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

Markus W. Scheppach, MD,[1,2] Stephen Ka Kei Ng, MD,[1,3] Shelly Ni, MD,[4] Philip Wai Yan Chiu, MD,[1,3] Hon Chi Yip, MD[1,3]

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

Upon repeated examination, a 25-mm, 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 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. A CT scan revealed a 25-mm contrast-enhanced thickening at the gastric fundus without signs of transmural growth or metastasis (Fig. 2).

In consideration of the relatively benign behavior of the GA-FG, endoscopic resection was contemplated (Video 1, available online at www.videogie.org). Endoscopic submucosal dissection was first attempted and started with the patient 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 (Fig. 4).[1] En bloc resection was achieved by conversion from the previously planned endoscopic submucosal dissection to a controlled endoscopic full-thickness

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

Figure 2. CT image of the gastric contrast-enhanced lesion in a sagittal view.

Abbreviations: EFTR, endoscopic full-thickness resection; GA-FG, gastric adenocarcinoma of fundic gland type.

2468-4481
https://doi.org/10.1016/j.vgie.2023.10.004

Institute of Digestive Disease, Faculty of Medicine, Chinese University of Hong Kong, Hong Kong, China (1), Internal Medicine III – Gastroenterology, University Hospital of Augsburg, Augsburg, Germany (2), Department of Surgery, Faculty of Medicine, Chinese University of Hong Kong, Hong Kong, China (3), Department of Anatomical Pathology, Prince of Wales Hospital, Hong Kong, China (4).

Reprint requests: Hon Chi Yip, MD. E-mail: hcyip@surgery.cuhk.edu.hk.

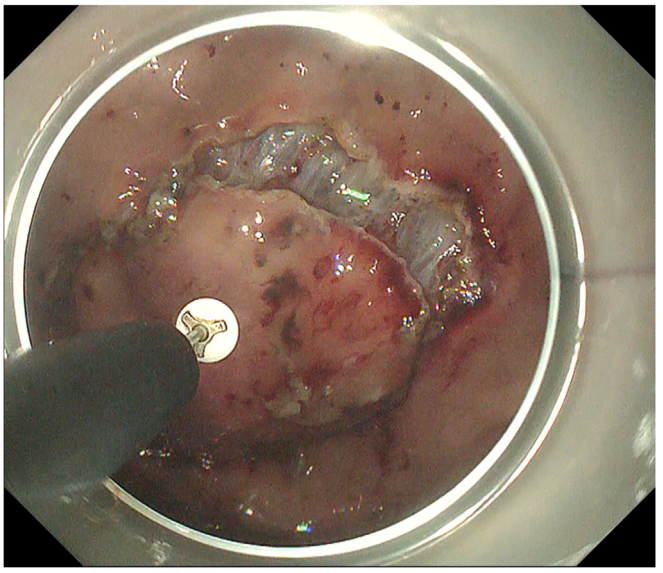

Figure 3. Endoscopic view during resection: circumferential incision using a blade-type knife with an insulated tip (IT2, Insulated Tip Knife 2; Olympus Medical Corporation, Tokyo, Japan).

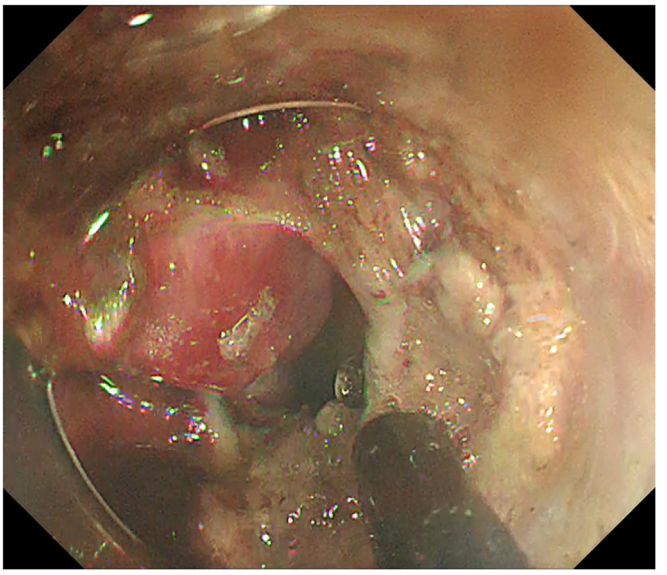

Figure 5. Endoscopic view during resection: controlled full-thickness dissection using the insulated-tip knife (IT2, Insulated Tip Knife 2; Olympus Medical Corporation, Tokyo, Japan).

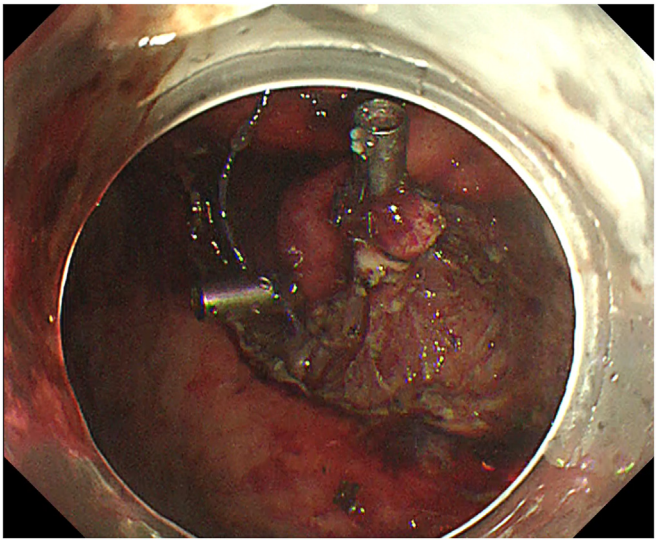

Figure 4. Endoscopic view during resection: application of 2 clip-and-line traction devices for improved exposure of the fibrous submucosal layer.

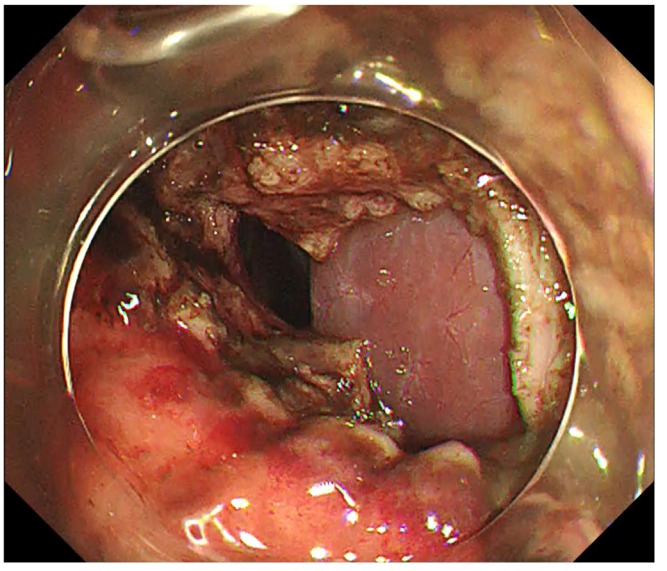

Figure 6. Endoscopic view during resection: inspection of the full-thickness resection defect with view of the peritoneal cavity and the liver.

resection (EFTR) (Figs. 5 and 6). Use of an insulated-tip knife (IT2, Insulated Tip Knife 2; Olympus Medical Corporation) 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. Carbon dioxide insufflation was used for the entire procedure. Despite inevitable gas leakage toward the peritoneum, the patient was continuously hemodynamically respiratorily stable under general anaesthesia. The EFTR defect was subsequently closed via the clip-and-loop technique (Fig. 7).[2] Partial insertion of the loop via one of the 2 working channels followed by subsequent attachment to the resection margins by through-the-scope clips 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 a GA-FG with a submucosal invasion depth of 250 μm, absence of lymphovascular invasion, and negative resection margins (T1bSM1, $Ly^{(-)}$, $V^{(-)}$, HM0, VM0) (Figs. 8 and 9). Submucosal fibrosis was not detected histologically. Thus,

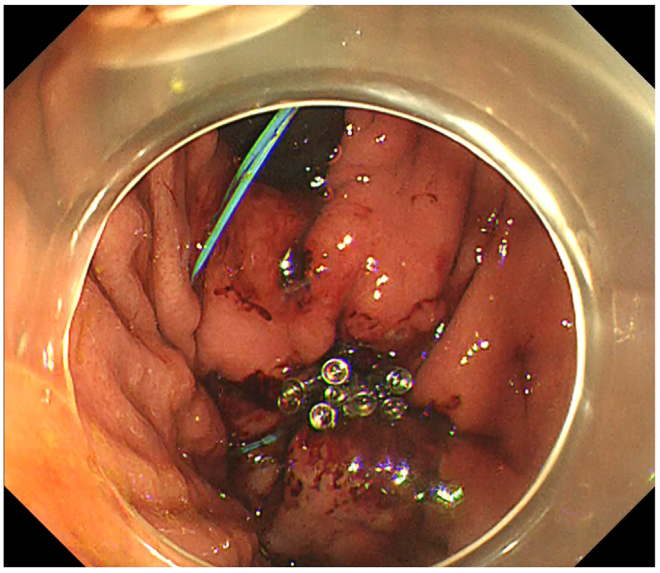

Figure 7. Endoscopic view after resection: completed closure of the defect via the clip-and-loop technique.

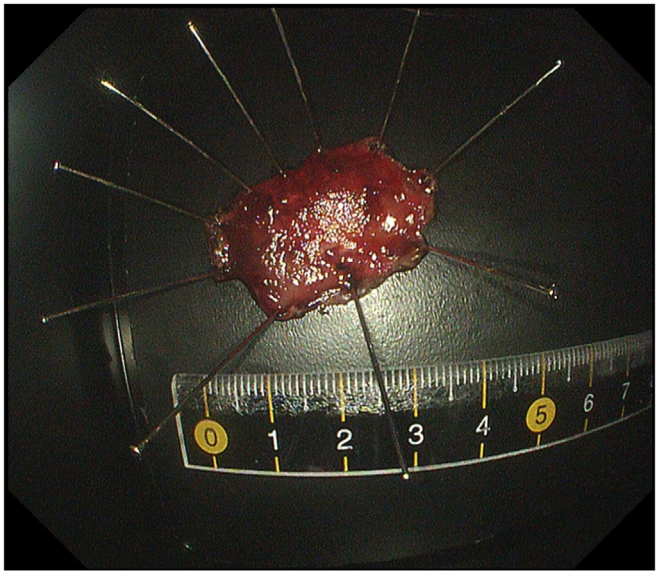

Figure 8. Pinned intact full-thickness resection specimen, macroscopically showing no sign of transmural growth.

curative resection of this lesion was achieved by EFTR. A positron emission tomography CT scan and EGD 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

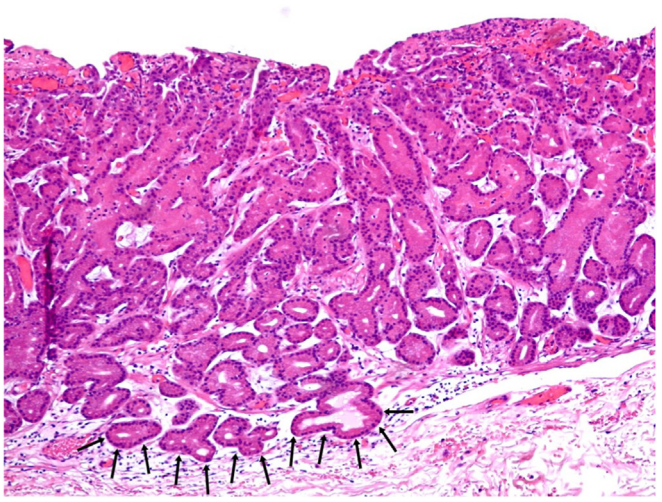

Figure 9. Histology image of the resected specimen in H&E staining with 10× magnification of the submucosal invasion area: adenocarcinoma of the fundic gland-type features with closely packed glandular proliferation forming irregular tubular, branching, and anastomotic glands with submucosal invasion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

submucosal invasion.[4,5] While additional research into this rare entity is required 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 muscle layers.

DISCLOSURE

Dr Wai-yan Chiu is a board member of Cornerstone Robotics, a scientific advisor for Endomaster Pte Ptd, a research collaborator for Boston Scientific Co Ltd, and a research grant recipient of Olympus Co Ltd. All other authors disclosed no financial relationships relevant to this publication.

REFERENCES

1. Abe S, Wu SYS, Ego M, et al. Efficacy of current traction techniques for endoscopic submucosal dissection. Gut Liver 2020;14:673-84.
2. Shiotsuki K, Takizawa K, Notsu A, et al. Endoloop closure following gastric endoscopic submucosal dissection to prevent delayed bleeding in patients receiving antithrombotic therapy. Scand J Gastroenterol 2021;56:1117-25.
3. Pimentel-Nunes P, Libânio D, Bastiaansen BAJ, et al. Endoscopic submucosal dissection for superficial gastrointestinal lesions: European Society of Gastrointestinal Endoscopy (ESGE) guideline - update 2022. Endoscopy 2022;54:591-622.
4. Benedict MA, Lauwers GY, Jain D. Gastric adenocarcinoma of the fundic gland type: update and literature review. Am J Clin Pathol 2018;149:461-73.
5. Ueyama H, Yao T, Akazawa Y, et al. Gastric epithelial neoplasm of fundic-gland mucosa lineage: proposal for a new classification in association with gastric adenocarcinoma of fundic-gland type. J Gastroenterol 2021;56:814-28.