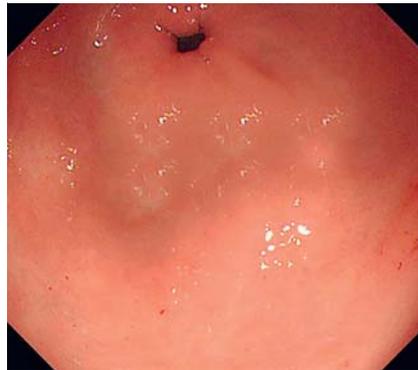


Endoscopic extraction of a gastric submucosal foreign body after precise location with endoscopic ultrasound combined with endoscopic submucosal dissection

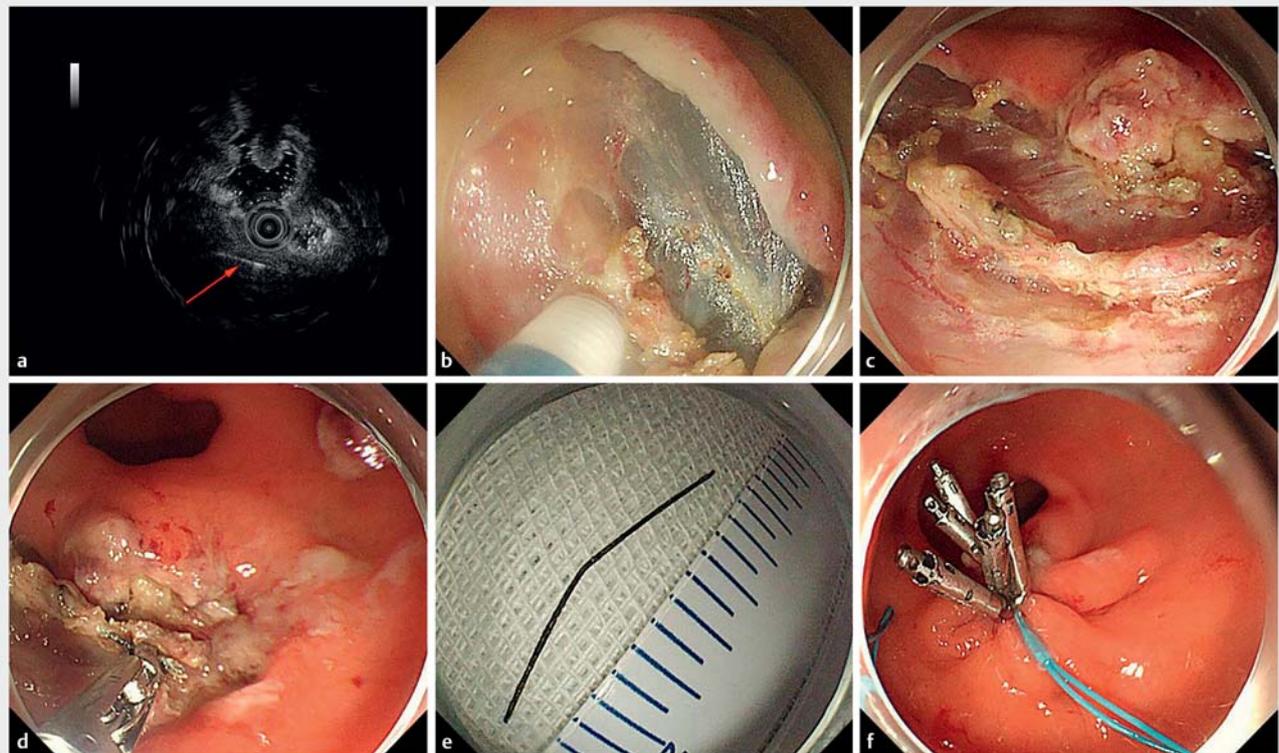


► **Fig. 1** Computed tomography scan showing an 18-mm high density shadow in the gastric antrum (red arrow), consistent with suspected penetration of the gastric wall.

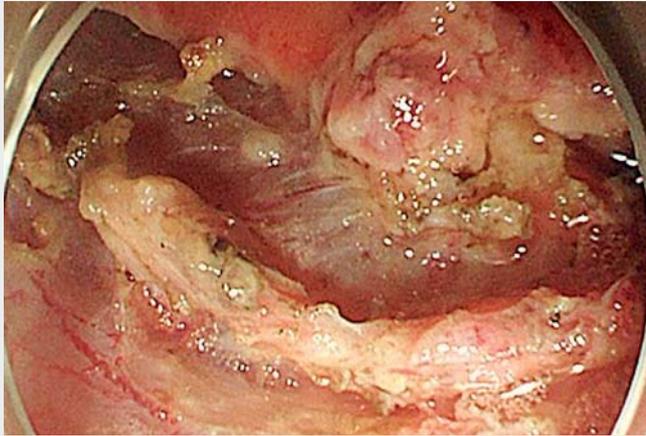


► **Fig. 2** Gastroscopic image showing no obvious foreign body and no evidence of mucosal damage or bleeding.

A 34-year-old woman was referred to the emergency department of our hospital with persistent epigastric pain for 2 days. Abdominal computed tomography (CT) scanning showed an 18-mm high density shadow in the gastric antrum, consistent with suspected penetration of the gastric wall (► **Fig. 1**). Gastroscopy however showed no obvious foreign body (► **Fig. 2**). The patient was still suffering from abdominal pain. We speculated that a foreign body might have completely imbedded into the submucosa or even the gastric serosal layer, which would make it more difficult to detect.



► **Fig. 3** Images from the procedure showing: **a** a cordlike hyperechoic shadow in the submucosa of the gastric antrum (red arrow) being precisely located and marked using endoscopic ultrasound; **b–d** endoscopic images of: **b** the submucosa and muscularis being carefully separated with a FlushKnife; **c** an iron wire that was deeply imbedded in the muscularis; **d** the iron wire being carefully clamped with a foreign body forceps; **e** a photograph of the iron wire foreign body after its successful removal; **f** endoscopic appearance of the wound after closure with endoscopic clips.



▶ Video 1 Endoscopic extraction of a gastric submucosal foreign body after its precise location using endoscopic ultrasound combined with endoscopic submucosal dissection.

We therefore proceeded to endoscopic ultrasound (EUS) and found a cordlike hyperechoic shadow in the submucosa of the gastric antrum (▶ **Fig. 3 a**). Because there was a risk of perforation if the foreign body was not removed in a timely fashion, a special endoscopic operation was immediately arranged for the patient.

Endoscopic submucosal dissection (ESD) is regarded as a common treatment for complete resection of early gastrointestinal neoplasms [1]. ESD-assisted removal of a submucosal foreign body in the stomach has rarely been reported [2]. After the lesion had been precisely located and marked using EUS, the submucosa and muscularis were carefully separated with a FlushKnife (Fujifilm) (▶ **Fig. 3 b**) and an iron wire was discovered that was deeply imbedded into the muscularis (▶ **Fig. 3 c**). The iron wire was carefully clamped with a foreign body forceps (Olympus) and gently pulled out (▶ **Fig. 3 d, e**; ▶ **Video 1**). The wound was closed with endoscopic clips and no bleeding was observed (▶ **Fig. 3 f**). The patient was discharged from hospital after 2 days of observation.

Buried submucosal foreign bodies in the stomach, although very rare, can cause serious complications. Endoscopic extraction of a gastric submucosal foreign

body with precise location by EUS combined with ESD is safe and avoided the risks of major surgery, thereby minimizing trauma and economic losses.

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Competing interests

The authors declare that they have no conflict of interest.

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