

Cardiac Calcified Amorphous Tumor in the Left Atrium: A Case Report

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A cardiac calcified amorphous tumor (CAT) is a rare non-neoplastic mass of the heart with histological characteristics comprising calcification and amorphous fibrous material. Little is known regarding the incidence, symptoms, and therapeutic strategies for CAT. Echocardiography and computed tomography were performed on a 48-year-old man who had a cardiac mass that was accidentally discovered on admission to a local hospital for a fracture related to a trauma that occurred 1 month prior. After surgery, a histological examination resulted in the diagnosis of a cardiac CAT. The patient was discharged without postoperative complications on the 12th day after surgery.

Keywords: Heart, Neoplasms, Physiologic calcification, Case report

Case report

A 48-year-old male patient visited Gyeongsang National University Hospital with an intracavitary cardiac mass that was accidentally discovered while he was admitted to a local hospital for a trimalleolar fracture related to trauma that occurred 1 month prior. The patient was a non-smoker and was taking drugs for cirrhosis and epilepsy; there was no other pertinent medical history. Upon examination,

he presented with normal vital signs, and cardiac murmur was absent. Laboratory tests revealed 3,360 leukocytes/mm³ with the normal formula, hemoglobin of 12.0 g/dL, 78,000 platelets/mm³, a creatinine level of 1.18 mg/dL, a C-reactive protein level of 7.7 mg/L, and cardiac biomarkers in the normal range. No bacteria were identified in the blood culture. A chest radiograph revealed a lesion suspected of being an intracardiac mass (Fig. 1A). Computed tomography (CT) and echocardiography were performed for a more

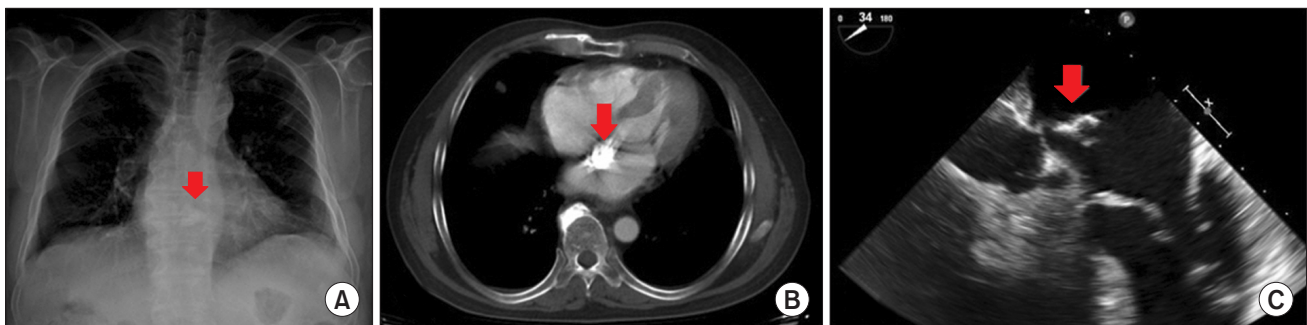


Fig. 1. (A) Chest radiography showing an intracardiac mass lesion (arrow). (B) Computed tomography showing a hyperdense calcified mass within the left atrium (arrow). (C) Echocardiography showing a large calcified mass attached to the interatrial septum superior to the mitral valve (arrow).

precise assessment. CT of the chest detected a 2.8×2.0 cm calcified mass in the left atrium (Fig. 1B). Echocardiography revealed a mobile mass attached to the interatrial septum superior to the posterior mitral valve leaflet (Fig. 1C). Since the mass was mobile and the risk of embolization was high, we decided to remove the mass surgically. Arterial cannulation for the aorta and venous cannulation for the superior and inferior vena cava were employed for cardiopulmonary bypass (CPB). Moderate systemic hypothermia was attained with CPB. The ascending aorta was cross-clamped and a cardioplegic histidine-tryptophan-ketoglutarate solution (Dr. Franz Kohler Chemie GmbH, Bensheim, Germany) was administered via a root cannula in the ascending aorta. The tumor-invaded portion of the atrial septum was completely resected and reconstructed with autologous pericardium. A 3.2×2.0×2.0 cm yellow and ivory-colored hard calcified mass (Fig. 2) attached to the atrial septum without adhesion to the mitral annulus was removed without any surgical complications. The total operation time was 2.5 hours, CPB time was 88 minutes, and aortic cross-clamping time was 52 minutes.

Histopathological examination of the mass revealed diffuse calcification in the stroma, with degenerated amorphous debris, fibrous material, and indistinguishable myxoma or malignant cells (Fig. 3); the patient was diagnosed with a calcified amorphous tumor (CAT) of the heart. On hospital day 12, the patient was discharged without any postoperative complications. The Human Research Ethics Committee of Gyeongsang National University Hospital provided a waiver considering that approval is not necessary for a single case report. The patient provided written informed consent for publication of the clinical details and images.

Discussion

Cardiac CAT is a rare non-neoplastic mass of the heart

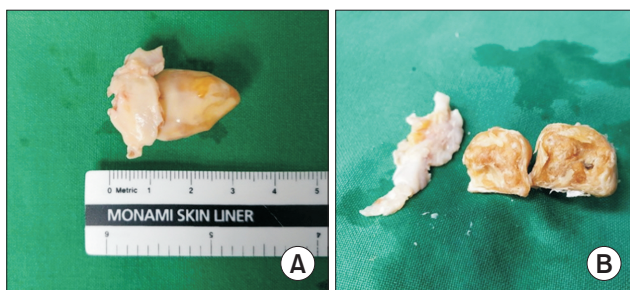


Fig. 2. (A, B) A 3.2×2.0×2.0 cm yellow and ivory-colored hard calcified mass.

with histological characteristics comprising calcification and an amorphous fibrous material [1]. The term CAT was first proposed by Reynolds et al. [2] in 1997 based on the clinical and microscopic appearance of 11 patients at the Mayo Clinic. Although the possibilities of chronic inflammation, hypercoagulability, organized calcific mural thrombus, and abnormal calcium and phosphate metabolism have been mentioned, the etiology of CAT has not been clearly elucidated [3]. Mitral valve disease (31%) is the most commonly associated condition, followed by end-stage renal disease (21%), mitral annulus calcification (MAC) (14%), diabetes (14%), and coronary disease (12%) [1]. CAT can occur in all chambers of the heart, especially around the mitral valve (36%) [1]. The most common symptoms are dyspnea (45%), syncope (21%), pulmonary embolism (8%), and systemic embolism (12%) [1,3]. Although ventricular arrhythmias have been reported, their causal relationship with CAT has not yet been established [4]. The CAT growth rate is not clear; however, it could be relatively fast for MAC-related CAT [4].

CT and echocardiography can help diagnose CAT by detecting calcified masses in the heart [5]. However, it is difficult to clearly differentiate between CAT and osteosarcoma, leiomyosarcoma, calcified myxoma, or vegetation using only cardiac imaging [5]. Reynolds et al. [2] defined CAT as a non-neoplastic cardiac mass consisting of a calcified nodule, fibrous material, and amorphous debris; surgical resection is required for diagnosis. Surgical removal is relatively safe [1]; however, there have been reports of patients who have died while removing the ventricular myocardium [6] and relapsed after incomplete resection [7]. Therefore, complete resection is generally proposed as a therapeutic strategy; however, further studies are needed in patients with diffuse myocardial involvement of CAT [1].

Little is known regarding the incidence, symptoms, and therapeutic strategies for CAT [5]. Prospective studies are

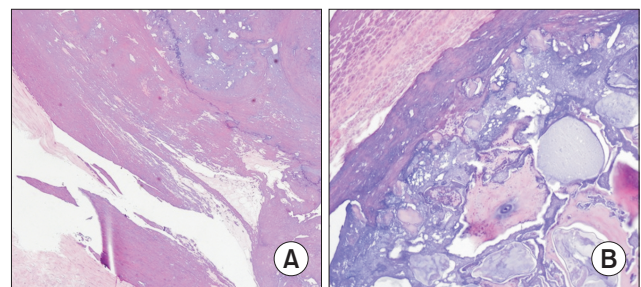


Fig. 3. (A, B) Histologic image of a hematoxylin and eosin–stained calcified amorphous tumor (A: ×100; B: ×200) with diffuse calcification on the background of degenerated amorphous debris and fibrous material.

needed to clearly understand its characteristics. Therefore, we believe that this report provides meaningful clinical data to help understand the characteristics of CAT. We suggest that CAT should be considered if a mass shows distinct characteristics from those of general myxoma in a preoperative examination.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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