

## REPORT A RARE SURGERY OF AMPULLOJEJUNOSTOMY IN A CORROSIVE ACID INGESTION: BRIEF REVIEW OF LITERATURE

### Surgery

<b>Dr. Shobhit Sengar</b>	Kaizen hospital, Institute of Gastroenterology & Research centre, Ahmedabad, Gujarat
<b>Dr. Sanjiv. Haribhakti</b>	Kaizen hospital, Institute of Gastroenterology & Research centre, Ahmedabad, Gujarat
<b>Dr. K. S. Patel</b>	Kaizen hospital, Institute of Gastroenterology & Research centre, Ahmedabad, Gujarat
<b>Dr. Atul Shah</b>	Kaizen hospital, Institute of Gastroenterology & Research centre, Ahmedabad, Gujarat
<b>DR. Harsh.J.Shah</b>	Kaizen hospital, Institute of Gastroenterology & Research centre, Ahmedabad, Gujarat
<b>Dr. Harshad. N. Soni*</b>	Kaizen hospital, Institute of Gastroenterology & Research centre, Ahmedabad, Gujarat *Corresponding Author

### ABSTRACT

**Introduction** Oral intoxication with corrosive acid agents occurs by ingestion of acid, heavy metal salts (sublimite), formalin, iodine tincture and many other chemical substances. The extent of injury that results from corrosive ingestion is estimated by the depth of resultant corrosive burn. **Case Report** We report a case of 22 year female with alleged history of corrosive acid ingestion with extensive necrosis of intra-abdominal organs in which ampullojejunostomy was done for reconstruction. **Discussion** Corrosive acid injury to the upper G.I. tract is a challenge to the surgeon. Emergency surgical intervention done in esophageal and gastric perforation, in case of transmural necrosis to avoid involvement of other organs and death. Transhiatal esophagectomy and total gastrectomy are the most common surgical procedures.

### KEYWORDS

Burns, Coagulation necrosis, Liquefaction necrosis, transmural necrosis

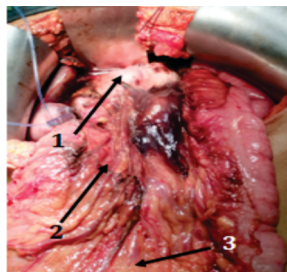
### INTRODUCTION

Oral intoxication with corrosive acid agents occurs by ingestion of acid (hydrochloric, acetic, sulphuric, lactic, oxalic, carbolic), alkalis (sodium, potassium, soap, detergents) heavy metal salts (sublimite), formalin, iodine tincture and many other chemical substances. Lye is a general term in American literature, denoting strong alkali found in cleansing agent (1). The extent of injury that results from corrosive ingestion is estimated by the depth of resultant corrosive burn. First degree burns tend to involve only the mucosa, with localized redness and edema noted in endoscopy. Second degree burns involve the mucosa and sub mucosa with blister formation, while third degree burns are characterized by transmural process that effects the entire lining with findings of extensive ulceration and necrosis appear on gangrene (2).

It is the third degree burns that lead to perforation of esophagus and stomach. These injuries may appear in the first 48 hours or they may be delayed until the 14th day after corrosive ingestion. A concentration of 22.5 % NAOH solution can produce perforation of the esophagus or stomach in 10 second. Emergency surgical intervention is indicated in these cases. Total esophagectomy or gastrectomy and installation of jejunostomy for artificial nutrition are made (3). Feeding jejunostomy should be constructed at the end of the operation, regardless of type of surgical procedure performed. Extended surgery (beyond esophagogastrectomy) should be attempted in case of existing injuries on other abdominal organs. All injured organs should be resected during the first operation as caustic lesion invariably varies (4).

### CASE REPORT

A 22 year female came in emergency with h/o ingestion of unknown liquid (?acid) at her home in the morning, she was taken to near by hospital where she was intubated and put on ventilator, her CECT neck, chest and abdomen was done which shows pneumoperitoneum with mild to moderate ascitis, edematous and thickened wall of lower esophagus, collapsed stomach and upper jejunum loops with dilated entire thoracic esophagus, bulky head and body of pancreas, her hematological reports done, emergency laparotomy done findings were complete necrosis of stomach, duodenum, with gastric and biliary leakage, transverse mesocolon necrosed, spleen lost its vascularity, 2 litre of dark colored peritoneal collection present. Total gastrectomy with splenectomy with pancreas preserving duodenectomy with esophagostomy with omentectomy performed with peritoneal lavage was done. Reconstruction done with ampullojejunostomy and feeding jejunostomy.



**Figure 1 Base of mesocolon gangrenous**  
1) Pancreas,  
2) Transverse Colon,  
3) Transverse Mesocolon

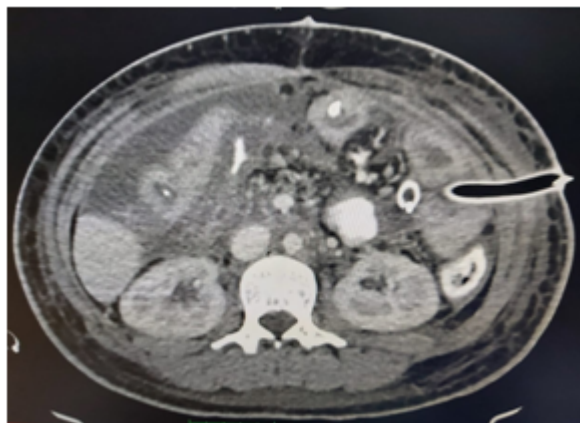


**Figure 2 Non vascularised spleen with peritoneal surface of diaphragm gangrenous**

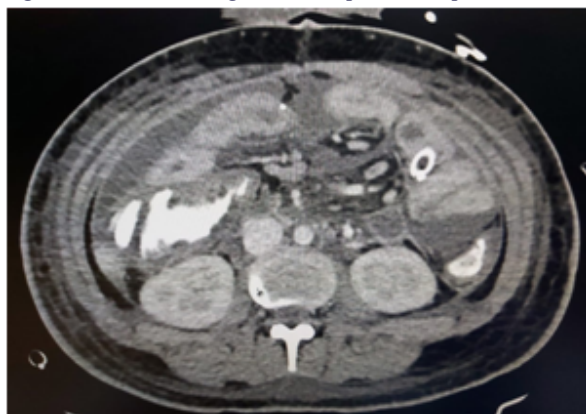


**Figure 3 Sloughed out and gangrenous omentum with stomach anterior wall gangrenous**

In the post-operative period she was kept in ICU, on ventilator with ionotropes support, antibiotics, intra venous fluid. Feeding was started through FJ on POD 1. Patient was deteriorating continuously clinically with fall in hemoglobin to 7g/dl from 9g/dl, rise in creatinine to 3 mg/dl and INR 2.02. Figure 2 Marked mural thickening of transverse, ascending, descending colon, root of mesentery, proximal small bowel loops with moderate free peritoneal fluid. Figure 1 Mural thickening of bowel loops with free peritoneal fluid. Patient was continuously on ionotropes support. She was investigated by follow up CECT whole abdomen, which was suggestive of marked mural thickening of the transverse colon, ascending and descending colon, root of mesentery, proximal small bowel loops with moderate free peritoneal fluid.



**Figure 1** Mural thickening of bowel loops with free peritoneal fluid



**Figure 2** Marked mural thickening of transverse, ascending, descending colon, root of mesentery, proximal small bowel loops with moderate free peritoneal fluid

Patient underwent Redo exploratory laparotomy with peritoneal lavage. Intra operative findings were – retroperitoneal large area of necrosis of tissue, slough at retroperitoneum, leak from ampullosite junostomy site as well as peripancreatic tissue necrosis. Considering the intra operative deteriorating condition of patient, surgery was not progressed, and abdomen was closed after placing abdominal drains and without any procedure.

## DISCUSSION

Corrosive acid injury to the upper G.I. tract is a challenge to the surgeon, as indicated by the continued reporting of mortality rates greater than 10%(5). The severity of chemical burns that affect the entire gastrointestinal tract depend on several factors, nature of corrosive substance, PH value, the quantity and amount taken, duration of exposure and act of swallowing.

In contact of acids, tissue proteins are transformed into acid proteins and hemoglobin is transformed into hematin, this is termed a coagulation necrosis. Alkalis cause transformation of tissue proteins into proteinates and fat into soaps, resulting in penetrating, that is liquefaction necrosis. Corrosive substances with a PH of less than 2 or greater than 12 are highly corrosive and cause tissue necrosis.

Gastric lavage, induced vomiting and activated charcoal are contraindicated because reexposure of the esophagus to the corrosive substances might happen and produce additional injuries. Milk and water are suggested to be useful in acute phase (first 1-3 hr) but their effectiveness has not been proven in controlled studies. Milk can compromise urgent esophagogastroduodenoscopy and heat produced during chemical reaction might cause additional post corrosive injuries(1).

In the acute phase, chest and abdomen radiograph give useful details regarding dimension of mediastinum, air in the mediastinum and under the diaphragm. The most optimal timing of esophagogastroduodenoscopy is the first 12-24 hour post ingestion. Inflammatory changes, vascular thrombosis and the healing process

changes of post corrosive changes begins in the 4th and the most intensive until the 14th day, it is suggested to avoid diagnostic procedure during this period. Gastrograffin dye is used cautiously in patients having tendency to aspirate like in case of post corrosive stricture esophagus. Barium sulfate should not be used in patient with post corrosive esophageal or gastric perforation as it will be not possible to remove spilled barium in thoracic and peritoneal cavity.

Endoscopic classification of post corrosive injuries in upper gastrointestinal tract is of enormous importance in diagnosing and treatment of acute corrosive intoxication.

## KIKENDALL CLASSIFICATION

Grade I	Oedema and erythema of the mucosa
Grade IIA	Hemorrhage, erosion, blisters, superficial ulcers
Grade IIB	Circumferential lesions
Grade III	Deep grey or brownish-black ulcers
Grade IV	Perforation

## ZARGAR'S CLASSIFICATION

Grade 0	Normal mucosa
Grade I	Edema and erythema of the mucosa
Grade IIA	Hemorrhage, erosion, blisters, superficial ulcers
Grade II B	Circumferential lesions
Grade IIIA	Focal deep gray or brownish black ulcers
Grade III B	Extensive deep gray or brownish black ulcers
Grade IV	Perforations

Emergency surgical intervention done in esophageal and gastric perforation, in case of transmural necrosis to avoid involvement of other organs and death. Transhiatal esophagectomy and total gastrectomy are the most common surgical procedures. Feeding jejunostomy was done at the end of procedure regardless of the type of surgical procedures. Extended surgery (beyond esophagogastrectomy) should be done in case of existing injuries on other abdominal organs. All injured organs should be resected in first surgery as caustic lesion invariably progress. If patient condition allow, immediate biliary and pancreatic reconstruction should be attempted after pancreaticoduodenectomy in case of necrosis of pancreatic head and duodenum. Massive intestinal necrosis may be the reason for surgeon to stop resection due to inability of later reconstruction and providing nutrition. Mortality rates are higher in these patients but surgery is the only treatment option for these patients(4). Amit et al operated thirteen patient in emergency from period 1983 to 2010 out of 209 total patient of corrosive ingestion presented in emergency. In the thirteen patient esophagus was spared, distal stomach and the first and second part of duodenum was completely necrotic and bile coming out from ampulla. Patient underwent distal gastrectomy, removal of necrotic duodenum, anastomosis of ampulla to Roux en y loop of jejunum, tube cholecystostomy, tube gastrostomy and feeding jejunostomy. Attempting pancreaticoduodenectomy in such patient was hazardous because of severe inflammation in the area. The patient had a controlled bile leak in post operative period which was gradually stopped, patient underwent gastrojejunostomy and had good outcome (6). Zargar suggested surgical intervention in patient with corrosive acid injuries grade IIIB, thus showing decrease in mortality and morbidity in these patients. Some other authors are against urgent resection of esophagus and stomach, explaining that the grade of post corrosive acid injuries cannot be always precisely determined (5).

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