

# BALANCING HIGH CLINICAL SUSPICION AGAINST DOUBTS: A CLINICAL DILEMMA A CLINICAL DILEMMA

## YÜKSEK KLİNİK ŞÜPHEYLE KONTRAENDİKASYONLARI DENGелеMEK: KLİNİK BİR İKİLEM KLİNİK BİR İKİLEM

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ARTICLE INFO	ABSTRACT
<b>Article Information</b> <b>Article Type:</b> Case Report <b>Received:</b> 24.06.2025 <b>Accepted:</b> 09.08.2025 <b>Published:</b> 31.08.2025  <b>Keywords:</b> Pulmonary embolism, Thrombolytic therapy, Resuscitation	Pulmonary embolism (PE) is a significant cause of mortality and is often difficult to diagnose, frequently being overlooked. Current clinical guidelines recommend fibrinolytic therapy for high-risk PE patients without contraindications. However, evidence indicates that fibrinolytic therapy is administered to only approximately 33% of eligible high-risk pulmonary embolism patients. We aim to present a case of successful resuscitation in a 54-year-old female patient with a history of head trauma and suspected gastrointestinal bleeding who presented to our emergency department with dyspnea and later suffered a witnessed cardiac arrest. Fibrinolytic therapy was given during cardiopulmonary resuscitation, leading to the return of spontaneous circulation. The use of fibrinolytic therapy in high-risk pulmonary embolism patients remains a complex and often controversial decision, especially when relative contraindications are present. This case underscores the critical importance of individualized clinical judgment and timely intervention, even in the context of potential bleeding risks. It further illustrates that, with careful risk-benefit evaluation and multidisciplinary collaboration, fibrinolytic therapy can be a life-saving measure in selected patients.

MAKALE BİLGİLERİ	ÖZET
<b>Makale Bilgisi</b> <b>Makale Türü:</b> Olgu Sunumu <b>Geliş Tarihi:</b> 24.06.2025 <b>Kabul Tarihi:</b> 09.08.2025 <b>Yayın Tarihi :</b> 31.08.2025  <b>Anahtar Kelimeler:</b> Pulmoner emboli, Trombolitik tedavi, Resüsitasyon	Pulmoner emboli (PE) tanısı zor ve gözden kaçabilen önemli bir mortalite sebebidir. Mevcut kılavuzlar kontraendikasyonu bulunmayan yüksek riskli pulmoner emboli hastalarında fibrinolitik tedaviyi önermektedir. Fakat yapılan çalışmalarda fibrinolitiklere uygun yüksek riskli PE'li hastaların yaklaşık %33'ünün bu tedaviyi aldığı ileri sürülmektedir. Acil servisimize nefes darlığı şikayetiyle başvuran 54 yaşındaki kafa travması öyküsü olan ve şüpheli bir gastrointestinal kanama öyküsü alınan kadın hastanın tanıklı arrest olması sonrası resüsitasyon sırasında uygulanan fibrinolitik tedaviyle başarılı resüsitasyonu sunmayı amaçlıyoruz. Yüksek riskli pulmoner embolili hastalarda fibrinolitik tedavinin uygulanması, özellikle de göreceli kontraendikasyonların varlığında, karmaşık bir karar olmaya devam etmektedir. Bu vaka, potansiyel kanama riskleri mevcut olsa bile, bireyselleştirilmiş değerlendirilmenin ve zamanında müdahalenin önemini vurgulamaktadır.

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## Introduction

Pulmonary embolism (PE) is the sudden obstruction of a portion of the pulmonary arterial vasculature, typically due to embolization originating from thrombi in the lower extremities or pelvic veins. PE is a significant cause of mortality and is often difficult to diagnose, frequently being overlooked. Although precise epidemiological data are lacking, the incidence of PE in the general population is estimated to be approximately 60 to 70 per 100,000 people (1). High-risk pulmonary embolism accounts for about 5% of all PE cases and is associated with a 30-day mortality rate of approximately 65% (2, 3). Among patients with PE who present with hemodynamic instability (i.e., high-risk or massive PE), in-hospital mortality rates range from 22% to 32% (4, 5).

Current clinical guidelines recommend fibrinolytic therapy for high-risk PE patients without contraindications (6, 7). However, studies suggest that only around 33% of eligible high-risk PE patients actually receive fibrinolytic treatment (8). We aim to present a case of successful resuscitation following fibrinolytic therapy administered during cardiopulmonary resuscitation in a patient who presented to our emergency department with dyspnea, had a history of head trauma, and a suspected history of gastrointestinal bleeding, and subsequently experienced witnessed cardiac arrest.

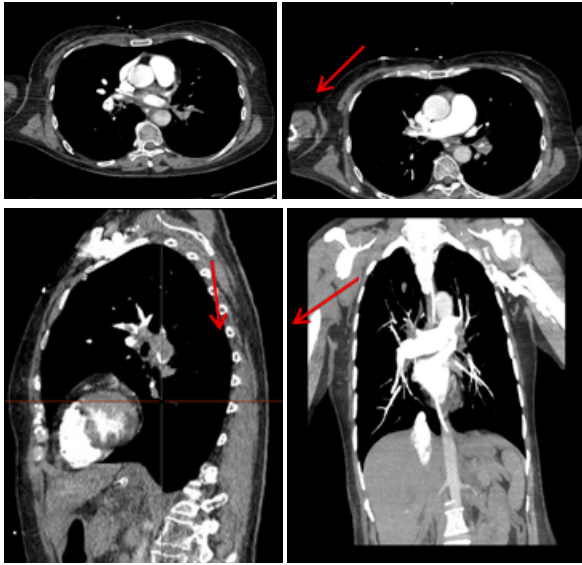
## Case Presentation

A 54-year-old female patient presented to the emergency department with complaints of altered mental status and shortness of breath. According to the accompanying relative, the patient had experienced a syncopal episode at home the previous day, during which she hit her head, but subsequently regained consciousness. On the morning of the presentation, she

was noted to have dark-colored stool, followed by another syncopal episode and subsequent mental confusion. A dermabrasion was observed on her chin. Her Glasgow Coma Scale (GCS) was 14. Digital rectal examination revealed normal stool coloration. During the initial evaluation in the emergency department, the patient suffered a cardiac arrest. She was intubated, and advanced cardiac life support was initiated.

Her medical history included PE and dementia, and she had been taking 100 mg of acetylsalicylic acid regularly. Return of spontaneous circulation (ROSC) was achieved after two cycles of cardiopulmonary resuscitation (CPR). Bedside ultrasonography revealed right ventricular dilation accompanied by tricuspid regurgitation. Other potential causes of hypotension were ruled out by ultrasonography. Initial arterial blood gas analysis showed profound acidosis (pH: 6.99), hypoxemia (pO<sub>2</sub>: 27.2 mmHg), and elevated lactate levels (12.18 mmol/L).

Due to persistent hemodynamic instability and recurrent cardiac arrest, fibrinolytic therapy (Alteplase 100 mg (Actiyse®)) was administered following current guidelines before a computed tomography (CT) scan could be performed, and CPR was resumed. ROSC was achieved after one cycle of CPR. Post-resuscitation vital signs were as follows: blood pressure 88/66 mmHg, heart rate 130 bpm, and oxygen saturation 99%. Electrocardiography revealed sinus tachycardia. After stabilization with inotropic agents and fluid support, brain CT and pulmonary CT angiography were performed. Brain CT showed no evidence of hemorrhage, contusion, or trauma-related pathology, whereas pulmonary CT angiography revealed bilateral PE (Figure 1).



**Figure 1.** Arrows indicate the locations of thromboembolic occlusions within the main pulmonary arteries as visualized on the computed tomography pulmonary angiography.

Following the ROSC, heparin infusion therapy was initiated upon consultation with relevant specialty physicians, and the patient was admitted to the intensive care unit (ICU) for further monitoring. Despite ongoing inotropic support during follow-up, after 10 hours, the patient developed hypotension and experienced another cardiac arrest, resulting in death.

In this case, although the patient had a history of oral antithrombotic use and a minor head trauma—both potential contraindications—we confirmed our high clinical suspicion with CT pulmonary angiography. This raises a critical question: in cases where fibrinolytic therapy is withheld due to relative contraindications, to what extent does this decision affect the likelihood of ROSC and overall survival?

## Discussion

PE is a rare but critical cause of sudden cardiac arrest. Studies conducted in both in-hospital and out-of-hospital settings have shown that PE accounts for approximately 2–3% of all hospital admissions associated with sudden

cardiac arrest (9). Data from the United States indicate an increasing incidence of PE-related cardiac arrests, with a reported annual increase of 2.4% in PE-associated sudden cardiac deaths (10).

Patients with massive PE are often hypotensive and exhibit altered mental status, making them clinically unsuitable for diagnostic imaging—such as computed tomography (CT), pulmonary angiography, or ventilation/perfusion (V/Q) scintigraphy—until stabilization is attained. In such critically ill patients, bedside echocardiography findings suggestive of right ventricular (RV) dysfunction—such as RV dilatation, hypokinesia, elevated pulmonary arterial pressure, interventricular septal deviation, or loss of inspiratory collapse in the inferior vena cava—may be sufficient to justify the initiation of reperfusion therapy without further diagnostic testing (11, 12).

When the RV/LV ratio exceeds 1.0, the risk of PE-related mortality increases fivefold (13). High-risk PE is associated with a short-term (24-hour) mortality rate exceeding 20% (14).

In our case, the patient had a documented history of PE and presented with a comparable clinical profile. Right ventricular dysfunction was confirmed by echocardiography, and other causes of hypotension were excluded by bedside ultrasonography. Despite these findings, the presence of minor head trauma and the patient's chronic use of oral anticoagulants prompted initial hesitation in administering fibrinolytic therapy.

The use of fibrinolytic agents in PE management was first introduced over 50 years ago (15). These agents aim to reduce thrombus burden, facilitate rapid reduction in right ventricular afterload, and promote earlier hemodynamic improvement (16). Absolute contraindications

for fibrinolytic therapy in acute PE include hemorrhagic stroke, ischemic stroke within the past 6 months, major surgery, head trauma within the past 3 weeks, bleeding diathesis, central nervous system malignancies, and active bleeding (17). Relative contraindications include prior bleeding events, use of anticoagulant medications, history of ischemic stroke >3 months prior, and traumatic or prolonged cardiopulmonary resuscitation.

In our case, the patient experienced in-hospital cardiac arrest, and physical examination revealed no additional bleeding or hypotensive cause. Her relatively young age also supported our decision to proceed with fibrinolysis.

In a cohort study conducted by Keller et al. thrombolysis in hemodynamically unstable patients was associated with lower in-hospital mortality rates (5). While systemic fibrinolysis carries a risk of major bleeding, including intracranial hemorrhage, studies report intracranial bleeding rates between 3% and 5%. Considering the high mortality associated with high-risk PE, several publications have concluded that this bleeding risk is acceptable in selected cases (2, 18).

### Conclusion

The administration of fibrinolytic therapy in patients with high-risk PE remains a complex decision, particularly in the presence of relative contraindications. This case highlights the importance of individualized assessment and timely intervention, even when potential bleeding risks exist. We believe that, with a balanced risk–benefit analysis, fibrinolytic therapy may offer significant survival benefits in selected high-risk patients. Further studies involving larger patient cohorts are warranted to refine clinical guidelines and improve outcomes in this high-risk population.

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