Not-so-benign massive cardiac lipoma

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ABSTRACT

Cardiac lipomas are rare and usually benign tumors that often remain asymptomatic throughout one's lifetime. We report a case of a 60-year-old man with a cardiac lipoma diagnosed early in childhood. However, due to the lack of surgical expertise in rural India, the lipoma was not removed. After moving to the United States, he received irregular follow-up with serial chest x-ray and computed tomography, which demonstrated an enlarging lipomatous mass occupying the pericardial space. After remaining asymptomatic for more than 37 years, he presented to the hospital with dyspnea. He underwent a surgical resection but, unfortunately, given the extension of the mass into multiple critical portions of the heart, he ultimately died.

KEYWORDS Cardiac lipoma; cardiac tumor; cardiomegaly

Cardiac lipomas are rare and often remain asymptomatic. The prevalence and diagnosis of cardiac lipomas have increased with the advent of regular diagnostic imaging in the hospital. We present a case of a tumor that grew to catastrophic proportion and ultimately caused the death of an individual due to an extensive mass effect. Although cardiac lipomas are usually easily resected, a few individuals with extensive spread unfortunately face a difficult surgery with poor outcomes.

CASE PRESENTATION

A 60-year-old man born in rural India had a congenital lipoma that was diagnosed when he was 38 years old during a routine chest x-ray. He was evaluated by several surgeons in India; however, at that time the surgical expertise was unavailable to resect the cardiac lipoma. He was managed conservatively and remained asymptomatic until the age of 59, when he was admitted multiple times for acute respiratory distress.

Chest x-ray at that time showed an enormous cardiac silhouette (*Figure 1a*). Computed tomography (CT) of the chest demonstrated an 18 × 16 × 19 cm lipomatous mass that completely encased the left atrium, left ventricle, aortic arch, main pulmonary artery, and right and left pulmonary veins with compression of his mainstem

bronchus and significant deviation of the trachea to the right (*Figures 1b, 1c*). An echocardiogram showed a left ventricular ejection fraction of 50% with grade 2 diastolic dysfunction, right ventricular dilation with reduced function, marked biatrial enlargement, moderate mitral and tricuspid regurgitation, and significant pulmonary arterial hypertension with a right ventricular systolic pressure of 64 mm Hg (*Figure 1d*).

A CT-guided biopsy showed mature adipose tissue without evidence of liposarcoma. Preoperative right and left heart catheterization did not demonstrate evidence of pericardial constriction on hemodynamics but did show extensive collateralizations of coronary arteries to vessels supplying the lipoma. Pulmonary function tests revealed severe restriction with forced expiratory volume in 1 second of 30% and a diffusing capacity of the lung for carbon monoxide of 39%.

He underwent staged resection. First approached from the left heart, the lipoma was around the four chambers of the heart, surrounded all major vessels, and was fully contained in the pericardial sac. Gross resection resulted in 1.5 and 3.75 kg of lipoma. The second stage approached from the right with the assistance of a right ventricular assist device resulted in another 0.2 kg of lipoma resection (*Figure 2*). Unfortunately, the patient developed multiple organ failure after staged partial

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Figure 1. Imaging. (a) Chest x-ray showing severe cardiomegaly. (b) CT axial view showing lipoma encasing the structures of the heart, with biatrial enlargement with lipomatous interatrial septum. (c) Coronary angiogram demonstrating extensive collateralizations of coronary arteries to vessels supplying the lipoma. (d) Echocardiogram demonstrating right ventricular dilation and biatrial enlargement.

resection, resulting in pulseless electrical activity and subsequent death.

DISCUSSION

Cardiac lipomas account for approximately 10% of all primary cardiac tumors, which have an incidence of 0.001% to 0.19%.¹⁻³ The most prevalent age group affected is approximately 50 years old, with most cases occurring between ages 40 and 60.^{4,5}

Often, these cardiac lipomas remain small and asymptomatic. However, a select few will continue to grow with potential to reach a massive size.^{1-3,5,6} The select few that continue to grow can eventually cause symptoms such as angina (if compressing the coronary arteries) or dyspnea (mass effect on the left ventricle) due to extension into critical portions of the heart.^{1-3,5,6} Typical locations for cardiac lipomas include the right atrium and left ventricle, though they can appear in almost any part of the heart.

Cardiac lipomas can be a rare cause of embolic phenomena, but most are encapsulated and therefore do not embolize.^{1,5,6} Almost all cardiac lipomas consist of mature adipose tissue, with a very small percentage having pathologic evidence of liposarcoma.⁶ Diagnostic imaging modalities can include an echocardiogram, CT scan, or magnetic resonance

Figure 2. Excised lipoma.

imaging, which are the preferred modalities for diagnosis.^{1,4,5} Usually screening involves an echocardiogram as a noninvasive, nonionizing radiation modality.⁵ Magnetic resonance imaging is an excellent imaging modality for characterization of the cardiac lipoma and can differentiate lipomas from liposarcomas.^{1,4-6}

During planning for a surgical resection, it is important to perform a coronary angiogram to elucidate coronary artery anatomy.^{5,6} There is no consensus for surgical versus conservative management of small, asymptomatic cardiac lipomas, but for large, symptomatic cardiac lipomas, surgical resection offers symptomatic relief and is appropriate in surgically optimized candidates.^{1,5,6} After resection, recurrence is extremely rare and prognosis is excellent.^{1,3,6}

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