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# Snake-Like Thrombus in the Right Heart Causing Massive Pulmonary Embolism and a Basic but Important Diagnostic Tool for Rapid Differential Diagnosis: Transthoracic Echocardiography

## Masif Pulmoner Emboliye Neden Olan Sağ Kalp İçerisindeki Yılanvari Trombus ve Hızlı Ayırıcı Tanı İçin Temel Bir Tanısal Araç: Transtorasik Ekokardiyografi

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## Abstract

We present a case diagnosed as massive pulmonary embolism in whom a snake-like thrombus was found in the right heart by transthoracic echocardiography, which is a basic but important diagnostic tool for rapid differential diagnosis. It is non-invasive and relatively cheap and can eliminate the necessity for complex and expensive diagnostic tools that are also inconvenient for these type patients who are hypotensive, cyanotic and confused. Pulmonary embolism is a life-threatening condition. 2/3 of the PTE cases are misdiagnosed. Some highly sensitive symptoms of massive pulmonary thromboemboli (PTE) like dyspnea, hypotension, angina pectoris and syncope have low specificity for PTE, though sometimes these patients are misdiagnosed or diagnosed late causing a delay in instituting the appropiate therapy. Transthoracic echocardiography is also useful for the differential diagnosis to eliminate the other causes which can trigger the similar symptoms.
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**Key words:** Pulmonary, thromboembolisation, echocardiography, thrombus

## Özet

Sağ kalpte, trasntorasik ekokardiyograf ile saptanmış, yılanvari bir trombus olan, bir masif pulmoner tromboemboli vakasını sunmaktayız. Transtorasik ekokardiyografi hem ucuz ve invazif olmayan hem de sıklıkla hipotansif, siyanotik ve konfüze oldukları için kompleks ve pahalı tanısal araçlar için uygun olmayan bu hastaların ayırıcı tanısında basit ama önemli bir tanısal araçtır. Pulmoner embolizm hayatı tehdit eden bir durumdur. Vakarlın 2/3'ünde yanlış tanı konulmaktadır. Sensitif olan dispne, hipotansiyon, göğüs ağrısı ve senkop gibi bulgular düşük spesifisiteleri dolayısıyla sıklıkla klinisyeni yanlış yönlendirmekte vce uygun tedavinin gecikmesine neden olmaktadır. Transtorasik ekokardiyografi, bu şekilde benzer bulgular ile gelebilen hastalıkların da ayırıcı tanısı açısından da kullanışlıdır.
*(JAEM 2013; 12: 98-100)*
**Anahtar kelimeler:** Pulmoner, tromboemboli, ekokardiyografi, trombüs

## Introduction

Pulmonary embolism is a life-threatening condition. 2/3 of the PTE cases are misdiagnosed. Some highly sensitive symptoms of massive pulmonary thromboemboli (PTE) like dyspnea, hypotension, angina pectoris and syncope are unlikely and have low specificity for PTE, though sometimes these patients are misdiagnosed or diagnosed late, causing a delay in instituting r the appropiate therapy. Echocardiography is a basic but important diagnostic tool for t quick and appropiate diagnosis. Also this non-invasive and relatively cheap diagnostic tool can eliminate the necessity for complex and expensive diagnostic tools which are also inconvenient for these type of patients most of whom are hypotensive, cyanotic and confused. The present case reports a pulmonary thromboembolic patient with a snake-like thrombus-in-transit diagnosed quickly with the transthoracic echocardiographic imagig.

## Case Report

A 32-year-old female patient was admitted to the emergency department because of the acute onset of chest pain and dyspnea for three days. She was operated because of a mass in the clivus three

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months previously. Her heart rate was 108/bpm and BP was 110/60 mmHg. Her d-dimer level was 7.29 mg/dL. Her arterial blood gas analysis was hypoxic and hypocapnic. Transthoracic echocardiography revealed a snake-like thrombus originating from the inferior caval vein, crossing the tricuspid valve and protruding into the pulmonary artery during systole (Figure 1, 2), with a significantly enlarged right ventricle, 3rd degree tricuspid insufficiency was causing 100 mmHg pulmonary arterial pressure. She was referred to the cardiovascular surgeons for an emergency surgical embolectomy. She was operated on and the main body and some remnants of the thrombi were extracted (Figure 3, 4). During the follow-up after the surgery, cardiopulmonary arrest after deep hypotension and bradycardia occured at the post-operative 2nd hour and she died after t cardiopulmoary resuscitation. Consent form was taken from the patient.

## Discussion

Pulmonary embolism is a life-threatening condition. Massive pulmonary thromboembolus is caused by the stenosis of the pulmonary artery system over 50%. Some highly sensitive symptoms of massive pulmonary thromboemboli (PTE) like dyspnea, hypotension, angina pectoris and syncope are unlikely and have low specificity for PTE, though sometimes these patients are misdiagnosed or l diagnosed late, causing a delay in initiating appropiate therapy. Over 90% of the PTE cases are caused by venous thrombosis of the legs. However, the etiology and deep venous thrombosis symptoms are only found in less than the 50% of the PTE patients (1). If the clinican evaluates only the clinical signs and symptoms, the case may be misdiagnosed. So 2/3 of the PTE cases are misdiagnosed. Echocardiography is a basic but important diagnostic tool for the quick and appropiate diagnosis (2). Also this non-invasive and relatively cheap diagnostic tool can eliminate the necessity for complex and expensive diagnostic tools which are also inconvenient for these type of patients most of whom are hypotensive, cyanotic and confused. It is also useful for the differential diagnosis to eliminate the other causes which can trigger similar symptoms. A It assists in the decrease of approximately 30% of mortality of untreated PTE patients to 2-8% (3). Mortality is over 70% in PTE patients with a free thrombus in the right ventricle (4). Demonstration of a thrombus in the right heart by bed-side echocardiography may guide the clinician to quick and appropiate diagnosis and so the appropriate therapy. Thrombus in transit image has been

**Figure 1.** Systolic image of the thrombus in the right heart

**Figure 2.** Diastolic image of the thrombus in the right heart

**Figure 3.** Extracted snake-like thrombus from the right heart

**Figure 4.** Extracted thrombi from the right heart

seen in 4% of the PTE patients (5). Kasper et al. (6) showed a thrombus in the right ventricular thrombus in 105 PTE patients. Bedside echocardiography also helps the diagnosis by indirect findings such as right ventricular dilatation, right ventricular segmentary wall motion disturbances (Mc-Connell's sign), increased pulmonary artery pressure, deviation of the interventrcular septum, and collapse of the inferior caval vein. Thrombi in the heart chambers are detected by the echocardiographic examination. The shape and mobility of the thrombus determine the risk of embolisation. Immobile and flat thrombi tend to cause less embolisation rather than the mobile and pedunculated ones (7). The mortality of the massive PTE patients in the first 2 hours is 8-30% and the misdiagnosis incidence is 62-84% based on the post-mortem studies, although rapid diagnosis and appropiate therapy is very important (8). Thrombolytic therapy should be considered as the first line therapy for these patients, because its superiority over heparin is evident based on many clinical studies, also as in the sub-massive PTE (9). Aggressive therapy (surgical embolectomy, thrombolytic therapy or catheter extraction) is recommended if the patient presents with deep hypotension or shock (10, 11). Where it has its own risks because of the risk of the application of cardiopulmonary bypass and cardiac plegia to the patients with increased pulmonary arterial pressure and right ventricular dysfunction, surgical embolectomy might be chosen for the massive PTE cases with thrombus in transit (12).

## Conclusion

Echocardiography is a basic but important diagnostic tool for the quick and appropiate diagnosis of PTE. Also this non-invasive and relatively cheap diagnostic tool can eliminate the necessity for complex and expensive diagnostic tools which are also inconvenient for these type of patients most of whom are hypotensive, cyanotic and confused and may guide us to the appropriate therapy in addition to the clinical findings.

**Conflict of Interest / *Çıkar Çatışması***
No conflict of interest was declared by the authors.
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