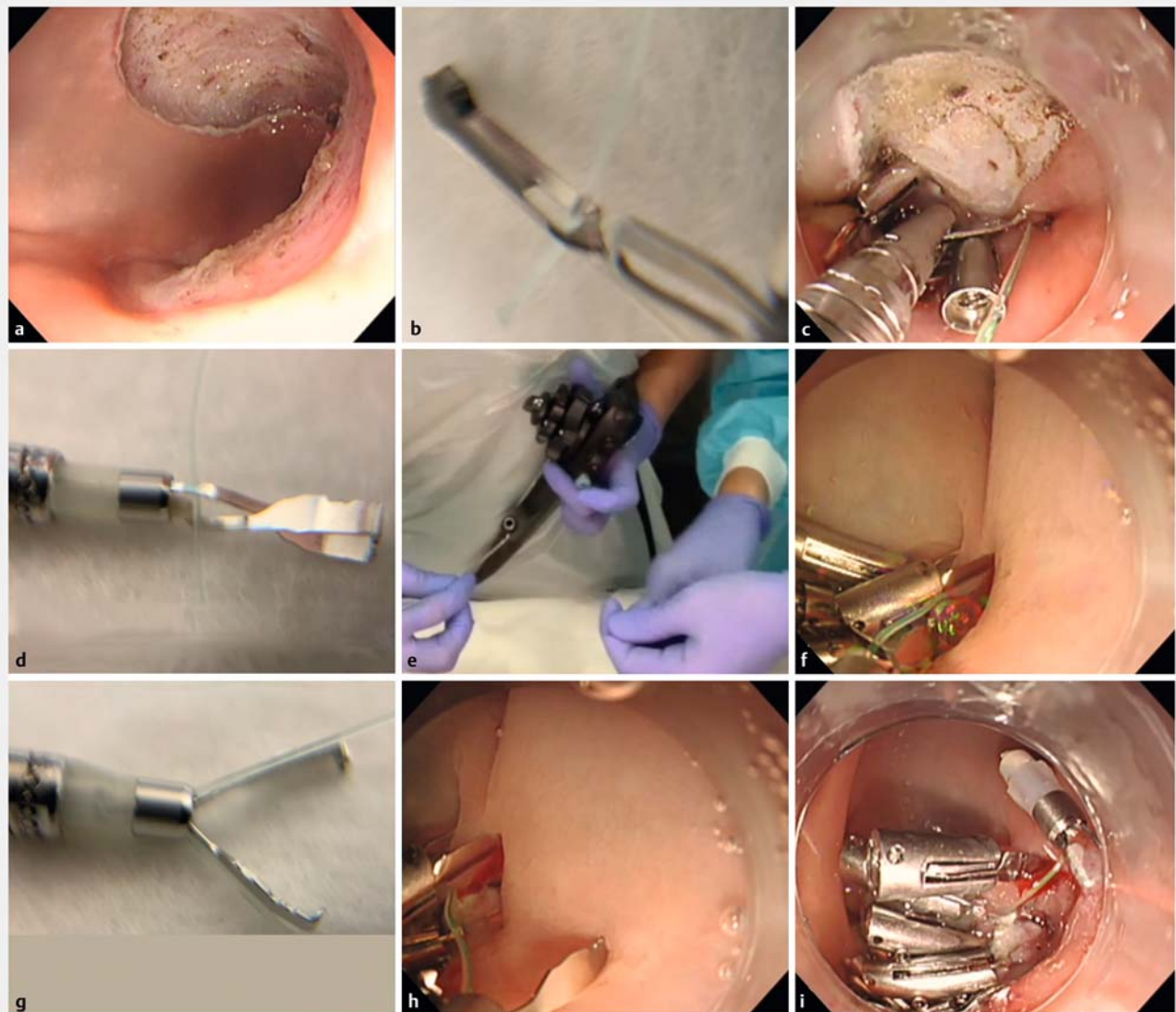


Large colorectal mucosal defect closure post-endoscopic submucosal dissection using the reopenable clip over line method and modified locking-clip technique

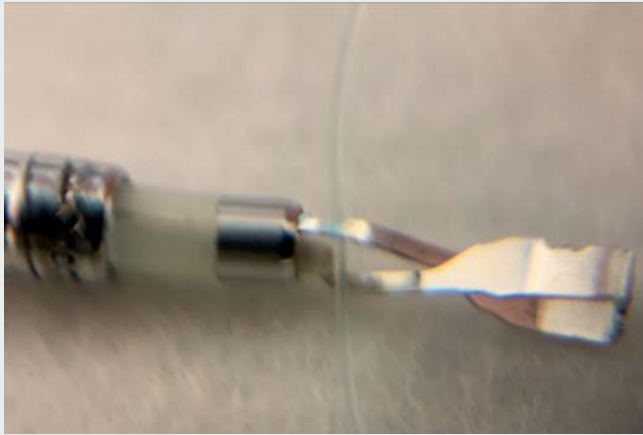
Mucosal defects during extensive colorectal endoscopic submucosal dissection (ESD) cause post-ESD bleeding [1], and a method to close these defects has not yet been established. In recent years, the

usefulness of a method for closing mucosal defects after colorectal ESD using a line and clips has been reported [2]. Therefore, we invented a new clip-line closure method called the “reopenable

clip over line method” (ROLM), which uses a line (0.23-mm nylon line) and reopenable clips (SureClip; 8 or 16 mm; MC Medical, Tokyo, Japan) to close large colorectal mucosal defects. We also pro-



▶ Fig. 1 Example use of novel method for closure of large defects after endoscopic submucosal dissection (ESD) showing: **a** a 70-mm mucosal defect with a circumference approximately three-quarters that of the intestinal tract; **b** the reopenable clip over line method (ROLM), which involves the line coming out of the endoscope accessory channel being threaded through one hole of a 16-mm reopenable-clip; **c** the mucosal defect gradually becoming smaller with repeated use of the ROLM; **d–f** the external end of the line being passed through the slightly opened clip, before its insertion through the accessory channel, meaning that, when the clip is in position, the line has already passed through the gap between the teeth at the base of the clip; **g, h** the modified locking-clip technique (M-LCT) being performed; **i** the final appearance after pulling the external line coming out of the endoscope accessory channel to cut the line at the base of the clip and leave a completely closed mucosal defect.



▶ **Video 1** Large mucosal defect closure in the sigmoid colon using the reopenable clip over line method and the modified locking-clip technique.

posed a method of fixing the line to the first and second clips after the mucosal defect had been closed with thread-assisted mucosal defect closure using the locking-clip technique (LCT) [3]. However, LCT is difficult technically because it requires fixation by threading a line through the gap between the teeth at the base of the clip (EZ clip, HX-610-90S; Olympus) in the intestinal tract [4]. Therefore, we proposed a modified LCT (M-LCT) that involves performing the LCT by inserting the line through the gap between the teeth at the base of the clip before it is passed through the accessory channel of the endoscope.

▶ **Video 1** shows the closure of a large mucosal defect in the sigmoid colon using the ROLM and M-LCT (▶ **Fig. 1**; ▶ **Video 1**). The patient had a 65-mm tumor in the sigmoid colon and was left with a post-ESD mucosal defect of 70 mm. We used the ROLM to close the mucosal defect, fixed the line to the clip with the M-LCT, and cut the line at the base of the clip. The procedure was successful and the patient was discharged without any adverse events. Use of the ROLM and the M-LCT is a novel method for reliably closing large colorectal mucosal defects.

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Competing interests

The authors declare that they have no conflict of interest.

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