Lipomatous hypertrophy of interatrial septum (LHIS), usually found in echocardiography, is a rare non-neoplastic disease entity, which may cause arrhythmia or sudden death. We reported a case of LHIS associated with hypertrophic cardiomyopathy (HCM), which was suspected a hyperechoic intratrial tumor in transthoracic echocardiography. Magnetic resonance (MR) imaging showed fat infiltration of the interatrial septum, indicating lipomatous hypertrophy in addition to hypertrophic myocardium. Combined HCM and LHIS were assumed incidental but had not been reported to our knowledge. Characteristic MR imaging of LHIS is an important supplement to echocardiography with ambiguous findings.

Key words: Heart, lipomatous hypertrophy; cardiomyopathy; magnetic resonance; imaging; echocardiography

CASE REPORT

A 62-year-old woman, who had a history of hypertension and hyperlipidemia for more than ten years, was admitted to evaluate her chest tightness sensation. Neither cerebrovascular accident nor pulmonary embolism was noted. Regular heartbeat and grade III/VI systolic murmur were found. Transthoracic echocardiography revealed systolic anterior movement of the mitral valve, asymmetric septal hypertrophy, dilated left atrium, good contractility of left ventricle and increased pressure gradient (about 60 mmHg) at left ventricular outflow track. The findings were suggestive of HCM. An initial transthoracic echocardiography revealed a hyperechoic mass in right atrium. A hyperechogenic mass (2.1x1.7cm) over the interatrial septum was found by transesophageal echocardiography (Fig. 1). For differentiating a cardiac tumor and lipomatous hypertrophy of interatrial septum, she received cardiac magnetic resonance (MR) imaging.

Spin-echo EKG-gated MR imaging (TR/TE, 779/16, slice thickness 5 mm) was performed in axial and coronal planes. An evenly distributed hyperintense...
mass was noted along the atrial septum with sparing of
the foramen ovale on spin-echo T1 weighted image
(Fig. 2). LHIS was diagnosed. Characteristic findings
of HCM were also noted in cardiac MR imaging.
Afterwards, she received cardiac catheterization, which
showed patent coronary artery and concentric myocar
dial hypertrophy. Under the impression of incidental
association of LHIS in HCM, she received medication
for hypertension and then follow-up in outpatient
clinic.

DISCUSSION

Unlike intracardiac lipoma, LHIS showing
increased fat deposition is not a true neoplasm. LHIS
generally occurs anterior or superior to the fossa
ovalis, and histologically is characterized by mature
fat with varying quantity of fetal fat, inflammation
and fibrosis, and entrapment of myocardial fibers with
atypia cytologically [3]. It has been advocated to eval-
uate this disorder by computed tomography (CT), MR
imaging, or echocardiography (Table 1). CT or MR
can define the fatty nature within the interatrial
septum and measure the thickness of the fatty tissue
precisely [4]. The normal range of thickness of the
interatrial fat is from 0 to 9.6mm anterior to fossa
ovalis and from 0 to 9.9mm posterior to the fossa
ovalis [5]. In our case, the thickness of the interatrial
septum was about 2 cm, at both cephalic and caudal to
the fossa ovalis (Figure 2). The diagnosis of LHIS can
be made on the basis of marked thickening of the
interatrial septum with sparing of the fossa ovalis. MR
imaging on coronal plane can demonstrate the charac-
teristic distribution and signal intensity of adipose
tissue on the interatrial septum in LHIS without the
limitation of appropriate window and depth resolution
on echocardiography.

LHIS has been reported to be associated with
arrhythmias (Table 1) [1,6,7,8]. It has been assumed
that fat infiltrating in the region of the conduction
system can cause arrhythmias and sudden death [9].
The mechanism by which fatty infiltration results in
arrhythmias and causes sudden death is unclear. It is
assumed that localized fat of LHIS causes a delay in
the intraventricular transmission of impulses, with the
subsequent development of re-entrant ventricular
arrhythmias [10]. Fatty infiltration of the heart is also
more susceptible to rupture if acute myocardial infarc-
tion occurs [11]. Malignant transformation of cardiac
lipomatous hypertrophy, though rarely encountered,
can occur [12].

HCM causes obstruction of the outflow from left
ventricle. The hypertrophy of myocardium results
from mutation of the gene, which interferes with the
organization and function within the myocytes
showing myocyte disarray histologically [13]. There
was no known correlation between HCM and LHIS. In
this report, incidental association of these two condi-
tions was considered (Table 1). Since no arrhythmias
was found, conservative medical treatment for hyper-
tension was undertaken.

Since LHIS is not a true neoplasm, the role of
surgical intervention remains controversial. The diag-
nosis of LHIS can be confidently made by trans-
esophageal echocardiography, CT or MR imaging.
Surgical incisional biopsy is unnecessary after the
Lipomatous hypertrophy of interatrial septum

Diagnosis has been made. The major risk of LHIS is arrhythmias and sudden death. In non-arrhythmic patient, surgical intervention may not be beneficial and is still controversial [14]. MR imaging is excellent in evaluating and diagnosing LHIS with multiplanar capability and tissue characterization. Though characteristic findings of echocardiography has been reported, limitations of echocardiography, including depth resolution, small field of view, and confusing nature of hyperechogenicity, may cause difficulty of making a correct diagnosis of LHIS. MR imaging overcomes technically difficult location for transthoracic and transesophageal echocardiography and avoids the possible partial volume artifact on CT imaging. It also provides excellent characterization of the fatty tissues by T1-weighted image and fat saturation techniques. MR imaging is an important supplementary evaluation for patients with inconclusive echocardiography.

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**Table 1. In vivo diagnostic modality and associated abnormality in lipomatous hypertrophy of the interatrial septum**

<table>
<thead>
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<th>Authors</th>
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脂肪性心房中隔肥大症合併肥大性心肌病變——病例報告

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脂肪性心房中隔肥大症並非真正的腫瘤，它相當罕見，通常於超音波檢查時偶然發現，主要的臨床表現為心率不整、可導致病人猝死。我們在此提出一個合併脂肪性心房中隔肥大症與肥大性心肌病變的病例，其初始之胸部超音波檢查發現為心肌肥大症及高迴音之心房腫瘤。經磁振造影掃描發現其心房中隔上有脂肪浸潤，顯示其為脂肪性心房中隔肥大症合併肥大性心肌病變。依我們所知，脂肪性心房中隔肥大症與肥大性心肌病變之合併發生被假設為偶發性且尚未有文獻報告。當脂肪性心房中隔肥大症之特徵在超音波檢查為模擬兩可時，磁振造影掃描可作為重要之輔助診斷工具。

關鍵詞：心臟，脂肪性心房中隔肥大症，心肌病變，磁振造影掃描，心臟超音波