中文題目：綠膿桿菌和麴菌同時在一位急性呼吸窘迫症患者合併有多處開洞性肺部病灶

英文題目：Concomitant *Pseudomonas* and *Aspergillus* presence in a Patient with ARDS and Multiple Cavitary Pulmonary Lesions

作　　者：張晉維[1]，黃兆逢[2]，黃禹馨[2]，陳韋成[3,4]

服務單位：[1]中國醫藥大學附設醫院內科部，[2]中國醫藥大學醫學系，[3]中國醫藥大學附設醫院內科部胸腔內科，[4]中國醫藥大學生物醫學研究所

Introduction

Invasive pulmonary aspergillosis has high mortality and delayed initiation of targeted therapy is deleterious to patients. Here, we presented a chest X ray of an easy-missing cavitary pulmonary lesion in a patient with diagnosis of *Pseudomonas aeruginosa* infection related acute respiratory distress syndrome (ARDS) and septic shock.

Case presentation

This 71-year-old woman with a history of hypertension and type II diabetes mellitus received Dexamethasone 8mg twice a day for one month under the impression of idiopathic thrombocytopenic purpura (Platelet count：13,000/mm^3). Progressive weakness developed for one week, accompanied with generalized malaise and exertional dyspnea. So, she was brought to our emergency room (ER), where physical examination showed drowsy consciousness, body temperature of 38.3℃, blood pressure of 99/65 mm Hg, pulse rate of 104 beats per minute, respiratory rate of 20 breaths per minute, and oxygen saturation level of 98% while breathing under nasal cannula 3 liter per minute. Chest auscultation disclosed bilateral rales. Laboratory data demonstrated a pancytopenia with leukocyte counts of 1,500 per mL and 84.4% of neutrophils, a declined hemoglobin of 10.3 g/dL, and a platelets of 7,800 per mL,　a raised C reactive protein up to 17.6 mg/dL; a declined hemoglobin of 8.5 g/dL; platelets of 274,000 per mL, an elevated C-reactive protein of 17.9 mg/dL, an elevated lactate of 47.7 mg/dL, a decreased serum sodium level of 123mEq/L and impaired liver function (serum aspartate aminotransferase 62 IU/L). Arterial blood gas analysis showed pH 7.45, PaCO2 58 mm Hg, $HCO3^-$ 33.4 mmol/L, PaO2 69mm Hg, and SaO2 94% under nasal cannula with FiO2 33%. Chest X-ray showed an alveolar pattern over left upper lung with a cavity formation and an alveolar pattern over right lower lung (Figure 1). Chest computed tomography disclosed multiple focal consolidation with cavity formation (Figure 2).

She was intubated for progressive dyspnea with effort and desaturation. Norepinephrine pump was applied for shock. She was admitted to intensive care unit with impressions of severe community-acquired pneumonia with ARDS (PaO2 / FiO2

= 74.2/0.8= 92.7 mmHg). After adjustment of fentanyl, midazolam, cisatracurium pump for ventilator synchronization and prone positioning, the saturation became 95% under mechanical ventilation with volume assist-control mode, a FiO2 60%, PEEP 10 cmH2O, and tidal volume 6ml per kg predicted body weight. Empirical antibiotics consisted of intravenous meropenem 1000mg every 8 hours, teicoplanin(6mg/kg), and voriconazole 240mg every 12 hours according to patient's risk factor, image of cavitary lesion, and Gram's stain of sputum with Gram negative bacilli:3+, Gram-positive coccus:2+ and yeast-like:1+. *Pseudomonas aeruginosa* was identified from the sputum culture and blood culture. The serum *Aspergillus* galactomannan antigen was also positive (6.4). After the antibiotics use, vasopressors, lung protective strategy, and prone position for the ARDS and septic shock, the hemodynamic status got improving. She was transferred to respiratory care center because of prolonged ventilator support on hospital Day 13 and was extubated on hospital Day 21. Finally, she was discharged without oxygen need and the CXR was quite improved on hospital Day 43 (Figure 3).

Figure 1

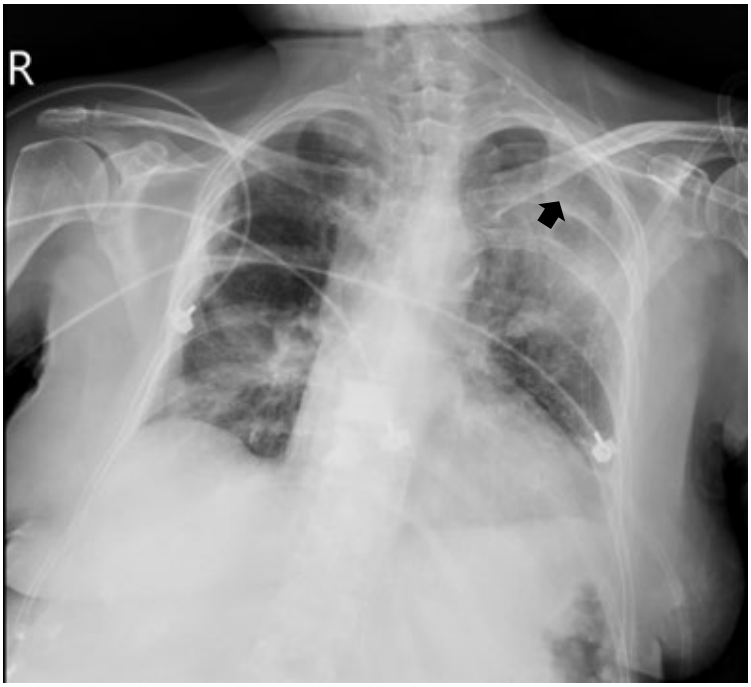
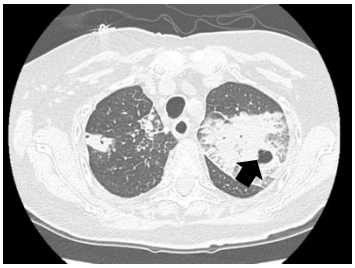


Figure 2



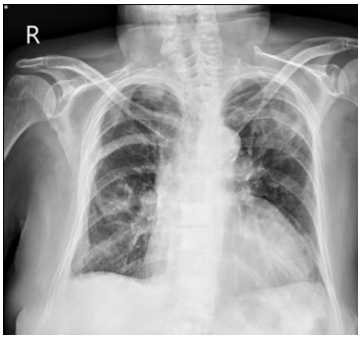


Figure 3

Discussion

This is a patient came to ER because of ARDS and septic shock, and the rapid progressive clinical course is more likely due to *Pseudomonas aeruginosa* infection confirmed by the sputum culture and blood culture result and improved after appropriate antibiotic therapy. However, the serum *Aspergillus* galactomannan antigen is also positive. It is easy to miss the cavitary lesion on the CXR and lost the chance for timely treatment for the invasive aspergillosis.

Multiple cavitary pulmonary lesions include many kinds of etiologies, like infectious disease: pulmonary tuberculosis, multiple lung abscess, septic emboli, aspergillosis; chronic inflammation: granulomatosis with polyangiitis; or malignancy: primary lung cancer or metastatic tumor.[1] In this patient, it's more favor the infectious process because of the fever, elevated CRP, and rapid decline course. Many studies have shown that severe *Pseudomonas* pneumonia can progress to septic shock or ARDS, which can be fatal. [2] Pulmonary abscesses have been reported with *Pseudomonas*, and the subpleural lesion could be the result of septic emboli. [3] But no vegetation was noted under cardiac ultrasound. So, the cause of the multiple cavitary lesion would be other else.

According to EORTC/MSG 2008 diagnostic criteria of the *Aspergillus* infection, a "probable" invasive aspergillosis was diagnosed by this patient's host risk of steroid use, cavitary pulmonary lesion, and positive serum *Aspergillus* galactomannan. [4] We're curious if invasive aspergillosis could result in severe disease. Two case reports showed that invasive aspergillosis could cause septic shock or ARDS in immunocompetent patients.[5,6] Both were improved and successfully weaning from extracorporeal membrane oxygenation after antifungal medication based on occupation of constructor and gardening history before *Aspergillus* were cultured, which highlighted the difficulty of diagnosis of invasive aspergillosis and importance of timely accurate therapy.

Conclusion

It is possible that *Pseudomonas* and *Aspergillus* concomitantly presented in one patient at the same time. We should alert about the cavitary lesion on imaging and survey the reasonable cause for timely treatment.

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