



Adaption of novel clip-closure technique for large mucosal defects after EMR of a colon laterally spreading tumor using standard hemostatic clips

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INTRODUCTION

Endoscopic resection of large colonic polyps can be challenging because the formation of mucosal defects requires hemostatic control. Prophylactic clip closure and suturing devices have been used to prevent delayed postpolypectomy bleeding.^{1,2} Endoscopists have used rubber bands³ and clip-on-clip closure,⁴ and some groups are developing their own tools and prototypes⁵ to achieve defect closure. Recently, a new endoscopic clip (MANTIS; Boston Scientific, Boston, Mass, USA) was specifically developed for large defects. It uses the Anchor, Mobilize, and Close approach rather than the “zipper” technique that is typically performed with standard clips. With larger defects, there is a concern that the margin grasped with an endoscopic clip can slip during approximation and closure of the tissue. This new device is designed with features to accomplish this new approach with ease thanks to its sharper teeth and more rigid jaw that can withstand the higher bending stress. In this video, we demonstrate closure of a large colonic defect after EMR (Video 1, available online at www.videogie.org) with 360-degree-rotating clips (Resolution 360 ULTRA Clip; Boston Scientific).

CASE

A 66-year-old man was referred for polypectomy. He had previously undergone a screening colonoscopy in which a 50-mm granular laterally spreading tumor (LST-G), nodular mixed type, in the ascending colon was identified. The polyp was partially lifted with saline injection at the time, and biopsy identified tubu-

lovillous adenoma. However, the polyp could not be resected by standard means, and he was referred for EMR.

Using a colonoscope, we identified a 50-mm LST-G in the ascending colon and lifted with 42 mL of submucosal injectable composition (Eleview; Medtronic, Minneapolis, Minn, USA) (Figs. 1 and 2). Piecemeal mucosal resection using hot and cold snares was performed. A 50- × 40-mm area was completely resected by piecemeal EMR. Once the LST-G was fully resected, a large mucosal defect was visualized in the ascending colon (Fig. 3). There were no signs of perforation. There was a small ooze that remained at the end of the procedure that eventually stopped. To prevent further bleeding, the mucosal defect was repaired using the Anchor, Mobilize, and Close approach with standard hemostatic clips. With a 360-degree-rotating clip, anchoring on the distal margin of the defect is necessary because these clips are not as sharp as prolonged clips. Without using prolonged clips, we used the device in Otake et al⁶. The clip is used to maneuver tissue

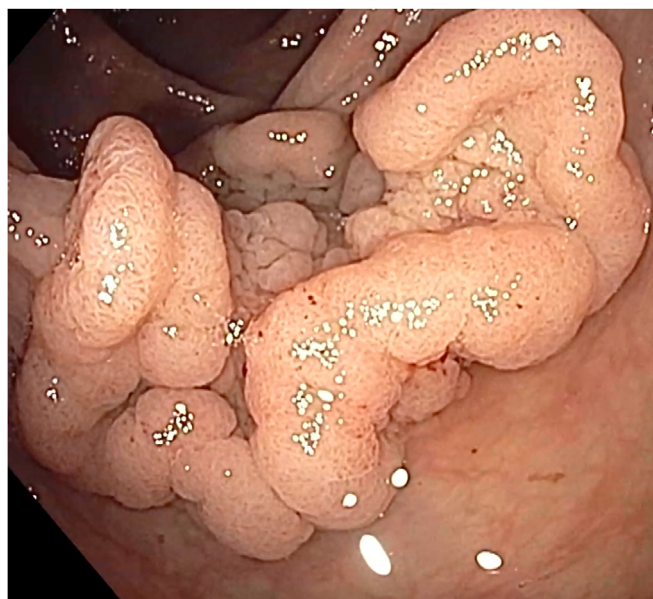


Figure 1. Identifying a 50-mm polyp in the ascending colon.

Abbreviation: LST-G, granular laterally spreading tumor.

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<https://doi.org/10.1016/j.vgie.2023.09.009>

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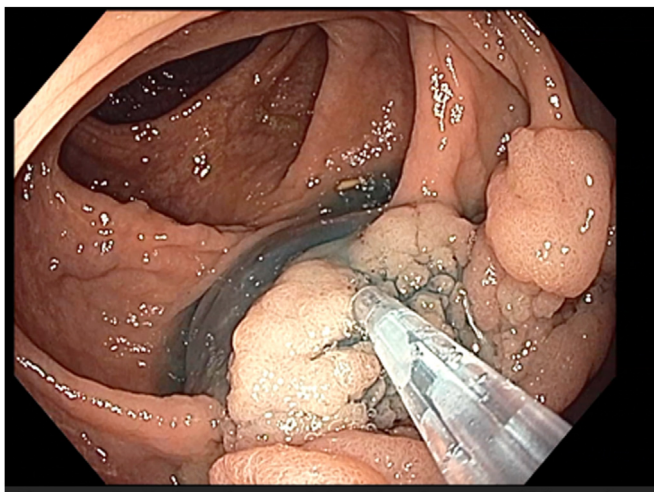


Figure 2. Injection with Eleview (Medtronic, Minneapolis, Minn, USA) to lift polyp.

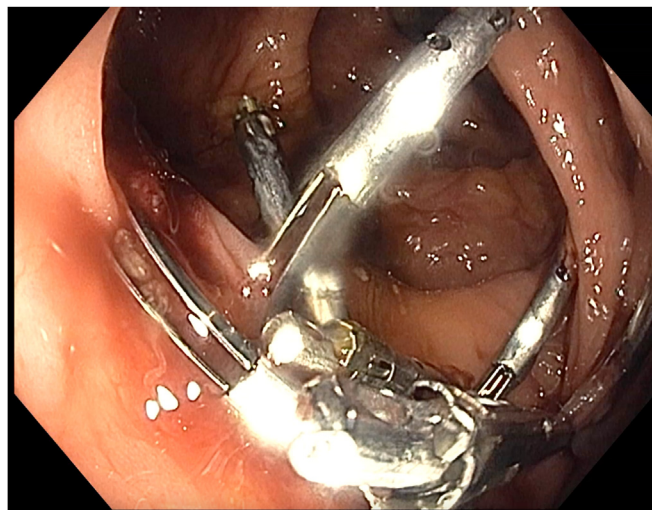


Figure 4. Seven hemostatic clips (Resolution 360 ULTRA Clip; Boston Scientific, Boston, Mass, USA) deployed for defect closure.

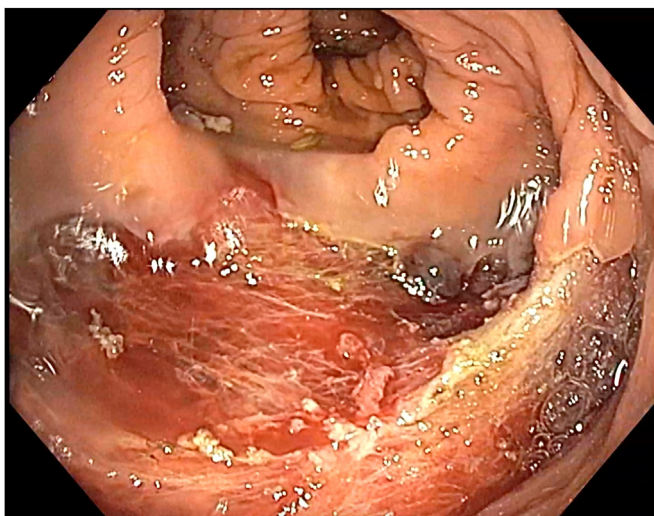


Figure 3. A 40- × 50-mm mucosal defect after EMR.

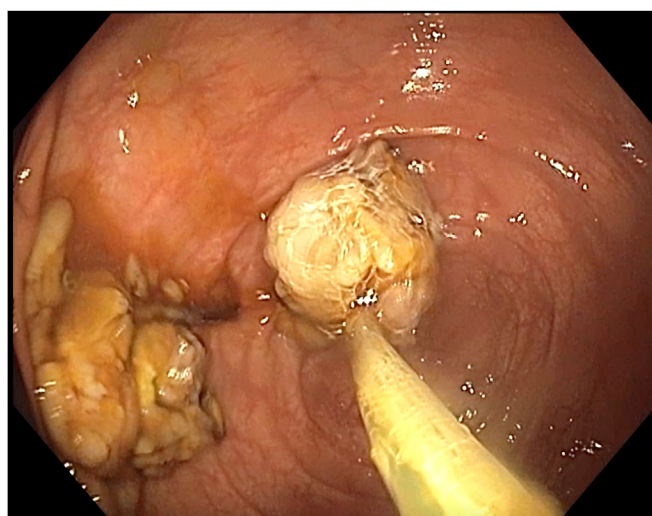


Figure 5. Polyp partially retrieved by Roth net (RescueNet Retrieval Net; Boston Scientific, Boston, Mass, USA) and suction.

to the proximal margin. The clip is then closed once the proximal margin is grasped. When the proximal margin is used as an anchor, the tissue slips. Seven 360-degree-rotating clips were deployed in total to close the defect (Fig. 4). Of note, one clip was unable to sustain the lateral force of defect closure and subsequently bent outward. This demonstrates that standard clips lack the binding strength necessary to hold together margins of large defects, which may be better accomplished with a prolonged clip. Approximating distal and proximal defect folds successfully stopped postprocedural bleeding, even if defect margins themselves were not approximated. Once defect closure was completed, the LST-G was removed using Roth net tissue retrieval and suction (RescueNet Retrieval Net; Boston Scientific) (Fig. 5). Pa-

thology confirmed the specimen to be a tubulovillous adenoma (Fig. 6). The patient tolerated the procedure well and was discharged home without adverse event. In the days following the procedure, the patient did not experience any postprocedural bleeding because the defect closure was successful.

CONCLUSION

Postpolypectomy hemorrhage following resection of larger polyps and LSTs is a major concern for endoscopists. Prolonged clips demonstrates a new technique to close mucosal lesions and prevent further bleeding following EMR. Though

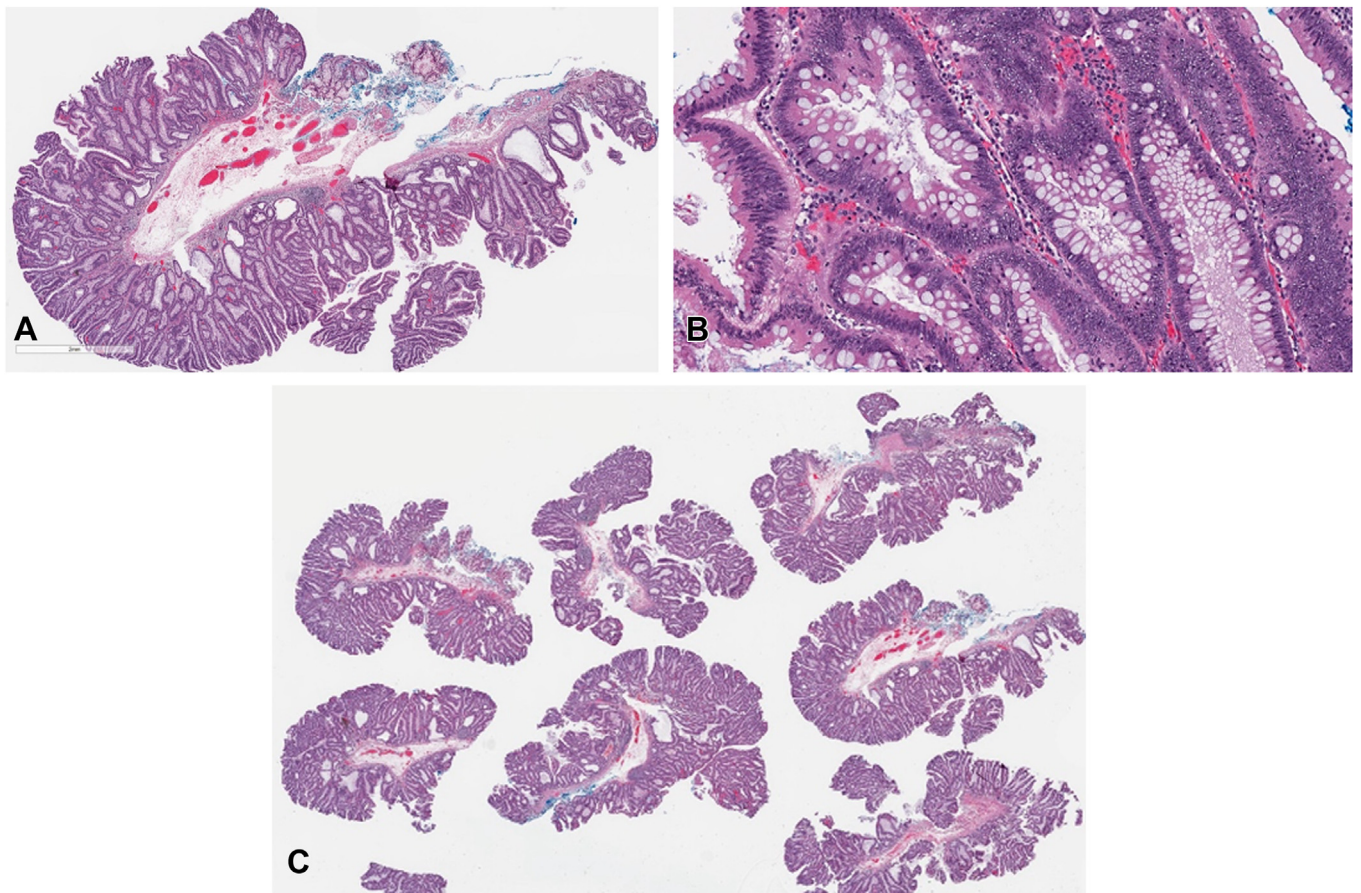


Figure 6. Microscopic pathology slides of tubulovillous adenoma stained with hematoxylin and eosin. **A**, Tubular and villous architecture of the polypoid fragments (orig. mag $\times 20$). **B**, High power showing cytologic atypia of low-grade dysplasia (orig. mag. $\times 100$). **C**, Extension of tubulovillous structures to the cauterized edges (orig. mag $\times 10$).

the approach was created for the specialized prolonged clips, this case demonstrates that the technique can be performed with standard hemostatic clips available to most endoscopists. However, most clips lack the sharp teeth and stronger jaw of prolonged clips, so the closure technique should be modified. In addition, 360-degree-resolution clips offer some advantage themselves because they have a wider opening angle with longer jaw length. However, the basic mechanism of the closure likely can be accomplished by other conventional clips.

DISCLOSURE

Dr Kim is a consultant for Medtronic, Cook Medical, and Apollo Endosurgery. The other authors did not disclose any financial relationships.

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