

Differential Diagnosis of Biatrial Masses on Hemodialytic Patient with Secondary Hyperparathyroidism

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Introduction

Masses in the heart of chronic kidney disease (CKD) hemodialysis patients are most commonly due to extensive valve calcifications, thrombi, vegetations and tumors.¹ In this group of patients, cardiac amorphous tumor (CAT) should be considered as differential diagnosis.

CAT is an extremely rare non-neoplastic cardiac mass firstly described as pedunculated mass with multiple calcifications.² Some authors describe this mass as late phase of a thrombus associated with abnormal calcium metabolism in patients with severe renal dysfunction and pro-inflammatory state related to hemodialysis. Regardless of little scientific evidence about treatment approaches to CAT, surgical excision has been recommended and it is generally curative with complete resection.³

Case Report

A 37-year-old female patient, hypertensive, diabetic, and on hemodialysis for five years was admitted to the hospital for preoperative assessment for parathyroidectomy. The medications in use were losartan, carvedilol, acetylsalicylic acid and cilostazol. The patient attended the hemodialysis sessions using a long-term catheter in the right subclavian vein. She complained of palpitation, weakness and pain on lower limbs. At examination, a 2/6 ejective systolic murmur in accessory aortic focus with no irradiation, was audible. The 12-lead electrocardiogram presented sinus rhythm and signs of left ventricular hypertrophy.

Transesophageal echocardiography (TEE) revealed a free mobile filamentary structure attached to the left atrial (LA) posterior wall measuring 22 mm in length and right atrial (RA) mass sitting next to the superior vena cava (SVC) outlet measuring about 26x13 mm. (Figure 1) Magnetic resonance

imaging (MRI) was performed utilizing a 1.5 tesla equipment (Philips Achieva; Philips Medical Systems) and multiple atrial masses were visualized on cine-RM (SSFP) sequence: RA mass was mobile, irregularly shaped, lobulated and attached to the vascular catheter extending from the SVC to the inferior vena cava outlet and measuring about 30x23x20 mm. Two masses were found attached to the LA lateral wall measuring 6x7x8 mm. (Figure 2)

Her condition worsened with sudden dyspnea evident on minimal exertion, chills, peripheral cyanosis (SatO₂ 67%) and bilateral diffuse rhonchi. CT confirmed the diagnosis of pulmonary embolism, with the image of calcified thrombus in the pulmonary artery branches. (Figure 3) The patient underwent immediate surgical resection of cardiac masses, whose macroscopic aspects were compatible with calcified thrombus and presented negative culture.

Discussion

Symptoms of cardiac tumors basically occur from obstruction, embolization, arrhythmias or for constitutional symptoms.⁴ Some factors related to the development of CAT are female, elderly, CKD undergoing hemodialysis, basal cardiovascular diseases and hypercoagulability state. Patients with CAT have increased risk of developing stroke and embolic events.⁵ Regarding the clinical presentation, most patients are asymptomatic. In symptomatic presentation, dyspnea (45%) and syncope (21%) are the most common symptoms.⁶

The diagnosis is made by echocardiographic tests, especially TEE. Imaging investigation could be complemented with MRI and CT, which would help in the differential diagnosis, assessment for surgical resection and evaluation of complications. On CT, hypodense masses are seen as a result of partial or diffuse calcifications. On MRI, CAT can present homogeneous images with T2 hyposignal of ovoid or irregular shape. On cine-MRI sequences, the masses could be mobile or static, when it is firmly attached to the ventricular wall.⁷

Possible differential diagnosis of CAT is fibroma. However, it is more common in children and present smaller central calcification. Calcification is also present in cardiac myxoma (which is the most prevalent cardiac mass) on the right side (about 14%). Nonetheless, hyper-signal on T2 and late and heterogeneous enhancement of contrast are present as anterior systolic movement in

Keywords

Neoplasm; Cardiac Surgical Procedures; Heart Diseases; Chronic Renal Failure; Differential Diagnosis.

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DOI: 10.5935/2318-8219.20190027

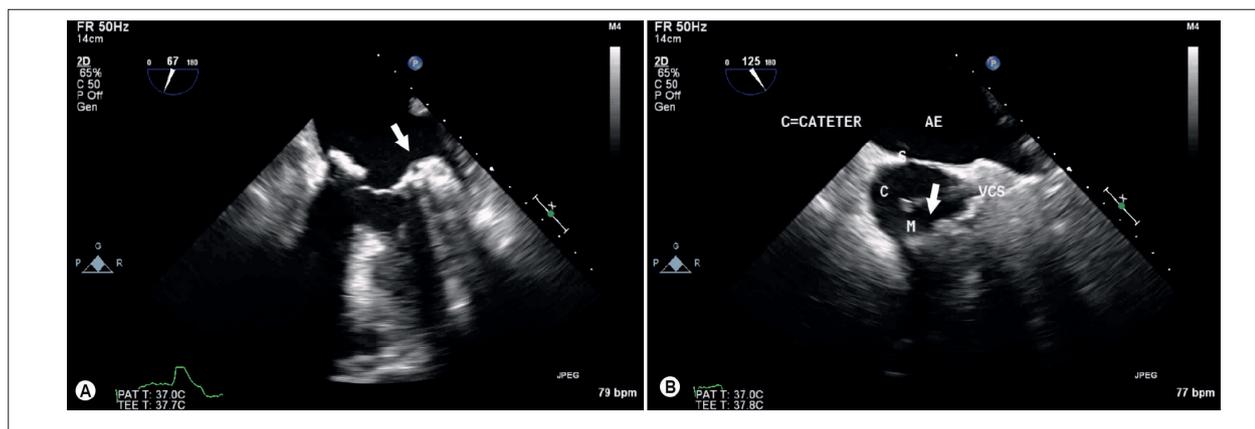


Figure 1 – Transesophageal echocardiogram (TEE). A – mass attached (white arrow) to the left atrial wall, adjacent to mitral valve annulus, measuring 22 mm. B – mass (white arrow) attached to the right atrium, adjacent to the opening of superior vena cava. C = central line catheter, LA – left atrium, S = interatrial septum, M = mass, SVC = superior vena cava.

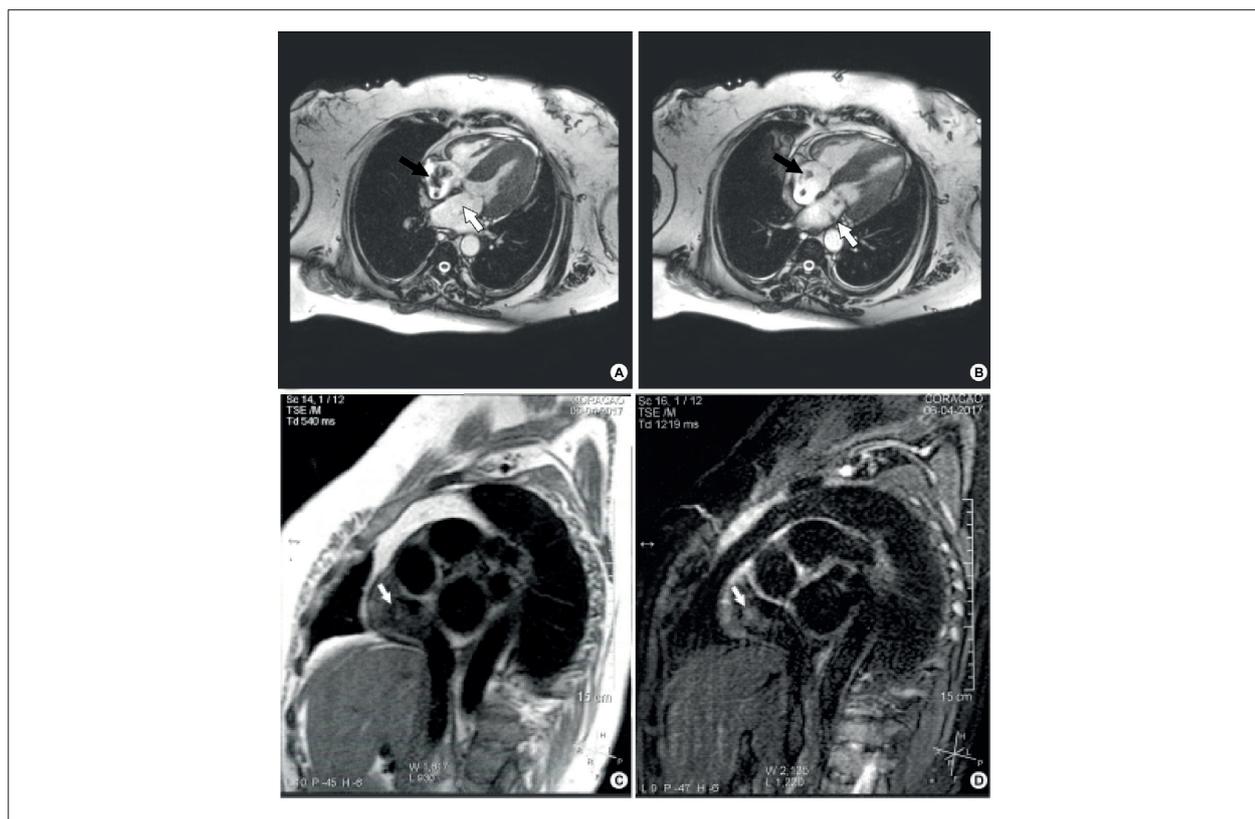


Figure 2 – Cardiac MRI. A and B shows an irregular shaped mass, in the right atrium (black arrow), as well as two smaller masses attached to the left atrium (white arrow). C – perfusion sequence. D – late enhancement sequence.

16% of patients after valvar repair.^{8,9} Calcification is present on osteosarcoma, but it has irregular borders and is very aggressive, characterized by T2 hypersignal e marked enhancement of contrast.⁷

The patient presented atrial volumes close to normal and sinus rhythm. Such facts increase the specificity for the diagnosis of CAT. Calcified thrombus is often located in the

apical areas of the dyskinetic ventricle, which is not the case. Calcifications in thrombi are usually seen in few focuses, large focuses or rare diffuse calcification. Vegetation and calcified thrombus are the most likely differential diagnosis, since they present the same patterns of T1 and T2.⁷ In the presented case, the culture was negative. In these cases, MRI is very useful for a precise diagnosis.

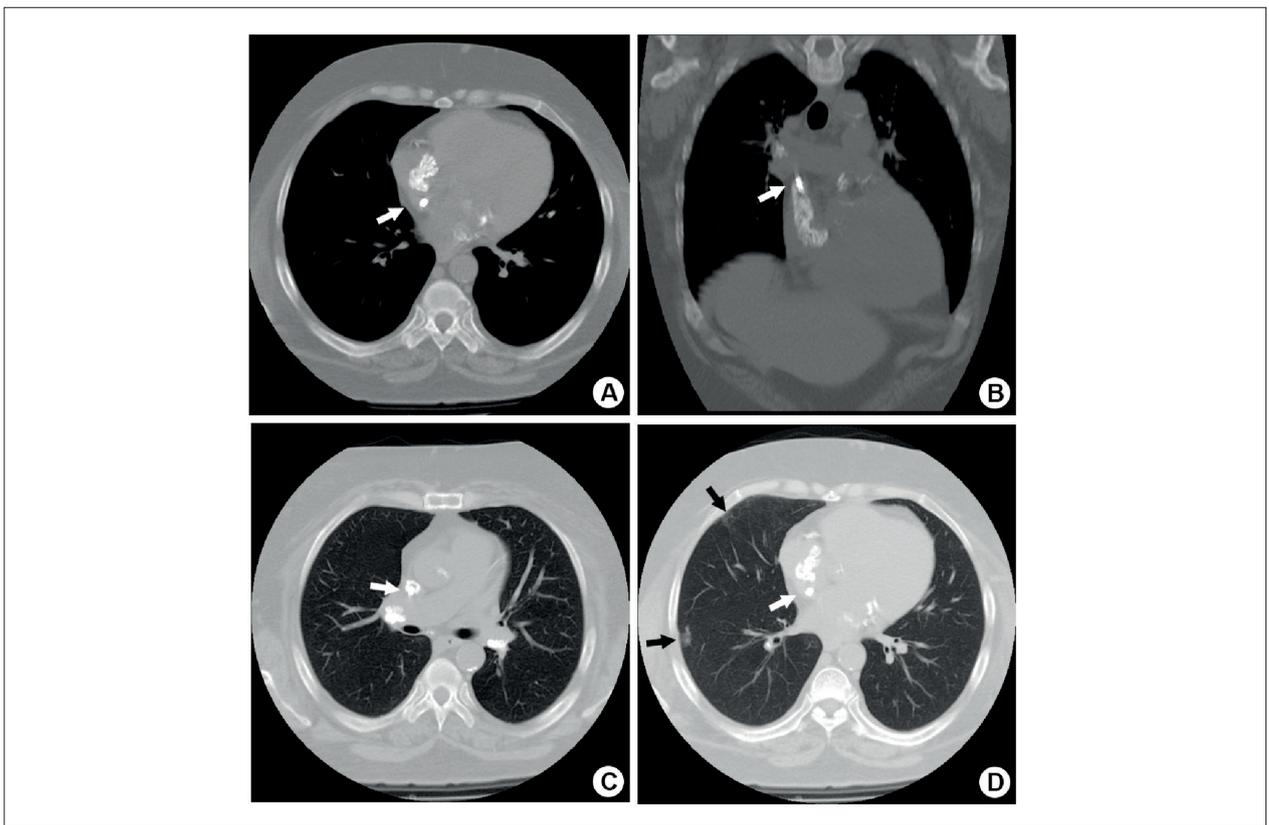


Figure 3 – CT-scan of the chest. A and B show an image of calcium density, measuring about 31 x 22 x 19 mm in the right atrium (white arrow), attached to the hemodialysis catheter. C – calcified thrombus in the pulmonary artery branches (white arrow). D – pulmonary infarction in the periphery of the right lung (black arrow).

Authors' contributions

Conception and design of the study: Lordsleem ABMS, Lima SG. Acquisition of data: Lordsleem ABMS, Calado EB, Santos-Veloso MAO, Bezerra LS. Analysis and interpretation of the data: Lordsleem ABMS, Lima SG, Calado EB, Santos-Veloso MAO. Writing the manuscript: Lordsleem

ABMS, Lima SG, Calado EB, Bezerra LS. Critical revision of the manuscript for important intellectual content: Lordsleem ABMS, Lima SG, Calado EB.

Potential conflict of interest

The authors declare that there is no relevant conflict of interest.

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