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Case Report

Refractory Esophageal Stricture Induced by Aluminium Phosphide Ingestion

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ABSTRACT

Benign esophageal stricture caused by corrosive substance can be treated successfully with endoscopic dilation using bougies or balloons but approximately one-third of patients develop recurrent stenosis.

We report a case of lower third benign esophageal stricture presented with severe dysphagia, passive and active regurgitation caused by ingestion of a corrosive substance (aluminium phosphide) which was refractory to multiple dilation with balloons and bougies and migration of fully covered metal stent. After two courses of intralesional 40 mg methyl prednisolone acetate injection with two weeks interval and serial dilation, symptoms improved without restenosis. So a less frequent injection-dilation schedule with longer intervals may also effective for refractory esophageal stricture induced by corrosive agents.

Keywords: Benign esophageal stricture, Refractory, Corrosive ingestion

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INTRODUCTION

Benign esophageal strictures are caused by various esophageal disorders or injuries. Gastroesophageal reflux disease, radiation or ablative therapy, corrosive ingestion, eosinophilic esophagitis, and strictures after surgical resection with anastomosis or endoscopic resection are examples of causative agents(1-3). Esophageal narrowing with a caustic agent is seen more commonly in the upper third among children, but it is seen more often in the mid and distal third in adults (4,5). Most of them are successfully managed with endoscopic dilation using Savary bougies or balloons. Dilatation of the esophagus had a very low rate of serious complications such as bleeding and perforation (6). The rate of perforation varies between 0.1-0.4%, so it is minimal when the rule of three is applied, which means that no more than three bougies dilator of sequentially larger sizes should be passed in a single session once the dilator is met with resistance (7). Nearly one third of patients develop recurrent stenosis (defined as an inability to maintain a satisfactory luminal diameter of 14 mm for four weeks).

Development of new strictures is caused by elevated pressure on the esophageal wall 8, 9. Most are managed by repeated dilatation. Despite the simpler strictures which are short, focal, and straight stenosis, complex strictures are usually more than 2 cm, angulated, irregular or have severely narrowed lumen. Such stricture is more difficult to manage and has a tendency to recur despite multiple (10). Dilation is a first-line management of benign esophageal stricture and 90% of patients are effectively treated with up to five sessions (6,8). The rest are refractory, defined as the inability to achieve a satisfactory luminal diameter

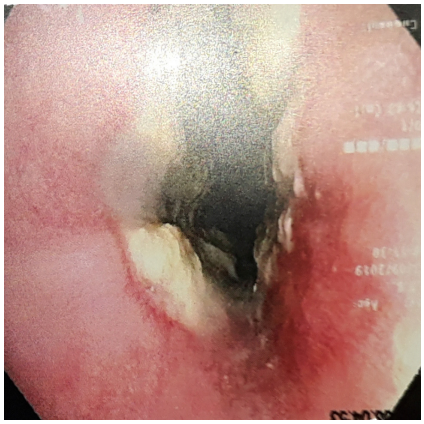

Fig. 1: One week after ingestion

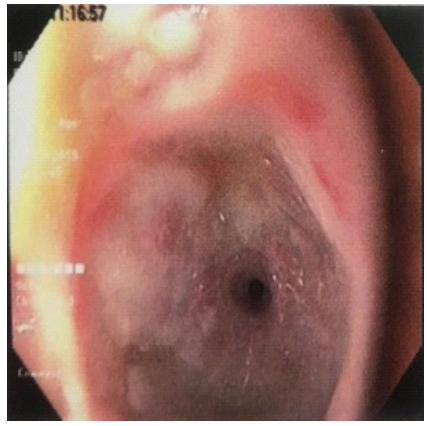

Fig. 2: Two weeks after ingestion

Fig. 3: One month after ingestion

Fig. 4: One month after ingestion

of 14 mm over five sessions with a two-week interval. Additional therapy including dilation with steroid injection, incisional therapy, stent placement or surgery should be considered (8,10). Although steroid injection and dilation have encouraging result in a smaller study but the optimal dose of a steroid, frequency and technique of injection remain to be determined (10). Herein, we describe a patient with severe dysphagia and esophageal stenosis caused by corrosive ingestion, refractory to multiple balloons and bougie dilation which relieved after two courses of intralesional steroid injection and re-dilation.

CASE REPORT

A 29-year-old healthy man referred with history of dysphagia 15 days after suicide attempted by ingestion of one tab of aluminium phosphide. Few minutes after ingestion he suffered from severe retrosternal pain and orthostatic dizziness. After admission to the Intensive Care Unit for two days and then four days in toxicology ward, he gradually developed dysphagia during the second week after ingestion. Serial endoscopy was performed although he was in a generally healthy state (figures 1 & 2). He gradually developed severe (grade 4) dysphagia and regurgitation and was unable to eat liquids. Dysphagia was graded using a previously described scale as follows: grade 0 = able to eat normal diet/ no dysphagia; grade 1 = able to swallow some solid foods; grade 2 = able to swallow only semi-solid foods; grade = able to swallow liquids only; grade 4 = total)(11). In endoscopy one month after injury, a tight smooth concentric narrowing was seen in the distal third of esophagus (38 cm from incisors) so that the

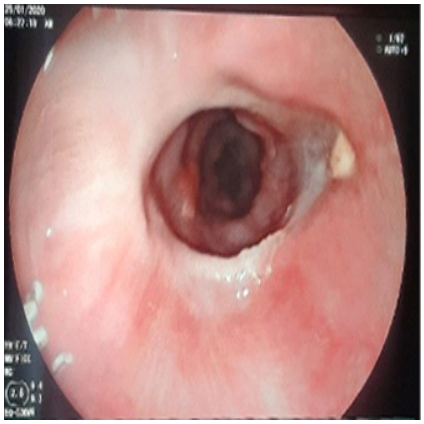

Fig. 5: After second session of steroid injection and dilation

Fig. 6: A few months later

scope with a diameter of 8 cm was not passed (figures 3 & 4). Dilatation with 6, 7, and 8-cm TTS (Through The Scope) balloons with guidewire was performed and the scope was passed. Simple stricture was identified and other parts of the upper gastrointestinal tract appeared to be normal. Four weeks later, the patient came back with recurrence of dysphagia and severe stricture on endoscopy, and an 8-cm scope was not passed. Re-dilation with 8, 9, and 10-cm TTS Balloon was performed, but during follow-up, stricture occurred again. Three other sessions of dilation with TTS or bougies resulted in refractory stricture. Last one was performed with adding fully covered self-expandable metal stand, but migration to stomach occurred. Therefore, 40 mg/ml of methyl prednisolone acetate diluted 1:3 with distilled water was injected into the four quadrants of the stricture and endoscopic dilation with 10, 11, and 12-cm bougies was performed. Three weeks later the lumen remained open and the procedure was repeated with the same dose of the steroid with 13.5, 15, and 16-cm TTS dilator (figure 5). The symptoms relieved and a few months later, the patient remained asymptomatic except for some large bullous foods (dysphagia grade 0-1) and the stricture relieved in endoscopy (figure 6).

The patient agreed to provide his information in the form of a case report.

DISCUSSION

Aluminium phosphide pesticide which is available as a tablet is a lethal systemic poison with 80–90% mortality (12). Aluminium phosphide release phosphine gas which inhibit oxidative phosphorylation and induced hypoxemia and circulatory failure (13). Management is supportive and there is no specific antidote (14). Survivors have taken either a very small amount of poison or ingestion of air exposed tablet, which makes it less toxic, but nearly one-third of them develop severe esophageal injuries (15,16). Ingestion of Aluminium phosphide has been reported to lead to esophageal strictures which behave like caustic-induced strictures (17).

The most common symptom of benign esophageal stricture is dysphagia but severe weight loss was not seen in most cases (18). The primary step in managing benign esophageal strictures is dilation with a balloon or a Savary-Gilliard bougie (18). No differences have been reported between these two in dysphagia improvement, recurrence of stricture, and risk of major complications (19). Most patients became dysphagia-free after up to five dilations. However, to reduce the number and burden of endoscopic dilations and in refractory cases, various endoscopic options have been suggested which includes dilation therapy combined with steroid injections, incisional therapy, stent placement, self-bougienage, or surgery (20). Steroids, by inhibition of inflammation reduced collagen formation, decrease fibrous tissue (21). Dilation after steroid injection into the stricture has been advocated since 1966 (22). Various small size studies of adding steroid to dilation showed promising results in patients with peptic strictures (10). Although this benefit was not seen in anastomotic strictures which are the most common cause of benign

esophageal stricture (23). The pathogenesis of peptic strictures differs from an anastomotic stricture in that the former is caused by inflammation and ulceration whereas the latter develops as a result of ischemia (24).

Corticosteroids can be injected in the four quadrants of structure in dose ranging from 40-80 mg per session (25). Dilation with a steroid injection for a maximum of three sessions is considered only in peptic stricture (25). If these sessions are unsuccessful, temporary stent placement is considered (fully covered self-expandable metal vs biodegradable stent) followed by self-dilation and surgery (25). Using a stent at an early stage increases the patient's quality of life, because of fewer hospital visits for regular dilation (3). However, compared to dilation therapy, stent therapy was not effective in increasing the dysphasia-free period (26). Most common complication of a stent placement is pain followed by stent migration to the stomach (27). In a prospective case series, eleven patients with refractory esophageal stricture caused by corrosive agents were subjected to weekly dilation of stricture with Savary-Gilliard bougie along with injection of triamcinolone (40 mg/mL, 1 mL diluted in 1 mL of saline, 0.5 mL per stricture quadrant) for five consecutive weeks, named as the rigorous schedule. The researchers found that this program was safe and effective in achieving significant dilatation, reducing the frequency of dilatations, maintaining dilatation, and improving dysphagia after a follow-up of 12 months (28).

CONCLUSION

As we showed here, a less frequent injection-dilation schedule with longer intervals may also effective for refractory esophageal stricture induced by corrosive agents.

CONFLICT OF INTEREST

The author declares no conflict of interests related to this work.

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