Clot in Lung, Clot in Heart: A Case Report of Tumor-Like Thrombus in Right Atrium

Clinical Medicine Insights: Case Reports
Volume 10: 1–3

DOI: 10.1177/1179547617698460

Roshanak Habibi[1], Alvaro J Altamirano[2] and Shahriar Dadkhah[3]

[1]Department of Internal Medicine, Presence Saint Francis Hospital, Evanston, IL, USA.
[2]Department of Internal Medicine, Advocate Illinois Masonic Medical Center, Chicago, IL, USA.
[3]Department of Cardiology, Presence Saint Francis Hospital, Evanston, IL, USA.

ABSTRACT: Tumor-like formation of thrombus in the right atrial cavity is rare. It may be mistaken for a myxoma. The exact pathophysiology of an isolated thrombus in the heart is still unclear. Management to prevent complications such as pulmonary thromboembolism depends on the clinical judgment of a cardiologist. This report describes a 76-year-old woman with right atrial thrombus causing subsequent pulmonary thromboembolism in right lung. She initially presented to us with pulmonary embolism, and later, an incidental finding of a mass in her right atrium revealed an association of thrombus in heart with thrombus in lung. The challenging management was to resect this thrombus which was fixed to atrial septum, and a trial of anticoagulation did not resolve it. Exact management of such incidental findings in right heart cavities is not well established. Some cases may benefit from resection of such formed fixed thrombus.

KEYWORDS: Right atrial thrombi, immobile thrombus, embolism

RECEIVED: December 20, 2016. **ACCEPTED:** January 30, 2017.

PEER REVIEW: Five peer reviewers contributed to the peer review report. Reviewers' reports totaled 409 words, excluding any confidential comments to the academic editor.

TYPE: Case Report

FUNDING: The author(s) received no financial support for the research, authorship, and/or publication of this article.

DECLARATION OF CONFLICTING INTERESTS: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

CORRESPONDING AUTHOR: Roshanak Habibi, 355 Ridge Ave, Evanston, IL 60620, USA. Email: roshahabibi@gmail.com

Introduction

Tumor-like formation of thrombus in the right atrial (RA) cavity is rare. It may be mistaken for a myxoma. The exact pathophysiology of an isolated thrombus in the heart is still unclear. Management to prevent complications such as pulmonary thromboembolism depends on the clinical judgment of a cardiologist without clear-cut guidelines. This report describes a mass having the size of a grape in RA causing subsequent unprovoked pulmonary thromboembolism.

Case Presentation

A 76-year-old El Salvadorian woman presented with warfarin-associated supratherapeutic international normalized ratio (INR) from nursing home. She was on warfarin for pulmonary embolism (PE) diagnosed 3 weeks earlier after presenting with acute shortness of breath. A filling defect in the right upper lobar artery was shown on computed tomographic (CT) angiography performed at that time with a normal venous duplex ultrasound of lower extremities for deep vein thrombosis. Hence, the initial CT angiography, which was done for pulmonary emboli thrombosis, showed an intracardiac lesion, but unfortunately radiologist did not report such lesion in the heart, probably because the focus was only on lungs. On her second admission, she was found to have an INR of 9.9. She was only on Coumadin as an anticoagulant, and because of the lack of follow-up of INR in the nursing facility, she was admitted with such high number. She was otherwise asymptomatic. Her medical history was significant for permanent cardiac pacemaker insertion 4 years ago due to sick sinus syndrome. She had low risk of developing PE. Her vital signs were stable. Physical examination revealed decreased breath sounds in the lower region of her right lung. On initial investigations, she had a moderate-sized right pleural effusion with bibasilar atelectasis. Warfarin was discontinued and vitamin K was administered. The electrocardiogram revealed an atrial paced rhythm. Further workup for right-sided pleural effusion included a transthoracic echocardiography (TTE) which showed normal left ventricular function with a 2.5-cm^2 sessile mass in the RA cavity above the tricuspid valve attached to the septum (Figure 1). Patient did not have any recent TTE for comparison. Transesophageal echocardiogram was then ordered, which revealed a 2.5-cm^2 sessile mass attached to the inferolateral wall of the RA with no vegetative lesion. A pacer wire was noted traversing the tricuspid valve. Magnetic resonance imaging would be a very good next step after TTE in such patients, but as the mass was very similar to a cardiac myxoma, the surgeon and cardiologist decided to pursue with resection. The patient was scheduled for removal of the atrial mass with an impression of possible myxoma 5 days later. Because she was on anticoagulant for 3 weeks prior to the surgery and it did not affect the mass, and we initially thought it was a myxoma, we decided to proceed with the surgery soon. Her preoperative cardiac catheterization showed minimal coronary artery disease. During operation, the mass was identified near the annulus of the tricuspid valve with a small stalk and it was excised completely, including the stalk involving the endocardium of the heart (Figure 2A). Histopathologic examination revealed a smooth red-tan to dark red-tan surface. Microscopic views showed significant deposit of fibrin and proliferation of the blood vessels and fibroblasts. Focal accumulation of hemosiderin-containing histiocytes was

also noted (Figure 2B to D). Three pathologists evaluated the samples, and the mass was reported as a cardiac thrombus. They all agreed that this mass was not a myxoma because it did not have typical features of myxoma, such as hypocellularity, bland cells, collagenized capsule at periphery, with basophilic matrix, and few spindle cells.

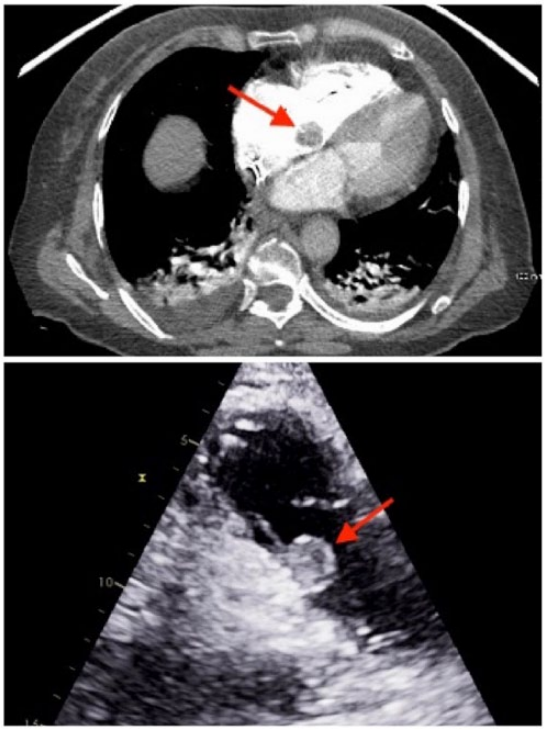

Figure 1. Computed tomographic scan of chest and 2-dimensional transthoracic echocardiographic images showing a 2.5-cm^2 sessile mass attached to the inferolateral wall of the right atrium indicated by arrow.

The patient had an uneventful hospital course. She had the thrombus in both lung and heart initially before starting any warfarin. She did not have a positive family history of thrombophilia. The only reliable tests of hypercoagulable disorder during an acute thromboembolism, such as antithrombin, protein C, and protein S, were measured which were negative. The rest of the tests were deferred to later in follow-up course. Also, a basic workup, including pan-CT scan of body cavities, was done to look for malignant lesions, which were all unremarkable. She was restarted on warfarin for at least 6 months and discharged to a rehab facility for postoperative recovery. The patient was followed up by the oncologist and her primary care physician in the 6 months with improvement of her chest imaging and resolution of PE on warfarin treatment.

Discussion

The RA mass in this patient was suspicious of myxoma, given the size, shape, and presence of a stalk. However, it did lack some classic features of myxoma: chamber location and attachment site. In 1986, Corman et al[1] reported a series of 16 RA thrombotic masses, of which 4 were relatively immobile thrombi.

Tumors of the RA are rare and tend to become large before the onset of symptoms. The imaging appearance of thrombus can sometimes be mistaken for myxoma.[2] The differentiation between the 2 is important because of the differing treatment strategies. It is often difficult to dissociate one from the other. In some cases, atrial thrombus has a stalk, misdiagnosing as myxoma, which can lead to surgical resection.[3,4]

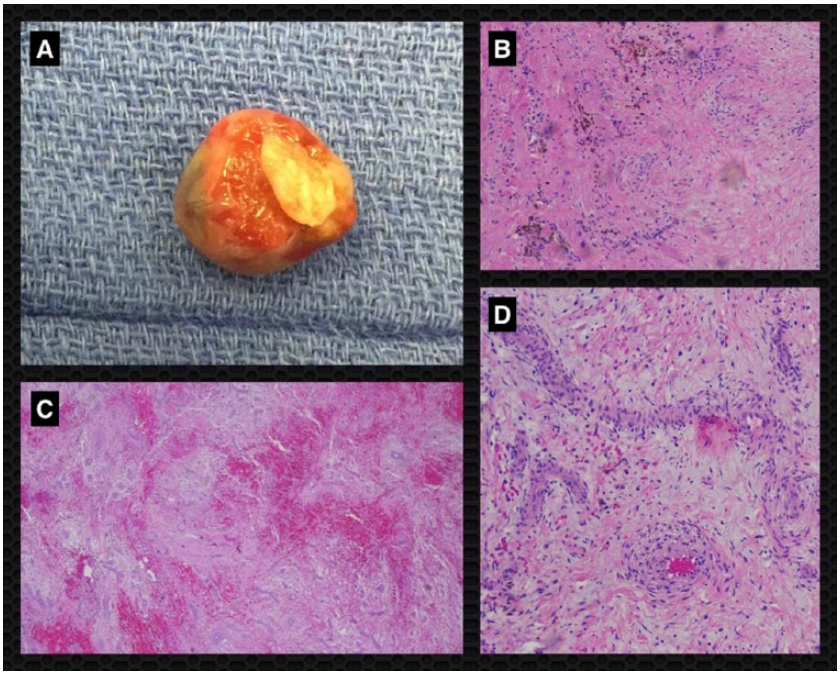

Figure 2. (A) Gross pathologic specimen of right atrium mass revealed a thrombus with a smooth red-tan to dark red-tan surface, (B) microscopic views showed focal accumulation of hemosiderin-containing histiocytes, (C) significant deposit of fibrin, and (D) proliferation of the blood vessels and fibroblasts.

Atrial thrombi are more often in the left atrium and left atrial appendage and generally accompanied by structural heart disease.[5] It can be associated with several cardiac pathologies, those of which favor blood stasis or the slackening of the blood flow. Examples include the following: acute myocardial infarction, cardiomyopathies and myocarditis, left ventricular aneurysm, valve disease and/or prosthesis, atrial fibrillation, and atrial flutter, all of which can predispose to the aggregation of thrombotic material. Our patient had no structural heart disease, and her only pertinent history was pacemaker insertion which may have caused RA damage during insertion, putting the patient at risk to develop a thrombus. Right heart thrombi can be morphologically serpiginous, highly mobile, and associated with deep vein thrombosis and PE. Hence, it is associated with a high mortality. Treatment with anticoagulants can help dissolve the thrombus.[6] Right heart thrombi can also be immobile and is believed to form in situ with underlying cardiac abnormalities. These immobile thrombi have unknown prevalence but generally result in better outcomes.[7] In this case, the thrombi had neovascularization and it clearly had a stalk that was attached to the RA septum. It did not resolve with 3 weeks of anticoagulation therapy and eventually needed resection.

There is still controversy regarding the true nature of myxoma. Some authors believe that a myxoma may originate from an organized thrombus.[8]

There are a few cases reported in literature in which a clot was formed on the pacemaker lead.[9] Our presenting patient had a pacemaker lead in the RA, but the mass origin revealed in surgery was away from the leads. It is still unclear whether an original injury to atrial septum during pacemaker insertion triggered a thrombus to be formed gradually.

This case had unusual aspects: origin in RA cavity, having a stalk, no response to anticoagulants, unprovoked right-sided PE likely originated from the RA thrombi, and formation in a heart with relatively normal structure. In conclusion, in a RA mass with stalk, differentiation between thrombus and myxoma may be difficult; hence, a trial of anticoagulation may be advised. But it may still not be resolved by anticoagulants alone and needs surgical removal. Management is based on the individual rare case scenario. Of note, this patient was diagnosed with cardiac thrombi on her second admission as an incidental finding on the echo ordered for pleural effusion; hence, it could be easily unrecognized. Unprovoked PE in this age should be evaluated carefully for an underlying structural intrathoracic pathology.

Acknowledgements

The authors thank Dr Monika Tripathi for her contribution as the hospitalist physician taking care of the patient. She allowed us to collect data and further evaluate the patient. The authors also sincerely thank Dr William Bradshaw for his guidance and encouragement in carrying out this report.

Author Contributions

RH wrote the first draft of the manuscript. AJA contributed to the writing of the manuscript. SD, RH, and AJA agree with manuscript results and conclusions. RH, AJA, and SD jointly developed the structure and arguments for the paper. RH and SD made critical revisions and approved the final version. All authors reviewed and approved the final manuscript.

Disclosure and Ethics

As a requirement of publication, authors have provided to the publisher signed confirmation of compliance with legal and ethical obligations including, but not limited to, the following: authorship and contributorship, conflicts of interest, privacy and confidentiality, and protection of human research subject. The authors have read and confirmed their agreement with the ICMJE authorship and conflict of interest criteria. The authors have also confirmed that this article is unique and not under consideration or published in any other publication, and that they have permission from rights holders to reproduce any copyrighted material. Any disclosures are made in this section. The external blind peer reviewers report no conflicts of interest. Written consent was obtained from the patient prior to disclose her information. The case report was conducted in accordance with the principles of the Declaration of Helsinki.

REFERENCES

1. Corman C, Roudat R, Gosse P, Billes MA, Besse P, Dallocchio M. Thromboses of the right atrium: echocardiographic aspects, practical management. Apropos of 8 cases. *Arch Mal Coeur Vaiss*. 1986;79:464–471.
2. Alam M, Sun I, Smith S. Transesophageal echocardiographic evaluation of right atrial mass lesions. *J Am Soc Echocardiogr*. 1991;4:331–337.
3. Hesse B, Murphy RT, Myles J, Huang J, Sabik EM. Images in cardiovascular medicine. A left atrial appendage thrombus mimicking atrial myxoma. *Circulation*. 2006;113:e456–e457.
4. Heitner JF, Klem I, Alexander K, et al. The case of the disappearing myxoma. *J Cardiovasc Magn Reson*. 2005;7:841–843.
5. Restrepo CS, Largoza A, Lemos DF, et al. MR imaging findings of benign cardiac tumors. *Curr Probl Diagn Radiol*. 2005;34:12–21.
6. Farfel Z, Schechter M, Vered Z, Rath S, Goor D, Gafni J. Review of echocardiographically diagnosed right heart entrapment of pulmonary emboli-in-transit with emphasis on management. *Am Heart J*. 1987;113:171–178.
7. Finlayson GA. Right heart thrombi: consider the cause. *Can J Cardiol*. 2008;24:888.
8. Kumar V, Abbas AK, Fausto N, Stanley L, Robbins, Ramzi S. *Robbins and Cotran Pathologic Basis of Disease*. 7th ed. Philadelphia, PA: Saunders Elsevier; 2005.
9. Rahbar AS, Azadani PN, Thatipelli S, Fleischmann KE, Nguyen N, Lee BK. Risk factors and prognosis for clot formation on cardiac device leads. *Pacing Clin Electrophysiol*. 2013;36:1294–1300.