



Comparison of peroral endoscopic myotomy and endoscopic balloon dilation for primary treatment of pediatric achalasia



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ABSTRACT

Background: Both peroral endoscopic myotomy (POEM) and endoscopic balloon dilation (EBD) are effective method for pediatric achalasia, however little is known about the comparison between them. Herein we compare the safety and efficacy of them for primary treatment of pediatric achalasia.

Methods: We retrospectively reviewed the medical records of pediatric patients who received POEM or EBD for their primary therapy of achalasia at our hospital from January 2007 to June 2015, they were divided into the POEM group and EBD group. Demographics, and data about safety and efficacy were retrospectively collected and compared between the two groups.

Results: A total of 21 patients (Female/male: 11/10, aged 6 ~ 17 year-old) were enrolled, 12 of them received POEM, while the other 9 received EBD. As for the short-term efficacy, the treatment success (Eckardt score ≤ 3) rate of POEM and EBD 3, 6 and 12 months after the primary treatment were comparable (100% vs 100%, 100% vs 88.9%, 100% vs 66.7%, $P > 0.05$). As for the medium to long-term efficacy, the treatment success rate of POEM 24 and 36 months after the primary treatment was higher than that of EBD (100% vs 44.4%, 100% vs 33.3%, $P < 0.05$). Two cases in the POEM group suffered from esophagitis, and there was no significant difference between POEM and EBD ($P > 0.05$). No severe complications were observed during operation and periodical follow-up.

Conclusions: Short-term efficacy of POEM and EBD for primary treatment of pediatric achalasia was comparable, however POEM could result in a better intermediate and long-term efficacy. Large scale, randomized study is necessary for a confirmed conclusion.

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Achalasia is a rare primary esophageal dysmotility disorder, with an estimated annual incidence of 0.01–0.11 cases per 100,000 children [1,2]. It is characterized by failed relaxation of the lower esophageal sphincter (LES) and absent peristalsis of the distal esophagus. The distinctive symptoms of pediatric achalasia are dysphagia, regurgitation, vomiting, respiratory symptoms (nocturnal cough, aspiration), retrosternal pain, and weight loss [3]. All therapeutic options focus on reducing the pressure gradient across the LES, and this can be achieved by pharmacological agents, endoscopic methods (botulinum toxin injection, balloon dilation, stent insertion) and surgical myotomy (open or laparoscopic) [3]. The optimal management of pediatric achalasia remains unclear, and both endoscopic balloon dilation (EBD) and Heller myotomy (HM) has proved to be safe and effective [4,5].

Peroral endoscopic myotomy (POEM) is a novel technique for treating achalasia and has also shown exciting results in pediatric patients [6–13]. However little is known about the comparison of safety

and efficacy between POEM and EBD for the treatment of pediatric achalasia. In this study, we collected the clinical data of pediatric patients who received POEM or EBD for primary treatment of achalasia to compare the safety and efficacy of the two methods.

1. Patients and methods

1.1. Patient information

This retrospective study was approved by the ethics committee of the Second Xiangya Hospital of Central South University. All the pediatric patients with esophageal achalasia, who underwent endoscopic treatment in our department between January 2007 and June 2015, were retrospectively identified. Demographics, data about the clinical history, presentation, manometry, etc. were retrieved from the medical charts or hospital database. The inclusion criteria for enrollment in the study were as follows: a) achalasia diagnosed by established methods, on the basis of symptoms, esophageal manometry, esophagogastroduodenoscopy (EGD) and barium esophagram; b) patients with an age of less than 18 year-old; c) patients received POEM or EBD as the treatment, and did not receive endoscopic or surgical treatment for achalasia before enrollment. Those patients with

Abbreviation: EBD, Endoscopic balloon dilation; POEM, Peroral endoscopic myotomy; HM, Heller myotomy; LES, Lower esophageal sphincter; EGD, Esophagogastroduodenoscopy; EGJ, Esophagogastric junction.

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severe cardiopulmonary disease or blood coagulation disorders were excluded from the study.

As we did not perform pediatric POEM until October 2011, in the present study, the patients received EBD between January 2007 and October 2011, while the patients received POEM between October 2011 and June 2015. Informed consent was obtained from all their parents before the procedure was performed. All parents were informed of possible adverse events and other possible treatment options.

1.2. POEM procedure

POEM was performed under general anesthesia via tracheal intubation using a standard single-channel endoscopy (GIF-Q260Z; Olympus, Tokyo, Japan) with a transparent cap (D-201-11,802, Olympus)

attached to the front. Carbon dioxide insufflator (UCR, Olympus) was used. The pediatric POEM was began from October 2011, after more than 30 adult POEM procedure were performed. The POEM procedure was performed as previously reported [9]: (1) A submucosal injection was made into the right posterior esophageal wall at 6–10 cm above esophagogastric junction (EGJ), the distance from EGJ was determined by the length of esophagus, which is influenced by the age and height of the child. (2) A 2–3 cm longitudinal mucosal incision was made to create tunnel entry. (3) A submucosal tunnel was created, passing over the EGJ, and about 3 cm into the proximal stomach. (4) Myotomy was started from 2 to 3 cm below tunnel entry. Seven patients received circular myotomy alone while another five received full-thickness myotomy at about 3 cm above EGJ and 3 cm below EGJ. (5) Several metal clips were applied to close mucosal entry. Fig. 1 describes the procedure of POEM.

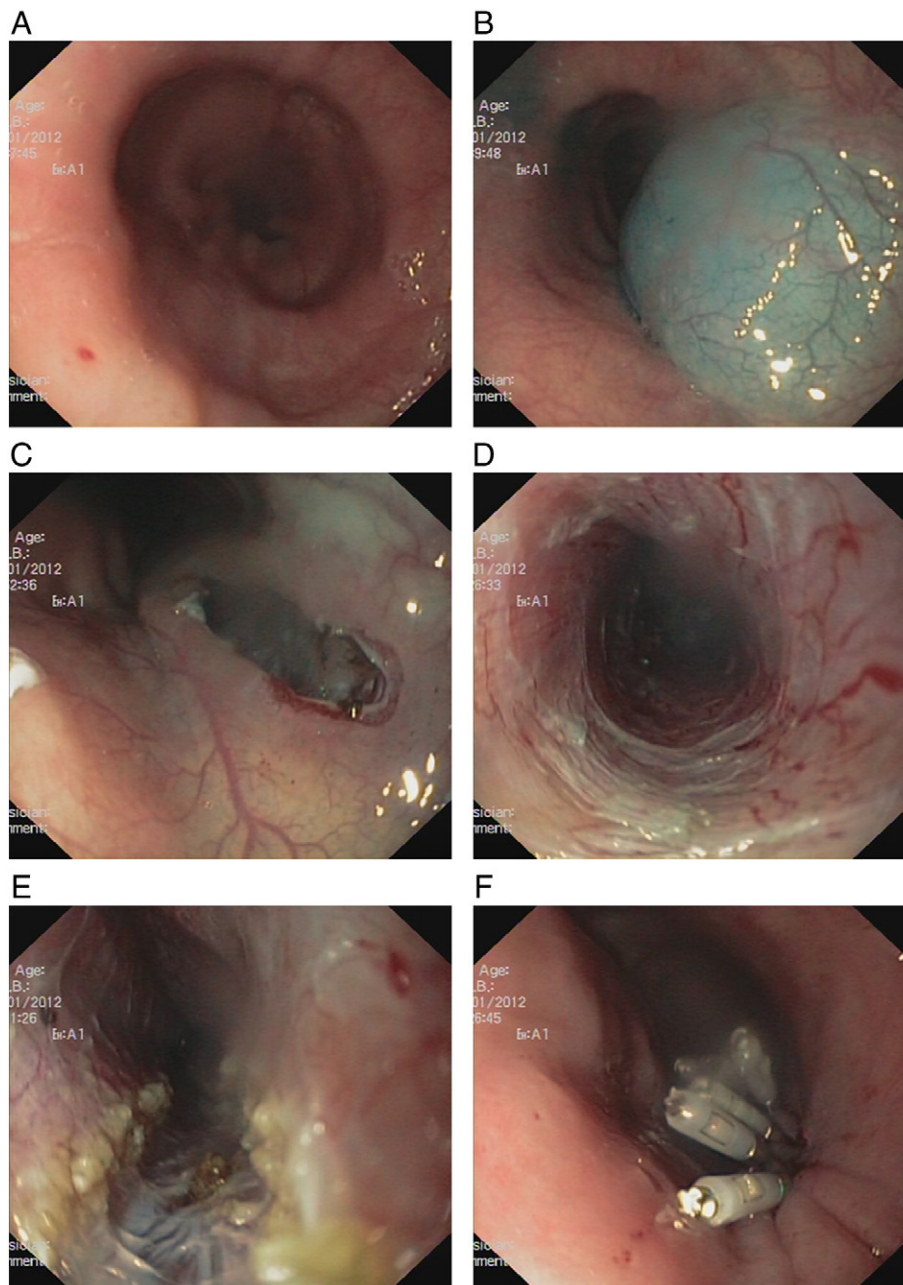


Fig. 1. Case illustration of peroral endoscopic myotomy. A. Endoscopy image showing a dilated esophagus. B. Submucosal injection. C. Create tunnel entry. D. Submucosal tunnel. E. Circular myotomy. F. Close the tunnel entry.

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