

Durable Resolution of Refractory Corrosive-Induced Pyloric Stenosis Treated with Endoscopic Balloon Dilatation and Intralesional Triamcinolone Injection: A Case Report

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ABSTRACT

Corrosive ingestion may result in severe gastrointestinal injury and subsequent benign pyloric stenosis. Although endoscopic balloon dilatation is considered first-line therapy, recurrence is common because of fibrotic scar remodeling. We report a young adult with corrosive-induced pyloric stenosis who developed progressive gastric outlet obstruction and severe malnutrition. Despite multiple sessions of endoscopic balloon dilatation and temporary stent placement, recurrent stenosis occurred. The patient subsequently underwent balloon dilatation combined with intralesional triamcinolone injection. Following two sessions of steroid-augmented dilatation, sustained clinical improvement was achieved. The patient resumed oral intake, gained weight, and follow-up endoscopy demonstrated complete resolution of the stricture. Intralesional steroid injection may be an effective adjunct to balloon dilatation in selected patients with refractory benign pyloric stenosis, potentially avoiding surgical intervention.

Keywords: balloon dilatation; corrosive ingestion; gastric outlet obstruction; pyloric stenosis; triamcinolone

INTRODUCTION

Corrosive ingestion can result in acute mucosal injury, followed by chronic complications; including fibrosis and stricture formation¹. Among these, pyloric stenosis is

a relatively uncommon but clinically significant condition that can lead to gastric outlet obstruction and severe malnutrition^{1,2}.

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Endoscopic balloon dilatation is generally considered first-line therapy for benign pyloric stenosis. However, recurrence is frequently observed, particularly in patients with dense fibrotic strictures. Repeated procedures are often required^{2,3}, and a subset of patients ultimately require surgical intervention^{2,3}.

Intralesional steroid injection has been proposed as an adjunctive therapy to reduce restenosis by modulating fibrosis. While its efficacy has been demonstrated in esophageal strictures, evidence in pyloric stenosis remains limited^{4,5}.

Herein, we present a case of refractory corrosive-induced pyloric stenosis successfully treated with steroid-augmented endoscopic balloon dilatation, resulting in durable clinical and endoscopic resolution.

SHORT REPORT

A young adult patient was referred for management of pyloric stenosis following corrosive ingestion. Approximately three weeks after ingestion, the patient developed progressive intolerance to oral intake accompanied by postprandial vomiting. Body weight decreased significantly from 64 kg to 40 kg, necessitating feeding jejunostomy for nutritional support.

Initial esophagogastroduodenoscopy (EGD) revealed severe pyloric stenosis, with inability to pass a 10-mm endoscope (Figure 1). Serial endoscopic evaluations demonstrated a tight, short-segment, dumbbell-shaped stricture; with significant gastric retention. The esophagus and duodenum were normal, and malignancy was excluded.

The patient underwent multiple sessions of endoscopic balloon dilatation (Figure 2) using CRE and Hurricane balloons (10–15 mm), along with temporary pyloric stent placement. Although, transient symptomatic improvement was observed, recurrent obstruction developed.

Given refractory disease, balloon dilatation combined with intralesional triamcinolone injection was performed. Triamcinolone acetonide (40 mg/mL, total volume 2 mL)

was injected circumferentially into the stenotic segment following dilatation. Two sessions were performed at an interval of approximately 7 weeks. This was influenced by both clinical reassessment and logistical considerations; including limited access to the hospital. No immediate complications were observed.

Following treatment, oral intake was gradually resumed, and jejunostomy feeding was discontinued. Body weight increased from 41.6 kg to 48 kg. Follow-up endoscopy at three months demonstrated complete resolution of the stricture (Figure 3), with easy passage of the endoscope.

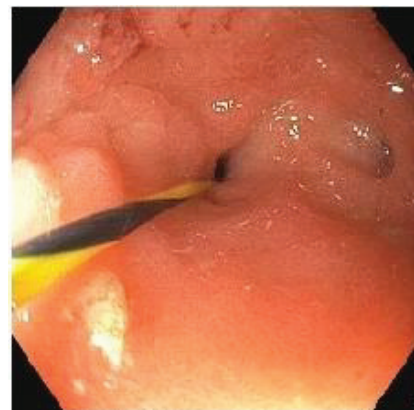


Figure 1 Initial esophagogastroduodenoscopy showing severe pyloric stenosis, with inability to pass a 10-mm endoscope



Figure 2 Endoscopic balloon dilatation of the pyloric stricture performed as part of the treatment

At nine-month follow-up, after the first intralesional triamcinolone injection, the patient remained asymptomatic. The patient had sustained weight gain to 63 kg and only occasional mild symptoms after large meals. The detailed clinical timeline is presented in Table 1.



Figure 3 Follow-up esophagogastroduodenoscopy demonstrating complete resolution of pyloric stenosis, with easy passage of a 10-mm endoscope

DISCUSSION

Corrosive-induced pyloric stenosis represents a challenging sequela of caustic injury. It is characterized by progressive fibrosis, luminal narrowing and impaired gastric emptying. The underlying pathophysiology involves an initial phase of mucosal necrosis and inflammation, followed by fibroblast activation, excessive collagen deposition, and scar contracture; ultimately leading to a fixed, often refractory stricture¹. In this context, endoscopic balloon dilation remains the first-line treatment^{2,3}; however, its effectiveness may be limited in cases with dense fibrosis, where elastic recoil and recurrent contracture are common³.

In this present case, serial balloon dilations resulted in gradual but incomplete clinical improvement. Early sessions reduced gastric retention and alleviated vomiting frequency, indicating partial restoration of luminal patency. Nevertheless, the persistence of a narrow lumen and the recurrence of symptoms suggested a dominant fibrotic component, which is consistent with previous observations in corrosive strictures¹. The temporary benefit observed

Table 1 Time-based clinical course and response to sequential interventions

Week	Key findings	Intervention	Clinical response
0	Corrosive ingestion	Supportive care	Initial stabilization (Baseline BW 64 kg)
4	Pyloric stenosis diagnosed	—	Progressive vomiting, poor oral intake
6	Inadequate oral intake	Feeding jejunostomy	Nutritional support achieved, BW 40 kg
26	Severe stenosis (approximately 3 mm in diameter) with large retained gastric content (approximately 1,200 mL)	Balloon dilation (1 st)	Minimal improvement
29	Persistent stenosis (approximately 4 mm), reduced gastric retention	Balloon dilation (2 nd)	Decreased vomiting frequency, BW 40 kg
31	Minimal retained gastric content, improved luminal patency	Balloon dilation (3 rd)	Improved oral intake, nasogastric tube removed
33	Fibrotic stricture (approximately 1.8 cm in length)	Stent placement	Initial improvement
42	Stent malposition with recurrent obstruction	Stent removal	Symptom improvement
45	Mild residual stenosis	TA injection (1 st)	Improved oral intake, BW 45 kg
52	Improved luminal patency	TA injection (2 nd)	Sustained improvement, BW 48 kg
65	No residual stenosis	—	Complete clinical and endoscopic resolution, BW 55.7 kg
82	Clinical follow up	—	Sustained resolution, BW 63 kg

TA=triamcinolone; BW=body weight (kg)

Time is expressed in weeks from the initial corrosive ingestion, and rounded to the nearest whole number

short-segment, anatomically complex pyloric strictures³. as stenting provides mechanical expansion but does not directly address the underlying fibrotic remodeling. The subsequent stent malposition and recurrence of obstruction underscore the limitations of stent therapy in short-segment, anatomically complex pyloric strictures³.

The addition of intralesional triamcinolone injection appeared to play a pivotal role in achieving sustained clinical and endoscopic resolution in this case. Corticosteroids exert anti-fibrotic effects through inhibition of fibroblast proliferation, suppression of collagen synthesis, and modulation of pro-inflammatory cytokines; particularly transforming growth factor-beta signaling pathways. By attenuating extracellular matrix deposition and scar contracture, triamcinolone may enhance the durability of luminal expansion achieved by balloon dilation. This mechanism is well established in the management of refractory esophageal strictures and keloid formation^{4,5}; however, evidence in pyloric strictures remains limited.

In this patient, the transition from transient improvement with dilation alone to sustained recovery following combined dilation and steroid injection suggests a synergistic effect. Clinically, this was reflected by progressive tolerance of solid oral intake, discontinuation of jejunostomy feeding, and significant weight gain. Endoscopically, there was resolution of retained gastric contents and restoration of pyloric patency, with successful passage of the gastroscope at follow-up. These findings support the hypothesis that fibrosis-driven restenosis is a key determinant of treatment failure in corrosive pyloric stenosis and that adjunct anti-fibrotic therapy may improve long-term outcomes³.

Despite these favorable results, several considerations should be acknowledged. Intralesional steroid injection is an off-label intervention in this setting, and standardized protocols regarding optimal dosing, injection technique as well as treatment intervals have not been established. Although, the procedure is generally safe, potential

complications include mucosal injury, delayed healing, and –rarely– perforation; particularly when combined with aggressive dilation^{4,5}. Careful technique and patient selection are therefore essential. In addition, the conclusions drawn from a single case are inherently limited, and further studies are needed to validate the efficacy and safety of this combined approach in larger cohorts.

From a clinical perspective, this case highlights the importance of a stepwise and individualized treatment strategy. While balloon dilation remains the cornerstone of therapy, early recognition of refractory disease and timely incorporation of adjunctive modalities; such as intralesional steroid injection, may reduce the need for repeated interventions or surgical bypass. Future research should focus on defining criteria for steroid use, optimizing treatment protocols, and identifying predictors of response to facilitate more targeted management.

Based on available evidence, and prior studies, on benign gastrointestinal strictures, the following criteria may help identify suitable candidates for steroid-augmented dilatation:

- Benign stricture confirmed
- Short-segment (<2–3 cm)
- Refractory to repeated dilatation
- No complex angulation
- Suitable for endoscopic therapy (2–5)

Key learning points

- Refractory pyloric stenosis often fails with balloon dilatation alone
- Steroid injection may reduce fibrosis and restenosis
- Combined therapy may avoid surgery
- Patient selection is crucial
- Long-term follow-up is necessary

CONCLUSION

Steroid-augmented endoscopic balloon dilatation

may be an effective alternative to surgery in selected patients with refractory corrosive-induced pyloric stenosis; having sustained clinical and endoscopic resolution.

Ethical considerations

This study was conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained. IRB approval was not required.

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CONFLICT OF INTEREST

None

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