

# Lipoma At Right Ventricular Outflow Tract In A 57-Year-Old Patient With Atrial Fibrillation: A Case Report

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## Abstract

Primary cardiac tumours are rare with a particularly low incidence. Cardiac lipomas that make up 10% of these tumours are mostly asymptomatic. We report a previously healthy 57-year-old patient with new onset atrial fibrillation that was incidentally found to have an atrial lipoma. A transoesophageal echocardiogram, computer tomography (CT) scanning and magnetic resonance imaging (MRI) aided the diagnosis. To our knowledge the radiographic features presented have never been reported

## INTRODUCTION

Primary cardiac tumours have got a relatively low incidence with more than three quarters of the cases being benign. Cardiac lipomas account for just under 10% of this group of tumours and are histologically similar to extracardiac lipomas<sup>1</sup>. Over the past 100 years just over 60 cases of heart lipoma have been reported. We present a case of a previously healthy middle-aged individual with an atrial lipoma indenting the right ventricular outflow tract and in close approximation to the right coronary artery.

## CASE REPORT

A 57-year-old gentleman was electively admitted to our Cardiothoracic Centre (CTC) for a transoesophageal echocardiogram (TOE), having been previously fit and well. The patient's general practitioner had incidentally found an irregular pulse that was confirmed with an electrocardiogram (ECG) and digoxin and warfarin were commenced. He was then referred to our CTC for a planned direct-current (DC) cardioversion. This was however abandoned as the transthoracic echo that was performed previously showed a mass in the aortic root. As a result it was suggested to proceed with a TOE instead to rule out any thrombus.

The TOE re-demonstrated a mass occupying the right coronary sinus but further imaging was required to define this structure. A subsequent computer tomography (CT) of the aorta demonstrated a 2.7 x 2.0 cm fat attenuation lesion located between the right coronary sinus and the ventricular outflow tract (Fig. 1). This mass was closely related to the

origin and also to the proximal right coronary artery (Fig. 1). The structure appeared to indent into the right ventricular outflow tract (RVOT) and also into the ventricle itself, but did not seem to invade either structure (Fig. 2).

Subsequently, cardiac magnetic resonance (CMR) imaging was needed for further characterisation of the mass. It similarly showed a mass indenting the RVOT close to the tricuspid valve with fatty signal characteristics suggestive of a lipoma (Fig 3 and 4). The mass was homogenous with regular borders and appeared non-vascular after perfusion imaging. There was no evidence of myocardial fibrosis or infarction.

Following these investigations it was decided that this patient could be followed up as an outpatient with either an exercise tolerance test (ETT) or a 2-methoxy isobutyl isonitrile (MIBI) stress test. No surgical intervention was advised.

Figure 1

Fig 1 showing fatty attenuation mass between the right coronary sinus and ventricular out flow tract.

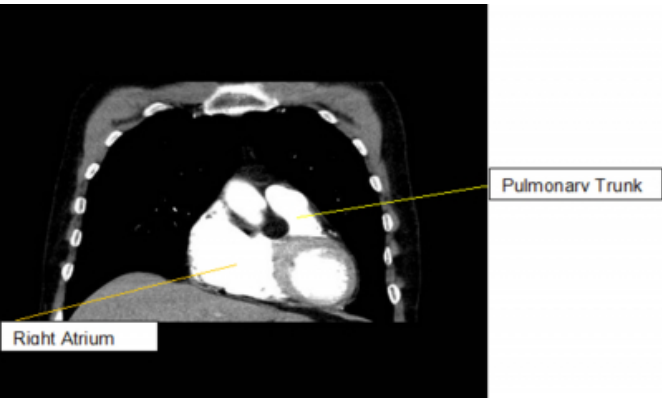


Figure 4

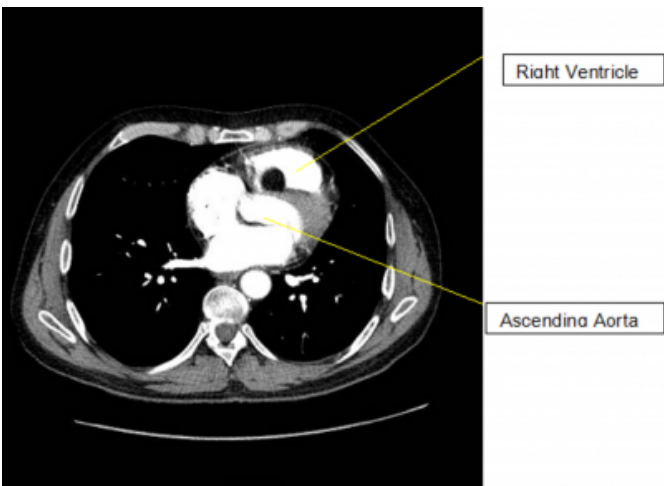


Figure 2

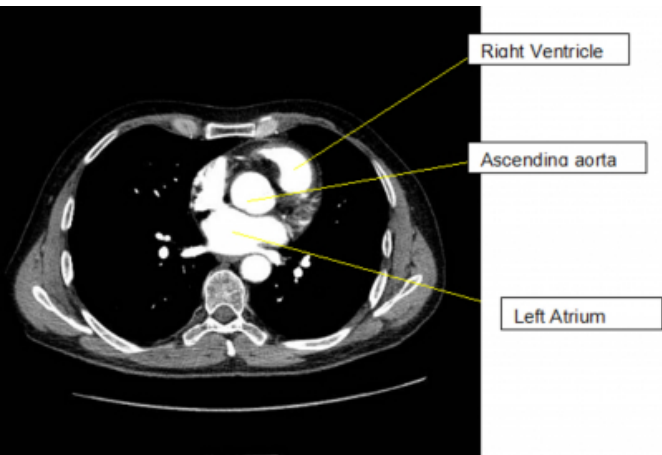


Figure 5

Fig 3 a) and b) fatty signal mass indenting RIGHT ventricle

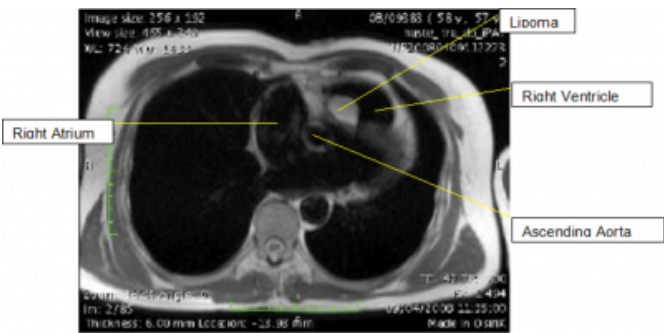


Figure 3

Fig 2 a) and b) fatty attenuation mass indenting RIGHT ventricle

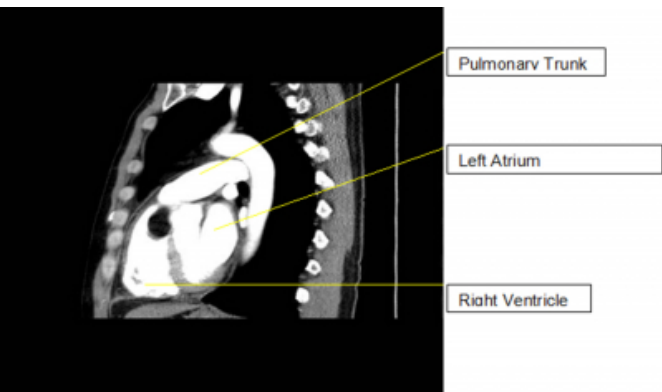
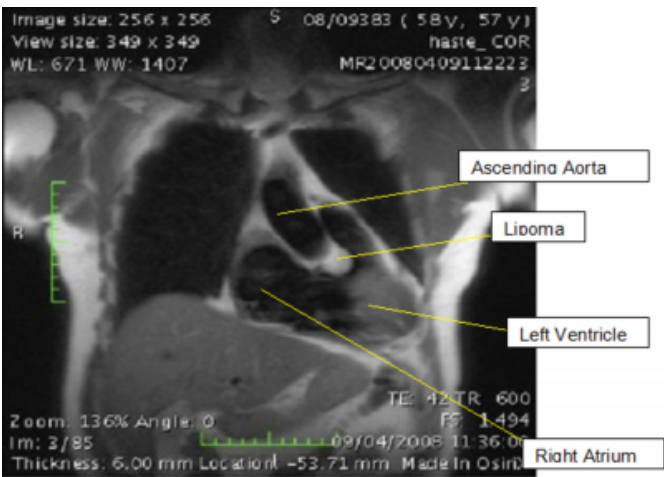
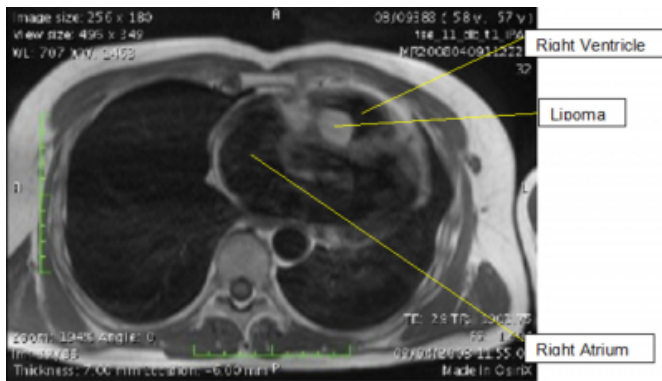


Figure 6



**Figure 7**

Fig 4 showing fatty signal mass between the right coronary sinus and ventricular out flow tract.



## DISCUSSION

Primary tumours of the heart have got a very low incidence. Based on a number of autopsy reports, it is believed that the incidence varies from 0.001% to 0.28%<sup>2</sup>. Approximately 75% of these tumours are benign with the majority being myxomas, whereas the rest are lipomas, papillary fibroelastomas, and rhabdomyomas<sup>3</sup>. Modern cardiac imaging has transformed the detection and subsequent management of these tumours from a condition diagnosed mainly following autopsy, to a curable heart disease.

Cardiac lipomas account for around 10% of all primary cardiac neoplasms<sup>3</sup> and can present at any age with equal frequency in both sexes. Lipomas can either be intracavitary or intramyocardial 50% and 25% of the time respectively, or reside less commonly on the pericardium in 25% of the cases<sup>4</sup>. Invasion of the interatrial septum is particularly unusual however it should be born in mind that true cardiac lipomas are much less frequent than lipomatous hypertrophy of the interatrial septum. This latter entity unlike lipomas is not encapsulated and is generally not considered as a true neoplasm<sup>1</sup>. Extracavitary lipomas commonly reside on the left ventricle or right atrium and tend to be asymptomatic requiring no further treatment or surgical intervention. Conversely, intracardiac lipomas can potentially cause a number of symptoms such as congestive cardiac failure, arrhythmias, syncope and even death depending on their location<sup>5,6</sup>. Lipomas on the cardiac valves are extremely rare, but reports do exist involving either of the four cardiac valves<sup>7</sup>. Even rarer however are multiple synchronous lipomas with only three known cases to date<sup>4</sup>. The case report we are presenting is the only one in the literature to the best of our knowledge, involving a lipoma compressing the right ventricular outflow tract in close approximation

with the right coronary artery. We are also speculating that this patient's atrial fibrillation was directly related to this benign tumour, something that in itself has neither been reported for a young and healthy individual.

The diagnosis of cardiac lipomas can be facilitated with the aid of echocardiography, CT scanning and MRI as was also described in our case report<sup>8</sup>. TOE provides a very good view of both the atria and interatrial septum and can provide valuable information with relation to the localisation of the tumour. CT scanning can subsequently provide more information by determining the degree of invasion into the myocardium or nearby structures. It can also differentiate fatty tumours with low attenuation from normal myocardium or other pathological tissues with high a different degree of radiodensity. In our case report the CT scan demonstrated how the fat attenuation mass was indenting the RVOT and also its relation with the right coronary artery. The diagnosis of a lipoma was therefore made. Eventually, an MRI is needed to characterise lipomas further. It undoubtedly represents the best imaging modality in such cases as it allows for non-invasive tissue characterisation while providing accurate anatomic delineation. Lipomas have homogenous increased signal intensity on T1-weighted images that do not enhance with administration of contrast. As also shown in our case report they are well-encapsulated. It is relatively common practice following the diagnosis of a cardiac lipoma to perform a coronary angiogram if surgery is contemplated to further define the anatomy. In our case nonetheless it was not suggested because of the conservative management that was preferred.

To our knowledge, this is the first reported case of a relatively young patient presenting with atrial fibrillation with a diagnosis of atrial lipoma indenting into the right ventricular outflow tract. We believe that this pathological process is the direct cause of his irregular heart beat. Though cardiac lipomas are benign and usually asymptomatic, this case illustrates how cardiac lipomas can be diagnosed incidentally with the aid of modern diagnostic modalities.

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