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Retrograde navigational tunnel technique in peroral endoscopic myotomy for sigmoid-type achalasia

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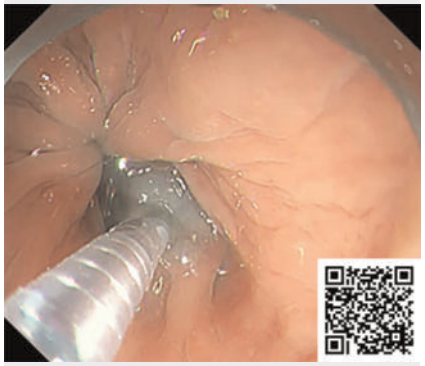
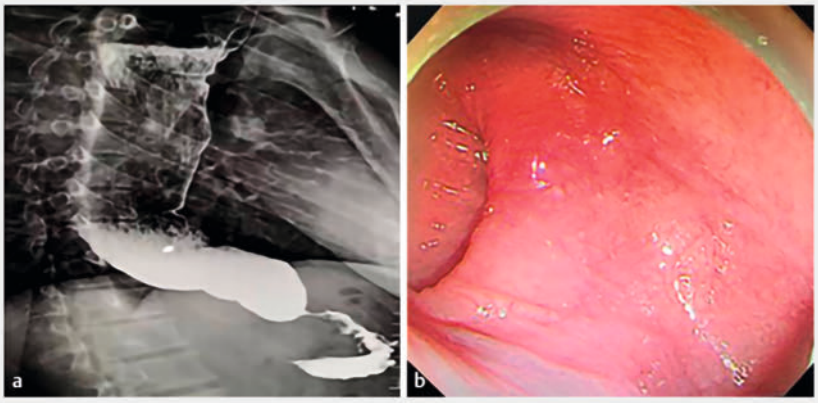
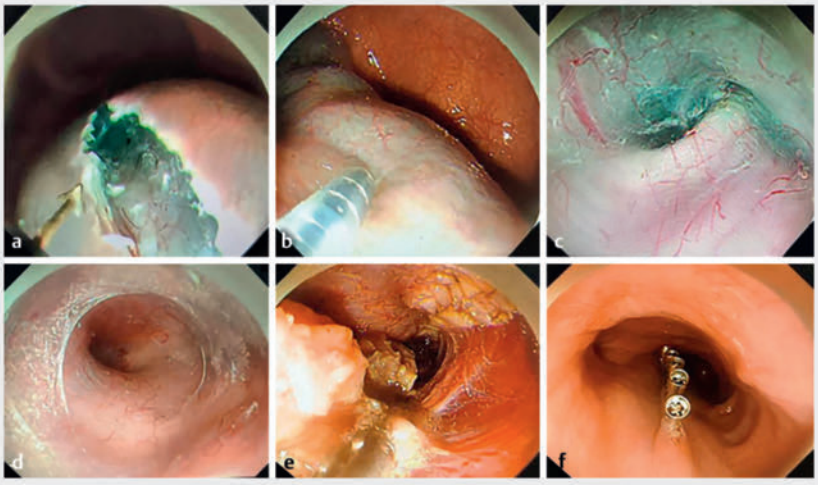


Video 1 The navigational tunnel technique is used during peroral endoscopic myotomy for a patient with sigmoid-type achalasia.



▶ **Fig. 1** The appearance of sigmoid-type achalasia on: **a** barium swallow, showing a diffusely dilated esophagus with a beak-like appearance at the lower end of the cardia; **b** endoscopic view, showing sigmoid contortion of the lower esophagus and closed cardia.



▶ **Fig. 2** Endoscopic images during the treatment of sigmoid-type achalasia by the navigational tunnel technique for peroral endoscopic myotomy showing: **a** the established tunnel entrance; **b** submucosal injection being performed in retrograde fashion from the cardia to the tunnel entrance; **c** the submucosal dissection navigation route at the flexion; **d** establishment of the submucosal tunnel; **e** incision of the annular and longitudinal muscles; **f** closure of the tunnel entrance with metal clips.

Standard peroral endoscopic myotomy (POEM) techniques are effective for typical achalasia [1–4]; however, limitations are encountered when treating the sigmoid type owing to its complex anatomy. Here, we introduce a novel retrograde navigational tunnel technique in POEM that aims to address these challenges.

A 31-year-old man was admitted to our hospital with a history of postprandial choking sensations for 5 years. Upon admission, a barium meal showed that the esophagus was diffusely dilated with a beak-like appearance at the lower end of the cardia (▶ **Fig. 1 a**). We chose to perform POEM after undertaking multidisciplinary consultation and obtaining consent from the patient (▶ **Video 1**). The procedure was performed with the patient under general anesthesia with endotracheal intubation. A triangular knife was used throughout the surgical procedure. The lower end of the esophagus exhibited a sigmoid contortion and the cardia was seen to be closed (▶ **Fig. 1 b**). First, a submucosal injection was administered 30 cm from the incisors to establish the tunnel entrance (▶ **Fig. 2 a**). Second, a retrograde submucosal injection was performed from the cardia to the tunnel entrance (▶ **Fig. 2 b**). Third, submucosal dissection was performed in the tunnel to navigate from the entrance to 3 cm below the cardia (▶ **Fig. 2 c, d**). Both the annular and longitudinal muscles were incised in the tunnel (▶ **Fig. 2 e**). Hemostasis was achieved using hot forceps, and the tunnel entrance was closed with metal clamps (▶ **Fig. 2 f**). The opera-

tion was successfully completed in 47 minutes, without any complications being experienced.

Postoperatively, the patient was fasted and given anti-infection therapy; he was discharged 3 days after the surgery. At 12-month follow-up, the patient had had no recurrence of his choking after eating.

The retrograde navigational tunnel technique in POEM for sigmoid-type achalasia offers two major advantages: (i) reduced surgical time because of continuous submucosal injection; (ii) enhanced accuracy in tunnel navigation, minimizing disorientation during submucosal stripping. In conclusion, the retrograde navigational tunnel technique in POEM is a viable and effective approach for the treatment of sigmoid-type achalasia.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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