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CASE REPORT

A Case of Candida Empyema in a Patient With Esophagopleural Fistula

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Abstract

Fungal empyema is a rare entity, particularly in immunocompetent patients. It has been noted to occur in a patient with esophageal perforation. Esophageal perforation has a wide range of clinical presentations and associated complications depending on the size and site of perforation. Although the classic presentation of esophageal perforation, also known as Boerhaave syndrome, is often dramatic with hemodynamic instability and mediastinitis. Smaller perforations and esophageopleural fistula can lead to more indolent presentation in the form of complications such as necrotizing pneumonia and pleural effusions.

Here we present a 42-year-old patient with alcohol withdrawal and aspiration pneumonia, later found to have loculated pleural effusions and empyema with pleural culture growing candida and staph Epidermidis. After his mental recovery, the initiation of oral feeding led to the discovery of esophageal perforation, further complicated by esophageopleural fistula formation. He had a prolonged hospital course but remained hemodynamically stable. He was treated with an esophageal stent and feeding tube placement, as well as antifungals for candida empyema.

Keywords: Esophagopleural fistula, Esophageal perforation, Empyema, Candida

1. Introduction

Candida species are considered to be part of the normal flora of the gastrointestinal and genitourinary tract of the human body. Invasive candida infections with or without lung involvement as a result of hematogenous spread tend to occur in patients with conditions such as neutropenia, immunosuppression, and central venous catheter placement. Candida empyema can occur following invasive thoracoabdominal surgical procedures or as a complication of esophageal perforation.[1,2] In this article, we present a 42-year-old patient with alcohol withdrawal and suspected aspiration pneumonia, later found to have loculated pleural effusions and candida empyema. He was later diagnosed with esophagopleural fistula leading to candida empyema.

2. Case presentation

A 42-year-old Brazilian male with a past medical history of chronic alcohol and cocaine abuse) initially admitted to the medical floors for altered mental status secondary to alcohol intoxication with impending withdrawal. The patient had no other significant medical history. On admission, his heart rate and blood pressure were elevated at 115 bpm and 168/111 mmHg, respectively. He was hypoxic with an O2 saturation of 70% on room air. Physical Examination was remarkable for agitation, altered mental status, and expiratory wheezes on auscultation. The results of laboratory studies showed a white blood cell (WBC) count of 14,500/μL, Hb of 15.2 g/dL, and platelet count of 380,000/μl. Serum biochemistry was normal, with the exception of serum creatinine which was elevated at 1.27 mg/dL). The urine drug screen was positive for cocaine, and the blood alcohol level was elevated at 34. CT scan of the head without contrast was normal. Chest X-ray showed a possible right small pleural effusion (Fig. 1). CT pulmonary angiogram showed findings of moderate hiatal hernia with moderate distention of the esophagus, mild debris in the left main stem bronchus concerning aspiration, small right pleural effusion, patchy subsegmental bibasilar opacities

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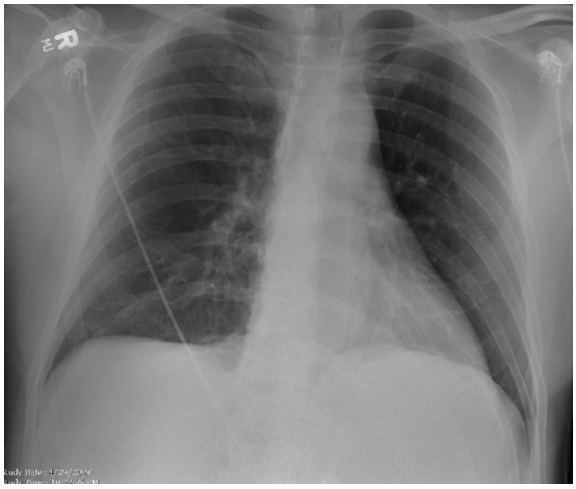

Fig. 1. Chest X-ray showed possible right small pleural effusion.

with mild nonspecific ground-glass opacities (Fig. 2). He was admitted to the medical floor. He was started on CIWA protocol for alcohol withdrawal, antibiotics (Piperacillin-Tazobactam) for aspiration pneumonia, and oxygen supplementation with a nasal cannula. A COVID-19 test was done and came negative. The patient had an episode of coffee ground vomitus in the Emergency Department. He was started on IV Protonix, and a consultation with gastroenterology department indicated that the patient was not stable for endoscopic intervention. There was no further active bleeding, and hemoglobin value remained within the normal range). But the patient developed worsening mental status on the 2nd day and had to be transferred to the intensive care unit for worsening delirium tremens and respiratory distress. He was noted to be increasingly hypoxic, with decreased breath sounds on the right side of the chest. Repeat CXR showed a large right-sided pleural effusion (Fig. 3). Thoracic surgery consultation was obtained, with the insertion of the right inferior chest thoracostomy tube, draining 2 L of dark fluid. Fluid analysis of pleural fluid was suggestive of exudative effusion, likely empyema; WBC 82831 (Polys 92%), fluid glucose <10, LDH 1459, protein 2.1, PH 6. Later, fluid cultures were positive for Candida Albicans. The infectious diseases department was consulted following the results of the pleural fluid culture, and a decision was made to switch the antibiotics to meropenem and vancomycin with the addition of an antifungal agent-micafungin. Subsequently, the patient was transferred to the medical floor. However, he developed worsening agitation and was again admitted to the ICU, where he was treated with lorazepam infusion. The patient was also persistently febrile (T max of 101.7 °F) with leukocytosis (WBC count up to 24,000). A repeat CT scan of the chest showed multiple right-sided loculated pleural effusions with air-fluid levels (Fig. 4). Blood cultures showed no growth.

A consultation with the thoracic surgery department indicated) that patient was a poor surgical candidate due to altered mental status and had a high risk of operative complications. The patient eventually required two chest tubes to be inserted by the interventional radiology department for the loculated effusions in the upper chest with the removal of the initially inserted one. The superiorly inserted chest tube drained 300 mL of pus, whereas the 2nd inferior chest tube drained approximately 50 mL of purulent fluid and some air. Pleural fluid cultures showed candida and staphylococcus epidermidis growths in the superior chest tube, while only candida in the inferior one with fluid analysis suggestive of empyema. Eventually, the antibiotic

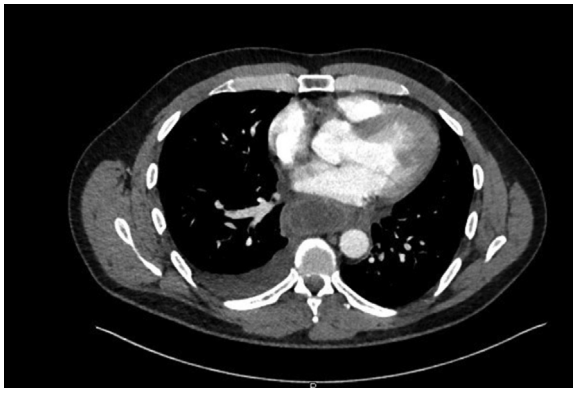

Fig. 2. CT Pulmonary angiogram Showed small right pleural effusion, patchy subsegmental bibasilar opacities with mild nonspecific ground-glass opacities.

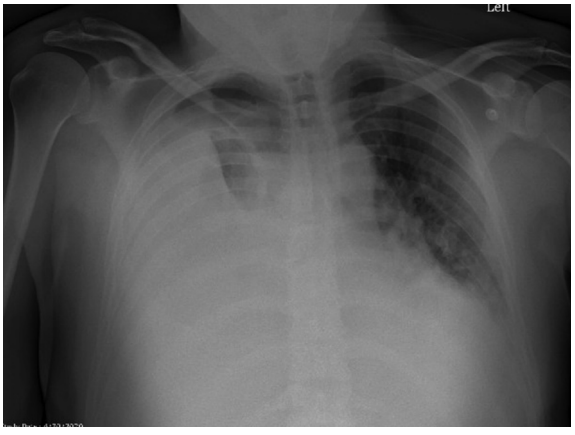

Fig. 3. CXR showed large right sided pleural effusion.

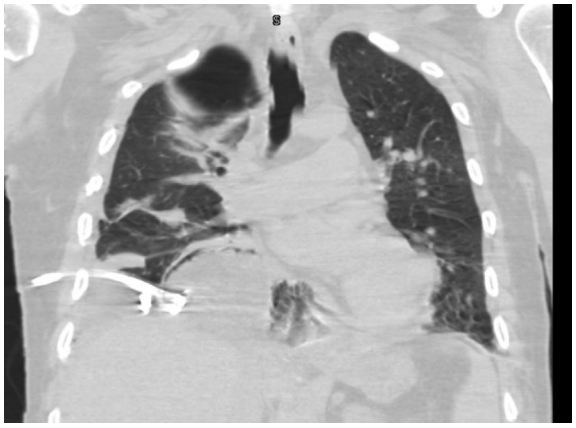

Fig. 4. CT scan of the chest showed multiple right sided loculated pleural effusions with air-fluid levels.

regimen was changed to meropenem, vancomycin, and fluconazole. A 3rd chest tube was placed inferiorly following a repeat CT chest which showed an increased effusion size in a basilar portion of the right lung. The two upper chest tubes were removed later. Meropenem was switched to ampicillin-sulbactam because cultures were negative for gram-negative bacteria. The patient's mental status improved after about 15 days of hospitalization. Subsequently, oral feeding was started. Repeat CT chest demonstrated empyema on the right side with a slight decrease in size, moderate left pleural effusion.

Later, it was noted that food contents were coming out from the chest tube.

Despite improvement in chest imaging findings, chest tube output remained high at 1.5−2 L per day. Subsequently, a contrast esophagogram demonstrated findings compatible with a leak from the right side of the distal esophagus with the preferential passage of contrast into the right pleural space rather than the stomach. Following a discussion with the gastroenterology and thoracic surgery departments, a decision was made to proceed with feeding tube placement with esophageal stent insertion. The patient had percutaneous endoscopic gastrostomy (PEG), with endoscopic findings confirming esophageal defect. The patient underwent endoscopic esophageal stent placement on the 28th day of hospitalization. Vancomycin was stopped and later switched to ampicillin-sulbactam. The patient completed an additional month of fluconazole treatment after the discharge.

3. Discussion

Here we present a case of esophageal perforation complicated by esophago-pleural fistula formation and candida empyema. The patient has no significant past medical history apart from chronic alcohol abuse. Chronic alcohol abuse can lead to a variety of medical morbidities, including aspiration pneumonia. Our patient presented with alcohol withdrawal and had mild right-sided pleural effusion, which later progressed to large effusion and empyema. On initial assessment, we suspected aspiration pneumonia due to the involvement of the right lung. The patient was placed on piperacillin-tazobactam for anaerobic coverage. This case presented a diagnostic challenge, given the patient's prolonged alteration of mental status. Esophageal perforations are rare, with spontaneous effort rupture of the esophagus known as Booerheave syndrome comprising about 15% of esophageal perforations.[3]

Esophago-pleural fistula, in turn, is usually secondary to surgical procedures or as a complication of malignancy, infection, or trauma. It can also be secondary to endoscopic interventions or intubation. Spontaneous fistula is rarely reported in the literature and can be a diagnostic challenge. Esophago-pleural fistula commonly occurs on the right side of the chest since the esophagus is in closer contact with the pleura on the right side.[4] Our patient had chronic alcohol abuse, which can predispose to esophageal mucosal tears secondary to repeated bouts of vomiting, a condition called Mallory Weiss syndrome. MW tear is a longitudinal laceration of the esophageal mucosa, but it can lead to full-thickness perforation with repeat triggers.[3] Spontaneous effort rupture of the esophagus occurs due to increased intrathoracic pressure. It's possible that the patient had a pre-existing mucosal tear that progressed to full defect and fistula formation. Due to the patient unstable mental status and the inability to perform an endoscopy early, it was hard to determine the exact cause and timing of the perforation. Esophageal perforation typically has various presentations depending on the site of perforation. Clinical features of esophageal perforation and esophago-pleural fistula can be variable, which include fever, cough, and shortness of breath. Patients can present with complications that usually start as necrotizing pneumonia with pleural effusion and can later progress to empyema.

Diagnosis can be suspected with the presence of food contents in the pleural fluid. Elevated pleural fluid amylase can also be a clue. However, it's not usually part of the routine initial tests for pleural fluid analysis. Pleural fluid PH less than seven can also lead to the diagnosis. The identification of certain organisms in the pleural fluid confers high suspicion of esophageal perforation. Candida

empyema has been reported as a red flag for esophageal perforation in otherwise immunocompetent individuals with no risk factors.[5] A retrospective study of 128 patients with empyema included seven whose cause of empyema was esophago- or gastropleural fistula. Candida was identified in 5 of the seven patients.[6] In another larger retrospective study of 67 patients with fungal empyema, abdominal diseases were present in 30% of the patients, and 4% had esophageal rupture.[7]

Definitive diagnosis can be confirmed by performing esophagogram with water-soluble contrast (gastrograffin). The finding of Extra-vasation of oral contrast into the pleural space confirms esophagopleural fistula. CT scan of the chest is the imaging of choice, especially when a contrast esophagogram can't be performed, and is also helpful in identifying collections that require drainage.[8] Endoscopy should be reserved for patients in whom the location of the perforation is unclear from imaging alone and in whom endoscopic treatment is planned.

Esophageal perforation has a high mortality rate with the risk of progression to mediastinitis and sepsis. Management usually requires the involvement of a multidisciplinary team, including the gastroenterology department. Early involvement of the thoracic surgery department with pulmonology and infectious diseases consultations in case of complications including empyema is also crucial in the management. Initial treatment is with the cessation of oral feeding and initiation of parenteral nutrition, intravenous proton pump inhibitors, and IV antibiotics. Treatment of associated complications like empyema should be with IV antibiotics and drainage. The choice of antibiotics usually should include appropriate anaerobic coverage. Our patient had candida empyema. It is a rare entity and is usually seen in immunocompromised patients, especially in neutropenic patients. Treatment is usually by an intravenous echinocandin (micafungin) that can be changed to fluconazole in case the organism is susceptible. Since Candida Albicans was isolated and susceptible to fluconazole, antifungals were changed to fluconazole. Although culture from pleural fluid empyema grew candida only, we suspected that other anaerobes could be contributing, and cultures could have been affected by antibiotics. Systemic antibiotics should be administered for at least 4−6 weeks. In addition, management of empyema might require additional drainage by CT guidance or VATS and possible thoracotomy with decortication.[9]

Definitive treatment options for the perforation include surgical management and endoscopic expandable stent placement.[9] Operative management has been historically the standard of care for esophageal perforations. However, endoscopic treatment with stents has been reported as a successful treatment in the literature.[10] Potential drawbacks include the need for endoscopic re-intervention or surgical repair. There are no strict guidelines for patient selection, and early surgical team involvement is vital. There are no randomized controlled trials to determine the best treatment approach by comparing surgical and endoscopic therapies.

4. Conclusions

Esophageal perforation has high morbidity and mortality and often results in hemodynamic instability. Smaller perforations and fistula formations often have a more indolent course. Patients can present with complications such as loculated pleural effusions and empyema with infrequent organisms such as candida.

Conflict of interest

No conflict of interest.

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