

Caseous Calcification of the Mitral Annulus: Role of Cardiac Magnetic Resonance

To the Editor:

The calcification of the mitral ring (CMR) is a chronic degenerative process that affects the fibrous mitral ring. It is frequent in elderly patients, and is more common in women. It can be observed at younger ages associated with chronic renal insufficiency or alterations of the calcium metabolism. Its prevalence among the population undergoing an echocardiographic study is 10.6%.¹ The caseous calcification of the mitral ring (CCMR) is a much less frequent variant, with an echocardiographic prevalence among patients with CMR of 0.6% and much less, from 0.06%-0.07%, in the population not selected from different ages.^{1,2} Typically, it is found at the level of the posterior mitral ring, and the diagnosis is made by echocardiography. However, in some cases, the differential diagnosis with other disorders is difficult. Therefore, the new imaging techniques, such as the computerised tomography (CT) and the cardiac magnetic resonance imaging (CMRI), can help in its treatment. We present a case of a patient where the CMRI permitted a correct diagnosis.

A 75-year-old woman with a history of high blood pressure and paroxysmal atrial fibrillation that had been sent to see a cardiologist for dyspnea. A hypertensive cardiopathy was found on echocardiogram with diastolic dysfunction and an image that was compatible with a tumour at the level of the mitral ring. She was sent from another centre to be evaluated by the cardiac surgery department where a CMR is requested to complete the diagnostic evaluation. During the study, a mass of 17×30×18 mm was found at the level of the posterolateral mitral ring suspended the former, with well defined edges and in contact with the basal segment of the posterior leaflet. In the gradient echosequence (steady state free precession), it was seen to be hypointense compared to the adjacent myocardium, as seen in

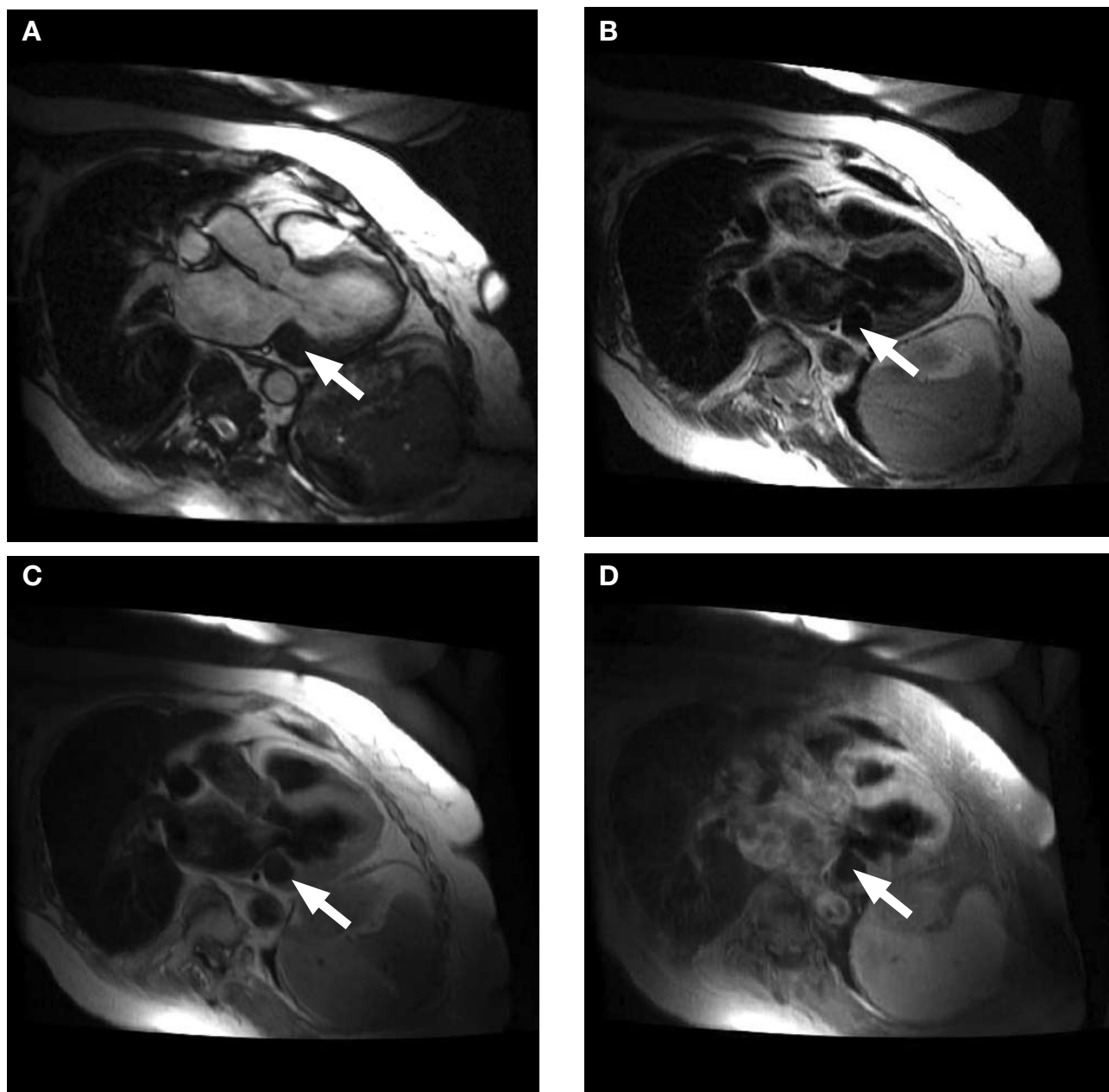


Figure 1. A: echographic gradient sequence in a three chamber view, where a mass is observed at the posterior mitral ring level, hypo-intensive compared to the adjacent myocardium. B, C, and D: spin-echo sequence in the same T2, T1, and T1 plane, with fat saturation and hypo-intensive signals in all of them compared to the adjacent myocardium.

the ponderal sequences in T1 and T2 (Figure 1). In the perfusion sequence, no contrast penetration was seen in the mass, nor any enhancement in the T1 spin-echo sequence after injecting gadolinium. In the late enhancement sequence, only a certain grade of peripheral enhancement was seen related to the presence of a fibrous capsule (Figure 2). These findings are characteristic of the caseous calcification of the mitral ring. The control CMRI at 6 months showed no significant changes.

The CCMR is a rare entity whose diagnosis is established by echocardiography in the majority of

the cases. Deluca et al¹ have analysed the prevalence and the echocardiographic characteristics of this condition in a population of 20 468 patients. It is usually located at the level of the posterior ring and can be seen as a round structure of a variable size (an approximate average size of 20×16mm) with well defined edges, echodense, with central areas of echotransparency and without any signs of posterior acoustic shadows. It seems to be more common in women and in patients with high arterial blood pressure. It is a benign disorder that does not require specific treatment.

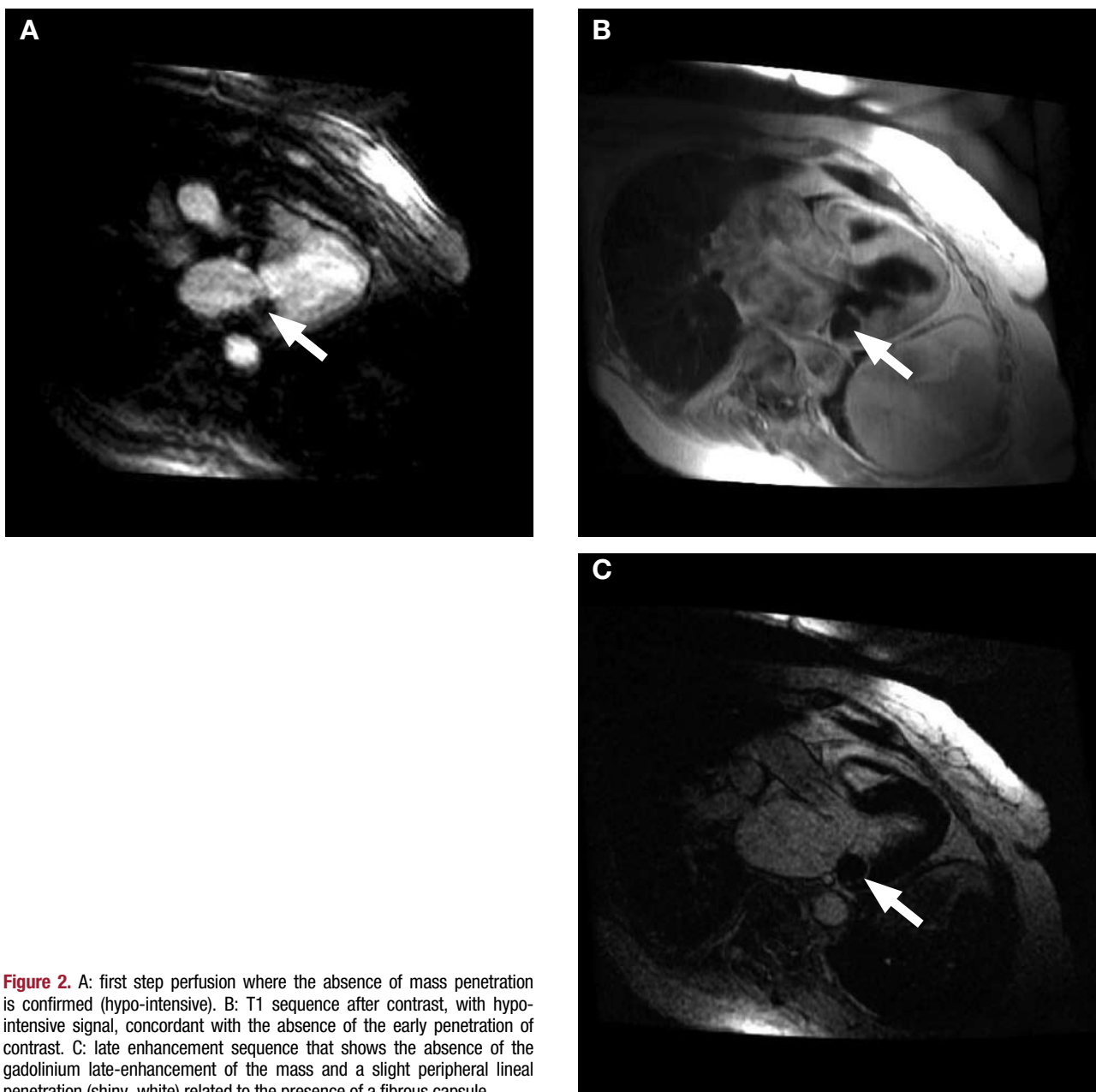


Figure 2. A: first step perfusion where the absence of mass penetration is confirmed (hypo-intensive). B: T1 sequence after contrast, with hypo-intensive signal, concordant with the absence of the early penetration of contrast. C: late enhancement sequence that shows the absence of the gadolinium late-enhancement of the mass and a slight peripheral lineal penetration (shiny, white) related to the presence of a fibrous capsule.

However, the differentiation between a tumour, an abscess or a thrombus is sometimes difficult. Cases have been described where, because of a lack of an obvious diagnosis, patients underwent cardiac surgery,^{3,4} where the CCMR was confirmed in the anatomopathological study (fatty acids, cholesterol, and calcium). In the last few years, new imaging techniques, primarily the CT⁵ and the CMRI,^{6,7} have shown to be useful to identify this condition. CMRI, with its spatial resolution and its capacity of tissue characterisation, is probably the technique of choice in the study of doubtful cases, and the CCMR should be considered in the differential diagnosis of cardiac masses. Because of

its low prevalence, there are few cases of CCMR studied using CMRI.

Recently, Monti et al⁷ described the characteristics of this disease using CMRI, identical to those found in our case. Its typical behaviour in the different sequences includes: hypointensive signal compared to the myocardium in echographic gradient sequences, hypointensive in T1 and T2 sequences and the absence of perfusion and early penetration of the contrast. The majority do not present late enhancement, although a peripheral enhancement can be observed in certain cases related to a fibrous capsule.

The CCMR is a rare, benign condition. It is usually found incidentally when performing an

echocardiographic study. The differential diagnosis with other potentially serious conditions (cardiac tumours) is fundamental. The CMRI, a non-invasive imaging technique that does not use ionizing radiation, is very useful to diagnose this condition and its use should be considered in all cases that are not clear.

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