

CASE REPORT

Anaesthetic Challenges in Boerhaave Syndrome with Delayed Diagnosis

Sumita Swain, Bikash Parida*, Satya Sundar Gajendra Mohapatra*

Abstract

Boerhaave syndrome is the spontaneous rupture of the esophagus, most commonly the left lower third of the esophagus, mainly due to increased intraluminal esophageal pressure after straining. The classic triad of symptoms includes vomiting, lower thoracic pain, and subcutaneous emphysema. A 45-year-old male patient presented with vomiting and lower chest pain after heavy alcohol intake. He was diagnosed with Boerhaave syndrome by contrast-enhanced computed tomography. The patient was given a bronchial blocker with an ambuscope as a backup for one-lung ventilation. An emergency operation was done with resection of the perforated part with esophagogastric anastomosis.

Keywords

Anaesthetic challenges, Boerhaave syndrome, esophagus

Introduction

Boerhaave syndrome was first reported by a German doctor, Hermann Boerhaave, in 1724.^[1] Boerhaave syndrome is a rare condition with an incidence of 3.1 per 10,00000 per year globally. Spontaneous rupture is mainly due to increased intraluminal esophageal pressure after straining caused by retching, vomiting, defecation, vaginal delivery, and weightlifting.^[2] Esophageal rupture may occur in all age groups, but most frequently, middle-aged males are affected.^[3] Diagnosis of Boerhaave syndrome may be difficult, but the outcome can be fatal if not treated early. Patients treated within 24 hours have a good prognosis, and the survival rate is 75%. Even after 24 hours, the mortality rate is more than 50%, and after 48 hours, the mortality rate is 90%.^[2]

Case Report

A 45-year male patient presented with sudden onset of severe lower chest pain and retching 2 weeks back, one hour after alcohol intake. Pain in the lower chest gradually increased, for which he visited a local Hospital and was

diagnosed with right-sided pneumothorax. On examination, the patient was tachypnoeic and tachycardic, with decreased chest expansion and air entry on the right side. Tenderness was noted in the right hypochondrium and epigastric region. The chest radiograph revealed right-sided hydropneumothorax (*Fig. 1*). Right-sided Intercostal chest drain (ICD) was given with an immediate return of 500 ml of pus-tinged drainage. Contrast-enhanced CT (CECT) thorax showed a feature of esophageal tear near the gastroesophageal junction on the right side with contrast leakage into the right pleural cavity and moderate hydropneumothorax (*Fig. 2*). The patient was diagnosed with Boerhaave syndrome with mediastinitis. TLC was 15730/deciliter, and the rest of the blood investigations were within normal range. Emergency surgical intervention was planned. The thoracic epidural catheter was given at the T10-11 level. The patient was preoxygenated and induced by rapid sequence induction using i.v. glycopyrrolate, midazolam, fentanyl, propofol, and

Departments of Anaesthesiology and *Radiodiagnosis, Institute of Medical Sciences and SUM Hospital, Siksha O Anusandhan, Deemed to be University, Bhubaneswar-751003, India.

Correspondence to: Dr. Sumita Swain, Department of Anaesthesiology, Institute of Medical Sciences and SUM Hospital, Siksha O Anusandhan Deemed to be University, Bhubaneswar-751003

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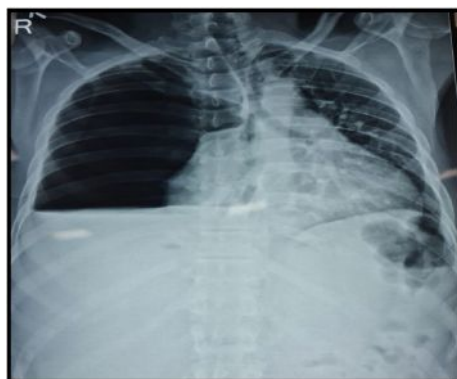


Fig. 1. Frontal Chest X-ray showing Right moderate hydropneumothorax with left-sided mediastinal shift and tracheal deviation.



Fig. 2. Axial CECT thorax showing defect in right lateral lower thoracic esophagus with leakage of positive intraluminal contrast into right side pleural cavity with moderate hydropneumothorax.

succinylcholine. The precaution was to avoid increased intraabdominal pressure to prevent further leakage. The patient was intubated with an 8.0 Fr endotracheal tube, and a bronchial blocker (EZ blocker) was given with an ambuscope as a backup for one-lung ventilation (*Fig. 3*). Invasive blood pressure monitoring and right internal jugular vein central line catheterization were done. Through a transhiatal approach, a rent of approximately 5cm was identified on the anterolateral region of the right lower esophagus 3cm above the gastroesophageal junction (*Fig. 4*). Gross mediastinal contamination (pus) was present, and mediastinal toiletting was done. Transhiatal esophagectomy with gastric conduit and anastomosis in the neck was done. Intraoperative vitals were stable, with occasional bradyarrhythmias observed during thoracic manipulation, aborted after the removal of surgical stimulation. The patient was extubated after 24 hours of operation. After 3rd week of the postoperative day, the



Fig. 3. Intra-operative placement of bronchial blocker (EZ blocker) through a single lumen endotracheal tube with the aid of an ambuscope.

patient was diagnosed with esophageal stricture, and endoscopic dilatation was done, after which the patient was doing fine.

Discussion

Spontaneous rupture usually occurs on the left posterolateral wall (90%) of the lower one-third of the esophagus 2-3 cm above the gastroesophageal junction rather than the right. Spontaneous rupture is uncommon in the thoracic part of the esophagus or below the diaphragm.^[4] In our case, the rupture was located 5cm above the gastroesophageal junction and was on the right anterolateral wall, which is unusual.^[5] Pathophysiology of Boerhaave syndrome is usually due to a lack of coordination between upper and lower esophageal sphincters, resulting in a transmural tear of the esophageal wall due to increased intragastric pressure transmitted to the esophagus during retching.^[6] Mallory Weiss syndrome also has a similar etiology and symptoms due to laceration of the submucosal layer of the gastric cardia, usually having a good prognosis with conservative management.^[7] Most patients with lower esophagus rupture present with Mackler's triad of symptoms and signs: vomiting, lower thoracic pain, and subcutaneous emphysema.^[4] Atypical symptoms like hypotension, tachycardia, fever, and diaphoresis may present in delayed diagnosis with sepsis.^[5] It can rarely manifest through haematemesis, malena, or other signs of GI bleeding.^[8] In our case, lower thoracic pain was the chief complaint, preceded by severe retching after a heavy alcohol intake.

Physical examination may reveal subcutaneous emphysema in 28-66 % of cases within 24 hours and is more typically found later. In our case, subcutaneous emphysema was not there, which may be because the



Fig. 4. Gross surgical specimen showing a large rent in right antero-lateral thoracic esophagus near Gastro-esophageal junction.

patient presented to us after 2 weeks of symptom onset.^[9] A decreased breathing sound due to pneumomediastinum is a typical finding that may cause a crackling sound upon chest auscultation called Hamman crunch.^[8] In our case, Hydropneumomediastinum was present due to pus and air, but the patient had not gone to frank sepsis and organ failure.

Chest radiographs may reveal pneumomediastinum or hydropneumothorax.^[4,10] Diagnostic thoracentesis may reveal food remnants and squamous cells from saliva, pH less than 6, and increased amylase.^[10] Chest CT may reveal air in the mediastinum, around the aorta, and pleural collection.

Anesthetic Induction agents like etomidate and ketamine are to be considered if the patient is in shock; otherwise, propofol can be given.^[11] Lung separation is usually essential to facilitate surgical access, which can be done by a double-lumen tube or a single-lumen endotracheal tube with a bronchial blocker.^[11] In our case, a single-lumen endotracheal tube with a bronchial blocker was used. Thoracotomy with lavage and repair of rupture is the ideal treatment, but in our case, the surgeon preferred transhiatal esophagectomy and esophagogastric anastomosis due to the presence of pus in the mediastinum and to decrease morbidity associated with thoracotomy. Although the patient was presented to our hospital after 2 weeks with features of mediastinitis and sepsis due to delayed diagnosis in remote setup, we were still able to save the patient despite the high mortality of the condition and with limited resources in the emergency setup.

Conclusion

Boerhaave syndrome is a rare clinical condition and challenging for both anesthetists and surgeons. Early diagnosis, aggressive resuscitative measures, preventive measures to decrease the risk of aspiration and worsening of existing esophageal tear, vigilance during intrathoracic manipulations, and intra as well as postoperative protective ventilatory strategies by the clinicians can prevent adverse events in this life-threatening situation.

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