

Original article

A study of clinical profile and therapeutic efficacy of esophageal dilatation with Savary- Gilliard dilators in benign strictures of middle and lower thirds of esophagus, without the use of fluoroscopy

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Abstract

Introduction: Patients with fixed, structural, intrinsic, benign esophageal dysphagia in middle and lower one thirds of esophagus were studied. The aim of this study was to describe the etiology and clinical profile of these patients, to assess the grade of dysphagia in each and confirm site of stricture by barium swallow and endoscopy, to perform serial dilatations in them with Savary- Gilliard dilators without fluoroscopy and to analyse the efficacy and safety of dilatation in relieving the dysphagia immediately by check endoscopy and during a short term follow up of minimum three months.

Methods: It was a prospective, cross sectional, descriptive study where thirty patients with benign structural esophageal dysphagia of middle and lower thirds were studied. Barium swallow and endoscopy were first carried out to assess the stricture and then serial dilatations with Savary-Gilliard dilators were done without fluoroscopy. Subjective relief of dysphagia (less than grade 2) and maintaining a solid or semisolid diet for the period of follow up of 3 months was considered an effective treatment. The efficacy and safety of this procedure was assessed.

Observations and Results: The commonest etiology of benign esophageal dysphagia was found to be peptic stricture (43.33%). Corrosive (23.33%) and post sclerotherapy strictures (20%) followed suit. 53.85% patients with peptic strictures had dysphagia grade II. Patients with corrosive strictures had dysphagia grade III-V. Technical success was achieved in 93.33% of patients. Adequate dysphagia relief was obtained in 23 patients (76.67%). Maximum sittings were required in corrosive poisonings.

Conclusion: Serial dilatation with Savary- Gilliard dilators even without use of fluoroscopy is an effective, safe and economical method to relieve benign esophageal dysphagia in a government tertiary care set up.

Keywords: benign, esophageal, dysphagia, strictures, Savary-Gilliard dilators

Introduction:

Dysphagia—difficulty with swallowing—refers to problems with the transit of food or liquid from the mouth to the hypopharynx or through the esophagus^[1] There are two types of esophageal dysphagia: structural, which is due to the luminal narrowing or large bolus; and motor, which is due to in coordination or weakness of peristalsis. The normal diameter of the esophagus is 40 mm

(distended). The classical structural dysphagia occurs when the lumen of esophagus narrows to 13 mm, but slight dysphagia can be experienced by some patients even when lumen is narrowed to 25mm.^[1] The causes of structural dysphagia can be further grouped into intrinsic and extrinsic.^[1,2] the intrinsic ones are either benign or malignant. Benign strictures are peptic, corrosive, post sclerotherapy, post-radiation, post operative rings,

webs, benign tumours, inflammatory, pill induced and congenital etc.^[1,2,3]

Esophageal dilation has been an effective and safe method of treatment of structural intrinsic dysphagia since a long time. In clinical practice, fluoroscopy is recommended for monitoring the position of a guide wire and dilator. Some authors, however, believe that fluoroscopy is not necessary for dilatation.^[4,5]

Guide wire directed hollow core polyvinyl dilators like Savary- Gilliard and American dilators; and the balloon dilators are the most commonly used modern dilators. There are other methods to treat strictures like surgical replacement and strictureoplasty. But dilatation is considered the best initial treatment for all types of strictures ,according to several studies.^[2,6]

This study was conducted on thirty patients with fixed, structural, intrinsic, benign esophageal dysphagia in middle and lower one thirds of esophagus, in whom dilatation was carried out with Savary-Gilliard dilators without fluoroscopy. The aims were to study the etiology and clinical profile of these patients, to assess the grade of dysphagia in each and confirm site of stricture by barium swallow and endoscopy. It was aimed to perform serial dilatations with Savary- Gilliard dilators in them and to analyse the efficacy and safety of dilatation in relieving the dysphagia immediately by check endoscopy and during a short term follow up of minimum three months. Fluoroscopy was not used during the endoscopic procedure.

Materials and Methods:

It was a prospective, cross sectional, descriptive study. Institute ethics committee approval was taken and informed consent was obtained from every patient.

Thirty patients who presented with history of dysphagia and other related complaints and who had endoscopic evidence of narrowing which was

benign in nature(benign strictures) were included. These patients were selected from the Medicine OPDs and wards of a tertiary care teaching hospital in Western India over a period of 2 years. All adult patients above 18 years of age,complaining of dysphagia, who had pathology in middle and lower thirds of the oesophagus, due to any one of peptic stricture,corrosive stricture,post radiotherapy stricture,post operative (usually anastomotic),post sclerotherapy or benign tumors were included in the study. Patients with dysphagia due to motility disorders like achalasia cardia ,dysphagia due to pathology in oropharyngeal region and upper thirds of oesophagus,oesophageal and tracheoesophageal fistulae and dysphagia due to malignancy of esophagus were excluded from the study. Detailed history of all patients was recorded. A pre-dilation grading of dysphagia was done as follows: Grade 0- No dysphagia ,Grade I: Dysphagia intermittently occasionally to solids, Grade II : Dysphagia to solids (at all times),Grade III : Dysphagia to semisolids ,Grade IV: Dysphagia to liquidized /pureed food and Grade V : Inability to swallow saliva. A detailed causative history was asked as to corrosive ingestion in the past ,exposure to radiation ,chronic heartburn ,operations on esophagus,sclerotherapy done, history of vomiting/regurgitation ,site of obstruction defined by complaint as upper /middle/lower sternum .The type of dysphagia was assessed – whether intermittent/progressive and the duration was recorded. Thorough clinical examination of the patient was carried out . Basic investigations such as hemogram, blood sugars,renal and liver function tests were done. X- Ray (chest) was done in the all cases and ECG wherever indicated.Barium swallow was done to confirm the presence of stricture. It gave information about: site, approximate length and severity of stricture, mucosal pattern, tightness of stricture and benign or malignant nature. Upper

gastrointestinal diagnostic endoscopy was now carried out by upper gastrointestinal, forward viewing; PENTAXFG 29V fibreoptic endoscope, to note and confirm the site, approximate length of stricture and associated findings pointing out to the cause such as coexisting gastroesophageal reflux disease (GERD), corrosive ulcerations, sclerotherapy changes in mucosa with white sheathing of varices/ active varices and operative site.

Endoscopic biopsy was taken from the site of stricture for histopathology and to rule out malignancy. Patients who were to undergo endoscopy and dilatation were asked to remain nil by mouth for twelve hours before procedure. The throat was anaesthetized using lignocaine spray and sedation in the form of intravenous midazolam was given in a dose of 0.05mg/kg weight to selected patients with anticipated difficult strictures. The scope was inserted up to the stricture. Once the stricture was identified, the guide wire with markings was passed (100 cm metal Savary Guide Wire with spring tip). The super- stiff Zebra Guide wire (0.38) from Microvasive USA was also used in some cases. Savary- Gilliard dilators from Wilson Cook, USA (polyvinyl hollow core) 100cm (lumen 1.8mm) set with outer diameters 5,7,8,9,10,11,12,14,15,&17mm were used for the dilatations.

The wire was passed through the biopsy channel of the scope. The position of the distal spring tip was confirmed under vision through the scope. Fluoroscopy was not used. The dilation was started- by inserting the first dilator equal to the diameter of the stricture; the dilator being passed over to the guide wire. The feel of it going past the stricture was obtained and then that dilator was removed. Usually, 3 dilators in increasing dimensions were passed in a single session (rule of threes). Once dilation upto 11 mms was done, the scope which

had the outer diameter of 10.8 mm was again inserted after removing the guide wire and it was assessed if the scope could be passed beyond the stricture; or if not to assess the decrease in narrowing. If the scope could be passed, it meant that adequate dilation had been achieved, but maximum dilation was still done to No. 14. When 11-14 mm was dilated, it was considered to be adequate.

A check chest X-ray was done two hours after procedure to note if any complication like perforation. Subjective reduction in the grade of dysphagia immediately after dilatation session was assessed 3-4 hrs after the procedure.

If dysphagia was subjectively totally relieved at 1st session, then patient was called for the follow-up once a month for at least 3 months and dilatation was done only if dysphagia was present. If dysphagia was not totally relieved, patient was reviewed every 7-15 days till adequate relief was obtained. Subjective relief of dysphagia (less than grade 2) and maintaining a solid or semisolid diet for the period of follow up was considered an effective treatment.

Dilatation was always done based on a subjective assessment of dysphagia. Minimum period of follow-up was 3 months. On each follow-up ,the subjective grade of dysphagia , body weight and endoscopic findings were assessed. Data was collected and compiled in the SPSS software and relevant percentages were calculated. Technical success rate and efficacy were calculated based on definitions given above.

Results:

Most of the patients were between 20 to 60 years of age and the mean was 41.3 + 18.2 years. There were 19 females (63.33%) and 11 males (36.67%). At presentation most patients had dysphagia grade II to IV with Grade II being commonest (43.33%) (Table 1). 80% patients presented with duration of

dysphagia between 2 to 6 months . In this study, maximum cases were of peptic strictures (43.33%). Corrosive (23.33%) and post sclerotherapy strictures (20%) followed suit. (Table 2)

53.85% patients with peptic strictures had dysphagia grade II. Patients with corrosive strictures had dysphagia grade III-V, commonest being grade IV (57.14%). Grade II was the commonest grade of dysphagia in post operative and post radiotherapy strictures. (Table 3)

Most patients were poorly built with 56.67% patients having a weight of less than 40 kg. The mean weight of patients in this study was 42.1 + 10.6. Anemia with haemoglobin less than 9 gm % was found in 66.67% patients.

On barium swallow, most of the patients had strictures in lower end of esophagus (68%) . 19 patients had short strictures (63.33%) while only 9 had long ones. Six patients (21.43%), all having corrosive strictures had severe degree of narrowing with only a thin streak of dye passing beyond the stricture. (Table 4)

On endoscopy, 10 patients (33.33%) had stricture length more than 5 cm and all of them were corrosive strictures. Maximum patients had stricture in lower third of esophagus, 6 had mid esophageal and two had multiple strictures. 5 strictures were very tight (16.67%) (less than 6 mm) and 12 were tight (40%) (7 to 10mm). (Table 5)

Technical success was defined as passage of one dilator more than the stricture. It was achieved in 93.33% of patients. In 16 patients (53.33%), maximum dilatation achieved was > 11 mm and immediate objective success was achieved in 23 patients (76.76%), meaning that scope could be passed immediately after dilatation. (Figure 1)

In 21 patients (70%), the dysphagia was reduced by two grades after first session. Eleven patients (36.67%) had no dysphagia after first session .

Adequate dysphagia relief was obtained in 23 patients out of 30 (76.67%). There were only 2 frank failures. (Table 6) Maximum sittings were required in corrosive poisonings (4.14 sittings) and least for post sclerotherapy strictures (1). A total of 205 dilatations were performed on 30 patients. 72 dilatations were required for 13 peptic strictures. 85 dilatations were performed on 7 corrosive ones. 35 dilatations were required for 6 patients of post sclero therapy strictures, while 10 dilatations were performed on 3 post operative patients, only 3 dilatations were required for 1 case of post radio therapy strictures. (Figure 2) During the study, one esophageal perforation occurred which was managed successfully, while there were two minor bleeds. Pain was the most common complication which occurred in 63.33% patients. No life threatening major bleed occurred during the procedure.

Discussion:

In the present study, the age range of patients was 16-91 years with mean age of 41.33±18.3 years. Females outnumbered males with male to female ratio of 0.58:1. Nanda V, Kochhar R et al reported a mean age of 35 yrs. In their study the male: female ratio was 1.6:1.^[7] In a study by Desai et al the mean age was 55 yrs. with a male : female of 2.2:1. ^[8]In this study, most patients had dysphagia ranging between Grade II to IV. In a comparable study by Desai et al, most patients had dysphagia ranging between Grade II to IV . ^[8]In present study, most patients with peptic strictures had dysphagia Grade II- IV. Those with corrosive strictures had grades III-V dysphagia. The commonest grade of dysphagia in the patients with post sclerotherapy and post radiation strictures was grade II. In patients with post operative strictures, commonest grade of dysphagia was grade II. In a study by Lahoti D et al, on benign strictures, commonest grade of dysphagia at presentation was

grade III in corrosive strictures and grade, II in the other causes.^[9] In the present study, only cases with benign strictures were studied. Maximum out of these were peptic strictures(43.33%) while post corrosive(23.3%) and post sclerotherapy(20%) strictures followed closely. Many studies found comparable causative profile, notably, a study by Nanda V and Kocchar R, where 30% were peptic strictures; 25% corrosive; 13.3% post sclerotherapy, post radiation and postoperative strictures being 3.3% each.^[7] On barium swallow and endoscopy, most patients had stricture in lower 1/3rd of esophagus. Studies which only included benign strictures, like Ogilvie et al, Lanza et al showed a preponderance of lower 1/3rd stricture as in present study. ^[10,11] In present study, stricture length was short in maximum patients. In study by Lahoti D, Broor SL, the mean stricture length was 11.8±2.89 cms with a range of 1.5-25cm.^[9] In present study, technical success was considered to be the passage of one dilator larger than the stricture. Success(as per that rule) was achieved in 28(93.33%) of patients in the present study. The maximum dilation achieved was more than 11 mm in 16 patients (53.33%) in the 1st session itself. In 23(76.67%) of patients the endoscope could be immediately passed following 1st session of dilation, that was considered to be immediate objective success. The present study did not use fluoroscopy and the success was comparable with other studies. Yong- Guang Wong et al had success percentage of 100 % while Kadakia SC et al (47) reported a success percentage of 92%; these two studies did the dilatations without fluoroscopy.^[12,13]

Adequate dysphagia relief that is dysphagia less than grade II (or Gr 0 in cases of initial dysphagia Grade II) was achieved in 23 patients (76.76%) in

present study. Frank failures were only two cases, while 5 patients were lost to follow up. Pereira – lima JC et al reported a rate of 93.5% with a 6.5% failure rate.^[14] Andreollo et al had a relief rate of 76.2% with a failure rate of 5.6% .18.2% of their patients were lost to follow up.^[6] These findings were comparable to the present study. In the present study maximum number of sittings were required for corrosive strictures(4.14) while 1 to 2.5 sittings were required for the rest of the cases to achieve adequate relief. Comparatively, in the study by Goyal R,corrosive strictures required maximum number of sittings.^[15]

In the study by Monnier, Savary et al ,corrosive stricture required 6 sittings, while peptic postoperative and postradiotherapy strictures required 2 sittings each .^[16] Thus it is seen that in each comparative study corrosive structure required maximum number of sittings probably due to their tortuous, narrow eccentric nature which are difficult to dilate.

In present study, total patients were 30 who underwent a total of 205 dilatations. Adequate dysphagia relief was achieved in 76.67%(23Patients).The follow-up period was for 3 month (short term assessment). In a study by Yong-Guang Wong et al, 55 patients underwent a total of 401 dilatations without fluoroscopy where corrosive strictures needed 99 dilatations. This was comparable to present study.^[12]

Conclusion:

Hence this study described the etiological profile of benign esophageal strictures and demonstrated that dilatation with Savary- Gilliard dilators even without use of fluoroscopy was effective and safe. This method is therefore an economical way to relieve dysphagia in a government tertiary care set up.

Table 1. Dysphagia grade at Presentation:

Grade	No. of Patients	Percentage
I	2	6.67
II	13	43.33
III	6	20
IV	8	26.67
V	1	3.33
Total	30	100

Table 2. Causative history

Cause	No. of Patients	Percentage
Corrosive	7	23.33
Peptic	13	43.33
Post Sclerotherapy	6	20
Post Op.	3	10
Post Radiotherapy	1	3.33
Total	30	100

Table 3. Grade Related to Cause

Grade	Peptic	corrosive	Post RT	Post Sclero	Post Op	Total
I	0	0	0	1	1	2
II	7	0	1	3	2	13
III	3	2	0	1	0	6
IV	3	4	0	1	0	8
V	0	1	0	0	0	1
Total	13	7	1	6	3	30

Table 4. Site of stricture on Barium swallow

Site of stricture	No. of Patients	Percentage
Lower	19	67.86
Middle	6	21.43
Multiple	3	10.71
Total	28	100

Table 5. Lumen diameter in endoscopy

Diameter	No. of Patients	Percentage
≤6mm	5	16.67
7-10mm	12	40
≥11 mm	13	43.33
Total	30	100

Table 6. Follow up and efficacy

Efficacy	No. of Patients	Percentage
Adequate dysphagia relief (less than gr II)	23	76.67
Failure	2	6.67
Lost to follow up	5	16.67
Total	30	100

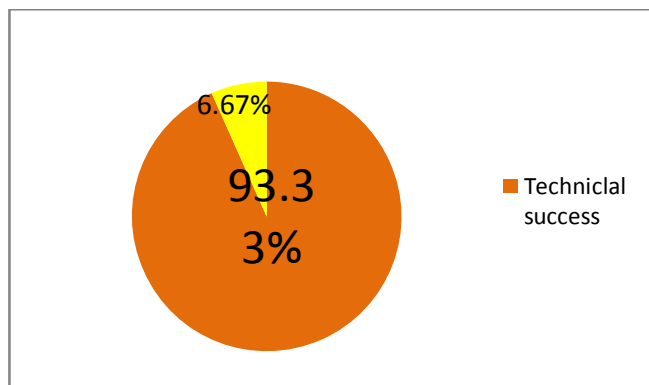


Figure 1. Technical success rate

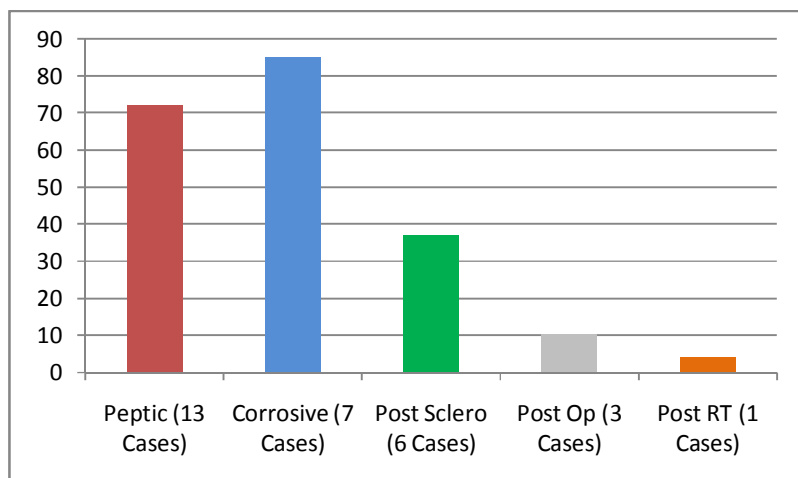


Figure 2. Total number of dilatations related to cause

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