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DIAGNOSTIC IMAGING OF CARDIAC MYXOMAS: A DESCRIPTIVE ANALYSIS OF IMAGING FINDINGS BASED ON PUBLISHED CASE REPORTS

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ABSTRACT: Cardiac myxoma is the most frequent primary cardiac tumor, although it is rare in the general population. Despite being benign, it can cause serious complications such as obstructions, embolic events, and sudden death. The accuracy of imaging methods is essential for diagnosis and therapeutic planning. The objective was to describe the main imaging findings used in the diagnosis of cardiac myxomas based on published case reports. This narrative review of case reports adopted a structured approach for study selection and data presentation, with previously defined inclusion and exclusion criteria, acknowledging the inherent limitations of case-based evidence. The PubMed database was searched using MeSH terms related to cardiac myxoma and imaging modalities, covering the period from 2020 to January 2025, restricted to articles with free full text. Case reports describing the use of imaging techniques in the diagnosis of cardiac myxoma were included. Data regarding imaging modality, tumor location, radiological findings, and patient characteristics were extracted and descriptively summarized. Thirty-six studies, comprising 46 case reports, were included. Transthoracic echocardiography was the most frequently used initial imaging modality, often complemented by transesophageal echocardiography, magnetic resonance imaging, and computed tomography. A predominance of myxomas located in the left atrium was observed. Cardiac magnetic resonance imaging demonstrated consistent imaging patterns that aided in differentiating myxoma from thrombus in most reported cases, particularly through the analysis of signal characteristics on T1- and T2-weighted images and gadolinium enhancement patterns. Computed tomography proved effective in detecting calcifications, supporting surgical planning, and providing detailed anatomical assessment.

Keywords: Myxoma. Diagnostic Imaging. Case Reports as Topic. Echocardiography. Tomography. Magnetic Resonance Imaging.

RESUMO: O mixoma cardíaco é o tumor cardíaco primário mais frequente, embora raro na população geral. Apesar de ser benigno, pode causar complicações graves, como obstruções, eventos embólicos e morte súbita. A acurácia dos métodos de imagem é essencial para o diagnóstico e o planejamento terapêutico. O objetivo foi descrever os principais achados de imagem utilizados no diagnóstico de mixomas cardíacos com base em relatos de casos publicados, baseando-se em uma revisão narrativa de relatos de caso adotou uma abordagem estruturada para a seleção dos estudos e apresentação dos dados, com critérios de inclusão e exclusão previamente definidos, reconhecendo-se as limitações inerentes às evidências baseadas em casos. A base de dados PubMed foi pesquisada utilizando termos MeSH relacionados ao mixoma cardíaco e às modalidades de imagem, abrangendo o período de 2020 a janeiro de 2025, restrito a artigos com texto completo gratuito. Foram incluídos relatos de caso que descreviam o uso de técnicas de imagem no diagnóstico do mixoma cardíaco. Dados referentes à modalidade de imagem, localização tumoral, achados radiológicos e características dos pacientes foram extraídos e sumarizados de forma descritiva. Trinta e seis estudos, compreendendo 46 relatos de caso, foram incluídos. A ecocardiografia transtorácica foi a modalidade de imagem inicial mais frequentemente utilizada, muitas vezes complementada pela ecocardiografia transesofágica, ressonância magnética e tomografia computadorizada. Observou-se predominância de mixomas localizados no átrio esquerdo. A ressonância magnética cardíaca demonstrou padrões de imagem consistentes que auxiliaram na diferenciação entre mixoma e trombo na maioria dos casos relatados, especialmente por meio da análise do sinal em imagens ponderadas em T1 e T2 e dos padrões de realce por gadolínio. A tomografia computadorizada mostrou-se eficaz na detecção de calcificações, no apoio ao planejamento cirúrgico e na avaliação anatômica detalhada.

Palavras-chave: Mixoma. Diagnóstico por imagem. Relatos de casos. Ecocardiografia. Tomografia. Ressonância magnética.

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1.INTRODUCTION

Primary cardiac tumors are rare in clinical practice, with an estimated incidence ranging from 0.001% to 0.03% in the general population. Among these, cardiac myxoma (CM) is the most prevalent type, accounting for approximately 30% to 50% of primary cardiac neoplasms (Uchime et al., 2023). Although benign, CM can cause potentially fatal clinical events such as heart failure, arrhythmias, systemic embolism, and even sudden death (Hădăreanu et al., 2023; Antoniak et al., 2023).

The clinical presentation of CM is variable and can be classified into three main syndromes: obstructive, embolic, and constitutional. Symptoms such as dyspnea, syncope, and heart failure result from obstruction of intracardiac blood flow. Embolic events, though less frequent, include stroke and peripheral embolisms. Constitutional symptoms, such as fever, fatigue, and weight loss, are attributed to the production of inflammatory cytokines by the tumor (Tsagkridi et al., 2022; Hădăreanu et al., 2023).

Accurate diagnosis fundamentally depends on imaging methods. Transthoracic echocardiography (TTE) is usually the initial examination due to its wide availability and sensitivity. Transesophageal echocardiography (TEE) offers better anatomical definition, especially for small masses or those located on the septum (Balahura et al., 2020). Cardiac magnetic resonance imaging (MRI) and computed tomography (CT) are complementary methods that provide detailed information about tissue composition, vascularization, calcifications, and lesion extent (Antoniak et al., 2023; Kassop et al., 2014).

The correct differentiation between CM and intracardiac thrombus is a diagnostic challenge. MRI, particularly with prolonged inversion time sequences, is effective in this distinction, although exceptions have been reported in the literature where CM with necrotic areas or organized thrombi may present atypical patterns (Rana et al., 2024)

Given the rarity of CM and the diversity of clinical and radiological presentations, this study aims to analyze, through a narrative review, the main imaging findings in the diagnosis of this neoplasm, seeking to understand how these tools contribute to current clinical practice.

2. METHODS

2.1. SEARCH STRATEGY

This narrative review of case reports adopted a structured approach for study selection and data reporting, with predefined inclusion and exclusion criteria, while acknowledging the

inherent limitations of case-based evidence. The literature search was performed using the PubMed database, employing the following Medical Subject Headings (MeSH): "Myxoma"[MeSH] AND ("Magnetic Resonance Imaging"[MeSH] OR "Tomography, X-Ray Computed"[MeSH] OR "Echocardiography"[MeSH]). The following filters were applied: Publication period: January 2020 to January 2025; Availability: Free full text; Language: English or Portuguese.

2.2. ELIGIBILITY CRITERIA

The inclusion criteria were: original studies and case reports that addressed the use of magnetic resonance imaging, computed tomography, or echocardiography in the diagnosis of cardiac myxoma. Only freely accessible articles published within the defined time frame were included.

2.3. EXCLUSION CRITERIA

Studies focusing on angiomyxoma or other cardiac or non-cardiac conditions associated with neoplasms not related to myxoma; Articles published in languages other than English or Portuguese.

The initial search yielded 76 records. Titles and abstracts were screened, followed by full-text assessment according to the inclusion and exclusion criteria.

Study selection and data extraction were performed by a single reviewer due to the narrative nature of the study and its focus on imaging characterization.

2.4. ADDITIONAL LITERATURE

In addition to the case reports selected through the strategy and documented in the flow diagram, supplementary references were used exclusively to support and contextualize the discussion section. These sources were not included in the analytical dataset and did not influence the extraction or synthesis of results.

2.5. LIMITATIONS

This review is limited by its reliance on case reports and its restriction to articles indexed in PubMed with free full-text availability, potentially introducing selection and availability bias. The narrative nature of the data precludes robust statistical analysis and limits

the generalizability of the findings. Variability in reporting, imaging protocols, and diagnostic criteria across cases further contributes to heterogeneity and restricts the strength of conclusions.

3. RESULTS

A total of 46 case reports from 36 articles were selected, describing patients diagnosed with cardiac myxoma using different imaging methods. The main information extracted from these reports is summarized (Table 1), including author, sex, age, imaging technique(s) employed, radiological findings, and confirmed diagnosis.

It was observed that transthoracic echocardiography (TTE) was the initial method in most cases, frequently complemented by transesophageal echocardiography (TEE), MRI, and CT. Specific cases also utilized positron emission tomography/computed tomography (PET/CT).

Reference	Radiological Finding	Imaging technique(s)	Sex and age	Confirmed diagnosis
Uchime et al., 2023	Mass in the LA attached to the IAS; hypodense mass with minimal enhancement, 5.8×3.5×4.3 cm.	TTE; CT.	Woman, 68 years old.	AM.
Hădăreanu et al., 2023	Non-homogeneous intracardiac mass in the LV, with irregular margins, attached to the posterior mitral valve and posterior LV wall.	TTE.	Woman, 65 years old.	LVM.
Antoniak et al., 2023	Sessile mass in the LA, measuring 35×45 mm, attached to the IAS, with calcifications and blood flow on Doppler; Slightly hypodense lesion with calcifications, contrast flow from branches of the left circumflex artery into the center of the mass and possible fistula with the LA; Non-homogeneous mass, hypo- to isointense on T1, hyperintense with hypointense foci on T2; Perfusion showing central arterial flow; Mild and heterogeneous late enhancement.	TTE and TEE; CT; Cardiac MRI.	Man, 60 years old.	CM with intratumoral fistula between circumflex artery branches and the LA.
Tsagkridi et al., 2022	Mass in the LA, 7.0×2.7 cm, with irregular borders, attached to the fossa ovalis, prolapsing through the mitral valve and obstructing the mitral annulus. Large mass in LA prolapsing through the mitral annulus, high signal intensity on T2 with fat suppression, and slight irregular gadolinium enhancement.	TTE; Cardiac MRI.	Woman, about 30 years old.	LAM.

Balahura et al., 2020	Sessile, mobile, oval mass, 42×18 mm, attached to the anterior wall of the RV, intermittently protruding into the RV outflow tract, causing mild stenosis; inability to differentiate thrombus from cardiac tumor; RV mass with attenuation lower than myocardium; ovoid mass, 47×16 mm, in the RV outflow tract, attached to apical trabeculae, mobile during the cardiac cycle, T1 isointense and hypointense with contrast.	TEE; TTE; CT; Cardiac MRI.	Woman, 66 years old.	RVM.
Rana et al., 2024	Mobile echodense mass in the LA; mass and late gadolinium enhancement with long inversion time (TI 600) showed no enhancement, suggestive of thrombus.	TTE; MRI.	Man, 51 years old.	CM with hemosiderin deposits
Siddiqui et al., 2024	Mobile echogenic mass, 30×24 mm, on the anterolateral commissure of the mitral valve; mild enlargement of the LA (4.4 cm).	TTE.	Man, 75 years old.	LAM.
Yin et al., 2024. (Case 1)	Hyperechogenic mass in the LA with minimal mobility; multiple short, nodular hyperechogenic lesions within the mass in the LA, with distal acoustic shadowing; mass with limited vascularization; heterogeneous mass enhanced in the LA.	TTE; TEE; cTTE; CTPA.	Woman, 47 years old.	LAM with partial ossification.
Yin et al., 2024. (Case 2)	Heterogeneous and echogenic mass in the RA, pedunculated, attached to the IAS by a stalk, mobile, with a band-like hyperechogenic area and broad acoustic shadowing; heterogeneous mass in the RA with arc-shaped hyperechogenic foci, distal acoustic shadowing, stalk between the atrial appendage and superior vena cava.	TTE; TEE.	Man, 35 years old.	RAM with extensive calcification.
Horita et al., 2024	Abnormal mass in the LA; mass in the LA; mobile mass in the LA, attached to the IAS; mass in the IAS and mobile.	TEE; CT; TTE	Man, 84 years old.	LAM.
Munirathinam, 2022	Heterogeneous mass in the LA, 2×2 cm, attached to the IAS; heterogeneous mass in the LA, originating from the junction of the IAS with the base of the anterior mitral leaflet, and another heterogeneous echogenic mass, 1×1 cm, attached to the RA wall.	TTE; TEE.	Man, 17 years old.	Recurrent BAM.
Sakakibara, 2024	Tumor measuring 20×33 mm in the LA floating into the LV; left atrial tumor attached to the anterior mitral	TTE, TEE; Cardiac CT.	Woman, 80 years old.	LAM (originating from the posterior wall of the LA).

	leaflet; left atrial tumor attached to the posterior wall of the LA, near the coronary sinus.			
Osipenko et al., 2024	Mass measuring 46×37×30 mm in the RA, extending into the tricuspid valve and RV.	Cardiac MRI and TEE.	Woman, 52 years old.	RVM.
Tomlinson et al., 2020	Large mass in the RA (68%), mobile, originating from the IAS; right atrial mass adherent to the IAS with no significant contrast uptake or clear indication of pedicle insertion; low FDG-18F uptake.	TTE; CTPA; PET/CT.	Man, 85 years old.	AM.
Meter, 2024	Oval mass measuring 45×35 mm in the RV outflow tract with prolapse into the pulmonary valve; mass attached to the IAS, T1 isointense and T2 hyperintense after gadolinium.	TTE, Cardiac MRI.	Woman, 39 years old.	CM.
Theodoropoulos et al., 2021	Mass in the LA attached to the IAS; immobile, broad-based mass measuring 33×30×23 mm, attached to the left side of the IAS, with no pedicle identified.	TTE; Cardiac MRI.	Woman, 64 years old.	AM.
Shrestha et al., 2023	Myxoma in the LA, 2.5×1.5 cm, attached to the fossa ovalis; severe mitral calcification in a mobile 1.3 cm mass in the posterior chordae; mass in the LA, attached to the fossa ovalis, with a lobulated appearance; mass in the LA, ~2 cm, fixed to the IAS by a narrow base, with defined location, indeterminate T1 intensity, and signal ranging from hypo- to hyperintense in T2.	TTE; TEE; Cardiac MRI.	Woman, 67 years old.	LAM.
Rajic et al., 2022	Cardiac tumor in the RA, 72×45 mm, spreading through a patent foramen ovale into the LA (15×15 mm); biatrial tumor, attached to the IAS by a stalk, mobile.	CT; TTE.	Man, 37 years old.	True BAM.
Karagöz et al., 2021	Mass attached to the basal free wall and the anterior leaflet of the tricuspid valve; heterogeneous, mobile mass, 6.57×3.33 cm.	TTE; Cardiac MRI.	Man, 26 years old.	Recurrent RVM.
Lee et al., 2023	Barrel-shaped mass in the LA, double-lobed, with a central echolucent area measuring 5.8×2.7 cm, attached to the IAS by a thick echogenic base.	TTE.	Woman, 63 years old.	CM.
Hamdan, 2023	Spheroid mass in the RA, 86×63 mm, with smooth borders; RA mass, 9.3 cm in diameter, smooth borders, microcalcifications, without tissue invasion.	TTE; CT.	Man, 77 years old.	CM.
Ak, 2024	Mass in the LA connected to the IAS; hypodense mass measuring 5×3×1.5 cm in the LA, prolapsing into	CT; TTE; PET-CT; Cardiac MRI.	Woman, 46 years old.	LAM.

	the LV; insignificant FDG uptake; well-defined tumor lesion, 4×2 cm, in the LA, extending toward the IAS.			
Wang et al., 2025. (Case 1)	Striated mass in the RV; RV filling defect.	TTE; CT.	Man, 51 years old.	Thrombosis.
Wang et al., 2025. (Case 2)	Isoechoic mass in the RA, 15.36×17.45 mm; round filling defect in the RA.	TTE; CT.	Woman, 39 years old.	RA thrombosis.
Wang et al., 2025. (Case 3)	Heterogeneous echogenic mass on the RV free wall; rounded hypodense shadows, arc-shaped calcification.	TTE; CT.	Man, 67 years old.	RVM.
Ji, 2021	Low-density lesion on the left side of the heart; moderately echogenic mass, 88×51×43 mm, in the LA, attached by a pedicle to the IAS, protruding into the LV via the mitral orifice.	CT; TTE.	Man, 56 years old.	LVM with LAM.
Hermawati et al., 2024	Rounded mass, 3×3.3 cm, in the LA chamber.	TTE.	Man, 9 years old.	AM.
Raicea et al., 2021	Cardiac mass, 6×5 cm, with ill-defined margins, in the LA, attached to the IAS; non-homogeneous tumor mass in the LA, with imprecise margins, minimal post-contrast enhancement, 67×46×45 mm.	TTE; CT.	Woman, 38 years old.	LAM.
Kasmeridis, 2021	Mobile cardiac mass, 17×18–19 mm, originating from the RV outflow tract by a narrow stalk; intracardiac mass.	TTE; Cardiac MRI.	Woman, 46 years old.	RVM.
Nzomvuama et al., 2023. (Case 1)	Pedunculated mass in the LA, 37×48 mm, located on the IAS.	TTE.	Man, 54 years old.	AM.
Nzomvuama et al., 2023. (Case 2)	Mass measuring 64×26 mm, attached to the roof of the LA.	TTE.	Man, 48 years old.	AM.
Ajaja et al., 2020	Mobile, rounded, pedunculated mass, 20×13 mm, in the LV outflow tract, originating from the interventricular septum, without calcification or vascularization.	TTE.	Man, 70 years old.	LVM.
Fabijanić et al., 2021	Rounded, well-defined, homogeneous mass, slightly mobile, 27×22 mm, with focal calcification, stalk attached to the apicolateral segment of the LV.	TTE.	Man, 54 years old.	LVM.
Randriamanga et al., 2022	Mass hanging from the right side of the IAS, 7.3×5.8 cm, mobile, passing through the tricuspid valve	TTE.	Man, 17 years old.	RAM.
Hu, 2024. (Case1)	Mobile hyperechoic mass, 46×35 mm, pedunculated and fixed to the IAS in the RA.	TTE.	Woman, 70 years old.	Trombo.
Hu, 2024. (Case 2)	Oval heterogeneous mass, 42×31 mm, with a short stalk on the IAS of the RA, flexible and mobile.	TTE.	Man, 57 years old.	Organized thrombus with vascularization

Hu, 2024. (Case 3)	Mobile mass, 'squirrel tail' shape, 61×9–11 mm, originating from the IAS.	TTE.	Man, 50 years old.	Organized thrombus without evidence of myxoma.
Hu, 2024. (Case 4)	Oval hyperechoic mass, 28×25 mm, with central necrosis, flexible, mobile and pedunculated, attached to the IAS in the LA.	TTE.	Man, 68 years old.	After anticoagulation, the mass disappeared on TTE.
Hu, 2024. (Case 5)	Irregular hyperechoic mass, 33×26 mm, mobile and flexible, fixed by a narrow base to the lateral wall of the LA.	TTE.	Woman, 77 years old.	Heparinization was performed and, after ten days, TTE showed no evidence of mass.
Hu, 2024. (Case 6)	Irregular, mobile mass in the LA, 38×28 mm, with a broad base on the IAS, near the anterior mitral leaflet.	TTE.	Woman, 89 years old.	Post-anticoagulation, on the seventh day of hospitalization, absence of mass on TTE.
Hu, 2024. (Case 7)	Mobile, elongated mass in the LA ('squirrel tail' shape), 62×6–11 mm, originating from the IAS.	TTE.	Man, 66 years old.	Post-anticoagulation, absence of mass on TTE.
Hu, 2024. (Case 8)	Irregular and mobile mass in the LA, 40×20 mm, with a broad base, originating from the lateral wall of the LA.	TTE.	Woman, 73 years old.	After one week of thrombolysis and anticoagulation, no evidence of mass.
Christa et al., 2023	Interatrial septal thickening/mass in the LA; non-homogeneous mass in the LA, 15×14×14 mm, originating from the IAS, rounded shape; contrast uptake by the LA mass on echocardiography, confirming vascularization and excluding thrombus.	TTE; TEE; cTTE.	Woman, 83 years old.	LAM.
Zuwasti et al., 2020	Mass located in the inferior portion of the IAS, attached to the LA, measuring 7×3.9×2.1 cm.	TTE.	Woman, 45 years old.	LAM.
Gewehr et al., 2022	Homogeneous mass in the RA, 3.18×3.28 cm, attached to the septum.	TTE.	Woman, 69 years old.	RAM.
Yasin et al., 2024	Oval soft-tissue mass, 3.2×2.8 cm, attached to the RV wall by a wide and short pedicle; well-defined hypodense oval mass, heterogeneous enhancement in the RV, approximately 4×3.8×4.6 cm.	TTE; CT.	Man, 23 years old.	IVM.
Lancaster et al., 2024	Mass in the LA, measuring 2.15×2.22 cm, consistent with temporary mitral valve obstruction.	TTE.	Man, 58 years old.	LAM.

Table 1: Description of Case Reports Included in the narrative Review. RA (Right Atrium); LA (Left Atrium); CT (Computed Tomography); CTPA (CT Pulmonary Angiography); TEE (Transesophageal Echocardiography); TTE (Transthoracic Echocardiography); cTTE (Contrast Transthoracic Echocardiography); BAM (Biatrial Myxoma); RAM (Right Atrial Myxoma); AM (Atrial Myxoma); LAM (Left Atrial Myxoma);

CM (Cardiac Myxoma); IVM (Intraventricular Myxoma); RVM (Right Ventricular Myxoma); LVM (Left Ventricular Myxoma); PET-CT (Positron Emission Tomography–Computed Tomography); MRI (Magnetic Resonance Imaging); IAS (Interatrial Septum); RV (Right Ventricle); LV (Left Ventricle). Note: Semicolons (";") are used within the table columns to separate multiple radiological findings and imaging techniques for clarity.

4. DECLARATION ON THE USE OF ARTIFICIAL INTELLIGENCE TOOLS

This manuscript used the ChatGPT tool (OpenAI) as support during the initial drafting of the text, specifically for organizing ideas. The tool was not used to generate scientific interpretations or analyze data. The author remains fully responsible for the content, accuracy, and integrity of the manuscript.

5. DISCUSSÃO

Myxomas are rare benign mesenchymal tumors, accounting for 30 to 50% of primary cardiac tumors. Their estimated global prevalence is 0.03%, being more frequent in women (Uchime et al., 2023). CM is the most common primary tumor, found mainly in the left atrium (LA), which corresponds to about 75% of cases. In the right atrium (RA), the occurrence rate is approximately 15 to 20%, and myxomas can be detected in all four cardiac chambers. Only 3 to 4% are found in the left ventricle (LV), with a similar percentage for the right ventricle (RV). Most atrial myxomas are sporadic; however, those associated with familial cases have an autosomal dominant inheritance pattern. They usually originate from the fossa ovalis of the interatrial septum (IAS), attached by a narrow stalk (Tsagkridi et al., 2022). Nevertheless, attachment site and surface contour are not definitive criteria for differentiation. These tumors can be mobile or sessile, with mobility related to the stalk length, influencing the potential for atrioventricular tract obstruction. Additionally, the surface may be smooth, lobulated, or irregular, with irregular tumors showing a higher propensity for thrombus formation. The size of these masses is variable, averaging 3–4 cm but can reach up to 15 cm, with an estimated annual growth rate of 4–5 mm. Some remain stable for years, while others grow rapidly, mimicking malignant neoplasms (Antoniak et al., 2023). Unlike fibromas and angiosarcomas, myxomas do not invade other tissues and are exclusively endocardial masses without involvement of other cardiac structures (Zuwasti et al., 2020).

They present a variety of symptoms and can be classified as obstructive, embolic, or constitutional. Constitutional symptoms, such as weight loss, myalgia, and fatigue, are common. However, about half of cases exhibit symptoms related to intracardiac obstruction, such as dyspnea and syncope. Embolic events are less common and result from tumor

fragmentation and embolization, such as stroke (Tsagkridi et al., 2022; Hădăreanu et al., 2023). Despite being benign, myxomas can cause embolism and cardiac arrhythmias, leading to sudden death. Due to their rarity, they may be mistakenly diagnosed as LV thrombosis (Ji, 2021). Because they present common and nonspecific symptoms, they can also be confused with coronary artery disease or heart failure (Hădăreanu et al., 2023), although most cases are asymptomatic (Gewehr et al., 2022; Yasin et al., 2024). Regarding metastasis, myxomas have the potential for dissemination from the primary site, with the brain being the most common location (Antoniak et al., 2023). Surgical intervention, as well as early diagnosis, enables reduction of fatal complications (Balahura et al., 2020). Among the most common complications found in cardiac myxomas are heart failure, resulting in fluid overload; arrhythmias due to local tumor invasion or surgical resection; valvular defects; infections; and thrombotic events, the severity of which depends on emboli location, often requiring anticoagulation (Lancaster et al., 2024).

Imaging examinations play a fundamental role in the evaluation of cardiac masses, allowing distinction between myxomas and other intracardiac formations. Two-dimensional echocardiography is widely used due to its ability to identify tumor characteristics such as location, size, and mobility with high accuracy. However, methods such as CT and MRI are often employed complementarily, providing additional information on the morphology and tissue composition of the mass (Balahura et al., 2020). Although echocardiography remains the primary imaging modality for cardiac mass evaluation, cardiac CT has become an increasingly relevant alternative, especially in cases where other techniques do not provide conclusive diagnosis or when contraindications exist. Cardiac CT stands out for its high spatial and temporal resolution, rapid acquisition times, and multiplanar image reconstruction capability, offering an effective solution in many patients and complementing cardiac MRI when necessary (Kassop et al., 2014). Cardiac MRI facilitates differentiation between myxomas and thrombi. Myxomas generally exhibit hypointensity on T1-weighted images relative to myocardium and hyperintensity on T2-weighted images, reflecting their high extracellular water content. Additionally, myxomas have a heterogeneous appearance due to areas of necrosis, hemorrhage, or calcification. With gadolinium enhancement, myxomas show a heterogeneous enhancement pattern indicative of neovascularization. In contrast, atrial thrombi have distinct characteristics, such as higher signal intensity than myocardium on short inversion time images and lower intensity on long inversion time images, without significant

contrast enhancement. For differential diagnosis, post-contrast T1 sequences with prolonged inversion times (500–600 ms) are highly specific for thrombi, which do not exhibit signal intensity (Antoniak et al., 2023, Balahura et al., 2020). However, despite these characteristics described in the literature, the behavior of the mass on imaging does not always follow the expected pattern. An interesting example is the case reported by Rana et al. 2024, in which an atrial mass initially appeared on MRI with prolonged inversion time (TI 600 ms) as a non-enhancing lesion—suggesting a thrombus. However, histopathological examination revealed a myxoma with areas of hemosiderin. This case highlights potential diagnostic pitfalls, as some tumors with necrosis or low vascularization may also fail to enhance. Similarly, organized thrombi may develop neovascularization and exhibit enhancement on these sequences. Therefore, the isolated use of the TI 600 sequence may lead to misinterpretations, making it essential to integrate all clinical and imaging data for more accurate evaluation (Rana et al., 2024).

Another method that can be employed is cardiac CT combined with PET using the radiotracer 18F-FDG. This approach can differentiate benign and malignant cardiac tumors through metabolic evaluation of glucose uptake, with the standardized uptake value (SUV) serving as a semi-quantitative metric that allows comparison of activity between different tissues or patients (Kinahan, 2010). Increased 18F-FDG uptake, quantified by SUV, is frequently observed in primary and metastatic malignant neoplasms, while benign tumors tend to show lower metabolic activity. Moreover, PET/CT integration enhances neoplastic characterization and can contribute to identifying distant metastases, aiding in therapeutic decision-making (Rahbar et al., 2012).

The case reports analyzed in this review highlight the broad applicability of imaging methods in the diagnosis of cardiac myxomas. TTE stood out as the initial examination due to its accessibility and high sensitivity in detecting typically mobile masses. TEE complemented this evaluation by providing better definition of the tumor's attachment, mobility, and internal characteristics, especially for differentiating myxomas from thrombi. cTTE was also used to assess tumor vascularization.

Cardiac MRI, often employed as a second-line method, proved effective in distinguishing myxomas from thrombi through the evaluation of heterogeneous enhancement, T2 hyperintensity, and tissue characteristics such as edema and fibrosis. Although CT has lower soft tissue characterization capability, it played an important role in anatomical

assessment, surgical planning, and the identification of calcifications or fistulas. PET/CT was used in select cases, showing low 18F-FDG uptake in myxomas, supporting their benign nature.

Some cases showed rapid tumor growth over a short period, as well as sporadic recurrence of myxomas even after surgical resection. Therefore, selecting the appropriate imaging modalities is essential to reduce diagnostic delays and improve treatment planning, ultimately influencing patient prognosis.

The predominance of isolated case reports and the heterogeneity of imaging descriptions limit the possibility of establishing standardized diagnostic criteria based solely on the present sample. Differences in imaging protocols, operator expertise, and reporting detail further reduce comparability between cases.

6. DECLARATION OF CONFLICT OF INTEREST

The author declares no conflict of interest related to this study.

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None

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