

# Mitral Valve Aspergilloma in an Immunocompromised Patient with Recurrent Cerebrovascular Accidents



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## INTRODUCTION

Echocardiography is a useful tool when there is concern for a possible cardiac source of systemic embolization. Determining the etiology of a cardiac mass with transthoracic and transesophageal echocardiography can assist in this challenging task. A patient's clinical presentation and medical history along with the features identified on transthoracic and transesophageal echocardiography can be useful in narrowing a differential diagnosis. Often histopathology of embolic material or the mass itself may ultimately be required to arrive at the diagnosis. We present the case of an immunocompromised patient who presented with recurrent multiterritory strokes and was subsequently found to have a cardiac mass, seen on transesophageal echocardiography, of unclear etiology concerning for the source of embolic disease.

## CASE PRESENTATION

A 58-year-old woman with ulcerative colitis, previously treated with dexamethasone for immunosuppressive therapy, presented to the hospital with sudden onset of a frontal headache, expressive aphasia, and progressively worsening blurry vision of 1 hour in duration. Computed tomography of the head showed a right occipital intraparenchymal hemorrhage; computed tomographic angiography revealed an occluded branch of the left middle cerebral artery. In view of the multiple neurologic findings, a cardiac source was sought. Transthoracic echocardiography revealed a large, complex, multi-lobed, mobile mass on the atrial and ventricular surfaces of the mitral valve, associated with mild mitral regurgitation (Video 1). The multi-lobulated mass measured  $1.2 \times 1.7$  cm on the ventricular aspect of the valve and  $1.2 \times 0.7$  cm on the atrial aspect (Figure 1A–D) and contained mobile elements, resulting in mild mitral regurgitation. Initially the mass was thought to most likely represent a myxoma, in view of its appearance, though the lack of a characteristic stalk and its attachment to both the ventricular and atrial aspects of the valve

## VIDEO HIGHLIGHTS

**Video 1:** Transesophageal echocardiography, midesophageal window, two-dimensional five-chamber view of the large mitral valve mass displayed in systole.

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were not characteristic. Also within the differential diagnosis was infectious endocarditis given her immunocompromised state as well as nonbacterial thrombotic endocarditis (NBTE) and its subtypes (Libman-Sacks endocarditis and marantic endocarditis). She was empirically treated with broad-spectrum antibiotics; however, blood cultures obtained during multiple different time points throughout her admission were negative for bacteria or fungi. An initial positive result on  $\beta$ -D-glucan antigen analysis, used to detect a broad range of fungal antibodies, was thought to be a false positive. Given her persistently negative cultures, antiphospholipid antibody and disseminated intravascular coagulation panels were completed, with negative results. Her hospital course was further complicated by progressive bilateral vision loss as well as new right hemiplegia. Imaging studies showed an occlusion of the left M1 middle cerebral artery. Recanalization was complicated by right femoral artery occlusion, which required thromboendarterectomy. Evaluation of the clot showed polymerase chain reaction positive for *Aspergillus fumigatus*. An ophthalmology consultant performed an anterior chamber aspiration, and cultures were negative. Given the size of the cardiac mass, its appearance, and continued embolic events, cardiothoracic surgery was consulted, and the patient ultimately underwent surgical excision of the mass with bioprosthetic mitral valve replacement. Gross specimen following surgical valve replacement (Figure 2) showed septated hyphae on histopathologic examination (Figures 3 and 4) consistent with *Aspergillus*. A subsequent mycobacterial culture from the tissue sample was negative for mycobacteria but grew *A fumigatus*. She was initiated on intravenous voriconazole for acute treatment, followed by lifelong suppressive treatment.

## DISCUSSION

Fungal endocarditis accounts for <2% of cases of endocarditis, but its prevalence is increasing with advancing medical and surgical therapies. *Aspergillus* is a ubiquitous fungal organism whose spores are easily inhaled and rarely can invade the heart. Cardiac aspergilloma has been reported to invade native and prosthetic valves, most commonly the aortic and mitral valves, as well as the right ventricle, left ventricle, and intraventricular septum.<sup>1</sup> This opportunistic infection accounts for 20% to 25% of fungal endocarditis, occurs more

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Keywords: Transesophageal echocardiography, Cardiac mass, Aspergilloma, Cardiac myxoma, Nonbacterial thrombotic endocarditis

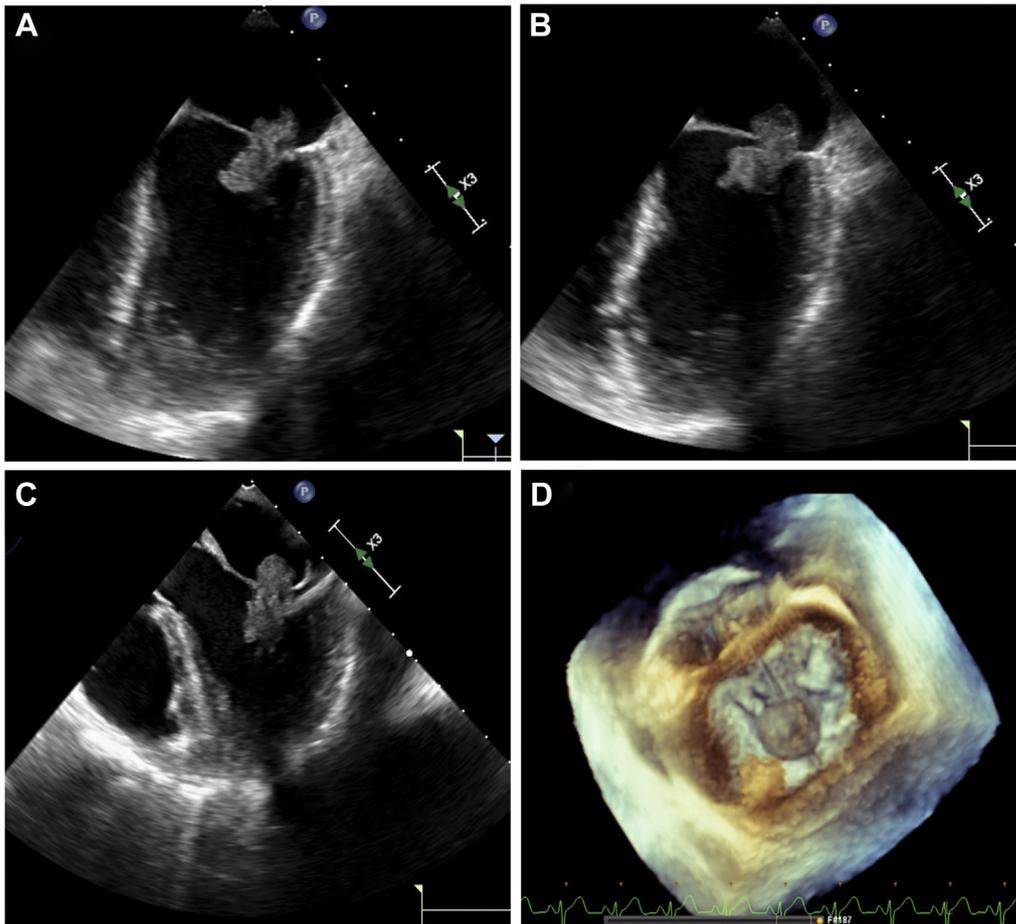
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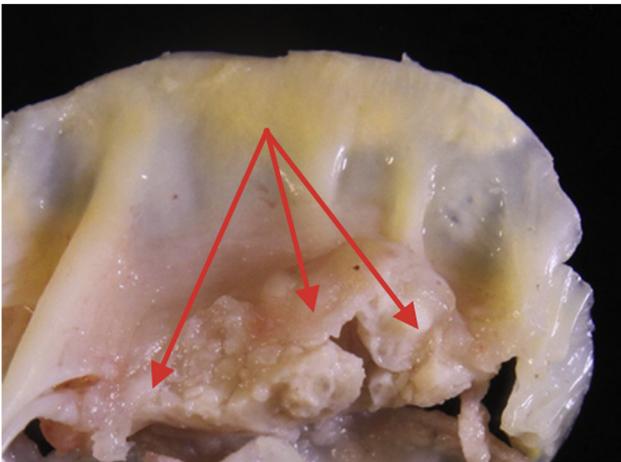
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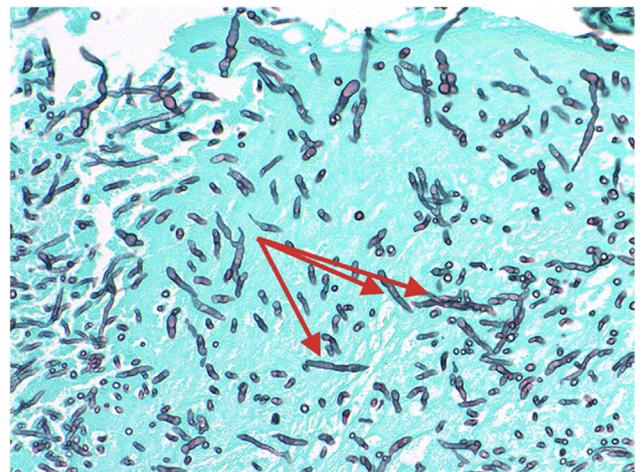
<https://doi.org/10.1016/j.case.2021.09.009>



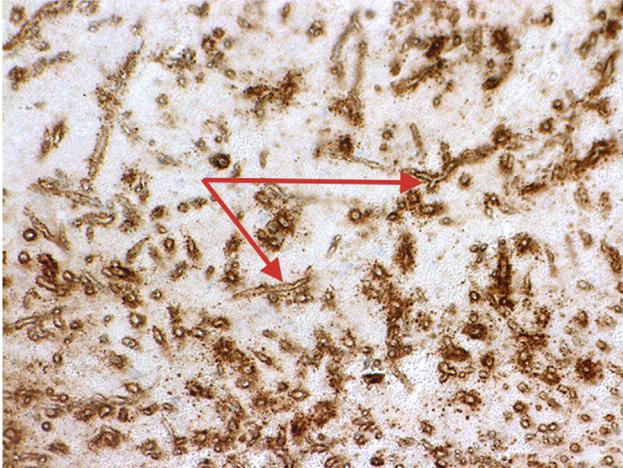
**Figure 1** Transesophageal echocardiography, midesophageal window, two-dimensional and three-dimensional systolic images. **(A)** Four-chamber display demonstrating the large mass attached to the atrial and ventricular surface of the mitral valve leaflets. **(B)** Slightly rotated rightward with a higher transesophageal angle to further illustrate the mass. **(C)** Five-chamber display to demonstrate the relationship of the mass to the left ventricular outflow tract. **(D)** Three-dimensional volume-rendered image (surgeon's view) of the large mitral valve mass from the perspective of the left atrium.



**Figure 2** Gross image of the mitral valve showing multiple irregular tan fleshy masses extending down into the base of the mitral leaflet involving one chordae tendineae, in total measuring  $2.8 \times 1.8 \times 1.4$  cm.



**Figure 3** Gomori methenamine silver stain showing numerous acute angle branching, septated, partially degenerated fungal hyphae.



**Figure 4** Brown-Hopps and Steiner stains also highlighted narrow septate hyphae with acute angle branching, as seen in Figure 3.

commonly in immunocompromised patients, and carries a poor prognosis with mortality rates of approximately 80%.<sup>2</sup>

It can be difficult to distinguish cardiac aspergilloma from other types of cardiac masses such as a myxoma or NBTE (Libman-Sacks endocarditis, marantic endocarditis). All can present as large, bulky, and mobile pedunculated masses. Furthermore, each can present with systemic embolization.<sup>3,4</sup> Surgical excision is critical to prevent embolization while allowing histologic examination and accurate diagnosis and treatment. Cardiac aspergilloma initially requires treatment with antifungal agents such as voriconazole or liposomal amphotericin, followed by lifelong antifungal treatment postsurgical valve replacement.<sup>2</sup>

## CONCLUSION

This case highlights an immunocompromised patient with recurrent multiterritory embolic disease found to have atypical-appearing cardiac mass on transthoracic echocardiography. The initial differential

diagnosis included myxoma, NBTE, and infectious endocarditis. Its appearance seemed atypical for myxoma given its presence on both the atrial and ventricular portions of the mitral valve as well as the absence of attachment to the interatrial septum. NBTE was considered given its appearance and the lack of valvular destruction although the patient did not have an underlying malignancy, systemic lupus erythematosus, or coagulation abnormalities, which are commonly seen in NBTE (Libman-Sacks endocarditis, marantic endocarditis).<sup>3,5</sup> Infectious endocarditis was also included in the differential diagnosis given her immunocompromised status, though it was considered less likely, as the mitral valve was intact and the culture was persistently negative for bacterial organisms. Evaluation of the clot obtained during thromboendarterectomy and histopathology following removal of the mass with subsequent valve replacement led to identification of the etiology of endocarditis as attributable to *Aspergillus*.

## SUPPLEMENTARY DATA

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.case.2021.09.009>.

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