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Surgical management of gastric cicatrisation resulting from corrosive ingestion

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ABSTRACT

Background: Caustic injury to the stomach can be complicated by gastric stenosis. We review our experience with surgical management of symptomatic gastric stenosis.

Methods: This is a retrospective chart review of patients who underwent surgery for gastric stenosis within 6 weeks to 26 months following corrosive ingestion. The data analyzed included the extent of cicatrisation, surgical procedure performed and outcome. Preoperative evaluation in these patients included a barium contrast study and upper gastrointestinal endoscopy.

Results: Main presenting symptoms were nonbilious vomiting, early satiety, dysphagia and significant weight loss. Antropyloric strictures were present in 28 (64%) patients, total gastric involvement was seen in 16 (36%) patients, associated esophageal stenosis was present in 18 (40.91%) patients. Surgical procedures performed included distal gastrectomy with Billroth1 reconstruction in 31.82%, distal gastrectomy with Roux-en-Y reconstruction in 20.45%, stricturoplasty in 11.36%, subtotal gastrectomy in 18.18% and total gastrectomy with pouch reconstruction in another 18.18% patients. Complications encountered were pneumonitis in 18.18%, wound infection in 11.36%, intra-abdominal infection, anastomotic breakdown, reactivation of pulmonary tuberculosis and dumping syndrome, each in 2.27% patients. One patient (2.27%) died.

Conclusion: Surgical procedure should be tailored according to the extent of gastric involvement. Surgical resection is feasible and safe. Our results suggest that satisfactory outcome could be expected with different therapeutic modalities based on degree of cicatrisation.

1. Introduction

Cicatrisation of the stomach following corrosive ingestion in adults is rare[1] and remains the main long-term complication.[2,3] It is reported equally after both strong acid[4] and alkali ingestion.[5] The overall incidence of gastric outlet obstruction reported varies from 5% to 8%.[6,7] The scarring may be segmental or diffuse. Various deformities produced are antropyloric stenosis, hour-glass deformity, or contracted small capacity stomach. Patients may develop symptoms within 3 months of caustic ingestion. Strictures are known to develop from 1 year to 6 years after the initial ingestion.[8] Severe malnutrition is present in a significant proportion of patients necessitating a feeding jejunostomy or placement of a nasoduodenal feeding tube (if possible) prior to definitive surgery.[8] There are only a few reports highlighting the management of corrosive injury of the stomach.[8–10] Surgery remains the mainstay of therapy for corrosive strictures of the stomach,[8,11] even though good results have been reported with balloon dilatation.[12] We report our experience in managing corrosive induced damage to the stomach over a period of 10 years.

2. Materials and methods

The present study is a retrospective review of 44 patients with gastric cicatrisation following corrosive ingestion who underwent surgical treatment from March 1998 to March 2008, at a tertiary care centre in north India. The site and extent of strictures were assessed in all patients using upper gastrointestinal (GI) contrast study as well as esophagogastroduodenoscopy whereever feasible. The patients were either referred to directly for surgery ($n = 36$) for symptoms, or after failure of endotherapy ($n = 8$). An enteral route for nutritional support was maintained wherever feasible. Jejunostomy feeds used were either commercially available enriched enteral formulae or, more often, home-made preparations rich in proteins, fats and carbohydrates.

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3. Surgical management

The choice of definitive surgical procedure was governed by the extent of cicatrisation of the stomach and the patient's general condition. Resection and reconstruction were tailored according to the pattern of gastric involvement.

In patients with segmental involvement of the stomach (Figs. 1 and 2), a limited gastrectomy was performed. Following antrectomy, a gastroduodenostomy in Billroth I fashion or a Roux-en-Y reconstruction was performed. The choice of reconstruction was based on the adequacy of the mobilized stomach. In patients with short segment stricture (Fig. 3), a stricturoplasty could be performed.

In patients with diffuse gastric involvement (Fig. 4), a total gastrectomy with jejunal pouch reconstruction was performed. A 15 cm jejunal pouch (J shaped using GIA 75×2) was made and anastomosed with distal end of abdominal oesophagus in a Roux-en-Y fashion. In patients with diffuse involvement and relative sparing of the fundus, a subtotal gastrectomy with gastrojejunostomy was done.

Intraoperative parameters and postoperative complications were noted. The patients were followed up for a period of 3 months to 9 years.

4. Results

The study included 28 females and 16 males, age range was16–72 years (median age 37 years). The presenting symptoms were recurrent vomiting and pain in the abdomen suggestive of gastric outlet obstruction in 33 (75%) patients and early satiety with failure to thrive in 11 (25%) patients. The interval between the corrosive intake and presentation was 6 weeks to 26 months (median 5 months). The corrosive agent responsible for the injury was toilet cleaning acid in 34 (77.27%) cases, adulterated country liquor in 6 (13.64%), phenolic acid in 2 (4.55%), and undetermined in 2 (4.55%). The ingestion was with suicidal intent in 27 (61.36%), accidental in 12 (27.27%) and homicidal in 5 (11.36%) patients.

Fig. 2. Dilated stomach with residue. Long antral stricture with pseudodiverticuli. Duodenal bulb is normal. He underwent Billroth I reconstruction.

An enteral feeding line could be established in 43 (97.73%) patients – nasoenteric tube in 24 (54.55%) and feeding jejunostomy in 19 (43.18%). One patient (2.27%) in whom nasoenteral tube could not be placed, refused for surgical placement of feeding tube and was maintained on parentral nutrition till definitive reconstruction could be undertaken.

A contrast study was done in all the patients to define the site and extent of cicatrisation. In 28 (64%) patients, there were segmental involvement of the stomach, while 16 (36%) had diffuse involvement with a small capacity cicatricial stomach (Table 1). Small fibrosed and tubular stomach were the commonest pattern of involvement in the diffuse variety while the antropyloric involvement was the commonest pattern in the segmental variety.

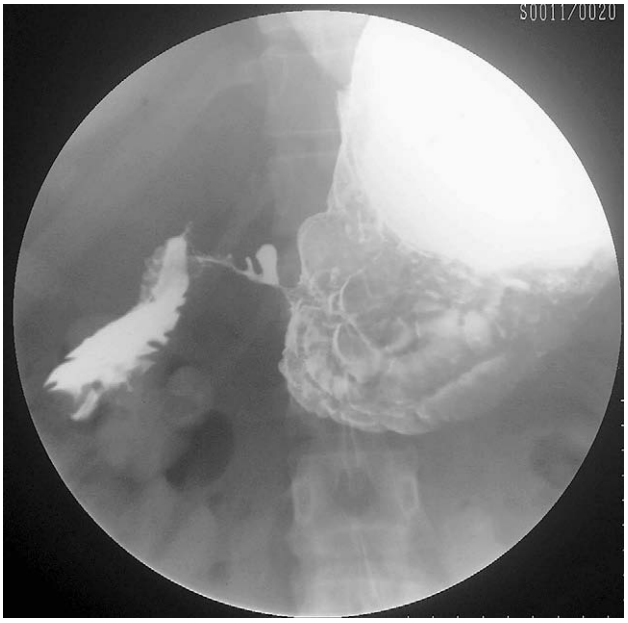

Fig. 1. Long segmental narrowing in distal body and antrum with pseudodiverticuli. Stomach proximal to the stricture is dilated and shows polypoidal filling defects suggestive of regenerative hyperplasia.

Fig. 3. Short segmental stricture in the distal body. The proximal and distal parts of the stomach are normal. He underwent stricturoplasty.