

Left Ventricle Intramuscular Haemangioma

A case report and review of literature

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ABSTRACT: Cardiac haemangiomas are rare cardiac tumours that are usually asymptomatic and detected incidentally while imaging the heart with echocardiogram. Cardiovascular magnetic resonance (CMR) is a non-ionising imaging modality that allows the diagnosis of cardiac haemangiomas prior to surgery. We report a 36-year old male patient who was referred to the Adult Cardiology Clinic at the Royal Hospital, Muscat, Oman, in 2006 with a history of a left ventricle mass detected on echocardiogram. Further assessment of the mass by CMR revealed that the mass within the left ventricle apical septum contained features that were consistent with a cardiac haemangioma. Due to the surgical risk of ventricular septal defect and the stability of the mass, the patient was managed conservatively and upon follow-up the patient's condition remained stable.

Keywords: Heart Neoplasms; Hemangioma; Heart, Neoplasm; Magnetic Resonance Imaging; Cardiovascular; Left Ventricle; Coronary Angiography; Case Report; Oman.

CARDIAC TUMOURS ARE RARE, WITH AN estimated incidence of 0.3–0.7% according to surgery and autopsy reports.¹ The majority (75%) of these tumours are benign, of which cardiac haemangiomas account for approximately 1–5%.^{2,3} Although the majority of patients with cardiac haemangiomas are asymptomatic, some patients might be symptomatic depending on the size and location of the haemangioma.⁴ Cardiac haemangiomas are frequently detected incidentally while imaging the heart with echocardiogram. Cardiovascular magnetic resonance (CMR) is a non-ionising imaging modality that allows for tissue characterisation and is widely used for assessment of cardiac tumours. It can show the hypervascular nature of cardiac haemangiomas and allow preoperative diagnosis.^{3,5–7} This case report describes a patient with a left ventricular mass that was detected during an echocardiogram. CMR showed a left ventricle apical septum hypervascular mass with features consistent with a cardiac haemangioma. The information provided in this article aims to increase awareness of physicians and radiologists about this rare entity and highlight the usefulness of CMR in establishing the diagnosis. To the best of the author's knowledge, this is the first case of cardiac haemangioma detected on cardiac MRI to be reported in Oman.

Case Report

A 36-year-old male patient was referred to the Adult Cardiology Clinic in 2006 at the Royal Hospital, Muscat, Oman, for further assessment of a left ventricle mass. Initially, he presented with a history of

chest discomfort, shortness of breath and presyncope. His electrocardiogram showed sinus rhythm and T-wave inversion in the anterior and lateral leads. Further evaluation with echocardiogram revealed an isoechoic mass within the apical septum measuring 4 × 2.5 cm; the initial impression was of a rhabdomyoma. As the mass was located at the apical septum and was not causing obstruction, the patient's symptoms were not thought to be related to the mass, however, the patient continued to have symptoms and therefore the surgical option was discussed. Nevertheless, there was a concern that the patient might develop a ventricular septal defect (VSD) and the decision was made to conservatively manage the patient. The mass remained stable in size on the follow-up echocardiogram, however, in 2019, the patient presented with a history of haemoptysis; his haemoglobin was within 12.7 g/dL (normal range: 11.5–15.5 g/dL). The patient was admitted to the hospital and an echocardiogram showed a stable mass related to the left ventricle apical septum with a normal left ventricle ejection fraction of 60%. CMR was performed for further evaluation and showed a non-obstructive apical septum mass measuring 3.7 × 3 cm. The mass was hyperintense to the myocardium on T2-weighted images, isointense to the myocardium on T1-weighted images and showed homogenous intense enhancement on post-contrast sequence [Figures 1–3]. Upon coronary angiography a vascular blush was revealed [Figure 4], indicating a vascular mass that was receiving blood supply from the left anterior descending artery.

As the mass was stable in size and not causing symptoms, we thought that the haemoptysis was not

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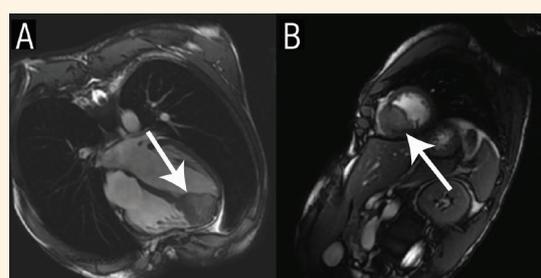


Figure 1: Cine-steady-state free-precession magnetic resonance images of the heart of a 36-year old male patient showing (A) the 4-chamber view and (B) the short axis oblique plane showing a well-defined hyperintense mass located within the apical septum (arrow).

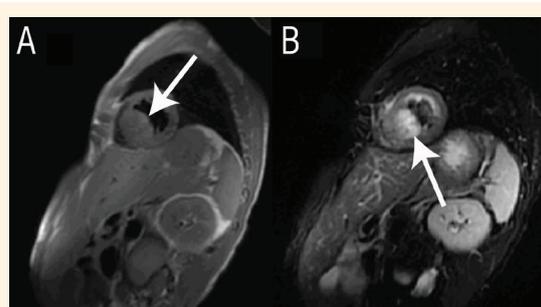


Figure 2: Short axis oblique magnetic resonance image of the heart of a 36-year old male patient showing a mass arising within the apical septum (arrow) that appears isointense on the short axis oblique (A) T1-weighted and hyperintense on short axis oblique (B) T2-weighted short-tau inversion recovery.

related to cardiac haemangioma. However, there was a concern that the patient might have an extracardiac cause of haemoptysis that might be part of a syndrome related to the cardiac haemangioma or due to an entirely new cause such as neoplasm. Therefore, the patient was further evaluated with a chest, neck and abdomen computed tomography (CT) scan; however, no extracardiac haemangioma or neoplasm was detected. The patient did not have haemoptysis during admission. Upon follow-up in January 2020, the patient did not report new episodes of haemoptysis.

As the patient had mild symptoms and the tumour remained stable for more than 14 years and the tumour was not causing obstruction nor compressing adjacent structures, the decision was made to continue the conservative management but to retain the surgical option if the patient's condition changed or deteriorated in any way or developed new symptoms that could be attributed to the haemangioma. Verbal consent was taken from the patient for publication this case report.

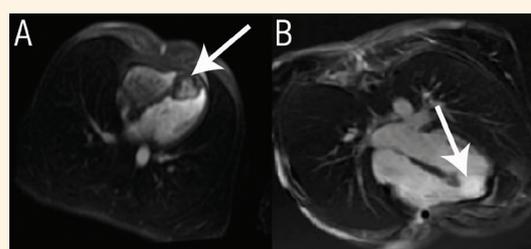


Figure 3: Late gadolinium first-pass rest perfusion 4-chamber view of the heart of a 36-year old male patient showing (A) rapid enhancement of the tumour (arrow) and (B) delayed enhancement of the tumour (arrow) on a post-gadolinium T1-weighted image.

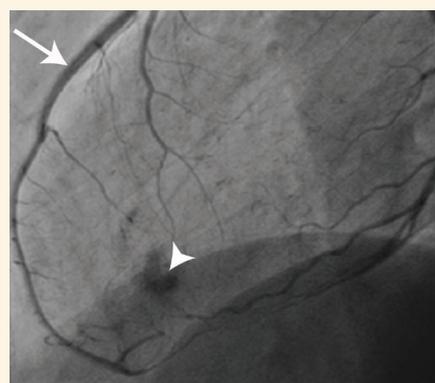


Figure 4: Left coronary angiography of the heart of a 36-year old male patient showing a delayed vascular blush (arrow) indicating a vascular mass which was fed from septal branches of left anterior descending artery (arrowhead).

Discussion

Cardiac haemangiomas are rare benign cardiac tumours that account for approximately 1–5% of primary cardiac tumours and can present at any age with a reported higher incidence among females.^{2–4} Cardiac haemangiomas can arise from any cardiac layer (epicardium, myocardium and endocardium) and are typically located in the walls of the ventricles, but can be found in any cardiac chambers.⁸ Han *et al.* reviewed 56 cases of cardiac haemangioma and found that haemangiomas were located in the right ventricle in 19 (33.9%) cases, the left ventricle in 20 (35.7%) cases, the right atrium in 13 (23.2%) cases, the interatrial and interventricular septum in six (10.7%) cases each and the left atrium in four (7.1%) cases.⁹

Histologically, cardiac haemangiomas are classified into three subtypes: capillary, cavernous and arteriovenous. However, sometimes cardiac haemangiomas can show a combination of all the three types.⁴ While most patients are symptomatic and cardiac haemangiomas are detected incidentally, some patients can present

with variable symptoms depending on the size and location of the tumours including dyspnoea, palpitation, arrhythmia, murmur, pericardial effusion and thromboembolic events.^{2,10,11} In the current case, the patient presented with on-and-off chest discomfort, shortness of breath and presyncope.

Imaging plays an essential role in the diagnosis of cardiac haemangiomas. Most cardiac haemangiomas are detected by echocardiogram and typically appear as hyperechoic lesions.^{4,12} On cardiac CT angiography, cardiac haemangiomas appear as hyper-enhancing lesions due to its hypervascularity.¹³ Coronary angiography does not only show the typical tumour blush [Figure 4], but it is also useful to delineate the blood supply to the tumour.^{2,4} In the current patient, the feeding artery arose from the left anterior descending artery.

On CMR, cardiac haemangiomas are typically intermediate to high signal intensity on T1- and T2-weighted images and show intense enhancement on post-contrast examination.³ Owing to high ability for tissue characterisation, CMR can permit pre-operative diagnosis of cardiac haemangioma and differentiate it from other cardiac tumours such as fibroma, rhabdomyoma, lipoma and myxoma. Cardiac fibroma is isointense to the myocardium on T1-weighted images, hypointense to the myocardium on T2-weighted images and shows intense enhancement on post-contrast images.³ Rhabdomyoma is another benign cardiac tumour that is typically seen in paediatric patients; on CMR, it appears isointense on T1-weighted images, hyperintense to the myocardium on T2-weighted images and shows minimal or no contrast enhancement on post-contrast examination.³ Cardiac lipomas are benign cardiac tumours that have homogenous high signal intensity on T1-weighted images with complete suppression on fat suppression sequences. Cardiac lipomas show no enhancement on post-contrast sequences due to their poor vascularity.³ In the current case, the CMR and coronary angiography findings of the tumour were consistent with a cardiac haemangioma.

The course of cardiac haemangiomas are variable, with some increasing in size while others regress or remain stable.^{14,15} Treatment of cardiac haemangioma depends on the size and location of the tumour as well as associated symptoms.⁴ Surgical resection is usually the treatment of choice in symptomatic patients, with a regular follow-up to identify recurrence. However, if the patient is asymptomatic and the haemangioma is not compressing major structures, surgery can be

avoided.¹⁴ In the present case, conservative management was chosen and to monitor the patient via follow-up.

Conclusion

Cardiac haemangiomas are rare, benign cardiac tumours that are usually detected incidentally. Patients with cardiac haemangiomas are frequently asymptomatic; however, some patients can be symptomatic depending on the size and location of the haemangioma. Awareness of the typical CMR findings of cardiac haemangiomas allows pre-operative diagnosis with a high level of confidence. Although surgical excision is the treatment of choice in symptomatic patients, conservative treatment is an option in asymptomatic patients with non-obstructive cardiac haemangioma.

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