Intramyocardial Cardiac Tumor: A Case Report

Luisa Latado,[1] *Fabio Figueiredo Costa,*[1] *Carlos Frederico Lopes Benevides,*[1] *Jorge Andion Torreão,*[2] *Adna Keyne Lima,*[3] *Adelina Sanches de Melo,*[4] *Adriana Lopes Latado*[1]

Universidade Federal da Bahia,[1] *Salvador, BA – Brazil*

Hospital Cardio Pulmonar, IDOR, Instituto D'or de Pesquisa e Ensino,[2] *Salvador, BA – Brazil*

Delfin Medicina Diagnóstica,[3] *Salvador, BA – Brazil*

Hospital Santa Izabel,[4] *Salvador, BA – Brazil*

Introduction

Primary cardiac tumors are rare entities, approximately 75% of which are benign, with myxoma as the most common type.[1,2] Only about 15% of primary cardiac tumors are malignant, predominantly sarcomas.[2] In contrast, metastatic cardiac involvement is relatively frequent and has been identified in up to 9% of patients who died from cancer.[3]

Clinical manifestations are more closely related to tumor location than to histopathological classification. They may result from embolic phenomena, intracardiac obstruction with signs of heart failure (HF), valvular involvement, myocardial invasion with alterations in contractile function and electrical conduction, and pericardial involvement with the risk of effusion and cardiac tamponade, among other presentations.[4]

The diagnostic approach is primarily based on imaging methods. Echocardiography is the initial examination of choice and may be complemented by computed tomography (CT) or cardiac magnetic resonance (CMR).[5] Positron emission tomography–CT (PET-CT) is useful for assessing the metabolic activity of the lesion, assisting in the differentiation between benign and malignant tumors, identifying metastatic cardiac involvement,[6] and defining the most appropriate site for biopsy when distant lesions are present.[7] Cardiac catheterization allows evaluation of the tumor's vascular supply.[7] In selected situations, image-guided endomyocardial biopsy based on preoperative imaging findings may contribute to therapeutic decision-making.[8]

Treatment depends fundamentally on tumor type. Surgical resection is indicated in most cases of myxomas and sarcomas. Myxomas have a low risk of recurrence after complete resection, whereas cardiac sarcomas are more frequently associated with tumor recurrence.[9,10] In the context of metastatic cardiac involvement, surgical resection is reserved for carefully selected cases.[8]

Keywords

Case Reports; Heart Neoplasms; Cardiovascular Diseases

Mailing Address: Luisa Latado •
Universidade Federal da Bahia, Faculdade de Medicina da Bahia. Avenida Reitor Miguel Calmon, s/n. Postal Code: 40110-100. Salvador, BA – Brazil
E-mail: luisa.latado@gmail.com

Manuscript received June 8, 2025, revised manuscript November 6, 2025, accepted November 16, 2025
Editor responsible for the review: Isabela Costa

DOI: https://doi.org/10.36660/abcimg.20250051i

Because of the rarity of these conditions and the diagnostic challenges often involved, clinical case reports of cardiac tumors are relevant because they highlight the role and impact of a multimodal cardiovascular imaging approach in differential diagnosis and clinical decision-making. Accordingly, this article aims to report the case of a patient with a primary intramyocardial cardiac tumor.

Case report

A 57-year-old woman, self-identified as mixed race, born and residing in the state of Bahia, Brazil, began cardiology follow-up in 2017 due to poorly characterized precordial chest pain and dyspnea on moderate exertion. Her medical history included systemic arterial hypertension, diabetes mellitus, and dyslipidemia, with no family history of neoplasms. She was on regular treatment with acetylsalicylic acid, hydrochlorothiazide, losartan, amlodipine, spironolactone, atenolol, metformin, and simvastatin. Previous laboratory tests showed isolated elevation of low-density lipoprotein cholesterol.

Electrocardiography showed sinus rhythm with nonspecific ventricular repolarization abnormalities in the inferior wall of the left ventricle. Chest radiography revealed no significant abnormalities. 24-hour Holter monitoring demonstrated sinus rhythm with preserved atrioventricular and intraventricular conduction and no relevant arrhythmias.

Initial transthoracic echocardiography revealed a left ventricular ejection fraction (LVEF) of 42% by the Simpson method, associated with inferodorsolateral akinesia and apical dyskinesia. In view of these findings, medical therapy for HF was optimized, and cardiac catheterization with hemodynamic assessment and coronary angiography was performed to exclude coronary artery disease and guide therapeutic management. The examination showed no evidence of obstructive coronary atherosclerotic disease. Serological tests for Chagas disease, viral infections, and the venereal disease research laboratory test were negative, as was the autoimmune antibody panel.

CMR and CT of the chest and abdomen were subsequently requested. CT scans showed no lymphadenopathy or findings suggestive of infiltrative or neoplastic disease. CMR performed in December 2021 demonstrated a hypointense lesion located in the mid-basal inferolateral segment of the left ventricle, measuring 5.6 × 2.7 × 2.3 cm, associated with marked edema and late gadolinium enhancement, suggestive of a tumoral lesion. The CMR findings were

compatible with a benign lesion, with fibroma considered the leading diagnostic hypothesis. Given the patient's clinical stability and an apparently unfavorable risk–benefit ratio for invasive intervention, a strategy of periodic clinical and imaging follow-up was adopted.

In May 2022, repeat CMR demonstrated growth of the intramyocardial lesion, which measured 6.0 × 5.4 × 3.2 cm (Figure 1). Evaluation by the Oncology team recommended PET-CT with fluorine-18 fluorodeoxyglucose (^{18}F-FDG) and repeat whole-body CT imaging. PET-CT performed in June 2022 showed a hypodense lesion in the inferolateral wall of the left ventricle without significant metabolic activity, of indeterminate nature, and unable to exclude fibrosis or a neoplastic process with low ^{18}F-FDG avidity (Figure 2). No suspicious extracardiac lesions were identified on CT, and serum tumor markers were within normal limits.

After further multidisciplinary discussion, the most likely diagnosis was considered to be a fibrous lesion, such as fibroma or elastoma, or alternatively a low-grade mesenchymal tumor, based on imaging findings and the indolent clinical course. Image-guided endomyocardial biopsy, which could provide a definitive diagnosis, was deemed to carry a high risk of complications by the surgical team. Therefore, a shared decision was made to continue outpatient follow-up with periodic CMR.

Subsequent CMR examinations were performed in 2022 and 2023, with the most recent study demonstrating stability of the intramyocardial mass. To date, the patient remains oligosymptomatic and continues to receive optimized medical therapy for HF.

Discussion

Based on nonspecific cardiologic complaints, the patient described in this case was diagnosed with an intramyocardial tumoral lesion. Unlike intracavitary lesions, which carry a higher risk of embolization, intramural lesions of the left ventricle tend to manifest with conduction disturbances, left ventricular dysfunction, and/or syncope.[8,11]

Initially, the patient presented with transthoracic echocardiography showing mildly decreased LVEF and akinesia in the inferodorsolateral region of the left ventricle, corresponding to the site where the tumoral lesion was later identified. Further investigation included chest CT and CMR, imaging modalities with superior soft tissue resolution that allow detailed assessment of the mediastinum and exclusion of extracardiac involvement. CT, which is more widely available than CMR, enables not only evaluation of tumor location, morphology, and margins but also identification of calcifications, a relevant feature in the differential diagnosis of cardiac neoplasms.[5,11,12]

Among the diagnostic hypotheses considered, benign cardiac tumors appeared more likely. Fibromas consist of aggregates of fibroblasts surrounded by collagen and are typically intramyocardial, most often located in the interventricular septum or the free wall of the left ventricle, without a tendency for spontaneous regression.[11,12] Although more common in the pediatric population and histologically benign, they may be associated with ventricular arrhythmias, sudden death due to involvement of the conduction system, and dyspnea resulting from ventricular cavity compression. On CMR, fibromas typically show signal intensity isointense to myocardium on T1-weighted images and hypointense and homogeneous on T2-weighted images, with minimal or absent late gadolinium enhancement. On CT, more than half of cases demonstrate areas of calcification.[12]

Fibroelastomas are rare tumors, predominantly located on the endocardial surface of the aortic and mitral valves in 80%-90% of cases, and are usually smaller than 1 cm. Although often asymptomatic, they may cause embolic events, including sudden death due to coronary embolism. On CMR, they appear as well-defined nodular lesions with signal intensity similar to that of the endocardium and may exhibit late gadolinium enhancement due to gadolinium accumulation.[13,14]

Myxomas are the most frequent primary cardiac tumors. They typically form intracavitary masses, most commonly located in the left atrium and attached to the fossa ovalis by a pedicle. They may also occur in the right atrium, particularly in children, in the atrial free wall, or on the mitral valve leaflets, although less frequently.[11] On echocardiography, myxomas usually appear as mobile, pedunculated masses attached to the endocardium. Transesophageal echocardiography may be required for better definition of the implantation site and assessment of possible extension into the pulmonary or caval veins. On CT, myxomas present as low-attenuation intracavitary masses with a smooth or slightly villous surface, with calcification observed in approximately 14% of cases. On CMR, they often display a heterogeneous appearance on T1- and T2-weighted images, reflecting their variable composition, which may include myxoid, hemorrhagic, ossified, and necrotic components.[11,15]

Lipoma is the second most common benign primary cardiac neoplasm, accounting for approximately 8%-12% of cases, and occurs predominantly in middle-aged and older adults. About half originate from the subendocardial layer, while the remainder arise from the subepicardial or myocardial layers, with growth toward the pericardial sac. Although usually asymptomatic, they may cause arrhythmias or valvular dysfunction. On echocardiography, lipomas appear as well-defined, immobile masses with a broad base and no pedicle. CT demonstrates homogeneous masses with characteristic fat attenuation, whereas on CMR they exhibit homogeneous high signal intensity on T1-weighted images, hyperintensity on T2-weighted images, and signal suppression on fat-saturation sequences.[11,16]

Other benign cardiac tumors, such as rhabdomyomas and paragangliomas, are rarer or present clinical and imaging characteristics distinct from those observed in the present case.[11]

When imaging findings suggest diffuse and nonresectable tumors, image-guided endomyocardial biopsy may contribute to therapeutic decision-making.[8] In the present case, the surgical team considered lesion excision

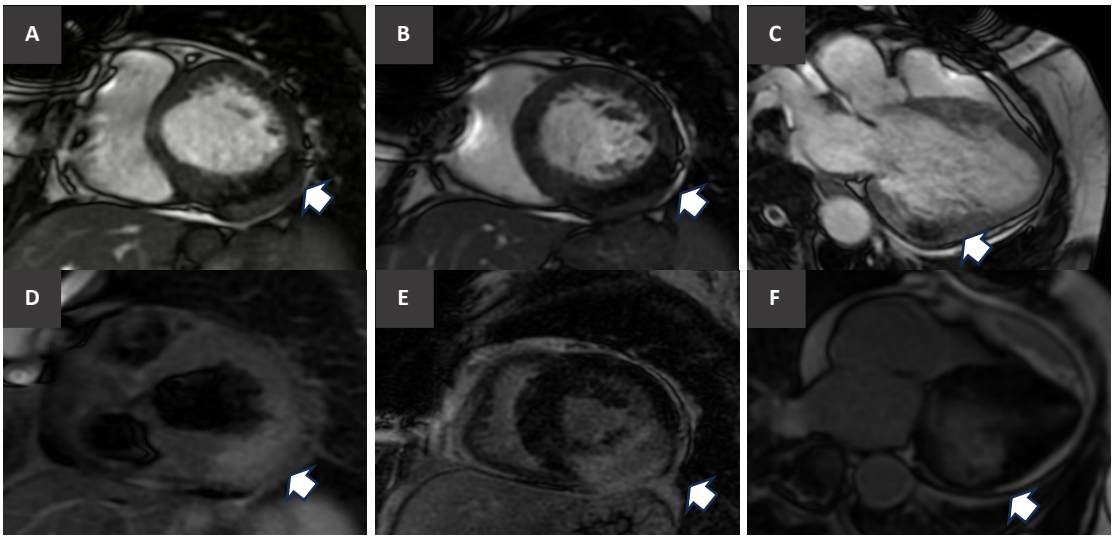

Figure 1 – *Intramyocardial lesion identified by cardiac magnetic resonance in 2022. An intramyocardial mass located in the inferior and mid-basal inferolateral walls of the left ventricle, with imaging features consistent with a low-vascularization tumor and predominantly fibrous tissue. A) Basal short-axis gradient-echo sequence showing a hypointense signal within the lesion; B) mid short-axis gradient-echo sequence demonstrating persistent hypointensity; C) three-chamber gradient-echo view depicting a hypointense lesion; D) T2-weighted sequence with fat suppression (short tau inversion recovery), demonstrating hyperintense signal; E) short-axis late gadolinium enhancement sequence showing marked delayed contrast uptake; F) four-chamber late gadolinium enhancement sequence confirming intense delayed enhancement of the lesion.*

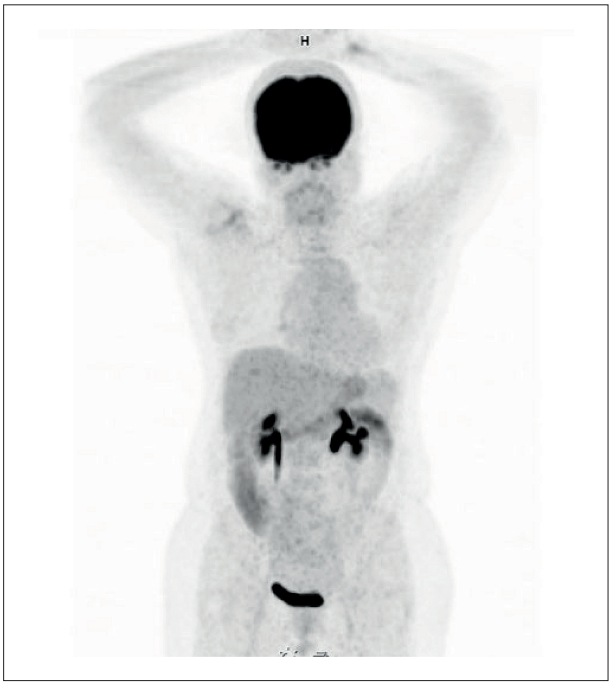

Figure 2 – *Positron emission tomography–computed tomography with fluorine-18 fluorodeoxyglucose (3D maximum intensity projection). Maximum intensity projection image demonstrating physiological distribution of the radiotracer, with no evidence of abnormal uptake in the cardiac region, as indicated by the arrow.*

technically challenging due to the absence of a well-defined cleavage plane on imaging studies. Endomyocardial biopsy was also not performed because of the tumor location, the associated higher risk of complications, and the possibility of obtaining nonrepresentative tissue samples. The combined use of imaging modalities such as CMR, PET-CT, and chest CT provides complementary information for diagnosis, therapeutic planning, and prognostic assessment, as each modality has specific limitations but, when integrated, increases diagnostic confidence.[7]

When feasible, surgical resection of cardiac tumors is recommended. However, in asymptomatic or small lesions, serial follow-up with imaging modalities may be an appropriate alternative.[7] In the present case, given the intramyocardial location, the probable benign etiology, the lack of a clear cleavage plane on imaging, and the patient's oligosymptomatic status, a strategy of outpatient clinical follow-up with periodic imaging was chosen.

Conclusion

This report describes the case of a patient with an intramyocardial cardiac tumor located in the left ventricle, who remained oligosymptomatic and was managed with a conservative approach and clinical follow-up. This case contributes to the understanding of this rare condition and highlights the inherent diagnostic and therapeutic limitations, emphasizing the importance of a multimodal imaging approach in the management of such patients.

Author Contributions

Conception and design of the research and writing of the manuscript: Latado L, Costa FF, Latado AL; acquisition of data: Latado L, Torreão JÁ, Melo AS, Latado AL, Lima AK; analysis and interpretation of the data: Latado L, Benevides CFL, Latado AL; critical revision of the manuscript for intellectual content: Latado L, Costa FF, Benevides CFL, Torreão JÁ, Melo AS, Latado AL, Lima AK.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

Sources of Funding

There were no external funding sources for this study.

Study Association

This study is not associated with any thesis or dissertation work.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of the Universidade Federal da Bahia under the protocol number 6304046. All the procedures in this study were in accordance with the 1975 Helsinki Declaration, updated in 2013. Informed consent was obtained from all participants included in the study.

Use of Artificial Intelligence

The authors did not use any artificial intelligence tools in the development of this work.

Availability of Research Data

The underlying content of the research text is contained within the manuscript.

References

1. Brasil. Ministério da Saúde. Doenças Cardiovasculares - Principal Causa de Morte no Mundo pode ser Prevenida [Internet]. Brasília: Ministério da Saúde; 2022 [cited 2025 dez 23]. Available from: https://www.gov.br/pt-br/noticias/saude-e-vigilancia-sanitaria/2022/09/doencas-cardiovasculares-principal-causa-de-morte-no-mundo-pode-ser-prevenida.
2. Tazelaar HD, Locke TJ, McGregor CG. Pathology of Surgically Excised Primary Cardiac Tumors. Mayo Clin Proc. 1992;67(10):957-65. doi: 10.1016/s0025-6196(12)60926-4.
3. Silvestri F, Bussani R, Pavletic N, Mannone T. Metastases of the Heart and Pericardium. G Ital Cardiol. 1997;27(12):1252-5.
4. Salm TJV. Unusual Primary Tumors of the Heart. Semin Thorac Cardiovasc Surg. 2000;12(2):89-100. doi: 10.1053/ct.2000.5080.
5. Araoz PA, Mulvagh SL, Tazelaar HD, Julsrud PR, Breen JF. CT and MR Imaging of Benign Primary Cardiac Neoplasms with Echocardiographic Correlation. Radiographics. 2000;20(5):1303-19. doi: 10.1148/radiographics.20.5.g00se121303.
6. García JR, Simo M, Huguet M, Ysamat M, Lomeña F. Usefulness of 18-Fluorodeoxyglucose Positron Emission Tomography in the Evaluation of Tumor Cardiac Thrombus from Renal Cell Carcinoma. Clin Transl Oncol. 2006;8(2):124-8. doi: 10.1007/s12094-006-0169-7.
7. Brandão SCS, Sobrinho JMDR, Leão EDLM, Carreira LCTF, Brito ASX. My Approach to Evaluation of Cardiac Masses Using FDG PET/CT. Arq Bras Cardiol: Imagem Cardiovasc. 2024;37(2):e20240040. doi: 10.36660/abcimg.20240040i.
8. Vander Salm TJ. Cardiac tumors [Internet]. Waltham: UpToDate; 2023 [cited 2025 Dec 23]. Available from: https://www.uptodate.com/contents/cardiac-tumors.
9. Keeling IM, Oberwalder P, Anelli-Monti M, Schuchlenz H, Demel U, Tilz GP, et al. Cardiac Myxomas: 24 Years of Experience in 49 Patients. Eur J Cardiothorac Surg. 2002;22(6):971-7. doi: 10.1016/s1010-7940(02)00592-4.
10. Ramlawi B, Leja MJ, Abu Saleh WK, Al Jabbari O, Benjamin R, Ravi V, et al. Surgical Treatment of Primary Cardiac Sarcomas: Review of a Single-Institution Experience. Ann Thorac Surg. 2016;101(2):698-702. doi: 10.1016/j.athoracsur.2015.07.087.
11. Tyebally S, Chen D, Bhattacharyya S, Mughrabi A, Hussain Z, Manisty C, et al. Cardiac Tumors: JACC CardioOncology State-of-the-Art Review. JACC CardioOncol. 2020;2(2):293-311. doi: 10.1016/j.jaccao.2020.05.009.
12. Burke AP, Rosado-de-Christenson M, Templeton PA, Virmani R. Cardiac Fibroma: Clinicopathologic Correlates and Surgical Treatment. J Thorac Cardiovasc Surg. 1994;108(5):862-70.
13. Hoey ET, Mankad K, Puppala S, Gopalan D, Sivananthan MU. MRI and CT Appearances of Cardiac Tumours in Adults. Clin Radiol. 2009;64(12):1214-30. doi: 10.1016/j.crad.2009.09.002.
14. Angeli F, Bodega F, Bergamaschi L, Armillotta M, Amicone S, Canton L, et al. Multimodality Imaging in the Diagnostic Work-Up of Patients with Cardiac Masses: JACC: CardioOncology State-of-the-Art Review. JACC CardioOncol. 2024;6(6):847-62. doi: 10.1016/j.jaccao.2024.09.006.
15. Grebenc ML, Rosado-de-Christenson ML, Green CE, Burke AP, Galvin JR. Cardiac Myxoma: Imaging Features in 83 Patients. Radiographics. 2002;22(3):673-89. doi: 10.1148/radiographics.22.3.g02ma02673.
16. Sparrow PJ, Kurian JB, Jones TR, Sivananthan MU. MR Imaging of Cardiac Tumors. Radiographics. 2005;25(5):1255-76. doi: 10.1148/rg.255045721.