

INTERVENTIONS

CASE REPORT: CLINICAL CASE

Percutaneous Vacuum-Assisted Aspiration of Mobile Caseous Mitral Annulus Calcification



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ABSTRACT

A 68-year-old woman presented with an incidentally found intracardiac mass. Transesophageal echocardiography (TEE) showed a 26 × 8 mm mobile mass attached to a calcified posterolateral mitral annulus. The mass was removed with a commercially available percutaneous catheter system using cerebral embolic protection and TEE guidance. The pathologic examination showed caseous mitral annular calcification. (J Am Coll Cardiol Case Rep 2024;29:102182) © 2024 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/>).

HISTORY OF PRESENTATION

A 68-year-old woman underwent evaluation of atypical chest pain. Physical examination was within normal limits except for grade 2/6 systolic ejection murmur at the right upper sternal border. Transthoracic echocardiography showed a mobile mass in the left atrium attached to the calcified mitral annulus.

PAST MEDICAL HISTORY

Past medical history included end-stage renal disease on hemodialysis via right upper extremity

LEARNING OBJECTIVES

- To be able to make a differential diagnosis of intracardiac masses.
- To understand the role of percutaneous vacuum-assisted devices in the treatment of intracardiac masses.

arteriovenous fistula, chronic hypoxic respiratory failure, type 2 diabetes mellitus, and obesity

DIFFERENTIAL DIAGNOSIS

The differential diagnosis included vegetation, thrombus, or intracardiac tumor.

INVESTIGATIONS

Transesophageal echocardiography (TEE) confirmed the 26 × 8 mm mobile mass with a single stalk arising from the posterolateral mitral annulus (**Figure 1**). Cardiac computed tomography characterized a filamentous, highly calcified mass attached to a focal calcified area in the posterior mitral annulus, which extruded across the mitral valve orifice during diastole. Infective endocarditis work-up was negative.

MANAGEMENT

Given the large size, location, and mobility with concern for embolization, removal of the mass was planned. A multidisciplinary heart team concluded

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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](#).

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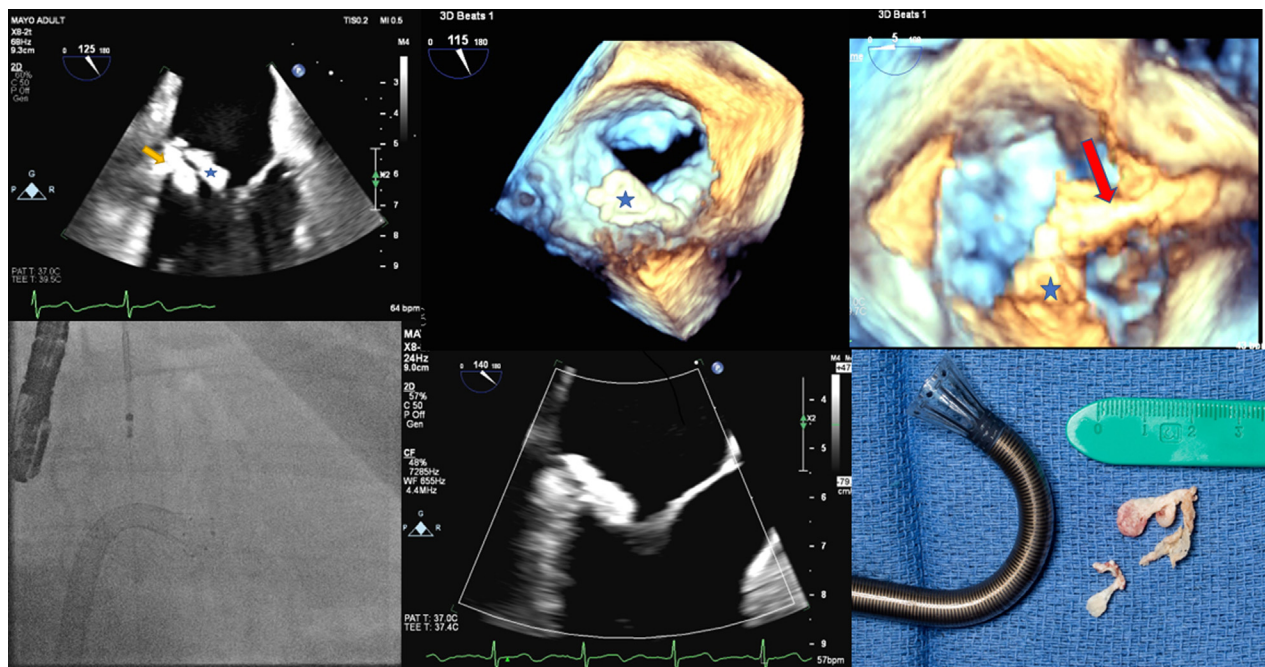
**ABBREVIATIONS
AND ACRONYMS****TEE** = transesophageal
echocardiogram

that the patient was at prohibitively high risk for surgical excision. The patient therefore opted for removal of the mass with a commercially available percutaneous vacuum-assisted system. The procedure was performed under general anesthesia with fluoroscopic and TEE guidance. Vascular access was obtained in the bilateral radial arteries and bilateral femoral veins. Bilateral Sentinel devices were deployed with filters in the right brachiocephalic, left carotid, and left subclavian arteries for full cerebral protection, with careful manipulation of the wire and device through the existing right upper extremity fistula. Transseptal puncture was performed, and septostomy was dilated with the use of a 12-mm ZMed balloon. The AngioVac catheter was then advanced via right femoral vein to the left atrium and connected to a left femoral vein reperfusion cannula (Figure 1). The device was directed under TEE and fluoroscopic guidance toward the mass, and a large quantity of material was successfully removed (Figure 1, Video 1). TEE demonstrated no visible residual mass and no significant change in mitral valve

function (Figure 1). The bilateral Sentinel filters were recaptured with a small amount of filamentous material noted in the right-side filter. The septostomy was not closed after the procedure. There were no intraprocedural complications. Pathology of the removed tissue demonstrated extensive amorphous calcification debris and fibrin, consistent with caseous mitral annular calcification (Figure 1).

DISCUSSION

Intracardiac masses are frequently identified on cardiac imaging. Treatment of these masses can be challenging owing to different underlying disease processes and patient characteristics. Mass removal is considered when there is concomitant valvular dysfunction, systemic thromboembolism, or need for tissue diagnosis, or in the presence of high-risk features for systemic embolism such as large size (>10 mm), mobility, and mitral valve involvement.^{1,2} Surgical resection is the standard of care if mass removal is indicated. In patients with prohibitive surgical risk, percutaneous transcatheter systems

FIGURE 1 Vacuum-Assisted Mitral Valve Mass Extraction

(Top left) Midesophageal mitral valve inflow view showing 26 × 8 mm mass (star) attached to posterior MAC (arrow). (Top center) Three-dimensional (3D) en face view of the mitral valve demonstrating the mass (star) attached to the posterior mitral valve annulus with a stalk. (Top right) 3D view showing AngioVac catheter (arrow) attached to the mass (star). (Bottom left) Anteroposterior view showing the position of AngioVac catheter. (Bottom center) Two-dimensional midesophageal mitral valve inflow view after mass removal. (Bottom right) Pathologic specimen.

have emerged since 2011 as an alternative means of intravascular mass removal.³ The AngioVac system (AngioDynamics) is a vacuum-assisted device originally approved in 2014 for removal of intravascular thrombus. Since then, there is growing evidence of its successful use in other intracardiac masses, such as valvular lesions and pacemaker lead vegetations in patients at high surgical risk.^{4,5} Mobile caseous mitral annulus calcification is a rare phenomenon and is associated with embolic strokes and increased risk of infective endocarditis. Surgical removal is rarely performed owing to high operative risk.⁶ Here we demonstrate that such a mass can be successfully removed with the use of the AngioVac system. Although promising, percutaneous vacuum-assisted devices are not without risk, such as distal embolization, valvular injury, and vascular access complications. Further studies are needed to establish its potential role and risks.

FOLLOW-UP

The patient had an uneventful postprocedure hospital course and was discharged home.

CONCLUSIONS

Percutaneous vacuum-assisted removal is a feasible and safe alternative to surgical removal of intracardiac masses in selected individuals.

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

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KEY WORDS intracardiac mass, mitral annulus calcification, percutaneous aspiration

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