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ENDOSCOPIC EVALUATION AND ENDOSCOPIC MANAGEMENT OF PATIENTS WITH ESOPHAGEAL STRICTURES: A HOSPITAL BASED STUDY FROM NORTH EASTERN INDIA

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ABSTRACT

Introduction: Dysphagia is an alarming distressing symptom that requires a thorough evaluation to determine the underlying cause. Esophageal stricture is the condition where there is significant narrowing of the esophageal lumen and is usually symptomatic. Esophageal strictures are one amongst the various common causes of dysphagia. There are numerous disorders that cause esophageal strictures and vary from benign to malignant. Upper GI Endoscopy is an important diagnostic tool for the evaluation of esophageal strictures and it is the preferred diagnostic modality since endoscopic interventions can also be offerd to relieve the symptoms. Esophageal dilatation for treatment of strictures is a safe and preferred therapeutic options, it has a good outcome with only minor adverse effects. **Materials and Methods**: This is a hospital based retrospective observational study carried out over a period of five years in a tertiary teaching Institute from January 2021 to December 2025. All patients who were referred for upper GI endoscopy for evaluation of dysphagia, diagnosed with esophageal stricture were included in the study and all patients with esophageal strictures were taken up for dilatation. **Results:** Out of 1508 patients referred for evaluation of dysphagia, 61patients had esophageal strictures. Male consist of 40 patients and Females 21 with a male to female ratio of 1.9:1. Patient age ranged between 19 and 75 years, overall the mean age of the study population was 52.39 ± 12.16 years. All patients with esophageal strictures were taken up for endoscopic dilatations. **Conclusion:** UGI Endoscopy is an important diagnostic tool for evaluation of patients suffering from esophageal strictures. The lesions can be diagnosed with greater precision as direct visualization of the site of the lesion as well as the ability for collection of biopsy and various therapeutic endoscopic interventions can be carried out.

KEYWORDS: Benign; Malignant; Esophagus; Strictures; Dilatations.

INTRODUCTION

Dysphagia is an alarming distressing symptom that requires a thorough evaluation to determine the underlying cause. Eesophageal stricture is the condition where there is significant narrowing of the esophageal lumen and is usually symptomatic. Esophageal strictures are one amongst the various common causes of dysphagia.[1,2] The causes are varied that vary from benign to malignant. The usual causes are peptic strictures from long-standing gastroesophageal reflux disease (GERD)[3] corrosive ingestion,[4,5,6,7] Eosinophilic esophagitis (EoE),[8,9,10,11,12,13] Drug-induced esophagitis,[14,15] radiation-induced esophageal stricture (RIES),[16,17] Iatrogenic stricture,[1819] Anastomotic Stricture,[20] post chemotherapy esophageal stricture,[21] Thermal Injury,[22] Tuberculosis,[23] Malignant Stricture.[24]

The symptom of esophageal stricture is progressive dysphagia. The condition is usually diagnosed by Upper gastrointestinal endoscopy (UGIE) (Figure 1) and also by Barium esophagogram (Figure 2). Endoscopy is the preferred diagnostic modalities as the lesions can be diagnosed with greater precision as it gives direct visualization of the site of the lesion as well as the ability for collection of biopsy. In addition to diagnosis, endoscopy has the added advantage for therapeutic endoscopic intervention. The treatment is aimed in relieving patients of dysphagia.[25] The therapeutic options are esophageal dilatation,[26,27] Intralesional steroid injection injection,[28,29,30] Intralesional Mitomycin C,[31] Esophageal stenting,[32] Surgery.[33] Thetherapeutic options offered can be in isolation or in combination, the combination of esophageal dilatation and mitomycin C.[34,35,36]

MATERIAL AND METHOD

This is a hospital based retrospective observational study carried out over a period of five years in a tertiary teaching Institute from January 2021 to December 2025. All patients who were referred for upper GI endoscopy for evaluation of dysphagia, diagnosed with esophageal stricture were included in the study.

All patients with esophageal strictures were taken up for dilatation. Prior to dilatations all patients underwent barium esophagram (Figure 2) to establish the location, length, diameter, and number of strictures. Almost all patients except a few who were already admitted, the esophageal dilatations were carried out as an outpatient procedure. The main goal is the symptomatic relieve of dysphagia while at the same time measures are being taken to prevent adverse events. Except for two patients where the procedure was carried out under anaesthesia, with Propofol, the procedure was carried out under sedations with intravenous Midazolam (1-2 mg) along with Fentanyl (1 mcg/kg). Endoscopic dilatation was performed using Savary-Gilliard (wire-guided) dilators and CRE (Controlled Radial Expansion) balloon dilators TTS (Through the scope) Wire-guided balloon dilators. A pediatric upper GI scope was used and passed through the stricture if possible and guide wire passed through the scope, if the scope cannot pass through the narrowing, fluoroscopic guided guide wire insertion was carried out. The targeted endpoint of dilation is an esophageal diameter of 14-15 mm. Dilators are passed through the guide wires and dilatations were performed repeatedly until the target diameter is achieved or in some cases after significant symptomatic relieved, the patients refused further dilatation. In each session, as per protocol not more than three dilators were passed. The gap between dilatation is two to three weeks.

After dilation, the patient was observed for four hours and monitors for symptoms/signs of complications like chest pain, difficulty in breathing, oxygen saturation, tachycardia and blood pressure. Endoscopic follow up for all patients are carried up once every three months for one year and for six months for two years.

RESULTS

All together 12,381 number of Upper GI endoscopy was carried over a period of 5 years from January 2021 to December 2025. The number of male was 8429 while the number of females was 3952 in numbers which constituted about 68.08% and 29.01% respectively with a male to female ratio of 2.3:1. Patient age ranged between 7 and 89 years, with mean age of 32.62 ± 12.01. Out of these patients, 1508 of them were referred for evaluation of dysphagia, of which 61patients had esophageal strictures. Male consist of 40 patients and Females 21 with a male to female ratio of 1.9:1. Patient age ranged between 19 and 75 years, overall the mean age of the study population was 52.39 ± 12.16 years (median 53.00, IQR 45.00-60.00). Among males, mean age was 52.42 ± 9.73 years, while among females it was 52.33 ± 16.10 years. There was no statistically significant age difference between male and female participants (Welch t-test p=0.981; Mann-Whitney U p=0.457). (Table 1) In the present study strictures was seen more involving the middle third, followed by the lower third and least number are those involving the upper third (Table 2). In this study esophageal stricture was more due to post radiation followed by peptic, malignant, post surgical, post corrosive strictures and one patient each due to esophageal ring and tuberculosis (Table 3). The post corrosive strictures are more resistant to dilatation followed by post radiation, malignant and post operative anastomotic strictures. Peptic strictures are more or less much easier to dilate (Table 4). The successful dilatations also depends on the site of the stricture, we achieved successful dilatation in 63.6% involving the upper third, 88.9% involving the middle third and maximum successful dilatation was the one involving the lower third 91.3%. The mean number of dilatations required achieving end point or adequate dilation was 3.07± 1.4. Strictures involving the upper third required more number of dilatations 4.2±0.61, compared to middle and lower third 3.11±0.47and 2.94±0.53 respectively.Three patients involving the upper third had refractory strictures (1.83%) with an overall percentage of 4.91%. Seven (4.27%) had recurrent strictures, two (18.18%) involving the upper third, three (11.11%) involving the middle and two (8.69) involving the lower third of esophagus (Table 5).

Table 1: Age wise distribution of Patients with Esophageal stricture.

Age band (Years)	Number of Male	Number of Female	Total=61) (Male and Female)	Percentage
<30	0	3	3	4.91%
30–39	3	1	4	6.55%
40–49	12	1	13	21.31%
50–59	16	9	25	40.98%
60–69	7	5	12	19.67%
≥70	2	2	4	6.55%

Table 2: Showing Site of Esophageal stricture.

Site of stricture	Number	Percentage
Upper third	11	20.68 %)
Middle third	27	56.03 %)
Lower third	23	23.27 %)

Table 3: Showing etiology of Esophageal strictures.

Etiology	Number of patients (n=61)	Percentage
Peptic stricture	15	24.59 %
Post radiation	18	29.50%
Post corrosive	4	6.55%
Post-surgical	7	11.47%
Malignant stricture	15	26.22%
Esophageal ring	1	1.63%
Tuberculosis	1	1.63%

Table 4: Showing average number of dilatations.

Etiology	Average number of Dilatations
Peptic stricture	2
Post radiation	5
Post corrosive	8
Post-surgical	3
Malignant stricture	3
Esophageal ring	1

Table 5: Number of patients achieving end point and outcomes.

Number of patients achieving end point and outcomes					
Site of stricture	**Number of patients**	**Percentage**	**Recurrent (n and %)**	**Refractory(n)**	**Average number of dilatation**
Upper third (n=11)	7	63.6%	2(18.18%)	3 (1.83%)	4.2±0.61
Middle third(n=27)	24	88.9%	3(11.11%)	0 (0.00%)	3.11±0.47
Lower third(n=23)	21	91.3%	2(8.69 %)	0(0.00%)	2.94±0.53

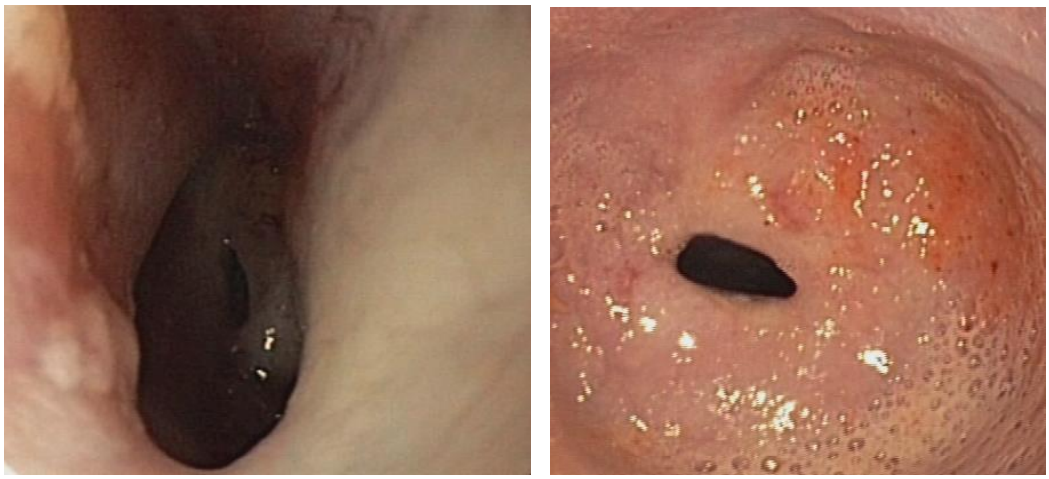

Figure 1: Endoscopy pictures of Esophageal strictures.

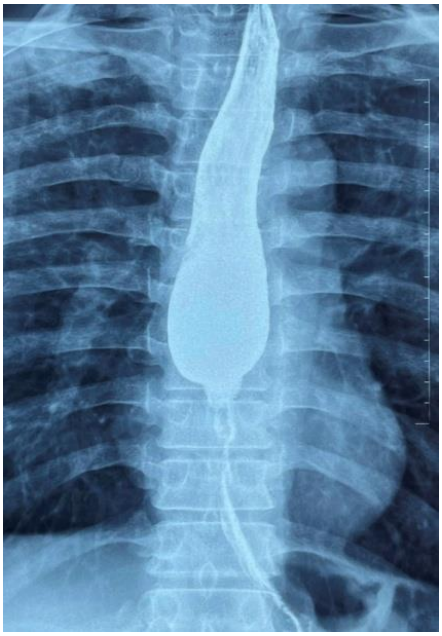

Figure 2: Barium esophagogram.

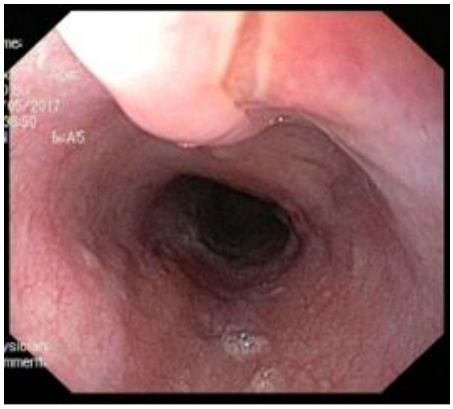

Figure 3: Esophageal tuberculosis (Pre-treatment). Figure 4: Esophageal tuberculosis(Post-treatment)

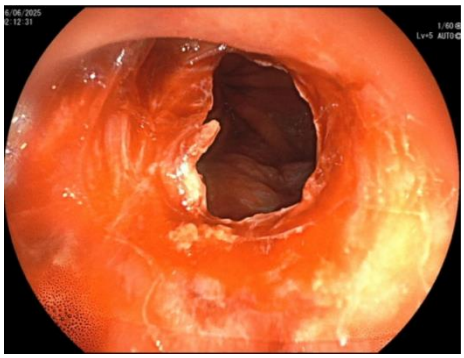

Figure 5: Peptic stricture, before and after dilatation.

DISCUSSION

Dysphagia is an alarm symptom which requires thorough evaluation to determine the underlying cause, exclude malignancy, and carry out therapeutic intervention wherever indicated/feasible.[37,38]

In the present study, 12,381 number of Upper GI endoscopy was carried over a period of 5 years from January 2021 to December 2025, and out of these patients, 1508 of them were referred for evaluation of dysphagia. In this study majority of the patients were male similar to other reported series of patients with dysphagia.[39] Out of the 1508 patients, 61patients had esophageal strictures. Male consist of 40 patients and Females 21 with a male to female ratio of 1.9:1. Patient age ranged between 19 and 75 years, overall the mean age of the study population was 52.39 ± 12.16 years (median 53.00, IQR 45.00-60.00). Among males, mean age was 52.42 ± 9.73 years, while among females it was 52.33 ± 16.10 years. There was no statistically significant age difference between male and female participants (Welch t-test p=0.981; Mann-Whitney U p=0.457). Esophageal dilatations was offered for all patients and carried out till the end point is achieved or patients symptomatic relieved. The mean number of dilatations required to achieve adequate dilation were 3.07± 1.4 which is similar to other study where an average number for successful outcome ranges from two to three sittings.[40, 41,42] Successful dilatation depends on the etiology as well as the location of the stricture. In this series the response was better in peptic strictures followed by post radiation and post anastomotic strictures. The more difficult one to achieve end point was post corrosive which is similar to other study.[40,43,44]

One patient with rare esophageal tuberculosis (Fig 3) did not required dilatation as his symptom responded to anti tubercular therapy and patient did not have narrowing at the end of treatment(Fig 4). This study showed that esophageal

dilatation is a good and safe procedure for the treatment of esophageal stricture with a success rate of 81.2% which is more or less the same compared to previous study.[40]

In this present series, three patients had a refractory stricture, one post-radiation and two post-corrosive strictures, and all three of them were lost to follow up.It was observed that, upper esophageal strictures are more resistant to dilatation as they required more number of sessions and the same time it was also observed that the stricture involving the upper end of esophagus are better tolerated with more successful dilatations with balloon than with the dilators. The middle and lower esophageal stricture requires fewer number of dilatation which is similar to other study.[40]

CONCLUSION

Endoscopy is an effective diagnostic tool for the diagnosis of patients suffering from dysphagia. It is the preferred diagnostic modalities in patients with dysphagia as it gives a direct visualization of the site of the lesion as well as the ability for collection of biopsy and in addition to diagnosis; endoscopy has the added advantage for endoscopic therapeutic interventions.

Esophageal dilatation for treatment of strictures is a safe and preferred therapeutic options, it has a good outcome with only minor adverse effects. Overall successful dilatations depend on the etiology and the location of the esophageal stricture. The upper esophageal strictures is more difficult to dilate and requires much more number of sitting compared to middle and lower third esophageal stricture. Corrosive strictures are much more difficult to dilate followed by the post-radiation and postsurgical anastomotic stricture. The peptic esophageal strictures are much easier to dilate and have the best prognosis (Figure 5). Overall a successful intervention in such cases gives a great satisfaction to the patients as well to the treating physician.

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