

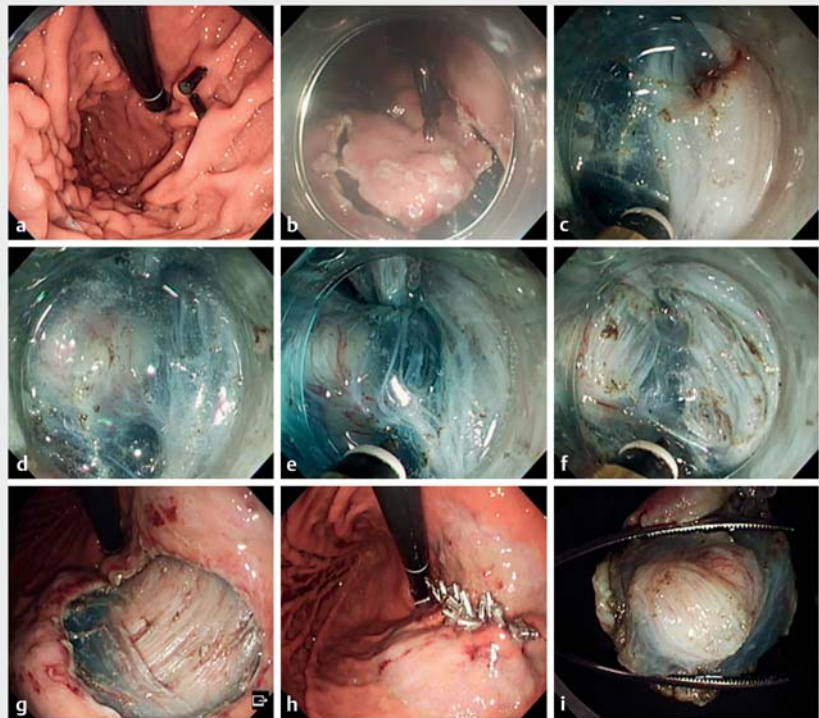
Gastric endoscopic muscularis dissection using a partial intramuscular injection technique

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Diagnostic techniques for a gastrointestinal stromal tumor (GIST) by endoscopic biopsy have recently improved, and endoscopic muscularis dissection (EMD) for smaller GISTs is widely performed [1, 2]. However, it is difficult to resect only the superficial layer of the muscularis propria without damaging the capsule of a GIST [3]. We introduce a technique to perform EMD by partially injecting a highly viscous solution into the superficial layer of the muscularis propria using an injection knife.

The injection knife (TechKnife T-type; Micro-Tech, Nanjing, China) has a tip with a luminal diameter of 0.15 mm. For submucosal injection, a 0.4% sodium hyaluronate solution (MucoUp; Seikagaku, Tokyo, Japan) with 0.004% indigo carmine was used (► Fig. 1, ► Video 1).

A patient had a 15-mm subepithelial tumor in the lesser curvature of the upper gastric body. A boring biopsy revealed the mass to be a GIST, which was resected en bloc using EMD. A circumferential mucosal incision was made around the tumor, and the submucosa was dissected just above the muscularis propria from the oral side. The tumor was identified in the submucosa, and an adhesion between the muscularis propria and the mass was visualized. An injection knife was used to infuse sodium hyaluronate solution into the muscularis propria, resulting in a bulge in its superficial layers. Thus, the fibers of the muscularis propria were dissected. The superficial layer was effectively separated from the tumor in the muscularis propria. The tumor was completely resected without perforation, and the mucosa-muscularis propria defect was closed using the reopenable clip over the line method [4, 5]. The patient was discharged without any complications. Macroscopic specimens revealed thin fibers of muscle overlying the tumor capsule.



► **Fig. 1** Endoscopic muscularis dissection using an injection knife. **a** Clipping after diagnostic boring biopsy. **b** After circumferential mucosal incision. **c** Dissection of the submucosa above the muscularis propria. **d** Site of adhesion between the tumor and the muscularis propria. **e** The injection knife was used to infuse a sodium hyaluronate solution into the superficial muscularis propria, resulting in the bulging of the muscularis propria. **f** After cutting through the superficial layer of muscle on the tumor side. **g** Mucosa-muscular layer defect after partial dissection of the superficial muscular layer. **h** Mucosal defect after complete closure with a reopenable clip. **i** Completely resected tumor and superficial muscular layer overlying the tumor capsule.

The injection knife allows partial injection of sodium hyaluronate solution into the superficial muscularis propria. The present case emphasizes its utility in isolating GISTs during EMD.

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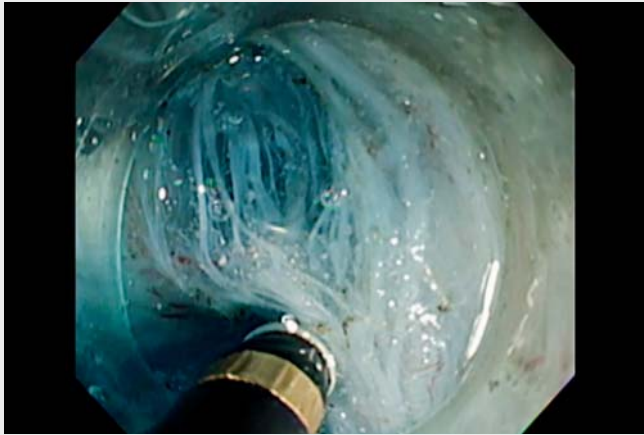
Competing interests

The authors declare that they have no conflict of interest.

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Video 1 Gastric endoscopic muscularis dissection using partial intramuscular injection with an injection knife.

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References

- [1] Liu BR, Song JT, Qu B et al. Endoscopic muscularis dissection for upper gastrointestinal subepithelial tumors originating from the muscularis propria. *Surg Endosc* 2012; 26: 3141–3148
- [2] Kobara H, Mori H, Fujiwara S et al. Bloc biopsy by tunneling method using endo-

scopic submucosal dissection for an upper gastrointestinal submucosal tumor. *Endoscopy* 2012; 44: E197–E198

- [3] Liu F, Zhang S, Ren W et al. The fourth space surgery: endoscopic subserosal dissection for upper gastrointestinal subepithelial tumors originating from the muscularis propria layer. *Surgical Endoscopy* 2018; 32: 2575–2582
- [4] Nomura T, Sugimoto S, Temma T et al. Clip-line closure with the reopenable clip over line method for a large mucosal defect after gastric endoscopic submucosal dissection. *Endoscopy* 2022; 54: E1–E2
- [5] Nomura T, Sugimoto S, Nakamura H et al. Reopenable clip over line method for the closure of full-thickness defect after gastric endoscopic full-thickness resection. *Endoscopy* 2022. doi:10.1055/a-1824-4919

Bibliography

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