

IMAGE CHALLENGE

Heart murmur with unusual diagnosis

CASE

An asymptomatic man in his 30s was referred to the cardiologist because of heart murmur. The patient had no cardiovascular risk factors, toxic habits or family history of heart disease. In order to study the murmur, an echocardiogram was performed showing a mass in the left atrium. A chest CT angiography was ordered to assess mediastinum and vascular structures. It revealed a heterogeneous cardiac mass without evidence of pulmonary involvement. A cardiac hybrid ^{18}F Fluorodesoxiglucose positron emission tomography/MRI (PET/MRI) study was finally performed to characterise the mass (figure 1).

Questions

Which of the following would be the most suitable diagnosis?

- Vegetation.
- Angiosarcoma.
- Metastasis.
- Myxoma.
- Thrombus.

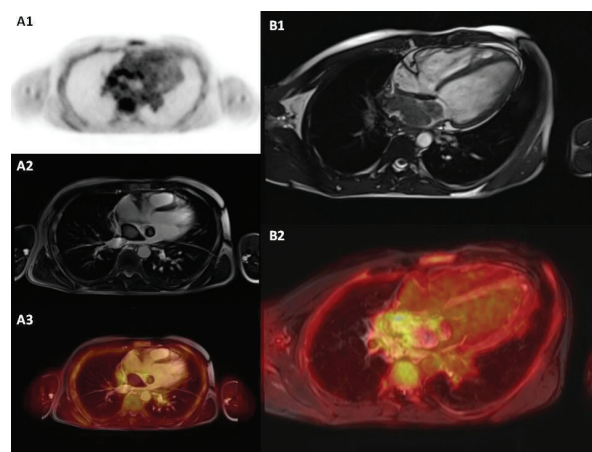


Figure 1 Multiple ^{18}F -FDG PET/MR images of a large mass in the left atrium. Panels on the left (A1: PET; A2: late gadolinium enhancement MR; and A3: fused PET/MR images) show the most representative area of the mass on axial views to evaluate its characteristics and panels on the right (B1: SSFP cine sequence and B2: fused images of SSFP and PET) displays the extension of the mass in four-chamber views. ^{18}F -FDG, ^{18}F Fluorodesoxiglucose; PET, positron emission tomography.

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ANSWER B

The picture shows a mass within the left atrium with intense peripheral metabolic activity based on increased ^{18}F Fluorodesoxyglucose (^{18}F -FDG) uptake but null signal inside. Thrombus would not have showed increased metabolic activity (option E incorrect). Endocarditis should be accompanied by clinical findings that are not present in this patient (option A incorrect). Differential diagnoses would include a variety of cardiac tumours; however, benign conditions are excluded because of the infiltrative behaviour with intense ^{18}F -FDG uptake (option D incorrect). Malignant cardiac tumours are a rare condition,¹ and primary malignant tumours are extremely rare. In cardiac metastases, the pericardium and epicardium are frequently involved and a solitary mass is an atypical presentation (option C incorrect). The most common malignant cardiac primary tumour is the angiosarcoma (option B correct). MRI is traditionally considered the reference standard technique for characterisation of a suspected mass.² ^{18}F -FDG positron emission tomography (PET)/MRI was required to establish the mass diagnosis³ based on its location, extension, tissue composition and metabolism,⁴ subsequently confirmed by surgical histopathology. Recent developments on hybrid technology using fused cardiac MRI and PET modalities allow simultaneous visualisation of anatomical and metabolic characteristics, helping to establish the final diagnosis for a given mass in regions with inconclusive results on MRI.⁵

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