

Cardiac Fibroma: Long-Term Follow-up by Cardiac Magnetic Resonance

Fibroma Cardíaco: Seguimento a Longo Prazo por Ressonância Magnética Cardíaca

Fernanda Sayuri Oshiro¹, Raul Serra Valério¹, Alfredo Augusto Eyer Rodrigues¹, Gilberto Szarf¹, Marly Uellendahl¹, Maria Eduarda Menezes de Siqueira¹

Federal University of São Paulo¹, São Paulo, Brazil

Abstract

Background: Primary cardiac neoplasms are rare, and a correct diagnosis is essential to planning the most appropriate treatment.

Objective: To demonstrate the role of cardiac magnetic resonance imaging (CMR) in the assessment, diagnosis, and follow-up of cardiac fibroma.

Case report: Female 21-year-old patient with a myocardial mass detected on echocardiogram. CMR confirmed a diagnosis of cardiac fibroma. The patient chose to be followed up, and her condition remained stable after six years.

Discussion: Cardiac fibromas are the second most common neoplasm in children and young people. On CMR, it is characterized by intense and homogeneous delayed enhancement. CMR plays an important role in the assessment of cardiac masses.

Cardiac tumors are extremely rare; however, upon clinical suspicion, the correct diagnosis is essential to planning the most appropriate treatment and management. In this context, cardiac magnetic resonance imaging (CMR) plays an important role as a noninvasive test with high-resolution images of the heart that allows for tissue characterization of the tumor, size and location assessment, and correlation with other adjacent structures. Tissue characterization of cardiac masses is performed using T1 and T2⁴ weighting techniques, fat suppression, perfusion, and delayed gadolinium enhancement, allowing the differentiation between malignant and benign tumors and sometimes indicating a suspected histological diagnosis.^{1,3,5}

The objective of this report was to present the six-year follow-up of a patient referred to the Magnetic Resonance Service of the Federal University of São Paulo (*Universidade Federal de São Paulo*) for presenting a cardiac mass and demonstrate the role of CMR in its assessment, diagnosis, and follow-up.

Introduction

Primary cardiac neoplasms are rare, with an estimated prevalence of 0.001–0.03% in autopsy studies, and may affect the endocardium, myocardium, and epicardium.¹ Secondary tumors are 20- to 40-fold more frequent than primary tumors. The diagnosis of cardiac tumors has increased in recent decades with complementary imaging methods in cardiology such as echocardiography, magnetic resonance, and tomography.²

More than 75% of primary tumors are benign¹. Myxomas (about 50% of benign tumors), papillary fibroelastomas, and lipomas are the most common in adults, with rhabdomyoma and fibroma being the most common benign tumors in children.^{2,3}

The clinical presentation varies and can mimic both cardiac and systemic diseases, which determines its inclusion as a differential diagnosis in different heart diseases. In general, the specific signs and symptoms of cardiac tumors are determined by their location in the heart rather than their histopathology.²

Case report

A 21-year-old female student born in Macapá, AP, Brazil, and living in Diadema, SP, Brazil, sought medical care in 2013 for palpitations and dyspnea on great exertion for which cardiac investigations were initiated. Initial electrocardiography and 24-hour Holter monitoring showed no significant changes. Echocardiography showed the presence of a fixed mass affecting the inferolateral and anterolateral regions from the base to the apex of the left ventricle, with regular contours, hyperechoic, heterogeneous, with calcium spots inside measuring 5.5 × 4.4 cm in cross-section.

The patient was referred for CMR for better characterization of the mass: We noted the presence of an intramyocardial mass with regular contours affecting the lateral wall and part of the anterior and inferior walls of the left ventricle measuring 7.4 × 4.0 cm in four-chamber view, hypointense in steady-state free precession sequences and T2-weighted (Figure 1) and isointense on T1-weighted sequences (Figure 2). We also noted the absence of perfusion in the first gadolinium passage (Video 1) and the presence of intense and homogeneous delayed enhancement (Figure 3). No signs of compromised left ventricular global systolic function were noted on CMR (Video 2).

Cardiac fibroma was hypothesized. The patient was followed up for six years, with no clinical worsening and no signs of changes in the cardiac mass characteristics or dimensions or functional impairment of the left ventricle on CMR. Conservative treatment and follow-up were chosen due to the patient's stable condition.

Keywords

Magnetic Resonance Imaging; Heart Neoplasms; Fibromas.

Mailing Address: Fernanda Sayuri Oshiro •

E-mail: fernanda_s_oshiro@hotmail.com

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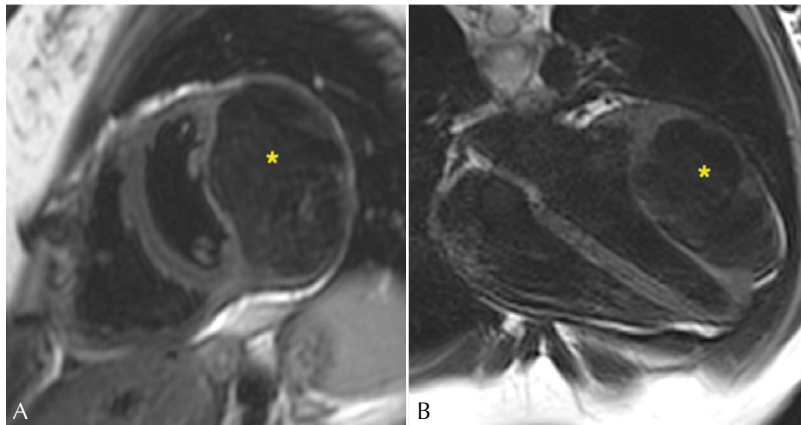


Figure 1 – Short-axis (A) and four-chamber (B) section showing a hypointense intramyocardial mass (*) on T2-weighted cardiac magnetic resonance. Follow-up images from 2016 (A) and 2020 (B).

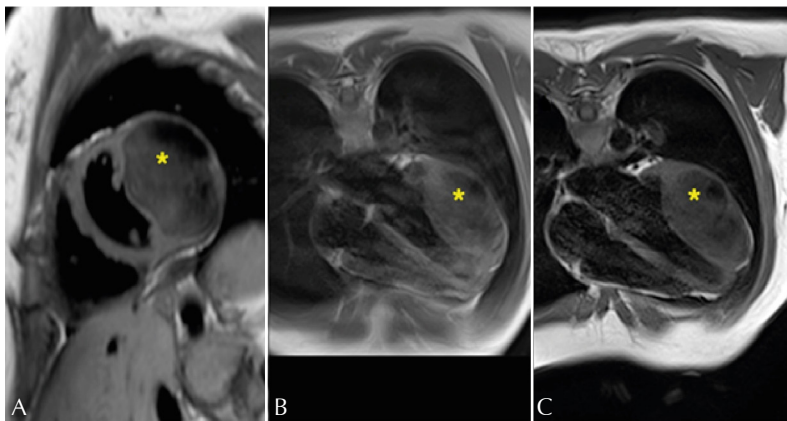


Figure 2 – Short-axis (A) and four-chamber (B-C) section showing intramyocardial mass (*) isointensity on T1-weighted cardiac magnetic resonance. Follow-up images from 2016 (A), 2018 (B), and 2020 (C).



Video 1 – Myocardial four-chamber perfusion confirming the absence of myocardial perfusion in the first gadolinium passage. Follow-up image from 2020.

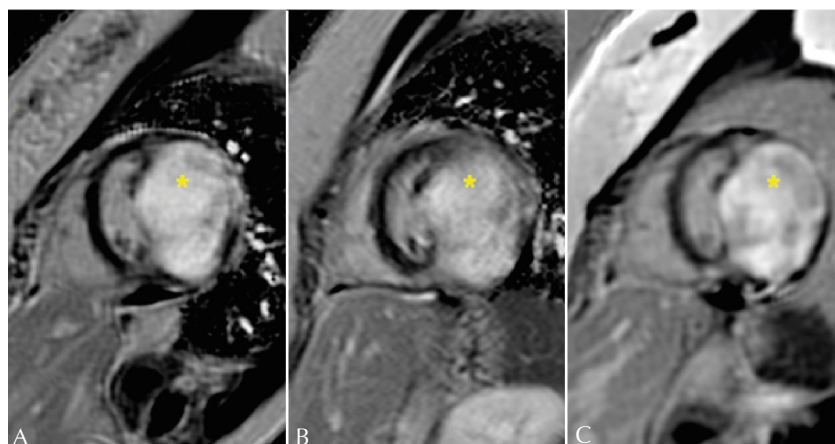
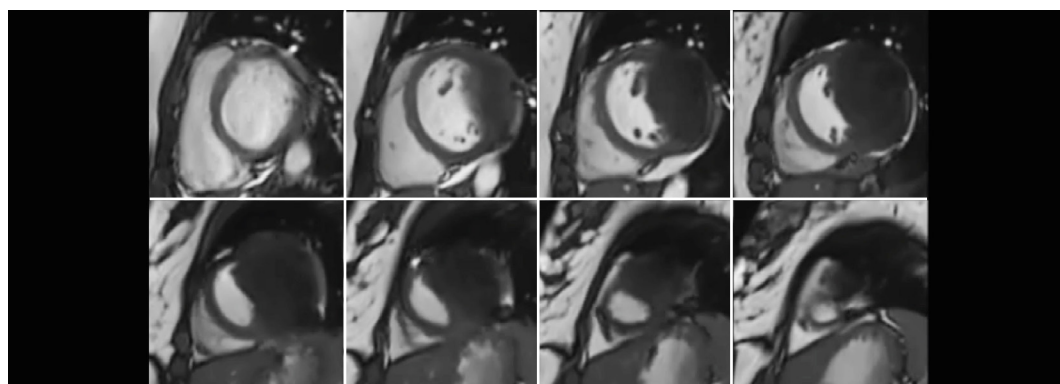


Figure 3 – Short-axis section of the left ventricle showing an intramyocardial mass (*) with an intense and homogeneous pattern after delayed gadolinium enhancement. Follow-up images from 2014 (A), 2017 (B), and 2018 (C).



Video 2 – Short-axis cine magnetic resonance imaging of the left ventricle showing an intramyocardial mass not compromising ventricular function (2020).

Discussion

Primary cardiac neoplasms are extremely rare, have different clinical and histological presentations, and require a high index of clinical suspicion.²

Cardiac fibromas, the second most common neoplasm in children and young people, also affect adults. They originate in the myocardium and, more commonly, present as a single well-defined lesion that can become quite voluminous and does not regress spontaneously.¹ It occurs more frequently in the free wall of the left ventricle, interventricular septum, and the free wall of the right ventricle (in descending order).⁶

The described symptoms of left ventricular and interventricular septal tumors are dyspnea, fatigue, syncope, atypical chest pain, conduction disturbances, ventricular arrhythmias, and sudden death.¹

On CMR, the lesion is characterized by isointensity or slight hyperintensity on T1-weighted sequences in relation to the

myocardium and hypointensity on T2-weighted sequences. It presents no perfusion at rest as it is avascular; in delayed gadolinium enhancement sequences, fibromas present intense and homogeneous enhancement related to contrast medium extravasation and retention in the large extracellular space that permeates the fibrotic tissue of the tumor. The lesion may have a low-signal central component associated with calcifications.^{1,6-8}

Symptomatic tumors must be completely resected. Very large tumors may require heart transplantation.^{9,10}

In conclusion, CMR plays an important role in the assessment of cardiac masses, contributing to a more accurate noninvasive diagnosis and therapeutic planning and enabling safe clinical follow-up with good reproducibility.^{1,5}

Authors' contribution

Data collection: Oshiro FS, Rodrigues AAE, Valério RS; Data analysis and interpretation: Oshiro FS, Rodrigues AAE,

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Valério RS; Manuscript writing: Oshiro FS; Critical review of the manuscript for intellectual content: Szarf G, Uellendahl M, Siqueira MEM.

Conflict of interest

The authors have declared that they have no conflict of interest.

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