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Lipoma in the right atrium

Primary tumors of the heart are rare. Approximately 75% of primary tumors are benign and 50% of benign tumors are myxomas. Although traditionally less frequently reported, papillary fibroelastoma is increasingly recognized [1]. Other benign tumors of the heart include rhabdomyomas, fibromas, fibroelastomas, and lipomas. Lipomas are well-encapsulated and homogenous masses of mature fat and account for approximately 4% of the primary cardiac tumors [2]. Herein, we report a case of right atrial lipoma.

Case report

A 53-year-old woman presented to our institution with palpitations and dyspnea on exertion. Physical examination was unremarkable. Laboratory test results including complete blood count, blood chemistry, and sedimentation rate were within normal limits. An electrocardiogram showed normal sinus rhythm. Echocardiography demonstrated an echogenic, nonmobile mass attached to the interatrial septum. Magnetic resonance imaging confirmed an encapsulated, homogenous contoured mass with signal intensity characteristics of fat tissue, consistent

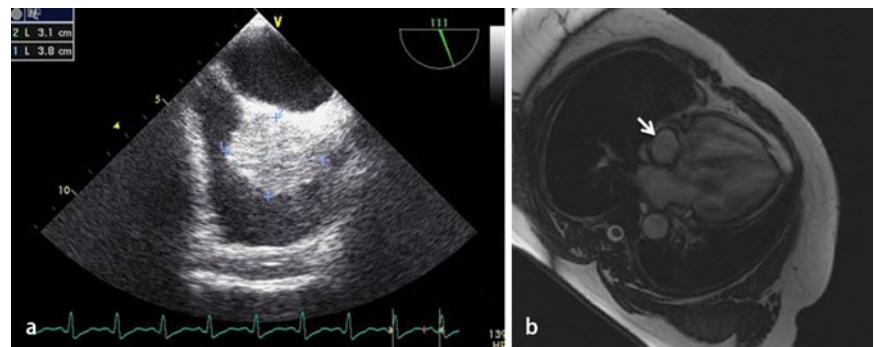


Fig. 1 ▲ a Transesophageal echocardiography of the mass. b Magnetic resonance imaging; arrow shows the encapsulated mass



Fig. 2 ▲ Intraoperative images of the mass

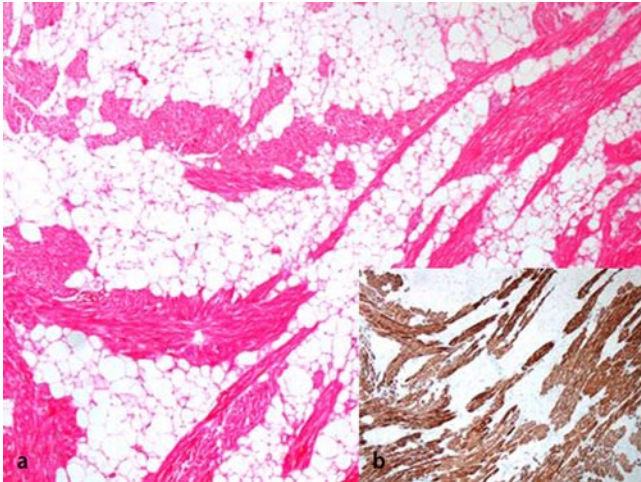


Fig. 3 ◀ Histological examination of the mass showing mature adipocytes between muscle fibers: (a) H&E staining, (b) immunohistochemical actin staining

with lipoma (■ Fig. 1). The patient was referred to cardiac surgery for the intracavitary mass after a preoperative angiogram showed normal coronary arteries. After right atriotomy, a smooth, yellowish fatty mass protruding into the right atrium was noted. The 3.5×3×3-cm mass had a broad attachment to the upper interatrial septum in the right atrium (■ Fig. 2). The tumor was resected with the interatrial septum and the defect was closed with a polytetrafluoroethylene (PTFE) patch. The patient's postoperative course was uneventful. Pathological examination of the lipoma revealed mature adipocytes limited by a collagenous capsule on the atrial side and minimal invasion to the atrial septum (■ Fig. 3).

Discussion

Cardiac lipomas may occur anywhere in the heart; however, most lipomas occur in the epicardium and grow into the pericardial surface [3]. They may also grow in subendocardial or myocardial locations. Subendocardial lipomas can manifest as protruding masses into the cardiac chambers. Cardiac lipomas are most often detected incidentally. However, clinical manifestations of cardiac tumors depend on the size and location of the mass and infiltration of adjacent tissues. They can be symptomatic if the protruding part of the subendocardial lipomas obstructs the circulation or interferes with valve function. Intramyocardial lipomas can lead to conduction defects, arrhythmias, or heart failure by local invasion. The most com-

mon arrhythmia caused by cardiac tumors is atrial fibrillation; however, ventricular tachycardias may also occur [4]. Likewise, subepicardial lipomas can cause symptoms due to compression or infiltration ([5], ■ Tab. 1).

As noninvasive imaging modalities continue developing, an increase in the incidence of primary cardiac tumors has been reported. Echocardiography is the initial imaging method for the diagnosis of a cardiac lipoma. Tumor location, size, attachment, mobility, echogenicity, and calcification can be assessed with two-dimensional echocardiography. Transesophageal echocardiography offers higher sensitivity and is useful especially in cases with suboptimal resolution. Other imaging modalities such as computed tomography (CT) or magnetic resonance imaging (MRI) may provide additional data and use of these techniques in cardiac tumors has grown over the years. Both CT and MRI have high specificity in identifying fat.

The differential diagnosis of lipoma includes benign and malignant tumors. Metastases may occur at any location within the heart. Benign lesions in the region of the interatrial septum include myxomas, rhabdomyomas, fibromas, and fibroelastomas as well as lipomatous hypertrophy of the interatrial septum. Cardiac lipomas are much less frequent than lipomatous hypertrophy, are well encapsulated, contain few myocytes, and can occur in almost any location of the heart in contrast to lipomatous hypertrophy, which is unencapsulated and is confined to the in-

Tab. 1 Summary of the location and presentation of cardiac lipomas

Location
– Subendocardial/valvular [6, 7]
– Myocardial
– Epicardial
– Pericardial
Presentation
– Incidental
– Dyspnea
– Syncope
– Blood flow obstruction
– Interference with valves (obstruction/insufficiency)
– Embolization/stroke (systemic/pulmonary infarcts)
– Arrhythmias/conduction disturbances/sudden cardiac death [8, 9]
– Symptoms due to compression (coronary artery [10], cardiac chambers [11, 12], extra-cardiac structures [13])
– Altered ventricular function due to mass effect [14]

teratrial septum [3, 5]. A pathognomonic dumbbell shape can also be appreciated during imaging. Cardiac liposarcoma is another rare entity with an unfavorable prognosis that is predominantly localized in the right atrium. Pericardial lipomas should also be differentiated from pericardial cysts [3].

Cardiac lipomas are slow-growing tumors and may remain asymptomatic for years; nevertheless, they have a broad spectrum of clinical symptoms and signs including sudden cardiac death, which are often determined by size, location, and infiltration of the tumor [8, 15]. While the management of asymptomatic patients is controversial, surgical resection should be performed for symptomatic lipomas. Small benign tumors can be enucleated by peeling the tumor out of its capsule; others must be resected totally [4].

Conclusion

Cardiac lipomas are slow-growing tumors and may remain asymptomatic for years. The differential diagnosis includes other tumors of the heart, as well as lipomatous hypertrophy of the interatrial septum. Management is determined by the symptoms, size, location, and infiltration of the tumor.

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Compliance with ethical guidelines

Conflict of interest. I.D. Kilic, I. Alur, Y.I. Alihanoglu, B.S. Yildiz, F. Bir, and A.V. Ozcan state that there are no conflicts of interest.

The accompanying manuscript does not include studies on humans or animals.

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