

## CASE REPORT

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### A Rare cause of acute massive pulmonary embolism: Thrombi-in-transit

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#### Abstract

Although the existing guidelines do not offer a clear statement for the management of thrombus in the right heart, it is associated with worse outcomes in patients with acute massive pulmonary embolism (PE). Thrombolytic therapy has not been convincingly shown to improve mortality or reduce the frequency of recurrent thromboembolism. Therefore, thrombolysis should be considered on a case-by-case basis when the benefits are assessed by the clinician to outweigh the risk of hemorrhage. While thrombi-in-transit in the right heart increases the rate of morbidity and mortality in patients with acute massive PE, thrombolytic therapy may lead to completely recovery of thrombus in these patients. We present here a rare case of 71 years-old woman presented with acute massive PE due to thrombi-in-transit in the right heart.

**Keywords:** Pulmonary embolism, thrombi-in-transit, thrombolytic therapy

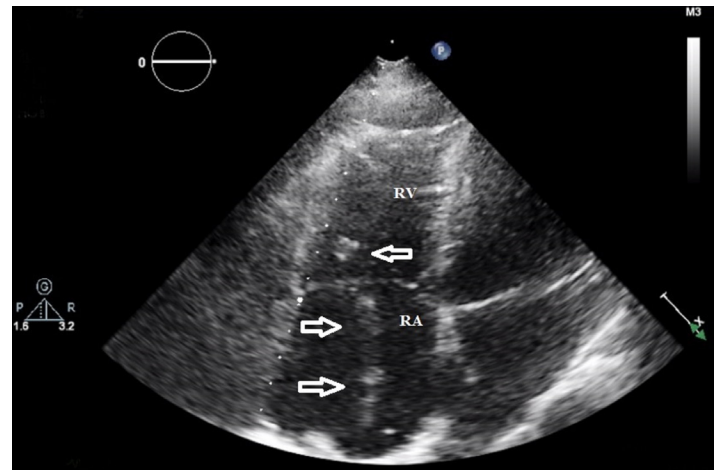
#### Introduction

Evidence from randomized and retrospective observational studies in patients with acute massive pulmonary embolism (PE) indicates that thrombolytic therapy leads to early hemodynamic improvement, but at a cost of increased major bleeding [1]. Thrombolytic therapy has not been convincingly shown to improve mortality or reduce the frequency of recurrent thromboembolism [2]. Therefore, only patients in whom the diagnosis of acute massive PE should be considered for thrombolytic therapy because of the increased mortality rate of these patients [3]. We present here a rare case of 71 years-old woman presented with acute massive PE due to thrombi-in-transit in the right heart.

#### Case Presentation

71 year-old female patient was admitted to emergency unit with severe dyspnea and chest pain for two hours. The medical history of the patient was asthma for ten years and recently diagnosed atrial fibrillation (AF). The patient was on medical treatment with bronchodilator therapy for asthma. She has not been receiving anticoagulant therapy for AF. Physical examination was normal except for tachypnea and systolic murmur on the left lower sternal border. Her heart rate was 110 beats per minute and her blood pressure was 90/55 mmHg. Arterial blood gas (ABG) showed hypocarbia (PaCO<sub>2</sub>: 30 mmHg) and hypoxia (PaO<sub>2</sub>: 75 mmHg). Pulmonary computed tomography angiography showed massive PE extending from main pulmonary trunk to right pulmonary artery.

Transthoracic echocardiography showed enlargement of the right heart, increased systolic pulmonary arterial pressure (sPAB: 75 mmHg), right ventricular dysfunction (tricuspid annular plane systolic excursion: 11 mm), thrombi-in-transit in the right atrium and right ventricle and a huge thrombi particle attaching to tricuspid valves resulting in severe tricuspid regurgitation due to coaptation defect (Figure 1,2).

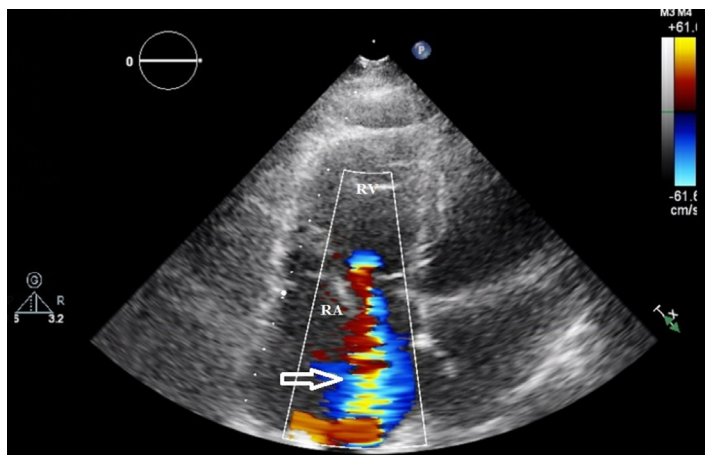


**Figure 1.** Transthoracic echocardiography shows right atrial (RA) and right ventricular (RV) enlargement, thrombi-in-transit from the RA to the RV

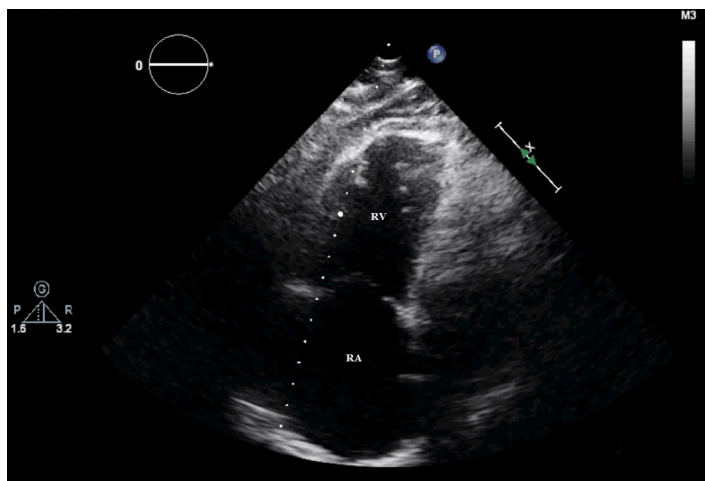
After diagnosis of acute massive PE, patient was transferred to coronary care unit for thrombolytic therapy. Tissue plasminogen activator (tPA) was administered at the rate of 50 mg/hour (total 100 mg) and then continued with unfractionated heparin for 24 hour (aPTT being above 2 times the normal value). The patient's complaints were dramatically recovered after thrombolytic therapy. Her blood pressure was 125/85 mmHg and peripheral oxygen saturation was 92% at room air. Low molecular weight heparin

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was continued for anticoagulant therapy (Enoxaparin 2x0.6 ml). After two days later, transthoracic echocardiography revealed no thrombus in right heart (Figure 3). The patient was discharged on the tenth day of admission with optimal warfarin therapy.



**Figure 2.** Transthoracic echocardiography shows a huge thrombi particle attaching to tricuspid valves resulting in severe tricuspid regurgitation due to coaptation defect



**Figure 3.** Transthoracic echocardiography shows completely recovery of thrombus in the right heart after thrombolytic therapy

## Discussion

Although the existing guidelines do not offer a clear statement for the management of right atrial thrombus, it is associated with worse outcomes in patients with acute massive PE [1]. Despite the lack of data from randomized studies, right atrial thrombi-in-transit should be considered a severe form of thromboembolic disease and it usually requires an aggressive medical treatment

[3,4]. Persistent hypotension or shock (i.e. a systolic blood pressure <90 mmHg or a decrease in the systolic blood pressure by  $\geq 40$  mmHg from baseline) due to acute PE is the widely accepted indication for systemic thrombolysis. Most guidelines also suggest catheter-directed thrombolysis as rescue therapy following failed systemic thrombolysis in centers with appropriate expertise [5]. For each patient, the indications and potential benefits must be carefully weighed against the risk of adverse events, taking into consideration the patient's values and preference. Thrombolysis should be considered on a case-by-case basis when the benefits are assessed by the clinician to outweigh the risk of hemorrhage and the patient's values and preferences have been taken into consideration. Right ventricular dysfunction, cardiopulmonary resuscitation, moderate PE (large perfusion defect on ventilation/perfusion scan or extensive embolic burden on computed tomography), severe hypoxemia and free-floating right atrial or ventricular thrombus are also important factors for indication of thrombolytic therapy [3].

## Conclusion

Although there is no evidence-based data for treatment of thrombus in the right heart, aggressive treatment is crucial in patients with acute massive PE. Although thrombi-in-transit in the right heart increases the rate of morbidity and mortality in patients with acute massive PE, thrombolytic therapy may provide to completely recovery of thrombus in these patients.

## Competing interests

*The authors declare that they have no competing interest*

## Financial Disclosure

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