Self-bougienage: long-term relief of corrosive esophageal strictures

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Background: Corrosive esophageal strictures require dilatation at frequent intervals. Objective: To determine the efficacy of self-dilatation in treatment of corrosive esophageal strictures. Methods: Retrospective analysis of data from 51 patients with corrosive esophageal strictures seen in a surgical unit. Eighteen patients underwent per-oral antegrade dilatation of stricture using gum elastic bougies (Group I); 15 patients underwent retrograde dilatation with endless string using an India rubber dilator devised at the authors’ institution, followed by per-oral antegrade dilatation (Group II); 15 patients underwent retrograde dilatation followed by antegrade dilatation with endless string through esophagostomy (Group III). In three patients with stricture of the entire esophagus, endless string could not be passed; they were subjected to esophagogastroplasty. All patients were taught self-dilatation with gum elastic bougies as the final step, and were put on a progressive, domiciliary, self-dilatation program. Quarterly follow up was done for one year, to ascertain whether self-bougienage was being performed properly. Results: All patients responded well to treatment, with significant relief of dysphagia and improvement in health and barium study findings. Six patients developed mediastinitis (3, 2 and 1 in Groups I, II and III, respectively) during initial dilatation; all improved with conservative management. Only one patient who failed to carry out self-bougienage had to be readmitted and retrained in the procedure, after which he remained asymptomatic. Conclusions: Patients with corrosive esophageal strictures can be treated with a long-term self-bougienage program, which avoids the need for frequent hospital admissions for esophageal dilatation. [Indian J Gastroenterol 2001; 20:180-182]

Key words: Endless string, India rubber dilator, self-dilatation

Corrosive esophageal strictures require early and effective treatment; untreated, they may lead to slow death from dysphagia, malnutrition and respiratory complications. The treatment modalities for stricture are dilatation and surgery; dilatation is effective in most cases. It has been our experience (unpublished observation) that initial blind or endoscopic dilatation of long-segment strictures or multiple strictures is fraught with the danger of potentially fatal complications like esophageal perforation and mediastinitis. Moreover, unlike peptic strictures, corrosive esophageal strictures require life-long dilatation because of continuing submucous inflammation.

We analyzed our long-term follow-up data on initial stricture dilatation with self-bougienage to assess its efficacy, safety, ease and patient compliance.

Methods

This is a retrospective analysis of data obtained from 51 patients (aged 15-61 years; 38 men) with corrosive esophageal strictures seen between January 1981 and March 2000. Thirty-six strictures were caused by ingestion of acid and 15 were due to alkali. They presented one to five months (median 13 weeks) following ingestion of corrosive agent, with features of weight loss and dehydration. Barium study showed stricture of the upper one-third of the esophagus in 10 cases and of the lower two-thirds of the esophagus in 38 cases; in three patients, the stricture involved the entire esophagus. Fluid and electrolyte abnormalities were corrected with parenteral fluids or by gastrostomy feeds.

Dilatation procedure

Patients were classified in 3 groups depending upon the dilatation modality adopted. Strictures in group I patients could be dilated by per-oral antegrade dilatation. Those in group II patients could not be dilated by antegrade dilatation; these patients were subjected to gastrostomy and placement of nasogastric endless string. Group III patients were non-compliant for per-oral dilatation with endless string; they were therefore subjected to esophagostomy, placement of esophagogastric string and dilatation.

Dilatation was done under topical anesthesia as follows:

Per-oral antegrade dilatation: Five patients with strictures of the upper 1/3rd and 13 with strictures in the lower 2/3rd were dilated using gum elastic bougies. Gastrostomy with establishment of nasogastric endless string: This was done in 15 patients with lower
either by asking the patient to swallow a thread and retrieving it through a gastrostomy or by passing a 4F-6F ureteric catheter with the aid of a fiberoptic endoscope. The endless string provided intraluminal access across the stricture for string-guided dilatation. This was done with the help of dilators prepared (by RDB) from India rubber catheters. Each dilator (Fig 1) is a chain of three India rubber catheters stitched end-to-end in increasing diameters; the smallest proximal catheter has a loop of linen to which the endless string is attached. Dilatation is done by pulling the string from the other end.

After each dilatation session, the thread was delivered through the nostril and secured to the check. Retrograde dilatation through the gastrostomy was done till 20F dilator could be passed per oral; thereafter, antegrade dilatation was done.

**Esophagostomy and gastrostomy with esophageal gastric endless string**: This procedure was followed in 15 patients (5 upper third, 10 lower two-third strictures) who had poor compliance with peroral dilatation. Cervical loop esophagostomy was done and after one week, dilatation was carried out, first retrograde and then antegrade through the esophagostomy.

In three patients with stricture involving the entire esophagus, dilatation was not possible and esophagogastoplasty was done.

Dilatation was done twice a week till the esophagus was dilated to 32F-34F. During this period, patients were fed through a gastrostomy. This was followed by self-bougienage.

Patients were taught self-bougienage with nasogastric tube initially and later with 32F gum elastic bougie (Fig 2). At discharge they were advised to do self-bougienage every day for the first 3 months followed by at least once a week lifelong.

All patients were told to follow up 3 monthly for one year to ascertain whether self-bougienage was performed properly.

**Results**

Patients required an average of 4-5 weeks of dilatation (mean 12 sessions) before they could be taught self-bougienage. Relief of dysphagia was observed in all patients; patients with absolute dysphagia before treatment could swallow liquids, soft food and, finally, solid diet. Barium studies, repeated at varying intervals, showed increase in esophageal caliber to normal in all patients. Antegrade dilatation through esophagostomy was better tolerated than retrograde dilatation using endless string or per-oral dilatation. These patients had no procedure-related pain and had the best compliance with the procedure.

Once the esophagostomy was closed (4-6 weeks after successful dilatation was achieved), these patients continued per-oral self-bougienage.

In groups I, II and III, 3, 2 and 1 patients, respectively, developed mediastinitis during initial dilatation. All were treated conservatively with analgesics, antibiotics and salivary diversion by esophagostomy.

Forty of 51 patients followed up regularly. One patient who failed to carry out self-bougienage was readmitted and retrained in the procedure, after which he remained asymptomatic. The others remained asymptomatic for dysphagia and showed progressive weight gain.

**Discussion**

Esophageal dilatation is an important method of treating dysphagia in patients with luminal narrowing of the esophagus. Jackson and Jackson\(^1\) recommended retrograde dilatation using a string or filliform-guided bougie
as they felt that it is the safest method. Per-oral antegrade string dilatation has been advocated by others. Mercury-filled Hurst bougies were used for minimal or moderate strictures.

Multiple or long-segment corrosive strictures are not amenable to blind or endoscopic dilatation since, even in the best of hands, there is risk of complications, viz., perforation and mediastinitis. In patients in whom antegrade dilatation was not possible, our method of establishing endobronchial gastric string and performing string-guided dilatations was successful, with minimal complication. The indigenously fabricated bougie was easy to make and followed the intraluminal path of the string without creating a false passage.

In corrosive esophageal stricture, chronic inflammation persists under intact epithelium for months after the injury. This is responsible for the high number of symptomatic recurrences even after adequate dilatation has been achieved. That is why we devised self-bougienage as the last step in our dilatation program. Self-bougienage has been used in dilating cervical esophago-gastric anastomotic stricture as well as in dilatation of upper-esophageal stricture following esophagectomy. The patient on self-bougienage is self-dependent, better compliant and does not require repeated hospital admissions for further dilatation. This makes the procedure cost-effective.

In conclusion, in patients with corrosive esophageal strictures in whom antegrade dilatation is not possible, retrograde dilatation using an endless string and an indigenously fabricated bougie is an alternative effective.

We advocate self-bougienage as long-term therapy for corrosive esophageal strictures.

References

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NEWS AND NOTICES
The 9th Asian Conference on Diarrheal Diseases and Nutrition will be held in New Delhi September 28-30, 2001.
For details, contact: Prof M K Bhan, Conference Secretary, ASCODDD2001, Room No. 2054, Academic Block, Department of Pediatrics, All India Institute of Medical Sciences, Ansari Nagar, New Delhi 110 029.
Tel: (11) 696 3822, 659 4792, 656 1123, 656 0110 Extn 3290. Fax: (11) 686 2663. E-mail: ascodd2001@delhi.as.
Website: http://www.ascodd2001.delhi.as

The 42nd Annual Conference of the Indian Society of Gastroenterology and associated societies will be held in Lucknow November 23-29, 2001.
The program includes two pre-conference symposia on gastrointestinal motility and scientific communication, a postgraduate course / CME, and endoscopy workshop.
For details, contact: Prof S R Naik, Department of Gastroenterology, SGPGI, Lucknow 226 014.
Tel: (522) 44 0700, 44 0800 Extn 2400.
Fax: (522) 44 0078, 44 0017.
Website: http://www.sgpgi.ac.in/conf/tsxg2001.html

The X Surgical Gastroenterology Week will be organized by the Department of Gastroenterology, Sanjay Gandhi PGIMS, Lucknow 226 014 December 21-23, 2001.
For details, contact: Dr Ashok Kumar.
Fax: (522) 440 017, 440 973.
E-mail: sgweek@sgpgi.ac.in

The 3rd World Chinese Congress of Digestology will be held in China September 23-25, 2002.
For details, contact: Lian-Sheng Ma, President of WCCD, P O Box 2345, Beijing 100230, China.
Fax: 86 65891893.
E-mail: wcjd@public.bta.net.cn

The VI International Surgical Conference of the Society of Surgeons of Nepal will be held in Kathmandu, Nepal November 21-23, 2002.
For details, contact: Dr Manohar Lal Shrestha, Organizing Secretary, Society of Surgeons of Nepal, NMA Building, Exhibition Road, Kathmandu, Nepal.
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