a surgical thread (► **Fig. 1 a**). ► **Video 1** shows how to perform mucosal closure using the clip-fixed endoloop. First, the tip of endoloop is fixed to the clip's teeth with surgical thread (► **Fig. 1 b**). The clip-fixed endoloop is housed in the outer sheath of the clip by moving the outer slider distally until the clip-fixed endoloop is completely hidden in the outer sheath (► **Fig. 1 c**). It is opened by slowly moving the outer sheath until it is endoscopically confirmed that the endoloop is properly open.



► **Video 1** The clip-fixed endoloop is prepared and then used to suture a mucosal defect after colorectal endoscopic submucosal dissection.

► **Video 1** shows how the mucosal defect is sutured after colorectal endoscopic submucosal dissection (ESD) using the clip-fixed endoloop. The patient had a 40-mm sessile serrated adenoma in the descending colon. ESD was performed; the area of the mucosal defect after ESD was slightly larger than 40 mm (► **Fig. 2 a**). The clip-fixed endoloop was inserted through the working

channel of the endoscope and was confirmed to be opening properly (► **Fig. 2 b**). It was then fixed onto the normal mucosa near the mucosal defect (► **Fig. 2 c**). Four metal clips were used to anchor the endoloop around the edge of the mucosal defect. The endoloop tail was then grasped by a hook device (HX-20Q-1; Olympus) and the endoloop was tightened to close the



► **Fig. 2** Endoscopic images showing: **a** a mucosal defect with an area >40 mm post-endoscopic submucosal dissection; **b** the clip-fixed endoloop, which has been inserted into the working channel of the endoscope, and is confirmed to be opening properly; **c** the clip-fixed endoloop having been fixed to the normal mucosa near the mucosal defect; **d** complete closure of the mucosal defect following application of the clip-fixed endoloop and a number of additional clips.

defect. Additional clips were added to the remaining mucosal defect to ensure it was completely sutured (► **Fig. 2 d**). By fixing the endoloop to the clip in advance and housing it in the outer sheath, we have made simple and efficient suturing of a mucosal defect possible.

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### Competing interests

None

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