Acute Right Intracardiac Thrombus-in-Transit Complicated by Submassive Pulmonary Embolism

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A 61-year-old female presented with symptoms suggestive of congestive cardiac failure that was confirmed on transthoracic echocardiography (TTE) with the absence of an intracardiac thrombus. In the hospital, she suffered episodes of syncope, prompting further investigations. Repeat TTE revealed an acute mobile right atrial thrombus, and CT imaging of the pulmonary artery confirmed the presence of a massive pulmonary embolism (PE). Despite a low pulmonary embolism severity index (PESI) score, the patient underwent surgical pulmonary embolectomy. The prevalence of right-sided thrombi ranges between 4–18% in the presence of acute PE, and right-sided thrombi will almost always lead to PE. Our case highlights the limitation of the PESI score and emphasizes urgent management for the presence of a thrombus-in-transit, despite a low PESI score.

Key words Pulmonary embolism · Intracardiac thrombus · Case report.
Cardiac Thrombus Complicated by Pulmonary Embolism

CVIA

Fig. 1. Transthoracic echocardiography. (A) Parasternal long axis and (B) short axis views showing the presence of a dilated right ventricle with septal flattening, (C) subcostal view showing dilated inferior vena cava and (D and E) modified apical 4-chamber view, focused on the right atrium and ventricle, showing a thrombus in transit.

Fig. 2. CT pulmonary angiography. (A and B) Saddle embolism in the main pulmonary artery extending into the left and right pulmonary arteries and (C and D) right atrial thrombus that measured 26 cm following surgical embolectomy.

Intra-cardiac thrombus commonly occurs in patients with congestive cardiac failure in the presence of Virchow's triad [1]. Hospitalization for heart failure remains a strong predisposing factor for venous thromboembolism [3]. Moreover, RIT often develops following the migration of deep vein thrombi into the cardiac chambers [1].

The prevalence of RIT ranges between 4–18% in the presence of acute PE, and RIT will almost always lead to PE [4]. Three distinct patterns of thrombi exist: type A (serpiginous and highly mobile), type B (rarely mobile and likely in-situ in origin), and type C (intermediate between A and B) [1]. Our case highlights the limitation of incorporating the PESI scoring system. The PESI score was developed to predict mortality and morbidity following a diagnosis of PE, and it incorporates multiple clinical criteria to categorise patients into five classes stratified by their predicted risk (class I being very low risk, and class V indicating very high risk) [3]. However, the presence of RIT is not included into the scoring system. Regardless of the PESI score, RIT should warrant emergent management. Recent guidelines have recognised the importance of RIT as an independent risk for mortality in PE (21% after 14 days to 29% after 3 months) [2,5].

The treatments for RIT include anticoagulation, thrombolytics (systemic and catheter-guided), catheter aspiration and surgical thrombectomy. In our case, we opted for emergent surgical management for two reasons: first, to circumvent the theoretical risk of thrombus fragmentation and dispersion associated with thrombolysis; and second, surgical embolectomy is associated with lower mortality rates [6].

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.
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REFERENCES
1. The European Working Group on Echocardiography; Kronik G. The European Cooperative Study on the clinical significance of right heart thrombi. Eur Heart J 1989;10:1046-1059.

2. Koć M, Kostrubiec M, Elikowski W, Meneveau N, Lankeit M, Grifoni S, et al. Outcome of patients with right heart thrombi: the Right Heart Thrombi European Registry. Eur Respir J 2016;47:869-875.

3. Konstantinides SV, Meyer G, Becattini C, Bueno H, Geersing GJ, Harjola VP, et al. 2019 ESC guidelines for the diagnosis and management of acute pulmonary embolism developed in collaboration with the European Respiratory Society (ERS). Eur Heart J 2020;41:543-603.

4. Nasrin S, Cader FA, Salahuddin M, Nazrin T, Shafi MJ. Pulmonary embolism with floating right atrial thrombus successfully treated with streptokinase: a case report. BMC Res Notes 2016;9:371.

5. Torbicki A, Galié N, Covezzoli A, Rossi E, De Rosa M, Goldhaber SZ, et al. Right heart thrombi in pulmonary embolism: results from the International Cooperative Pulmonary Embolism Registry. J Am Coll Cardiol 2003;41:2245-2251.

6. Selwanos PPS, Ahmed AO, El Bakry KM, Elsharkawy AN, Mohamed OA, Hosny H, et al. Management of a huge right atrial thrombus in a patient with multiple comorbidities. Egypt Heart J 2020;72:79.