Left Atrial Myxoma with a Small Secundum Atrial Septal Defect Diagnosed with Multi-Detector Computed Tomography

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Myxoma represents the most common primary tumor of the heart. However, it is rarely shown by conventional imaging tools to co-exist with other congenital anomalies. We report a 63-year-old woman with a pedunculated, mobile left atrial mass and suspected interatrial shunt on a transthoracic echocardiogram. A contrast-enhanced multi-detector computed tomography scan undoubtedly defined a small secundum atrial septal defect and a hypoattenuated left atrial mass attached to the atrial septum. These findings optimized surgical procedures to eradicate the left atrial tumor (5 × 3.2 cm), which later proved to be a myxoma, and also guided repair of the associated secundum atrial septal defect (0.75 cm). Thus, when managing patients with cardiac tumors and coexistent structural abnormalities, multi-detector computed tomography can play a decisive role in offering additional three-dimensional imaging information. This facilitates diagnosis and treatment of this otherwise easily under-diagnosed medical problem.

Key Words: Atrial septal defect • Multi-detector computed tomography • Myxoma

INTRODUCTION

Myxomas are the most common primary tumors of the heart. They typically emerge as solitary masses from the left atrial side of the interatrial septum and are always identifiable with echocardiography. However, the relatively low discriminative capability of echocardiography renders this imaging tool little able to definitely distinguish tumorous masses from mural thrombi.1 In situations when a cardiac myxoma is associated with other congenital heart diseases, a correct diagnosis is even less achievable with echocardiography alone since the bulky myxoma may obscure demonstration of the co-existing cardiac abnormality. Recently, cardiac multi-detector computed tomography (CT) has been widely used for noninvasive diagnosis of cardiovascular diseases. The high-resolution three-dimensional imaging shows a promising alternative for assessment of complex structural heart disease. Accordingly, this work describes a patient with a left atrial myxoma and a co-existent small secundum atrial septal defect (ASD) confirmed preoperatively by multi-detector CT, which clearly illustrated the anatomical characteristics of this cardiac tumor as well as the associated indistinct congenital abnormality and directed subsequent surgical curative operations.

CASE REPORT

A 63-year-old woman came to the outpatient department with progressive exertional dyspnea for over a month. Twelve-lead ECG showed atrial fibrillation and right axis deviation. Chest radiography (Figure 1) re-
revealed moderate cardiomegaly and prominent pulmonary trunk. Transthoracic echocardiography showed a hyper-echoic, heterogeneous globular mass butting the mitral valve, occupying the left atrium, and prolapsing into the left ventricle during diastole, causing mitral inflow obstruction (Figure 2A). Color flow mapping revealed a dynamic left-to-right shunt through a suspected small interatrial defect (Figure 2B). To more clearly illustrate the structural defect of the atrial septum and to differentiate this mass lesion from mural thrombi, a contrast-enhanced multi-detector CT scan (Philips Brilliance 40-channel CT system) was performed, demonstrating a 5.5 × 4 × 3.5-cm hypoattenuated left atrial mass attached to the interatrial septum (Figure 2C). A tiny (2.1 mm) secundum atrial septal defect (ASD) was also identified (Figure 2D). The 5 × 3.2 cm mass was successfully excised from the left atrium, and the 0.75 cm ASD was closed with an autologous pericardium patch (2 × 3 cm). Subsequent histological examination confirmed the diagnosis of atrial myxoma. The postoperative course passed uneventfully and the patient was discharged on the third postoperative day. The patient has returned to normal activity and remains asymptomatic as of the six-month follow-up.

DISCUSSION

Myxomas are rare yet the most common primary tumors of the heart. With an incidence of 0.28% in reported or collected autopsy series, more than 90% of cardiac myxomas present as solitary masses, in which approximately three quarters are situated in the left atrium, 18% in the right atrium, and the rest in both atria. These tumors usually arise from the fossa ovalis of the atrial septum, or less frequently from atrial free walls or appendages, and grow into the atrial chamber as polyploidy, pedunculated intracardiac masses. Wherever the myxoma originates, echocardiography remains the first choice conventional diagnostic tool to clarify the anatomical and hemodynamic characteristics of this chamber-occupying lesion. However, the diagnostic power of echocardiography is limited in that it cannot definitely discriminate myxomas from intra-cardiac mural thrombi. When left atrial myxoma is associated with an ASD, the close contact of the tumor with the atrial septum may obscure the evaluation of atrial septal integrity and render the septal defect undetectable. In this situation, magnetic resonance imaging (MRI) can be used to identify specific tissue characteristics and facilitate diagnosis of myxoma preoperatively, yet the cost for this imaging is

Figure 1. Chest radiography revealed moderate cardiomegaly and prominent pulmonary trunk.

Figure 2. (A) Transthoracic echocardiogram revealed a large heterogeneous echogenic mass (arrowhead) obstructing diastolic filling of the left ventricle. (B) Color-flow Doppler echocardiogram showed a left-to-right shunt through a secundum atrial septal defect (arrowhead). (C & D) Multi-detector CT scan revealed a large tumorous mass fills the left atrium (arrow), with a narrow base attached to the interatrial septum and a small secundum atrial septal defect (2.1 mm in diameter) lies between right atrium (RA) and left atrium (LA), with a left-to-right shunt.
much greater and the study time extended. Besides, whether this tool could clearly delineate the atrial septal boundary remains unclear. In contrast, multi-detector CT scanning covers a large imaging volume within one breath-hold duration as compared to the extended scanning time of MRI. This CT scanning may provide insight into the nature of a mass through measurement of x-ray attenuation and thereby offers more information to discriminate tumors from thrombi as well as benign from malignant tumors. In addition, characteristic features of malignant tumors such as central necrosis, local extension, or distant spreading can be identified at the same time. These advantages make multi-detector CT a promising modality with which to quickly and definitively explore the nature of an intra-cardiac mass. Moreover, an ASD as small as 2.1 mm is prone to be under-diagnosed by conventional imaging tools yet can be clearly demonstrated by multi-detector CT even in the presence a large left atrial myxoma, further implying the feasibility and reliability of multi-detector CT in offering high-resolution diagnosis of structurally complex heart disease. Thus, when encountering patients with a cardiac tumor and suspected atrial septal abnormality, multi-slice CT can facilitate diagnosis and management of this otherwise easily under-diagnosed medical problem and should be considered the imaging tool of choice.

REFERENCES