



## Echocardiography-Negative Endocarditis:

# The Importance of a Multi-Modal Imaging Diagnostic Approach in Prosthetic Valve Endocarditis

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### INTRODUCTION

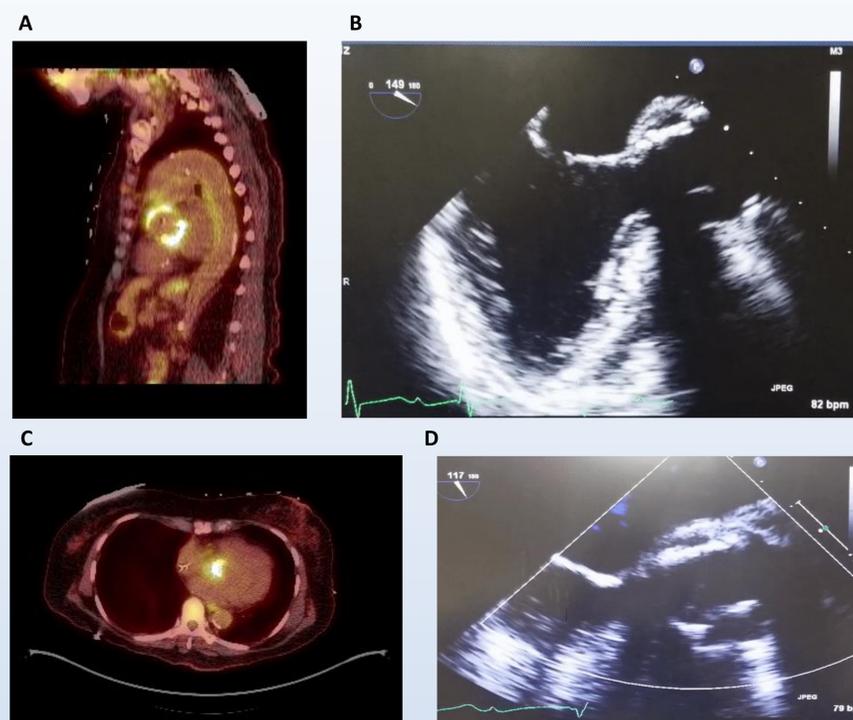
Prosthetic valve endocarditis (PVE) is associated with notable morbidity and mortality and makes up about 10-30% of all cases of infective endocarditis. The initial work up is largely reliant on modified Duke criteria (MDC), which integrates echocardiographic, clinical, and microbiological data to risk stratify patients. However, in up to 30% of cases, echocardiography can be non-diagnostic in PVE. Multimodal imaging techniques can improve PVE diagnostic accuracy in transesophageal echocardiography-negative endocarditis.

### CASE REPORT

A 71-year-old female with a history of severe bicuspid aortic stenosis and aortic root dilation status post Edwards 23mm bioprosthetic aortic valve replacement and Gelweave ascending aortic graft presented with night sweats, rigors, and malaise about three years post-operatively. Blood cultures grew *Streptococcus mitis* and she was empirically treated with synergistic antibiotic therapy for presumed infective endocarditis. However, both transthoracic and transesophageal echocardiography did not reveal the presence of a vegetation. Following the negative results, her antibiotic regimen was deescalated, and fluorodeoxyglucose-positron emission tomography (FDG-PET) was ordered to confirm for any evidence of infection. During the course of her stay, she unfortunately suffered rapid decline requiring ICU admission and high-grade AV block for which she received a permanent pacemaker. FDG-PET ultimately demonstrated hypermetabolic areas involving the aortic valve and proximal aortic arch. At this time, she was reinitiated on appropriate antibiotic therapy for infective endocarditis and cardiac surgery was consulted given concerns for paravalvular/aortic abscess as evidenced by PET imaging.

### IMAGING

**Figure 1:** Multi-modal imaging of echocardiography-negative prosthetic valve endocarditis



**Figure 1A:** 18F FDG PET/CT scan (sagittal view) demonstrating intense FDG activity in the periprosthetic aortic valve replacement concerning for infection.

**Figure 1B:** Transesophageal echocardiography demonstrating normal bioprosthetic AV opening and no vegetation.

**Figure 1C:** 18F FDG PET/CT scan (transverse view) demonstrates intense FDG activity in the perivalvular area of aortic valve replacement suggestive of infection.

**Figure 1D:** Transesophageal echocardiography with the color flow does not show any evidence of abscess.

### CONCLUSION AND DISCUSSION

Over the past decade, several prospective studies have shown that the addition of FDG-PET as a major criterion to the modified Duke criteria increases its sensitivity from 61% up to 97% with comparable specificity. In the 2020 ACC/AHA VHD guidelines, obtaining FDG-PET as an adjunctive imaging modality is a class 2a recommendation when the modified Duke criteria suggests possible endocarditis. In patients with high clinical suspicion for prosthetic valve endocarditis despite negative or equivocal echocardiography, FDG-PET should be pursued in a timely fashion given its high sensitivity and feasibility to prevent inadequate management and complications associated with the disease.

### CITATIONS

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