Introduction

Benign esophageal strictures can be defined as a lumen-narrowing lesion of the esophagus with no associated malignancy. Hiatal hernias can cause severe reflux and have been identified as a cause of esophageal strictures in adults. Here, we report a case of esophageal stricture secondary to hiatal hernia in a developmentally delayed adolescent, making this one of the few-reported cases of esophageal stricture secondary to hiatal hernia in the pediatric population.

Case Report

A 15-year-old male with Autism Spectrum Disorder presented with a four month history of vomiting and weight loss. On admission, his upper GI series revealed a distal esophageal stricture and hiatal hernia. He was treated with Omeprazole and underwent 5 sequential endoscopic dilatations with resolution of symptoms.

Discussion

Esophageal strictures can be classified as simple or complex based on the depth of injury and magnitude of fibrosis. Chronic acid reflux leading to chronic inflammation can predispose to stricture formation. The treatment of esophageal stricture includes gastric acid suppression and esophageal dilatation. The goal of any dilation is to establish and maintain a patent lumen compatible with patient’s lifestyle with lowest risk to the patient. Complications associated with dilations include bleeding, perforation and infection.

Conclusion

Hiatal hernias and secondary esophageal strictures are rare in the pediatric age group and thus are not well characterized. Esophageal stricture should be considered as a cause of emesis and weight loss in the pediatric population.

Keywords: Hiatal Hernia; Benign Esophageal Stricture
the distal esophagus. This only permitted for entrance of an Olympus XP190 upper endoscope with a 5.4 mm diameter. The patient underwent five sequential endoscopies with progressive dilations from 6 to 15 mm using through-the-scope balloon dilatations. Biopsies distal to the stricture revealed chronically inflamed gastric cardiac mucosa, confirming the presence of a hiatal hernia.

The patient was treated with omeprazole 40 mg twice daily and slowly progressed back to a full diet after dilatations were preformed. He continued to do well without any recurrent episodes of emesis and was tolerating a regular diet in a 6 month follow-up period.

Discussion

An esophageal stricture is defined as a decrease in the caliber of the esophagus secondary to fibrotic contraction or deposition of abnormal tissue. The etiology of most benign esophageal strictures involves persistent chronic acid reflux in about 90% of cases in adults. The esophagus is normally exposed to low amounts of gastric acid, mediated by the competence of the lower esophageal sphincter and pace of clearance by esophageal peristalsis. Any defect in these mechanisms, including hiatal hernias that compromise lower esophageal sphincter function, can lead to chronic buildup of gastric contents. In the esophageal lumen the exposure of the esophagus to refluxed gastric contents, leads to chronic inflammation secondary to exposure to acid, pepsin and pancreatic enzymes and ultimately stricture formation of the tissue. Thus, 7-23% of patients with significant reflux esophagitis will have concurrent esophageal stricture formation [1].

Though less common, multiple other etiologies exist for the formation of an esophageal stricture. These pathologies may be thought of as intrinsic versus extrinsic esophageal disease. For example, any history of prior surgical intervention, radiation exposure or caustic ingestion may contribute to significant intrinsic fibrosis upon healing, thus leading to stricture formation [3]. Anatomic causes like congenital esophageal atresia can cause subsequent stricture [4]. Prior trachea-esophageal fistula repair is a risk factor for stricture formation in the pediatric population [5]. Consideration must also be given to primary dermatologic disorders like scleroderma and epidermolysis bullosa dystrophica, which can cause progressive erosive mucosal injury, healing with overlying fibrosis and scarring. Similarly, eosinophilic esophagitis is known to causes significant stricture and food impaction secondary to untreated inflammation [6].

Finally, external compression of the esophagus is a known cause of stricture formation. Mediastinal pathology from tuberculosis or idiopathic fibroing mediastinitis are among causes of mediastinal changes that physically compress the esophagus [3,4].

Strictures can be classified as simple or complex based on the depth of injury and the magnitude of fibrosis present. Complex strictures are characterized by a length of 2 cm or greater, a severely narrowed luminal diameter or an angulated or irregular contour [7]. Typically, 1 to 3 dilations are sufficient to relieve dysphagia in simple strictures where 5 dilations is the upper limit in > 85% of patents [8]. The Kochman criteria better define characteristics of recurrent and refractory strictures. They are characterized by extensive fibrosis or luminal compromise that anatomically restricts the luminal width of the esophagus, inability to dilate 14 mm over 5 sessions, inability to maintain patency to 14 mm over subsequent 4 weeks [9]. Cases also must exclude both neuromuscular dysfunction and inflammatory states that cause strictures. Once the stricture is classified, a therapeutic plan can be initiated with regards to dilation frequency and a determination of prognosis can be made [9,10] (Figure 2 & 3).

The goal of any dilation is always to establish and maintain a patent lumen compatible with patient’s life style with the lowest associated cost and risk to the patient. Options for dilations include balloon dilation and bougie dilation. The bougie exerts both a circumferential and shearing force that dilates from the proximal to the distal end of the stricture. Maloney dilators are mercury-weighted boulges in which the bougie is blindly inserted in sequentially increasing size until dilation is accomplished. A Savary Gilliard is a similar bougie but introduced, over a spring tipped guide wire via the working channel of an endoscope. In contrast, a through the scope (TTS) balloon dilation delivers radial forces simultaneously throughout the stricture.

In head to head studies, there does not seem to be a superior dilatation method. Furthermore, there does not seem to be increased post procedure complications in trials of balloon versus bougie dilations. [9] . There are cases, such as epidermolysis bullosa where longitudinal shear force should be avoided, thus making the balloon method more advantageous [3].

Complications associated with dilations include bleeding, perforation and infection. Guidelines follow the “rule of three” and advise not to increase a luminal diameter by more than 3 millimeters per session to minimize perforation risk [6]. There is debate with regard to the efficacy of steroid injection and its ability to prevent recurrence of stricture in refractory cases. Studies to date remain small, uncontrolled and involve strictures of differing etiologies, making it difficult to make evidence based conclusions [5]. In one published randomized study, 13% of patients who received steroids needed repeat dilation versus 60% who did not receive a steroid injection, pointing to the possible efficacy of this intervention [12]. Incisional therapy is an option for a safe alternative if dilatation does not prove effective. Some studies show efficacy with application of mitomycin C, an antineoplastic agent, though long-term effects are poorly studied [13]. In a prospective study, effectiveness with endoscopic ultrasound was demonstrated by its ability to define the extent of wall involvement in benign esophageal strictures and to accurately predict the response to endoscopic dilatation [14].

Conclusion

Acquired hiatal hernia and secondary strictures are rare in the pediatric age group and thus are not well characterized or defined. Clinical suspicion must remain high to rule out organic causes of emesis and weight loss in developmentally delayed children. Persistence of symptoms or severity of presentation may warrant consultation with pediatric gastroenterology and endoscopic evaluation. If stricture is confirmed, simple, complex and refractory strictures must be classified and dilatations methods must be clinically determined to optimize clinical outcomes for each patient. Frequent follow-up and chronic medical management of reflux is essential to good long term clinical outcomes.

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Conflict of Interest

No conflict of interests exist in the above work.

References
