Cardiac varix in the right atrium

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Abstract

A 73-year old man underwent transthoracic and transoesophageal echocardiography and computed tomography, which revealed what appeared to be an asymptomatic primary mobile tumour located in the right atrium. During surgery, the mass was found to be associated with the right atrial septum and was subsequently resected. Histopathology of the mass revealed a cardiac varix with phleboliths. The patient had an uneventful postoperative course and no signs of recurrence at the 10-month follow-up.

Keywords: Cardiac varix • Cardiac varices • Cardiac tumour

INTRODUCTION

Cardiac varices are rare. They are endocardial, unilocular, blood-filled cysts lined by endothelial cells and filled with organizing thrombi. They are found in the right atrium and are composed of dilated, thrombosed veins [1]. They are also small, associated with the interatrial septum, and mistaken for cardiac myxoma. We herein present a case in which the diagnosis of a cardiac varix was made histologically.

CASE REPORT

A 73-year old man with a history of hypertension was evaluated by his primary care physician for frequent premature ventricular contractions on an electrocardiogram. Transthoracic echocardiography (TTE) was performed for the purpose of detecting organic heart disease, and a cardiac tumour was revealed. Two years ago, the mass had not been detected by TTE. He was admitted to our hospital for further evaluation. TTE demonstrated a mobile mass (15 × 18 mm) attached to the atrial septum in the right atrium and a very bright region suggesting partial calcification. Transoesophageal echocardiography (TEE) also demonstrated a mobile mass attached to the right atrial septum. The other heart cavities were normal. In contrast, computed tomography (CT), a low-intensity 20 × 15-mm region without enhancement and with partial calcification was present in the right atrium (Fig. 1). No feeding artery was found by coronary arterial catheterization. We evaluated it to be difficult to perform an endomyocardial biopsy because the mass in the right atrium was a small and mobile tumour.

The patient was asymptomatic, but mass excision was performed because of the enlargement of the mass in 2 years and the risks of prolapse into the right ventricle, tricuspid valve obstruction, pulmonary embolism and malignancy.

After routine median sternotomy, cardiopulmonary bypass was set up between the aorta and both venae cavae. The inferior vena cava cannula was inserted very low near to the diaphragm so as to be away from the tumour. The superior vena cava cannula was also inserted very high in the superior vena cava. After aortic cross-clamping and induction of cardiac arrest with cold crystalloid cardioplegia at 4°C, right atriotomy was performed with moderate systemic hypothermia (28–30°C). The implantation base of the tumour was located under the fossa ovalis of the heart. This ~15-mm tumour had a cystic aspect and was smooth on palpation. Resection was performed, and the implantation base was repaired using a pericardial patch. The patient was weaned from bypass with sinus rhythm.

Two resected masses measuring 5 × 10 × 15 and 15 × 15 × 15 mm were submitted for histopathological examination. The cut surfaces revealed a concentric ring structure containing brownish necrotic material (Fig. 2a). Microscopically, the section showed the atrial wall and a dilated vein with an organized thrombus. The wall showed collagenization and some vascular proliferation. The histopathological diagnosis was right atrial varices associated with phleboliths (Fig. 2b and c). The patient had an uneventful postoperative course and was discharged on the 10th postoperative day. At the 10-month follow-up, the patient was in good health and without any signs of recurrence.

DISCUSSION

Cardiac varices almost always occur in the right atrium, at or near the postero-inferior border of the limbus of the fossa ovalis, and are composed of single or multiple large, dilated venous channels often associated with intraluminal thrombi or phleboliths [2]. The incidence of heart tumours varies between 0.001...
and 0.28% [3]. Among these benign tumours, the incidence of heart varices is reportedly 0.07% [4]. They are situated in the lower part of the interatrial septum and rarely exceed 20 mm in diameter. However, in this case, a large cardiac varix (80 × 65 × 55 mm) was found in relation to the right atrial free wall, presenting as a mass compressing the right atrium [5]. Rasmussen et al. [6] reported that a cardiac varix supplied by atrial branches of both the right and left coronary arteries made it more likely that the lesion was an arteriovenous malformation rather than a venous varicosity.

The use of TTE, TEE, magnetic resonance imaging (MRI) and CT has increased the chances of finding cardiac tumours. However, even a combination of these modalities may not lead to the diagnosis of cardiac varices, and thus, the patient may be treated for a cardiac tumour commonly misdiagnosed as a myxoma. Cardiac varices are often associated with calcified phleboliths, whereas calcification of myxomas is generally infrequent [2]. In a recent series of 17 surgically excised right atrial cardiac myxomas, only 2 (12%) contained calcium histologically. In contrast, cardiac varices that arose in the right

Figure 1: (a) Contrast CT image demonstrates a spherical mass without enhancement (arrow) with partial calcification (arrowhead). (b) Mass in relation to the right atrial septum (arrow) with partial calcification (arrowhead).

Figure 2: (a) Macroscopic surface view of varices (black arrow) with a phlebolith (arrowhead). A concentric ring structure containing brownish necrotic material (grey arrow) is also seen. (b) Microscopic view of specimens removed at surgery. Dilated vein with organized thrombus (arrow). (c) The wall showed collagenization and some vascular proliferation (arrow) (Elastica van Gieson stain).
atrium were often associated with densely calcified phleboliths in 55 (84%) of the 65 reported cases [2]. In the present case, contrast cardiac CT similarly demonstrated a right atrial mass with partial calcification. Moir et al. reported a case of a large mobile varix along the right atrial septum in a 58-year old man with a history of stroke; the mass was thought to be the source of an embolism. Cardiac CT imaging demonstrated a large right atrial mass containing calcified matter [7]. Okamoto et al. reported a case of an asymptomatic cardiac varix in the right atrium in a 61-year old man. Cardiac CT imaging demonstrated a spherical mass without enhancement with partial calcification [8].

In the diagnosis for a cardiac tumour, CT and MRI were suggestive of a well-defined space-occupying lesion adjacent to the right cardiac border, suggesting the possibility of a cardiac tumour. Common characteristics of cardiac varices include (i) development of a lesion close to the posteroinferior margin of the fossa ovalis as a round mass with a smooth surface and thrombus-like phlebolith features without CT enhancement and (ii) an inner region in many cases that shows slightly high intensity on T1-weighted MRI and low intensity on T2-weighted MRI [8]. Coronary angiography is also helpful in differentiating between a cardiac varix and myxoma. In this case, it detected arterial tumour blush associated with venous filling of a varicosity [9].

Regardless of histological type, surgical excision of right atrial lesions is necessary considering the risks of prolapse into the right ventricle and tricuspid valve obstruction [2]. Because there are no reports on recurrence and long-term prognosis, close follow-up will be necessary in future.

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REFERENCES