Lipoma of the Right Atrium

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ABSTRACT: A 66-year-old asymptomatic woman was admitted to our hospital with the diagnosis of a right atrial mass detected on an outside transthoracic echocardiogram and confirmed on transesophageal echocardiography. Physical examination and basal electrocardiogram were normal. Transthoracic echocardiography revealed a 3.8×2.5 cm echogenic mass in the right atrium. A multislice CT examination demonstrated a right atrial mass with a fat density ranging from ~80 to ~110 HU. The patient had a successful surgical excision of the mass, and the diagnosis of lipoma was confirmed on histopathological examination. © 2008 Wiley Periodicals, Inc. J Clin Ultrasound 37:185–188, 2009; Published online in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/jcu.20497

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CASE REPORT

A 66-year-old asymptomatic woman with previous history of diabetes mellitus, coronary artery bypass, and an aortic valve-sparing operation for aortic root aneurysm (David I procedure) in 2005 was admitted to our hospital with the recent diagnosis of a right atrial mass detected by an outside transthoracic echocardiography, which was confirmed on transesophageal echocardiography. Physical examination was normal, and a baseline electrocardiogram showed sinus rhythm, with a heart rate of 60 bpm. A chest radiograph revealed no signs of cardiomegaly. Two-dimensional transthoracic echocardiography using an Acuson Sequoia 512 scanner equipped with a 3V2c-S, H4.0-MHz transducer (Siemens Ultrasound, Mountain View, CA) performed in our hospital demonstrated a 3.8×2.5 cm echogenic mass in the right atrium extending along the atrial septal wall. The lesion spared the fossa ovalis, involving the septum superiorly and inferiorly (Figure 1). The differential diagnosis included lipomatous lesions of the heart, emphasizing those adjacent to or involving the interatrial septum. CT performed with a slice thickness of 5 mm and without contrast administration demonstrated a 3.9×3.8 cm mass in the right atrium. The mass was attached to the interatrial septum and posterior wall of the atrium. The density measured in different areas of the mass ranged from ~80 to ~110 HU, consistent with a fatty tumor (Figure 2).
FIGURE 1. Apical transthoracic echocardiogram shows the echogenic right atrial mass (calipers, arrow). LA, left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle.

FIGURE 2. Axial CT scan shows the low-density mass in the right atrium.
Lipomatous lesions of the heart such as lipomatous hypertrophy of the interatrial septum (LHIS), lipoma, or liposarcoma was considered the most likely diagnosis. The patient underwent on-pump cardiac surgery through sternotomy. After femoral arterial venous cannulation and selective superior caval cannulation, the patient was placed on cardiopulmonary bypass. When the right atrium was opened, the mass was found located at the posterior side of the right atrium, protruding into the right atrium, and completely covered with normal endocardium. It was resected totally and the primary incision in the atrial wall was repaired with a flap of bovine pericardium. The mass measured $5 \times 4 \times 4$ cm and was yellowish, homogeneous, and solid (Figure 3). Histopathologic examination revealed that the tumor consisted of mature adipocytes and a few entrapped myocytes at the resection margins.

There was neither evidence of myxoma nor of malignancy (Figure 4).

The patient’s postoperative recovery was uneventful, and she was discharged on the fifth postoperative day.

DISCUSSION

Lipomatous lesions of the heart are rare and not well known. These lesions are commonly divided into 3 distinct histopathologic entities: true cardiac lipomas, LHIS, and liposarcoma.

Cardiac lipomas can arise from interatrial groove tissues or adjacent epicardial fat.\textsuperscript{3} They may involve the endocardium, the myocardium, and the pericardium.\textsuperscript{4} Approximately 50\% of these tumors have a subendocardial origin, 25\% have an intramyocardial origin (affecting most frequently the left ventricle, right atrium, and the interatrial septum), and the remaining 25\% have a pericardial origin.\textsuperscript{5} Although they may be asymptomatic for years, they may present with cardiac symptoms and signs from intracardiac obstruction, which depend on the size and location of the tumors. Complications include arrhythmia, dyspnea, embolism, and sudden death.

LHIS is defined as a fatty infiltration $\geq 2$ cm thick in the atrial septum. It is more frequent than true cardiac lipomas, and usually occurs in elderly, obese patients.\textsuperscript{6} It derives exclusively from the upper and/or lower part of the interatrial septum with typical sparing of the foramen ovale, giving the lesion the characteristic dumbbell shape.

Liposarcomas are one of the rarest sarcomas of the heart, and the prognosis is poor. It is found in only 1\% of primary malignant cardiac tumors. They usually grow quickly and infiltrate into surrounding structure, with metastases being unusual.\textsuperscript{3} The majority of such tumors originate.
from the right heart, particularly from the right atrium.\textsuperscript{7}

Currently, transthoracic echocardiography is the first-line imaging modality to investigate cardiac masses. Although tissue characterization is limited, lesion localization, size, and mobility can be readily assessed with echocardiography. CT and MRI can provide additional information in particular tissue characterization, exact anatomic location of the tumor, and determination of any local invasion or extension of the tumor into adjacent organs. Lipomas usually have low density, which ranges from \(-80\) to \(-115\) HU.\textsuperscript{5}

Definite diagnosis requires tissue sampling to exclude myxoma, thrombus, and malignant tumors. From the histopathologic point of view, lipomas are true neoplasms, being encapsulated masses constituted of mature adipose tissue. LHIS, in contrast, appears as a nonencapsulated, nonneoplastic mass of mature adipose tissue.\textsuperscript{2,8} Liposarcomas tend not to be encapsulated with focal nuclear atypia and hyperchromasia of adipocytes. There are 4 major histologic subtypes of liposarcoma: well-differentiated, round cell, pleomorphic, and myxoid. The well-differentiated lipoma-like liposarcoma may be the most challenging to distinguish from benign fatty lesions.\textsuperscript{3}

Indications for surgical excision of cardiac fatty lesions include intractible arrhythmias, valvular dysfunction, inflow or outflow obstruction to blood, thromboembolic sequela, and inability to confidently exclude liposarcomas.\textsuperscript{5} Surgical excision of cardiac lipomas generally provides complete cure, and good long-term prognosis. Moreover, detecting an abnormal fatty lesion of the heart requires extensive sampling to identify regions of dedifferentiation.\textsuperscript{3} In our case, despite the large size of the mass, the patient was asymptomatic because of the immobility of the tumor and absence of interference with the dynamics of the tricuspid valve. There was no arrhythmia, and no thromboembolic event was documented. However, cardiac liposarcoma could not be definitely excluded with transthoracic echocardiogram, and CT findings, especially in the context of possible rapid progression of the tumors on a preoperative transthoracic echocardiogram in 2005, failed to reveal any abnormality. Therefore, surgical removal of the tumor was preferred for a definite diagnosis, which resulted in complete cure.

REFERENCES