

## Effective hemostasis under gel immersion endoscopy using inflated balloons on the tip of double balloon endoscope for active bleeding in the small intestine

Shunsuke Horitani<sup>1</sup>, Natsuko Saito<sup>1</sup>, Koki Hosoda<sup>1</sup>, Hironao Matsumoto<sup>1</sup>, Toshiyuki Mitsuyama<sup>1</sup>, Takeshi Yamashina<sup>1</sup>, Masaaki Shimatani<sup>1</sup>, Makoto Naganuma<sup>2</sup>

<sup>1</sup>Department of Gastroenterology and Hepatology, Kansai Medical University Medical Center, Osaka; <sup>2</sup>Department of Gastroenterology and Hepatology, Kansai Medical University, Osaka, Japan

Securing an endoscopic visual field when identifying the source of gastrointestinal bleeding is difficult because the injected water easily mixes with blood and residue. Performing endoscopic procedures is challenging when the luminal contents are displaced by gas insufflation, which leads to significant discomfort. Gel immersion endoscopy (GIE) using an electrolyte-free gel (VISCOCLEAR; Otsuka Pharmaceutical Factory) has been reported to be useful for securing the visual field during endoscopy for gastrointestinal bleeding.<sup>1,2</sup> Particularly in the case of the small intestine, which is frequently filled with blood, GIE is effective for narrow lumens. This gel can easily replace the blood. Insufflation of the endoscope balloon avoids backflow of the gel, enabling it to push away blood and hold the intestinal wall, allowing the endoscope to stay at the targeted position. We also used a BioShield irrigator (US Endoscopy), which allowed additional injection of the gel with a therapeutic device through the accessory channel. In addition, the use of a transparent cap makes it easier to concentrate the gel in front of the endoscope (Fig. 1). Herein, we report the successful treatment of a heman-

gioma with active bleeding in the small intestine under GIE using inflated balloons on the tip of a double balloon endoscope (DBE).

A 15-year-old boy had been suffering from melena for a month. Esophagogastroduodenoscopy and colonoscopy failed to reveal any signs of active bleeding. Capsule endoscopy was performed to check for small intestinal lesions and detected bloody intestinal fluid in the jejunum, followed by DBE, which revealed a large amount of fresh blood in the jejunum (Fig. 2). The cause of gastrointestinal bleeding was undetectable because



**Fig. 1.** The equipment figure for gel immersion endoscopy using double balloon endoscope.

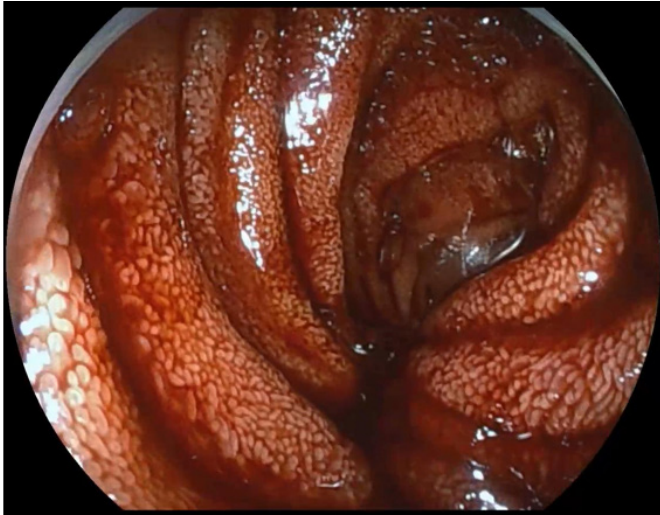
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Correspondence: Masaaki Shimatani

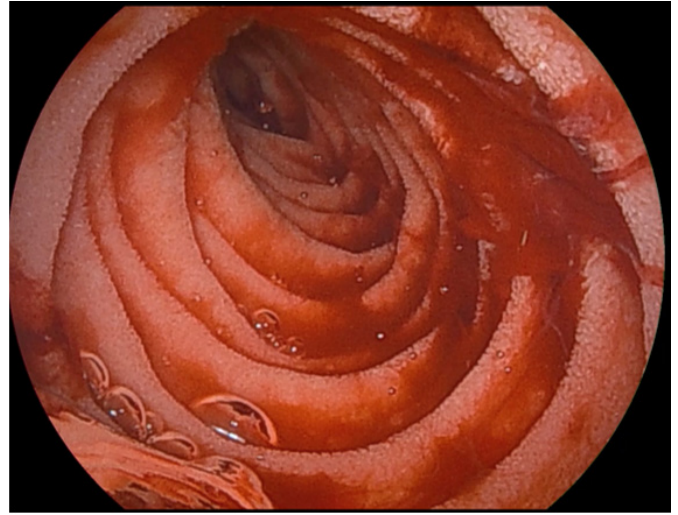
Department of Gastroenterology and Hepatology, Kansai Medical University Medical Center, 10-15 Fumizonochō, Moriguchi, Osaka 570-8507, Japan

E-mail: shimatam@hirakata.kmu.ac.jp

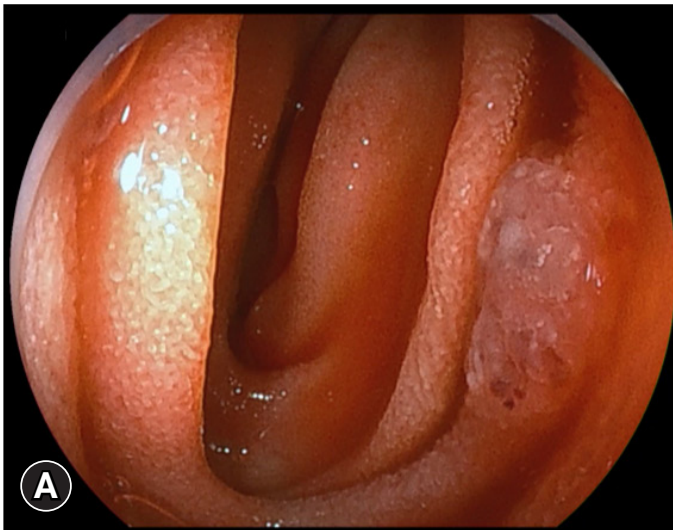
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**Fig. 2.** A large amount of fresh blood in the jejunum.



**Fig. 3.** Gel immersion endoscopy using inflated balloons on the tip of double balloon endoscope secured the visual field, and the bleeding source was detected.



**Fig. 4.** (A) After injection of hypertonic saline-epinephrine solution, the lesion suspicious of being hemangioma, which was the source of the bleeding, was visualized. (B) Hemostasis using endoclips was carried out.

the injected water was mixed with blood and the endoscope did not remain at the targeted position. However, by applying GIE using inflated balloons on the tip of the DBE, the visual field was secured, and the bleeding source was detected (Fig. 3, Supplementary Video 1). We immediately injected a hypertonic saline-epinephrine solution at the point of bleeding. Moderately active bleeding allowed us to secure the visual field. We were able to identify the lesion suspicious for a hemangioma as the source of bleeding, which was further performed with complete

hemostasis using endoclips (SureClip; Microtech) (Fig. 4). In this case, approximately 80 mL of gel was used. The patient was discharged without complications, and has not suffered from recurrence.

In conclusion, GIE using inflated balloons on the tip of DBE is useful for precise treatment of active gastrointestinal bleeding, for it could facilitate endoscopic maneuvers and allow clear endoscopic view.

## Supplementary Material

**Supplementary Video 1.** Effective hemostasis under gel immersion endoscopy using inflated balloons on the tip of double balloon endoscope (<https://doi.org/10.5946/ce.2023.146.v1>).

Supplementary materials related to this article can be found online at <https://doi.org/10.5946/ce.2023.146>.

## Conflicts of Interest

The authors have no potential conflicts of interest.

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## Author Contributions

Conceptualization: SH; Investigation: SH, NS, HM, TM; Method-

ology: SH, NS, HM, TM, TY, MS; Project administration: all authors; Resources: SH, MS; Supervision: SH, MS; Validation: SH, MS; Visualization: SH; Writing–original draft: SH, MN; Writing–review and editing: SH, TY, MS, MN.

## ORCID

Shunsuke Horitani	<a href="https://orcid.org/0000-0002-8413-6110">https://orcid.org/0000-0002-8413-6110</a>
Natsuko Saito	<a href="https://orcid.org/0009-0005-4059-7491">https://orcid.org/0009-0005-4059-7491</a>
Koki Hosoda	<a href="https://orcid.org/0009-0007-9902-1002">https://orcid.org/0009-0007-9902-1002</a>
Hironao Matsumoto	<a href="https://orcid.org/0009-0002-3838-2414">https://orcid.org/0009-0002-3838-2414</a>
Toshiyuki Mitsuyama	<a href="https://orcid.org/0009-0006-6898-5450">https://orcid.org/0009-0006-6898-5450</a>
Takeshi Yamashina	<a href="https://orcid.org/0000-0003-2845-7988">https://orcid.org/0000-0003-2845-7988</a>
Masaaki Shimatani	<a href="https://orcid.org/0000-0001-6911-7686">https://orcid.org/0000-0001-6911-7686</a>
Makoto Naganuma	<a href="https://orcid.org/0000-0002-4244-3243">https://orcid.org/0000-0002-4244-3243</a>

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