Institutional report - Esophagus

Gastrocoele: a complication of combined oesophageal and antral corrosive strictures

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Abstract

Corrosive strictures of the gastrointestinal tract are a surgical challenge. We describe a previously undescribed condition called gastrocoele, a rare condition caused by combined oesophageal and antral strictures and review our results. We present our experience with nine cases of gastrocoele due to combined corrosive strictures of oesophagus and antrum between 1993 and 2005. The age group was 21–65 years with female preponderant (66%) sex distribution. The presentation was at a median of 110 days (range 45–400 days) following the corrosive ingestion. The standard investigations included barium swallow, endoscopy, jejunostomy tubogram and barium enema. The surgical procedures performed were antrectomy and coloplasty in six (one staged), antrectomy and oesophageal dilatation in two and gastrojejunostomy and coloplasty in one. There was no major morbidity or mortality with a median follow-up of 3 years. Gastrocoele is a rare entity where good results can be achieved with surgery, however, prevention of corrosive injuries by public education is the best cure!

Keywords: Gastrocoele; Corrosive strictures; Oesophageal and antral strictures

1. Introduction

Corrosive ingestion causes severe injuries to the upper gastrointestinal tract [1]. This ranges from erosions, oesophagitis, gastritis in severe cases with corrosive burns leading to stricture [2]. Ingestion of corrosives is common in Asia and usually occurs among young adults as an intentional suicide attempt [3]. We describe a previously undescribed condition called gastrocoele (named by Prof SMC) caused by double strictures involving the gastro oesophageal junction and the gastric antrum resulting in severe gastric distension.

We review our experience of corrosive strictures in a twelve-year period to analyse the treatment outcomes of gastrocoele. The clinical data, the technical considerations, and the long-term results are discussed.

2. Materials and methods

We reviewed nine patients with gastrocoele due to double strictures following corrosive ingestion managed in our unit between September 1993 and August 2005. The medical records, initial management, operative data, postoperative course, and follow-up data of these nine patients were reviewed.

There was a female preponderance (66%) in sex distribution with an age range from 21 to 65 years. The presentation was at a median 110 days (range 45–400 days) after corrosive ingestion. All of them had combined oesophageal and antral stricture. There was intent to commit suicide in all the patients.

2.1. Preoperative management

The initial treatment of acute cases included resuscitation when needed, antibiotics, nasogastric decompression, and correction of the acid-base imbalance, managed in our tertiary unit in India. Investigations included barium swallow, endoscopy and jejunostomy tubogram along with complete haemogram and blood biochemistry including liver function tests. All the patients were nourished using jejunostomy feeding prior to reconstruction (three were referred to us with feeding jejunostomy). Assessment of the airways was performed both by direct laryngoscopy and fibro-optic bronchoscopy. Colonoscopy and double contrast barium enema were performed to assess the status of colon should there be a need for a colonic conduit.

2.2. Assessment of the caustic stricture

Level and severity of the stricture were evaluated by oesophagography and endoscopy.

2.3. Operative strategies

The choice of the procedure depended on the nature of the lesion. If the stricture was too tight to be assessed by
endoscopy preoperatively they then underwent an intra-operative endoscopy by making an opening in the oesophagus and passing the endoscope in through the oesophagotomy for a final assessment.

2.4. Decision making

If the oesophageal stricture was a short segment stricture attempts were made to dilate it. If the stricture was a long segment stricture then a coloplasty was performed with a cervical anastomosis. The antral stricture was managed either by antrectomy (Fig. 3) or gastrojejunostomy.

2.5. Follow-up and assessment

Barium meal studies were routinely carried out two weeks after reconstruction, to evaluate the patency of conduit and the condition of anastomoses. In some patients aortograms were performed to ensure vascularity (Fig. 4). Patients were followed up as out-patients. Data recorded included ability to swallow a regular diet without dysphagia or only semi liquid or liquid diet, body weight, activity, aspiration, and timing and frequency of regurgitation. Complications developing immediately after the operation or during long-term follow-up were defined as operative morbidity.

3. Results

Six patients underwent antrectomy and coloplasty with one patient requiring cover gastrojejunostomy before the procedure. Two patients underwent antrectomy and esophageal dilatation and one patient underwent gastrojejunostomy and coloplasty.

The first patient to be operated on in this series was referred as a large pancreatic pseudocyst and underwent an emergency laparotomy, and when the large stomach was encountered we performed a posterior gastrojejunostomy and a decompression gastrostomy (Table 1). The patient subsequently underwent a coloplasty.

Two patients had short segment strictures of the oesophagus which was amenable to dilatation and the antral stricture was managed by antrectomy. In the others the colon was mobilised and anastomosed based on a left colic artery pedicle. In one patient where antrectomy was not possible a gastrojejunostomy was performed as a stapled anastomosis with coloplasty. There were no anastomotic leaks, conduit insufficiency. In this series of nine patients, there was no operative mortality. There was no major morbidity other than respiratory tract infection in one patient.

The length of follow-up was a median of three years (range 3–9 years). The follow-up studies included barium meal study, aortogram, clinical evaluation for improvement in nutritional status and endoscopy (Fig. 4). The two patients who underwent oesophageal dilatation required serial dilatations during follow-up.

Functional results of all the patients were good with a good ability to swallow a full diet without any dysphagia, and weight gain (Table 1).

4. Discussion

Corrosive injuries are generally encountered in the developing world following ingestion with suicidal intent. The mainstay of early management of the stable patient is prevention of stricture formation, this may include neutralization of caustics, corticosteroids, antibiotics, oesophageal dilatation, stenting, and surgical intervention. However, a significant proportion of them result in strictures of the oesophagus, stomach or both. Occasionally the patients have strictures of the antrum due to flow along the magenstrasse and distal oesophagus. This results in a double blind stomach which acts as a giant mucocele.

### Table 1

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Sex</th>
<th>Presentation (days)</th>
<th>Previous procedure</th>
<th>Surgery</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>F</td>
<td>45</td>
<td>Feeding</td>
<td>Antrectomy + Coloplasty</td>
<td>No Dysphagia</td>
</tr>
<tr>
<td>27</td>
<td>M</td>
<td>95</td>
<td>Jejunostomy</td>
<td>Antrectomy + Coloplasty</td>
<td>No Dysphagia</td>
</tr>
<tr>
<td>23</td>
<td>F</td>
<td>68</td>
<td>None</td>
<td>Antrectomy and dilatation</td>
<td>No Dysphagia</td>
</tr>
<tr>
<td>25</td>
<td>F</td>
<td>73</td>
<td>None</td>
<td>Antrectomy and dilatation</td>
<td>No Dysphagia</td>
</tr>
<tr>
<td>35</td>
<td>M</td>
<td>110</td>
<td>Feeding</td>
<td>GJ and Coloplasty</td>
<td>No Dysphagia</td>
</tr>
<tr>
<td>65</td>
<td>M</td>
<td>180</td>
<td>Feeding</td>
<td>I GJ + Gastrostomy + Coloplasty</td>
<td>No Dysphagia</td>
</tr>
<tr>
<td>21</td>
<td>F</td>
<td>210</td>
<td>Jejunostomy</td>
<td>Antrectomy + Coloplasty</td>
<td>No Dysphagia</td>
</tr>
<tr>
<td>26</td>
<td>F</td>
<td>312</td>
<td>Jejunostomy</td>
<td>Antrectomy + Coloplasty</td>
<td>No Dysphagia</td>
</tr>
<tr>
<td>23</td>
<td>F</td>
<td>400</td>
<td>Feeding</td>
<td>Antrectomy + Coloplasty</td>
<td>No Dysphagia</td>
</tr>
</tbody>
</table>

- Failed dilatation
- Oesophageal perforation during dilatation
- Transient aspiration + Respiratory Tract Infection + No Dysphagia
- Weight gain + +
- Weight gain + +
- Weight gain + +
- Weight gain + +
- Weight gain + +
- Weight gain + +
- Weight gain + +
- Weight gain + +
- Weight gain + +
and distends with progressive gastric secretions. We describe this condition as gastrocoele where the stomach itself develops into an enlarged giant mucocoele. The differential diagnosis is gastric outlet obstruction and gastric volvulus, however, presence of corrosive ingestion in the history usually clinches the diagnosis. It is well known from the literature that a mucocoele can develop in the excluded oesophagus, appendix and colon [5–7]. Surgery for severe oesophagogastric corrosive injuries, with immediate or delayed full-thickness necrosis or perforation of the stomach with oesophageal exclusion results in a secondary mucocoele [8].

Gastrocoeles usually present with progressive gastric dilatation and distension resulting in respiratory embarrassment. It is also associated with abdominal pain.

Initial investigations include optimization of the fluid and electrolyte imbalance and pain relief. The chest radiograph shows enlarged gastric shadow with elevation of the diaphragm, barium swallow demonstrates the strictures with the distended stomach with the strictures (Fig. 1). Endoscopic assessment usually reveals the oesophageal stricture and in most of the four cases we could not dilate the oesophagus to enter the stomach and extent of oesophageal involvement was assessed at the time of operation by intraoperative endoscopy. All these types of patients also need an assessment of their airway with bronchoscopy to rule out any injury to the airway. It is imperative to prepare the colon after evaluation of the colonic conduit by double contrast barium enema and colonoscopy in these double stricture patients.

The laparotomy is performed first and care is taken while performing the lapartomy as the stomach can be very distended and tense (Fig. 2).

The operative strategy is determined by the involvement of the oesophageal and gastric strictures and the nature of
uninvolved stomach. Whenever possible the stricture should be dilated [9]. When there is no relief with dilatation, oesophageal substitutes are considered which include stomach, jejunum and colon in previous studies [10, 11]. The stomach in this condition has disadvantages of insufficient length due to antral disease due to the caustic injury. The colon is long enough for esophageal replacement with good blood supply and improved somatic growth, and it causes fewer late complications of oesophagitis and stricture because of the resistance to acid. So the colon could offer potential advantages over other organs and is an ideal organ for the replacement [10]. We were able to dilate the esophageal stricture in two patients, however, seven patients warranted coloplasty which was performed through the retro-sternal route with cervical anastomosis.

The antral stricture is dealt with in a similar fashion with antrectomy, partial gastrectomy or gastrojejunostomy [12]. In our series the antral stricture was managed with antrectomy in eight patients and gastro jejunostomy in one patient.

The postoperative care includes continuing the nutrition with a cover feeding jejunostomy until oral nutrition is established and anastomosis assessed by barium swallow. Follow-up showed satisfactory results in all nine patients.

5. Conclusion

Gastrocoele is a rare complication after corrosive ingestion, careful case selection and good surgical strategy results in good results.

References