

Removal of a large, 40-mm, submucosal leiomyoma using submucosal tunneling endoscopic resection and extraction of specimen using a distal mucosal incision

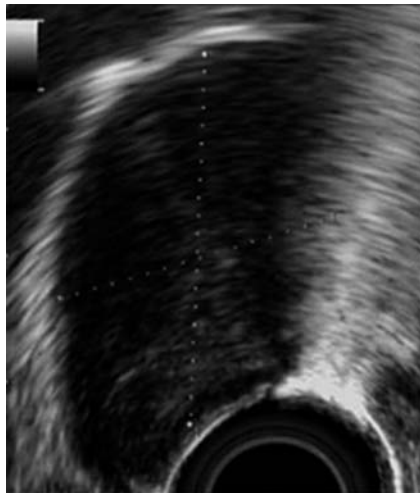


Fig. 1 Endoscopic ultrasound demonstrated a homogeneous hypoechoic mass originating from the muscularis propria.

Submucosal tunneling endoscopic resection (STER) combines the techniques of peroral endoscopic myotomy [1] and endoscopic submucosal dissection for removal of upper gastrointestinal tract submucosal tumors (SMTs). STER has been used for removal of small SMTs below 20 mm with low complication rates [2–4]. This report describes the removal of a large 40-mm esophageal SMT using STER, and describes a novel technique to aid the en bloc extraction of large SMTs during STER. A 57-year-old man presented with dysphagia. Upper endoscopy (Video 1) and endoscopic ultrasound (Fig. 1) confirmed a 40-mm SMT in the mid esophagus. The novel technique used for the removal of the SMT is shown in Fig. 2. A single-channel endoscope with a trans-

parent distal cap attachment was used. Following injection of diluted indigo carmine, a mucosal incision was made using a triangle tip knife, 4 cm proximal to the tumor. A submucosal tunnel was created towards the tumor (Video 2), and peritumoral dissection was accomplished by division of submucosal fibers and attachments (Video 3). After completion of peri-tumoral dissection, removal of the SMT by various endoscopic retrieval devices, including snares and nets, was unsuccessful because of the size of the SMT and the limited working space available within the submucosal tunnel (Video 4). A novel second distal mucosal incision technique was performed for en bloc removal of the resected specimen, as illustrated in Fig. 3. A submucosal tunnel was created 4 cm distal to the tumor, and a mucosal incision was made from within the submucosal tunnel (Video 4). The SMT was then pushed using the endoscope from the submucosal tunnel into the true lumen of the distal esophagus and into the stomach through the distal mucosal incision. With adequate working space in the stomach, a net could be deployed easily over the SMT, and the SMT was retrieved.

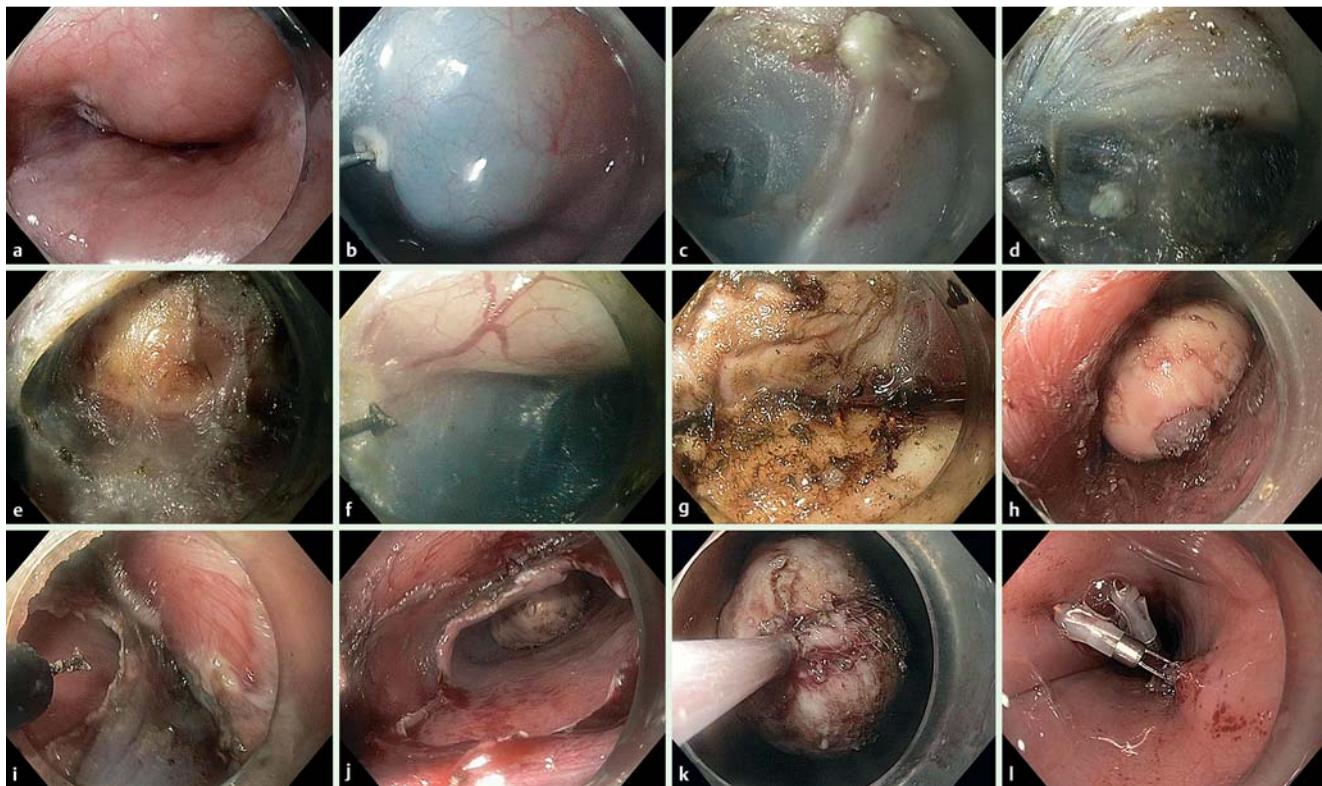


Fig. 2 Case illustration of the submucosal tunneling endoscopic resection technique and distal mucosal incision technique. **a** The submucosal tumor (SMT), located at 29–33 cm from the incisors. **b** A mucosal incision was made 4 cm proximal to the SMT. **c–e** A submucosal tunnel was created toward the SMT. **f–h** Peri-tumoral dissection was performed to free the SMT. **i** A mucosal incision was made distal to the tumor from within the submucosal tunnel. **j** The tumor was pushed through the distal mucosal incision into the true lumen of the distal esophagus and proximal stomach using the endoscope. **k** Retrieval of the tumor from the proximal stomach using a Roth net. **l** Closure of the distal and proximal mucosal defects with endoscopic clips.

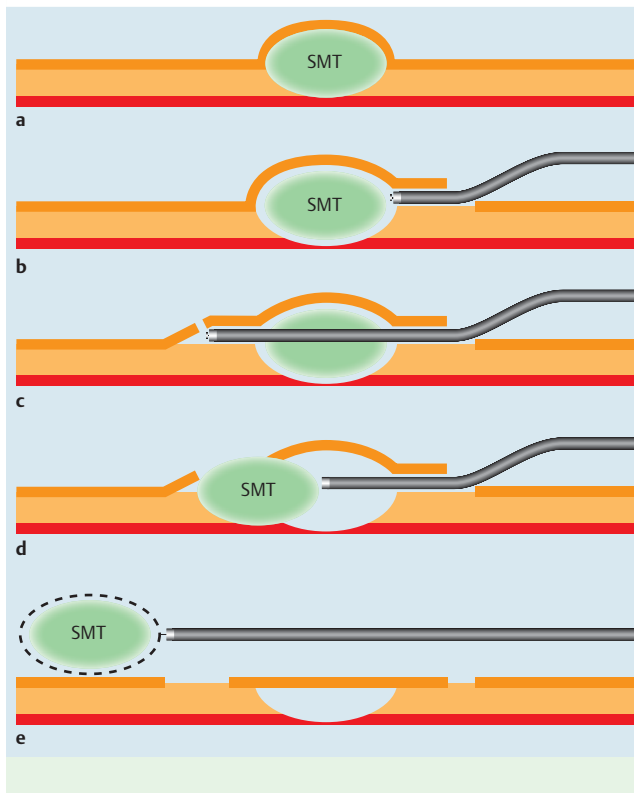


Fig. 3 Schematic of the distal mucosal incision technique. **a** Submucosal tumor (SMT) arising from the submucosal layer of the esophagus. **b** A proximal mucosal incision was made as part of the standard submucosal tunneling endoscopic resection technique. **c** The submucosal tunnel was further developed distal to the SMT after peri-tumoral dissection, and a second mucosal incision was made from within. **d** The SMT was pushed using the endoscope through the distal mucosal incision into the true esophageal lumen. **e** The SMT was retrieved using an endoscopic retrieval device from the true lumen of the esophagus or stomach.



Fig. 4 The resected submucosal tumor was retrieved en bloc, and measured 40 mm in maximal diameter.

The mucosal defects were closed using endoscopic clips and endoloops (▶ **Video 5**). The entire procedure took 245 minutes. The final resected specimen (▶ **Fig. 4**) measured 40 mm, and histopathological examination confirmed a diagnosis of a leiomyoma.

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Competing interests: None

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Video 1

Identification of the submucosal tumor.

Video 2

Development of a submucosal tunnel toward the submucosal tumor.

Video 3

Peri-tumoral dissection within the submucosal tunnel.

Video 4

Distal mucosal incision and tumor retrieval.

Video 5

Closure of the mucosal incisions.

References

- 1 Inoue H, Minami H, Kobayashi Y et al. Peroral endoscopic myotomy (POEM) for esophageal achalasia. *Endoscopy* 2010; 42: 265–271
- 2 Ye LP, Zhang Y, Mao XL et al. Submucosal tunneling endoscopic resection for small upper gastrointestinal subepithelial tumors originating from the muscularis propria layer. *Surg Endosc* 2014; 28: 524–530
- 3 Liu BR, Song JT, Kong LJ et al. Tunneling endoscopic muscularis dissection for subepithelial tumors originating from the muscularis propria of the esophagus and gastric cardia. *Surg Endosc* 2013; 27: 4354–4359
- 4 Xu MD, Cai MY, Zhou PH et al. Submucosal tunneling endoscopic resection: a new technique for treating upper GI submucosal tumors originating from the muscularis propria layer (with videos). *Gastrointest Endosc* 2012; 75: 195–199

Bibliography

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