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# SURGICAL MANAGEMENT OF GASTRIC CORROSIVE STRICTURE

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## ABSTRACT

The 7 consecutive patient with chronic corrosive gastric injury treated in single surgery unit over a period of four and a half year were reviewed with special reference to presentation and surgical management. Patient's age ranged from 20 to 55 years with mean age of 31 years. Male female ratio was 4:3. Etiology of ingestion was suicidal in 5 cases and accidental in 2 cases. Main presenting symptoms were postprandial nonbilious vomiting; early satiety and significant weight loss. Preoperative evaluation includes oral barium contrast study and upper gastrointestinal endoscopy. Posterior gastrojejunostomy was done in 4 cases. Near total gastrectomy and Billroth I procedure was done in one case each. One patient developed severe malnutrition and sepsis despite being on jejunostomy feeds. She died without any definitive surgical management. During the mean follow up period of 21.5 months (1 to 52 months) all patients were symptoms free except for one patient who had incisional hernia. We did not encounter gastrojejunostomy related complication in our patients. Surgical procedure should be tailored according to extent and degree of involvement. Posterior gastrojejunostomy is an effective alternative in corrosive gastric stricture.

**Keywords:** *Corrosive Ingestion, Gastric Stricture, Gastric Outlet Obstruction*

## INTRODUCTION

Corrosive agent ingestion either accidental or suicidal causes severe injury to the upper gastrointestinal tract. The injury ranges from esophagitis, erosions, ulcerations, gastritis to stricture formation in severe cases. The severity and pattern of injury depends upon type of corrosive, volume, concentration, intention of intake, duration of contact and the presence of food in stomach. It has been stated that alkali damages the esophagus and acid damages the stomach. This "selective" damage occurs because alkali tend to coat the esophagus, acid on the other hand has rapid transit through esophagus, reflux spasm of pylorus in response to acid also causes its accumulation in antral region (Hsu *et al.*, 1997a). However injuries to both the esophagus and stomach are common with both the corrosive agents.

Isolated corrosive stricture in stomach is relatively rare. We report our experience in managing isolated corrosive induced gastric stricture.

## MATERIALS AND METHODS

This is a retrospective analysis of prospectively collected data base of corrosive injuries of upper gastrointestinal tract admitted in single surgical unit of our hospital from June 2010 to December 2014. Case records of all the patients with isolated gastric injury were reviewed with attention to presenting complaints, interval between time of ingestion and presentation in hospital, nature of corrosive, definitive procedure performed and outcome. All the patients underwent preoperative evaluation with upper gastrointestinal tract contrast studies and esophagogastroduodenoscopy to assess the site and extent of stricture. Feeding jejunostomy was done in all the patients to access the alimentary tract for nutrition. Feeding jejunostomy was done with 10 Fr catheter using Witzel technique 15 cm from duodenojejunal flexure. Patients were taught and started on homemade nutrition. Definitive surgery was delayed for 3 months after the ingestion of corrosive agents. The choice of definitive surgical procedure was determined by extent of cicatrization of stomach and general condition of the patient. In cases of localized antropyloric stricture with gastric body dilatation posterior gastrojejunostomy was done. In case of diffuse stricture near total gastrectomy followed by Roux-en- Y anastomosis was done. If there was associated

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esophageal stricture successful esophageal serial dilatation, resection of antropyloric strictured segment and Billroth I anastomosis was done to avoid any adhesions in infracolic compartment, in case of future requirement of colonic replacement of esophagus.

Intraoperative findings and postoperative complications were noted. Patients were followed up for a period of 1 to 52 months.

## RESULTS AND DISCUSSION

### Results

The study includes 7 patients, 4 male and 3 female (Table No 1). Mean age at presentation was 31 years ranging from 20 to 55 years. The presenting symptoms were recurrent postprandial nonbilious vomiting and abdominal pain suggestive of gastric outlet obstruction in 6 patients and difficulty in swallowing in one patient. There was history of significant weight loss in all the patients. The interval between corrosive intake and presentation was ranging from 21 to 42 days (mean=33 days). Corrosive ingestion was with suicidal intent in 5 cases and accidental in 2 cases. The corrosive agent causative of injury was toilet cleaning agent (hydrochloric acid) in 5 cases and undetermined in 2 cases. Feeding jejunostomy was done at the time of presentation in 5 patients as an access to enteral nutrition. In 2 cases feeding jejunostomy was done elsewhere and was referred to our institution for further management. All the 7 patients underwent assessment of gastric cicatrization with upper gastrointestinal tract endoscopy and oral contrast studies. One patient had associated lower esophageal stricture he underwent serial esophageal dilatation and responded well to the same. Features of gastric outlet obstruction appeared once the patient started oral intake after the resolution of lower esophageal stricture.

Definitive surgery was performed once the nutritional status was adequate in terms of weight gain, hemoglobin and albumin status. The mean interval between corrosive ingestion and definitive surgery was 105 days (Range 50-180 days).

**Table 1: Patient data**

| S No | Age (Yrs) | Sex | Corrosive agent   | Preliminary procedure | Interval definitive surgery (days) | of Definitive surgery               | Follow up (months) | Outcome           |
|------|-----------|-----|-------------------|-----------------------|------------------------------------|-------------------------------------|--------------------|-------------------|
| 1    | 20        | F   | Hydrochloric acid | Feeding jejunostomy   | 50                                 | Posterior gastrojejunostomy         | 52                 | Satisfactory      |
| 2    | 22        | M   | Hydrochloric acid | Feeding jejunostomy   | 90                                 | Near total gastrectomy Roux-en-Y GJ | 27                 | Satisfactory      |
| 3    | 55        | M   | Hydrochloric acid | Feeding jejunostomy   | 90                                 | Posterior gastrojejunostomy         | 23                 | Satisfactory      |
| 4    | 30        | F   | Hydrochloric acid | Feeding jejunostomy   | 180                                | Posterior gastrojejunostomy         | 20                 | Incisional hernia |
| 5    | 24        | F   | Hydrochloric acid | Feeding jejunostomy   |                                    |                                     |                    | Death             |
| 6    | 22        | M   | unknown           | Feeding jejunostomy   | 100                                | Posterior gastrojejunostomy         | 6                  | Satisfactory      |
| 7    | 45        | M   | unknown           | Feeding jejunostomy   | 120                                | Billroth I                          | 1                  | Satisfactory      |

One patient did not undergo definitive surgery. She died of severe malnutrition and sepsis despite on feeding jejunostomy feeds. Posterior Gastrojejunostomy was done in 4 patients, Billroth I gastroduodenostomy was done in 1 patient, Near total gastrectomy followed by reconstruction with Roux-en- Y Gastrojejunostomy in 1 patient. In the post operative one patient had wound infection. In all other patients postoperative recovery was uneventful.

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All the patients were on regular follow up. Mean follow up was 21.5 months (1 to 52 months). Overall results were good none had problem of postprandial vomiting and abdominal pain. One patient developed incisional hernia at 1 year on follow up.

### Discussion

Gastric injury as a consequence of corrosive ingestion usually occurs along lesser curvature and prepyloric antrum region (Subbarao *et al.*, 1998). Prepyloric and antrum is the commonest site owing to reflex pylorospasm and pooling of secretions in this region (Tohda *et al.*, 2008). The ensuing fibrosis results in cicatrization causing gastric outlet obstruction. Severity and site of stricture depends upon many factors like nature and concentration of corrosive agent, intent of ingestion, fasting or fed state (McAuley *et al.*, 1985). The presenting symptoms include nonbilious vomiting, weight loss. Majority of patients develop symptoms between 6 weeks to 26 months, however it has been reported to occur between 19 days to 22 years (Ciftci *et al.*, 1999; Oxcan *et al.*, 2004; Agarwal *et al.*, 2004). In our case series the mean interval between corrosive intake and presentation to our unit was 33 days (21-42 days).

Upper gastrointestinal tract contrast studies and upper gastrointestinal endoscopy are useful tools for evaluating corrosive induced gastric strictures. As a part of evaluation our all patients underwent upper gastrointestinal tract contrast study and esophagogastroduodenoscopy.

Definitive surgery was performed 105 days after ingestion of corrosive. Our policy is to wait for a minimum period of 90 days before undertaking surgery. Also it has been recommended by others to perform surgery 3- 24 months after corrosive ingestion (Chungh *et al.*, 1997; Chaudhary *et al.*, 1998). Although there has been reports of early surgery (Hwang and Chen, 1996), definitive procedure is often postponed till the full extent of cicatrization is visible and patient is nutritionally optimized. Therefore preliminary feeding jejunostomy was done in all the patients presenting with history of corrosive ingestion and features of gastric outlet obstruction. Posterior gastrojejunostomy was favored in most cases except for Billroth I in one case and near total gastrectomy in another case.

Billroth I was done in patient having associated lower esophageal stricture. He was on regular esophageal dilatation. After achieving satisfactory dilatation he was taken up for surgery 120 days after ingestion of corrosive. In view of future possibility of need for surgery in esophageal stricture infra colic compartment was left untouched to avoid any adhesions later on. Second patient had diffuse stricture of gastric body with sparing of proximal stomach. He had history of feeding jejunostomy and failed attempt for gastrojejunostomy elsewhere. Near total gastrectomy followed by reconstruction with Roux- en- Y gastrojejunostomy was done.

Most centers prefer some form of gastric resection considering the possibility of malignant potential of scarred stomach (Zamir *et al.*, 1985). However Hsu *et al.*, (1997b) experienced no case of malignancy arising from background of corrosive ingestion on examination of more than 750 esophageal cancers and 2000 gastric cancers. Gastrojejunostomy is reasonable alternative. In comparison to gastric resection, gastrojejunostomy is a lesser procedure with minimal risk of stomal ulceration due to histamine released achlorhydria in these patients (physiological antrectomy) (Chaudhary *et al.*, 1996). Concomitant stricture in both esophagus and stomach is found in 6% to 63% cases (Kamijo *et al.*, 2007; Feng *et al.*, 2005; Tekant *et al.*, 2001). In our series there was one case with associated esophageal stricture 14.28 % (1/7). This case was managed by periodic esophageal dilatation, gastric outlet obstruction manifested when patient started eating normally once the dilatation was achieved to satisfactory level. All the patients who underwent definitive surgical procedure were relieved of symptoms of postprandial vomiting and early satiety on follow up for mean period of 21.5 months. One patient developed incisional hernia detected at 1 year on follow up. In conclusion corrosive ingestion is associated with considerably morbidity. Surgery is tailored according to the extent and pattern of gastric involvement. Posterior gastrojejunostomy in our case series gave good results. Patients on regular follow up were symptom free and gained satisfactory weight.

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