**Epicardial lipoma—a rare differential diagnosis in cardiovascular medicine**

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**Abstract**

Cardiac lipomas are benign tumours that represent an uncommon cause of chest discomfort. We report the case of a 52-year-old woman who was admitted to our institution with a mediastinal mass. Computed tomography and magnetic resonance imaging scans revealed an intrapericardial mass mainly located around the left atrium/left ventricle. After midline sternotomy, the pericardial mass was entirely resected after luxating the heart into the right pleural space. Histopathological examination confirmed the diagnosis of two intraepicardial lipomas with a total weight of 122 g.

**Keywords:** Epicardial lipoma • Pericardium • Cardiac surgery

**CASE PRESENTATION**

A 52-year-old woman was referred to our institution with a 4-year history of an epicardial tumour of unknown aetiology increasing in size. The epicardial mass was first recognized when further routine diagnostics were initiated due to non-specific chest discomfort. The patient had reported dizziness, fatigue, New York Heart Association II dyspnoea and a singular syncopal episode 1 year before admission to our hospital.

Laboratory tests were unremarkable. Electrocardiogram (ECG) showed normal sinus rhythm at 74 bpm. Blood pressure was 150/80 mmHg. Physical examination revealed a 2/6 systolic murmur consistent with pre-diagnosed mild mitral regurgitation, but was otherwise unremarkable.

ECG revealed an echogenic, inhomogeneous tumour located between the left atrium (LA) and left ventricle (LV) measuring 2.7 × 6 cm², as well as mild mitral und tricuspid regurgitation. Left ventricular ejection fraction was normal (66%). Computed tomography (CT) and magnetic resonance (MR) imaging confirmed the diagnosis of an epicardial tumour primarily located around the LA and LV with a concomitant 1 cm pericardial effusion (see Fig. 1). Mild compression and LV displacement was already evident. In all radiologic examinations, the described mass was highly suspicious for an epicardial lipoma. Coronary angiography showed normal coronary arteries without significant compression or dislocation by the tumour.

After midline sternotomy, the right pleura was opened using an L-shaped incision and the heart was luxated into the right pleural space. The intrapericardial mass presented as a soft, yellow and well-encapsulated, ovoid tumour, grossly suggestive of lipoma (see Fig. 2). The first tumour that was resected measured 9.8 × 6 × 1.5 cm³ (Fig. 2, +). A second fatty, pedicular tumour measuring 6.3 × 5.0 × 2.5 cm³ (Fig. 2, *) was attached to the myocardium inferior to the LA appendage. The total weight of both tumours was 122 g. No further adhesion to the surrounding organs or other evidence of malignancy was noted. Cardiopulmonary bypass was not necessary for complete resection of both tumours. Histopathological findings confirmed the diagnosis of an intrapericardial lipoma and did not reveal any signs of malignancy. The postoperative course was uncomplicated and the patient was discharged on the eighth postoperative day.

**DISCUSSION**

Cardiac lipoma is a rare case of chest discomfort and represents only 10–19% of primary cardiac and pericardial tumours [1]. Since most patients are asymptomatic, these lesions are often diagnosed incidentally, and the literature may underestimate their actual prevalence. The incidence of primary cardiac neoplasms varies from 0.17 to 0.19% in different autopsy series, with most of them being cardiac myxomas [1]. There is no predilection for age or gender. In a study from Basso et al. [2], there was only 1 lipoma among 125 biopct primary cardiac neoplasms. Due to their origin, lipomas are soft tumours with a slow growth rate. Although cardiac lipoma can originate from every location, the LA and LV walls represent the most frequent origin [3]. Infiltration of the myocardium is reported and is often associated with the lipoma being attached to the right atrial or right ventricular wall [4].

Intrapercardial lipomas are usually primarily detected by radiologic imaging studies, in particular, ECG. In a previously reported case, the lipoma had already grown to huge dimensions by the time of diagnosis [5]. In our case, a cardiac lipoma was first suspected when routine ECG was performed because of non-specific discomfort. Symptoms occur when the
intrapericardial mass leads to compression of the heart chambers and consecutive haemodynamic alterations, sometimes mimicking pericardial effusion [6]. As in our case, symptoms commonly reported are fatigue, dyspnoea, syncope or even chest pain [7]. Chest pain is frequently a result of compression of the coronary arteries. Palpitations due to supraventricular or ventricular arrhythmia may arise when the cardiac conduction system is involved [4, 8]. In very rare cases, intrapericardial lipomas are a cause of near-sudden cardiac death [9].

Radiologic imaging studies can provide strong information for evaluation of cardiac and pericardial tumours. Due to their typical characteristics (Hounsfield measurement <−50 HU), cardiac lipomas can be diagnosed with high certainty by radiologic studies. In particular, MR imaging depicts the typical fatty composition of the tumour comparable to subcutaneous adipose tissue with high signal intensity in T1- and T2-weighted images. Even liposarcoma can be excluded by CT imaging because, in contrast to the lipoma, it possesses a higher HU number than normal subcutaneous fat [10]. Yet, in order to rule out potential malignancy and to gain a definitive diagnosis, histopathological examination is essential. Thus, surgery is recommended for all patients when the diagnosis of an intrapericardial mass is made. Preoperative evaluation of the coronary arteries by coronary angiography or CT is necessary in order to exclude their affection by the tumour.

Figure 1: (A) MR imaging studies demonstrated an intrapericardial tumour mainly located around the LA and LV. Note the high signal intensity comparable to subcutaneous adipose tissue. (B) CT image of the intrapericardial lipoma (blue arrows). The lipoma is not enhanced by contrast media and Hounsfield units are equal to subcutaneous fat.

Figure 2: (A) Exposition of the tumour was obtained by luxating the heart into the right pleural space. The intrapericardial mass presented as two yellow, soft and well-encapsulated tumours consistent with a lipoma. (B) Gross pathology of the lipoma. The tumours measured 9.8 × 6 × 1.5 cm3 (+) and 6.3 × 5.0 × 2.5 cm3 (*). (C) Histopathology confirmed the diagnosis of a lipoma.
In previously reported cases, the resection of cardiac lipomas was performed without serious complications. Surgical access can be gained via midline sternotomy or via left or right anterior thoracotomy [5]. Total excision is crucial in order to avoid recurrence of the tumour. In our case, excision was possible without establishing cardiopulmonary bypass.

If surgery is considered unnecessary by the time of diagnosis, tumour growth rate should be serially measured in short intervals by means of radiologic imaging. On the other hand, patients presenting to their cardiologist will mainly do this because of symptomatic disease, and relief of symptoms can only be gained by surgery. Removal of an incidentally diagnosed epicardial tumour should be self-evident if patients are admitted to the operating room due to other cardiac diseases and excision of the tumour can be done without additional risk. Close follow-up should be performed after the operation in order to detect recurrence of the tumour although this has not been reported so far. Yet, common follow-up time in previously reported cases is only short, so to date, it is rarely possible to determine a long-time recurrence.

This case demonstrates a rare but easy-to-handle differential diagnosis that should be considered when patients present with non-specific symptoms of chest discomfort.

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REFERENCES