EDITORIAL

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The long-term outcome of balloon dilation versus botulinum toxin injection in patients with primary achalasia

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Balloon dilation (BD) is currently the most commonly performed treatment for achalasia. Intrasphincteric botulinum toxin injection (BTI) is also used as an alternative to BD or laparoscopic Heller's myotomy with partial fundoplication. These treatments reduce lower esophageal sphincter (LES) pressure, resulting in improved esophageal emptying by gravity and in improved symptoms, such as dysphagia, regurgitation, chest pain, and weight loss; however, few studies have identified predictors of the long-term outcomes for BD versus BTI in patients with primary achalasia.

In the current issue of *The Korean Journal of Internal Medicine*, the long-term outcomes of BD versus BTI in patients with primary achalasia from a single institution were compared and the predictors of remission identified [1]. At a median follow-up of 61 months, BD appeared to be more effica cious than BTI in terms of long-term remission in the enrolled patients with achalasia. Independent factors predicting long-term remission included the treatment type and the difference in LES pressure.

Botulinum toxin (BT) can impede the release of acetylcholine from cholinergic neurons. Chemical denervation after BTI is intended to lower both basal and residual LES pressure, thereby reducing bolus obstruction [2,3]. Commonly, 70% to 80% of referred patients show relieved or improved symptoms within 30 days after the procedure. According to a literature review performed by Bassotti and Annese [4], a single injection of BT is effective in approximately 85% of patients with achalasia, but its effect diminishes over time to 50% by 6 months and to 30% by 1 year. According to a review by Vaezi and Richter [5], 26% of patients are resistant to BT and show no clinical response, which is thought to be due to antibodies against the protein [6].

Although BTI is safe and easy to perform, it was found to be effective only in short-term evaluations, with reduced benefit within 2 years after injection and eventually no benefit with repeated injections [7,8]. Because of these limitations, BTI is best reserved for patients who are too ill to undergo surgery, such as those who are elderly, those whose disease is complicated by overlapping diseases, or those who decline surgery or BD [9]. BTI is also suitable as a transition during periods in which more invasive treatments are not possible, for

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example, during pregnancy or temporal use of double or triple antiplatelet therapy. In addition, BTI has been used as a rescue treatment after unsuccessful BD or surgical myotomy [10]. However, there is increased difficulty with performing esophagomyotomy after BTI [11].

BD is the most cost-effective treatment for achalasia over a 5- to 10-year postprocedure period [12,13]. BD aims to fracture the muscularis propria forcibly, decreasing LES pressure and thereby improving bolus transit through the cardia. According to a review of 1,144 patients across 24 studies with an average follow-up of 37 months, BD showed good to excellent symptom relief in a graded manner in 74%, 86%, and 90% of patients treated with 30-, 35-, and 40-mm balloons, respectively [8]. Irrespectively of the protocol used, a large portion of patients will relapse, mainly during the first year after treatment [14,15]. After 4 to 6 years, nearly one-third of patients experience symptom relapse [14,16,17]. However, long-term remission, based on symptom recurrence, can be achieved in almost all patients by repeated BD [17]. Those patients with the best outcomes following BD tend to be older (> 40 years), female, and to present with type II patterns on high resolution manometry [14,18-21]. Several studies using long-term follow-up periods are available currently. Eckardt et al. [22] showed a 5-year follow-up response rate of 40% among patients with unique BD, and patients experiencing a relief in symptoms after 5 years were more likely to continue in this way. Zerbib et al. [17] reported estimated efficacies of 97% and 93% after 5 and 10 years, respectively, but most frequently in cases of repeated BD. In a study comprising 209 patients with a mean follow-up of 70 months, a 72% success rate with BD was observed [16]. However, in these studies, BD was not repeated routinely, rather performed on demand only for patients were are still symptomatic. In a meta-analysis performed by Weber et al. [23], the 10-year remission rate for BD was 47.9%, while the perforation rate was 2.4%. When performed by experienced operators, BD can achieve good to excellent outcomes (defined as an improved swallowing ability and an improved quality of life); however, only a few patients can be definitively treated by a single dilation, with most needing repeated dilations over a long-term follow-up [24].

A recent Cochrane Review compared 178 patients from six randomized, controlled trials after esophageal BD versus endoscopic BTI. At the 1-year follow-up, up to 74% of patients who underwent BTI experienced treatment failure, compared with 30% of patients who underwent BD [25]. In addition, Campos et al. [26] performed a systematic review and a meta-analysis on 7,855 achalasia patients and found better symptomatic relief in patients treated by BD compared with BTI.

Perforation is the most serious complication of BD, with an overall rate of 1.9% [24,27]. Most such cases should be managed by surgical correction, such as simple closure, second-look operation after simple drainage, or esophagectomy.

Recently, peroral endoscopic myotomy (POEM) has been introduced as a promising alternative to the current treatments. However, the POEM technique is difficult and requires extensive experience with therapeutic endoscopy. POEM is an elegant treatment resulting in excellent short-term results and is considered an alternative for achalasia. BD and laparoscopic Heller's myotomy have shortcomings, suggesting a need for a better treatment option. A recent POEM survey showed an overall clinical success rate of 98% after a mean follow-up of 9.3 months [28].

Therefore, BD should be used as the first-line treatment in Korean patients with achalasia due to its superior long-term clinical success rate. BTI is best reserved for patients who are too ill to undergo surgery and as a suitable transition during periods in which more invasive treatments are not possible. BTI can also be used as rescue treatment after unsuccessful BD or surgical myotomy. However, the number of effective treatments available for achalasia, such as POEM, is increasing. Short-term follow-up data for POEM are promising; however, more long-term follow-up data and prospective randomized trials comparing POEM with BD or surgical myotomy are needed to determine the potential of POEM as a new treatment option for achalasia.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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