

Esophagobronchial Fistula Following Corrosive Injury of Esophagus: 2 Cases with Different Etiology But Similar Presentation

Edvard Skripochnik, Robert Ashton and Siyamek Neragi-Miandoab*

Department of Cardiovascular and Thoracic Surgery, Montefiore Medical Center, Albert Einstein College of Medicine, Bronx, NY, USA

Abstract: Acquired esophagobronchial fistula (EBF) is a rare condition and its surgical remediation is challenging. Management depends on the cause and degree of the injury. Corrosive substances can be alkaline or acidic in nature. Alkali ingestion commonly causes esophageal injury while acid ingestion most often damages the stomach. However, it is not always clear which gastrointestinal site will be injured. We present two cases of tracheoesophageal fistula with different etiology but similar complication: one due to alkaline ingestion, and one due to acidic ingestion. Both patients had successful surgical management.

Keywords: Esophageal fistula, corrosive injury, alkaline substances, acidic substances.

CASE PRESENTATION

Patient 1

The first patient is a 28-year-old male with a history of alcohol abuse who presented with complaints of burning and bleeding from his oral cavity after ingestion of Drano in a suicide attempt. He was initially afebrile and had stable vital signs. However, he developed respiratory distress mandating endotracheal intubation. A computed tomogram demonstrated esophageal thickening and left pleural effusion (Fig. 1). An esophagogastroduodenoscopy (EGD) was performed on the following day, which demonstrated scattered dusky areas of necrosis in the proximal esophagus and friable circumferential ulcerations in the distal esophagus extending into the gastroesophageal junction. There were necrotic areas along the greater curvature of the stomach and a circumferentially ulcerated antrum was visible. A second EGD 10 days later demonstrated oropharyngeal erythema, esophagitis, and strictures in the upper esophagus. The esophageal lumen distal to 26 cm could not be evaluated. EBF was suspected in the distal esophagus and confirmed on bronchoscopy. This diagnosis was confirmed on video esophagogram (Fig. 2).

The patient remained intubated and his hemodynamics was stable until he was taken to the operating room for esophagectomy. The upper abdomen was incised and the stomach was mobilized. A right thoracotomy (Ivor-Lewis approach) was performed and the esophagus was found to be cord-like, with narrowing strictures along its entire length. The esophagus was resected up to the level of the left mainstem bronchus and carina. After dissection of the esophagus, the left main bronchus was repaired primarily and the fistula was eliminated. The repaired bronchus was

covered with intercostal muscle and fat tissue. An esophagogastric anastomosis was performed in the cervical region and a feeding jejunostomy was performed. The patient had an uneventful postoperative course. As per our protocol, a gastrografin swallow study was conducted on postoperative day (POD) 6 showing contrast extravasation. The patient was discharged home, while on an advancing diet.

Patient 2

The second patient is a 48-year-old male with no significant past medical history who presented with oral and midsternal pain after the ingestion of approximately 300 mL of sulfuric acid in a suicide attempt. Additionally, he ingested 5 beers and a large amount of acetaminophen. On admission, the patient was afebrile and his vital signs were stable. His first EGD on admission demonstrated severe hemorrhagic necrosis in the esophagus and stomach with a patent esophageal lumen and pylorus. An interval CT of the thorax displayed a thickened esophagus with opacities in the bilateral lower lobe bronchi consistent with aspiration. His second EGD, a week later, demonstrated a severely ulcerated esophagus without discrete stricture or obstruction and an ulcerated necrotic mucosa in the pre-pyloric antrum. A conservative management strategy was attempted; he was kept NPO (non per os), on total parenteral nutrition (TPN), and started on antibiotics. Two weeks after the initial incident, he was started on a puree diet, which caused episodes of dysphagia, coughing, and regurgitation. A computed tomogram (CT) scan showed thickening of the esophageal wall, compatible with esophagitis. A chest X-ray (CXR) showed a new left lower lobe infiltrate in his lung. A video esophagogram was obtained, confirming the presence of a clear fistula between the mid-esophagus and left mainstem bronchus. Given the extent of the disease process, a decision was made to perform an esophagectomy. After an open gastric mobilization with pyloroplasty and placement of a feeding jejunostomy, we made a right thoracotomy (Ivor-Lewis approach), mobilized the esophagus and

*Address correspondence to this author at the Department of Cardiothoracic Surgery, Staten Island University Hospital, SUNY Downstate College of Medicine, New York, NY, USA; Tel: 001 917 242 0766; Fax: 001 718 920 8556; E-mail: siyamekneragi@yahoo.com

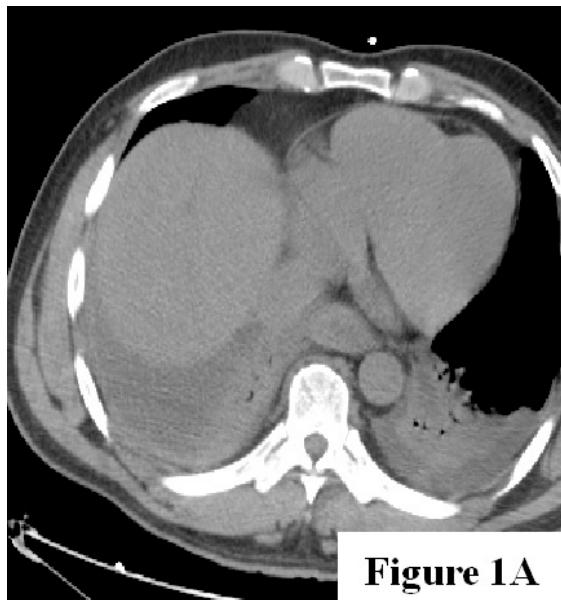
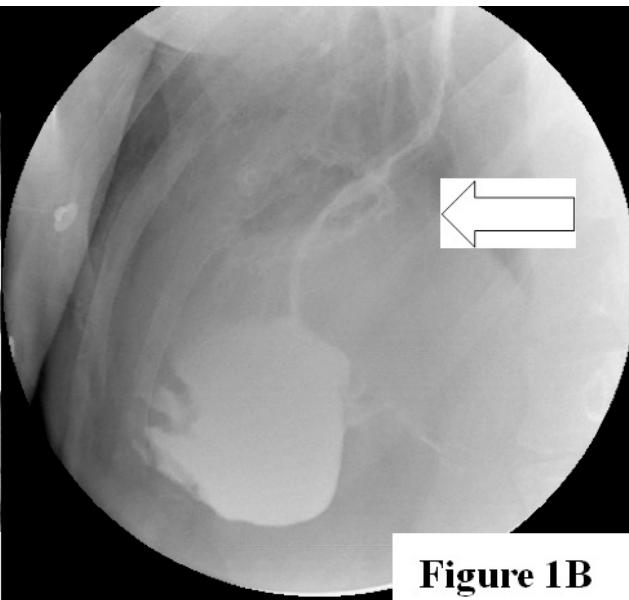
**Figure 1A****Figure 1B**

Fig. (1). (A) This a 48 year old male with recent ingestion of sulfuric acid. CT of chest shows mediastinal collection and pneumomediastinum suggestive of esophageal perforation. (B) Upper GI Series show a stricture in the distal esophagus with ulceration in the mid portion. There is contrast extravasation into the bronchus.

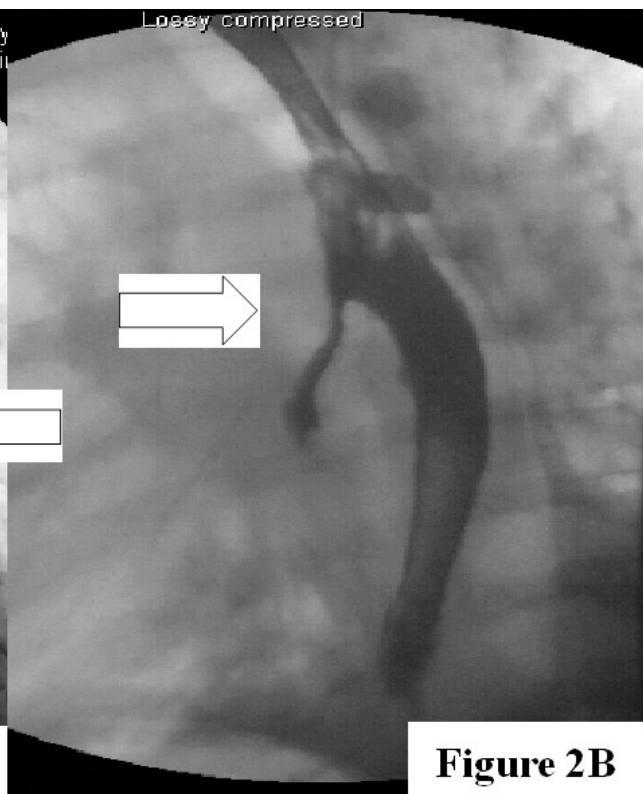
**Figure 2A****Figure 2B**

Fig. (2). (A, B) Esophagram With Video. Tracheoesophageal fistula, new, and extensive esophageal mucosal irregularity. Video esophagram with oral contrast under direct fluoroscopic visualization. From the level of the aortic arch all the way to the gastroesophageal junction. A fistulous connection is visualized between the mid esophagus and left main stem bronchus. There is no penetration or aspiration of contrast.

repaired the left main bronchus, which was buttressed with intercostal muscle. The gastric conduit was pulled through the posterior thorax toward the esophagus and a cervical anastomosis was formed. The gastrografin swallow study on POD 6 showed no extravasation of contrast. His diet was advanced per protocol and he was discharged home on POD 11.

Comment

Caustic ingestion can cause severe injury to the esophagus and stomach. On occasion, corrosive injuries may present with life-threatening conditions requiring surgery, such as perforation of the esophagus or stomach resulting in mediastinitis, peritonitis, and shock. Extensive injury may

even lead to death. Esophagobronchial fistula is a rare and late complication of esophageal disease and its incidence has been increasing lately due to greater survival following severe corrosive injuries [1]. Other causes of EBF include radiation therapy [2], trauma [3], complication from esophageal diverticulum, human immunodeficiency virus, and inflammatory injury [4]. Fukuhsara *et al.* [2] reported EBF secondary to radiation therapy, which was not manageable with stenting. The authors recommended a thoracic esophagectomy, closure of the EBF, and retrosternal gastric pull-through reconstruction. Gao *et al.* [5] reported a series of 26 patients with EBF of whom 23 patients received surgical repair including; direct repair, closure of an esophageal defect, tracheal resection and reconstruction, pulmonary resection, thoracoplasty, esophagectomy, and esophagogastric anastomosis. A nonsurgical treatment carries poor prognosis [5]. Gerzic *et al.* [3] reported 16 cases of EBF, who presented with pulmonary complications. A fistula between the esophagus and bronchus, considered to be of inflammatory origin, developed in 7 patients while a fistula secondary to trauma was found in 9 patients. A permanent one-stage repair was performed in 12 patients and a temporary gastrostomy for feeding tube placement was done in 4 patients to improve nutrition before definite repair. Two patients required esophageal resection and late reconstruction with colonic interposition. The operative mortality was 8.3% (1/12) in the definitive one-stage repair group; the remaining 11 patients had a satisfactory long-term result. The authors recommended early direct repair [3].

CONCLUSION

Received: July 9, 2013

Revised: October 3, 2013

Accepted: October 10, 2013

© Skripochnik *et al.*; Licensee Bentham Open.

This is an open access article licensed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0/>) which permits unrestricted, non-commercial use, distribution and reproduction in any medium, provided the work is properly cited.

Caustic ingestion can cause severe injury to the esophagus and stomach. Each patient must be evaluated individually as the clinical picture varies widely. Signs and symptoms alone are an unreliable guide to injury. Early endoscopy is crucial in both diagnosing the severity of injury and managing the patient. Surgery is generally reserved for patients with perforation, fistula, mediastinitis, stricture, or cancer. Overall, early diagnosis and management may reduce the risk of death and future complications.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

ACKNOWLEDGEMENTS

Declared none.

REFERENCES

- [1] Sarfati E, Gossot D, Assens P, Celerier M. Management of caustic ingestion in adults. *Br J Surg* 1987; 74: 146-8.
- [2] Fukuhsara K, Osugi H, Tokuhara T, *et al.* Surgical repair of esophagobronchial fistula caused by radiation injury. *Hepato-Gastroenterol* 2004; 51: 754-6.
- [3] Gerzic ZB, Knezevic JB, Milicevic MN, Jovanovic BK. Esophagocoloplasty in the management of postcorrosive strictures of the esophagus. *Ann Surg* 1990; 211: 329-36.
- [4] Rakic S, Gerzic Z. Esophagobronchial fistula associated with corrosive stricture of the esophagus. *Ann Thorac Surg* 1992; 53: 142-3.
- [5] Gao C, Huang O, Gu K. The diagnosis and treatment of benign esophagotracheo-bronchial fistula: a report of 26 cases. *Zhonghua wai ke za zhi [Chinese J Surg]* 1995; 33(2): 71-2.