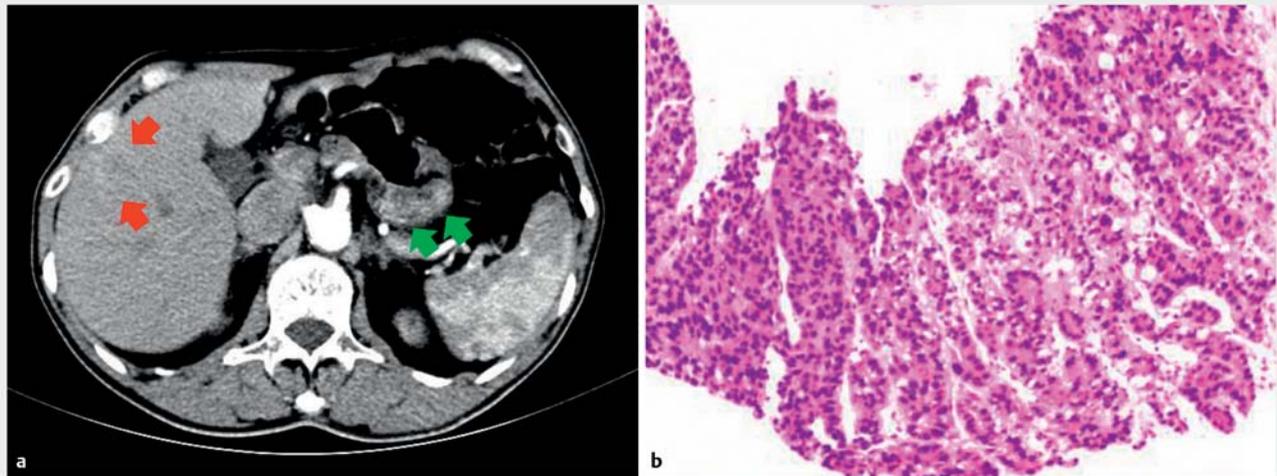
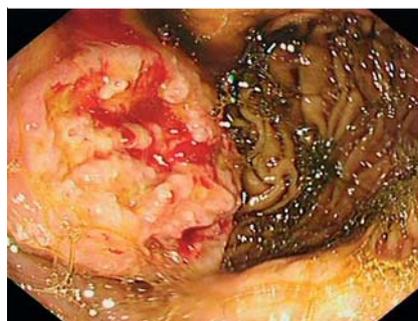


A new therapy for refractory gastric cancer bleeding: endoscopic ultrasound-guided lauromacrogol injection



► **Fig. 1** The patient was confirmed to have liver metastasis from gastric stump cancer. **a** Computed tomography showed that the residual stomach and anastomotic stoma were thickened and enhanced (green arrows). A hypoechoic lesion approximately 2 cm in size was observed in the liver (red arrows) and showed as slightly enhanced. **b** Metastatic tumor was confirmed by liver biopsy.

A 71-year-old man was admitted for intractable gastrointestinal bleeding because of residual gastric cancer with liver metastasis (► **Fig. 1**). He presented having had three episodes of hematemesis or melena in the previous 30 days. Conventional endoscopic management for bleeding of unresectable gastric cancer is challenging because of the low clinical success rate and high amount of rebleeding [1]. After careful discussion with the patient and his family, treatment using endoscopic ultrasound (EUS)-guided lauromacrogol injection was decided. Repeat endoscopy revealed persistent active bleeding from the anastomosis of the residual stomach (► **Fig. 2**). A vessel originating from the submucosa and extending into the mucosa was identified using EUS-aided color Doppler imaging (► **Video 1**). EUS-guided lauromacrogol injection was performed using a 22-gauge needle (Echo 3–22; Cook Endoscopy, Winston-Salem, NC, USA). Moreover, color Doppler imaging confirmed the absence of blood flow after therapy (► **Video 1**). Endoscopy immedi-



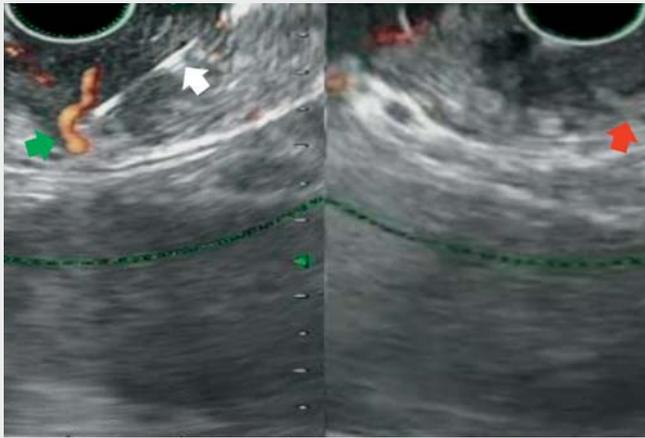
► **Fig. 2** Endoscopy revealed persistent active bleeding in the residual stomach even after proton pump inhibitor and somatostatin were used.



► **Fig. 3** Endoscopy immediately after the injection confirmed the absence of bleeding.

ately after the injection confirmed the absence of bleeding (► **Fig. 3**). The patient was followed for more than 6 months without further episodes of gastrointestinal bleeding. No adverse events or complications were recorded during or after the procedures. The efficacy of EUS-guided therapy of nonvariceal upper gastrointestinal bleeding has been described. Series have been published with success rates of 88%–

100% for the treatment of Dieulafoy's lesions, pancreatic/gastroduodenal artery pseudoaneurysms, gastrointestinal stromal tumors, periampullary tumors, duodenal ulcers, and intractable marginal ulcers after Roux-en-Y gastric bypass [2–4]. To our knowledge, EUS-guided lauromacrogol injection for the treatment of refractory gastric cancer bleeding has not been reported in this setting.



Video 1 Endoscopic ultrasound (EUS) showed a persistent bleeding from a vessel in the submucosa identified by color Doppler imaging. EUS-guided injection of 12 mL laurmacrogol was performed using a 22-gauge needle. EUS then showed the absence of blood flow at the site, with cutoff of the vessel.

In conclusion, EUS-guided angiotherapy may be a safe and effective therapeutic option in patients with refractory bleeding gastric cancer considered unsuitable for surgery.

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Competing interests

The authors declare that they have no conflict of interest.

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