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RESEARCH ARTICLE

SURGICAL MANAGEMENT FOR CORROSIVE ANTROPYLORIC STRICTURES: RETROSPECTIVE ANALYSIS IN A TERTIARY CARE SETTING

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Abstract

Background: Corrosive Oesophagogastric injuries are widely prevalent in India with a subset of individuals presenting with isolated antropyloric strictures without oesophageal and proximal gastric strictures. These strictures often progress to gastric outlet obstruction (GOO). Thorough evaluation to define the extent of stricture and appropriate management of isolated gastric injuries yield favourable outcomes with morbidity compared to extensive corrosive injuries.

Materials and Methods: We conducted a retrospective analysis of 12 patients who underwent Antrectomy with Billroth-1 reconstruction for isolated Antropyloric stricture following corrosive ingestion at the Department of General Surgery, Basaveshwara Teaching and General Hospital affiliated with Mahadevappa Rampure Medical College, Kalaburagi, from November 2022 to April 2024. Extent of gastric cicatrisation was evaluated by upper GI Endoscopy and Barium study. Nutritional support, if required, was provided via feeding jejunostomy, followed by definitive operation performed between 3rd to 6th month post ingestion. Patients were followed by upper GI endoscopy.

Results: All patients had isolated antropyloric stricture without any oesophageal or proximal gastric involvement. 82% had suicidal intent of ingestion and 18% accidental. Antrectomy with Billroth-1 anastomosis was performed. The postoperative period was uneventful, with no instances of anastomotic leak or intra-abdominal collection. All patients gained weight within 8 weeks.

Conclusion: Ingestion of corrosive carries high late morbidity. Surgery is the mainstay of management for corrosive-induced gastric injuries with good short- & long-term results. Surgical procedure should be tailored according to the patient's general condition and extent of gastric injury. We advocate resection to eliminate the risk of malignancy in the scarred stomach, and the potential risk of stomal ulceration following gastrojejunostomy.

Introduction:-

Isolated gastric cicatrisation is a rare clinical presentation in patients with a history of corrosive ingestion, as it is typically seen in conjunction with esophageal injuries. Despite its rarity, it remains one of the major delayed complications following corrosive substance exposure.[1,2] Both acid and alkali ingestion are known to cause such

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injuries, with the extent of gastric involvement ranging from segmental strictures to complete cicatrisation of the stomach.
Among the various regions of the stomach, the antrum is particularly vulnerable due to the dependent position and stasis of the caustic agent, which facilitates prolonged contact and increased mucosal damage. The incidence of gastric outlet obstruction (GOO) secondary to corrosive injury has been reported to be between 5% and 8% in published series.[3,4].

A variety of endoscopic and surgical treatment options have been explored for managing these strictures. However, in the presence of dense fibrosis or failed endoscopic attempts, surgical intervention remains the mainstay of treatment.[5–7].
The aim of this study is to present our retrospective experience with the surgical management of gastric cicatrisation secondary to corrosive ingestion, emphasizing patient characteristics, operative strategies, and outcomes.

Materials and Methods:-

Study Design and Setting

A retrospective observational study was conducted at the Department of General Surgery, Basaveshwara Teaching and General Hospital, affiliated with Mahadevappa Rampure Medical College, Kalaburagi, Karnataka, India.

Study Period

The study included patients treated from November 2022 to April 2024.

Inclusion Criteria

1. Patients with history of corrosive ingestion (acid or alkali)
2. Radiological or endoscopic evidence of isolated antropyloric stricture
3. Underwent definitive surgical intervention (antrectomy with Billroth I)

Exclusion Criteria

1. Presence of concurrent esophageal or proximal gastric strictures
2. Non-corrosive causes of gastric outlet obstruction
3. Incomplete clinical data or managed conservatively

Results:-

The time period of the study saw total 12 patients admitted corrosive injuries. Males outnumbered females and hydrochloric acid was the most common caustic agent ingested. Suicidal ingestion being more common. Initial endoscopic assessment was carried out for all the patients. All patients presented with symptoms of gastric outlet obstruction, including recurrent non bilious vomiting, early satiety, weight loss, dehydration and electrolyte imbalance. 7 patients (58%) were severely malnourished at the time of presentation. These patients underwent feeding jejunostomy prior to definitive surgery to improve nutritional status. The remaining 5 patients were managed with parenteral nutrition and diet optimization preoperatively. Definitive surgical intervention was carried out between the 3rd to 6th month post-ingestion, based on nutritional recovery and absence of ongoing inflammation.

The demographics of the patient population included in the study is presented in Table 1

Table 1:-

Variable	Total number
Males	8
Females	4
Mean Age (years)	34.8

Preoperative Workup

Patients were evaluated using upper GI endoscopy and barium meal follow-through to determine the extent and severity of the stricture. Nutritional support, including feeding jejunostomy, was provided in patients with poor oral intake. Definitive surgery was planned between the 3rd and 6th month post-ingestion.

Surgical Procedure

All patients underwent open surgical antrectomy with Billroth I reconstruction under general anaesthesia. A midline vertical incision was employed to access the peritoneal cavity. Intraoperative findings were correlated with preoperative endoscopic evaluations to determine the extent of distal gastric resection, particularly assessing the pliability and distensibility of the gastric remnant (Figure 1).A right gastroepiploic artery-sparing antrectomy was performed in all cases. The stomach and duodenum were transected using a surgical knife. Following confirmation of an adequate luminal diameter, a gastroduodenal anastomosis was fashioned. The posterior wall of the stomach was anastomosed to the cut end of the duodenum in an end-to-end manner. The anterior wall of the stomach was hand-sewn or closed using a linear stapler, depending on intraoperative judgment (Figure 2). Postoperative recovery was monitored. Patients were followed up with clinical assessment and upper GI endoscopy

Figure 1:- Pyloric stricture.

Figure 2;- Reconstruction of Billroth 1.

Postoperative outcomes

The timing of intervention and the post operative hospital stay are presented in Table 2

Table 2:-

Variable	Total number
Time from consumption to reconstruction	3 to 6 months
Post operative hospital stay	10.3 days (9-13days)

All patients resumed oral intake by postoperative day 5. Full solid diet was tolerated by postoperative day 10.

Surgical outcomes and complications is tabulated in Table 3

Table 3:-

Parameter	Outcome
Type of Surgery	Antrectomy + Billroth I
Anastomotic Leak	0
SSI or Collection	1
Weight Gain (8 weeks)	All patients
Endoscopic Patency	100%

One patient developed wound dehiscence and later underwent secondary suturing. There were no recurrence. The study did not witness any mortality. All patients gained weight post operatively.

Complications

Early Postoperative Complications

The postoperative recovery in this cohort was largely uneventful, reflecting the safety and reliability of antrectomy with Billroth I reconstruction when performed in optimized conditions. Among the 12 patients, one developed a superficial surgical site infection (SSI), which was mild in nature and managed conservatively with local wound care and antibiotics. Another patient experienced minor wound dehiscence, which was successfully treated with secondary suturing. Importantly, there were no instances of anastomotic leakage, intra-abdominal collections, or prolonged postoperative ileus. All patients were able to resume oral intake by the fifth postoperative day, and most transitioned to a solid diet by the tenth day, indicating a smooth gastrointestinal recovery in the early postoperative phase.

Late Complications

Follow-up evaluation over the ensuing weeks did not reveal any delayed complications. All patients gained weight within eight weeks, indicating satisfactory nutritional rehabilitation and functional gastric emptying. Endoscopic surveillance confirmed anastomotic patency in all cases, and none of the patients developed recurrent symptoms or stricture formation at the anastomotic site. There was no evidence of gastric dysplasia or malignancy in the resected specimens or during follow-up, and no mortality was reported during the study period.

The low complication rate in our series highlights the importance of preoperative nutritional optimization, careful intraoperative technique, and early identification of stricture extent through endoscopy and imaging. These elements, when combined, contribute to improved surgical outcomes and patient satisfaction.

Table 4:-

Type of Complication	Number of Patients (n = 12)	Percentage (%)	Remarks
Superficial Surgical Site Infection (SSI)	1	8.3%	Managed conservatively with dressings and antibiotics
Wound Dehiscence	1	8.3%	Required secondary suturing
Anastomotic Leak	0	0%	None observed
Intra-abdominal Collection	0	0%	None observed
Delayed Gastric Emptying	0	0%	All patients resumed oral intake by POD 5
Anastomotic Stricture (Late)	0	0%	100% endoscopic patency on follow-up
Weight Loss Post-op	0	0%	All patients gained weight within 8 weeks
Mortality	0	0%	No deaths reported during study period

Discussion:-

Corrosive ingestion injuries represent a serious public health concern in developing countries, particularly in India, where intentional ingestion of acids during suicide attempts is prevalent among adults. In the context of corrosive injury, the esophagus is often the most affected organ; however, isolated gastric involvement, especially strictures confined to the antropyloric region, although rare, is increasingly recognized as a significant delayed complication [1,2]. The antrum is particularly susceptible due to its dependent anatomical position, which facilitates prolonged stasis and contact of the corrosive agent, often hydrochloric acid, resulting in deep tissue injury and subsequent cicatrisation [3].

In our study, the majority of patients presented with typical symptoms of gastric outlet obstruction (GOO), such as persistent non-bilious vomiting, early satiety, and weight loss. This clinical pattern is consistent with previous studies which reported a 5–8% incidence of GOO in patients with a history of corrosive ingestion [3,4]. The high frequency of malnutrition at presentation, as noted in 58% of our cohort, underscores the debilitating nature of the disease and the need for early nutritional support. Nutritional rehabilitation, either by feeding jejunostomy or parenteral means, is crucial in optimizing patient condition prior to any definitive surgical intervention [5,6].

Endoscopic balloon dilatation, though minimally invasive and suitable for short or simple strictures, is largely ineffective in cases of dense fibrosis or complex long-segment strictures, as seen in our patients [7]. Several reports have documented limited long-term success rates with repeated dilatation and an increased risk of perforation in cicatrized gastric tissue [13]. Thus, surgical management becomes the mainstay in such scenarios.

We opted for antrectomy with Billroth I reconstruction in all 12 patients, which yielded excellent postoperative outcomes. This surgical technique offers several advantages over other methods such as gastrojejunostomy. Firstly, it maintains physiological continuity by restoring the natural route of gastric emptying via the duodenum. Secondly, it eliminates the risk of stomal ulceration, a known complication of bypass procedures like gastrojejunostomy [8]. Lastly, resection of the scarred gastric segment eliminates the potential risk of malignant transformation, as chronically inflamed or fibrotic gastric mucosa has been shown to harbor dysplastic changes over time [9].

Previous studies have endorsed early resection in isolated gastric cicatrisation, provided the patient's nutritional status permits surgery [6,8]. In our series, the mean postoperative hospital stay was approximately 10 days, with no major intra-abdominal complications. One patient experienced superficial wound dehiscence, which was managed with secondary suturing. There was no mortality, and all patients demonstrated weight gain within eight weeks, reflecting good functional recovery. Endoscopic follow-up confirmed 100% anastomotic patency, affirming the technical success of the procedure.

These results are comparable to outcomes reported by Agarwal et al. and Tseng et al., who also advocated for early surgical correction with antrectomy in patients with isolated strictures [5,6]. Additionally, our findings contribute to a growing body of evidence supporting definitive resection as both curative and preventive in terms of symptom control, nutritional restoration, and oncologic safety.

In conclusion, timely surgical intervention with antrectomy and Billroth I reconstruction, preceded by nutritional optimization, offers a definitive solution for isolated corrosive-induced antropyloric strictures. It provides excellent symptomatic relief, prevents long-term complications, and should be the preferred approach in well-selected patients

Conclusion:-

Antrectomy with Billroth I reconstruction is a safe and effective treatment for isolated corrosive-induced antropyloric strictures. It restores normal gastrointestinal continuity, ensures symptomatic relief, promotes nutritional recovery, and prevents long-term complications such as stomal ulcers and malignant transformation. Timely intervention after nutritional optimization leads to excellent postoperative outcomes with minimal morbidity..

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