

# Echocardiographical findings of giant cardiac lipoma

## A case report

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### Abstract

**Rationale:** Cardiac lipoma is a kind of extremely rare benign tumor. Lipomas can be located in various parts of the pericardium and heart, among which the pericardial lipoma is relatively rare.

**Patient concerns:** We report the case of a 59-year-old male with extremely rare cardiac lipoma. The patient was admitted to the hospital because of palpitation and dyspnea for more than one month. Echocardiography examination and the pathological results indicated lipoma.

**Diagnoses:** Diagnosed with lipoma.

**Interventions:** The patient underwent cardiac lipoma resection successfully.

**Outcomes:** There was no obvious cardiac abnormality in the follow-up three months after the surgery.

**Lessons:** Echocardiography is of great significance for preoperative evaluation and postoperative follow-up.

**Keywords:** cardiac lipoma, echocardiography

## 1. Introduction

Cardiac lipoma is a kind of extremely rare benign tumor, accounting for about 8.4% of all primary cardiac tumors.<sup>[1]</sup> Its pathological changes are composed of mature adipose tissue, a small number of fibrous tissue, small blood vessels, and lymphatic vessels.<sup>[2]</sup> Lipomas can be located in various parts of the pericardium and heart, among which the pericardial lipoma is relatively rare. We report a giant cardiac lipoma, which was successfully removed surgically and the patient recovered well after surgery.

## 2. Case report

A 59-year-old male (farmer, Han nationality) was admitted to the hospital because of palpitation and dyspnea for more than one

month. On admission, the temperature, respiration and blood pressure (124/72 mmHg) were normal, and the heart rate was 110 beats/min. On auscultation, we heard distant heart sounds and diminished first and second heart sounds. Pathological cardiac murmur was not detected in the valvular auscultation areas. Other physical examinations showed no obvious abnormality. History: the patient was in good health and had no history of infection or trauma, and so on.

Echocardiography examination showed that there was a slightly hyperechoic mass in the pericardial cavity of the posterior, inferior, and lateral walls of the left ventricle (Fig. 1A, B). The size of the mass was about 12 cm × 4.7 cm × 3.9 cm, the shape of which was irregular, and the boundary was clear and the internal echo was homogeneous. The upper bound of the mass reached the lower part of left atrium, and the lower bound reached the cardiac apex and the right side of it extended to the lateral posterior wall of the right ventricular. The mass was closely adjacent to the posterior, inferior, and lateral walls of the left ventricle and the posterior wall of the right ventricle (Fig. 1C). The posterior and lateral walls of the left ventricle and the posterior wall of the right ventricle were slightly compressed. There was no obvious activity of the mass with the cardiac cycle. Obvious blood flow signal was not detected by color Doppler flow imaging. There were echo-free areas of about 7 mm in the apical pericardium cavity and the pericardial cavity of the lateral wall of the right ventricle (Fig. 1A and B). The residual cardiac structure (including pericardial thickness), intracardiac flow and left ventricular function (ejection fraction 66%) had no obvious abnormality. Preliminary diagnosis for it was a solid mass in the pericardium (considering the possibility of lipoma) with limited pericardial effusion.

Computed tomography (CT) revealed that there was a nodular occupying shadow in the pericardial cavity (Fig. 1D). The size was about 7.9 cm × 11.3 cm and the CT value was about -89 HU.

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In this case report, the authors have obtained informed consent from the patient.

The authors declare that they have no conflict interests.

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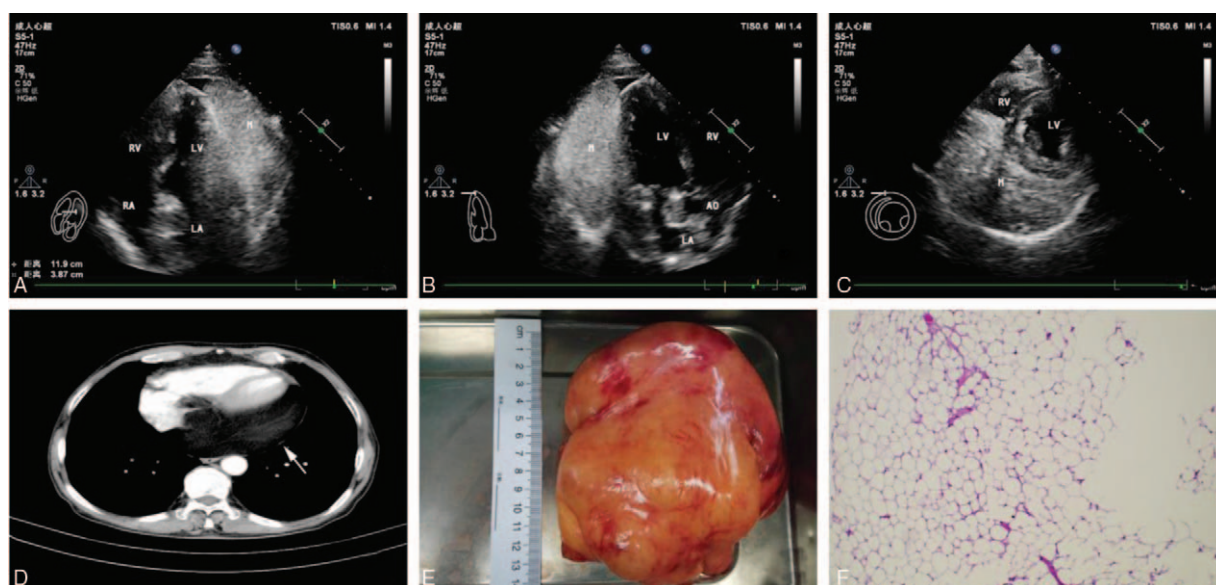
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**Figure 1.** Two-dimensional echocardiography, CT, surgical resection specimens and pathological images of the cardiac lipoma. A and B: the apical four-chamber view and the apical 3-chamber view show a slightly hyperechoic mass in the pericardial cavity of the lateral and posterior walls of the left ventricle, with irregular shape and clear boundary. C: the left ventricular short axis view shows that the mass is adjacent to the posterior wall, the inferior wall of the left ventricle and the posterior wall of the right ventricle. D: CT shows a low-density (−89 HU) mass in the pericardial cavity (arrow). E: The cut surface of the removed cardiac tumor is soft and yellowish to the naked eye. F: Pathology indicates a lipoma. CT=computed tomography.

The left atrium was compressed. Preliminary diagnosis for it was nodular shadow in pericardial cavity, and considered as lipoma.

Electrocardiogram showed sinus tachycardia (heart rate was 111 beats/min).

The patient underwent cardiac lipoma resection with closed drainage of the left thoracic cavity under general anesthesia. Surgical findings was a large, soft, and yellowish tumor in the pericardial cavity, whose size was about 12cm × 8cm (Fig. 1E). The length of the mass pedicle was 1.5cm, which was in the pericardium about 0.5cm below the left lower pulmonary vein. During the operation, the pedicle and the left inferior pulmonary vein were separated and the mass was completely removed. Postoperative pathological examination showed a lipoma (Fig. 1F). The patient recovered and was discharged from the hospital. There was no obvious cardiac abnormality in the follow-up three months after the surgery.

### 3. Discussion

Cardiac lipomas may originate from the endocardium, myocardium layer, and pericardium. The pathogenesis is not clear. It may be related to heredity and obesity. Studies have reported that it is related to chromosome 12q13-15 gene translocations, intergenic deletions of 13q genes and recombination of 6q21-23 gene.<sup>[2]</sup> The patient in our case had no history of heredity and obesity. The clinical symptoms depend on the size, location of the tumor, and the speed of tumor growth and so on.<sup>[3]</sup> The majority of the patients are asymptomatic and the tumors are usually discovered at the time of physical examination or autopsy. Compression or obstruction occurs only when the tumor is large, with symptoms such as chest discomfort, dyspnea, heart tightness, syncope, and so on.<sup>[4]</sup>

Usually, echocardiography, CT, and MRI have significant reference value for the diagnosis of cardiac lipoma, but echocardiography should be the first-line examination for the cardiac lipoma because of the cheap price, simple operation, clear

detection of the tumor size, location, shape, boundary, relation with the surrounding tissues, and blood flow signals within the tumor, and so on. Cardiac lipoma may present as slightly hyperechoic mass with a clear boundary with the surrounding tissues. When liquefaction and necrosis occur in the tumor, it may appear as a large flaky hypoechoic area.<sup>[5]</sup> In this case, the lipoma was very large, which compressed the heart and presented symptoms such as palpitation and dyspnea, which were very rare in clinical practice.

In this case, the mass was located in the pericardial cavity, and the diagnosis of lipoma should be differentiated from other space-occupying diseases:

- (1) pericardial mesothelioma, which shows single or multiple tubercles of the pericardium and the irregular thickened pericardium with or without pericardial effusion;<sup>[4]</sup>
- (2) pericardial cyst, which appears as an anechoic region near the cardiac boundary,<sup>[6]</sup> with regular morphology and clear boundary;
- (3) pericardial secondary tumor, which is often secondary to lymphoma, melanoma, lung cancer, and breast carcinoma,<sup>[7]</sup> and presents the clinical manifestations of the primary diseases.

It can be identified easily with clinical history and other related examinations.

In conclusion, although echocardiography cannot make pathological diagnosis of cardiac lipoma, it is of great significance for preoperative evaluation and postoperative follow-up.

### Author contributions

**Conceptualization:** Liting Cao.

**Investigation:** Yangping Zuo, Yuwen Huang.

**Writing – original draft:** Liu Liu.

**Writing – review & editing:** Liu Liu.

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