



Successful hemostasis for refractory colonic diverticulum bleeding by clipping with polyglycolic acid sheets

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There are various methods of achieving endoscopic hemostasis for diverticular hemorrhage, such as endoscopic clipping¹⁻³ and band ligation.³⁻⁶ Endoscopic clipping is the most commonly used method. However, direct placement of the hemoclips on the bleeding site is often challenging, and inadequate clipping may lead to early recurrent bleeding. Generally, it is easy to directly place the hemoclips on the exposed vessel when it is visible at the neck of the diverticulum (Fig. 1A). However, it is difficult to directly place the hemoclips on the exposed vessel when it is located at the dome and the diverticular orifice is small (Fig. 1B).⁶ When direct placement of hemoclips is difficult, indirect placement in a zipper fashion is sometimes performed. However, this may not sufficiently occlude the exposed vessel and may contribute to early recurrent bleeding.^{3,6}

The use of a polyglycolic acid (PGA) sheet (Neoveil; Gunze Medical Division, Kyoto, Japan), a biodegradable suture material, with fibrin glue (Beriplast P combi-Set; CSL Behring Pharma, Tokyo, Japan) has been demonstrated as a method for closing fistulas or wounds in the surgical

field.^{7,8} Their use for treating endoscopic mucosal defects after endoscopic submucosal dissection has recently been increasing.⁹⁻¹¹ However, reports regarding their usefulness for diverticular hemorrhage are lacking. To overcome the shortcomings of the conventional clipping method, we developed a modified clipping method using PGA sheets, in which we placed the hemoclips in a zipper fashion after filling the exposed vessel with PGA sheets (Fig. 2). Here, we report a case of refractory colonic diverticular bleeding managed with a modified clipping method using PGA sheets.

A 70-year-old man with a history of cardiac infarction and regular aspirin consumption presented with massive hematochezia (Video 1, available online at www.giejournal.org). Colonoscopy revealed active bleeding from the diverticulum in the ascending colon (Fig. 3A). Because the bleeding site in the diverticulum was not identified, hemoclips (HX-610-090; Olympus Medical Systems, Tokyo, Japan) were indirectly placed to close the diverticular orifice in a zipper-like fashion, and immediate hemostasis was achieved. Repeated indirect hemoclip placement was

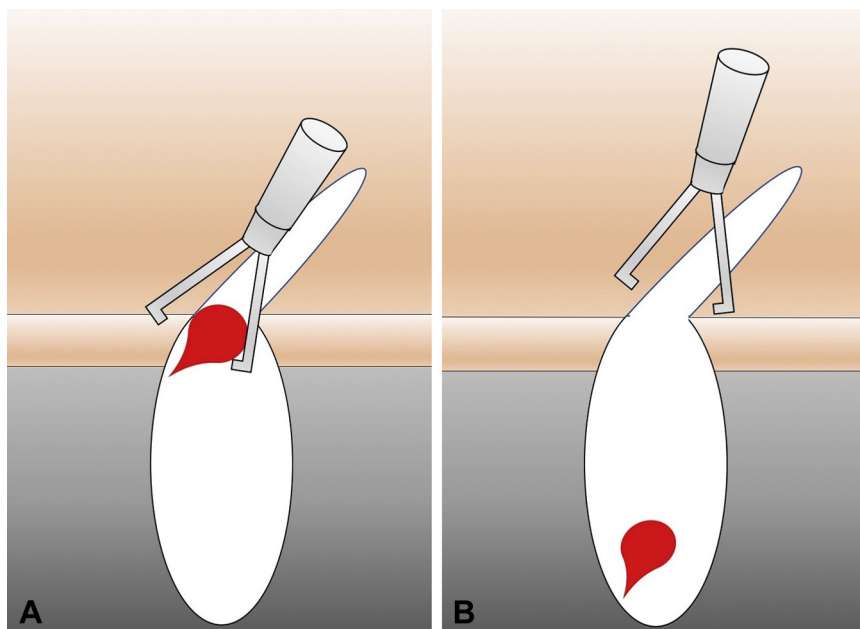


Figure 1. Endoscopic clipping for the treatment of colonic diverticular bleeding. **A**, Direct placement of hemoclip for bleeding at the neck of the diverticulum. **B**, Indirect placement of hemoclip for bleeding in the dome of the diverticulum.

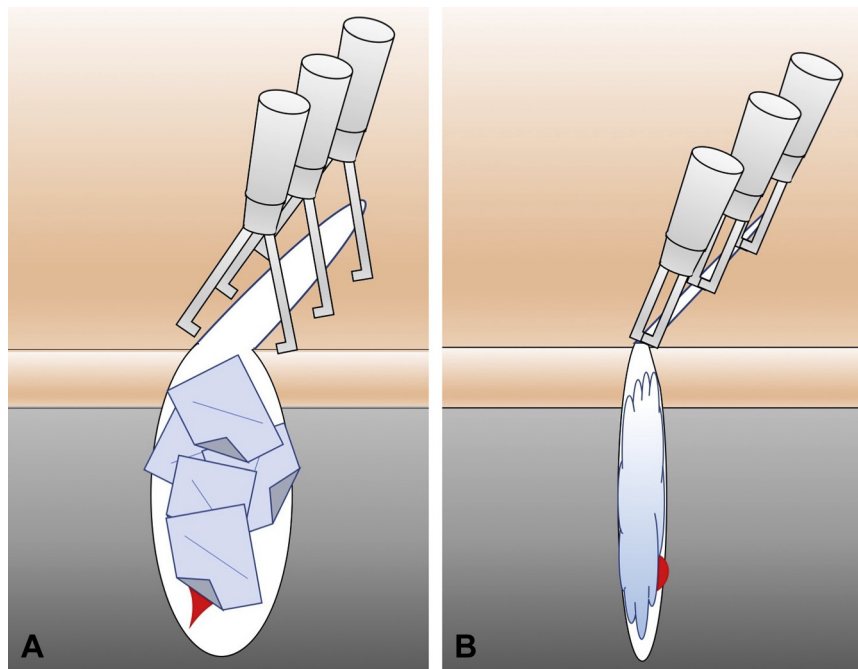


Figure 2. Endoscopic hemostasis for colonic diverticular bleeding with a modified clipping technique using polyglycolic acid (PGA) sheets. **A**, Filling the diverticulum with PGA sheets. **B**, Clipping in a zipper fashion after placement of PGA sheets compresses the actual bleeding site in spite of unsuccessful direct placement of hemoclips.

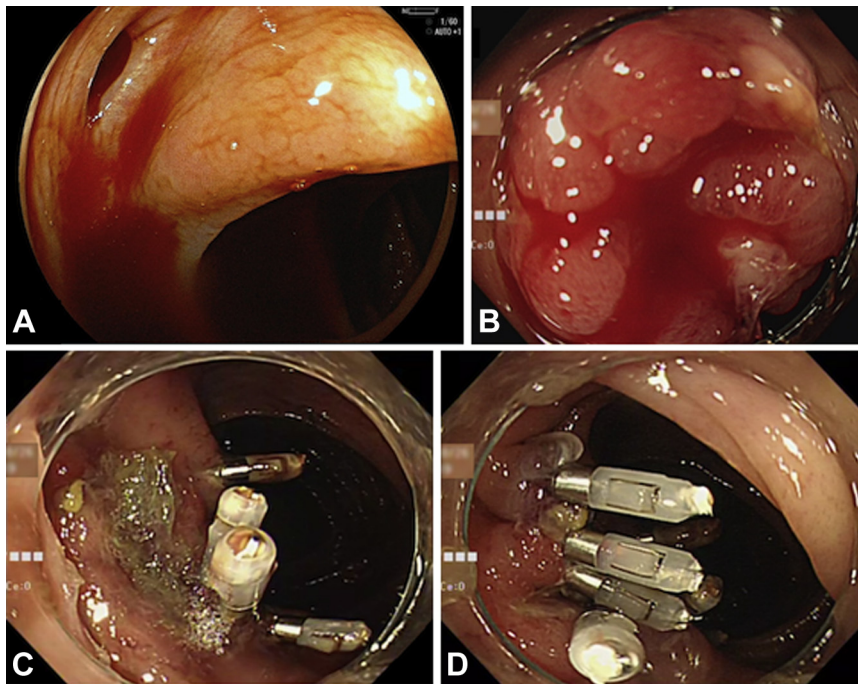


Figure 3. Endoscopic view of hemostasis for refractory colonic diverticulum bleeding by clipping after filling with polyglycolic acid sheets. **A**, Active bleeding from the diverticulum at the ascending colon during the initial procedure. **B**, The recurrent active bleeding from the treated diverticulum after the last procedure. **C**, The diverticulum is filled with polyglycolic acid sheets and fixed with fibrin glue. **D**, The orifice of the diverticulum is closed using multiple hemoclips, and hemostasis is completed.

performed for active rebleeding the next day and 6 days after the initial endoscopic treatment. Aspirin was withdrawn the next day. Angiography and embolization by interventional radiology were considered when melena was observed on

day 8. However, endoscopic treatment was attempted again at the patient's request. Colonoscopy revealed disengagement of the previous clips from the orifice of the treated diverticulum and active rebleeding (Fig. 3B). Therefore, we

performed endoscopic clip closure using PGA sheets. First, the diverticulum was filled with 10-mm-square PGA sheets using biopsy forceps. The sheets were gently pressed and repeatedly inserted until the space of the cavity was completely filled. Second, fibrin glue was sprayed onto the sheets for fixation (Fig. 3C). Third, endoscopic clip closure of the diverticulum was performed, and immediate hemostasis was successfully achieved, without adverse events (Fig. 3D). The patient was followed up for 30 days after the last procedure and showed no recurrent hemorrhage despite resumption of aspirin on day 14. Filling the diverticulum with PGA sheets and performing subsequent clip closure can enable compression of the actual bleeding site despite inadequate direct placement of hemoclips. This method can be a viable option for endoscopic treatment of refractory diverticular hemorrhage.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviation: PGA, polyglycolic acid.

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