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Uninvited Guest in the Left Ventricle: Cardiac Lipoma

Sol Ventrikülde Davetsiz Misafir: Kardiyak Lipom

ABSTRACT

Cardiac lipoma is a rare primary tumor of the heart. With advances in diagnostic and treatment methods, an increasing number of cases have been reported. This trend suggests that the clinical presentation, previously believed to follow classic patterns, may actually exhibit atypical features. In such cases, multimodal imaging facilitates accurate diagnosis and the selection of the most appropriate treatment. This case report presents a 28-year-old female with progressive exertional dyspnea. Transthoracic and transesophageal echocardiography revealed a large mass in the left ventricle, originating from the posteromedial papillary muscle. The mass exhibited a low-density focus with a well-defined boundary and regular shape and, fortunately, had no significant effect on the valves or hemodynamics. Cardiac magnetic resonance imaging confirmed the diagnosis of a cardiac lipoma. Although surgical intervention was offered, the patient ultimately declined the procedure. Most patients diagnosed with cardiac lipoma are asymptomatic, and the diagnosis is often made incidentally. The use of multimodality imaging greatly aids in diagnosis. Echocardiography is a suitable modality for ongoing monitoring.

Keywords: Cardiac tumors, intracardiac mass, lipoma, multimodality imaging

ÖZET

Kardiyak lipom, kalbin nadir görülen bir primer tümörüdür ve tanı ve tedavi yöntemleri geliştikçe daha fazla vaka bildirilmiştir. Bu durum, daha önce klasik özelliklere sahip olduğu düşünülen klinik sunumun aslında atipik belirtilere sahip olabileceğini düşündürmektedir. Bu olgu sunumunda, ilerleyici efor dispnesi olan 28 yaşında bir kadın hasta sunulmaktadır. Transtorasik ve transözofageal ekokardiyografide, sol ventrikülde posteromedial papiller kastan kaynaklanan büyük bir kitle görüldü. Kitle iyi tanımlanmış bir sınıra ve düzenli bir şekle sahip düşük yoğunluklu bir odak izlenimi verdi ve neyse ki kapaklar veya hemodinami üzerinde önemli bir etkisi yoktu. Kardiyak manyetik rezonans görüntüleme kardiyak lipom tanısını doğruladı. Hastaya lipom eksizyon ameliyatı önerildi, ancak hasta operasyonu reddetti. Lipom genellikle asemptomatiktir ve tesadüfen teşhis edilir. Cerrahi eksizyon ana terapötik müdahaledir. Multimodalite görüntüleme kullanımı tanıya büyük ölçüde yardımcı olur. Ekokardiyografi daha sonraki izlem için uygun bir yöntemdir.

Anahtar Kelimeler: Kardiyak tümörler, intrakardiyak kitle, lipoma, multimodalite görüntüleme

CASE REPORT
OLGU SUNUMU

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In population studies, the frequency of primary cardiac tumors ranges from 0.0017% to 0.02%.[1] Cardiac lipomas account for 8.4% of benign primary tumors and vary widely in shape and size.[2] Fang et al.[2] reported that cardiac lipomas represent 2.4% of benign primary cardiac tumors. They can occur in all heart chambers, with a preference for subepicardial and subendocardial locations. In rare cases, they may also develop within the myocardium or valve leaflets. Symptomatology depends on the size and location of the mass.[3] In this case report, we discuss a patient who presented to a cardiology outpatient clinic with atypical dyspnea and was diagnosed with a large lipoma.

Case Report

A 28-year-old woman presented with exertional dyspnea that had progressively worsened over the past two years. She was initially evaluated at a local hospital, where a cardiac mass was detected. The patient was then referred for further assessment and treatment. Her medical and family histories were unremarkable. Both pulmonary and cardiac examinations were within normal limits. Electrocardiography showed normal sinus rhythm with no significant ST-T segment changes. Laboratory tests revealed no abnormalities.

Transthoracic echocardiography (TTE) revealed the following measurements: a normal-sized left ventricular cavity (50 x 35 mm), aorta 30 mm, left atrium 35 mm, and a hyperechogenic mass measuring 37 x 28 mm located in the mid-apical region of the posterior left ventricular wall (Figure 1A-B, Video 1). Transesophageal echocardiography (TEE) confirmed a hyperechogenic, well-circumscribed mass originating from the posteromedial papillary muscle of the left ventricle. The mass caused thickening of the papillary muscle and its attachment to the left ventricle (Figure 1C, Video 2). For more detailed characterization of the mass, the patient underwent cardiovascular magnetic resonance imaging (MRI). The scan revealed a mass approximately 33 x 19 mm in size, located at the mid-level of the left ventricle, extending to the posteromedial papillary muscle and the left ventricular wall. The mass appeared hyperintense on all sequences, was suppressed in fat-suppressed sequences, and showed minimal contrast enhancement following intravenous contrast administration (Figure 2A-D).

Surgical intervention was recommended; however, the patient declined to give consent for the procedure.

Discussion

Cardiac lipomas, a type of primary cardiac tumor, are most often diagnosed incidentally. Symptomatology varies depending on the tumor's location and size. A significant number of these tumors are discovered either during autopsy or incidentally during cardiac imaging performed for unrelated reasons. The incidence of cardiac lipomas is not influenced by age or sex, with equal prevalence observed in both sexes across all age groups. The most commonly affected anatomical structures include the left ventricle, right atrium, and interatrial septum.[4] In a systematic review of Shu et al.[5] involving 255 patients with cardiac lipomas, 8.3% of the lipomas originated from cardiac valvular leaflets, and 32.5% were located in the pericardium. Cardiac lipomas can originate from the endocardium, epicardium, myocardium, or pericardium.[6]

Symptoms associated with these tumors may include dyspnea, palpitations, and chest pain, which can range from nonspecific to clinically significant manifestations. The patient presented in this report experienced progressive exertional dyspnea.[2]

ABBREVIATIONS

MRI	Magnetic resonance imaging
TEE	Transesophageal echocardiography
TTE	Transthoracic echocardiography

Multimodal imaging is highly valuable in characterizing cardiac tumors. Echocardiography is typically the first and primary tool for evaluating tumor location, extent, and characteristics (such as whether the mass is single or multiple, intramuscular or intracavitary, solid or cystic). Additionally, color Doppler is essential for assessing the hemodynamic impact of tumors, including obstruction, compression, or valvular leak. Echocardiography is a highly sensitive modality for detecting intraluminal tumors. After the mass is detected, further detail can be obtained with TEE. Although most cardiac lipomas can be detected and localized with high sensitivity and accuracy via TTE, their exact tissue nature cannot be determined based solely on acoustic properties. The acoustic characteristics of lipomas can help differentiate them from malignant cardiac tumors. However, differentiating lipomas from other benign lesions, such as myxomas, remains a challenging diagnostic task. Cardiac MRI and cardiac computed tomography may be required in cases where echocardiography alone does not provide sufficient information.[4,7]

MRI is a valuable diagnostic tool that offers critical insights into the relationship between the tumor, normal myocardium, and surrounding great vessels. Beyond simply identifying the tumor's location, size, and boundaries, MRI can also help characterize the tissue type, such as confirming the presence of a lipoma. It is well established that lipomas and mature adipose tissue are composed of the same elements. Furthermore, the imaging appearances of lipomas and subcutaneous fat on CT and MRI sequences are identical. The signal characteristics of cardiac lipomas are consistent with those of subcutaneous fat across all MRI sequences. Complete signal loss of the mass on fat-suppression sequences is considered a characteristic diagnostic indicator of lipoma. It is important to note that the "black boundary sign" seen on cine sequences, which is attributable to the chemical shift

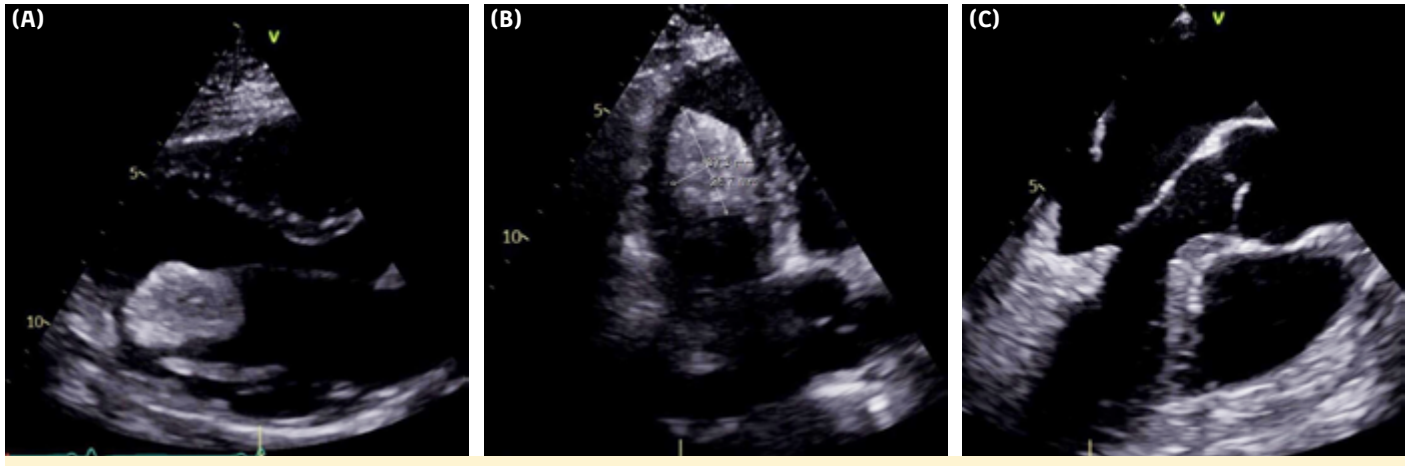

Figure 1. Transthoracic (A, B) and transesophageal echocardiographic (C) views. (A) Parasternal long-axis view; (B) Apical four-chamber view; (C) 135° view.

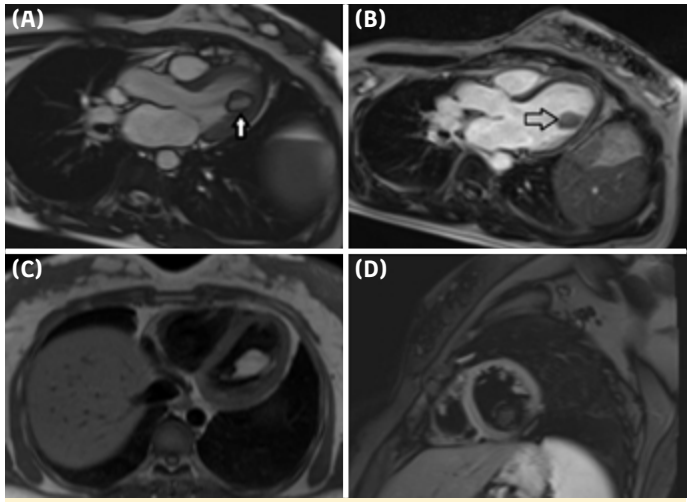

Figure 2. Cardiac magnetic resonance imaging: (A) Long-axis cine view. The mass is characterized by its smooth, well-circumscribed, hyperintense appearance, with evidence of origin from the papillary muscle. The presence of the "Indian ink" around the mass is also noted. (B) Late gadolinium enhancement in the long-axis cine view; (C) Hyperintense mass on transaxial T1-weighted image; (D) Hypointense mass on short-axis T2-weighted fat-suppressed image.

effect, is particularly valuable in diagnosing small lipomas.[5] This feature is especially significant for surgical planning, as it helps determine the extent and feasibility of tumor resection. In this case, cardiac MRI provided detailed information regarding the extent and nature of the tumor. Notably, in the fat-suppressed sequences, the "Indian ink sign," which is a characteristic feature of cardiac lipomas, was observed.[8,9]

Surgical excision is the preferred treatment option for all primary cardiac tumors when feasible. However, extensive myocardial involvement or proximity to critical structures such as coronary arteries or heart valves may limit the possibility of complete resection. Nevertheless, partial resection can still produce satisfactory surgical outcomes. Therefore, total tumor resection should not be considered the sole therapeutic goal. The primary objective should be the preservation of optimal cardiac function, which can often be achieved through partial resection and a conservative surgical approach. The majority of patients with benign tumors are cured by surgical resection, and recurrence is rare.[4,10] In the present case, the surgical intervention was declined by the patient. As a result, pathological examination could not be performed.

Cardiac lipoma is a benign cardiac tumor with a favorable prognosis. The intracardiac location and size are the most important factors influencing the clinical course of the disease. Multimodality imaging can provide detailed and valuable information about these parameters noninvasively. While pathological examination is essential for a definitive diagnosis, the information it offers is also invaluable for surgical planning.

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Video 1: Transthoracic echocardiographic short-axis view.

Video 2: Transesophageal echocardiographic 135° view.

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