

ORIGINAL RESEARCH

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The efficacy of pneumatic balloon dilatation treatment on achalasia: Single center experience

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Abstract

Achalasia is one of the most common motility disorders of esophagus characterized by deterioration of the lower esophageal sphincter due to loss of myenteric plexus. The main symptoms are progressive dysphagia towards fluids and solids, regurgitation of food, weight loss, aspiration pneumonia. Methods such as pneumatic dilatation, pharmacological agents, laparoscopic heller myotomy, and peroral endoscopic myotomy are used in the treatment. We want to present our results of pneumatic dilatation in this study. 31 newly diagnosed patients who underwent pneumatic dilatation at Inonu University Turgut Ozal Medical Center between 2008 and 2016, were included in the study. Pneumatic dilatation was applied once on 17 (55%) patients, twice on 6 (19%) patients, and thrice and over on 8 (26%) patients. In 27 (87%) patients, success was achieved with pneumatic dilatation and in 4 patients (13%) with laparoscopic Heller myotomy. Pneumatic dilatation being a less invasive method among available treatment methods, still maintains its efficacy when considering low complications and ease of administration.

Keywords: Achalasia, pneumatic dilatation, laparoscopic heller myotomy

Introduction

Achalasia is a rare disease of esophagus with the estimated prevalence ranging from 0.5-1.63 per 10000 per year. The main symptoms of the patients are progressive dysphagia towards fluids and solids, regurgitation of food, weight loss, aspiration pneumonia and chest pain [1,2]. Achalasia is one of the most common motility disorders of the esophagus characterized by deterioration of the loosening of the lower esophageal sphincter due to the loss of myenteric plexus, which is regarded as an autoimmune, viral, neurodegenerative disorder in etiology [3]. It affects both genders equally and may occur at any age [2]. Diagnosis is confirmed with esophageal manometry after being determined by endoscopic and / or radiological methods [1]. Methods such as pharmacological agents, pneumatic dilatation (PD), laparoscopic heller myotomy (LHM), and peroral endoscopic myotomy (POEM) are used in the treatment. PD is the most effective non-surgical method. It is performed by inflating a 3.0, 3.5, 4.0 cm balloon which is placed with a guide wire through the lower esophageal sphincter with the help of Endoscopy [4]. In this study, we wanted to discuss the

efficacy and complications of dilatation by evaluating the results of PD that we performed in our clinic.

Materials and Methods

31 newly diagnosed patients who underwent pneumatic dilatation at Inonu University Turgut Ozal Medical Center between 2008 and 2016, were included in the study. The diagnosis was made after endoscopic, radiological and manometric studies. A barium esophagus graphy was performed in order to determine the level and length of the narrowness. In the graphy; narrowing and esophageal dilatation in the form of bird-beak, were observed in the distal part of the esophagus. Upper endoscopy was performed in all patients in order to eliminate secondary causes. Esophageal manometry was applied. Clinical, endoscopic and radiological parameters were used for the success of treatment before and after dilatation. All procedures were performed by experienced gastroenterologists under fluoroscopy. Consent form was taken from all patients before the procedure. Patients were sedated with midazolam and propofol. Rigiflex balloons (Boston Scientific Cop., MA) of PD 3.0, 3.5 and 4.0 cm in diameter were used. The balloon placed in the LES with fluoroscopy was inflated using 7-15 psi air for 60 seconds. This process was repeated twice. After the procedures, presence of blood was checked on the surface of the balloon dilators. Presence of blood was considered significant in

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terms of success of the procedure. The procedure was started with the balloon having the smallest diameter and when the treatment of the patients failed who were called for check-up after 6-8 weeks, PD was performed by gradually increasing the balloon diameter in other sessions. Next follow-up periods were determined as 6-12-24 months. Patient follow-up was performed with gastroscopy, clinic and esophageal barium graphy.

The data were analyzed using SPSS version 16.0 (SPSS Inc, Chicago, IL, USA) after being entered manually.

Results

14 (45%) of the patients were female and 17 (55%) were male and the mean age was 53.23 years (29-80). PD was performed once on 17 (55%) of the patients. 8 of these patients were followed-up for 0-18 months, mean follow-up period was 7.6 months; 3 of patients were followed-up for 19-36 months, mean follow-up period was 28

months; 6 of patients were followed-up for more than 36 months and mean follow-up period was 72 months. PD was performed twice on 6 (19%) of the patients. 1 of these patients were followed-up for 0-18 months and follow-up period was 16 months, 5 of patients were followed-up for 19-36 months and follow-up period was 26.4 months. PD was performed thrice and over on 8 (26%) patients. 6 of these patients were followed-up for 0-18 months, mean follow-up period was 10.6 months; 2 were followed-up for 19-36 months, mean follow-up period was 30 months. In patients who underwent dilatation thrice and over; 1 patient was dilated 3 times, 5 patients were dilated 4 times, 1 was dilated 5 times, and 1 was diluted 6 times. Balloon diameter was increased in the next process in patients who underwent PD more than once (Table 1). LHM was performed on 4 patients who underwent dilatation sessions 4 times and over. Three of them were male and one was female and the mean age was 43 years. None of the patients had complications such as perforation and major bleeding.

Table 1. Pneumatic balloon dilatation results

	1 dilatation			2 dilatation			3≥ dilatation		
	0-18	19-36	36>	0-18	19-36	36>	0-18	19-36	36>
Follow-up duration (months)	0-18	19-36	36>	0-18	19-36	36>	0-18	19-36	36>
Age (mean)	49	64	50	44	49.4	-	49.5	62	-
Female	5	2	3	-	2	-	2	-	-
Male	3	1	3	1	3	-	4	2	-

Discussion

Although there is no definite treatment for achalasia, current approaches are aimed at evacuating alimentary canal, relieving symptoms, and preventing mega-esophageal development [5]. PD still maintains its first place of being the first choice in achalasia treatment in many centers [6]. Nowadays, the Eckardt score is widely used to evaluate the efficacy of treatment before and after treatment of achalasia patients. It is accepted that symptomatic recurrence is greater than 3 [7,8].

Remission rates are given in different rates in different publications for balloon dilatation. It is found that successful single post-PD remission rates were 62% for 6 months and 28% for 6 years. Young age, male gender, and broad esophagus were determined as risk factors for failure. No difference was observed between long-term and short-term results of PD and LHM [9]. While 27 of our patients (86.7%) had remission with PD, 4 of our patients (13.3%) underwent LHM.

Pneumatic dilation is more successful in women and elderly, whereas, LHM is more successful in young and men [10]. In a study by Andreevski V and his colleagues, it was found that after a single session, the 1 year remission rate was 35% [11]. However, the success rate was increased in dilatations that were performed by increasing the balloon diameters. The success rate of study conducted by Kadakia and his colleagues was 93%. 18 of these patients were dilated with a 3.0 cm balloon. 3.5 cm balloon dilatation was performed on 11 patients with no responses. Dilatation was successfully performed in 5 of these patients and 4.0 cm dilatation was performed in the remaining 6 patients. Dilatation was successful in 4 of these patients and 2 patients were referred to surgery [12]. In a study involving 24 studies conducted until 2009,

74%, 80% and 90% success rates were determined in dilatations performed with 3.0, 3.5 and 4.0 cm balloons, respectively [10]. In an average 48 weeks follow-up conducted by Cheng and his colleagues on 35 patients, one session dilatation was performed on 30 patients (85.7%), two sessions on 4 patients (11.4%) and three sessions on 1 patient (2.9%). While remission rates were 87.5% between 6 and 36 months, it was determined to be 40% after 60 months [13]. In our study, PD was successfully performed on 27 (87%) patients.

Perforation, being the most serious complication of balloon dilatation, has an overall rate of 1.9%. Age and starting dilatation with 3.5 cm first, are the risk factors. Other complications include chest pain, gastroesophageal reflux, bleeding and transient fever [14]. Chest pain and bleeding due to self-limiting mucosal rupture was observed in our patient group during the procedure. Severe complications such as abundant bleeding and perforation did not occur.

Conclusion

In conclusion, although new endoscopic techniques have been developed in recent years, these techniques can't be performed in most centers. We believe that PD's efficacy is high and as compared with more invasive methods such as surgery, it still maintains its efficacy.

Competing interests

The authors declare that they have no competing interest

Financial Disclosure

The financial support for this study was provided by the investigators themselves.

Ethical approval

Before the study, permissions were obtained from local ethical committee.

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