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Curative endoscopic full-thickness resection of a fundic gland-type gastric adenocarcinoma

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Curative endoscopic full-thickness resection of a fundic gland-type gastric adenocarcinoma

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A 66 year-old man was referred for the incidental finding of a gastric fundus lesion on upper endoscopy. The biopsy result from the referring hospital showed fundic gland polyp.

Upon repeated examination, a 25mm pale colored, elevated, well demarcated lesion (Paris 0-IIa) was detected in the fundus (**Fig. 1**), demonstrating a submucosal tumor-like appearance and dilated vessels with a branching architecture. The background mucosa showed no signs of atrophy. Although magnifying Narrow Band Imaging did not show an obvious irregular microsurface and microvascular pattern, the endoscopic features raised suspicion of a locally invasive fundic gland type adenocarcinoma (GA-FG), which was confirmed on biopsy. Computed Tomography revealed a 25mm contrast enhancing thickening at the gastric fundus without signs of transmural growth or metastasis (**Fig. 2**).

In consideration of the relatively benign behaviour of GA-FG, endoscopic resection was contemplated (**Video 1**). Endoscopic submucosal dissection (ESD) was first attempted and started under general anesthesia. After marking and submucosal injection, circumferential incision and submucosal dissection was performed using a multi-bend gastroscope (GIF-2TQ260M, Olympus Medical Corporation, Tokyo, Japan) (**Fig. 3**). Significant submucosal fibrosis was encountered under the lesion and tangential access to the fundus was not possible even with clip-line assisted traction [1] (**Fig. 4**). En-bloc resection was achieved by converting from the previously planned ESD to a controlled endoscopic full-thickness resection (EFTR) (**Fig. 5,6**). Utilization of an insulated tip knife (IT2, Insulated Tip Knife 2, Olympus Medical Corporation, Tokyo, Japan) was deemed advantageous for this purpose, as protection of the surrounding intraabdominal organs seemed secured by the insulated tip. A dislocation of the resection specimen into the abdominal cavity was prevented by the clip-and-line. CO₂ insufflation was used for the entire procedure. Despite inevitable gas leakage toward the peritoneum, the patient was continuously hemodynamically respiratorically stable under general anaesthesia. The EFTR defect was subsequently closed by the clip-and-loop technique [2] (**Fig. 7**). Partial insertion of the loop via one of the two working channels followed by subsequent attachment to the resection margins by through-the-scope clips (TTSC) via the other working channel of the multi-bend scope proved a safe and feasible method. The patient's recovery was uneventful.

Histologic examination confirmed the diagnosis of GA-FG with a submucosal invasion depth of 250µm, absence of lymphovascular invasion and negative resection margins (T1bSM1, Ly(-), V(-), HM0, VM0) (**Fig. 8,9**). Submucosal fibrosis was not detected histologically. Thus, curative resection of this lesion was achieved by EFTR. A PET-CT and EGD (esophagogastroduodenoscopy) 3 months after the operation showed no sign of local recurrence or distant metastasis.

EFTR is a viable backup option for the curative treatment of superficial submucosal invasive gastric cancer under special circumstances [3]. Here, the technically challenging EFTR of a rare T1b GA-FG in the gastric fundus is demonstrated. GA-FG is considered a less aggressive tumor entity than intestinal or diffuse type gastric cancer. It carries a low risk of metastasis, even in the presence of submucosal invasion [4, 5]. While additional research into this rare entity is required in order to issue treatment suggestions, the current evidence gives rise to the hypothesis that GA-FG may be amenable to endoscopic resection even in locally advanced cases with invasion of the deep submucosal or the muscle layers.

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Figure and Video legends:

Figure 1: Diagnostic image of the lesion: Underwater white light view.

Figure 2: CT image of the gastric contrast enhancing lesion in a sagittal view.

Figure 3: Endoscopic view during resection: circumferential incision using a blade type knife with an insulated tip (IT2, Insulated Tip Knife 2, Olympus Medical Corporation, Tokyo, Japan).

Figure 4: Endoscopic view during resection: application of two clip-an-line traction devices for improved exposure of the fibrous submucosal layer.

Figure 5: Endoscopic view during resection: controlled full thickness dissection using the insulated tip knife (IT2, Insulated Tip Knife 2, Olympus Medical Corporation, Tokyo, Japan).

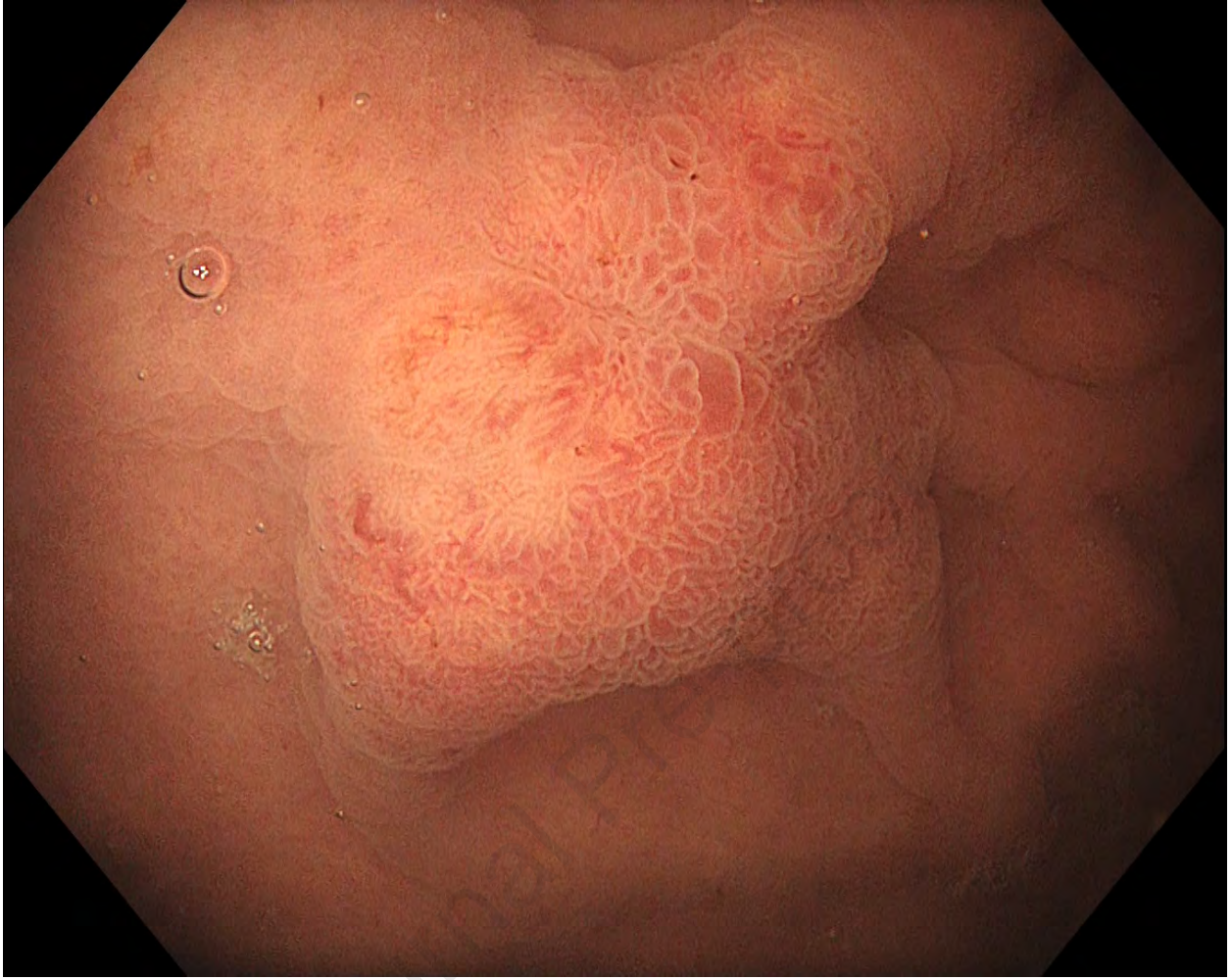
Figure 6: Endoscopic view during resection: inspection of the full thickness resection defect with view of the peritoneal cavity and the liver.

Figure 7: Endoscopic view after resection: completed closure of the defect by the clip-and-loop technique.

Figure 8: Pinned intact full thickness resection specimen, macroscopically no sign of transmural growth.

Figure 9: Histology image of the resected specimen in hematoxylin-eosin (H&E) staining with 10x magnification of the submucosal invasion area: adenocarcinoma of the fundic gland type features with closely-packed glandular proliferation forming irregular tubular, branching and anastomotic glands with submucosal invasion of 250 μm in one area (arrows).

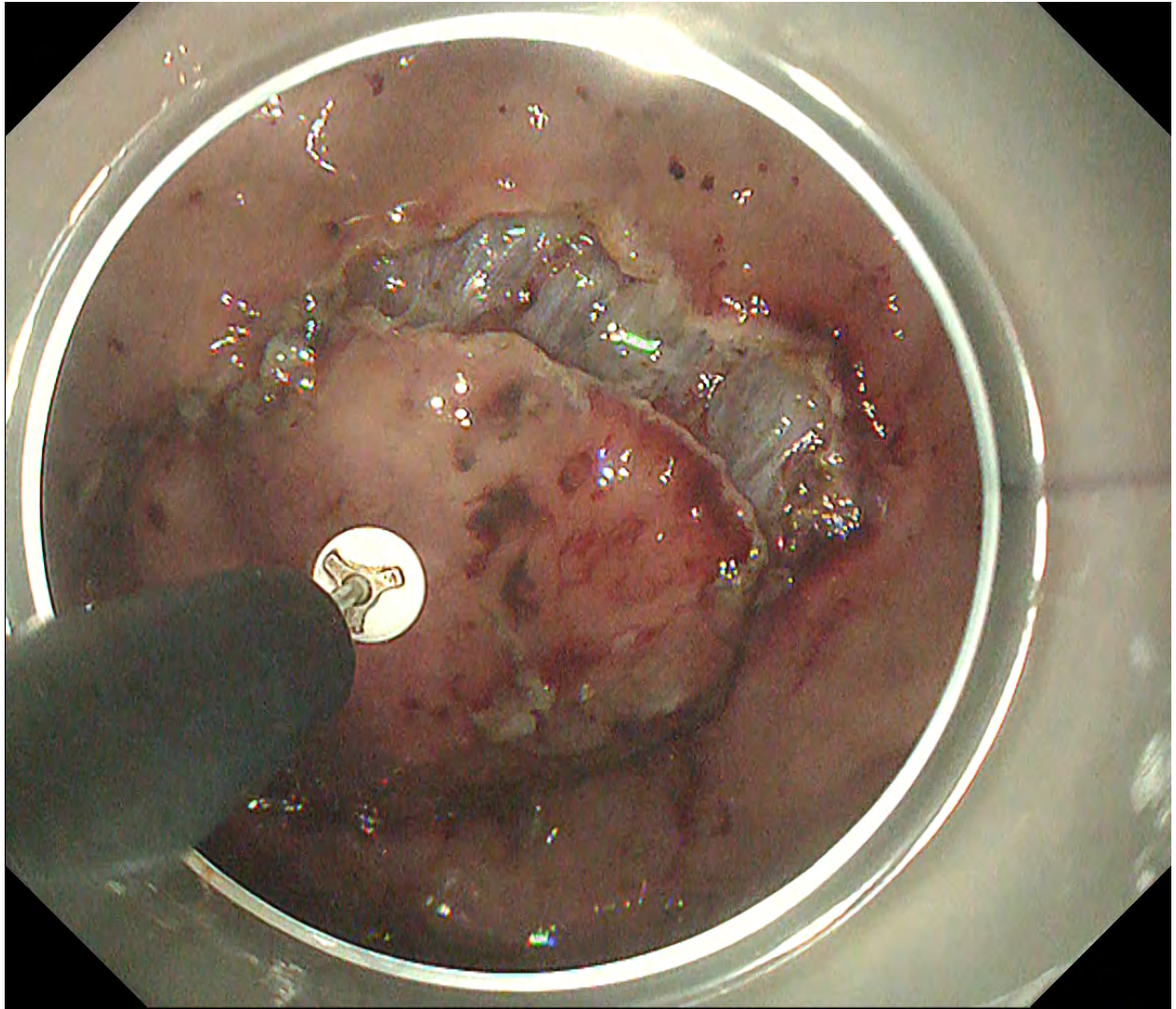
Video 1: Video summary of the presented case; macroscopic images of the lesion in white light endoscopy and narrow band imaging and in underwater view followed by scenes from the resection with circular marking, submucosal injection, circumferential incision, submucosal dissection using a multi-bend double channel endoscope, as well as clip traction, controlled full thickness dissection and inspection of the defect, closure of the defect with the clip-and-loop technique.

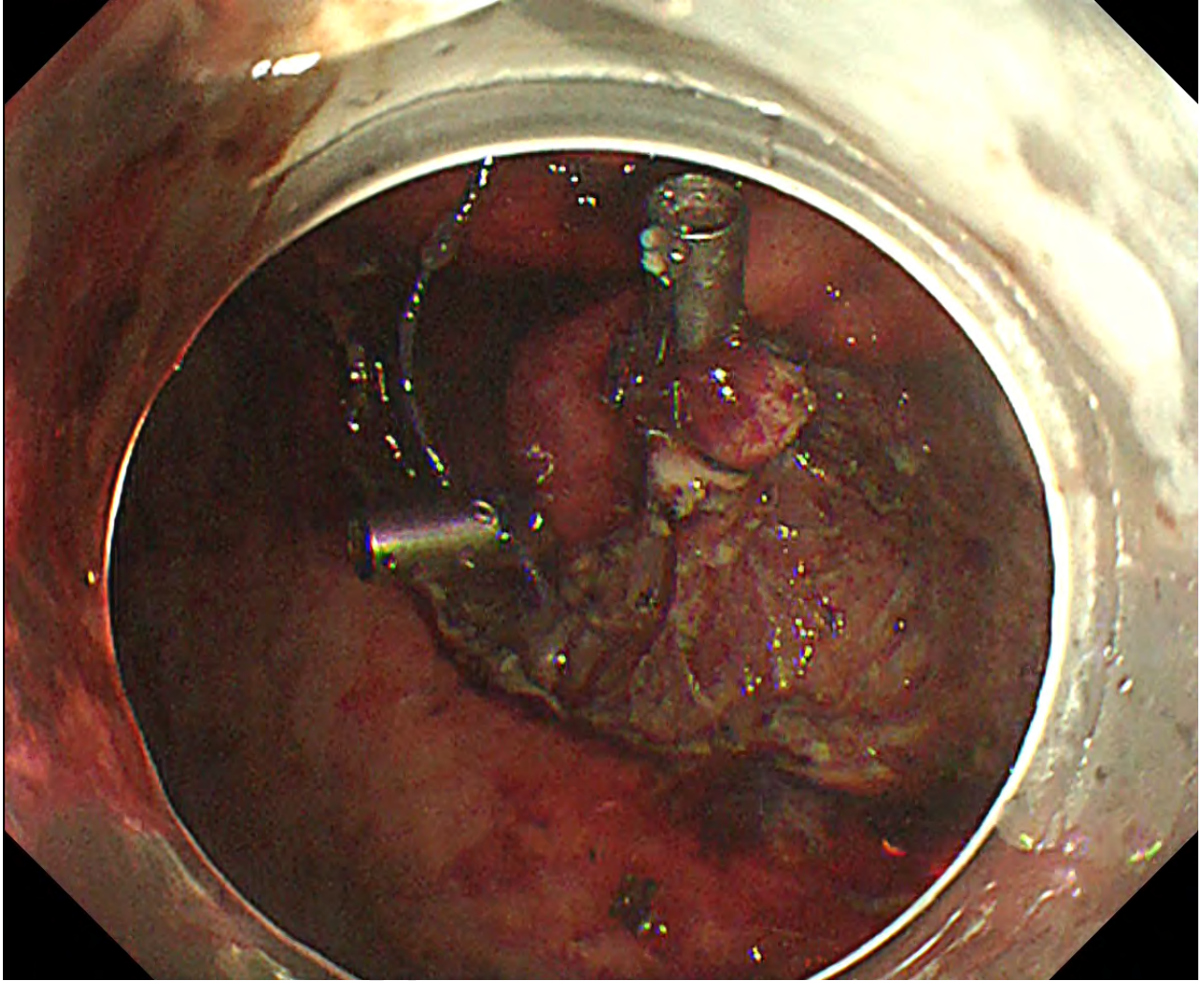


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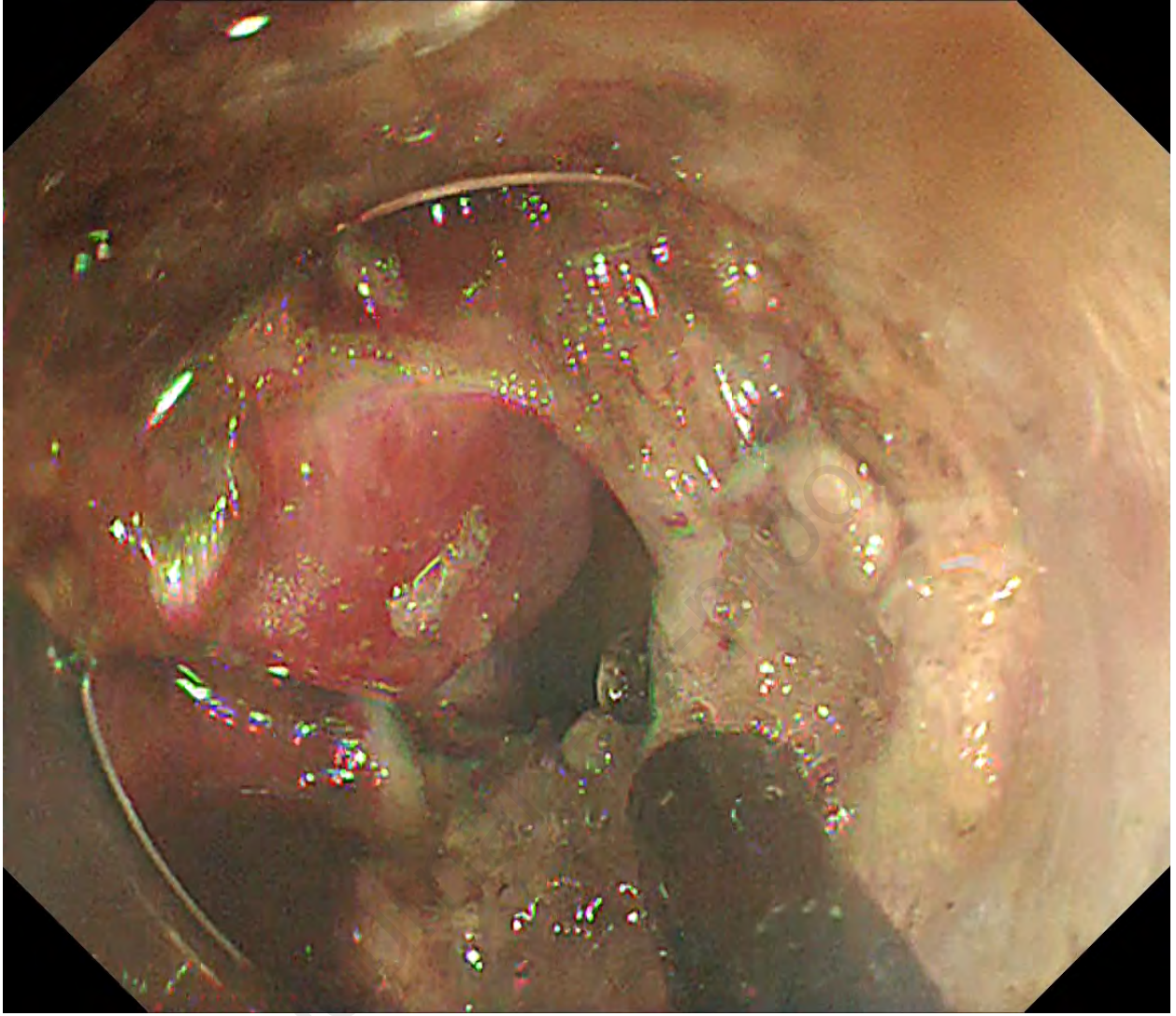


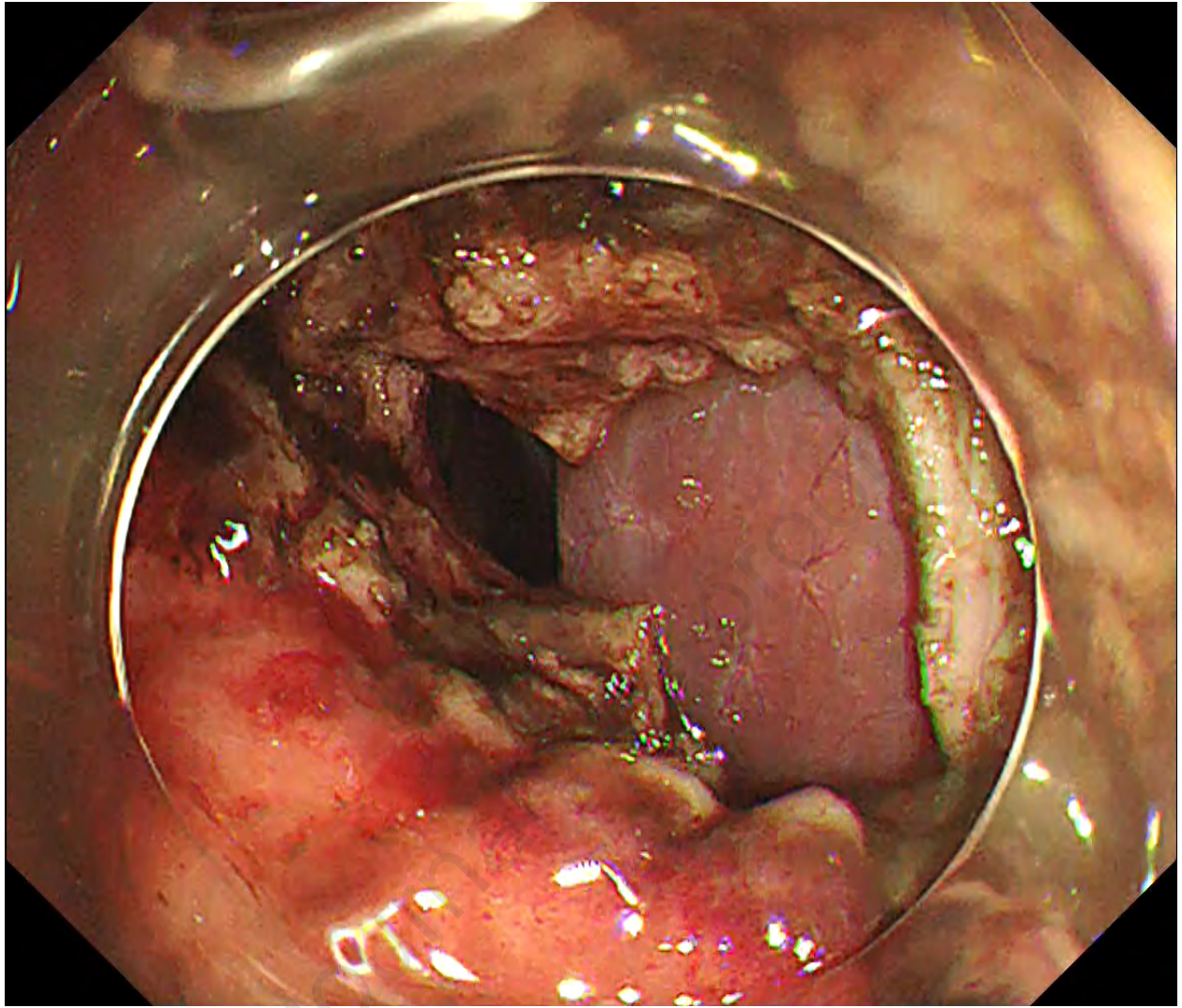
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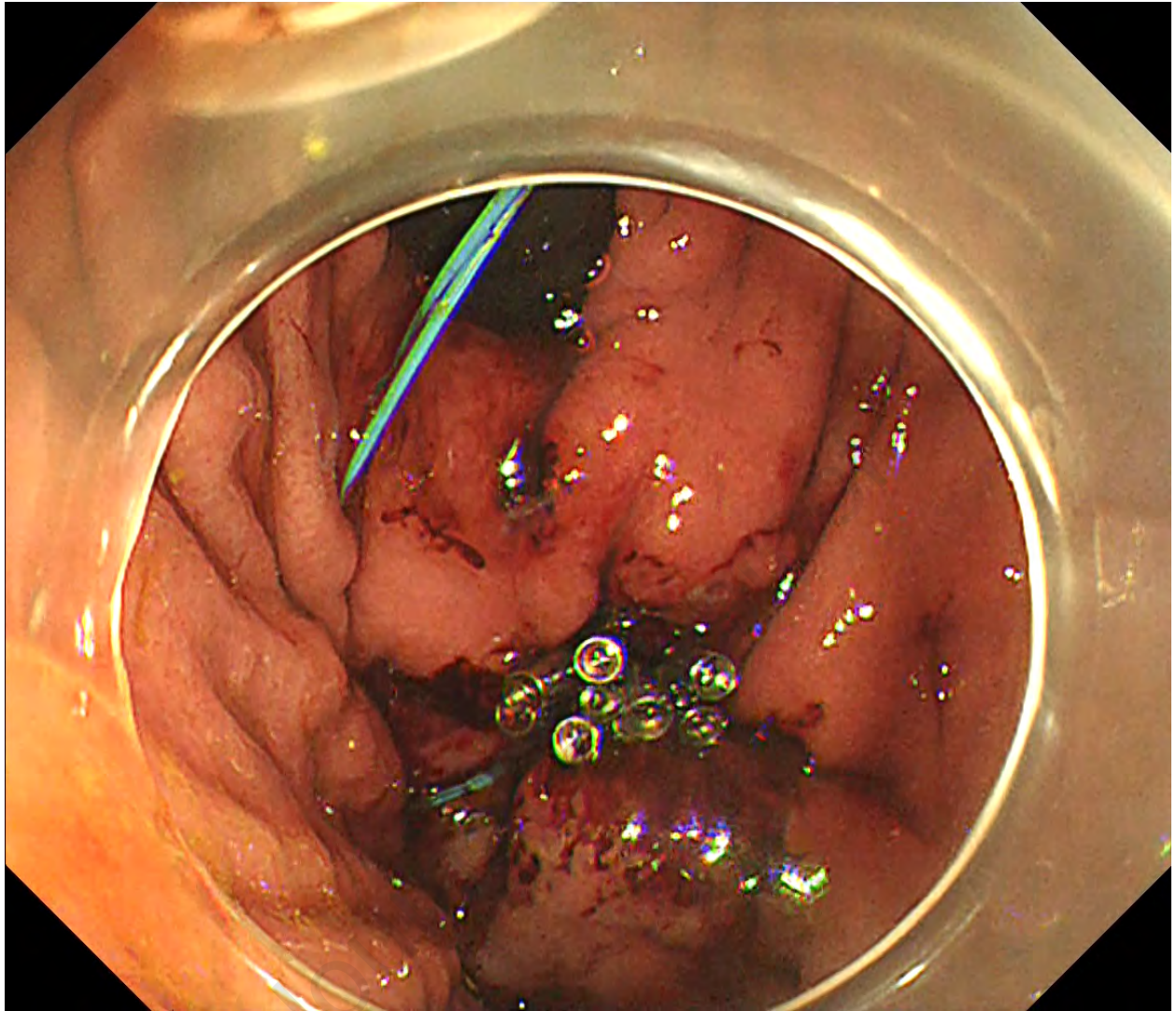


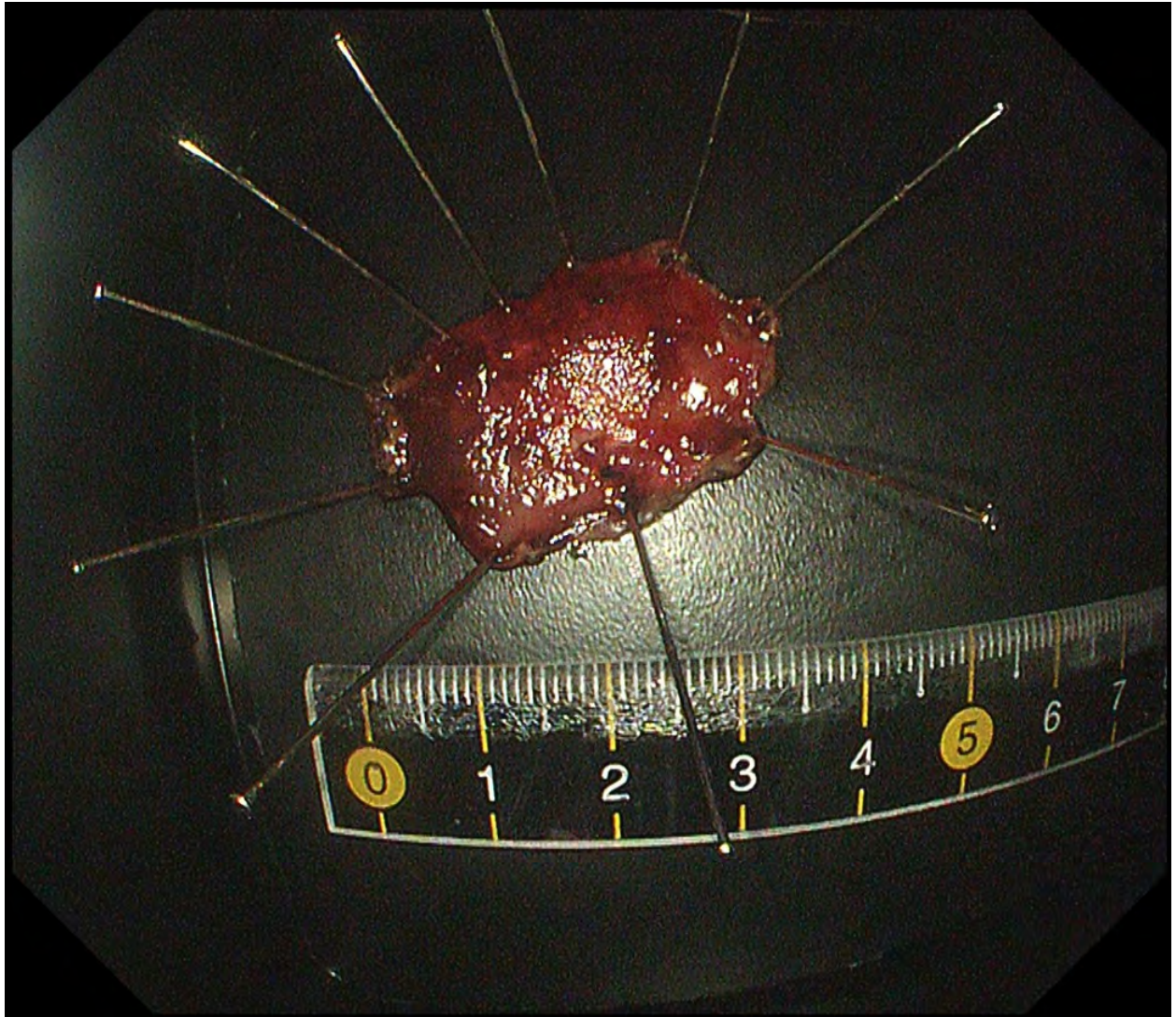


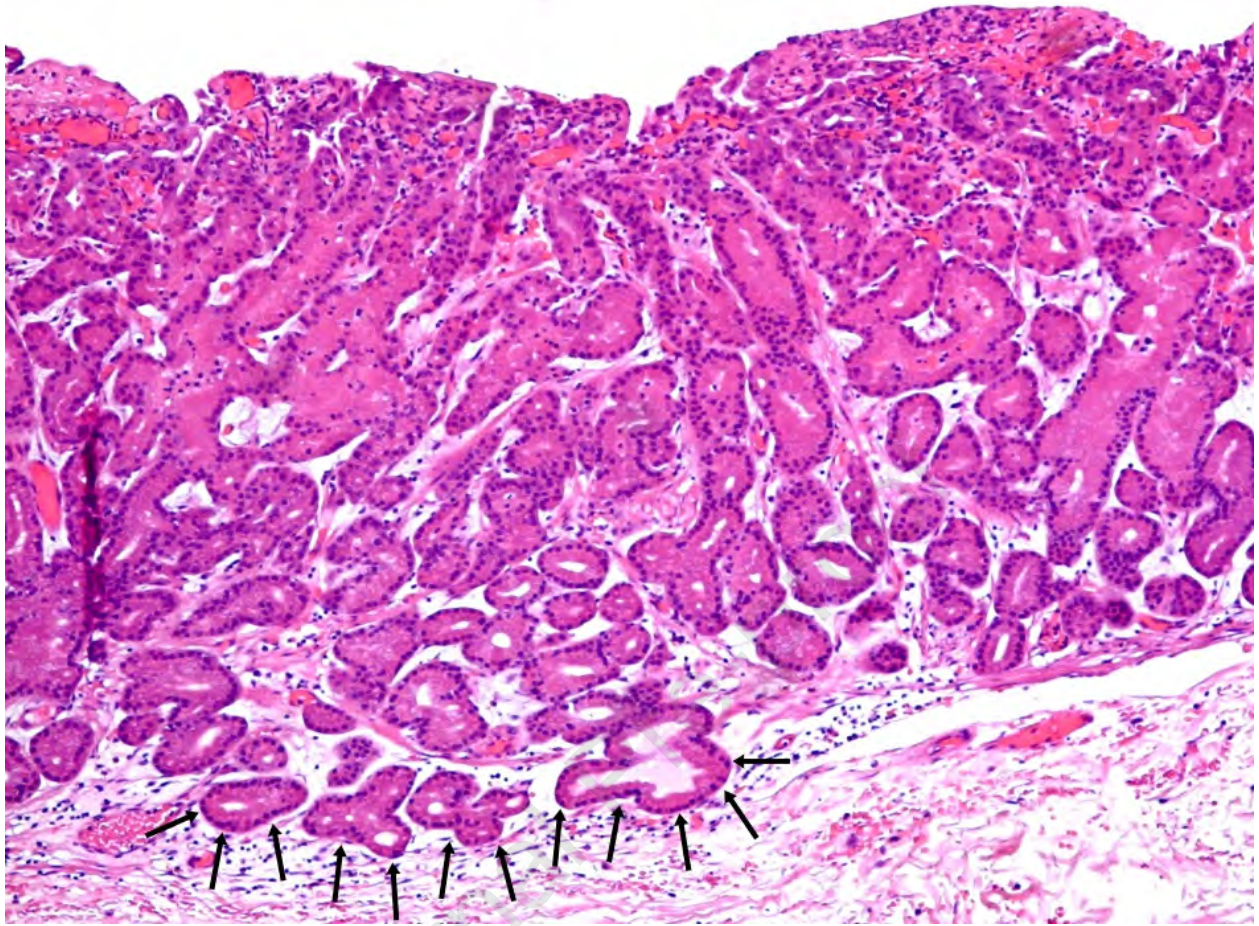
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Abbreviations: ESD, endoscopic submucosal dissection; EFTR, endoscopic full thickness resection; CA, carcinoma; NBI, narrow band imaging; WLI, white light imaging; EGD, esophagogastroduodenoscopy; CT, computer tomography, GA-FG, gastric adenocarcinoma of fundic gland type;

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