A Floating, Grapelike Thrombus in the Right Atrium Resulting in Pulmonary Embolism During Echocardiography: A Case Report

EKOKARDİYOGRAFİK İNCELEME SIRASINDA PULMONER EMBOLİ İLE SONUÇLANAN ÜZÜM SALKIMI ŞEKLİNDEKİ HAREKETLİ SAĞ ATRİYAL TROMBÜS: OLGU SUNUMU

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Abstract

Free-floating right heart thrombi are rarely seen on routine echocardiographic examination. They are generally diagnosed via transthoracic echocardiography in patients with suspected pulmonary embolism. A 30-year-old woman who had undergone surgical resection as the result of an intracranial mass presented with dyspnea and chest discomfort beginning suddenly 5 days after surgery. Echocardiography performed at bedside revealed a right atrial floating grapelike thrombus and indirect signs of pulmonary embolism. While echocardiographic examination was being performed, the thrombus prolapsed through the tricuspid orifice and passed into the right ventricle, where it disappeared into the right heart. Computed tomography of the thorax demonstrated thrombi within both right and left pulmonary arteries and their segmental branches, which was compatible with pulmonary embolism. The patient was successfully treated with anticoagulant agents.

Key Words: Thrombosis, echocardiography, pulmonary embolism

Özet

Sağ kalp boşluklarında serbest hareketli trombüsler rutin ekokardiyografik incelemelerde nadir olarak görülür. Bu trombüsler genellikle pulmoner emboli şüphesi olan hastalara transtorasik ekokardiyografi yapılırken tespit edilir. Kafa içi kitle nedeniyle opere edilmiş olan 30 yaşındaki bayan hasta operasyonun 5. gününde ani başlayan göğüste sıkışma hissi ve nefes darlığı şikayeti nedeni ile konsülte edildi. Yatak başı yapılan ekokardiyografide, sağ atriyumda hareketli, üzüm salkımını andıran trombüs ve pulmoner embolinin indirekt bulguları saptandı. Ekokardiyografik inceleme yapılırken, trombüs triküspit orifisinden sağ ventriküle geçti ve sonra gözden kayboldu. Kompüterize torakal tomografide hem sağ hem de sol pulmoner arterde ve segmental dallarında trombüsler saptandı. Hasta, antikoagülan ajanlarla başarıyla tedavi edildi.

Anahtar Kelimeler: Trombüs, ekokardiyografi, pulmoner emboli

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Floating thrombi in the right heart cavities are rarely seen and probably underdiagnosed in patients with pulmonary embolism.[1] Pulmonary embolism has high mortality and morbidity rate unless it is diagnosed early.[2] Clinical presentation of acute pulmonary embolism is variable and nonspecific. In addition, noninvasive diagnostic tools are not enough for definite diagnosis. Therefore, its diagnosis, especially early diagnosis, is frequently so difficult.[3] However, transthoracic echocardiography performed at bedside can provide valuable clues rapidly to diagnose pulmonary embolism, and if it performed early enough, thrombi in the right heart chambers may be demonstrated.

This case is an example of floating grapelike thrombosis in the right atrium resulting in second pulmonary embolism attack while bedside transthoracic echocardiography was being performed because of suspicious pulmonary embolism. We decided to report this case since it is probably the first live pulmonary embolism caused by right atrial thrombus observed during echocardiographic examination.

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Case Report

A 30-year-old woman who underwent tumor surgical resection because of intracranial mass associated with haematoma in the left parietal lob was consulted in intensive care unit because of dyspnea and chest pain starting suddenly 5 days after the surgery. On consultation, she had severe dyspnea and chest discomfort, a blood pressure of 110/60 mmHg, a respiratory rate of 40 breaths per minute, and a pulse and heart rate of 130 beats per minute. Although the patient was breathing 100% oxygen 5 liter per minute, initial analysis of arterial blood gas included: Saturation of oxygen 92%, partial pressure of oxygen 70 mmHg, and partial pressure of carbon dioxide 27 mmHg. The electrocardiography showed sinusal tachycardia with incomplete right bundle branch block, deep S wave in lead I, and Q wave and inverted T wave in lead III. According to these signs, pulmonary embolism was suspected and bedside echocardiographic examination was performed. Echocardiography revealed an in transit thrombus in the right atrium, an enlarged and hypokinetic right ventricle, and moderate tricuspid regurgitation (Figure 1A). Estimated pulmonary artery systolic pressure calculated from tricuspid regurgitation velocity was 70 mmHg. During echocardiographic examination, in transit right atrial floating thrombus prolapsed through tricuspid orifice and passed into right ventricle (Figure 1B, 1C). Afterwards, the thrombus disappeared in the right heart (Figure 1D). At that moment, severity of dyspnea increased and oxygen saturation fell to 85%. Spiral computed tomography of the thorax demonstrated thrombi within right and left pulmonary arteries and their segmental branches, compatible with pulmonary embolism (Figure 2). Lower extremity deep venous thrombosis involving the right main femoral and the left

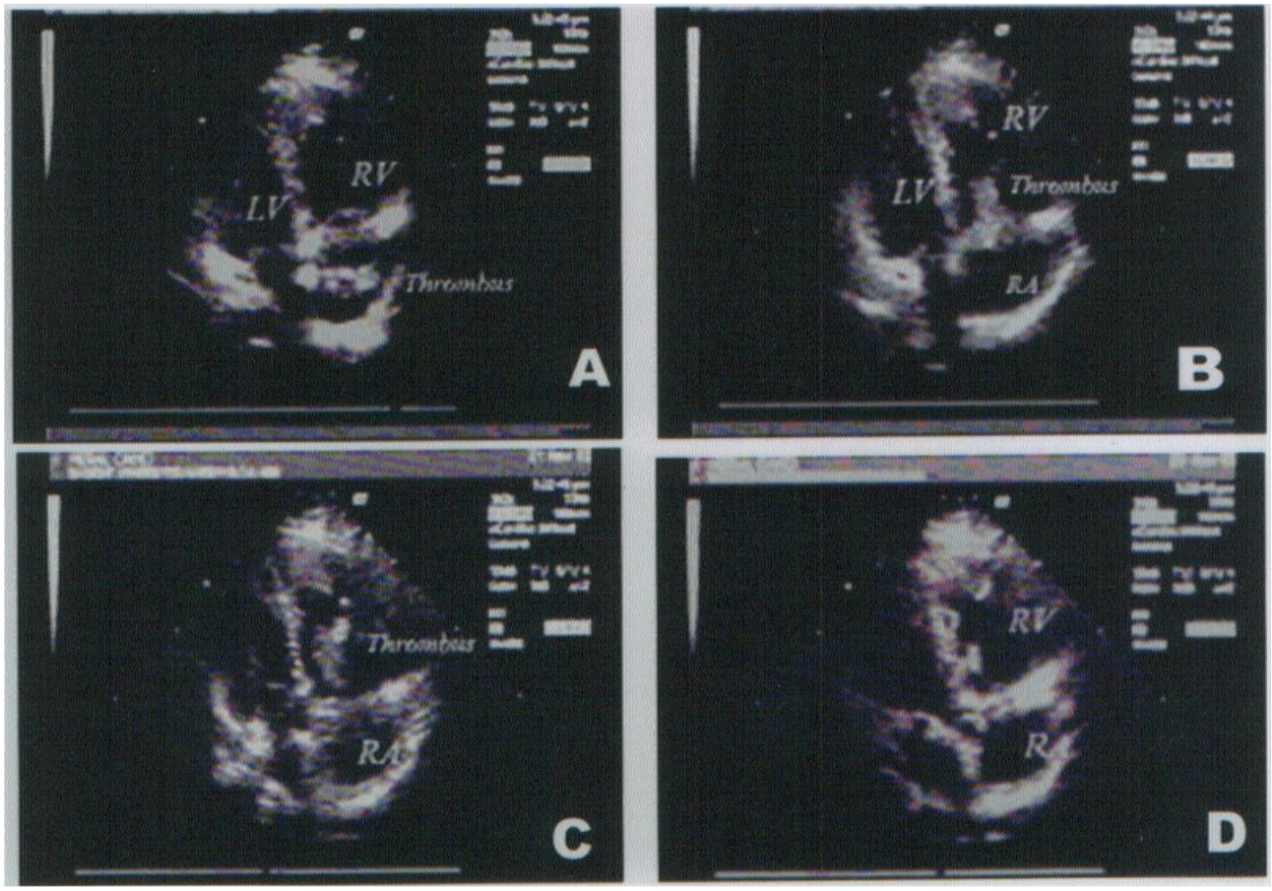

Figure 1A-D. Echocardiography in four chambers projection revealed an in transit right atrial floating grapelike thrombus.

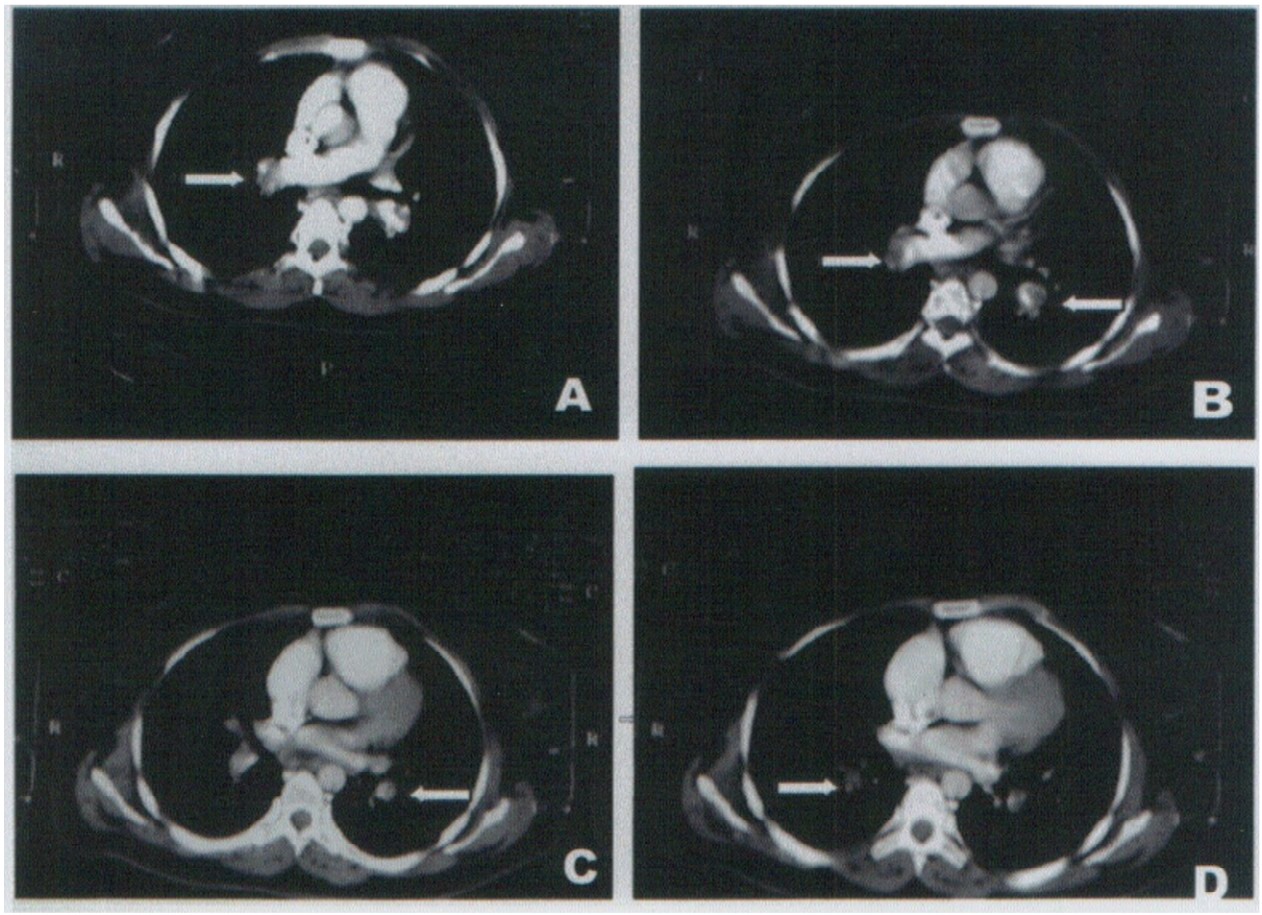

Figure 2. Spiral computed tomography of the thorax demonstrating thrombi (arrows) within right and left pulmonary arteries and their segmental branches.

popliteal vein detected by Doppler ultrasonography was thought to be responsible for right atrial in transit thrombosis and pulmonary embolism.

Thrombolytic therapy was not administered because of recent surgery. The patient was given unfractioned heparin intravenously and low molecular weight heparin subcutaneously, respectively. Afterwards, control echocardiography showed that right heart cavities returned to normal size, and tricuspid regurgitation almost disappeared. The patient was prescribed warfarin to be titrated for INR values between 2-3 continuously and discharged.

Discussion

Floating right heart thrombi are seldom seen on routine echocardiographic examination. It is generally diagnosed in patients with suspected pulmonary embolism by transthoracic echocardiography. On the other hand, the clinical diagnosis of pulmonary embolism is so difficult because of its nonspecific history, symptoms and sings, and even physical findings as well as noninvasive diagnostic tools can not be enough for definite diagnosis.[1,3] Although it is generally not regarded as a first-step test in diagnosis of pulmonary embolism, transthoracic echocardiography may provide rapid and convenient diagnosis with demonstrating a thrombus in the right heart cavities in addition to indirect signs of pulmonary embolism. In fact, transthoracic echocardiography is a simple, noninvasive and harmless tool, available in most of medical center, and it can be performed at bedside. Our case was being followed in general intensive care unit. The patient was consulted and transthoracic echocardiography at bedside was performed

because of severe dyspnea and chest discomfort occurring suddenly. On the base of echocardiographic findings, acute pulmonary embolism was strongly suspected. Thus, anticoagulant therapy was started soon. Computed tomography of the thorax definitely showed pulmonary embolism. Therefore, we greatly offer performing echocardiography in all patients with suspected pulmonary embolism.

Treatment of pulmonary embolism is not standardized. The choice of therapy depends on the judgment of the attending physicians. Several therapeutic models such as anticoagulation alone, intravenous thrombolytic agents (the drug and its application depends on the physician), surgical embolectomy, and percutaneous removal of thrombus using a basket device can be chosen.[4] When pulmonary embolism is suspected, anticoagulant therapy should be initiated as soon as possible. The first choice should be intravenously unfractionated heparin, initiated with a bolus of 80 U/kg per followed by a continuous infusion of about 18 U/kg per hour, and the activated partial thromboplastin time should be kept at 2 to 3 times normal.[5] Effective anticoagulation is very important in pulmonary embolism. Because, the anticoagulant effect is abate in a few hours. The rapid reversibility of anticoagulation may require thrombolytic or surgical therapy in patients with pulmonary embolism. When the patients are stable, low-molecular-weight heparin may be used instead of unfractionated heparin.[6] A recent published meta-analysis showed that low-molecular-weight heparin reduces mortality compared with unfractionated heparin in patients with acute deep venous thrombosis, with no increase in bleeding.[7] We initiated the therapy administering unfractionated heparin, and after stabilization of clinical status replaced with enoxaparin, a low-molecular-weight heparin. Afterwards, she was prescribed warfarin to be titrated for INR values between 2-3 continuou sly and discharged.

Conclusion

In this case, immediate bedside transthoracic echocardiography proved to be an indispensable method to diagnose acute pulmonary embolism and to direct the therapy. In addition, this case emphasizes the importance of early diagnosis and properly maintenance of anticoagulation in patients with pulmonary embolism.

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