Surgical Excision of a rare cardiac tumour: Cardiac Hibernoma

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Abstract

We report a case of cardiac hibernoma, which is a very rare type of benign lipomatous tumour. They are usually asymptomatic and therefore remain undetected or are found incidentally. When symptomatic, they vary and depend on location of heart involved. The patient had a hibernoma on right atrial wall invading the intra-atrial groove and extending over superior vena cava (SVC), causing significant symptoms of SVC obstruction and tamponade. The patient therefore underwent emergency operation, in which the tumour was resected and the right atrium was reconstructed with Bovine pericardial patch. He was discharged home well.

INTRODUCTION

Hibernoma is a very rare type of benign lipomatous tumour and only two cardiac cases are reported in the literature. We present a case of symptomatic hibernoma located on the right atrial wall, requiring emergency operation for resection and reconstruction of right atrium with Bovine patch. The current literature related to hibernoma is reviewed.

CASE REPORT

A 60-year-old male with background of atrial fibrillation, hypertension and chronic obstructive pulmonary disease was admitted to his local hospital with acutely worsening shortness of breath. Patient consent was obtained for this report. Ethical approval was waived. Data sharing is not applicable to this article as no new data were created or analyzed in this study. Computed tomography (CT) chest showed a mass in the right side of the pericardium. (Figure 1) The patient was discussed by both cardiology and respiratory multidisciplinary teams (MDT); it was decided to urgently transfer to a tertiary cardiac centre for further assessment including positron emission tomography (PET) scan to exclude metastasis from suspected pericardial tumour and consideration of surgery.

Following transfer, the patient experienced significantly worsening shortness of breath and was also unable to undergo PET scan due to significant symptoms of SVC obstruction and tamponade. Therefore, decision was made to proceed to emergency surgery. Under general anaesthetic, via median sternotomy the pericardium was opened. A mass was found in right atrial wall invading intra-atrial groove and extending over SVC. Following institution of cardiopulmonary bypass the tumour was removed en bloc with the right atrial free wall and dissected from the interatrial septum. The atrium was reconstructed with bovine pericardial patch. The patient was weaned easily from bypass and closed in the usual fashion.

Histology showed a fatty tumour weighing 120g, extensive replacement of myocardium with a vascularised lipomatous tumour composed of lobules and less well defined files of mature adipocytes admixed with variable proportions of multivacuolated brown fat cells and areas of bland spindle cells. The conclusion is that the tumour was a hibernoma with no evidence of malignancy.

Post-operatively, the patient was transferred to intensive therapy unit (ITU) and initially made a good recovery. On the fourth post-operative day, he developed type 1 respiratory failure requiring nasal high flow oxygen therapy. Despite four anti-arrhythmic agents, the patient continued to experience intermittent atrial fibrillation with fast heart rate and therefore underwent direct current cardioversion (DCCV), which was successful. He was subsequently stepped down to the ward and discharged home. At four months follow up, the patient was doing well. Repeat echocardiogram and CT showed dilated right atrium, but no occupying mass. LV ejection fraction was 55-60% and RV function were normal.

DISCUSSION

Primary cardiac tumours are uncommon and their incidence is around 0.02% as reported in autopsy studies (1). Hibernoma is a very rare type of benign lipomatous tumour. In 1906, it was first described by Merkel, as being composed of brown adipose tissue (2). In 1914, Gery described the similarity of morphological features between hibernoma and hibernating glands of animals (3). Only two previous cases of cardiac hibernoma are reported in the literature.

Hibernoma generally occurs in adults with a peak incidence in the third decades of life. Macroscopically, they are well-defined, encapsulated or circumscribed mass and are usually mobile. Depending on lipid concentration, their colour may range from light brown to gray. Furlong et al identifies four main histological subtypes of hibernoma: typical (82%), myxoid (9%), lipoma-like (7%) and spindle (2%) with typical hibernoma cells, either pale or glandular (4). Typical and lipoma-like variants have slight male predominance, while other have predominance in female. Heaton reports that highest amount of brown fat is found in interscapular, mediastinal, perinephric and neck sites in human and these deposits decrease with age and peripheral ones are lost first. Thus, it is hypothesised that incidence of hibernoma is more frequent in the mediastinum or neck of young people (5). Furlong et al partially agrees with the hypothesis that 15% of their cases involved chest or neck, but their most common anatomical location was thigh (30%) (4).

Cardiac lipoma are often asymptomatic and therefore remain undetected or found incidentally. When symptomatic, they vary and depend on location of heart involved. They can create a mass effect on nearby structures and may lead to obstruction of blood flow and congestive heart failure (6,7). Embolisation is a rare phenomenon, as they are typically encapsulated.

Definite diagnosis requires tissue sampling, but echocardiogram remains as first line imaging modality for cardiac tumours, which is a simple and non-invasive approach. It however cannot visualise smaller tumours and additional imaging, such as CT or magnetic resonance imaging (MRI) can be used. MRI yields a large differential diagnosis for lipomatous tumours. Imaging can vary in relation to proportional components of white and brown fat and hibernoma classically have increased signal in both T1 and T2 weighted images (8). MRI therefore helps to distinguish hibernoma from simple lipoma, but may not rule out from well-differentiated liposarcoma. Due to high metabolic activity of brown adipose tissue, positron emission tomography (PET) has been used to show increased uptake of hibernomas. However, some studies demonstrated that amount of brown adipose tissue may be inversely proportional to body mass index (BMI) (9).

Pre-operative biopsy may be appropriate in an asymptomatic lesion, but surgical excision remains as curative treatment with good long-term prognosis.

CONCLUSION

Hibernoma is a very rare type of benign lipomatous tumour found in the heart. However, due to indistinguishable clinical or radiological features from malignant tumours and the potential for compressive symptoms, surgical intervention should be considered.

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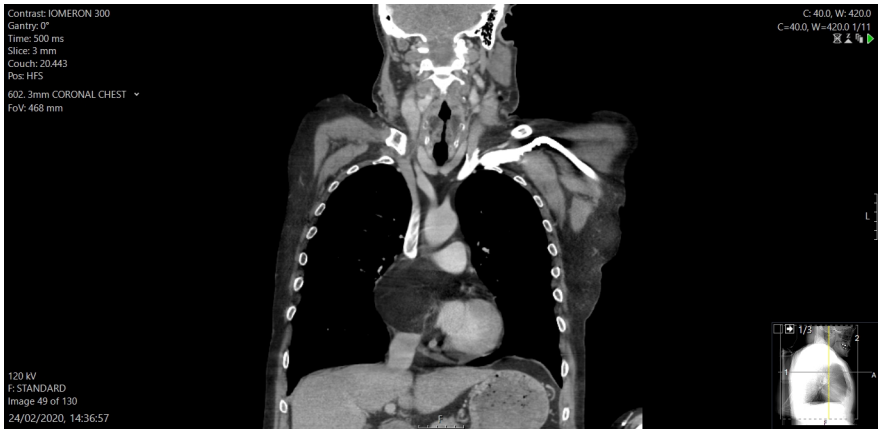
Figure 1. CT Thorax showing mass in right pericardium compressing superior vena cava and six months following surgery with patent SVC entering right atrium



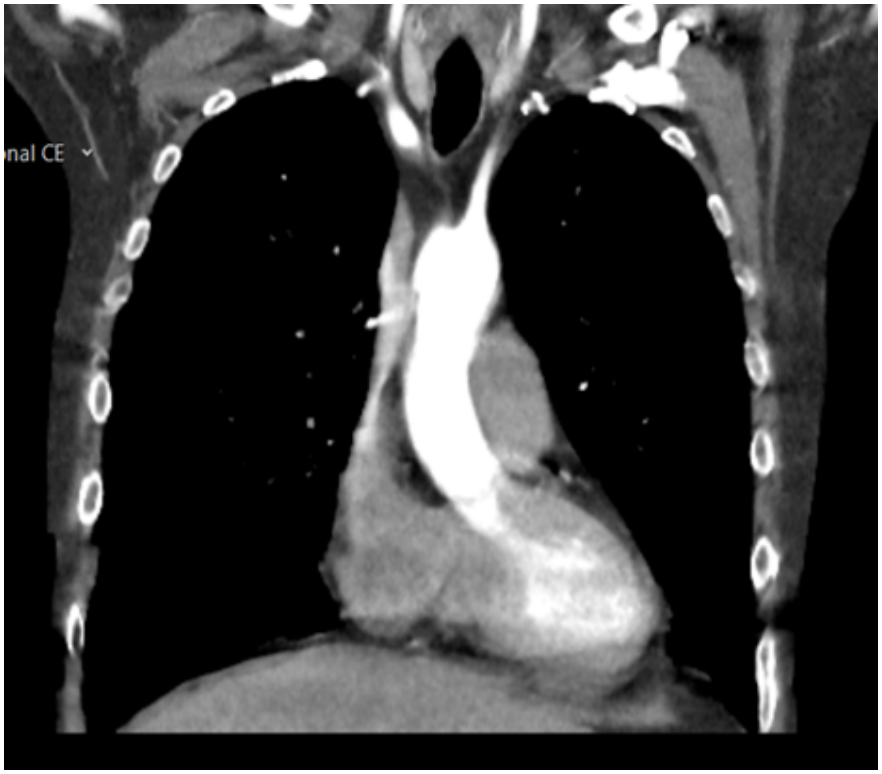


Figure 2. Gross histological specimen of cardiac hibernoma

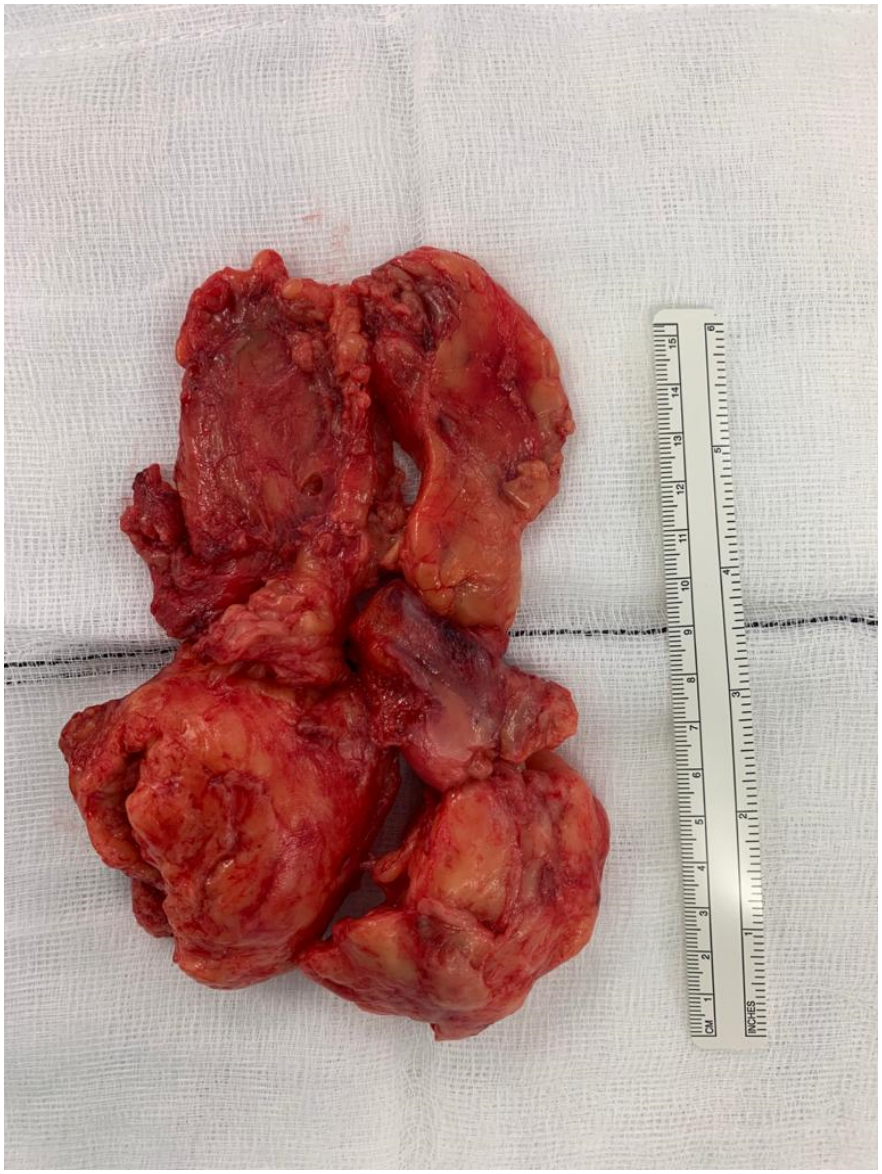


Figure 3. Histology showing vascularised lipomatous tumour composed of lobules and less well defined files of mature adipocytes admixed with variable proportions of multivacuolated brown fat cells (broad arrow) and background cardiac myocytes (thin arrow).