VIDEO CASE REPORT

Direct clipping using underwater inversion method for colonic diverticular bleeding

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Colonic diverticular bleeding is the most common cause of acute lower GI bleeding, sometimes requiring hemostatic interventions, such as endoscopic hemostasis, transcatheter arterial embolization, and surgery. Recently, various methods have been developed to achieve endoscopic hemostasis for colonic diverticular bleeding.[1] Endoscopic clipping is widely used because of its rare association with tissue damage and is classified as direct or indirect types. Direct clipping is performed on the exposed vessel in the diverticulum, whereas indirect clipping is performed to close the responsible diverticulum in a zipper fashion.[2] Direct clipping has been reported to be superior to indirect clipping in terms of early rebleeding rates[1,3]; however, it is sometimes technically challenging because of several factors, such as the size or shape of the diverticulum, the location of the exposed vessel, and insufficient visual field in an acute setting. Herein, we present a case of colonic diverticular bleeding successfully treated with endoscopic direct clipping using the underwater inversion method (Video 1, available online at www.giejournal.org).

A 78-year-old man was referred to our department because of intermittent hematochezia without abdominal pain for 2 weeks. He had a history of hypertension and was taking antihypertensive drugs. Antithrombotic and nonsteroidal anti-inflammatory drugs were not used. Colonoscopy performed 5 days earlier at the previous hospital revealed multiple diverticula throughout the colon; however, there was no active bleeding.

On admission, he was afebrile with a blood pressure of 162/82 mm Hg and a regular heart rate of 60 beats/min. Laboratory data showed a hemoglobin level of 10.8 g/dL. The patient was conservatively managed with fasting, but he developed recurrent hematochezia. Colonoscopy with standard bowel preparation revealed no active bleeding and was unable to identify the causative diverticulum. On the day after colonoscopy, he again reported hematochezia. Emergent colonoscopy revealed a fresh clot in the left side of the colon (Fig. 1), and careful observation with the underwater technique identified an exposed vessel located on the diverticulum in the descending colon (Figs. 2 and 3). Subsequent colonoscopic aspiration resulted in diverticulum inversion (Fig. 4), and we successfully achieved direct clipping of an exposed vessel in the diverticulum (Figs. 5 and 6). We used a transparent hood (D-201-12704; Olympus, Tokyo, Japan) and endoclips (HX-610-090SC; Olympus) in this procedure. The patient was discharged without any

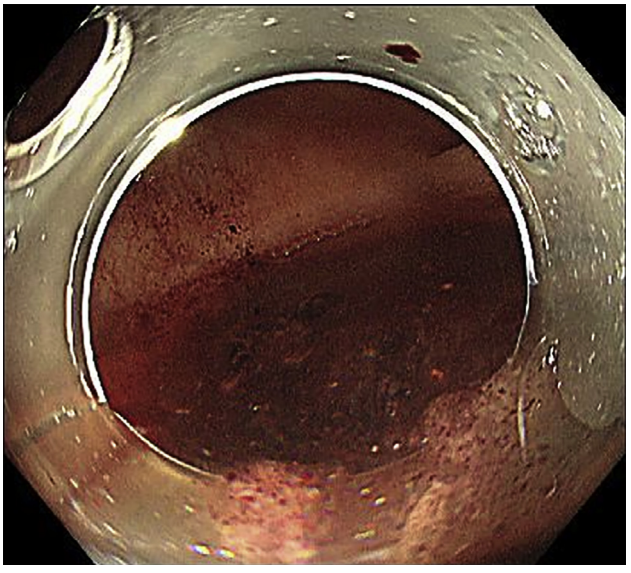

Figure 1. Emergent colonoscopy revealed a fresh clot in the left side of the colon.

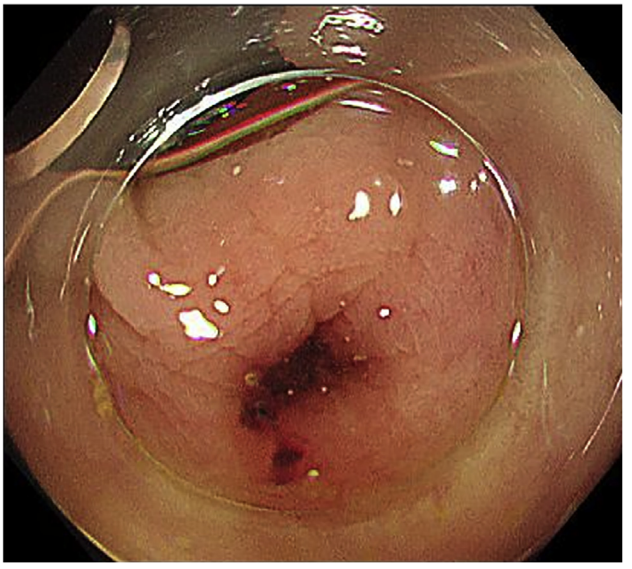

Figure 2. Adherent clot on the diverticulum in the descending colon, suggesting stigmata of the recent hemorrhage.

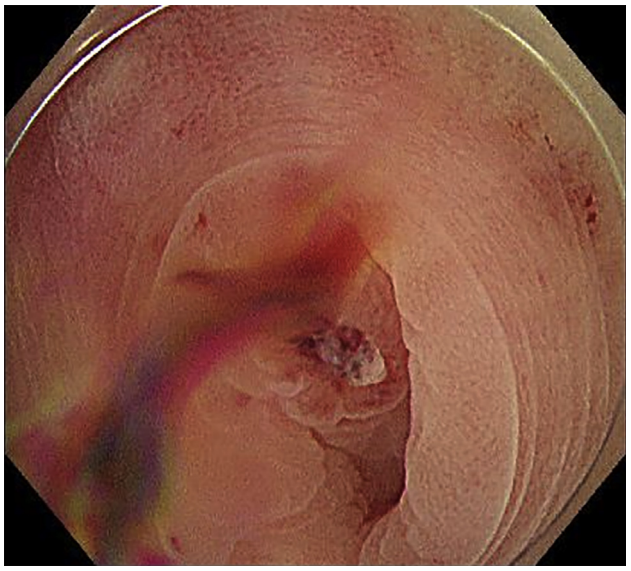

Figure 3. Underwater observation with water jet opening the diverticulum and detecting an exposed vessel located at the erosion in the diverticulum.

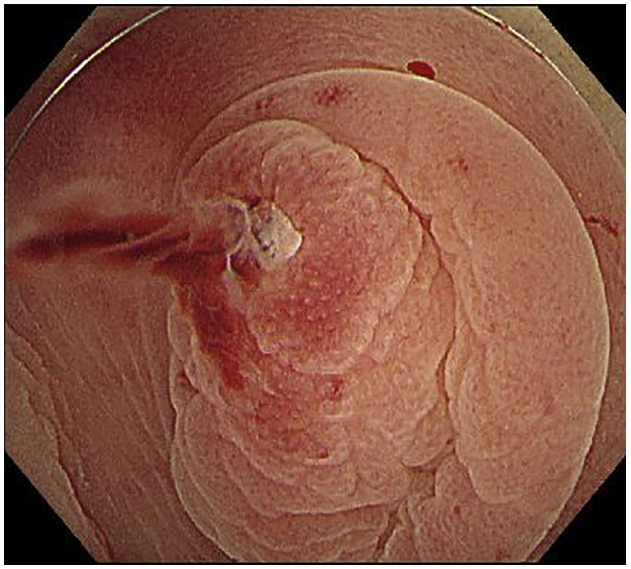

Figure 4. Endoscopic image of the inverted diverticulum in underwater condition.

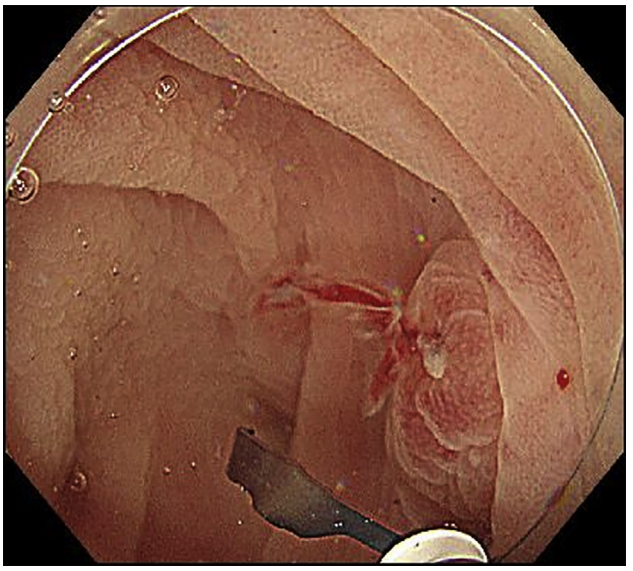

Figure 5. Endoscopic image of the direct clipping using an underwater inversion method.

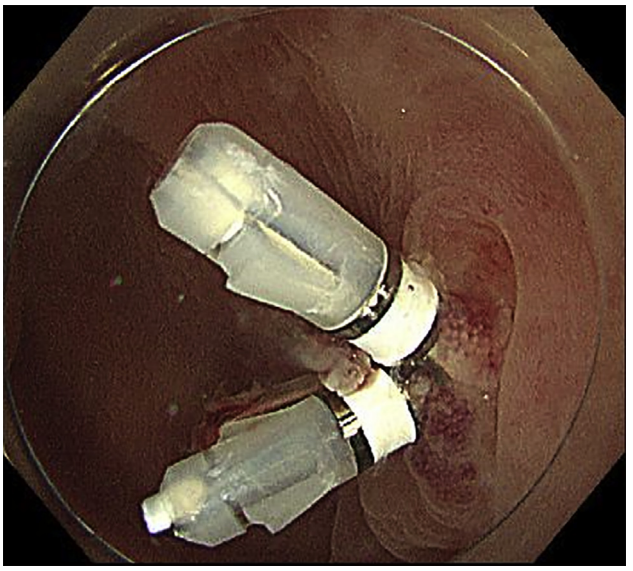

Figure 6. Endoscopic image immediately after direct clipping of an exposed vessel in the diverticulum

additional intervention. During a follow-up period of 3 months, he had no rebleeding.

In addition to endoscopic clipping, endoscopic band ligation (EBL) is increasingly used for colonic diverticular bleeding, and several studies have demonstrated that EBL is superior to endoscopic clipping in terms of early and long-term recurrent bleeding rates.[4,5] However, the types of the endoscopic clipping should be evaluated separately. Nagata et al[6] reported that the recurrent bleeding rate with EBL was lower than that with clipping, despite the clipping method used. A recent report by Kishino et al[3] demonstrated that direct clipping is comparable to EBL in terms of recurrent bleeding rate. Thus, although the results were inconsistent, direct clipping is convenient because it does not require scope reinsertion. The most important issue regarding direct clipping is the low feasibility rate of the procedure, which is reported as approximately 24% to 40%.[1,3] In a recent retrospective study, the rate of active bleeding was significantly lower in the direct clipping group compared to the indirect clipping group and EBL group,[3] suggesting that active bleeding is one of the factors affecting the feasibility of direct clipping. In addition, the following factors have been reported to complicate direct clipping: (1) endoscopic observations in colonic

diverticula; (2) insertion of endoclips into colonic diverticula; and (3) stability of the endoscope.[3]

As shown in the video, the underwater inversion method has several advantages in facilitating direct clipping. First, underwater conditions provide a clear endoscopic view and allow the detection of the stigmata of recent hemorrhage from a diverticulum.[7] Second, water pressure opens the diverticulum and facilitates inversion of the diverticulum by colonoscopic aspiration against the bottom of the diverticulum. In the present case, we performed mild suction that was just sufficient to expose the ulcer; strong suction may cause active bleeding from the exposed vessel and result in a worsening endoscopic visual field. Third, the underwater condition can keep the diverticula inverted because it increases intraluminal pressure less than standard air insufflation. Fourth, it allows direct clipping easily and safely, regardless of the condition of the diverticulum or exposed vessel. We usually use short clips for direct clipping to facilitate opening and closing even in a tight space. Thus, the underwater inversion method is helpful in achieving direct endoscopic clipping for colonic diverticular bleeding.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviation: EBL, endoscopic band ligation.

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REFERENCES

1. Kaise M, Nagata N, Ishii N, et al. Epidemiology of colonic diverticula and recent advances in the management of colonic diverticular bleeding. Dig Endosc 2020;32:240-50.
2. Nagata N, Ishii N, Manabe N, et al. Guidelines for colonic diverticular bleeding and colonic diverticulitis: Japan Gastroenterological Association. Digestion 2019;99(Suppl 1):1-26.
3. Kishino T, Kanemasa K, Kitamura Y, et al. Usefulness of direct clipping for the bleeding source of colonic diverticular hemorrhage (with videos). Endosc Int Open 2020;8:E377-85.
4. Setoyama T, Ishii N, Fujita Y. Enodoscopic band ligation (EBL) is superior to endoscopic clipping for the treatment of colonic diverticular hemorrhage. Surg Endosc 2011;25:3574-8.
5. Okamoto N, Tominaga N, Sakata Y, et al. Lower rebleeding rate after endoscopic band ligation than endoscopic clipping of the same colonic diverticular hemorrhagic lesion: a historical multicenter trial in Saga, Japan. Intern Med 2019;58:633-8.
6. Nagata N, Ishii N, Kaise M, et al. Long-term recurrent bleeding risk after endoscopic therapy for definitive colonic diverticular bleeding: band ligation versus clipping. Gastrointest Endosc 2018;88:841-53.e4.
7. Kishino T, Kitaichi T, Kanemasa K. Usefulness of water immersion observations to identify the stigmata of hemorrhage in colonic diverticular bleeding. Dig Endosc 2018;30:121-2.

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