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Peptic oesophageal stricture in children: Management problems

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ABSTRACT

Background: Peptic oesophageal stricture (PES) is a serious complication of gastroesophageal reflux disease (GERD) in childhood. The treatment of PES is still controversial, ranging from simple oesophageal dilations to resection/anastomosis of the stenotic portion of the oesophagus. In this study, we want to share our experience with 11 children with GERD and PES. **Patients and Methods:** A retrospective review of clinical data obtained from children who underwent dilation and antireflux surgery for PES was performed. **Results:** A total of 11 patients were diagnosed with PES. The clinical picture was dominated by dysphagia. Barium swallow showed hiatal hernia in nine cases (82%). Oesophageal strictures were located most commonly in the lower third of the oesophagus (91%). Three Children (27%) with PES had a neurologic impairment and patients had a mean duration of symptoms of 20 months (range, 3 month to 6.2 years) before intervention. Children received a median of four dilations (range, 1-21 dilations) for PES. Time to first dilation from age of diagnosis was a mean of 4.5 months (range, 2-14 months). Antireflux surgery was performed in all patients. Post-operatively, seven patients required repeat oesophageal dilation. Patients were followed with serial dilation for a median of 6 years (range, 1-9 years) and only one patient has a continued requirement of oesophageal dilation for PES. **Conclusion:** GERD complicated by PES is an important condition affecting a significant number of children. Early and effective treatment of both stricture and GERD is required to improve the prognosis of this serious condition.

Key words: Childhood, dilation, gastroesophageal reflux disease, peptic oesophageal stricture, surgery

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INTRODUCTION

Peptic oesophageal stricture (PES) is a serious complication of gastroesophageal reflux disease (GERD) in childhood. This problem is common in the third world countries where specialised centres are few.[1] Injuries caused by GERD stimulate the overproduction of fibrotic tissue and this leads to the formation of PES.[2] Dysphagia is the cardinal symptom of PES and diagnosis is achieved by barium swallow and endoscopy.[3]

Although endoscopic dilation of PES is safe and effective procedure in children,[4,5] some authors suggest that the most successful outcomes occur if treatment of PES involves pharmacologic therapy followed by endoscopic dilation, antireflux surgery and post-operative dilation.[6,7]

In this study, we want to share our experience with 11 children with GERD and PES.

PATIENTS AND METHODS

It is a retrospective study of 11 cases managed at Paediatric Surgery Service in Habib Thameur Hospital, Tunis, over a 15-year period between January 1997 and December 2011. Patient demographics, comorbidities, method of diagnosis, type of dilation, length of treatment and patient outcomes were reviewed. Upper gastrointestinal endoscopy confirmed oesophageal strictures. Barium swallow was performed in all patients to demonstrate structural abnormalities associated with GERD, such as stricture or hiatal hernia and to allow mucosal survey for oesophagitis, unrecognised malignancy, or gastric pathology. Oesophageal stricture dilation was performed using Savary-Guillard and Balloon dilators. All the patients were subjected to oesophageal dilatation and antireflux surgery.

RESULTS

In total 11 patients were diagnosed with PES between January 1998 and December 2012 with a mean age of 3.4 years (and a median of 2 years). There were six boys and five girls. The clinical picture was dominated by dysphagia affecting all the patients, five patients had failure to thrive. Upper gastrointestinal endoscopy and barium swallow confirmed oesophageal strictures in all cases [Figure 1]. All children received esophagoscopic biopsy of stricture site before dilation that demonstrated esophagitis in all patients. Barium swallow showed hiatal hernia associated with GERD in nine cases (82%). Oesophageal strictures were located most commonly in the lower third of the oesophagus (10 in lower third and one in middle third). Strictures were single in all patients. Three Children (27%) with PES had a neurologic impairment and patients had a mean duration of symptoms of 20 months (range, 3 month to 8.2 years) before intervention with a paediatric surgeon.

All dilations were performed under general anaesthesia and endoscopic control. Two types of dilators were used: Savary-Guillard dilators (42 dilatations) and balloon dilators (two dilatations). Balloon dilatations were done in one patient who had short PES.

Children received a median of four dilations (range, 1-21 dilations) for PES. Time to first dilation from age of diagnosis was a mean of 4.5 months (range, 2-14 months). Three children with PES required pre-operative dilation; they each received one dilation before antireflux surgery. Our patients received a median of three dilations post-antireflux surgery and surgery occurred at a median of 20 days after presentation to a paediatric surgeon. Oesophageal perforation from dilation (Savary-Guillard) occurred in one child who did well after conservative management.

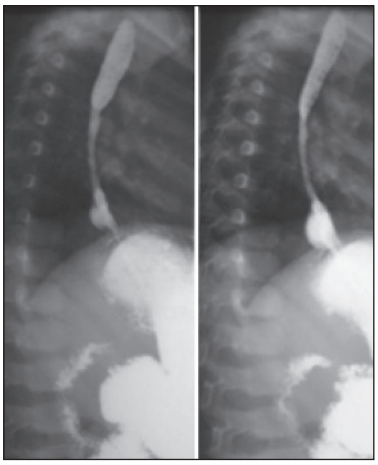


Figure 1: Barium swallows showing a peptic oesophageal stricture

Antireflux surgery was performed in all patients. The majority of children received an open Nissen fundoplication (10) and one child received a laparoscopic Nissen fundoplication. Post-operatively, seven patients required repeat oesophageal dilation; one of these children was dilated for a tight fundoplication. Patients were followed with serial dilation for a median of 6 years (range, 1-9 years) and only one patient has a continued requirement of oesophageal dilation for PES.

DISCUSSION

Peptic strictures are the end stage result of chronic reflux esophagitis. They account for 90% of benign oesophageal strictures and by definition, imply a stricture arising as a result of exposure to the acid-peptic content of the stomach. The oesophagus normally is exposed to frequent episodes of reflux of small amounts of gastric fluid which are limited by a competent lower oesophageal sphincter and rapidly cleared by normal oesophageal peristalsis. A defect in these and other oesophageal protective mechanisms leads to prolonged oesophageal exposure to acid, pepsin and possibly bile and pancreatic enzymes. Stricture formation occurs in 7-23% of patients with reflux esophagitis.[8] The process is progressive, beginning with mucosal oedema and inflammatory cell infiltrates of the lamina propria. Chronic esophagitis progresses transmurally, even into periesophageal tissues, with subsequent fibrosis and scarring leading to luminal compromise and oesophageal foreshortening.[9,10] Peptic strictures occur usually at the squamo-columnar junction and measure 1-4 cm in length. Significant predictors of stricture formation in patients with GERD are lower oesophageal sphincter tone of <8 mmHg, impaired oesophageal motility and duodenogastric reflux.[11,12] Hiatus hernia is twice as prevalent in GERD patients with stricture (85%) when compared to those with no esophagitis (42%).[9]

In agreement with other studies, we found a higher incidence of GERD leading to PES in male children; and the majority of our strictures were identified in the lower third of the oesophagus.[13]

The typical presentation of oesophageal stricture includes the insidious and sometimes sudden occurrence of dysphagia to solid food with antecedent pyrosis. However, in up to 25% of cases there is no prior history of heartburn and other acid-related symptoms.

In fact, some patients present a history in which reflux-related symptoms might even resolve over time secondary to progression of fibrosis and oesophageal narrowing, only to return after therapeutic dilation.[14-20]

Endoscopic dilation of PES is a safe and effective procedure in children. Three types of dilators are currently in use. These include bougies filled with mercury or tungsten (e.g., Maloney dilators), wire-guided polyvinyl dilators (e.g., Savary-Gilliard®) and through-the-scope (TTS) balloon dilators (Controlled Radial Expansion dilation balloon, with or without guide wire).[21] Of these, the Savary-Gilliard® and TTS balloon dilators are currently by far the most frequently used.[22] The main difference between these two dilators is their mechanism of action. A Savary-Gilliard® dilator exerts a radial force as it is passed down, but some of its dilating force is transmitted longitudinally because of its shearing effects. By contrast, longitudinal forces are not transmitted with balloon-type dilators.[23] Nonetheless, no clear advantage has been demonstrated for either one of these two dilator types.[24-27] The only exceptions include conditions in which a longitudinal shearing force should be avoided, such as strictures caused by epidermolysis bullosa,[28] or in cases in which tracheoesophageal puncture voice prosthesis is present. Savary-Gilliard® dilators are more cost-effective as they can be reused, whereas TTS balloon dilators are intended for single use only. The main complications associated with oesophageal dilation include perforation, haemorrhage and bacteraemia. The reported rate of perforation and massive bleeding is 0.5%.[29] Endoscopic dilation for PS was well-tolerated in our patient population. The single perforation was experienced in a 5-year-old child with a tight middle oesophageal stricture, sutured and patched by Nissen antireflux valve. Gastrostomy feeding tube was performed. Post-operatively, this patient required 21 oesophageal dilations with a Savary-Guillard dilator without further complications.

Antireflux surgery was done in all our patients. Surgery is more effective than medical therapy for healing esophagitis.[11,30,31] In general surgery has been the option of last resort, however, with the introduction of minimally invasive techniques this reservation is being challenged. Laparoscopic Nissen fundoplication is associated with much less patient discomfort and faster recovery than open surgery.[10] Siewert[32] reviewed the results of dilation and antireflux surgery and reported good results in 85% of the cases, with a mortality rate of 2%. Since 1991, laparoscopic antireflux surgery has seen an 8-fold increase in use.[33] While largely successful when performed by surgeons experienced in both laparoscopy and oesophageal surgery, even in the most experienced hands, surgery fails to control the patient's symptoms or results in new symptoms or anatomic problems in 3-16% of patients[34-36] More aggressive procedures such as oesophageal lengthening gastroplasty of the Collies-Nissen type or Collies-Belsey Mark IV type have been proposed. The rationale behind this surgical approach rests on the presence of a short oesophagus in virtually all of these patients and the need to ensure an intra-abdominal portion of the oesophagus to obtain sustained reflux control. The Collies-Belsey repair is associated with success rates ranging from 65% to 85%, with a post-operative mortality varying from 0.4% to 2% respectively. Corresponding figures have been reported after the Nissen type of antireflux repair.[37-40]

CONCLUSION

GERD complicated by PES is an important condition affecting a significant number of children. Early and effective treatment of both stricture and GERD is required to improve the prognosis of this serious condition.

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