

Septic Pulmonary Embolism: three Case Reports

Z. Celebi Sözen¹, A. Kaya¹, C. Atasoy², M. Kılıçkap³,
N. Numanoglu¹, I. Savas¹

ABSTRACT: *Septic Pulmonary Embolism: three Case Reports. Z. Celebi Sözen, A. Kaya, C. Atasoy, M. Kılıçkap, N. Numanoglu, I. Savas.*

We present three cases of septic pulmonary embolism which occurred as a result of three different causes. The first case, was a 23 year old woman suffering from cough, sputum, hemoptysis and pleuritic chest pain. She had a right subclavian port. On her thorax computed tomography (CT) scans there were widespread bilateral, irregular parenchymal nodular infiltrates and some of them beginning to cavitate. Meticilin resistant stafilococcus aureus (MRSA) was isolated from the blood culture and septic embolism was diagnosed. A month after antibiotic therapy her parenchymal nodules have considerably decreased in size.

The second case was a 40 year old woman admitted to our hospital with the same complaints. Her radiological findings were similar. Meticilin sensitive stafilococcus aureus (MSSA) was isolated from the blood cultures and an-

ti-biotic therapy was initiated. To investigate the etiology of the nodules due to septic embolism, echocardiography was performed and infective endocarditis was diagnosed. After the antibiotic therapy and a tricuspid valve operation her parenchymal nodules disappeared.

The final case involved a 51 year old man suffering from fever, fatigue, cough and pain in the left arm for one week. His general status was bad. His radiological findings were also similar to the others. Staphillococcus aureus was isolated from blood and wound culture. Following clinical and radiological findings we thought it was a case of septic pulmonary embolism and antibiotic therapy was started. Despite the therapy we did not take fever response and he died five days after antibiotic therapy.

In conclusion, septic pulmonary embolism should be considered in bilateral cavitory nodular infiltrates and must be managed fast.

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¹ Ankara University School of Medicine Department of Chest Diseases, Ankara,

² Ankara University School of Medicine Department of Radiology, Ankara,

³ Ankara University School of Medicine Department of Cardiology, Ankara, Turkey.

Correspondence: Akin Kaya, Ankara University, Faculty of Medicine, Chest Diseases, Cebeci / Ankara, Turkey; e-mail: akaya@medicine.ankara.edu.tr

Introduction

Septic pulmonary embolism is an uncommon but important disorder that generally presents with an insidious onset of fever, respiratory symptoms and lung infiltrates. Clinical and radiologic features at presentation are usually nonspecific, and the diagnosis of this disorder is frequently delayed [1]. The most common causes include bacterial endocarditis, infected venous catheters, and odontogenic infections. Early diagnosis and antibiotic therapy are the main determinants of the outcome of the patients. We present three cases with septic pulmonary embolism, which is secondary to venous catheter infection, infective endocarditis and soft tissue infection, respectively.

Case One

A 23-year-old woman was admitted to our hospital with cough, sputum, hemoptysis and pleuritic chest pain. She had polyglandular immune defect, Hashimoto's thyroiditis, gluten enteropathy, glomerulonephritis, IgA deficiency,

iron deficiency anemia for 15 years and she had a right subclavian port until 1998. The physical examination revealed that her spleen was palpated 10 cm below the costal arch and 1/6 pansystolic murmur was heard over the tricuspid area. She was pancytopenic and her erythrocyte sedimentation rate was 110 mm at one hour. A frontal chest x-ray showed widespread nodular infiltrates, and a computed tomography of the chest revealed widespread bilateral irregular nodules, some with cavitation (figure 1). Her bronchoscopic findings were normal. There was neither a pathogenic microorganism isolated from her sputum or bronchoalveolar lavage (BAL) specimens, nor was the cytology abnormal. We also performed an echocardiography because of the minimal pericardial effusion on the CT scans but this was normal except for some minimal pericardial effusion. Abdominal ultrasound showed hepatosplenomegaly. A blood culture from the catheter grew MRSA, which led us believe that the pulmonary nodules were secondary to septic embolism. The patient was treated with teicoplanin and subcutaneous low molecular weight heparin. A month after an-

tibiotic therapy, the parenchymal nodules had decreased considerably in size.

Case Two

A 40-year-old woman suffered from cough, hemoptysis, breathlessness, fever and abdominal pain for two weeks. She also had jaundice. We heard crackles bilaterally on the lung bases and she had pretibial edema. Her physical examination was otherwise normal. She had increased white blood cell count (WBC), elevated erythrocyte sedimentation rate (114 mm at one hour) and high bilirubin levels. On frontal chest radiograph there were bilateral widespread nodular infiltrates and her right costophrenic angle was obliterated. CT of the chest showed multiple pulmonary nodules, consolidations and bilateral pleural effusions (figure 2). Cytoplasmic antineutrophil cytoplasmic antibody (c-ANCA) and tumour markers were found to be negative. CT guided percutaneous lung biopsy showed infection. Biochemical analysis of the pleural fluid was compatible with exudative effusion. Though pleural fluid cultures were sterile, MRSA was isolated from the blood and intravenous antibiotic treatment was started. Echocardiography disclosed a mobile 17x14 mm vegetation on the tricuspid valve, which was presumably the source of septic embolism. We continued intravenous antibiotic therapy with vancomycin and then cardiac valve surgery was performed. After the antibiotic therapy and surgery her pulmonary infiltration disappeared.

Case Three

A 51-year-old man suffering from fever, fatigue, cough and pain in the left arm for one week. He had diabetes mellitus and a 60 pack-year of smoking history. His general status was poor. We heard crackles bilaterally on the lung bases. His left arm was hyperemic, edematous and had an ulcerative lesion. He had an increased WBC count and his erythrocyte sedimentation rate was 100 mm per hour. On frontal chest radiograph there were bilateral cavitating nodules. A CT scan also showed multiple bilateral nodules, some of them beginning to cavitate (figure 3). His blood and wound cultures demonstrated that *Staphylococcus aureus* was isolated. Since the clinical and radiological findings were consistent with septic pulmonary embolism, systemic antibiotic therapy was initiated. But the patient did not respond and died on the fifth day of the treatment.

Discussion

Septic pulmonary embolism is a rare but a serious disorder in which thrombi containing microorganisms in a fibrin matrix are mobilized from an infectious area and transported in the venous system to implant in the vascular system of the lungs [2]. Its main source is the cardiovascular system [3]. Septic pulmonary embolism is commonly associated with tricuspid valve endocarditis but

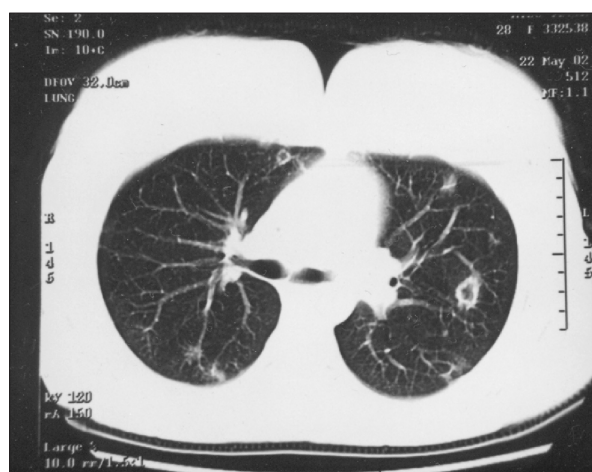


Fig. 1. - Chest CT shows multiple cavitating nodules in both lungs.

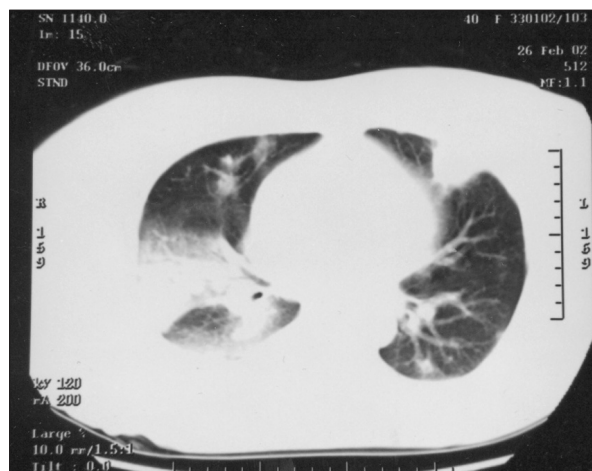


Fig. 2. - Chest CT demonstrates bilateral wedge-shaped peripheral consolidations accompanied by several nodules.

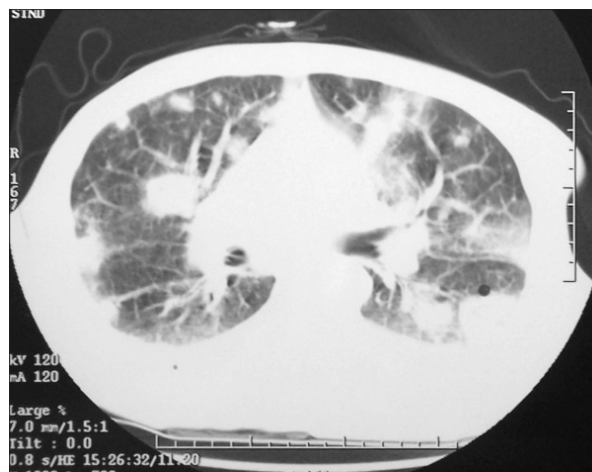


Fig. 3. - Chest CT shows widespread irregular nodules and masses in both lungs. Note the feeding vessel sign in two of the nodules in the right lung.

may also occur in patients with infections from indwelling catheters and pacemaker wires, peripheral septic thrombophlebitis, arteriovenous shunts for hemodialysis and organ transplants [1]. Intravenous drug abuse, soft tissue, odontogenic, tonsillar and pelvic infections have also been reported as sources. Immunocompromised patients and patients receiving steroids or anticancer drugs also

have an increased risk of suffering from a septic pulmonary embolism [4].

Typical symptoms are fever, cough and hemoptysis which also occurred in our patients. Early diagnosis and prompt antibiotic therapy is crucial, but since the clinical and radiological features at presentation are usually non-specific, the diagnosis is not easy. Proper identification of the septic focus is perhaps as important as the diagnosis of septic embolism itself, since the resolution of the problem will depend on elimination of the source [5].

We present three cases with similar clinical and radiologic findings as an example of different causes of septic pulmonary embolism. All have suffered from cough and fever and they have elevated sedimentation rates due to infection.

Although chest radiographs reveal peripheral bilateral poorly marginated lung nodules that have a tendency to cavitate with thick irregular walls, but tend to be non-specific, CT may yield helpful clues that may suggest the diagnosis of septic pulmonary embolism [3, 4]. It shows the extent of the disease and potential complications. On CT the most characteristic findings of septic embolism include lower lobe nodules that show various stages of cavitation. Other findings include the feeding vessel sign observed in 60-70% of patients, subpleural wedge-shaped opacities, air bronchograms

within nodules and extension into the pleural space and pleural effusion [4]. All these findings were present in our cases and dramatic radiological improvement was achieved by treatment except than in the last case.

By seeing respiratory symptoms, fever, elevated infection markers and cavitating nodular infiltrates on the CT scans one should bear in mind the possibility of septic pulmonary embolism and initiate antibiotic therapy fast. Investigating the infectious focus and isolating the microorganism is also very important in commencing the correct treatment.

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