Clinical Case Report

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A rare myxoma-like right atrial thrombus causing syncope

A case report

Yuanyuan Yang, Master[a], Zhenjie Gu, Master[b,*]

Abstract

Rationale: Syncope is a complicated clinical condition involving various diseases. Syncope due to myxoma-like right atrial thrombus is rarely seen in patient without structural heart disease.

Patient concerns: A 61-year-old ambulant old male visited our emergency department for sudden syncope.

Diagnoses: After the exclusion of neurological and coronary diseases, a right atrial block mass with a stalk connected to the atrial septum was accidentally found by echocardiography. Pulmonary embolism was subsequently revealed by computed tomographic pulmonary angiography. Atrial myxoma was initially suspected and surgical removal was conducted. Surprisingly, histological examination showed that the pedicled block mass was actually thrombus.

Interventions: The myxoma-like right atrial thrombus and the emboli in the bilateral pulmonary trunks were resected. This patient received anticoagulant treatment with warfarin for 6 months additionally.

Outcomes: The patient was successfully discharged and being continually followed.

Conclusion: This patient had a past medical history of right femoral neck fracture, which might be responsible for the formation of the myxoma-like right atrial thrombus. We should always consider echocardiography examination in syncope patient at risk of thrombus formation.

Abbreviations: ^{18}F-FDG PET = 18F-fluorodeoxyglucose positron emission tomography, CK = creatine kinase, CTPA = computed tomographic pulmonary angiography, ECG = electrocardiogram, INR = international normalized ratio, MRA = magnetic resonance angiogram, MRI = magnetic resonance image, TLOC = transient loss of consciousness.

Keywords: myxoma, right atrial thrombus, syncope

1. Introduction

Syncope is a dangerous and complicated condition involving various diseases, with a reported incidence rate as high as 41%.[1] Syncope is currently defined as transient loss of consciousness (TLOC) due to cerebral hypoperfusion according to the latest guidelines from the European Society of Cardiology and American College of Cardiology/American Heart Association/Heart Rhythm Society.[2,3] However, there are other TLOC-inducing causes such as epileptic seizures and psychogenic disorders.[2] In some cases, syncope and nonsyncope TLOC share some similar manifestations, leading to difficult differential diagnosis so that careful and comprehensive evaluation is necessary. Atrial mass is often seen in clinical practice, and its types mainly include cardiac tumor and thrombus. Myxoma is the most common primary cardiac tumor and usually originates from the left atrium.[4–6] Myxoma generally appears as a round lump with a stalk, floats randomly and may even protrude to the ventricle during cardiac cycle.[7] Atrial thrombus usually occurred in patient with structural heart disease, and lacked a stalk in most cases.[9] However, atrial thrombus sometimes displayed like myxoma in its shape. Here we presented a rare myxoma-like right atrial thrombus found in a syncope patient without structural heart disease.

2. Case report

A 61-year-old ambulant man presented to our emergency department for sudden loss of consciousness that happened and lasted for 5 minutes without convulsion and incontinence during climbing stairs. In addition, recurrent positional dizziness during the last 10 days was also reported by the patient. He had a past medical history of tuberculosis, rheumatic arthritis, and right femoral neck fracture, but no previous unconsciousness experience. Physical examination revealed no remarkable abnormalities except for the rapid heart rate of more than 100 beats per minute. Emergent electrocardiogram (ECG) was immediately performed, and showed abnormal Q wave in lead II, III, aVF, and inverted T

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Ethical approval was not needed according to the instructions of the Academic Administration Committee of Maoming People's Hospital. Informed consent was given by the patient.

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[a] Department of Respirology, [b] Department of Cardiology, Maoming People's Hospital, Maoming, China.

[*] Correspondence: Zhenjie Gu, Department of Cardiology, Maoming People's Hospital, Maoming 525000, China (e-mail: cubagu@163.com).

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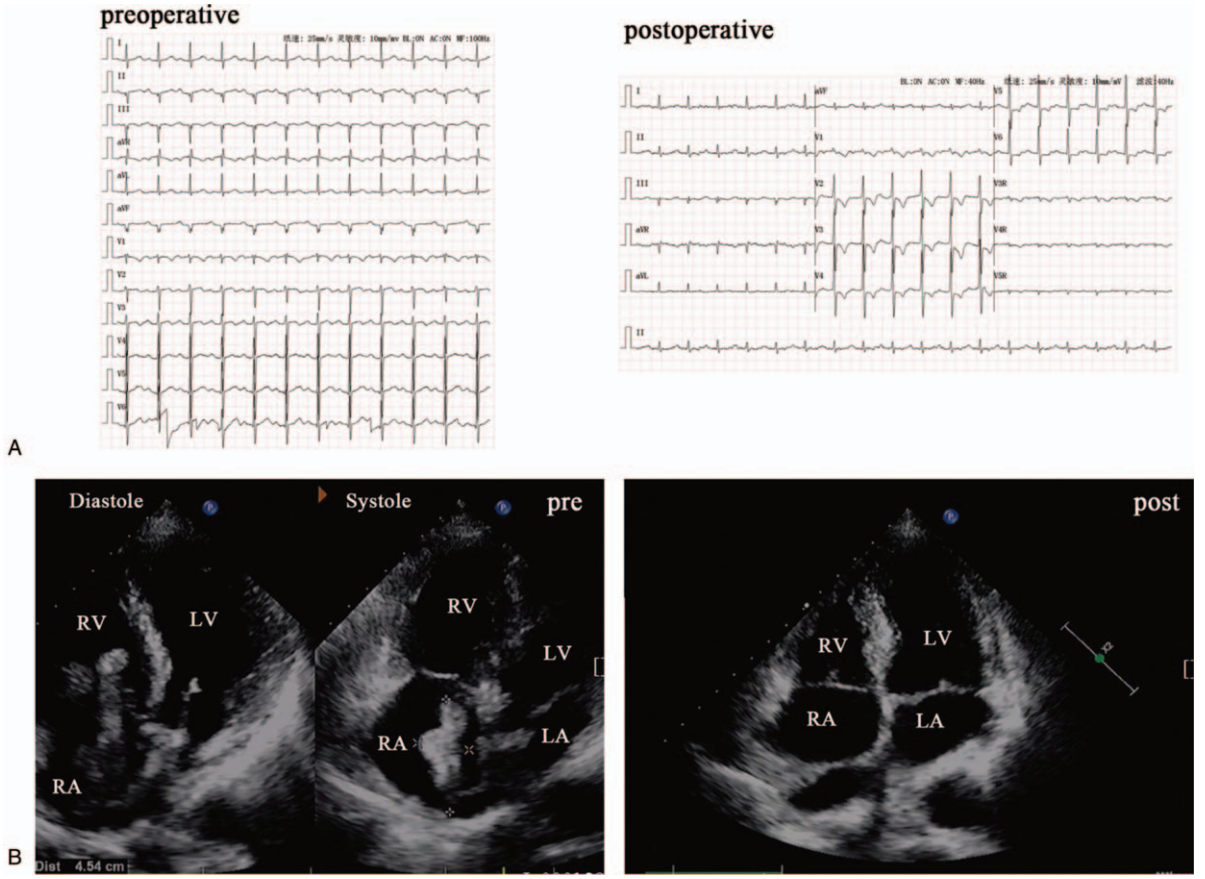

Figure 1. The comparisons of preoperative (left) and postoperative (right) electrocardiograms and echocardiography. A, Signs of right ventricle strain pattern (abnormal Q wave, T wave inversion, $S_IQ_{III}T_{III}$) were indicated in inferior and right side chest leads before operation. B, An unknown mobile block mass with a size of $45 \times 30 \times 30$ mm connected to the interatrial septum in right atrium.

wave from V1 to V3. The sign of $S_IQ_{III}T_{III}$ in the first ECG was ignored by us until pulmonary embolism was confirmed (Fig. 1). Despite the Q wave in ECG, this patient complained no chest pain and also had no chest pain experience before, which did not support acute coronary syndrome. So he was first admitted into the Department of Neurology, in which cranial magnetic resonance image (MRI), magnetic resonance angiogram (MRA), and electroencephalogram were conducted. MRI only indicated multiple lacunar infarctions, and MRA showed mild narrowing of bilateral posterior cerebral arteries. Electroencephalogram revealed no abnormality. Taken together, neurological disorders such as cerebral infarction, epileptic seizures, and transient ischemic attack were less likely. Meanwhile, along with the cranial examinations, ECG was repeatedly monitored and serum cardiac troponin I and N-terminal pro-B type natriuretic peptide (NT-proBNP) were tested. No dynamic changes were noticed in repeated ECGs; however, the level of cardiac troponin I was slightly increased. Moreover, NT-proBNP was as high as 2747.55 pg/mL. Then the patient was transferred to the Department of Cardiology in case of acute coronary syndrome. Serum cardiac markers [including creatine kinase (CK), creatine kinase-MB (CK-MB), troponin] were immediately re-examined, but no significant differences were observed. Moreover, no coronary stenosis was found by coronary computer tomographic angiography. However, routine echocardiography accidentally showed an unknown round mobile mass with a stalk connected to the atrial septum in the right atrium (Fig. 1). Moderate tricuspid regurgitation and pulmonary hypertension were also observed. Furthermore, D-dimer was found to be tremendously increased to 28,890.00 μg/L. Blood gas analysis showed the blood oxygen saturation of 97.1% and the blood oxygen pressure of 80 mm Hg. Then computed tomographic pulmonary angiography (CTPA) was performed, and revealed multiple embolisms in the bilateral pulmonary trunks plus their lower branches (Fig. 2). Thus, right atrial myxoma complicated with pulmonary embolism was initially diagnosed based on the CTPA and echocardiographic findings. This patient received surgical resection of the right atrial mass and the emboli in bilateral pulmonary trunks finally. Pathological study unexpectedly demonstrated that the nature of both lesion tissues was mixed thrombus (Fig. 2). Then anticoagulation treatment with warfarin was administered before discharge and continued for 6 months with a target international normalized ratio of 2.0 to 3.0.

3. Discussion

We presented the case of a rare right atrial pedicled thrombus with syncope as primary symptom in an old man without structural heart disease. After the exclusion of neurological and coronary causes, the syncope was probably attributed to the right heart obstruction and pulmonary thromboembolism induced by the right atrial thrombus. A pedicled right atrial thrombus was much like an atrial myxoma in its size, shape, and presence of a stalk, which was occasionally reported in the past few years.[9]

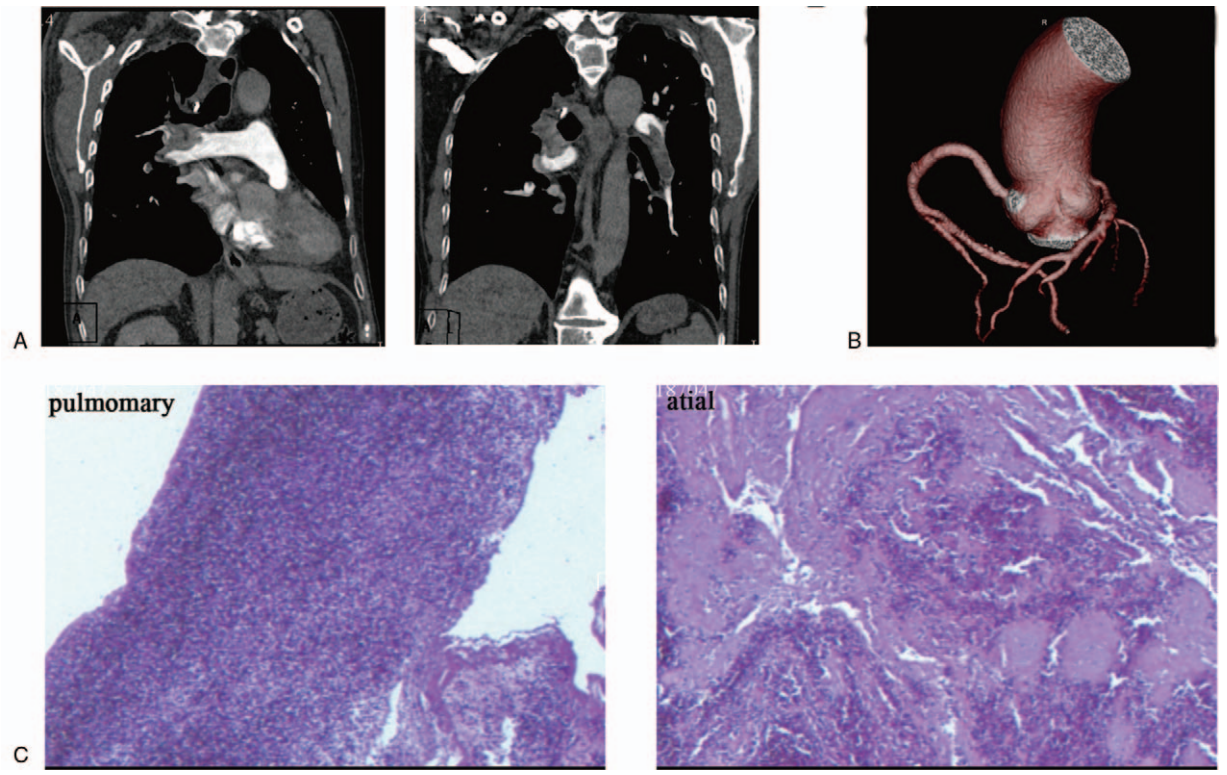

Figure 2. A, Large embolisms in bilateral pulmonary trunks in computed tomographic pulmonary angiography. B, No obvious stenosis in coronary computed tomographic angiography. C, The block masses in pulmonary artery and right atrium were both mixed thrombus.

Echocardiography is a widely accepted approach for the detection of atrial mass.[8] But the nature of atrial mass could not be identified by routine echocardiography. In addition, the incidence of right heart thrombus with similar appearance to atrial myxoma is quite low according to the study of the European Working Group on Echocardiography in 1989.[9] So, early diagnosis by imaging tests was rather difficult at present. However, a novel study by Nensa F et al tried to assess cardiac masses via integrated 18F-fluorodeoxyglucose positron emission tomography (^{18}F-FDG PET)/MR imaging. This imaging technology was found to provide morphologic characterization and visualization of mass metabolism.[10] It might help to differentiate myxoma from thrombus because vessel is theoretically absent in thrombus. Remarkably, such method is rather expensive and has not been proved by large-scale study.

Up until now, there are no established mechanisms for the formation of pedicled right atrial thrombus. Atrial thrombus usually formed under some structural cardiovascular diseases such as atrial fibrillation and valvular heart diseases, which were absent in our patient. Invasive cardiac intervention might be a possible cause since Habibi R et al reported a patient with a right atrial pacemaker lead insertion developed a similar right atrial thrombus.[11] Our patient had not received any invasive cardiac interventions before, but he did have 1 possible risk factor for thrombus formation. It was the medical history of right femoral neck fracture, which might gave rise to deep vein thrombus in lower limbs. These clots might detach from deep vein, and then be captured within the right heart.[9] Interestingly, our patient had recovered from the right femoral neck fracture for >6 months before the syncope. It's uncommon but still possible for such delayed thromboembolic episodes in ambulant discharged patient recovered from lower limb fracture, because thrombus might have been formed and persistently hidden in deep vein.[12]

In conclusion, we should always consider thromboembolism in syncope patient at risk of thrombus formation so that careful medical history collection and comprehensive evaluation are needed. Echocardiography should be a necessary screen test for syncope patient suspected of thrombotic complications. ^{18}F-FDG PET/MRI might be a feasible way to distinguish atrial thrombus from myxoma.

Author contributions

Data curation: Yuanyuan Yang.
Resources: Yuanyuan Yang, Zhenjie Gu.
Writing – original draft: Yuanyuan Yang.
Writing – review and editing: Zhenjie Gu.

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