Treatment of Eosinophilic Esophagitis by Dilation

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Key Words

Eosinophilic esophagitis · Esophageal dilation · Esophageal perforation

Abstract

Treatment options for eosinophilic esophagitis (EoE) include drugs, diets and esophageal dilation. Esophageal dilation can be performed using either through-the-scope balloons or wire-guided bougies. Dilation can lead to long-lasting symptom improvement in EoE patients presenting with esophageal strictures. Esophageal strictures are most often diagnosed when the 8- to 9-mm outer diameter adult gastroscop cannot be passed any further or only against resistance. A defined esophageal diameter to be targeted by dilation is missing, but the majority of patients have considerable symptomatic improvement when a diameter of 16–18 mm has been reached. A high complication rate, especially regarding esophageal perforations, has been reported in small case series until 2006. Several large series were published in 2007 and later that demonstrated that the complication risk (especially esophageal perforation) was much lower than what was reported in earlier series. The procedure can therefore be regarded as safe when some simple precautions are followed. It is noteworthy that esophageal dilation does not influence the underlying eosinophil-predominant inflammation. Patients should be informed before

the procedure that postprocedural retrosternal pain may occur for some days, but that it usually responds well to over-the-counter analgesics such as paracetamol. Dilation-related superficial lacerations of the mucosa should not be regarded and reported as complications, but instead represent a desired effect of the therapy. Patient tolerance and acceptance for esophageal dilation have been reported to be good.

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The History of Esophageal Dilation

The first consecutive case series of patients suffering from eosinophilic esophagitis (EoE) were published in 1993 and 1994 by Attwood et al. [1] and Straumann et al. [2]. Attwood and coworkers reported on a series of 12 patients with dysphagia and dense esophageal eosinophilic infiltration. Ten of these patients were dilated without any perforation. In 2003, Straumann et al. [3] reported on the natural history of 30 EoE patients, of which 11 were dilated due to dysphagia. In 10 patients the dilation was clinically successful with 6 patients free of symptoms and 4 with at least a 50% reduction of dysphagia [3]. The mean time of symptom improvement was 8.6 ± 7 months. Again, all patients tolerated the procedure well and there was no perforation. Thus, esopha-

geal dilation was one of the first therapies used to treat stricturing EoE. Esophageal dilation can be either performed using wire-guided Savary bougies or through-the-scope inflatable balloons. Most often, strictures are diagnosed if the 8- to 9-mm outer diameter endoscope can no longer be passed through a stricture or only against resistance. There has not been any data published on the endoscopist's ability to diagnose esophageal strictures with, for example, 12–13 mm that do not compromise the passage of a standard adult gastroscope. It can be hypothesized that the endoscopist often describes the esophageal caliper as normal despite the presence of low-grade strictures which may already provoke symptoms. Measures to objectively assess the esophageal caliper include the inflation of balloons with defined diameters or the EndoFLIP device [4].

Natural History of EoE

In a series of 30 EoE patients, Straumann et al. [3] demonstrated in 2003 that the eosinophil-predominant esophageal inflammation persists over time as well as the symptoms. The endoscopic presentation at EoE diagnosis includes a variety of different features. Hirano et al. [5] have recently classified and graded the appearance of EoE-associated endoscopic alterations. Briefly, the endoscopic alterations can be summarized into signs of acute inflammation (whitish exudates, furrows, edema) and chronic inflammation with subepithelial fibrosis (rings, strictures). EoE may present at diagnosis with either signs of acute inflammation, chronic inflammation or a combination of both.

The evolution of EoE's natural history regarding stricture formation has been unclear until recently. Our group evaluated the correlation between duration of untreated disease (represented by the diagnostic delay which is comprised of the time interval between EoE symptom onset and diagnosis) and the presence of strictures at EoE diagnosis. Strictures were defined as narrowing of the esophageal caliper to 10 mm and less which impaired the smooth passage with the standard adult gastroscope. We found that the time interval of untreated EoE correlates with the prevalence of strictures at EoE diagnosis [6]. When analyzing the endoscopic features over time, we found that the signs of acute inflammation persisted over time and that fibrotic features (rings, strictures) were added on top [6]. Thereby, EoE seems to undergo an evolution similar to Crohn's disease with an inflammatory phenotype at diagnosis in the majority of patients and the

development of stricturing complications over time [7]. Signs of chronic inflammation in EoE develop due to the deposit of subepithelial fibrous tissue which may lead over time to esophageal remodeling [8–10]. The median length of diagnostic delay, which is around 6 years, may explain why several EoE patients present with strictures at diagnosis.

Recently published trials have shown that subepithelial fibrosis is (at least) partially reversible under either swallowed topical steroids or elimination diets [11, 12]. The presence of esophageal strictures predisposes to food bolus impactions. Of note, more than one third of EoE patients suffer from one or several food bolus impactions necessitating endoscopic removal as an emergency procedure during their disease career [13]. Food bolus impactions have been associated with retching-induced spontaneous perforations (Boerhaave syndrome) and with procedure-induced esophageal perforations, especially if performed by rigid esophagoscopy [13, 14].

Effectiveness and Safety of Esophageal Dilation

The first patient reports suggested that esophageal dilation can offer long-lasting symptom improvement [1, 3]. This finding has been corroborated by later series. Dellon et al. [15] reported on a series of 36 EoE patients who were treated by a total of 70 dilations. The esophageal size improved from 12 to 16 mm and an overall symptom response rate of 83% was reported. A study in 207 EoE patients treated by esophageal dilation found that 67% of patients reported an improvement or absence of dysphagia following esophageal dilation [16]. Patient acceptance was assessed as well in this study, and showed that no patient would refuse undergoing dilation again if necessary [16].

Esophageal dilation may also be associated with some drawbacks. The first one is the occurrence of postprocedural thoracic pain [16]. Patients should be advised about this phenomenon before undergoing dilation. Postdilational pain may last for some days and responds favorably to paracetamol [16]. A second drawback is that dilation does not influence the severity of eosinophil-predominant esophageal inflammation [16]. Another drawback is that dilation may be associated with esophageal perforation. While earlier case series have reported on a high complication rate [17], a 2010 meta-analysis which included 468 patients who underwent 671 dilations found only one perforation (0.1%) [18]. Subsequent studies

Table 1. Assets and drawbacks of esophageal dilation

Advantages	Drawbacks
Long-lasting symptom response	No influence on underlying inflammation
Good patient acceptance	Postprocedural chest pain may occur
Safe	Perforation risk (low)

consistently showed a lower perforation rate than initially reported. Jung et al. [19] evaluated 293 dilations in 167 patients and found a perforation rate of 1% (3 cases). In a series of 207 dilated patients (mean: 2 dilations per patient), no case of esophageal perforation was documented [16].

In conclusion, the rate of perforation for dilation of EoE-related strictures is comparable to the perforation rate of strictures due to other causes than EoE (approx. 0.1–0.2%). A defined esophageal diameter to be targeted by dilation is unknown, but the majority of patients show considerable symptomatic improvement when a diameter of 16–18 mm is reached. It was recommended that the progression of dilation per session should be limited to 3 mm or less [19]. Mucosal tears following esophageal dilation should not be regarded as a complication, but rather as a desired therapy effect.

Esophageal dilation of stricturing EoE may lead to long-lasting symptom improvement. However, it does not influence the underlying eosinophil-predominant inflammation, and may be associated with postprocedural thoracic pain and esophageal perforation (although the

overall risk of perforation seems to be low). The advantages and drawbacks of esophageal dilation are illustrated in table 1.

Esophageal Dilation for Everyone?

Patients with stricturing disease can be treated by esophageal dilation. Dilation is not indicated in case of a normal esophageal caliber and endoscopic signs of acute inflammation. Patients should be informed before the intervention about the potential occurrence of postprocedural pain. It is currently unknown if the use of swallowed topical steroids before dilation reduces the risk of endoscopic complications (major bleeding or perforation) or postprocedural pain. Savary bougies and balloons seem to be equally effective for providing symptomatic relief. However, the use of balloons is more expensive compared to bougies. Avoiding dilation in case of stricturing disease is associated with the risk of acute food bolus impactions. Food impactions should be avoided since they represent a traumatic experience for patients and because they are associated with spontaneous esophageal perforation or procedure-induced complications.

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Disclosure Statement

The author reports no conflicts of interest.

References

1 Attwood SE, Smyrk TC, Demeester TR, Jones JB: Esophageal eosinophilia with dysphagia, a distinct clinicopathologic syndrome. *Dig Dis Sci* 1993;38:109–116.

2 Straumann A, Spichtin HP, Bernoulli R, Loosli J, Vögtlin J: Idiopathic eosinophilic esophagitis: a frequently overlooked disease with typical clinical aspects and discrete endoscopic findings (in German with English abstract). *Schweiz Med Wochenschr* 1994; 124:1419–1429.

3 Straumann A, Spichtin HP, Grize L, et al: Natural history of primary eosinophilic esophagitis: a follow-up of 30 adult patients for up to 11.5 years. *Gastroenterology* 2003;125:1660–1669.

4 Kwiatek MA, Pandolfino JE, Hirano I, et al: Esophagogastric junction distensibility assessed with an endoscopic functional luminal imaging probe (EndoFLIP). *Gastrointest Endosc* 2010;72:272–278.

5 Hirano I, Moy N, Heckman MG, et al: Endoscopic assessment of the oesophageal features of eosinophilic esophagitis: validation of a novel classification and grading system. *Gut* 2013;62:489–495.

6 Schoepfer AM, Safroneeva E, Bussmann C, et al: Delay in diagnosis of eosinophilic esophagitis increases risk for stricture formation, in a time-dependent manner. *Gastroenterology* 2013;145:1230–1236.

7 Cosnes J, Cattan S, Blain A, et al: Long-term evolution of disease behavior in Crohn's disease. *Inflamm Bowel Dis* 2002;8:244–250.

8 Kagalwalla AF, Akhtar N, Woodruff SA, et al: Eosinophilic esophagitis: epithelial mesenchymal transition contributes to esophageal remodeling and reverses with treatment. *J Allergy Clin Immunol* 2012;129:1387–1396.

9 Aceves SS, Ackerman SJ: Relationships between eosinophilic inflammation, tissue remodeling, and fibrosis in eosinophilic esophagitis. *Immunol Allergy Clin North Am* 2009;29:197–211.

10 Mishra A, Wang M, Pemmaraju VR, et al: Esophageal remodeling develops as a consequence of tissue specific IL-5-induced eosinophilia. *Gastroenterology* 2008;134:204–214.

- 11 Straumann A, Conus S, Degen L, et al: Long-term budesonide maintenance treatment is partially effective for patients with eosinophilic esophagitis. *Clin Gastroenterol Hepatol* 2011;9:400–409.
- 12 Lieberman JA, Morotti RA, Konstantinou GN, et al: Dietary therapy can reverse esophageal subepithelial fibrosis in patients with eosinophilic esophagitis: a historical cohort. *Allergy* 2012;67:1299–1307.
- 13 Straumann A, Bussmann C, Zuber M, et al: Eosinophilic esophagitis: analysis of food impaction and perforation in 251 adolescent and adult patients. *Clin Gastroenterol Hepatol* 2008;6:598–600.
- 14 Lucendo AJ, Frigal-Ruiz AB, Rodriguez B: Boerhaave's syndrome as the primary manifestation of adult eosinophilic esophagitis. Two case reports and a review of the literature. *Dis Esophagus* 2011;24:E11–E15.
- 15 Dellon ES, Gibbs WB, Rubinas TC, et al: Esophageal dilation in eosinophilic esophagitis: safety and predictors of clinical response and complications. *Gastrointest Endosc* 2010;71:706–712.
- 16 Schoepfer AM, Gonsalves N, Bussmann C, et al: Esophageal dilation in eosinophilic esophagitis: effectiveness, safety, and impact on the underlying inflammation. *Am J Gastroenterol* 2010;105:1062–1070.
- 17 Hirano I, et al: Dilation in eosinophilic esophagitis: to do or not to do? *Gastrointest Endosc* 2010;71:713–714.
- 18 Jacobs JW Jr, Spechler SJ: A systematic review of the risk of perforation during esophageal dilation for patients with eosinophilic esophagitis. *Dig Dis Sci* 2010;55:1512–1515.
- 19 Jung KW, Gundersen N, Kopacova J, et al: Occurrence and risk factors for complications after endoscopic dilation in eosinophilic esophagitis. *Gastrointest Endosc* 2011;73:15–21.