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Dynamic Nature of Caseous Mitral Annular Calcification

Daniel W. Groves, MD¹, Tushar Acharya, MD¹, Sujata M. Shanbhag, MD¹, W. Patricia Bandettini, MD¹, Andrew E. Arai, MD¹, and Marcus Y. Chen, MD¹

¹Advanced Cardiovascular Imaging Laboratory, Cardiovascular and Pulmonary Branch, National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, Maryland MD USA

Keywords

Mitral annular calcification; caseous necrosis

A 71-year-old former smoker with hyperlipidemia was referred for evaluation of a large echodense mass involving the posterior mitral annulus visualized on a transthoracic echocardiogram. He initially underwent a cardiac magnetic resonance imaging study. A well-circumscribed mass (yellow arrow) attached to the base of the posterior mitral valve leaflet was visualized on cine imaging (Figure 1, Panel A). The mass was dark on T2-weighted imaging including turbo-spin echo (Figure 1, Panel B). On late-gadolinium enhancement imaging, there was a bright rim of enhancement with a predominantly dark core (Figure 1, Panel C). The differential included thrombosed coronary sinus, severe mitral annular calcification (MAC), and caseous MAC. The patient was referred for cardiac computed tomography (CT) to further characterize the mass.

The cardiac CT demonstrated a mass in the posterior mitral annulus that was uniformly hyperdense, Hounsfield unit (HU) greater than 600 on the non-contrast (Figure 2, Panels A and B) and contrast images (Figure 2, Panels C and D). While the high density was evidence of calcification, the ovoid shape of the mass and its homogeneity was unusual for typical mitral annular calcification and suggested presence of caseous MAC, which has been described as “toothpaste-like, milky, caseous material” surrounded by a “large, calcified envelope that is non-collapsible.”¹ The patient remained asymptomatic without an embolic event. A transthoracic echocardiogram four years later demonstrated an echolucent core in the mitral annular mass. The patient underwent a repeat cardiac CT that showed a central area of lower density attenuation (HU less than 50) with only a peripheral rim of

Address of Correspondence: Marcus Y. Chen, MD, Advanced Cardiovascular Imaging Laboratory, Cardiovascular and Pulmonary Branch, National Heart, Lung, and Blood Institute, National Institutes of Health, 10 Center Dr, Building 10, Room B1D416, Bethesda, MD 20892-1061, USA, chenmy@nhlbi.nih.gov, Tel: +1-301-496-3658, Fax: +1-301-402-2389.

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calcification (Figure 3, Panels A-D), clearly demonstrating the dynamic nature of caseous MAC with progressive caseous necrosis since the initial examination.

MAC is a degenerative process of calcium deposition more commonly affecting the posterior annulus.² In rare circumstances with unclear triggers, the central core of the MAC undergoes the benign process of caseous necrosis giving it a putty-like appearance. Both low^{3–6} and high^{1, 7–8} CT attenuation properties have been described in the central regions of caseous MAC. In this patient, cardiac CT established the initial diagnosis of caseous MAC and demonstrated a configuration change with progressive caseous necrosis noted in the follow-up study.

List of Abbreviations

CT	Computed Tomography
HU	Hounsfield Unit
MAC	Mitral Annular Calcification

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Figure 1.

Cardiac MRI. A well-circumscribed mass (yellow arrow) attached to the base of the posterior mitral valve leaflet is visualized on cine imaging (Panel A), T2-weighted turbo spin-echo (Panel B), and late-gadolinium enhancement imaging (Panel C).

Figure 2.

Initial Cardiac CT. An ovoid shaped, uniformly hyperdense mass in the posterior mitral annulus is noted on non-contrast (Panels A-B) and contrast (Panels C-D) images, suggestive of caseous mitral annular calcification.

Figure 3.

Follow-up Cardiac CT. The ovoid shaped mass in the posterior mitral annulus now has a central area of lower density attenuation on non-contrast (Panels A-B) and contrast (Panels C-D) images, consistent with progressive caseous necrosis since the initial examination.