Guide wire dilatation of anastomotic strictures secondary to surgical repair of esophageal atresia

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Objective: To evaluate the efficacy of esophageal guide wire dilatation of stricture after surgical treatment of esophageal atresia.
Methodology: This prospective and descriptive study was carried out at Department of Pediatric Surgery, The children's hospital, Pakistan Institute of Medical Sciences (PIMS), Islamabad from January 2008 to December 2011. It included 23patients, 15 males and 8 females, aged one month to 3 years with esophageal stricture secondary to esophageal atresia who underwent guide wire esophageal dilatation with savary Gilliard Dilators. All procedures were performed under general anesthesia.
Results: Associated gastroesophageal reflux (GER), was noted in 13 patients. Dilatation relieved the stricture in all patients over a follow-up period varying from 3 months to 3 years. Only two patients developed esophageal perforation, which was treated conservatively.
Conclusions: Guide wire dilatation is a safe and effective method of treatment in the management of strictures secondary to surgical repair of esophageal atresia. (Rawal Med J 2013;38: 18-21).
Key words: Esophageal anastomotic stricture, esophageal atresia, dilatation.

INTRODUCTION

Esophageal atresia (EA), with or without tracheoesophageal fistula, is the most common congenital malformation of the esophagus. It requires primary or delayed surgical anastomosis. Anastomotic stricture occurs in 18-50% of patients undergoing repair of EA.[1,2] Gastroesophageal reflux disease accounts for about 70-80% of all cases of stricture.[3-5] Progressive dysphagia is the most common presenting symptom. The etiology of esophageal stricture can usually be identified by radiological and endoscopic modalities. Treatment of choice is dilatation. Three types of dilators are currently in use for dilatation. These are mercury or tungsten filled bougies (Maloney or Hurst), wire-guided polyvinyl dilators (Savary- Gilliard), and TTS ("through-the-scope") balloon dilators. Savary and American dilators are passed over a guide wire with or without fluoroscopic guidance.[6] Savary-Gilliard dilators have become more frequently used. The main complications associated with esophageal dilatation include perforation, hemorrhage and bacteremia. This report details our experience using Savary-Gilliard dilators to treat childrens with anastomotic stricture following surgical repair of EA.

METHODOLOGY

This prospective and descriptive study was carried out at Department of Pediatric Surgery, The children's hospital, PIMS, Islamabad from January 2008 to December 2011. Twenty three patients with anastomotic stricture secondary to surgical repair of esophageal atresia were included in the study. Diagnosis was confirmed by contrast radiological study. In all patients with esophageal atresia repair, contrast study was performed on 7th post operative day. Out of 23 patients, 15 were male and 8 female. Informed and written consent was taken from patients guardians.

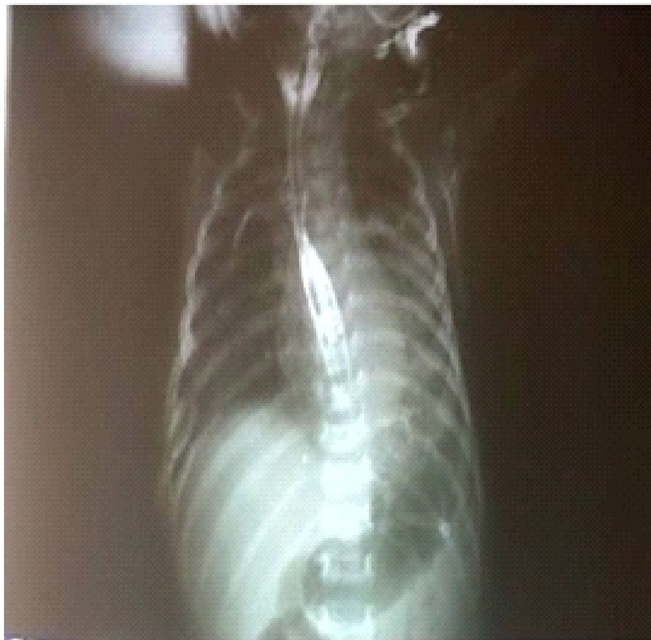
All patients were treated with guide wire dilatation. Early post operative contrast swallow following repair of esophageal atresia was performed and no leakage was noted. The selected strictures were more than 50% of esophageal lumen (Fig 1). All procedures were performed under general anesthesia. A standard guide wire was positioned with the help of endoscope up to the antrum. After

the guide wire was positioned, the scope was withdrawn and dilatation was performed with savary Gilliard dilators of increasing size (Fig. 2). Follow up was done 2 weekly for one month and monthly for a maximum of 12 months. Dilatation was done in follow up till the patient was without symptom. Treatment success was gauged according to the improvement of dysphagia and when weight gain and growth were satisfactory. Complication like perforation was treated accordingly.

RESULTS

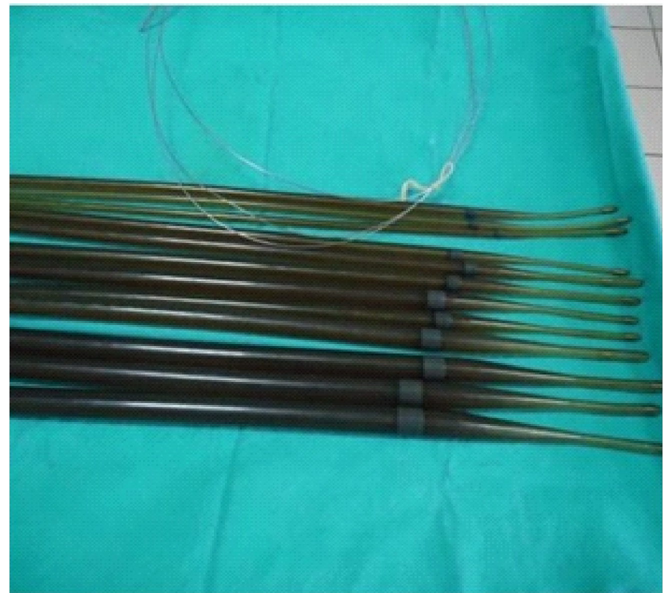
Out of 23 patients, there were 15 males (65.2%) and 8 (34.8%) females. Age ranged from one month to 36 months. All cases were type III EA of Ladd and Gross classification.

Fig 1. Esophagogram. A 2- month- old girl with esophageal anastomotic stricture secondary to esophageal atresia repair.



The delay from surgical treatment of EA and the first guide wire dilatation varied from one month to 36 months (Table 1). Dilatation was successful in 21 out of 23 patients and 1-14 procedures per patients (median 4 dilatations) were performed. A requirement for two or fewer dilatation sessions was significantly associated with an age of less than 6 months (Table 2).

Fig 2. Wire-guided polyvinyl dilators (Savary- Gilliard).



On the first barium swallow, to evaluate the esophageal stricture, GER was noted in 13 patients (56%). It was treated by medications and by surgery during or after dilatation sessions.

Table1. Data on 23 children undergoing guide wire dilatations.

No	Age (months)	Sex	Associated (GER?)	Number of dilatations required
1	22	M	Yes	5
2	4	M	Yes	2
3	3	F	No	2
4	5	M	Yes	1
5	1	F	No	2
6	32	F	Yes	7
7	1	F	Yes	1
8	3	M	Yes	3
9	4	M	No	2
10	26	F	Yes	4
11	24	M	No	7
12	5	M	Yes	2
13	4	F	Yes	3
14	15	M	No	5
15	2	M	No	2
16	3	M	No	1
17	4	F	Yes	3
18	3	F	Yes	3
19	18	M	Yes	4
20	4	M	No	3
21	15	M	No	5
22	36	M	Yes	9
23	22	M	No	11

GER. Gastroesophageal reflux.

Table 2. Relation between age of patients and number of dilatations required.

	No. of dilatations≤2	No. of dilatations≥3	Total
Age≤ 6 months	7	7	14
Age ≥6 months	2	7	9
Total	9	14	23

Complications included two cases of esophageal perforation which was treated conservatively by nothing per mouth, administering antibiotics and parenteral nutrition. Minor complications such as minimal bleeding required only conservative management. During the follow-up period, all patients were symptom free.

DISCUSSION

Anastomotic stricture secondary to EA repair is one of the main causes of esophageal strictures in children.[7-9] The anatomic variants of esophageal atresia generally comprise isolated esophageal fistula, esophageal atresia with a distal tracheoesophageal fistula, esophageal atresia with a proximal tracheoesophageal, esophageal atresia with proximal and distal tracheoesophageal fistula or H-type fistula. In this series, postoperative stricture was noted in 23% of cases. Owing to a high reported rate of esophageal perforation and high number of dilatation sessions per patient, treatment of these strictures by bougienage under fluoroscopic or endoscopic control was replaced by guide wire dilatation.[10]

It has been reported that better results from guide wire dilatation are obtained in post-operative anastomotic esophageal stricture when compared with esophageal stenosis secondary to GER and caustic ingestion.[7, 9,11,12] The success rate of 100% reported here has confirmed these results. The best results in anastomotic stricture following EA repair are related to early detection of stricture and rapid initiation of dilatation sessions before scar tissue and fibrosis occur, reducing the chance of stretching the stricture.

Gastroesophageal reflux is common in infants following repair of EA. Its incidences varies widely from 18% to 49%[13,14] and was 56% in our series. GER was 60% in patients with strictures secondary to surgical treatment of EA compared with 56% in the our series of 120 patients. In this series, two cases of esophageal perforation occurred in patients with strictures associated with GER. It has been shown that early post-operative anastomotic narrowing does not correlate with subsequent stricture formation.[15] Early detection of GER and its treatment before esophagitis occurs has reduced its morbidity.[15] Chittmittrapap et al.[14] noted that, after anti reflux surgery, the majority of strictures resolve requiring minimal dilatation.

Early detection of esophageal rupture, using water soluble contrast swallow immediately after dilatation, is very important to prevent frank sepsis and mediastinitis. Overall mortality is higher when treatment is delayed 24 hours after perforation. The limited number of patients in this series does not allow us meaningful statistical conclusion, however, this study provides guidance for the optimal management of a frequent sequel of EA treatment.

CONCLUSION

Guide wire dilatation was a safe and effective method of treatment in the management of strictures secondary to surgical repair of esophageal atresia.

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