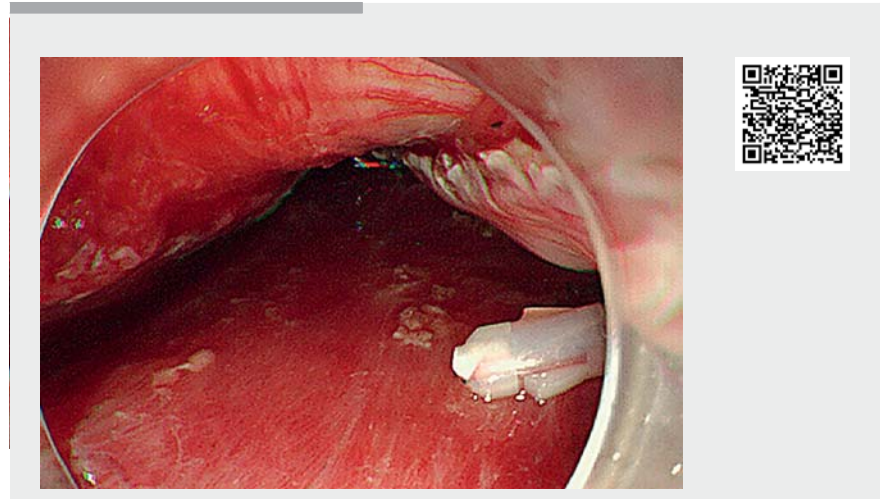


Esophageal muscle layer tear during endoscopic submucosal dissection treated by polyglycolic acid sheets and fibrin glue

An 88-year-old woman was referred to our hospital because of esophageal squamous cell carcinoma that had been detected by esophagogastroduodenoscopy. Computed tomography (CT) showed no abnormalities. Endoscopy revealed a half-circumferential, subtle, reddish lesion on the left side of the middle esophagus (▶ **Video 1**). Chromoendoscopy with iodine dye made the lesion clear as an unstained area (▶ **Fig. 1**). Endoscopic submucosal dissection (ESD) with carbon dioxide insufflation was performed. During the ESD procedure, massive gas insufflations were repeated many times because of poor endoscopic view. When en bloc resection was completed, endoscopy revealed a proper muscle layer tear on the anterior side of the ESD ulcer, and the epicardium was seen through the muscle layer tear (▶ **Fig. 2**, arrows). Massive gas insufflation may cause blunt injury to muscle tissue. By using a grasping forceps, a total of ten 1 cm × 1 cm polyglycolic acid (PGA) sheets were delivered to the site and attached by fibrin glue (▶ **Fig. 3** and ▶ **Fig. 4**). In addition, CT showed free air and fluid collection in the mediastinum. Therefore, we administered antibiotics as well as continuous esophageal suction by a nasogastric tube for 1 week. The lesion had been resected completely, and histological examination revealed squamous cell carcinoma confined to the lamina propria mucosae. Periodic endoscopic examinations showed the healing course of the post-ESD ulcer. The ulcer healed completely without signs of cancer recurrence at 10 weeks post-ESD (▶ **Fig. 5**).

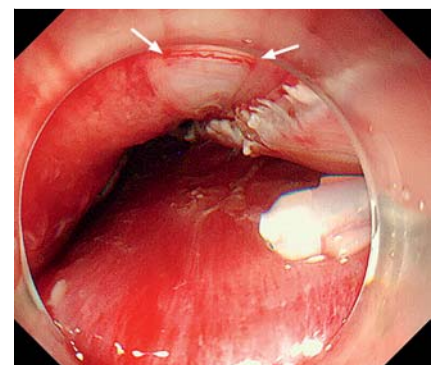
Perforation is one of the major complications of ESD [1]. A proper muscle layer tear might be considered the same as a perforation in Boerhaave syndrome, which results in a sudden increase in intraesophageal pressure [2]. PGA sheets are used in endoscopic techniques for



▶ **Video 1** Esophageal muscle layer tear during endoscopic submucosal dissection (ESD) treated with polyglycolic acid (PGA) sheets and fibrin glue endoscopically.



▶ **Fig. 1** Chromoendoscopy with iodine dye showed a half-circumferential, unstained lesion on the left side of the middle esophagus.



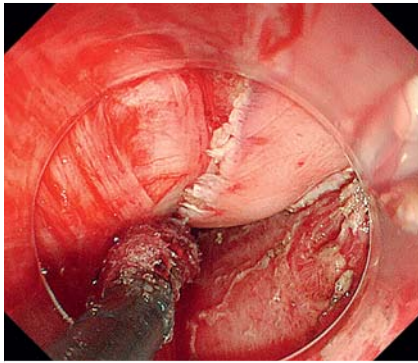
▶ **Fig. 2** Endoscopy revealed a proper muscle layer tear (arrows) on the anterior side of the ulcer after endoscopic submucosal dissection (ESD), and the epicardium was seen through the thin submucosa.

the closure of gastrointestinal perforations [3–5]. In the current case, the mucosal and muscular defect after esophageal ESD was treated with PGA sheets and fibrin glue.

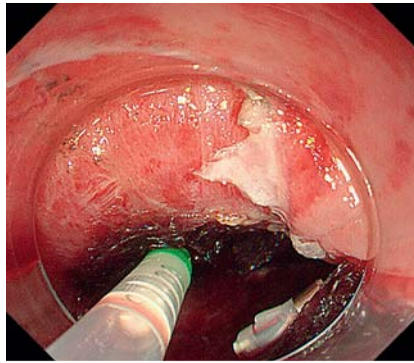
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Competing interests

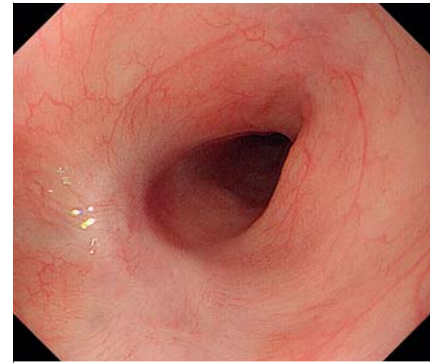
The authors declare that they have no conflict of interest.



► **Fig. 3** By using a grasping forceps, 1 cm × 1 cm polyglycolic acid (PGA) sheets were delivered to the site.



► **Fig. 4** A total of ten PGA sheets were attached on the mucosal and muscular defect, and then fibrin glue was applied endoscopically.



► **Fig. 5** Endoscopic view of the post-ESD site at 10 weeks after ESD. The ulcer had healed completely without signs of cancer recurrence.

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