

## Original Research Article

# Efficacy of intralesional triamcinolone injection in the management of benign refractory esophageal strictures

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### ABSTRACT

**Background:** Endoscopic therapy is the mainstay in the treatment of esophageal strictures. Refractory strictures are difficult to treat with patients requiring frequent endoscopic therapy. Intralesional steroid injection combined with SG dilation has been reported to reduce the frequency of endoscopic dilation in such cases.

**Methods:** Ten patients with benign esophageal strictures (corrosive 4, peptic 2, anastomotic 2, radiation-induced 2) were selected for this study. All of them had refractory esophageal stricture. They were being managed with intermittent endoscopic dilation by using Savary Gilliard dilators. All patients were treated by intralesional injections of triamcinolone acetonide 40 mg in a 4-quadrant fashion after SG dilation and were followed up for a period of 1 years. At each session, SG dilation was done followed by 4 injections (4 quadrants) at the proximal margin of the stricture. The interval between dilations and frequency of dilations were calculated before and after triamcinolone injections. A periodic dilation index (PDI) (number of dilations per month) before and after the triamcinolone injections was calculated.

**Results:** The PDI decreased significantly from 1.7 before injection to 0.6 after injection. This effect was seen irrespective of the etiology of the stricture involved.

**Conclusions:** Intralesional triamcinolone therapy is a useful and effective therapy for symptom relief in benign refractory esophageal strictures.

**Keywords:** Refractory stricture, Intralesional triamcinolone, Savary Gilliard dilation

### INTRODUCTION

Esophageal strictures are frequently encountered in gastroenterology practice. They can be benign or malignant. For malignant strictures, dilation is done only as a supplementary procedure for Ryles tube or stent placement. Common benign etiologies include corrosive stricture, peptic stricture, post radiation and anastomotic stricture.<sup>1</sup>

Esophageal strictures can be classified as simple or complex based on their characteristics and response to treatment. Simple strictures are focal, straight, symmetric, or concentric, with a diameter of >12 mm and are easily

treated by standard dilation techniques like balloon dilation or bouienage.<sup>1</sup> Symptom relief can usually be obtained in 1-3 sittings of dilation. Complex esophageal strictures are long (>2 cm), tortuous, asymmetrical. They are often associated with a luminal diameter (<12 mm).<sup>1</sup> As compared with peptic strictures, strictures due to corrosive injury, post radiotherapy or anastomotic stricture are usually complex strictures-they can be long, tortuous, and even multiple. They are difficult to treat, usually require more esophageal dilation sessions and tend to recur.<sup>2</sup>

Refractory strictures include strictures where there is an inability to successfully achieve a diameter of 14 mm

over 5 SG dilation sessions at 2-week intervals (refractory) or strictures where an inability to maintain a satisfactory luminal diameter for 4 weeks once the target diameter of 14 mm has been achieved (recurrent).<sup>3</sup>

Among the many treatment options available for refractory stricture, injection of triamcinolone along with dilation has been reported to be safe, effective and convenient. This study was done to evaluate whether intralesional triamcinolone injection along with Savary Gilliard dilation reduces the interval between dilation and the need for further dilation in refractory strictures of various etiologies.

**METHODS**

This was an interventional study done at a tertiary care centre. It was carried out in the Department of Digestive Health and Diseases, Government Kilpauk medical college between October 2019 and December 2021. Study group included 10 patients (6 male and 4 female) with refractory esophageal stricture. All had significant dysphagia and needed recurrent SG dilations. The esophageal strictures were diagnosed by barium contrast radiography and upper endoscopy.

The site, length, and number of strictures for each patient was noted. In complex strictures secondary to corrosive intake, post radiotherapy stricture and anastomotic site stricture, multiple biopsies were taken to rule out malignancy. All of the patients included in the study had refractory/recurrent strictures as defined by Kochman et al.<sup>3</sup> Refractory strictures include strictures where there is an inability to successfully achieve a diameter of 14 mm over 5 SG dilation sessions at 2-week intervals (refractory) or strictures where an inability to maintain a satisfactory luminal diameter for 4 weeks once the target diameter of 14 mm has been achieved (recurrent).

Patients less than 18 years of age and those with malignant strictures were excluded from this study. The institutional ethics committee clearance was obtained. Informed consent was obtained from all patients.

On the day of the procedure, patients were given injection midazolam 2 mg intravenously before dilation. All patients underwent wire-guided Savary Gilliard dilation followed by triamcinolone injection. 40mg of triamcinolone was given in 4 quadrants of the proximal portion of stricture -0.5 ml aliquots each via 23G EST needle. Patients were kept under observation for 6 hours post procedure to assess for any complications-any chest pain, breathing difficulty and the abdominal pain was noted.

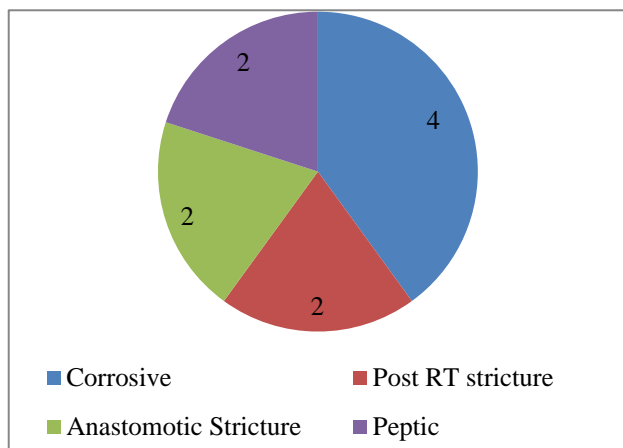
Patients were advised follow up after 3 weeks- symptoms of dysphagia were assessed. If there was no improvement, repeat injection was done. If there was improvement, Savary Gilliard dilation was done every 3 weeks till a diameter of 15 mm was obtained.

At every visit, the grade of dysphagia for each patient was noted (grade 0, no dysphagia; grade 1, dysphagia with ingestion of solid food; grade 2, dysphagia to semisolid food, grade 3, dysphagia to liquids; grade 4, aphagia).<sup>2</sup>

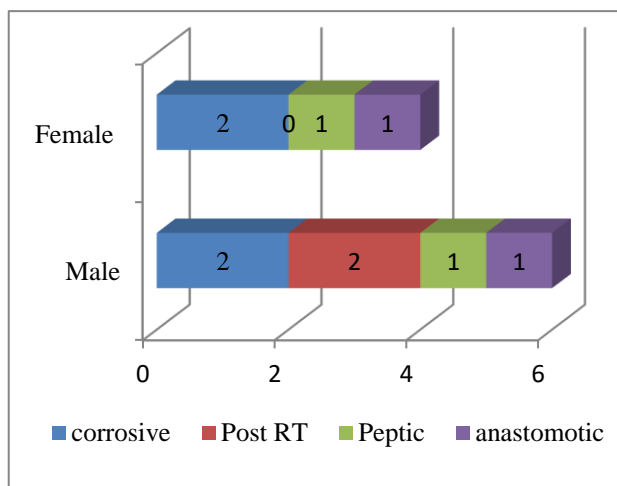
To assess the efficacy of triamcinolone injection, the PDI was calculated. All patients were followed up for a period of 1 year. The number of dilations per month was calculated prior to injection therapy and post injection therapy.

**RESULTS**

The etiologies of refractory stricture in the 10 patients were-4 corrosive, 2 post radiotherapy, 2 anastomotic, 2 peptic strictures. Six patients were male and 4 were female (Figure 1).

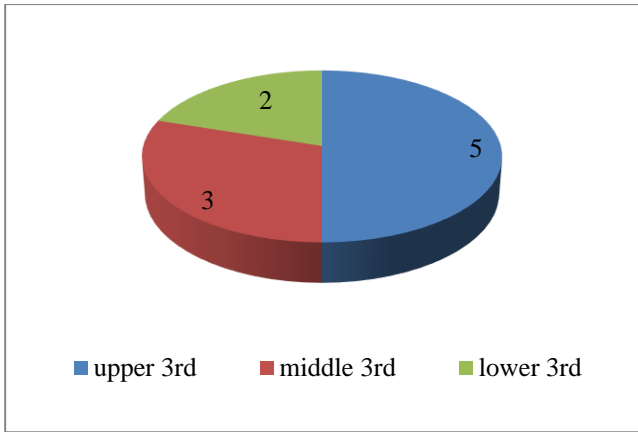


**Figure 1: Aetiology of refractory stricture.**



**Figure 2: Demographic profile and aetiology of stricture.**

Of the 10 patients, 50% had stricture in upper third of esophagus, 30% in middle third and 20% in lower third. All 4 corrosive strictures and 1 post radiation strictures were >3 cm in length, tortuous complex strictures.



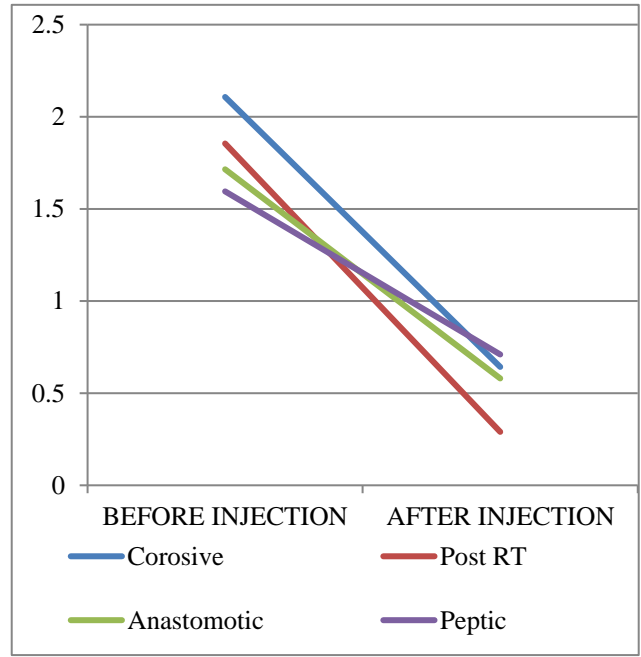
**Figure 3: Location of stricture.**

Intralesional triamcinolone injection was successful and without any major complications in all 10 patients. The mean number of sessions needed was 1.3. Out of 10 patients, 7 needed only 1 session of triamcinolone injection, 3 patients needed 2 sessions (2 corrosive and 1 post radiotherapy).

The mean number of dilations needed prior to injection therapy for all patients was 6.965. This reduced to 2.702 post triamcinolone injection. This showed that patients remained symptom free for longer duration of time (Table 1). The PDI also showed improvement from a mean PDI pre-injection therapy of 1.873 (range 1.47-2.54) to a post injection PDI of 0.473 (range 0.13-0.88). This was significant ( $p < 0.00001$ ). This decrease in PDI was significant across all etiologies. (Table 2 and Figure 4).

The number of patients in whom dilation could be done till 15 mm was 3 prior to injection therapy. After triamcinolone injection, dilation up to 15 mm was possible in 9 patients.

The grade of dysphagia for each patient was also recorded at each visit and all 10 showed a significant improvement in the grade of dysphagia.



**Figure 4: Change in PDI before and after injection therapy.**

**Table 1: Characteristics of stricture before and injection therapy.**

Variables	Corrosive stricture, (n=4)	Post radiotherapy, (n=2)	Anastomotic stricture, (n=2)	Peptic stricture, (n=2)	Total, (n=10)
<b>Mean number of dilations</b>					
Before injection therapy	10.21	8.10	6.54	3.01	6.965
After injection therapy	4.12	3.28	2.33	1.08	2.702
<b>PDI</b>					
Before injection therapy	2.1075	1.855	1.715	1.595	1.873
After injection therapy	0.6425	0.29	0.58	0.71	0.473

**Table 2: Change in PDI before and after dilation based on etiology.**

Etiology	Mean PDI	
	Prior to triamcinolone injection	After triamcinolone injection
Corrosive stricture	2.1075	0.6425
Post radiotherapy stricture	1.855	0.29
Anastomotic stricture	1.715	0.58
Peptic stricture	1.595	0.71
All etiologies	1.873	0.473

## DISCUSSION

Refractory esophageal strictures are difficult to manage in clinical practice. Patients come back at frequent intervals for dilation. The standard treatment for esophageal strictures is wire-guided bougie dilation. In our study we had 4 patients with corrosive stricture, 2 with peptic stricture, 2 with post radiotherapy and 2 with anastomotic site stricture. The earliest studies for intralesional steroids in management of refractory strictures were done in patients with corrosive stricture.

Mendelson et al used cortisone in their study in 1970.<sup>4</sup> For refractory strictures, multiple methods have been tried to augment the effects of dilation so that patients may remain symptom free for prolonged periods of time. These include intralesional corticosteroid injection, incisional therapy of stricture, intralesional mitomycin, treatment with NdYAG laser, stent placement. Sanden et al used NdYAG laser in their studies.<sup>5,6,13</sup>

The results of our study show that intralesional triamcinolone injection is an effective method for management of refractory strictures as evidenced by the significant decrease in PDI.<sup>6</sup> This was true across all etiologies and irrespective of length or location of the stricture.<sup>7,8</sup> These results are similar to those seen in the study by Kochhar et al where they treated 71 patients with refractory strictures with triamcinolone injection and found a decrease in the PDI and the dysphagia score across all etiologies.<sup>2</sup>

Post injection the number of patients in whom SG dilation could be done up to 15 mm increased from 3 to 9. There were no significant complications in our study. A meta-analysis conducted by Zhang et al which included 176 patients across 6 randomised controlled trials showed that intralesional triamcinolone injection combined with endoscopic dilation was safe and effective and reduced the stricture rate and further endoscopic sessions.<sup>10</sup> The findings were also seen in our study. The exact mechanism by which triamcinolone reduces the need for further dilation is unknown. Intralesional corticosteroid injection is an accepted treatment option in the management of keloids and burn scars.<sup>2,11</sup>

One hypothesis is that steroids inhibit collagen synthesis and further reduce crosslinking of the collagen which is needed for contracture of the scar.

### Limitation

Limitations of our study included the small sample size and lack of a control group.

## CONCLUSION

Intralesional triamcinolone injection is a safe and effective adjunct to Savary Gilliard dilation in the management of refractory strictures. Patients obtain

symptom relief for longer duration following injection therapy with triamcinolone.

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*Ethical approval: The study was approved by the Institutional Ethics Committee*

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