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CASE REPORT / OLGU SUNUMU

A Rare Case of Septic Pulmonary Embolism Associate with IV Substance Use Disorder

IV Madde Kullanım Bozukluğu ile İlişkili Nadir Bir Septik Pulmoner Emboli Olgusu

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ABSTRACT

Aim: People who inject drugs (PWID) are at increased risk for acute and chronic pulmonary complications. These sequelae may be due to pharmacodynamic properties of the drugs, effects of intravenous (IV) contaminants, or complications of the IV route of administration.

Case Report: A 35-year-old male patient admitted to Emergency Department (ED) with complaints of fever, chest pain and dyspnea. Thoracic computed tomography (CT) revealed thick-walled multiple cavitary lung lesions in the parenchyma of both lungs, with the largest measuring 5 cm being located in the superior part of the right lower lobe. Based on his medical history, it was learned that the patient was admitted to the hospital about 5 months ago due to bleeding after the right femoral injection, followed by an infected hematoma and thrombosis, and a necrotic wound on the anterior surface of the right tibia. With these clinical and radiological findings, the diagnosis of septic pulmonary embolism (PE) was made.

Conclusion: Although septic PE is a rare clinical condition, it should be considered especially in PWID patients and cases with bilateral nodules and cavitary lesions on CT, since it is a disease with high mortality and morbidity.

Keywords: Septic pulmonary embolism, computed tomography, iv substance use

ÖZ

Amaç: Damar içi uyuşturucu madde kullanıcıları akut ve kronik pulmoner komplikasyonlar açısından yüksek risk altındadırlar. Bu sekeller ilaçların farmakodinamik özelliklerine, intravenöz (İV) kontaminantların etkilerine veya İV uygulama yolunun komplikasyonlarına bağlı gelişebilir.

Olgu Sunumu: 35 yaşında erkek hasta Acil Servis'e ateş, göğüs ağrısı ve nefes darlığı şikayeti ile başvurdu. Çekilen toraks bilgisayarlı tomografisinde (BT) her iki akciğer parankim alanlarında en büyüğü sağ alt lob süperiorda 5 cm boyutunda olmak üzere kalın cidarlı multipl kaviter akciğer lezyonları gözlendi. Hastanın ayrıntılı anamnezinde, yaklaşık 5 ay önce sağ femoral enjeksiyon sonrası kanama nedeniyle hastaneye başvurduğu ve devamında enfekte hematom ve trombozun gözlendiği, sonrasında sağ tibia ön yüzünde nekrotik yaranın oluştuğu öğrenildi. Hastaya bu klinik ve radyolojik bulguları ile septik pulmoner emboli (PE) tanısı konuldu.

Sonuç: Septik PE nadir bir klinik durum olmasına rağmen, mortalitesi ve morbiditesi yüksek bir hastalık olması nedeniyle özellikle damar içi ilaç bağımlısı olan hastalarda ve BT'de bilateral nodül ve kaviter lezyonu olan olgularda düşünülmelidir.

Anahtar Kelimeler: Septik pulmoner emboli, bilgisayarlı tomografi, iv madde kullanımı

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Introduction

Septic PE is a clinical entity in which pulmonary infarction and infection develop as a result of embolism to lungs from an infected fibrin thrombus in septic phlebitis. A thrombus that contains microorganisms nested in a fibrin fragment that is dislodged from a source of infection, such as infective endocarditis, oropharyngeal infections, IV drug use, infected pacemaker leads, liver abscess, pelvic infections, osteomyelitis, septic abortion, skin and soft tissue infections, infected central venous catheters, seats in pulmonary arteries and causes multiple and bilateral nodular, cavitary, or wedge-shaped infiltrations that are located in both lung parenchyma, usually peripherally and adjacent to vessels (1,2).

Patients with septic PE may present with fever, dyspnea, cough, pleuritic chest pain, and hemoptysis. It is difficult to diagnose as the onset of clinical manifestations is usually non-specific. However, clinical signs, the findings of CT, and the detection of a suspected focus may support the diagnosis of septic PE. The most important factor determining the prognosis of septic PE is early diagnosis coupled with the start of appropriate wide spectrum antibiotics (3).

A systematic review of 388 septic PE studies identified PWID as the causative factor in 26% of septic PE cases. PWID enables bacteremia by inoculating skin pathogens into systemic circulation through nonsterile and shared needles (4). PWID have higher rates of Staphylococcus aureus bacteremia than patients without substance use disorder or those who ingest or inhale drugs (5). Moreover, the addition of nonsterile adulterants to illicit drugs contributes to pathogen transmission (6).

We present this case in order to consider this entity in the differential diagnosis of patients admitted to the ED with nonspecific signs and symptoms related to PWID, which have gradually increased in recent years.

Case Report

A 35-year-old man was admitted to ED with chest pain, dyspnea and fever for 2 days. In the history, the patient declared that he has used wide variety of opioid derivatives, especially heroin and cocaine for 5-6 years. Having been suspected of septic PE, the patient's detailed history and hospital records revealed that he had been using IV drugs and had presented to a hospital with bleeding after right femoral injection about 5 months ago; he had then developed an infected hematoma and thrombosis followed by the formation of a necrotic wound on the anterior aspect of the tibia.

His general status was moderately well; he was conscious; he showed full cooperation with the medical team and had a full time and place orientation. His body temperature was 37.3 ˚C; pulse rate 90 bpm; blood pressure 120/80 mmHg; and oxygen saturation 97% while breathing oxygen at a rate of 4lt/min. On physical examination, he had bilaterally coarse breath sounds and rhonchi. He had an ulcerated necrotic lesion with purulent discharge, with a size of 20*25 cm, on the anterior aspect of his tibia (Figure 1). His peripheral pulses were palpable on both sides. His other systemic examinations were normal.

Figure 1. Ulcerated necrotic lesion with purulent discharge measuring 20 * 25 cm on the anterior surface of the tibia

His laboratory tests revealed the following: WBC: 32500/mm3, HB: 7.3 g/dl, HCT: %21.9, PLT: 456000/mm3, CRP: 279.5 mg/L. A venous blood gas sample revealed normal findings. Chest CT showed thick-walled lung lesions in the parenchyma of both lungs, with multible large nodules and diffuse cavitation with air bronchograms as well as consolidation (Figure 2). A transthoracic echocardiogram (TTE) taken to rule out infective endocarditis was completely normal and revealed no valvular vegetation. A venous doppler ultrasonogram of his right lower extremity showed thrombotic material inside the lumens of his right external iliac vein, left main femoral vein, superficial femoral vein, and popliteal vein. A sample for blood culture was taken and vancomycin combined with piperacillin-tazobactam was started. Staphylococcus aureus grew from the blood culture result of the patient. The patient, who was hospitalized and continued his treatment, left without permission on the 3rd day of his hospitalization before his treatment was finished. Written informed consent was obtained from the patient for publication of this case report and any accompanying images

Discussion

Septic PE is an uncommon but serious disorder that is difficult to recognize and can be easily overlooked unless it is considered (7). Whereas septic abortion, thrombophlebitis due to post-puerperal infections, and head & neck infections were the leading causes, increasing IV drug use and

widespread use of IV catheters have been the most common sources of septic PE (4).

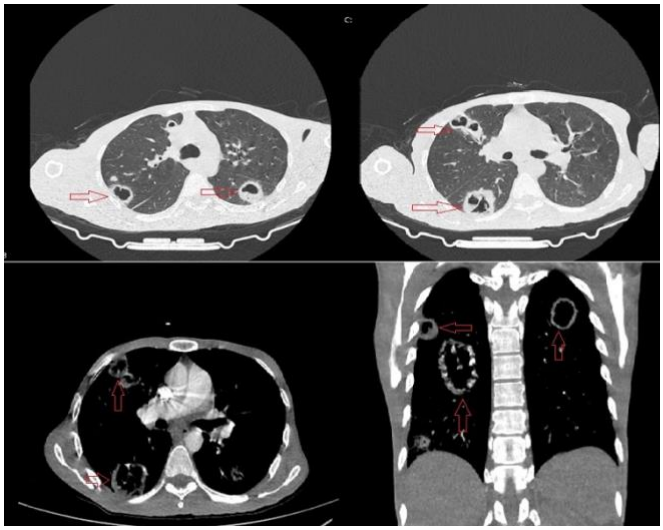

Figure 2. Chest CT showed thick-walled lung lesions in the parenchyma of both lungs, with the largest measuring 5 cm being located in the superior part of the right lower lobe

The clinical symptoms of septic PE are fever, dyspnea, cough, pleuritic chest pain, and hemoptysis. In addition to these symptoms, an extrapulmonary active infectious source may also be found and there may be symptoms related to it (3). In our case, dyspnea, fever, chest pain coupled with a history of IV drug addiction and the presence of a necrotic wound with purulent discharge on a lower extremity have all pointed to a preliminary diagnosis of septic PE.

In septic PE, the embolic blood clot that leads to an infarction in the pulmonary vasculature also contains microorganisms that incite a focal abscess (7). On imaging tests, the peripheral, subpleural parts of the lungs are most commonly affected. Chest radiography may reveal poorly marginated peripheral lung nodules that have a tendency to cavitate but are more often nonspecific in appearance. Chest CT can be more helpful in demonstrating peripheral cavitary lesions (7,8). On chest CT, there may be multiple air cysts; multiple small opacities mimicking diffuse bronchopneumonia; wedge-shaped opacities on the peripheral parts of the lungs; and bilateral nodules with cavities. Cavitations may also develop in aseptic emboli; however, a bacterial infection superimposed on a thromboembolic infarction should be suspected when cavitation is observed (8-10).

It is noteworthy that Kwon et al. recently reported that the size of nodules was greater in gram-positive septic emboli than gram-negative ones. While cavitation and air bronchograms are more frequent in gram-positive emboli, ground-glass attenuation halo, and supply vessel sign are more common in gram-negative emboli. Staphylococcus aureus is the usual etiological agent in septic pulmonary embolism. In addition to staphylococci, streptococcus viridans and klebsiella pneumonia may also cause the lesions (10). Our patient had radiological findings compatible with typical gram-positive septic PE where large nodules and diffuse cavitation with air bronchograms as well as consolidation.

There may be vegetations on the tricuspid valve, valvular insufficiency, and paravalvular abscess in cases of septic PE. Therefore, these patients should undergo TTE. transesophageal echocardiography (TEE) is a superior imaging modality than TTE for visualizing small vegetations (11,12). Our patient had no meaningful findings on TTE.

Conclusion

Although septic PE is a rare clinical condition, it should be considered especially in PWID patients and cases with bilateral nodules and cavitary lesions on CT, since it is a disease with high mortality and morbidity. In these patients, broad spectrum antibiotic therapy should be initiated in the early period.

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References

1. Bozkuş F, Dikmen N, Atilla N, et al. Septic pulmonary embolism, a case report. Journal of Contemporary Medicine. 2016;6:76-9.
2. Hong Geun O, Seung-Ick C, Kyung-Min S, et al. Risk factors for mortality in patients with septic pulmonary embolism. J Infect Chemother. 2016;22(8):553-8.
3. Rui Y, Li Z, Cuihong W, et al. Clinical characteristics of septic pulmonary embolism in adults: a systematic review. Respir Med. 2014(1);108:1–8.
4. Renata RA, Edson M, Efren JF. Frequency and reliability of the reversed halo sign in patients with septic pulmonary embolism due to ıv substance use disorder. AJR Am J Roentgenol. 2020;214(1):59-67.
5. Moss R, Munt B. Injection drug use and right sided endocarditis. Heart. 2003;89(5):577-81.
6. de Almeida RR, de Souza LS, Mançano AD, et al. High-resolution computed tomographic findings of cocaine-induced pulmonary disease: a state of the art review. Lung. 2014;192(2):225–33.
7. Rachel JC, Rendell WA, Gregory LA, et al. Septic pulmonary embolism: presenting features and clinical course of 14 patients. Chest. 2005;128(1):162-6.
8. Kuhlman JE, Fishman EK, Teigen C. Pulmonary septic emboli: diagnosis with CT. Radiology. 1990;174(1):211-3.
9. Iwasaki Y, Nagata K, Nakanishi M, et al. Spiral CT findings in septic pulmonary emboli. Eur J Radiol. 2001;37(3):190-4.
10. Kwon WJ, Jeong YJ, Kim KI, et al. Computed tomographic features of pulmonary septic emboli: Comparison of causative microorganisms. J. Comput. Assist. Tomogr. 2007;31(3):390–4.

11. Baddour LM, Wilson WR, Bayer AS, et al. Infective endocarditis in adults: diagnosis, antimicrobial therapy, and management of complications: a scientific statement for healthcare professionals from the american heart association. Circulation. 2015;132(15):1435-86.
12. Long B, Koyfman A. Infectious endocarditis: an update for emergency clinicians. Am J Emerg Med. 2018;36(9):1686–92.