Boerhaave's Syndrome Complicated by a Large Bronchopleural Fistula*

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We report a case of Boerhaave's syndrome complicated by a large bronchopleural fistula due to autolysis of lung parenchyma by gastric contents, a complication not previously documented to our knowledge.

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Herman Boerhaave first described spontaneous rupture of the esophagus in 1724, after performing an autopsy on Baron John Van Wassenaer, Grand Admiral of the Dutch Fleet, who had induced emesis after gorging on duck and wine. Spontaneous rupture may occur during vomiting, childbirth, defecation, or seizures. One case of rupture caused by hypotension-induced vomiting during spinal anesthesia has been reported, as has one case associated with vomiting against applied cricoidpressure.

CASE REPORT

A 71-year-old woman with long-standing peptic ulcer disease complicated by pyloric canal stenosis came to the emergency department. She had burning epigastric pain and had repeatedly vomited in the previous 48 h. Twelve hours before admission, the patient had developed constant perumbilical and severe right-sided pleuritic chest pains, dyspnea, and hematemesis. On examination, she was dehydrated. The pulse was irregular, with a rate of 120 beats per minute; blood pressure was 90/50 mm Hg, and the peripheral vessels were cyanotic. The patient was tachypneic, with labored and noisy breathing. There was limited movement of the right hemithorax, and on auscultation, rhonchi were heard throughout the left side of the chest. Initial arterial blood gas analysis revealed moderate hypoxia (PaO₂ 59 mm Hg), normocarbma (PaCO₂ 40 mm Hg), and mild metabolic alkalosis (pH 7.47). The electrocardiogram demonstrated atrial fibrillation, with a ventricular response rate of 170 beats per minute, and widespread ST segment depression consistent with myocardial ischemia. A chest x-ray film showed right-sided pneumothorax and hydrothorax (Fig 1).

The patient was resuscitated, and urgent thoracotomy was arranged. A right-sided chest tube was inserted, which drained partly digested food and fluid and demonstrated a large continuous air leak suggesting the presence of a bronchopleural fistula. The drained fluid had a pH of 3. A swallow of a mixture of sodium diatrizoate and meglumine diatrizoate (Gastrografin) demonstrated contrast media flowing freely from the esophagus into the right hemithorax and confirmed an esophageal rupture (Fig 2).

Prior to induction, the patient’s heart reverted to sinus rhythm. The anesthetic technique consisted of rapid-sequence induction followed by placement of a 37F left-sided double-lumen tube, the position of which was confirmed clinically and fiberoptically. The trachea, bronchi, and segmental bronchi appeared normal. Anesthesia was maintained with isoflurane, vecuronium, fentanyl, and oxygen. An arterial line and central venous line were inserted. Blood pressure was maintained by volume expansion and inotropic support.

Ventilation was difficult because of high airway pressures because of bronchospasm. Unilateral left-sided ventilation resulted in peak airway pressures of 55 cm H₂O and an oxygen saturation of 85 percent by pulse oximeter, and generalized wheeze was noted despite therapy with aerosolized albuterol. Unilateral right-side ventilation revealed a massive air leak, and saturation fell to 73 percent. Ventilation was optimal with high fresh gas flow and bilateral lung ventilation, which achieved a saturation of 92 percent with 100 percent oxygen.

At thoracotomy the surgeon found and repaired a 3-cm esophageal rent. The pleural space was contaminated by partly digested food. The entire surface of the right lung, from which gas was escaping, was eroded, with full-thickness loss of the visceral pleura and a sponge-like appearance due to exposure of alveoli, alveolar ducts, and small airways.

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After surgery, the patient was transferred to the intensive care unit. Ventilation continued to be problematic. Attempts were made at unilateral and differential lung ventilation; and changes in posture, including the prone position, were tried. The optimal result was achieved in the left lateral position with bilateral synchronous ventilation. Supportive therapy was continued, but the patient became progressively septic and increasingly dependent on inotropic therapy. She died on the fifth postoperative day. Permission for an autopsy was not obtained.

**DISCUSSION**

In cases of esophageal rupture, the classical diagnostic triad of vomiting, chest pain, and cervical emphysema is often not complete.7 Signs are those of cervical or mediastinal emphysema, hydro- and pneumothorax, and, later, septic shock. Diagnosis is suggested by x-ray findings of a pneumothorax and fluid level and is confirmed by Gastrografin swallow (Fig 2) followed by a barium swallow if necessary or endoscopy (or both).7 A Gastrografin swallow may not demonstrate a small leak but should be performed first, because barium spilling into the mediastium through a large rent will cause significant mediastinitis.

The pneumothorax is usually due to rupture or perforation of the esophagus through the parietal pleura, allowing swallowed air into the pleural space. Thus esophageal rupture is one of the causes of a pneumothorax where there has been no anatomic connection between the bronchial tree and the pleural space; however, in this case, gastric contents had caused erosion and autodigestion of the lung surface, resulting in a large bronchopleural fistula that significantly interfered with ventilation and anesthetic management. Mediastinal soiling may also have precipitated the patient's atrial fibrillation.

This patient had a double-lumen endotracheal tube to allow differential lung ventilation. High-frequency jet ventilation was not available; it may have benefited ventilatory mechanics but would probably not have altered outcome. Bronchospasm was only problematic during surgery; it may have been due to preoperative aspiration. There was no radiologic evidence of Gastrografin aspiration. Acidic gastric contents within the pleural space or permeating the eroded lung may also have caused bronchospasm.

Treatment of spontaneous rupture may be conservative or surgical,7,8 involving drainage alone, primary repair with or without lifting a vascularized mediastinal flap, esophageal exclusion, or esophagectomy. Conservative management has poor results; however, there is one report of successful conservative management after delayed diagnosis.8 There are numerous reviews of the benefits of various forms of management.9,10

In this case, other options would have included staple exclusion and a cervical esophagostomy or closure of the esophageal rent over a T tube to provide adequate drainage. There has been no discussion of lung repair in the literature.

**REFERENCES**


**Orthodoxia in Amiodarone-Induced Acute Reversible Pulmonary Damage**

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A case of acute reversible pulmonary damage from amiodarone is described. Pulmonary infiltrates had a basal predominance. The histopathologic picture was that of acute alveolitis. Orthodoxia was evident on blood gas analysis; the PaO₂ was 73 mm Hg on recumbency, and the PaO₂ was 57 mm Hg in the upright position. Partial arterial resaturation was evident on exercise (PaO₂, 64 mm Hg). (Chest 1994; 105:965-66)

Amiodarone, a well-known antiarrhythmic drug, is established as a cause of drug-induced pulmonary damage. The incidence of toxic effects ranges from 1 to 6 percent of the patients treated,1 with up to 25 percent mortality. Orthodoxia is arterial desaturation which becomes evident in the upright position and improves on recumbency. Platypnea is the appearance of dyspnea in the upright position and its disappearance on recumbency. Platypnea appears when orthodoxia is severe.

We report a case of acute alveolar lung damage from amiodarone, with orthodoxia and partial resaturation on exercise.

**CASE REPORT**

A 60-year-old man, a heavy smoker, was treated for 3 years with amiodarone, 200 mg/day, because of ventricular arrhythmias resistant to other drugs (caused by ischemic heart disease). Incomplete control of his condition led his cardiologist to increase the dose to 400 mg/day. A few days later, the patient complained of cough, pleuritic chest pain, and dyspnea. Physical examination revealed...