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Endoscopic clipping of spontaneous esophageal rupture: Case reports of three patients



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ABSTRACT

INTRODUCTION: Spontaneous esophageal rupture is a life-threatening condition which is difficult to diagnose early, and is usually treated surgically. Prolonged hospitalization is common. Non-operative treatment of esophageal rupture localized to the mediastinum has been reported. We report three patients with spontaneous esophageal rupture successfully managed with endoscopic clipping.

CASE PRESENTATIONS: Two patients had ruptures localized to the mediastinum, and were discharged within one week of undergoing closure. The third patient presented with Boerhaave's syndrome with a leak into the pleural space and needed prolonged hospitalization (34 days), but she did not need surgery and began oral intake two days after endoscopic clipping. The patient had an uneventful recovery.

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Discussion Surgery is the treatment of choice for most patients with spontaneous esophageal rupture, but is associated with complications in 14–40% of patients. Although there are many reports of non-operative treatment of spontaneous esophageal rupture localized to the mediastinum, the non-operative management of Boerhaave's syndrome with pleural rupture is rarely reported. We suggest that endoscopic clipping is a reasonable strategy not only for patients with esophageal rupture localized to the mediastinum, but also for those with Boerhaave's syndrome and pleural rupture.

1. Introduction

Spontaneous rupture of the esophagus involves all layers of the esophageal wall due to a sudden increase in intraluminal pressure, first documented by Herman Boerhaave in 1724. In patients with Boerhaave's syndrome with pleural rupture, the resulting mediastinitis can rapidly lead to severe pneumonia and death [1,2]. Surgery is the conventional treatment for patients with esophageal rupture. However, it has been reported recently that esophageal rupture localized to the mediastinum can be successfully treated non-operatively [3–5]. We suggest endoscopic clipping as a less invasive treatment strategy for patients not only with esophageal rupture localized to the mediastinum, but also for select patients with Boerhaave's syndrome and pleural rupture.

2. Presentation of cases

We describe three patients diagnosed with spontaneous esophageal rupture between January 2013 and May 2015, after presenting with chest pain after vomiting (Table 1).

All of the patients were in their late forties, and included two males and one female. The female patient had Boerhaave's syndrome with pleural rupture caused by severe vomiting due to obstruction secondary to duodenal ulcer stenosis. The two male patients had esophageal rupture localized to the mediastinum caused by vomiting after excessive alcohol consumption. This report was approved by the Institutional Review Board of the Showa University School of Medicine. Informed consent was obtained from each patient for the publication of this case report.

The diagnosis of spontaneous esophageal rupture was confirmed by physical examination and by radiography including computed tomography (CT) scan of the chest and abdomen. The female patient was referred with respiratory difficulty. Mediastinal emphysema and a massive pleural effusion were observed on a plain chest CT scan (Fig. 1a, b). Fluoroscopy with gastrografin showed an esophageal perforation approximately 1 cm in diameter (Fig. 2). Adequate drainage was achieved by a drain placed adjacent to the perforation site in the left pleural cavity. Subsequently, her general condition improved by the fifth hospital day, and we performed low-pressure insufflation endoscopy. The site of perforation was visualized, surrounded by 3 cm of lacerated mucosa on the left side of the distal esophagus. (Fig. 3a, b). The surrounding mucosa showed fibrosis due to inflammation. The patient underwent a contrast study using gastrografin to confirm the site of perforation (Fig. 4a), and then underwent endoscopic closure of the perforation

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Table 1
Patient characteristics and hospital course.

Patient	Age	Gender	Cause	Type	Endoscopy (days)	Treatment	Oral intake (days)	Hospital Stay (days)
1	46	F	Stenosis of Duodenal Ulcer	fistula with pleural cavity	5	Clipping	4	34
2	45	M	Alcohol, GERD (Grade D)	Mediastinitis	0	Clipping	3	8
3	50	M	Alcohol, GERD (Grade D)	Mediastinitis	0	Clipping	3	7

GERD: Gastroesophageal Reflux Disease, F=Female, M=Male.

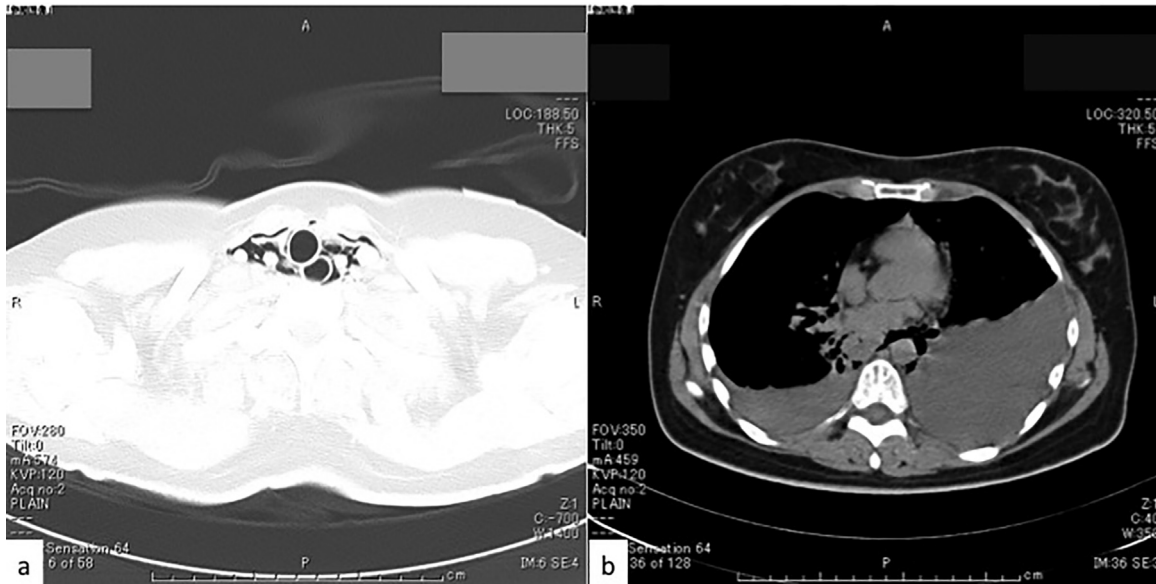


Fig. 1. a. At initial diagnosis, computed tomography scan revealed cervical subcutaneous emphysema. b. A large quantity of pleural fluid on the left side and mediastinal emphysema were detected.

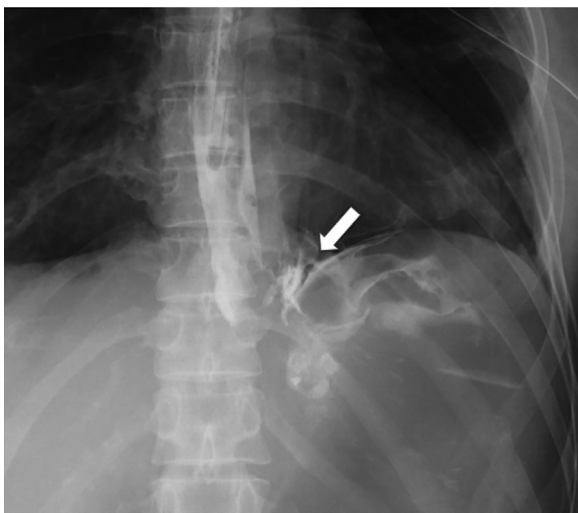


Fig. 2. At initial diagnosis, fluoroscopy indicated a perforation on the left side of the distal esophagus (arrow).

using five long metallic clips (HX-610-090L; Olympus Corporation, Tokyo, Japan) (Fig. 4b). Closure of the perforation was confirmed on a subsequent contrast study using gastrografin, which showed no leak (Fig. 4c). Follow-up endoscopy at six months after discharge showed in Fig. 4d. The patient started drinking water and a liquid diet on the second and third days, respectively, after endoscopic clipping, and had an uneventful recovery. However, because of the rupture, further therapy was needed (e.g., treatment for *Helicobacter pylori*, bacterial culture before drain withdrawal) and the patient was hospitalized for 34 days (Fig. 5).

The other two patients underwent endoscopic clipping immediately after esophageal perforation. Oral intake was initiated for both patients an average of 3.3d after endoscopic clipping.

3. Discussion

Spontaneous esophageal rupture is a life-threatening condition which is difficult to diagnose early. The most common site of perforation is the left side of the distal esophagus, where the wall is weak. Treatment of this condition is difficult and complications occur in 14–40% of patients [6]. Surgery is the treatment of choice for most patients with spontaneous esophageal rupture [7]. Among the various surgical approaches, the transthoracic approach is commonly chosen. However, some patients are treated with the transperitoneal approach because the perforation often occurs in the distal esophagus. Thoracoscopy has recently been reported for the treatment of this condition [8]. There are also several reports of non-operative treatment, by stopping all oral intake and providing intravenous nutrition or using a covered stent in patients with small ruptures localized to the mediastinum [3,5]. However, the use of covered stents is occasionally associated with migration of the stent or perforation of the lower esophagus. Cameron et al. [9] and Shaffer et al. [10] described eligibility criteria for non-operative treatment in patients with esophageal rupture. In two of the patients described here, the perforation was localized to the mediastinum, which is consistent with these criteria. In contrast, surgery was indicated in the female patient described here with a perforation located in the thoracic cavity. Insertion of a drain into the thoracic cavity was effective for this patient, and endoscopic clipping was performed after her general condition improved.

Although there are many reports regarding non-operative treatment of spontaneous esophageal rupture localized to the

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