The Heart Surgery Forum #2016-1619
19 (6), 2016 [Epub December 2016]
doi: 10.1532/hsf.1619

Online address: http://journal.hsforum.com

A Rare Case of a Pedicled Mobile Thrombus in Right Atrium

Xiaodong Li, MD,[1] Liping Chen, MD, PhD,[1] Xiumei Duan, MD, PhD,[2] Xiaocong Wang, MD[1]

[1]Department of Echocardiography, Cardiovascular Disease Center and [2]Department of Pathology, The First Hospital of Jilin University, Changchun, China

ABSTRACT

Pedicled mobile thrombus in the right atrium is an extremely rare condition. Here, we described a case of a 42-year-old male hospitalized with complaints of chest pain and hemoptysis. Computed tomographic angiography of the pulmonary artery showed signs of embolism, and thoracic echocardiography indicated a pedicled mobile cloudy echo in the right atrium, which was initially suspected to be a myxoma. However, it was confirmed to be a thrombus by histopathological examination. Postoperatively, the patient was treated with anticoagulant therapy comprising of low molecular heparin and warfarin, and the patient recovered well. Thoracic echocardiography performed 3 months after surgery ruled out any recurrence of right atrial thrombus.

INTRODUCTION

Pedicled mobile thrombus in the right atrium is an extremely rare condition that is usually associated with venous thrombosis in lower limbs, indwelling central venous catheter, placement of right heart pacemaker wire, and other disorders that cause the dysfunction of the right atrium evacuation [Cresti 2014; Fabijanić 2010]. Due to the high-risk for development of life-threatening pulmonary embolism in these patients [Bando 2015], right atrial mobile thrombus needs to be diagnosed in a timely manner and treated with anticoagulation therapy and/or surgery [Yamane 2016].

CASE REPORT

A 42-year-old male was hospitalized with complaints of chest pain and hemoptysis. His body temperature was 38.5°C, while his respiratory rate, blood pressure, and pulse rate were normal. The patient had a history of venous thrombosis in the lower limbs; there was no history of atrial fibrillation or that of a recent significant change in body weight. On chest auscultation, rough breath sounds were observed on the right side, while wet rales were audible bilaterally. Electrocardiogram showed a normal sinus rhythm.

Received June 6, 2016; accepted August 22, 2016.

Correspondence: Xiaocong Wang, MD, Department of Echocardiography, Cardiovascular Disease Center, The First Hospital of Jilin University, 71 Xinmin Street, Changchun, 130021 China; fax: 86-0431-85654528 (e-mail: wangxiaocong419@163.com).

On thoracic echocardiography, a cloudy echo was observed in the right atrium (sized 18 × 17 mm) with a clear boundary and smooth edges; the internal echo was uniform. A long pedicle was found connected to the mass with its other side attached to the opening of the inferior vena cava into the right atrium. The mass was mobile, and moved into the right ventricle through the tricuspid valve during diastole, which caused the blood flow velocity across the tricuspid valve to increase to a maximum of 98 cm/s. Color doppler flow imaging (CDFI) showed no blood flow signal within the mass (Figure 1).

Computed tomographic angiography (CTA) of the pulmonary artery showed low density shadows in the lateral arterial branches supplying the middle lobe, and in the distal arterial branches that supplied the basal segment of the lower lobe of the right lung, which was suggestive of embolism. A quasi-circular low-density filling defect (sized 24 × 23 mm) suggestive of a mass lesion was seen in the right atrium (Figure 2).

Surgical excision of the right atrial mass was performed under general anesthesia. Intraoperatively, the mass was found to be a hazel-colored quasi-circular nodule (sized 30 × 24 × 20 mm) with a smooth surface and a firm consistency. The mass was attached to the opening of the inferior vena cava through a long pedicle. The resected specimen was identified as a thrombus on histopathological examination (Figure 3). The patient recovered well from surgery, and was put on low molecular heparin for a week, followed by oral warfarin. Postoperative follow up was for 3 months, and thoracic echocardiography was performed 3 months after surgery and ruled out any recurrence of right atrial thrombus.

DISCUSSION

Pedicled mobile thrombus in the right atrium is an extremely rare condition with very few cases having been reported to date. Here, we describe a case of a 42-year-old male with a history of venous thrombosis in the lower limbs, who was hospitalized with complaints of chest pain and hemoptysis. The patient was diagnosed with pedicled mobile right atrial thrombus.

The mechanisms underlying thrombus formation are not clearly understood. Grandmougin et al postulated that a mobile thrombus in the right atrium might result from the accretion of floating micro thrombi [Grandmougin 2002]. This hypothesis appears to be consistent with the current case since the patient had a history of venous thrombosis in the lower limbs. Microthrombi in the veins of lower limbs are

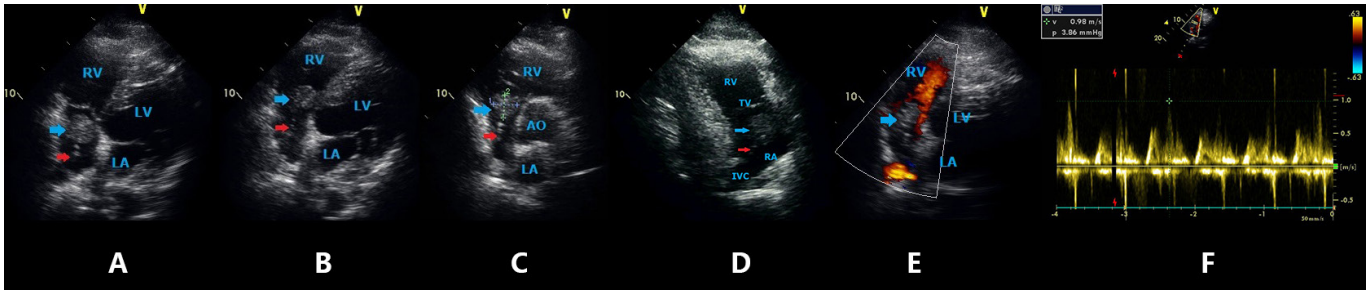

Figure 1. Echocardiography images. Parasternal four-chamber view (A, B) showing a substantial cloudy echo (blue arrow) that had a well-delineated boundary and smooth edges in the RA. Internal echo was uniform, and a long pedicle (red arrow) is connected to the mass. The mass showed a high mobility during the cardiac cycle. It was located in the RA in systole (A), and moved into the RV through the tricuspid valve in diastole (B), which caused the blood flow velocity across the tricuspid valve to increase to a maximum of 98 cm/s (F). CDFI showed no blood flow signal within the mass (E). In aortic short-axis section (C), the mass was measured 18 ×17 mm. The parasternal long axis view of the right ventricular inflow tract (D) showed one side of the pedicle (red arrows) connected to the mass (blue arrow); the other side was attached to the opening of the inferior vena cava in the RA.
LA indicates left atrium; LV, left ventricular; RA, right atrium; RV, right ventricle; AO, aortic; TV, tricuspid valve; IVC, inferior vena cava; CDFI, color doppler flow imaging. Blue arrow indicates the mass; red arrow indicates the pedicle.

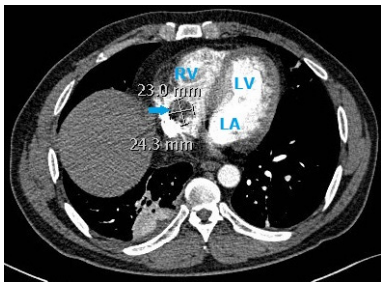

Figure 2. CTA imaging of the pulmonary artery: A quasi-circular low-density filling defect (arrow) measuring 24 × 23 mm was seen in the right atrium.

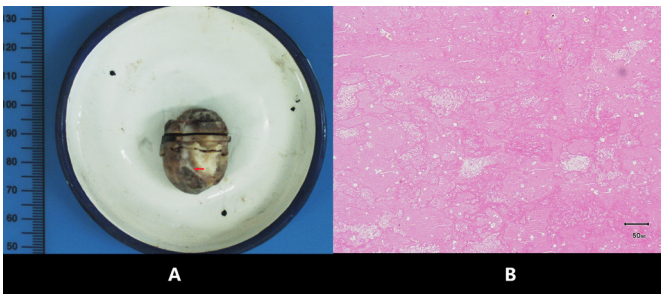

Figure 3. Pathological images: Gross specimen (A) showing a quasi-circular nodule measuring 30 × 24 × 20 mm. The mass was hazel-colored, had a smooth surface, and was of a firm consistency. A pedicle (red arrow) was attached to the mass. On histopathological examination (B), the mass was identified as a thrombus (HE staining, ×100).

liable to lodge in the right atrium, after being transported via venous circulation, gradually increasing in size and developing into a large mobile thrombus.

It is important to differentiate a mobile thrombus from benign (myxoma, papillary elastic fibroma, lipoma, and rhabdomyoma) as well as malignant tumors of the right atrium. About 15% of myxomas occur in the right atrium [Lucian 2014], and it is often difficult to distinguish between myxoma and atrial thrombus by echocardiography or CT [Scheffel 2009]. On echocardiography, myxoma appears as a dense mass with a strong echo and may exhibit a liquid dark space if the center is necrosed. Its morphology changes during the cardiac cycle, appearing round in systole, and elliptical in diastole. A pedicle connecting a myxoma with the area surrounding the foramen ovale is often present. The mass was initially suspected to be a right atrial myxoma owing to the presence of a pedicle and high mobility. However, the morphology of myxoma changes with the cardiac cycle, which is not the case with right atrial thrombus.

On two-dimensional echocardiography, papillary elastic fibroma often involves aortic valve and valvula bicuspidalis; rare cases with involvement of tricuspid valve, pulmonary valve, atrium and ventricle have been reported [Ryu 2015]. Kim et al reported a thrombus in the aortic valve that was misdiagnosed as a papillary elastic fibroma [Kim 2014]. Most malignant tumors on echocardiography appear lobulated or irregular, with an uneven internal echo. These tend to infiltrate the atrial wall and tend to have an ill-defined boundary. They are either stationary or have limited mobility, and are frequently associated with pericardial effusion [Orban 2004]. Therefore, it's of great importance to differentiate a mobile thrombus from benign and malignant tumors.

Last but not the least, the mass was initially suspected to be a myxoma, but was later confirmed to be a thrombus. Hence, diagnosis of an intraatrial mass lesion should not be based solely on the findings of echocardiography, but should also take into account other clinical findings and presence of predisposing conditions.

REFERENCES

Bando M, Yamada H, Kusunose K, et al. 2015. Pulmonary embolism due to right atrial free-floating thrombus during echocardiographic examination: a case of a pulmonary saddle thrombus. J Echocardiogr 13:145-7.

Cresti A, García-Fernández MA, Miracapillo G, et al. 2014. Frequency and significance of right atrial appendage thrombi in patients with persistent atrial fibrillation or atrial flutter. J Am Soc Echocardiogr 27:1200-7.

Fabijanić D, Rudež I, Radić M, et al. 2010. Pulmonary embolism due to the right atrial thrombus mimicking atrial myxoma. Chin Med J (Engl) 123:2483-5.

Grandmougin D, Letourneau T, Favre JP, Barral X. 2002. Paroxysmal postural dyspnea related to a left atrial ball thrombus. Ann Thorac Surg 74:1691-4.

Kim M, Kim SH, Moon SY, et al. 2014. Native aortic valve thrombosis resembling papillary fibroelastoma. J Cardiovasc Ultrasound 22:148-50.

Lucian FD, Ovidiu C, Alexandra P, et al. 2014. An unusual association: right atrial myxoma and severe left ventricular dysfunction. Case report and review of the literature. Heart Surg Forum 17:285-7.

Orban M, Tousek P, Becker I, Augustin N, Firschke C. 2004. Cardiac malignant tumor as a rare cause of acute myocardial infarction. Int J Cardiovasc Imaging 20:47-51.

Ryu SW, Beom MS, Kim SR, Kim GS. 2015. Cardiac papillary fibroelastoma. Rev Port Cardiol 34:507-8.

Scheffel H, Baumueller S, Stolzmann P, et al. 2009. Atrial myxomas and thrombi: comparison of imaging features on CT. AJR Am J Roentgenol 192:639-45.

Yamane Y, Morimoto H, Okubo S, Koshiyama H, Mukai S. 2016. Right atrial calcified ball thrombus mimicking a myxoma. Heart Lung Circ 25:21-3.