



Visual Case Discussion

A right atrial thrombus detected by transthoracic echocardiography

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A 52-year-old woman was admitted for a second insertion of a peripherally inserted central catheter (PICC) previously accidentally removed. She had a history of primary polycythemia and she received home parenteral nutrition, through PICC, for a short bowel syndrome due to mesenteric ischemia. She denied dyspnea, cardiovascular examination revealed a normal cardiac rhythm, no murmurs, normal peripheral pulses and no edema, chest auscultation revealed no abnormalities. Patient underwent two-dimensional transthoracic echocardiography, which revealed a large, mobile, right atrial mass that intermittently traversed the tricuspid valve, protruding into the right ventricle, compatible with right heart thrombus (Figs. 1–2, Video). As the patient was asymptomatic, the therapeutic option chosen by a multidisciplinary team was the anticoagulation. Thirty hours later, the patient developed a pulmonary embolism requiring intensive care unit admission.

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Right atrial masses, often detected incidentally during imaging studies, are uncommon and can be due to many etiologies including tumors, thrombus, vegetations, normal variants and artifacts. Transesophageal echocardiogram could be a useful approach for evaluating right atrial masses, especially in identifying normal anatomic variants, and magnetic resonance could be a complementary diagnostic modality to echocardiography.

Right heart thrombi (RHT) are commonly described in patients with atrial fibrillation/flutter, prolonged central venous catheters or transvenous pacing leads,¹ rarely they have been described in association with primary polycythemia.¹ While the therapeutic options for unstable pulmonary embolism patients with right heart thrombi are thrombolytics or surgical thrombectomy,² instead the best therapeutic option,

for patients with an accidentally discovered right atrial thrombus and without pulmonary embolism, has not yet been identified.

The European Working Group on Echocardiography identified three patterns of right heart thrombi³: type A thrombi are morphologically

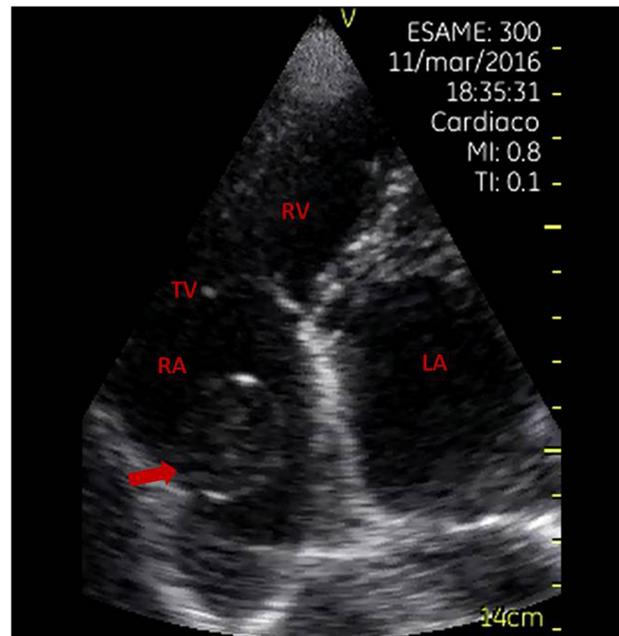


Fig. 1. A large, right atrial mass. Legend RV: right ventricle, RA: right atrium, LA: left atrium, TV: tricuspid valve.

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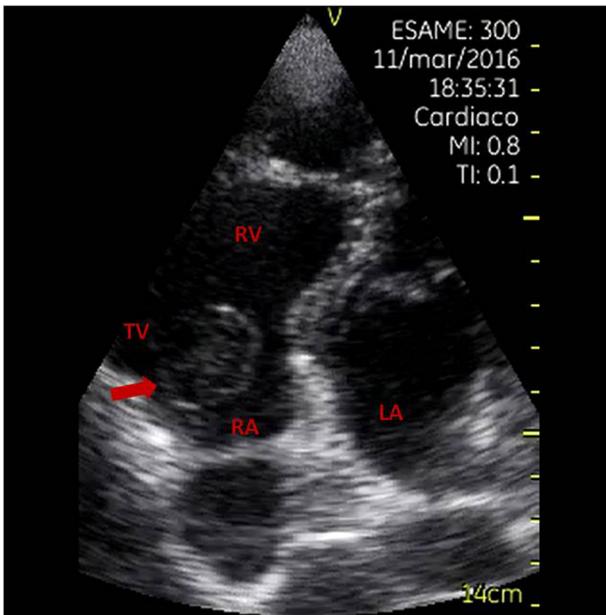


Fig. 2. The mass traversed the tricuspid valve, protruding into the right ventricle. Legend RV: right ventricle, RA: right atrium, LA: left atrium, TV: tricuspid valve.

serpiginous, highly mobile, probably originated in peripheral veins and at high risk of pulmonary embolism, type B thrombi are non-mobile showing a broad based attachment indicating that these develop within the right heart chambers probably in association with underlying cardiac abnormalities, type C thrombi are rare, share a similar appearance to a myxoma and are highly mobile.⁴

The optimal therapy, for asymptomatic patients with RHT detected incidentally, remains controversial, in fact only few cases have been described in literature. Considering that pulmonary embolism is more frequent if the thrombus is highly mobile (type A and type C thrombi) it is convincing that these patients should undergo surgical thrombectomy, while patients with immobile thrombus (type B) should undergo anticoagulation. We report a case of right atrial type C thrombus detected by *echocardiogram* in an asymptomatic patient, it represents a rare clinical entity described in literature. In conclusion, considering the morphologic characteristics of the thrombus: large size, highly mobile, probably the safest option would have been cardiac surgery.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.visj.2018.07.023.

References

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Questions

1. Which is the echocardiographic prevalence of mobile right heart thrombus in patients with pulmonary embolism?
 - a. 1%
 - b. 4%
 - c. 10%
 - d. 15%
 - e. 20%
2. Which type of right atrial thrombus is non-mobile?
 - a. Type A
 - b. Type C
 - c. Type B

Answers

1. 4%. Explanation: Analysis of a European multicentre pulmonary embolism registry involving 1135 patients with pulmonary embolism showed echocardiographic prevalence of mobile right heart thrombus to be around 4%. Reference: Torbiki A, Galie N, Covezzoli A, Rossi E, Goldhaber S. Right heart thrombi in pulmonary embolism: results from the international cooperative pulmonary embolism registry. *J Am Coll Cardiol*. 2003;41:2245–2251.
2. Type B. Explanation: Type B thrombi are non-mobile and are believed to form in situ in association with underlying cardiac abnormalities.³