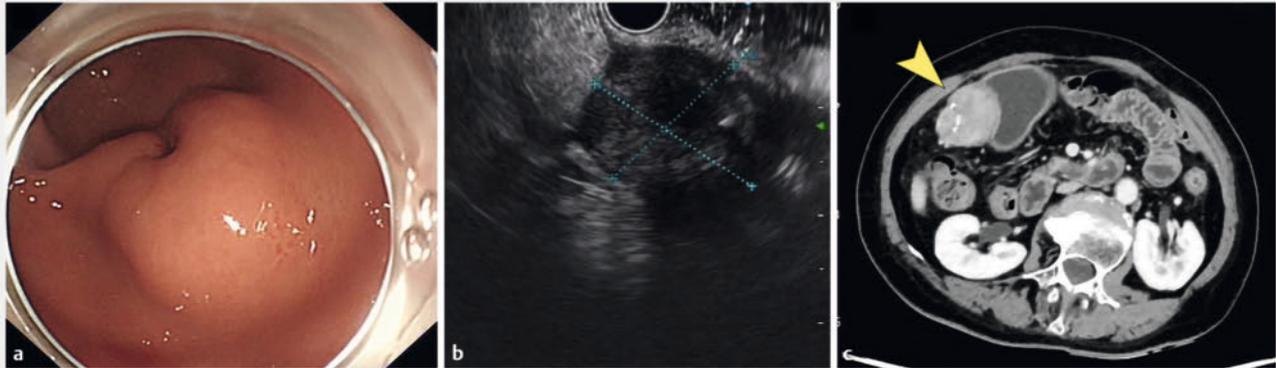


## A novel endoscopic electrocoagulation hemostasis technique for uncontrolled intraprocedural bleeding: series connection of foreign body forceps and hemostatic forceps

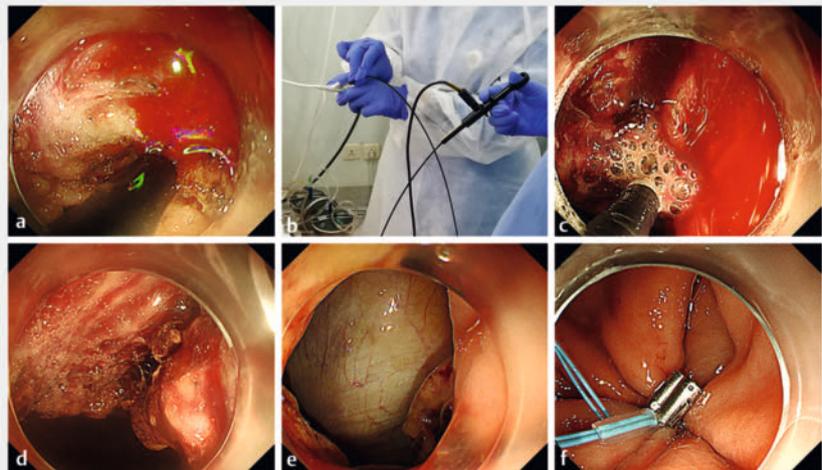
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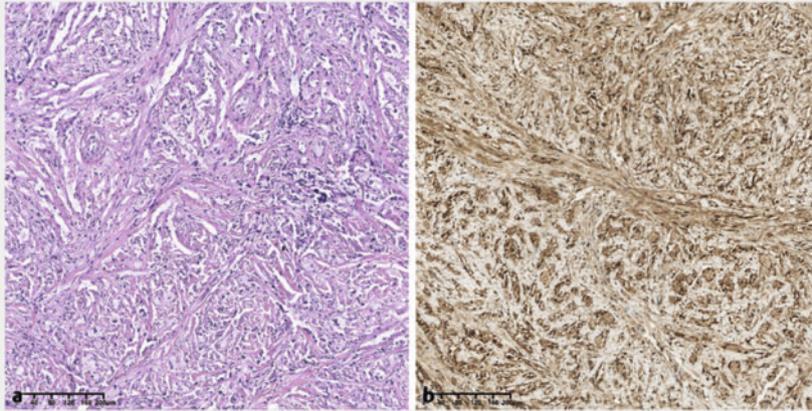
► **Fig. 1** Examinations before endoscopic full-thickness resection of a gastric mass in a 72-year-old woman. **a** Endoscopy showed a raised lesion with a central depression at the gastric antrum–body junction. **b** Endoscopic ultrasound demonstrated a hypoechoic mass about 3.1 × 3.5 cm in size, with heterogeneous anechoic areas, originating from the muscularis propria layer. **c** Upper abdominal enhanced computed tomography showed a soft tissue density mass measuring 4.4 × 3.6 cm, with calcification in the gastric antrum, protruding into the abdominal cavity (yellow arrowhead).

Intraprocedural bleeding is unavoidable during endoscopic procedures [1,2]. Minor bleeding from small vessels can typically be managed with an electric knife, while significant bleeding from larger vessels requires the use of hemostatic forceps [3,4]. In cases of uncontrollable severe bleeding, clips can be used as rescue treatment, but their use may impede subsequent procedures. Here, we introduce a method using foreign body forceps and hemostatic forceps to achieve hemostasis for emergency massive bleeding during endoscopic full-thickness resection (EFTR).

A 72-year-old woman was referred to our hospital for the treatment of a gastric mass. Endoscopy, endoscopic ultrasound, and upper abdominal enhanced computed tomography were performed (► **Fig. 1**). Following consultation with the patient and her family, EFTR was chosen as the optimal treatment approach. During the procedure, sudden bleeding occurred that could not be controlled using the electric knife (► **Video 1**, ► **Fig.**



► **Fig. 2** Series connection of foreign body forceps and hemostatic forceps for hemostasis of uncontrolled intraprocedural bleeding. **a** Sudden bleeding occurred during an endoscopic full-thickness resection, which could not be controlled using the electric knife and hemostatic forceps. **b** Extracorporeal connection of a hemostatic forceps in series with the foreign body forceps that was clamping the bleeding site. **c** This series connection enabled the distal end of the foreign body forceps to be charged, thereby providing electrocoagulation functionality. **d** This enabled successful hemostasis of the sudden bleeding. **e** The lesion was completely resected. **f** The wound was closed with a pursestring suture of clips and nylon ring.



► **Fig. 3** Histopathology of postoperative specimen. **a** Histology showed a spindle-cell tumor (hematoxylin and eosin,  $\times 100$ ). **b** Immunohistochemical staining of S-100 was positive, confirming the diagnosis of a gastric schwannoma ( $\times 100$ ).



► **Video 1** A novel endoscopic electrocoagulation technique for hemostasis of uncontrolled intraprocedural bleeding: series connection of foreign body forceps and hemostatic forceps.

**2a**). Despite repeated attempts with hemostatic forceps (FG-44NR-1; Olympus, Tokyo), bleeding persisted. Given the potential depth of the bleeding site and the longer jaws of foreign body forceps (4.5 mm, FD-410LR; Olympus) compared to hemostatic forceps (3.6 mm), we used a foreign body forceps to clamp the bleeding site, despite its lack of electrocoagulation capabilities. We then extracorporeally connected the foreign body forceps in series with a hemostatic forceps (► **Fig. 2b**). This enabled charging of the distal end of the foreign body forceps and successful hemostasis of the bleeding site (► **Fig. 2c, d**).

Finally, the lesion was completely removed, and the wound was closed with a pursestring suture of clips and nylon ring (► **Fig. 2e, f**). Postoperative recovery was uneventful, with no rebleeding. Histopathology revealed a gastric schwannoma [5] (► **Fig. 3**).

This connection in series of forceps to enable hemostasis highlights the adaptability of endoscopic equipment and the imaginative innovation on the part of the endoscopist, providing a novel approach for managing uncontrollable intraprocedural bleeding without interrupting the operation.

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### Conflict of Interest

The authors declare that they have no conflict of interest.

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