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Case Report

Mobile thrombus originating from densely calcified mitral annulus with cerebral embolism

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ABSTRACT

Mitral annular calcification (MAC) has been considered a predisposition and an association of thrombo-embolic disease. Superimposed thrombus on MAC is under-appreciated as a potential cause of systemic thrombo-embolism. This report describes an elderly gentleman, who had recurrent cerebral embolism and in one of the episodes, a large mobile thrombus was detected on the ventricular surface of calcified mitral annulus. The thrombus disappeared after initiation of anti-coagulation.

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1. Introduction

Mitral annulus calcification (MAC) is a non-inflammatory chronic degenerative process of the fibrous support structure of the mitral valve, preferentially involving the posterior part of the mitral annulus and often associated with risk factors of athero-thrombosis.¹ It is observed in 10% of the elderly men and about 16% of the elderly women.² MAC may also occur in younger patients with advanced renal disease or other metabolic disorders that result in abnormal calcium metabolism. The putative sequelae of MAC include mitral stenosis, mitral regurgitation, infective endocarditis, atrial arrhythmias, heart block, congestive heart failure and stroke.³ The Framingham study revealed that stroke was twice more frequent in patients with MAC despite adjustment for conventional risk factors and independent of presence or absence of atrial fibrillation and/or heart failure.² A possible link between MAC and cerebral embolism was reported in a study that comprised 16 autopsies, but none of which showed

a thrombus on the mitral annulus.⁴ A recent study has shown spontaneous fistulization of the caseous calcification and extrusion of the cheesy material mixed with calcium as the mechanism of embolic stroke.⁵ The exact mechanism of stroke in MAC is speculative and possibly multi-factorial; however a total of about twenty cases have been reported so far in the literature with vanishing mobile masses on the calcified annulus consistent with thrombi.⁶⁻¹⁴ This report deals with an elderly person with recurrent cerebral embolism, who was detected to have a large mobile mass on the ventricular surface of the mitral annulus consistent with thrombus in one of the several echocardiographic examinations. The mass and neurological symptoms disappeared on anti-coagulation.

2. Case report

A 73-year-old man with long-standing diabetes mellitus, hypertension and previous coronary bypass surgery

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was admitted to this hospital with a several-day history of light-headedness, followed by a sudden onset of loss of speech and cognition. He was on long-term aspirin and statin therapy. CT scan and MRI of brain showed a fresh frontal lobe infarct with several old infarcts. A year prior to that, he had similar complaints with unsteady gait and frequent falls. Detailed neurological examination at that time revealed some small fresh cerebral infarcts but no significant carotid artery disease and 24-h Holter monitoring showed no atrial fibrillation. Six months prior to index hospitalization, he had almost similar complaints of giddiness, unsteady gait and forgetfulness. Detailed cardiac and neurological examination, at that time, revealed a fresh lacunar infarct, dense mitral annular calcification with no thrombus and normal left ventricular function on transthoracic echocardiogram (TTE) and first-degree atrio-ventricular block (PR interval 320 ms). He was implanted with a dual-chamber pacemaker with some relief of symptoms. In the latest hospitalization, his physical examination showed a pulse rate of 88 beats/min (atrial-sensed and ventricular paced rhythm on ECG) and a blood pressure of 132/72 mmHg; his other findings were some neurological deficit in right lower limb and memory loss which gradually recovered over next five days. Laboratory studies showed anemia (hemoglobin level of 11.1 g/dl), with the following levels: serum creatinine, 1.24 mg/dl; total protein, 5.7 g/dl; albumin, 2.9 g/dl; blood sugar, 158 mg/dl; plasma homocysteine level of 16 pg/mL, calcium, 8.1 mg/dl; sodium 129 meq/L and phosphate, 4.3 mg/dl. Other basic laboratory data were normal. Immediately, he received anticoagulation therapy with heparin in combination with

anti-platelet therapy of 150 mg/day oral aspirin and 75 mg/day clopidogrel. He was again referred for an echocardiogram to evaluate the underlying heart disease and a possible embolic source. TTE showed not only normal left ventricular function, moderate mitral regurgitation, normal sizes of cardiac chambers, but also the presence of a single mobile mass (16 mm × 8 mm) superimposed on the ventricular side of the calcified mitral annulus of the posterior leaflet (Figs. 1 and 2, Video 1). After comparing echocardiographic images with her last two studies (1 year and six months before admission), we were able to verify the newly developed mobile mass on the MAC.

The mass was on the ventricular surface of the postero-medial annulus at the top of a calcified ridge, highly mobile and echo-dense. There was no clinical or echocardiographic evidence of infective endocarditis. Multi-planar reconstruction of the 3D echocardiographic acquisition showed the mass to be of uniform density and not obstructing the mitral orifice (Fig. 3). Doppler duplex examination of the neck vessels showed small, calcified plaques in both internal carotid arteries. Thus, 2 mg/day oral warfarin was started and gradually increased to get INR in therapeutic range. Additional laboratory tests including 2 sets of tests for blood cultures, coagulation function (antithrombin-III, fibrin degradation products, protein C, and protein S), tumor markers (carcinoembryonic antigen, CA19-9), and autoimmune antibodies (anti-nuclear antigen, anti-DNA antigen, and anti-cardiolipin IgG) were negative. After two weeks of anticoagulation, TTE was repeated and the mobile mass was no longer present (Figs. 1 and 3). Real-time, three-dimensional trans-thoracic echocardiography was successfully used to visualize the mobile mass on the MAC (Fig. 3, Video 2).

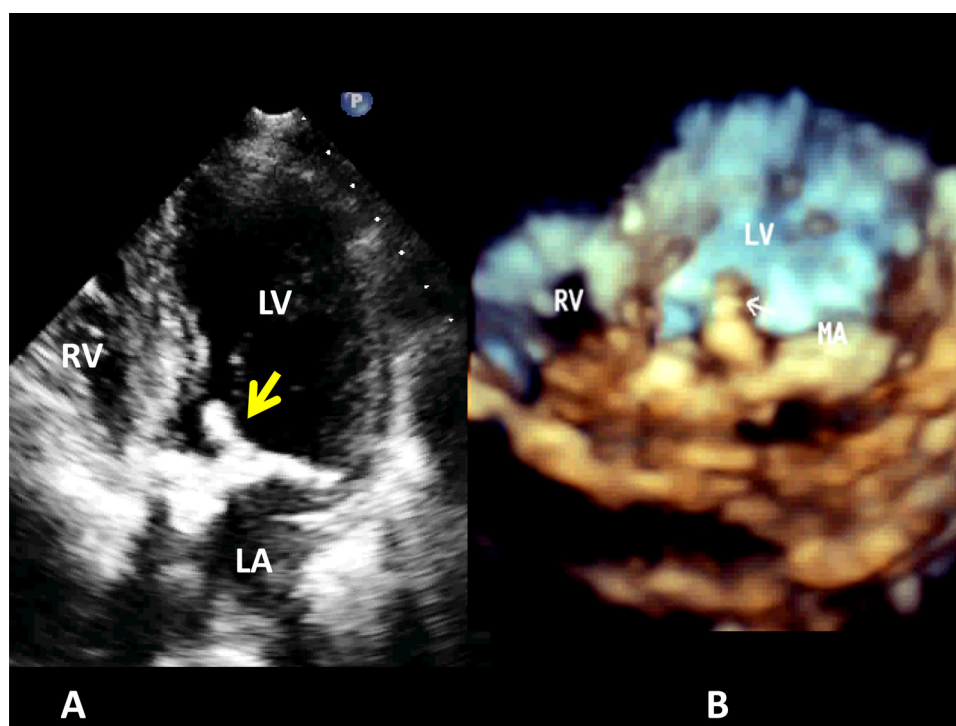


Fig. 1 – Modified 4-chamber view (A) showing an oblong echo-dense mass on MAC (yellow arrow). Real-time 3D echocardiographic image (B) showing the mass (white arrow).

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