JACC: CASE REPORTS VOL. 4, NO. 2, 2022

IMAGING VIGNETTE

INTERMEDIATE

CLINICAL VIGNETTE

Multiple Cardiac Calcified Amorphous Tumors

Yuto Suetani, MD,[a] Yoh Arita, MD, PhD,[a] Kenji Tanaka, MD,[b] Masako Okada, MD,[c] Nobuyuki Ogasawara, MD[a]

ABSTRACT

A 61-year-old woman who underwent hemodialysis presented with heart failure. Echocardiography revealed multiple mobile masses in the left atrium. The masses were excised, and histopathologic examination revealed calcified amorphous tumors. Here, we present several echocardiography images, including 3-dimensional transesophageal echocardiography, demonstrating the revolving masses in the left atrium. (**Level of Difficulty: Intermediate.**)
(J Am Coll Cardiol Case Rep 2022;4:91-93) © 2022 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

CASE PRESENTATION

A 61-year-old woman undergoing hemodialysis for 6 years was hospitalized in a referral hospital for infected ulceration of the lower limbs. Because transthoracic echocardiography (TTE) revealed mobile masses suggestive of infective endocarditis (IE), she was transferred to our hospital (Japan Community Healthcare Organization Osaka Hospital, Osaka, Japan). On admission, she presented with New York Heart Association (NYHA) functional class III heart failure and needed hemodialysis using nafamostat mesylate without clinically problematic arrhythmias, stroke, and transient ischemic attack. Her laboratory examination showed a C-reactive protein (CRP) level of 6.58 mg/dL (normal range 0-0.14 mg/dL), procalcitonin of 0.68 ng/mL (normal range 0-0.5 mg/mL), and an estimated glomerular filtration rate of 7.8 mL/min/1.73 m^2. The platelet count, prothrombin time, activated partial thromboplastin time, and prothrombin time-international normalized ratio were within a normal range. Chest radiography revealed cardiomegaly and pulmonary congestion. TTE revealed severe mitral regurgitation (MR) (maximal MR jet area / left atrium area = 47%), moderate mitral stenosis (MS) (1.47 cm^2 by planimetry methods), moderate aortic stenosis (mean pressure gradient 32 mm Hg). and moderate tricuspid regurgitation (peak pressure gradient 54 mm Hg) with pulmonary hypertension (**Figure 1A,** Video 1). Transesophageal echocardiography demonstrated 3 mobile masses in the left atrium (**Figure 1B,** Video 2). Two of the 3 masses were located in the posterior mitral annulus, and the other mass was attached to the mitral valve posterior leaflet accompanied by severe MR (**Figure 1C,** Video 3). Abdominal computed tomography revealed splenic infarction as a part of systemic embolism. The masses were excised during emergency surgery. Aortic and mitral valve replacements were also performed. Pathologic examination of the excised masses revealed calcification and fibrous degeneration (**Figure 1D**). No inflammatory or malignant cells were observed. These findings confirmed the diagnosis of calcified amorphous tumors (CATs).

From the [a]Department of Cardiology, Japan Community Healthcare Organization Osaka Hospital, Osaka, Japan; [b]Department of Cardiovascular Surgery, Japan Community Healthcare Organization Osaka Hospital, Osaka, Japan; and the [c]Clinical Laboratory, Japan Community Healthcare Organization Osaka Hospital, Osaka, Japan.
The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

Manuscript received May 27, 2021; revised manuscript received August 10, 2021, accepted August 26, 2021.

ISSN 2666-0849 https://doi.org/10.1016/j.jaccas.2021.08.018

ABBREVIATIONS AND ACRONYMS

CAT = calcified amorphous tumor

CRP = C-reactive protein

IE = infective endocarditis

MR = mitral regurgitation

MS = mitral stenosis

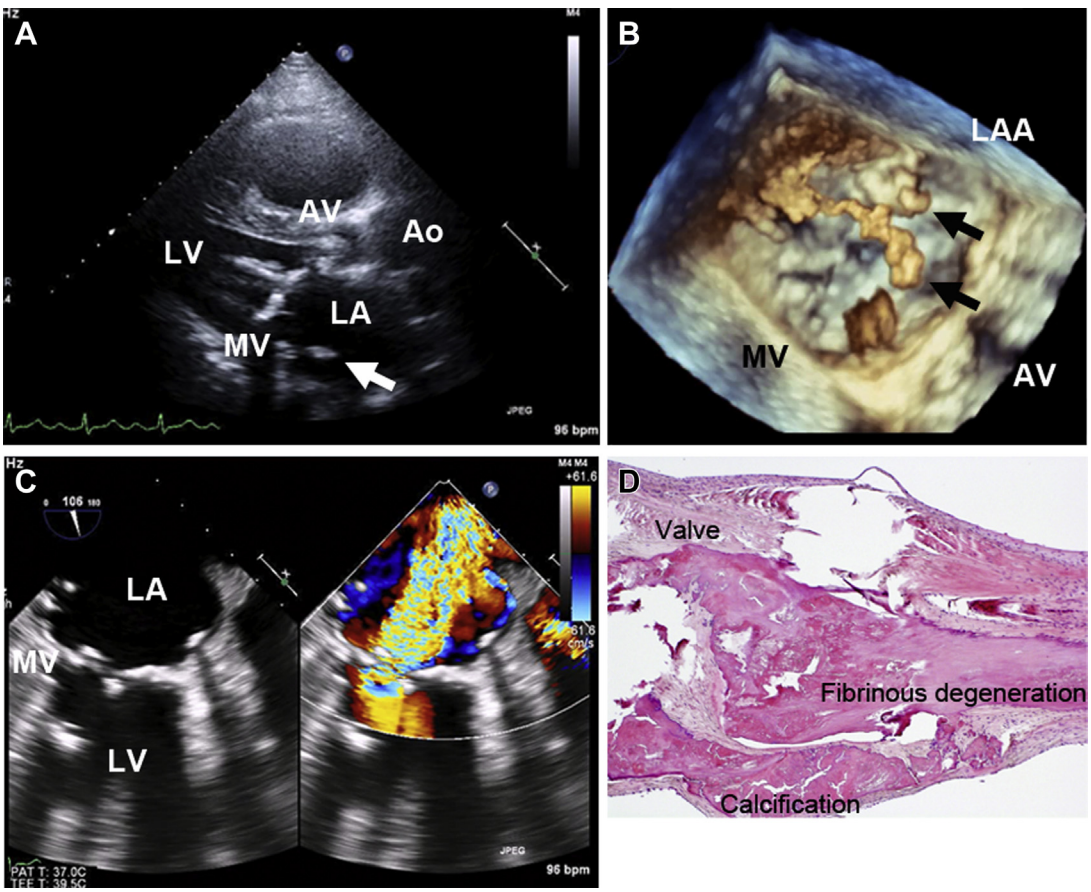
NYHA = New York Heart Association

TTE = transthoracic echocardiography

Postoperatively, the patient's symptoms improved to NYHA functional class I. However, the patient had progressive leg ulceration and underwent leg amputation.

Cardiac CATs, often reported in patients with end-stage renal disease or undergoing hemodialysis, are described as non-neoplastic masses characterized by nodular calcification in the background of degenerating blood elements and chronic inflammation (1). CATs have been found in all cardiac chambers. However, mobile CATs indicate an impending risk for stroke or other systemic embolism and should be regarded as distinct from immobile CATs (2). In addition, mobile CATs can interfere with blood flow through the mitral valve, as in our case. The mean pressure gradient of the mitral valve was 15 mm Hg, which could be considered severe MS, but the valve area was 1.47 cm^2, indicating moderate MS. Cardiac CATs accompanied by IE have also been reported (3). However, our patient did not present with typical symptoms such as Osler nodes, Janeway lesions, and conjunctival hemorrhages. The blood culture results for bacterial infection were negative, and the evidence of IE was not obtained by pathologic examination. Therefore, the possibility of cardiac CAT accompanied by IE was excluded in our case. The elevated CRP level was considered to be caused by the infection in the lower limbs. In conclusion, CATs cannot be diagnosed using imaging modalities alone. The final diagnosis is made on the basis of pathologic examination.

FIGURE 1 Cardiac Calcified Amorphous Tumor



(A) Transthoracic echocardiography (parasternal long-axis view) shows a mobile mass attached to the left atrium **(arrow). (B)** A 3-dimensional transesophageal echocardiography image shows mobile masses in the left atrium **(arrows). (C)** Transesophageal echocardiography shows severe mitral regurgitation. **(D)** Hematoxylin and eosin staining of the excised masses shows dense calcification and fibrous degeneration (magnification ×20). Ao = aorta; AV = aortic valve; LA = left atrium; LAA = left atrial appendage; LV = left ventricle; MV = mitral valve.

FUNDING SUPPORT AND AUTHOR DISCLOSURES

The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

ADDRESS FOR CORRESPONDENCE: Dr Yoh Arita, Department of Cardiology, Japan Community Healthcare Organization (JCHO) Osaka Hospital, 4-2-78, Fukushima, Fukushima-ku, Osaka 553-0003, Japan. E-mail: arita-yo@osaka.jcho.go.jp.

REFERENCES

1. Kyaw K, Latt H, Aung SSM, Roongsritong C. A case of cardiac calcified amorphous tumor presenting with concomitant ST-elevation myocardial infarction and occipital stroke and a brief review of the literature. *Case Rep Cardiol*. 2017;2017:8578031.

2. Kubota H, Fujioka Y, Yoshino H, et al. Cardiac swinging calcified amorphous tumors in end-stage renal failure patients. *Ann Thorac Surg*. 2010;90:1692–1694.

3. Okazaki A, Oyama Y, Hosokawa N, Ban H, Miyaji Y, Moody S. The first report of calcified amorphous tumor associated with infective endocarditis: a case report and review of literature. *Am J Case Rep*. 2020;21:e922960.

KEY WORDS calcified amorphous tumor, heart failure, infective endocarditis, echocardiography

APPENDIX For supplemental videos, please see the online version of this paper.