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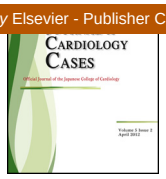

Case Report

Multimodality imaging of biatrial myxomas in an asymptomatic patient

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ABSTRACT

Myxomas are located in the left atrium in 75–80% of cases and almost always present with signs and symptoms of a thromboembolic event. Biatrial myxomas are rare, and their incidence is generally less than 2.5% of all myxomas. We herein present a case of biatrial myxomas as an incidental finding by echocardiography where the patient underwent surgery. Echocardiography continues to be the initial imaging modality for intracardiac masses. Cardiac magnetic resonance provides superior tissue characterization, particularly important in differentiating a myxoma from a thrombus. Appropriate use of these non-invasive imaging modalities may lead to a correct diagnosis and good outcome.
<**Learning objective:** In this report we present a rare case of cardiac biatrial myxomas. Multimodality imaging, especially delayed enhancement cardiac magnetic resonance imaging, provided specific findings for the diagnosis.>

Introduction

Myxomas are located in the left atrium in 75–80% of cases and almost always present with signs and symptoms of a thromboembolic event. Biatrial myxomas are rare, and their incidence is generally less than 2.5% of all myxomas. We herein present a case of biatrial myxomas as an incidental finding by echocardiography where the patient underwent surgery.

Case report

A 67-year-old man presented with a history of diabetes mellitus and cervical spondylosis. He was brought to our institution after undergoing an electrocardiograph (ECG) examination in a private hospital where a left complete bundle branch block (LBBB) was found. Because LBBB was associated with a high risk of mortality and major cardiac events [1], he was referred for a cardiac assessment including echocardiography. He was asymptomatic. His blood pressure was 124/66 mmHg and pulse rate was 64 bpm. Auscultation revealed no systolic or diastolic murmur. His abdomen was soft, non-tender, non-distended with normal bowel sounds in all four quadrants. ECG showed a normal sinus rhythm with LBBB. Chest X-ray revealed no apparent pulmonary disease, but showed a little enlarged cardiothoracic ratio. Laboratory analysis demonstrated anemia, an increased blood glucose and C-reactive protein, and an increased B-type natriuretic peptide.

Transthoracic and transesophageal echocardiogram revealed a reduced left ventricular ejection fraction (LVEF) of 40%, a diffused hypokinesis of the left ventricular wall, and a large mass occupying most of the left atrium, traversing the interatrial septum with a stalk, extending into the right atrium (Fig. 1 and Video clip 1). The left atrial mass measured 5.6 cm × 2.0 cm and the right atrial mass measured 3.6 cm × 2.3 cm. The surface of both the right and left atrial masses was irregular and appeared to be soft and fragile (Video clip 2). These masses were moving during diastole through the mitral and tricuspid valves, but there was no significant valve regurgitation. In addition, there was no spontaneous echo contrast in this patient. The lung perfusion scintigraphy using 99mTc-MAA showed that some lung defects were reported, and these findings suggested a pulmonary embolism. There was no evidence of embolism in the brain or in other organs on whole body computer tomography scan. Cardiac magnetic resonance

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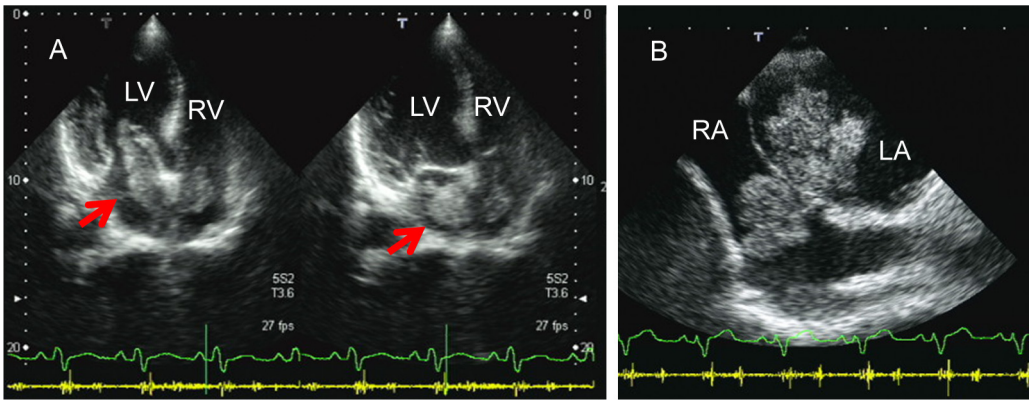

Fig. 1. Echocardiography revealed 5.6 cm × 2.0 cm and 3.6 cm × 2.3 cm mobile, echogenic masses (red arrow) with prolapse into the left ventricle during diastole. LV, left ventricle; RV, right ventricle; LA, left atrium; RA, right atrium. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

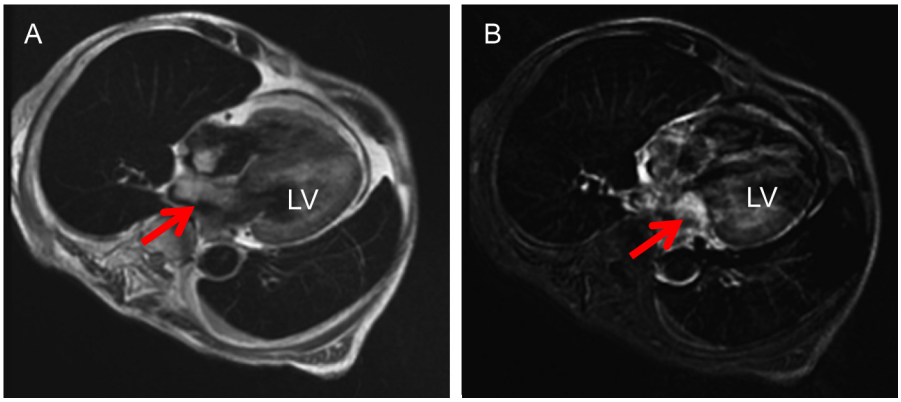

Fig. 2. Panel A: The mass was hyperintense to myocardium on T2-weighted spin-echo with fat suppression. Panel B: Areas of delayed hyper-enhancement were seen on postgadolinium contrast imaging (red arrow). LV, left ventricle. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

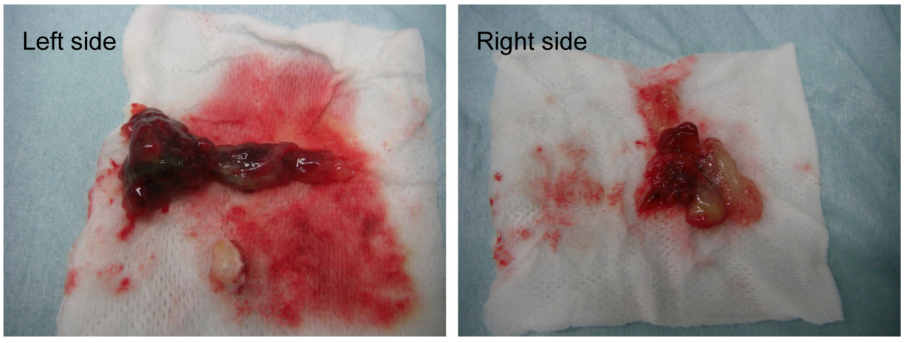

Fig. 3. Gross specimen of left and right atrial myxomas.

imaging demonstrated a hyper-enhancement using a delayed contrast enhancement imaging (Fig. 2). Cardiac catheterization revealed no significant coronary artery stenosis, and some arteries were feeding the tumor through the right coronary artery. The patient was diagnosed with nonischemic cardiomyopathy because of reduced LVEF and no coronary artery stenosis.

We diagnosed biatrial myxomas in the preoperative phase. The patient subsequently underwent cardiac surgery. We made a longitudinal right atriotomy and approach to this mass. Most of the mass was in the left atrium. The left atrial mass was attached to the upper right pulmonary vein, and the right atrial mass was attached to the atrial septum with a stalk. We found that the stalk originated from the atrial septum and pulmonary vein. The tumor was a soft and fragile mass and microscopically this mass consisted of loose myxoid stromal tissues with scattered areas of large, spindle-shaped cells. A diagnosis of biatrial cardiac myxomas was made (Fig. 3).

Discussion

Intracardiac myxoma is the most common mass of the heart. Most myxomas originate from the left atrium (60–88%), but far fewer originate from the left ventricle (8%), from the right atrium (4–28%), from the right ventricular (2.5–6.1%), and from the left and right atria (less than 2.5%) [2–4]. Echocardiography is the initial imaging modality for the assessment of intracardiac masses. Echocardiographic features of a myxoma are attachment to the

Table 1
Different findings between myxoma and thrombus by magnetic resonance imaging.

	Myxoma	Acute thrombus	Subacute thrombus	Chronic thrombus
T1 weighted	(−) – (±)	(+)	(+)	(−)
T2 weighted	(+)	(+)	(±)	(−)
Postcontrast	(+)	(−)	(−)	(−)

Hyperintense (+), isointense (±), hypointense (−).

interatrial septum with a narrow stalk, mobility, and distensibility. In addition, left atrial thrombus grows from left atrial appendages and a spontaneous echo contrast can provide useful information to differentiate a thrombus from a myxoma in many cases [5]. However, tissue heterogeneity may be variable, and differentiation of a thrombus from a myxoma is sometimes difficult. This diagnosis is important because the results of the surgical resection in cardiac myxomas are generally better than in thrombus. Cardiac magnetic resonance imaging has the advantage of superior tissue discrimination. Myxomas show iso/hypointensity in T1-weighted images and high intensity in T2-weighted images because of the extracellular fluid content. In addition, myxomas also show a delayed hyper-enhancement on the delayed enhancement image because of high vascularity. On the other hand, the intensity of thrombus in T1- and T2-weighted images changes depending on the time course, but avascular thrombus shows hypointense on the delayed enhancement image (Table 1) [6,7].

In previous reports, a biatrial myxoma was extending through the atrial septum to the other atrial side [8]. In our case, the left atrial mass attached to the upper right pulmonary vein, and the right atrial mass attached to the atrial septum. On the other hand, some studies showed that deep vein thrombi were trapped by the fossa ovalis; it is similar to an image of biatrial myxomas [9]. In addition, the lung perfusion scintigraphy showed the pulmonary embolism due to the right atrial mass and the patient had no family history of myxomas [10]. In this type of challenging cases, cardiac magnetic resonance imaging may be a useful tool to differentiate thrombus from myxoma. In our case, cardiac magnetic resonance imaging demonstrated the hyper-enhancement on the delayed contrast enhancement imaging. We diagnosed biatrial myxomas in the preoperative phase with echocardiographic and cardiac magnetic resonance assessments considered. In conclusion, an appropriate use of these non-invasive imaging modalities may lead to a correct diagnosis and good outcome.

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Conflict of interest

None declared.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at http://dx.doi.org/10.1016/j.jccase.2014.03.009.

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