

Histological findings of divided muscle after peroral endoscopic myotomy

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Abstract

Peroral endoscopic myotomy (POEM) is a revolutionary therapy for achalasia and related disorders. POEM utilizes almost the same myotomy procedure as the Heller myotomy; thus, it would be expected to have the same or greater duration of therapeutic effect. However, to date, there have been no reports to prove the basis for this procedure in achalasia. In this case, we were able to histologically show the divided muscle after POEM since the patient had an esophagectomy for esophageal cancer. Histology showed that the muscle tissue divided by the POEM procedure was completely replaced by fibrosis. These findings may indirectly show the permanence of the POEM procedure.

Keywords Fibrosis, achalasia, peroral endoscopic myotomy

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Introduction

Peroral endoscopic myotomy (POEM) is a revolutionary therapy, reported in 2008 by Inoue *et al* [1], that has gained increasing popularity for the treatment of achalasia and related disorders [2,3]. POEM utilizes almost the same myotomy procedure as the Heller myotomy; thus, it would be expected to have the same or greater duration of therapeutic effect. However, to date, there have been no reports to prove the basis for this procedure in achalasia. In the case herein presented, we were able to histologically show divided muscle after POEM since the patient had an esophagectomy for esophageal cancer.

Case report

A 51-year-old male presented with the chief complaint of dysphagia for over 30 years. Eight years ago, the patient was

diagnosed with esophageal achalasia, and balloon dilation was performed several times in a previous hospital, but it was not effective. Endoscopic findings before POEM showed a narrow esophagus in the lower esophageal sphincter (LES) region and severe circumferential esophagitis in the esophageal body due to stasis. In addition, there was a slightly depressed, reddish lesion suspected to be cancerous in the mid-thoracic esophagus. Histological diagnosis of the biopsy specimen prior to POEM was esophagitis (non-cancerous part) (Fig. 1A). However, early esophageal cancer was highly suspected. We expected secure diagnosis of the lesion by reducing the inflammation of esophageal mucosa by the POEM procedure. Thus, we performed myotomy from the distal side of the lesion, and the patient planned to undergo endoscopic submucosal dissection (ESD) procedure after POEM. We selected a posterior method for POEM, as there was severe scarring on anterior wall in the lower esophagus. During the POEM procedure, it was very difficult to create the submucosal tunnel because the mucosa adhered to the muscles (Fig. 1B). Therefore, we inserted an endoscope into the extraesophageal space through a tear in the musculature (Fig. 1C). Both the inner circular muscle and longitudinal muscles were pulled and divided carefully using a Triangle Tip knife to prevent mucosal damage outside of the esophagus (Fig. 1D). The total length of myotomy was 8 cm (the gastric side was 1 cm).

After POEM, LES opened and patient's dysphagia improved. Endoscopic findings 3 months after POEM showed that the esophagitis had improved to mild. The reddish lesion in mid-thoracic esophagus was histologically diagnosed as cancer by repeat biopsy at that time. Intra-mucosal cancer was suspected based on the endoscopic appearance. It is difficult

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Conflict of Interest: None

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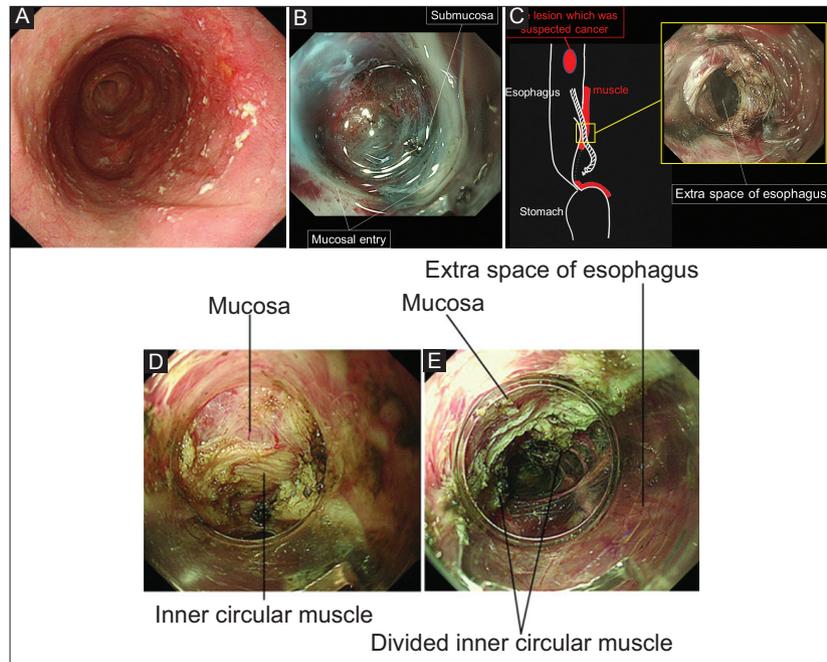


Figure 1 The endoscopic findings before and during peroral endoscopic myotomy (POEM): (A) The endoscopic findings before POEM. A slightly depressed, reddish lesion was visible in the mid-thoracic esophagus. (B) The endoscopic findings during POEM. There is severe fibrosis in the submucosal space. (C) The cracked part of the muscles. (D,E) Myotomy from extraesophageal space

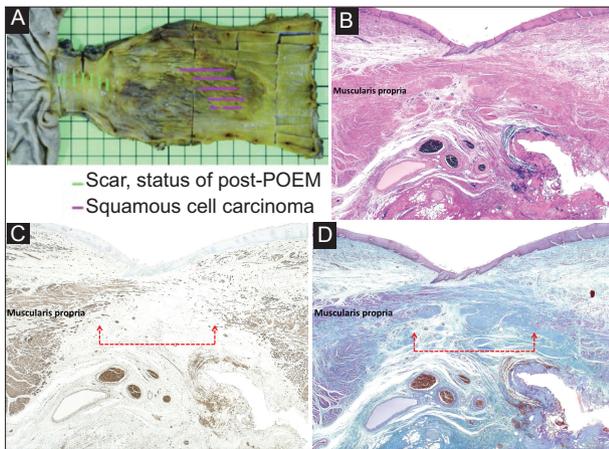


Figure 2 The histopathological findings of the resected specimen: (A) The macroscopic appearance of the resected specimen. The area occupied by the intramucosal carcinoma was ill-defined in the mid-thoracic esophagus. The scar was located in the lower esophagus. The red and green lines indicate the intramucosal squamous cell carcinoma and scar, respectively. (B) The histologic appearance of the muscularis propria divided by the peroral endoscopic myotomy (POEM) procedure (hematoxylin and eosin staining). (C) Desmin immunostaining demonstrates the muscularis propria, partially removed by the POEM procedure. The area of myotomy by POEM is between the arrows. (D) Masson-trichrome staining demonstrates the muscularis propria, replaced with dense fibrous tissue. The area of myotomy by POEM is demarcated between the arrows

to take specimens by ESD for accurate pathological diagnosis when there is severe fibrosis in the submucosal space. As this was revealed in our patient during the POEM procedure, the

patient instead underwent an esophagectomy (after informed consent). There were two main histological findings: first, intramucosal cancer; and second, the muscle tissue that had been divided by the POEM procedure was replaced with fibrotic tissue (Fig. 2 A,B,C,D).

Discussion

Histological findings of the part divided by POEM procedure are unknown. In this case, we were able to histologically show the divided muscle after POEM since the patient had an esophagectomy for esophageal cancer. Since the mucosa adhered to the muscles, the dilatation of divided muscle was narrow. However, histology showed that the muscle tissue divided by the POEM procedure was completely replaced by fibrosis. These findings may indirectly show the permanence of the POEM procedure.

References

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