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CASE REPORT

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THORACIC

Giant right ventricle infiltrative lipoma—a surgical success report

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Abstract

Benign primary cardiac tumours are rare, with lipomas accounting for <9% of them. Their presentation varies depending on the size and location of the tumour, with the majority of the cases being asymptomatic. We are presenting a case of an extremely rare primary heart-tumour infiltrating the right ventricle (RV) compromising its function. RV lipomas are so unusual that there are no clear treatment guidelines. In this case, we decided to treat the patient with surgical resection of the tumour. Although a total resection was not possible, due to the tumoural proximity to vital structures, a great portion of the tumour was removed, alleviating the patient's symptoms.

Keywords: Giant lipoma • Cardiac tumours • Infiltrative lipoma

INTRODUCTION

Primary heart tumours are rare (prevalence: 0.0017–0.02%) [1, 2], with benign tumours accounting for >75% [3]. Cardiac lipomas correspond to 8.4% of all benign primary cardiac tumours [2, 3], without gender or age predilection [2, 4, 5].

Although benign, cardiac lipomas can be symptomatic depending on their size and location [3, 4]; in some cases, surgical resection is necessary for symptomatic relief [2].

We are presenting the case of a patient who underwent partial resection of an infiltrative lipoma from an extremely rare location: the right ventricle (RV) [2].

CASE REPORT

A 24-year-old female with no past medical history presented with an occasional and moderate stinging chest pain. It was unrelated to physical activity, did not have any accompanying symptoms and was relieved with non-steroidal anti-inflammatories. During her initial workup, cardiomegaly was found on a chest X-ray and, followed by echocardiographic evaluation. A transthoracic echocardiogram revealed a 10.3 cm × 6.7 cm mediastinal, well-circumscribed mass compressing the right heart cavities, limiting RV filling and lowering its ejection fraction.

For further characterization of the tumour, the patient underwent magnetic resonance imaging (MRI) which showed a 10 cm × 9.1 cm × 4.7 cm intrapericardial lipoma attached to the free wall of the RV and the lateral wall of the right atrium (Fig. 1A). The mass limited the movement and compressed the free lateral wall of the RV, which ejection fraction was calculated as 38.9%.

A consensus was made with the patient for a surgical approach. The patient underwent partial epicardial tumour resection through a total median sternotomy. Upon exposure and pericardial opening, a 10 cm × 10 cm mass of fatty aspect and consistency was observed (Fig. 2A). The tumour was firmly attached to the muscular tissue (Fig. 2B) over the subepicardial area. It covered the anterior surface of the RV, extending through the outflow tract of the RV and pulmonary artery. The upper limit of the tumour reached the right atrioventricular groove, next to the inferior vena cava.

The patient was cannulated for cardiopulmonary bypass (CPB) support and two samples were taken and sent for transsurgical pathological evaluation. They were reported as benign. The final histopathological diagnosis was of encapsulated mature adipocytes, consistent with the suspected diagnosis of lipoma [2, 4, 5].

After confirming the benign origin of the tumour, a resective approach was followed. Due to its firm attachment to the heart muscular fibres, we were not able to establish a clear dissection plane. We performed a wide and zoned dissection, removing all the possible tumoural tissues avoiding injuring to myocardial fibres and coronary vessels. The adipose-tumoural tissue closer to vital structures was left in place. Nevertheless, a great portion of the tumour was resected (Fig. 2C) without additional actions. The patient was weaned off CPB and left the operating room extubated and under no vasopressor support.

Eight months after the surgery, the patient reported complete symptomatic relief. A transthoracic echocardiogram at the same time revealed an intrapericardial hyperechogenic image surrounding the free wall of the RV, consistent with the remaining

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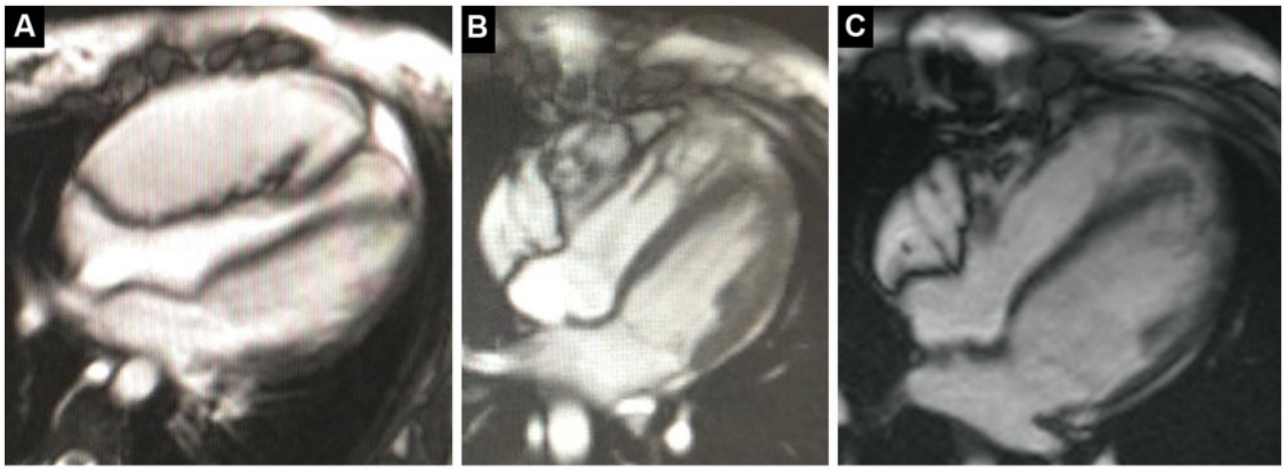

Figure 1: (**A**) Preoperative magnetic resonance imaging (MRI) showing intrapericardial lesion compressing the right ventricle suggestive of lipoma. (**B**) Postoperative MRI showing a significant size reduction of the tumour. (**C**) MRI performed 2 years after the surgery, showing no significant growth of the tumour.

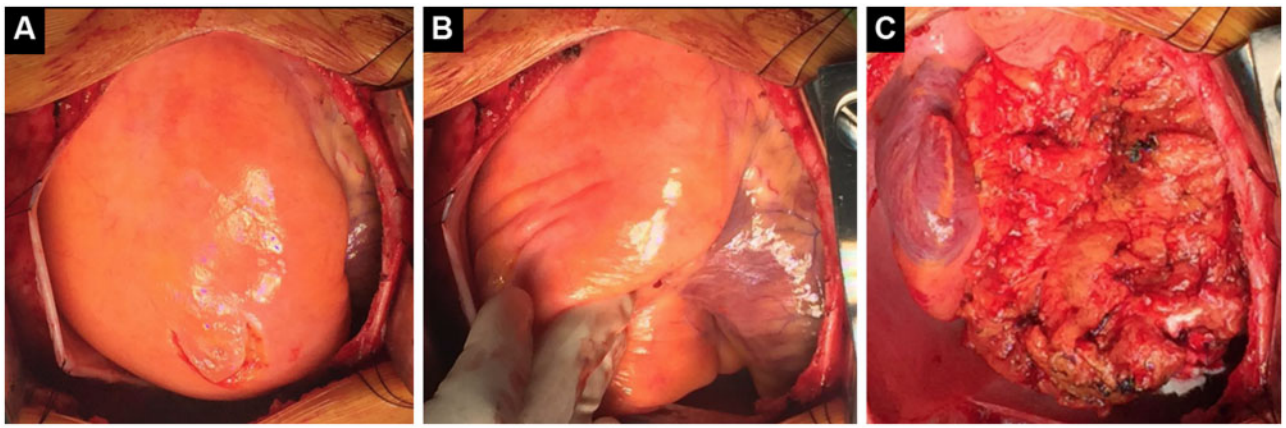

Figure 2: (**A**) Giant infiltrative cardiac lipoma. (**B**) Adipose-looking tumour firmly adhered to the muscular tissue. (**C**) Heart aspect after partial resection of the epicardial tumour.

tumoural tissue. Besides the anatomical deformity found on the RV, it had normal mobility and an ejection fraction of 56%.

Two years after the surgery, a follow-up MRI (Fig. 1C) showed a residual tumour measuring 9.8 cm × 5.6 cm × 2.5 cm. These measures, although sizable, did not show any relevant growth compared to the immediate postresection measures. The patient remains asymptomatic.

COMMENT

Lipomas can originate from any layer of the heart, having a predilection for the visceral and parietal pericardium. It can be found throughout the heart, but the most common chambers involved are the right atrium and the left ventricle [2–5]. Only a small proportion of lipomas (<5%) have been reported to originate from the RV, and from those, none exceeded 5 cm in diameter [2].

Cardiac lipomas are usually asymptomatic, and most of them are identified incidentally [1–3, 5]. Generally, they remain undetected unless local mass effect causes clinical manifestations [2–4]. Tumours with intracavitary extension can lead to outlet obstruction and symptomatic congestive heart failure [3, 5]; tumours in the myocardium can infiltrate the conduction system, causing ventricular arrhythmias; if the tumour compresses the coronary arteries or the left ventricle, the patient will suffer angina, while those in the subepicardial region can compress surrounding structures [2, 3].

Transthoracic echocardiogram offers a non-invasive approach for initial evaluation of cardiac tumours [3, 4]. It allows determining their location, size, shape and apparent texture [1]. While echocardiography findings are non-specific, lipomas are commonly described as bright, homogenous, well delimited and immobile masses [2]. However, echocardiography is not enough to differentiate between different primary cardiac tumours, highlighting the role of MRI and computerized axial tomography [3, 5].

MRI is the diagnostic modality of choice [3]: it accurately displays the location of the tumour and its relationship to the surrounding structures [2]. When compared with the myocardial tissue, lipomas show homogenous high signal intensity on T1 weighted sequences [2, 4].

Because of their low prevalence, there are no standardized clinical guidelines for the treatment of this condition. Nonetheless, it is agreed upon surgical intervention for symptomatic relief, particularly in cases of haemodynamic compromise, progressive and/or severe symptoms, or when malignancy is suspected [2–4]. Total or partial surgical excision is the main therapeutic intervention and it is associated with favourable early and long-term outcomes [2, 4].

Conflict of interest: none declared.

Reviewer information

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