A 64-Year-Old Woman with Imaging Features Consistent with a Posterior Intrapericardial Lipoma and 5-Year Imaging Follow-Up

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Patient: Female, 64-year-old
Final Diagnosis: Intrapericardial lipoma
Symptoms: No symptoms
Medication: —
Clinical Procedure: —
Specialty: Cardiology

Objective: Rare disease
Background: Primary cardiac and pericardial neoplasms are rare and may be found incidentally on echocardiography. We present a case of a 5-year imaging follow-up in a patient with a large posterior pericardial lipoma diagnosed by magnetic resonance imaging of the mediastinum.

Case Report: A 64-year-old woman was admitted to the Department of Cardiology for detailed assessment due to an intrapericardial mass revealed on transthoracic echocardiography in an outpatient setting. Computed tomography revealed a capsulated posterior intrapericardial homogenous mass of fat density. There was no enhancement of the lesion with contrast agent administration. Ultimately, magnetic resonance imaging confirmed the benign nature of the tumor, leading to the intrapericardial mass being classified as a lipoma. Due to the clinical features of the lesion – the preserved intracardiac flow and the asymptomatic course of the disease – conservative treatment was appropriate for this patient. A 5-year imaging follow-up was uneventful, the patient remained asymptomatic, a mild tumor growth was identified by computed tomography, and there was still no recommendation for surgery.

Conclusions: This case has shown that although echocardiography and computed tomography imaging can identify posterior intrapericardial tumors, magnetic resonance imaging can identify diagnostic features and support the benign nature of a tumor that may not be amenable to surgical removal.

Keywords: Heart Neoplasms • Lipoma • Magnetic Resonance Imaging • Pericardium • Cardiac Imaging Techniques • Case Reports

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Background

Primary neoplasms of the pericardium, both benign and malignant, are exceptionally rare, with a prevalence rate of 0.001-0.007% and account for 6.7-12.8% of all primary heart neoplasms [1,2]. Approximately 90% of them are benign [3]. The most common benign pericardial masses are pericardial cyst, intrapericardial lipoma, hemangioma, and teratoma. The most common primary malignant pericardial tumor is mesothelioma, while less common ones are sarcoma, lymphoma, and primitive neuroectodermal tumor. The secondary malignant pericardial neoplasms are usually of lung, breast, or bone marrow origin [1,4]. Lipoma is a benign soft tissue tumor composed of mature fat cells with a fibrous capsule [5]. These tumors occur in the cardiac chambers in 53.1% of cases, especially in the right atrium, within the pericardium in 32.5% of cases, and within the myocardium in 10.7% of cases, while 3.7% of cardiac lipomas involve multiple structures [5,6]. Clinical signs and symptoms of lipomas depend on their location, size, and rate of growth. They are usually asymptomatic, and when symptoms do occur, they are nonspecific and generally related to the compression of adjacent structures via mass effect or obstruction of blood flow [1,5]. Lipomas rarely reach a size larger than 2 cm and these small lesions are usually asymptomatic, however, some lipomas grow to be very large in size with or without infiltration of the myocardium. These large lesions can cause clinical symptoms [5,7], with the most common being chest pain, dyspnea, palpitations, and fatigue [5]. Multimodality imaging techniques play a key role in the noninvasive investigation of cardiac masses. Although most intrapericardial tumors may be identified by transthoracic echocardiography (TTE) or computed tomography (CT), magnetic resonance imaging (MRI) can reveal specific imaging features that enable making a definitive diagnosis [5,8]. Fat-containing tumors (including lipomas and liposarcomas) constitute a subgroup of pathologic lesions of the chest that can be detected and easily characterized by multimodality imaging techniques. On CT scans, lipomas are homogeneous fatty lesions with well-identified borders and attenuation values ranging between -30 and -100 Hounsfield units (HU), with no contrast-enhanced components. Compared with lipomas, liposarcomas are heterogeneous malignant fatty tumors, with a mean attenuation value greater than -30 HU, due to soft tissue and fibrous strands alternating with areas of fat [5,8,9]. On MRI, lipomas are homogenous lesions with signal intensity typical of fat tissue – hyperintense on both T1- and T2-weighted images, with the absence of internal septa or nodules and complete fat suppression on selective fat-suppressed images and showing little to no contrast enhancement. Compared with lipomas, liposarcomas are heterogeneous masses with heterogeneous contrast enhancement and thickened internal septa and nodules of non-adipose tissue may be detected on T1-weighted and fluid-sensitive MRI sequences [5,8-11].

Case Report

We present the case of a 64-year-old woman with arterial hypertension and good blood pressure control, dyslipidemia (with the serum low-density lipoprotein level remaining <70 mg/dL on statin therapy), and smoking history (40 pack-years) who was admitted due to a pericardial mass revealed on TTE in an outpatient setting. The patient did not have any general, cardiac, or oncological symptoms. A physical examination and laboratory tests (including blood counts, inflammatory markers, and tumor markers) were unremarkable. The spirometry values and blood gas test results were within normal limits. A 12-lead electrocardiogram (ECG) and 24-hour continuous ECG recording revealed a normal sinus rhythm without arrhythmias. The first-line imaging technique was TTE, and it demonstrated a large homogeneous intrapericardial mass with regular contours attached to the left atrium and the inferior and inferolateral walls of the left ventricle (Figure 1). CT scans revealed the intrapericardial homogenous hypodense encapsulated mass (sized 65×35×70 mm) with fat tissue density (-86 HU noncontrast CT attenuation value) surrounded by a thin capsule. On CT, the mass had a well-defined margin and did

Figure 1. Two-dimensional transthoracic echocardiography. The parasternal long-axis view shows a large homogeneously echogenic mass (arrows) in the pericardial cavity, and it is adjacent to the left atrium and the inferolateral wall of the left ventricle with clear boundary.

The majority of previously reported cases of a large intrapericardial lipomas were referred for surgical resection after recognition of these lesions [2,7,12-19]. The current report is of a case of a large lipoma of the posterior pericardium diagnosed by MRI of the mediastinum with 5-year imaging follow-up.
not invade the blood vessels or myocardium, and there was no associated lymphadenopathy. There was no enhancement of the lesion with contrast agent administration [5] (Figures 2, 3).

Ultimately, MRI was performed, and it demonstrated that the posterior intrapericardial mass had homogenous high signal intensity in relation to the myocardium (Figure 4) that was distinctly suppressed with the application of additional fat-saturation prepulses. Moreover, this lesion had the same signal intensity as the surrounding chest wall fat tissue on T1-weighted and T2-weighted images [20]. No internal septa or nodules were identified within the tumor (Figures 4, 5). MRI confirmed the benign nature of a tumor and led to the intrapericardial mass being classified as a lipoma. On multimodality imaging, the left ventricular ejection fraction and the valve flow parameters were within normal limits. As clear identification of the lesion was established, a diagnostic biopsy was not performed. The patient was assessed by the
Heart Team, and conservative management with clinical evaluation and annual CT monitoring was proposed. A 5-year imaging follow-up was uneventful, the patient was asymptomatic, and mild tumor growth to 79×30×89 mm was identified on CT scans. There was no enhancement with contrast agent administration, and signs of vascular or myocardial invasion and lymphadenopathy were absent. There continued to be no indication for surgical excision of the lipoma. The patient remains under close follow-up.

Discussion

As primary pericardial tumors are exceptionally rare [1,21], there are no clear guidelines for their management. Imaging plays a pivotal role in the differential diagnosis prior to the histological examination of a tissue sample. However, our patient avoided cardiac surgery due to imaging features identifying a benign tumor.

An intrapericardial lipoma is a slow-growing soft tissue tumor that is encapsulated by a thin layer of fibrous tissue [5,18]. The clinical symptoms of this tumor result from compression of the cardiac chambers or adjacent anatomic structures [7]. The etiology of cardiac masses is critical for therapeutic management; however, the evaluation of cardiac masses is often a diagnostic challenge. In the case of our patient, the clear imaging features, the asymptomatic course of the disease, and the lack of certainty that surgery would be an effective treatment supported our decision to perform conservative management. During the 5-year follow-up, the patient remained asymptomatic despite mild tumor growth identified on subsequent CT scans.

Previously reported cases of large intrapericardial lipomas were referred for surgical resection [7,12]. Severe dyspnea [7] or dysrhythmia [12] were the indications for surgical removal of tumors, and both patients had an uneventful recovery. Similar cases of symptomatic pericardial lipoma with surgical treatment were also reported [2,13,15-17]. However, there are a limited number of case reports of a large pericardial lipoma treated with a conservative approach. Salim et al [22] reported an asymptomatic patient with a large pericardial lipoma (12×5 cm) diagnosed by MRI. Based on the clinical and radiological characteristics, the patient qualified for conservative treatment with imaging follow-up; however, data on the follow-up were not provided. To the best of our knowledge, this is the first report of a large posterior intrapericardial lipoma diagnosed by MRI in an asymptomatic patient with 5-year imaging follow-up.

Conclusions

Cardiac masses pose several difficulties in the differential diagnosis. Initial echocardiography and CT imaging can provide important data on the lesion location. MRI can identify diagnostic features and support the benign nature of a tumor that may not be amenable to surgical removal.

Declaration of Figures’ Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

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