Side to Side Esophagogastrojejunoplasty in Post-corrosive Stricture of Distal Esophagus and Proximal Stomach

Praveen Sharma · Mukesh Pancholi · Gulab Patel ·
Anju Sharma

Received: 13 January 2014 / Accepted: 7 January 2015 / Published online: 25 January 2015
© Association of Surgeons of India 2015

Abstract A four years old female child presented after 2 months of ingestion of battery fluid (sulfuric acid) accidentally with stricture of the distal esophagus, esophagogastric junction, and fundus as well as proximal portion of the body of the stomach. Corrosive stricture involving the distal esophagus with the proximal stomach is not a frequently encountered condition. Side to side esophagogastrojejunostomy without removal of the strictured esophagus or stomach (side to side esophagogastrojejunoplasty) can be done in such patient hence preserving the stomach which is important physiologically as a reservoir and for the secretion of gastric juices. In review of literature in search engines like MD Consult, PubMed, Cochrane Library, and Embase and standard textbooks of surgery, we could not find such procedure had been performed till date, so that it is the innovative approach with support of literature and surgical principles.

Keywords Corrosive stricture · Esophagogastrojejunoplasty · Esophageal carcinoma · Gastrectomy

Introduction

A four years old female child presented after 2 months of ingestion of battery fluid (sulfuric acid) accidentally with stricture of the distal esophagus, esophagogastric junction, and fundus as well as proximal portion of the body of the stomach. Corrosive stricture involving the distal esophagus with the

proximal stomach is not a frequently encountered condition [1]. Side to side esophagogastrojejunostomy without removal of the strictured esophagus or stomach (side to side esophagogastrojejunoplasty) can be done in such patients hence preserving the stomach which is important physiologically as a reservoir and for the secretion of gastric juices. After review of literature, we came to know that this type of procedure is performed for the first time in a single patient with a good result after follow-up of 1 year. This procedure is safe and gastrectomy can be avoided, although it requires long-term follow-up and a series of cases to prove it.

Case Study

A female patient aged 4 years was admitted in New Civil Hospital, Surat, on the 26th of November 2012 with history of accidental ingestion of battery fluid at home on the 15th of September 2012 and presented with complaints of non-bilious vomiting off and on since 2 months, dysphagia to solid since 1 month, and decreased liquid intake since 7 days. On examination, she was anemic, weighing 9 kg with PEM grade III (IAP). On investigation, blood examinations were normal except anemia (Hb—7 g%) and radiologically chest X-ray was normal, ultrasonography showed thickened stomach wall with mild ascites, and barium swallow examination was showing stricture at the gastroesophageal (GE) junction and contracted proximal stomach. On upper gastrointestinal endoscopy, the GE junction could not be negotiated and the proximal esophagus was normal.

Operative Technique

In supine position under general anesthesia, the abdomen was opened with upper midline incision. On exploration, the

P. Sharma · M. Pancholi (✉) · G. Patel
Department of Surgery, Government Medical College, Majuragate,
Surat, Gujarat 395001, India
e-mail: dr_mpancholi@yahoo.co.in

A. Sharma
Department of Radiology, Government Medical College,
Surat, Gujarat 395001, India

stomach was contracted and thickened grossly at fundus and in its proximal part of the body but the distal portion of the body, antrum, and pylorus were normal from the outside. The whole strictured portion was opened up after extending gastrotomy proximally and distally with some normal tissues of both the esophagus and stomach and prepared for anastomosis with Roux limb of jejunum. A 40-cm-long Roux limb of jejunum about 15 cm distal to the ligament of Treitz was resected with linear stapler. After a check for intact vascularity of that jejunal segment for 10 min, the stapled distal end (Roux limb) of jejunum was brought out in retrocolic fashion and positioned alongside about 8–10-cm-long opened strictured portion of the esophagogastric area. Proximally side to side anastomosis with silk 3-0 in four layers (Fig. 1) and distally end to side jejunojejunal anastomosis (Fig. 2) were performed. Feeding jejunostomy was done. Two closed abdominal drains were placed; one near esophagogastric anastomosis in the subhepatic space and another in the pelvis. The abdomen was closed in a single-layer continuous manner with PDS 2-0.

Postoperatively, the patient was kept nil by mouth for 8 days with nasogastric tube aspiration intermittently, intravenous fluids, and broad-spectrum antibiotics. The enteral feeding was started through feeding jejunostomy on resumption of peristalsis, and pelvic drain was removed on the third postoperative day. On the ninth postoperative day, Gastrografin dye study was done showing no leak and the dye was going distally through both the pylorus and the Roux-en-Y jejunum; the abdominal drain placed near anastomosis was removed, and the patient was allowed to start oral liquid diet followed by soft diet. The patient was discharged on the 11th postoperative day with soft diet orally, and feeding jejunostomy was removed on the 15th postoperative day.

Fig. 1 Completed side to side esophagogastric anastomosis

Fig. 2 Esophagogastric anastomosis (EGJ) with Roux-en-Y jejunum. *a* Dilated proximal esophagus, *b* strictured distal esophagus and gastroesophageal junction, *c* strictured proximal stomach, *d* anastomotic site of EGJ, *e* Roux loop of jejunum, and *f* end-to-side jejunojejunal anastomosis

Follow-Up

She was on regular weekly follow-up for 1 month and then monthly up to 1 year postoperatively, without any complaint or complication. Patient is on full diet with no single episode of dysphagia or vomiting with good amount of weight gain of 10 kg in a year. After 1 year, upper gastrointestinal endoscopy was done showing normal pouch of EGJ with normal distal stomach and jejunum without any anastomotic narrowing (Fig. 3). The patient and her parents were counseled regarding lifelong follow-up with schedule of follow-up endoscopy every 5 years up to the age of 40 years and then annually.

Discussion

Operative management of post-corrosive stricture of the esophagus and the stomach depends on which parts are involved. A number of surgeries are described for corrosive stricture of the esophagus and the stomach ranging from simple side to side gastrojejunostomy in case of only pyloric stenosis to esophagogastric resection with colonic or jejunal interposition in case of total involvement of both the esophagus

Fig. 3 Follow up endoscopic picture

and stomach [2]. We are managing patients of corrosive stricture of the esophagus and the stomach with this range of surgeries, but it is infrequent to find out strictured proximal stomach with normal distal stomach after corrosive ingestion. We usually remove strictured portion and replace it with colon or jejunum except in pyloric stenosis where we perform gastrojejunostomy. We are also doing substernal colonic interposition to bypass scarred esophagus. We can preserve organ which is partially strictured by keeping the strictured part in situ, and continuity of the bowel can be maintained by anastomosis of jejunum with the whole strictured area. We have performed esophagogastroroplasty on this basis when we received a child with post-corrosive stricture of the distal esophagus, gastroesophageal junction, and proximal stomach with normal rest of the distal stomach. The issue regarding this procedure is the development of complications like anastomotic stricture and Barrett's esophagus due to direct exposure to gastric juices and bile acids, followed by development of carcinoma in the strictured area later. But review of literature suggests that these issues are overstated. Alkaline reflux is highly improbable due to the long Roux jejunal loop, and isolated gastric juices are less likely to be responsible for

causing any change of the esophageal mucosa. For development of Barrett's esophagus, exposure of both gastric juices and bile acids is required for long duration of about 40–50 years [3, 4].

An important recognized long-term complication is the development of carcinoma in the diseased esophagus and stomach. Ananthakrishnan et al. depicted in their study that the mandatory need for gastric resection as prophylaxis against future malignancy has been overstated in the literature. There have been reports of malignancy developing in a scarred esophagus or stomach following corrosive ingestion. However, in their experience, this association has been found to be tenuous. In an experience of over 500 corrosive injuries seen over a 30-year period, there was only one solitary instance of cricopharyngeal carcinoma following esophageal burns by caustic ingestion and one case of peri-gastroenterostomy carcinoma 17 years after the ingestion of acid. In the latter, it was not clear whether the carcinoma was corrosive induced or secondary to chronic bile reflux through the gastrojejunostomy stoma (stump carcinoma or post-gastric surgery carcinoma) [5]. However, the patient should be kept in lifelong surveillance for developing malignancy because

according to literature, the incidence of carcinoma developed on corrosively scarred esophagus and stomach after a period of 40–50 years from caustic ingestion is about 2.5–4 % [4]. We advised our patient for follow-up upper gastrointestinal endoscopy every 5 years till the age of 40 years and afterwards yearly for the rest of the life.

Conclusion

Corrosive stricture involving distal esophagus with proximal stomach is not a frequently encountered condition. Accidental acid ingestion in children is common due to easy availability in vicinity. Esophagogastrojejunoplasty without resection of esophagus or stomach can be done safely and successfully, preserving functionally important organ as a reservoir and secretion of gastric juices. In review of literature in search engines like MD Consult, PubMed, Cochrane Library, and Embase and standard textbooks of surgery, we could not find such procedure had been performed till date, so that it is the

innovative approach with support of literature and surgical principles.

References

1. Agarwal S, Sikora SS, Kumar A et al (2004) Surgical management of corrosive strictures of stomach. *Indian J Gastroenterol* 23(5):178–180, 15599001 Cit: 5
2. von Rahden BHA, Stein HJ, Siewert JR (2006) Surgical management of esophagogastric junction tumors. *World J Gastroenterol* 12(41): 6608–6613
3. Lu S, Lowe AW, Triadafilopoulos G et al (2009) Endoscopic evaluation of esophago-gastro-jejunostomy in rat model of Barrett's esophagus. *Dis Esophagus* 22:323–330. doi:[10.1111/j.1442-2050.2008.00909x](https://doi.org/10.1111/j.1442-2050.2008.00909x)
4. Raghu Ramulu Naik R, Vadivelan M (2012) Review article: corrosive poisoning. *Indian J Clin Pract* 23(3):131–134
5. Ananthakrishnan N, Parthasarathy G, Kate V (2011) Acute corrosive injuries of the stomach: a single unit experience of thirty years. *ISRN Gastroenterol* 914013. Published online 2010 October 28. doi:[10.5402/2011/914013](https://doi.org/10.5402/2011/914013)