Intraoperative enteroscopy using a disposable single-use sterile endoscope

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Intraoperative enteroscopy is frequently performed on the basis of the requirements of the requesting surgical team. The endoscope used during surgery is normally disinfected with an iodophor before being placed on the platform. However, the effects of disinfection remain unclear. Recently, we successfully performed intraoperative enteroscopy with a disposable single-use sterile endoscope.

A 69-year-old man was admitted to the nephrology ward with edema and a 1-month history of elevated serum creatinine levels. Laboratory tests revealed a serum creatinine level of 1136 (44-133) μmol/L. He was diagnosed with rapidly progressive glomerulonephritis, and a renal biopsy confirmed crescentic glomerulonephritis type III. The patient underwent methylprednisolone pulse therapy (500 mg for 3 days) and therapeutic plasma exchange on 8 occasions. After treatment, his renal function significantly improved, with serum creatinine levels fluctuating between 160 and 210 μmol/L. However, 6 days after methylprednisolone pulse therapy, the patient developed hematochezia, and his hemoglobin levels dropped to a minimum of 40 g/L. He underwent fasting and was resuscitated with liquid and blood components, including a total of 17 units of red blood cells. Bedside gastroscopy revealed insignificant chronic gastritis, and colonoscopy revealed blood clots in the terminal ileum, indicating small intestinal bleeding. Celiac arteriography revealed no positive findings. Capsule endoscopy, although potentially helpful in identifying the general intestinal segment affected by the bleeding, was not pursued because of its limitations in pinpointing the exact site of hemorrhage and its inability to provide hemostasis. Moreover, our hospital did not have access to the necessary equipment for balloon enteroscopy hemostasis.

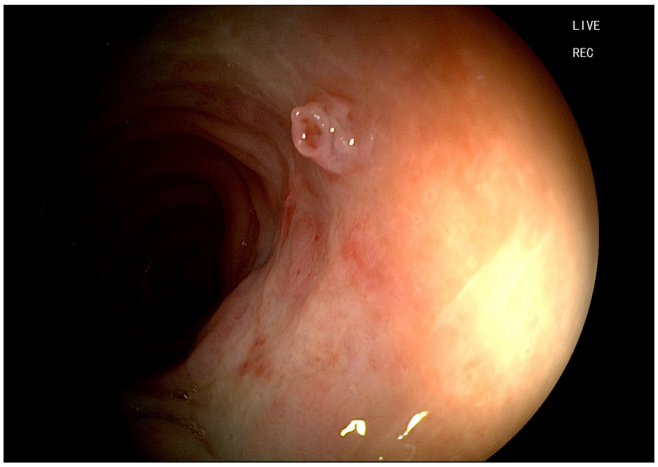

Figure 1. A visible vessel with an overlying fibrin clot was observed during enteroscopy.

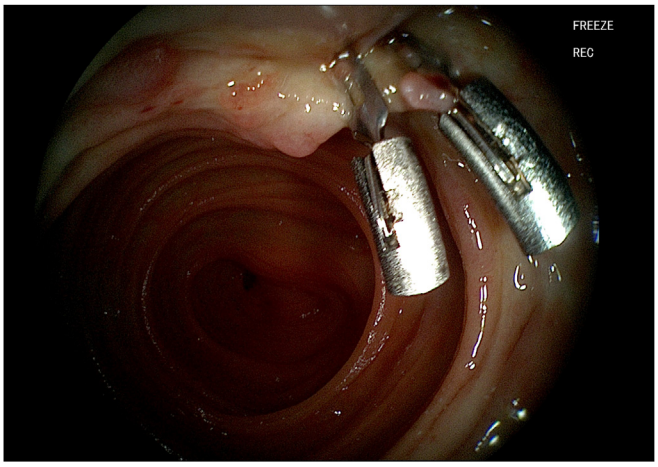

Figure 2. Two clips were passed through the operative channel and fixed to the vessel site to prevent recurrent bleeding.

After multidisciplinary treatment and thorough communication with the patient and his family, the patient decided to undergo an exploratory laparotomy. Intraoperative enteroscopy was performed using a disposable single-use sterile colonoscopy (XZING-W200B; Huizhou Xianzan Technology Co, Ltd, Huizhou, China) through an incision 70 cm downward from the ligament of Treitz, where a visible small vessel was found at the serosal surface (Video 1, available

Abbreviation: COVID-19, coronavirus disease 2019.

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online at www.videogie.org). First, we advanced the endoscope in a retrograde manner to the upper side of the small intestine until there was no blood in the lumen. With the help of surgeons manually pushing the bowel over the endoscope, the entire small intestine could be observed through the endoscope, revealing a visible vessel with an overlying fibrin clot (Fig. 1). Although no active bleeding was observed, we believed this was the cause of the bleeding episode; thus, 2 clips were passed through the operative channel and fixed to the vessel site to prevent recurrent bleeding (Fig. 2). After the operation, the bleeding stopped for 4 days but then reappeared. Intraoperative enteroscopy was repeated, and enterectomy of the suspicious intestinal segment with the visible vessel was performed. Pathologic examination revealed intestinal mucosal inflammation and erosion, with dilated small arterioles and veins in the submucosa. We supposed that these changes might be attributed to the vasculitic nature of his primary renal disease, which was exacerbated by the use of steroids. The patient gradually improved and was finally discharged from our hospital.

As a result of the sterilization protocols followed during the coronavirus disease 2019 (COVID-19) outbreak, health care providers have become increasingly aware of the risk of infection.[1] Disposable single-use endoscopes are extremely desirable for scenarios involving high-risk patients that require high-level disinfection, such as intraoperative endoscopy or endoscopy for immunocompromised and multidrug-resistant bacterial-infected patients.[2] The cost of such an endoscope is approximately $1500. The endoscope is disposed of as medical waste, eliminating the risk of infection from reuse. In this case, we confirmed that the technical feasibility, operability, and image quality of the disposable single-use endoscope were satisfactory for most endoscopists. Overall, the disposable single-use endoscope opens up a new horizon for endoscopists in intraoperative endoscopy examinations and other scenarios.

DISCLOSURE

None of the authors have any disclosures to make.

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