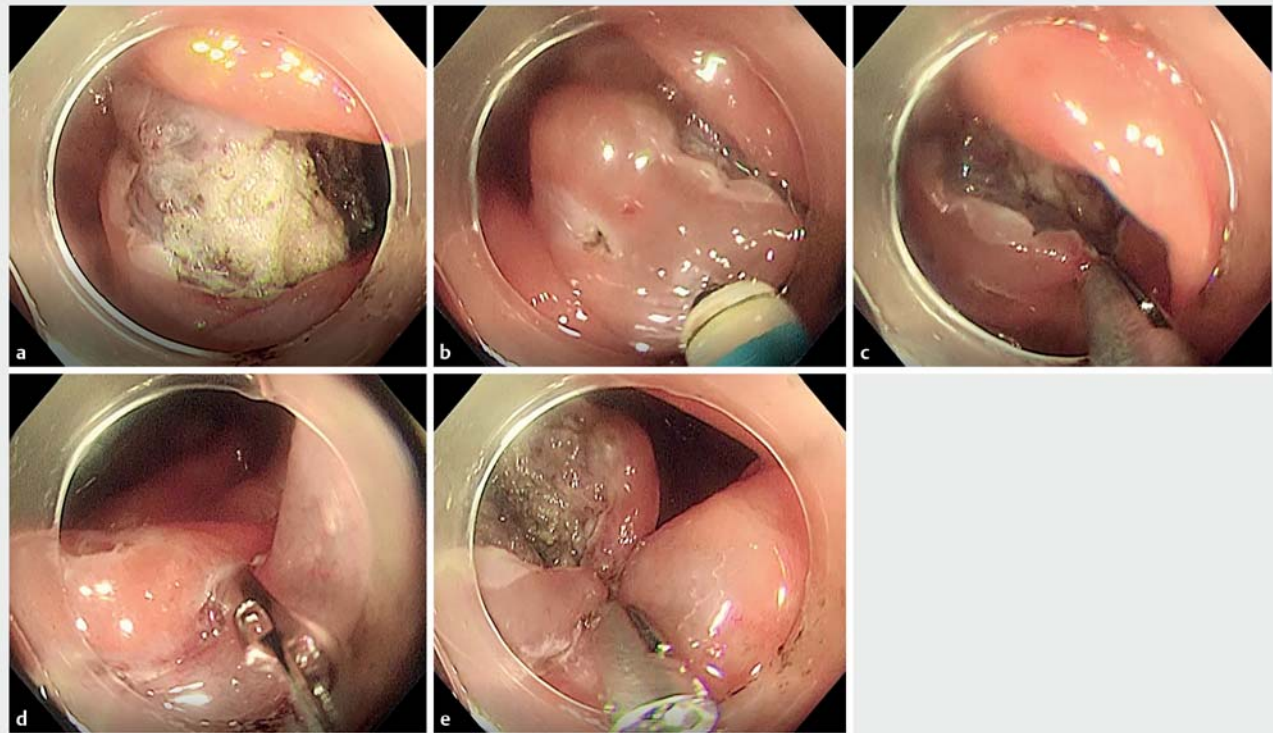


A novel clip closure method using precutting and a reopenable clip after colorectal endoscopic submucosal dissection



► Fig. 1 Representative case in which clip closure after colorectal endoscopic submucosal resection (ESD) was carried out using precutting and a reopenable clip. **a** A 70-mm laterally spreading tumor in the ascending colon was removed by ESD, resulting in a large mucosal defect. **b** Additional incisions were made with a DualKnife J on the oral and anal sides of the mucosal defect. **c** A reopenable clip was used to grasp the anal incision and margin of the mucosal defect. **d** While holding its grasp, the clip was moved to the opposite side of the mucosal defect and reopened to grasp the incision on the oral side. **e** Closure was successful. After that, the same procedure was repeated as needed to complete the closure.

Clip closure of mucosal defects after endoscopic resection has been shown to reduce delayed adverse events [1,2]; however, closing large defects using a conventional clip can be difficult [1]. Thus, alternative clip closure techniques have been developed, but they still need improvement in terms of simplicity and solderability [3,4]. We therefore modified an existing precutting technique [4] using a reopenable clip to close large mucosal defects.

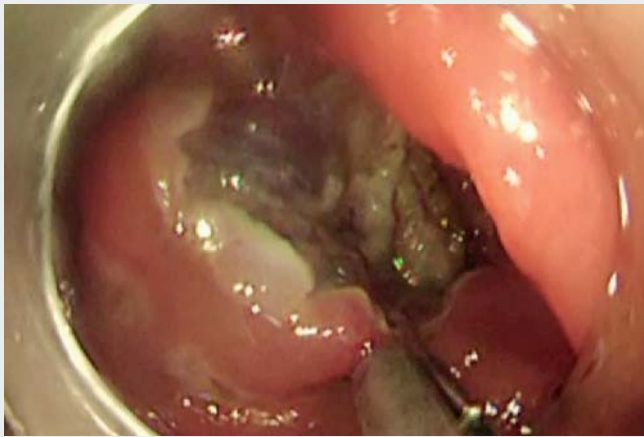
After resection of the lesion, multiple small incisions were performed circumferentially just outside the defect using a DualKnife J (Olympus, Tokyo). A reopen-

able clip (SureClip, Microtech, Nanjing) was opened, and one side of the claw was inserted into the incision on the anal side, while the other side of the claw was placed just inside the margin of the defect, and the claws were closed while catching the normal mucosa. Bringing the caught mucosa closer to the oral side of the defect, the clip was reopened to insert the opposite side of the claw into the oral-side incision. Finally, the claws were completely closed, and the normal mucosae of both sides were drawn together. The combination of mucosal incision and mucosal catching using a reopenable clip was easily achieved without clip slipping.

After repeating the same procedures to minimize the defects, regular clips were added to close the defect completely.

This method was applied in three patients with defect sizes between 33 and 71 mm located in the ascending colon, transverse colon, and rectum. The median (range) procedure time was 20 (10–26) minutes. Complete closure was easily achieved in all cases, and there were no adverse events during the perioperative period. A representative case is shown in ► **Fig. 1** and ► **Video 1**.

In conclusion, using a reopenable clip with multiple pre-cut small circumferential mucosal incisions is an excellent



Video 1 A novel clip closure method using mucosal precutting and reopenable clips to close large mucosal defects after endoscopic submucosal dissection for colonic lesions. Complete closure was easily achieved using this novel method.

method to facilitate the complete closure of large mucosal defects.

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Competing interests

The authors declare that they have no conflict of interest.

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