

# Chasing Ghosts: Unexplained Artifactual Echogenicity on the Aortic Valve Leading to Unwarranted Surgery



Daina Blitz, MD, Feroze Mahmood, MD, Mayanka Tickoo, MD, Robert Schonberger, MD, and Amit Bardia, MD, *New Haven, Connecticut; and Boston, Massachusetts*

## INTRODUCTION

Cardiac papillary fibroelastoma is a benign endocardial papilloma. The prevalence of intracardiac tumors ranges between 0.02% and 0.45%, with fibroelastoma being the second most common primary cardiac tumor and the most prevalent valvular tumor, with the aortic valve being the most frequently affected.<sup>1</sup> Clinically, patients with fibroelastomas often present with thromboembolic events. If the lesion is symptomatic, surgical resection is recommended to prevent further embolic or thromboembolic events. If it is found incidentally, the decision to resect is made on a case-by-case basis.<sup>2,3</sup>

Echocardiographic artifacts can sometimes be mistaken as a true pathology. Differentiating artifacts from cardiac lesions is extremely critical, as it can lead to unwarranted surgery. We present the case of a patient who presented with a stroke and an echocardiographic artifact masquerading as a papillary fibroelastoma.

## CASE PRESENTATION

A 44-year-old man with no significant medical history presented to the emergency department with sudden onset of right arm and leg sensory deficits, word-finding difficulty, and poor coordination. The patient was on no medications and had no allergies. His family history was remarkable for a mother with first stroke at 35 years of age with multiple subsequent strokes and a father with a stroke at 52 years of age. The patient's social history was notable for heavy smoking and alcohol use. There was no history of intravenous drug use.

Initial magnetic resonance imaging (MRI) of the brain revealed acute ischemic stroke in the left thalamus and scattered foci of restricted diffusion in the left occipital lobe concerning for multiple, small embolic strokes. Upon further evaluation, transthoracic echocardiography was performed and was notable for a very small patent foramen ovale, no significant valvular regurgitation or stenosis, and normal biventricular function (ejection fraction > 65%). Most notably, a poorly defined echogenicity was visualized on the transthoracic echocardiographic images. The poor quality of the images precluded

making a definitive diagnosis, which prompted transesophageal echocardiography (TEE) for more specificity (Figure 1, Video 1). On the basis of the imaging, the echogenicity was thought to be a cardiac papillary fibroelastoma.

Considering the patient's clinical presentation, and the finding on echocardiography, the decision was made to resect the mass to prevent further embolization. The structure was again visualized during intraoperative TEE (Figures 2-4, Videos 2 and 3). However, after cardiopulmonary bypass was initiated and upon exposure of the aortic valve, no mass, thrombus, or vegetation could be identified on the leaflets or sinuses, despite prolonged exploration by two experienced cardiac surgeons. Postbypass TEE revealed continued presence of the echogenicity (Figures 5 and 6, Video 4).

Ultimately, the patient underwent cardiac MRI, which revealed a trileaflet aortic valve with no evidence of any mass or vegetation associated with the aortic valve. Given the knowledge of a small patent foramen ovale, a lower extremity Doppler scan was subsequently ordered and found to be negative for deep venous thrombi. On further workup, the patient was also found to have factor V Leiden deficiency, which might have been the cause of his cerebral vascular incident.

## DISCUSSION

This case demonstrates the visualization of an echogenicity associated with the aortic valve on echocardiography appearing to be a fibroelastoma and correlating with clinical presentation, which may nevertheless represent an echocardiographic artifact. A similar case of a transesophageal echocardiographic artifact mimicking an aortic valve tumor has been described.<sup>4</sup> An important clue suggesting that an echogenicity is artifactual rather than an intracardiac mass is that the echogenicity is not attached to the aortic valve but is rather seen floating in the aortic sinus without a clear-cut origin. Although the exact etiology of the artifact is difficult to determine, reverberation from the aortic leaflets might be contributory. Thus, in the setting of suspected acute embolic events from a papillary fibroelastoma, it is worthwhile to consider further workup, including hypercoagulable studies and cardiac MRI, before proceeding to surgery.

In this case, the patient was at high risk for vascular thrombosis given his factor V Leiden deficiency and the presence of a patent foramen ovale, both of which could be putative causes of paradoxical embolus and stroke. Given the patient's clinical presentation and findings on TEE, the negative findings on cardiac MRI may not have precluded surgery. However, they may have prompted a more focused look at the available clinical and imaging data. This case does not imply that MRI is superior to TEE as an imaging modality for cardiac fibroelastoma; instead it simply draws attention to the possibility of echocardiographic artifacts masquerading as papillary fibroelastoma.

From the Department of Anesthesiology (D.B., R.S., A.B.) and the Department of Pulmonary, Sleep and Critical Care Medicine (M.T.), Yale School of Medicine, New Haven, Connecticut; the Department of Anesthesia, Critical Care and Pain Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts (F.M.).

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## VIDEO HIGHLIGHTS

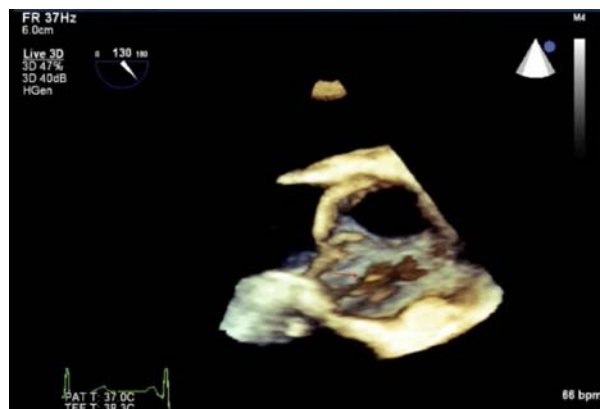
**Video 1:** An echogenicity (*arrow*) is seen associated with the aortic valve using two-dimensional transesophageal echocardiography in the midesophageal long-axis view.

**Video 2:** Three-dimensional transesophageal echocardiography illustrating a mass (*arrow*) associated with the aortic valve.

**Video 3:** Three-dimensional transesophageal echocardiography illustrating papillary mass (*arrow*) associated with the aortic valve.

**Video 4:** Three-dimensional transesophageal echocardiography shows continued presence of the opacity (*arrow*) after weaning from cardiopulmonary bypass.

View the video content online at [www.cvcasejournal.com](http://www.cvcasejournal.com).



**Figure 3** Three-dimensional transesophageal echocardiography illustrating papillary mass (*arrow*) associated with the aortic valve.



**Figure 1** An echogenicity (*arrow*) is seen associated with the aortic valve using two-dimensional transesophageal echocardiography in the midesophageal long-axis view.



**Figure 4** Intraoperative two-dimensional transesophageal echocardiography also reveals an echogenicity (*arrow*) associated with the aortic valve in the midesophageal long-axis view.



**Figure 2** Three-dimensional transesophageal echocardiography illustrating a mass (*arrow*) associated with the aortic valve.



**Figure 5** Three-dimensional transesophageal echocardiography shows continued presence of the opacity (*arrow*) after weaning from cardiopulmonary bypass.



**Figure 6** Midesophageal long-axis view by two-dimensional transesophageal echocardiography shows continued presence of the opacity (*arrow*) after weaning from cardiopulmonary bypass.

## CONCLUSION

Echoluencies associated with the aortic valve can be mistaken for papillary fibroelastomas. Additional imaging studies such as cardiac

MRI may be helpful for confirmation before proceeding to surgery and in determining if surgical exploration is warranted.

## SUPPLEMENTARY DATA

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.case.2019.01.002>.

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