

# Acute Severe Aortic Regurgitation: Imaging with Pathological Correlation

Rajesh Janardhanan, Ahmed Khurshid Pasha

Department of Medicine, Division of Cardiology, Sarver Heart Center, University of Arizona, Tucson, Arizona, USA

## Abstract

**Context:** Acute aortic regurgitation (AR) is an important finding associated with a wide variety of disease processes. Its timely diagnosis is of utmost importance. Delay in diagnosis could prove fatal. **Case Report:** We describe a case of acute severe AR that was timely diagnosed using real time three-dimensional (3D) transesophageal echocardiogram (3D TEE). Not only did it diagnose but also the images obtained by 3D TEE clearly matched with the pathologic specimen. Using this sophisticated imaging modality that is mostly available at the tertiary centers helped in the timely diagnosis, which lead to the optimal management saving his life. **Conclusion:** Echocardiography and especially 3D TEE can diagnose AR very accurately. Surgical intervention is the definitive treatment but medical therapy is utilized to stabilize the patient initially.

**Keywords:** Aortic regurgitation (AR), three-dimensional transesophageal echocardiogram (3D TEE), *enterococcus faecalis*, perforation, transthoracic echocardiography (TTE), vegetation

**Address for correspondence:** Dr. Rajesh Janardhanan, Banner-University Medical Center, South Sarver Heart Center, Box 245037, 1501 N. Campbell Avenue, Tucson - 85724, Arizona, USA. E-mail: raj@shc.arizona.edu

## Introduction

Aortic regurgitation (AR) implies the return of blood from the aorta into the left ventricle. Its clinical presentation is diverse and hence, causes a delay in diagnosis, leading to deleterious consequences. Its incidence is precisely not known but is more prevalent in men.<sup>[1]</sup> Echocardiography is an important imaging modality, which not only diagnoses it but has a potential to quantitate it as well.<sup>[2]</sup> Surgical management is the definitive treatment for acute AR.

## Case Presentation

A 65-year-old man was admitted with severe sepsis and bacteremia. Blood cultures grew *Enterococcus faecalis*. Initial transthoracic echocardiography (TTE) revealed a large, mobile aortic valve vegetation [Figure 1]

measuring 3 cm × 1.4 cm. There was moderate AR. Real-time three-dimensional (3D)-transesophageal echocardiogram (RT-3DTEE) done a few hours later did not demonstrate the vegetation. Instead, it revealed acute severe AR [Figure 2a and b]. RT-3DTEE identified a large perforation in one of the cusps [Figure 3a and b] causing eccentric AR. Body imaging located a nonocclusive acute thrombus in the left internal iliac artery. This was the site of the embolized vegetation. No acute cerebral emboli/infarction was demonstrated. The patient underwent successful bioprosthetic aortic valve replacement. The findings on the excised aortic valve [Figure 4] correlated well with the preoperative RT-3DTEE. At a 3-month follow-up, TTE showed that the bioprosthetic valve was well-seated and the patient is doing well.

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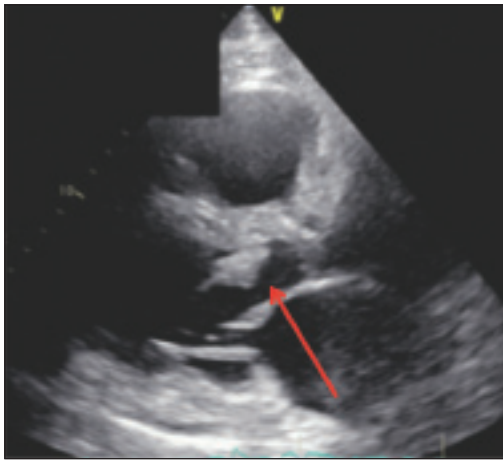
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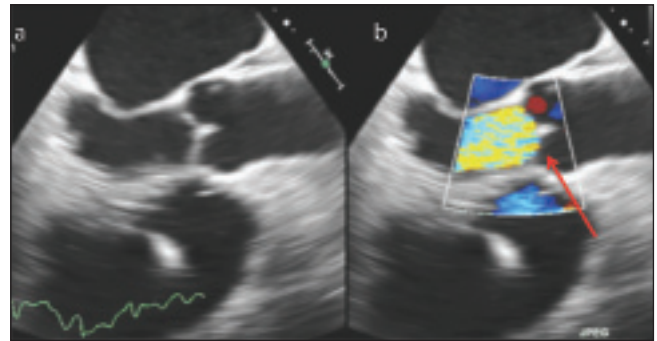


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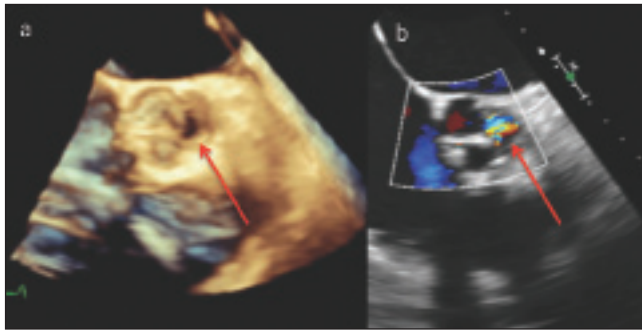
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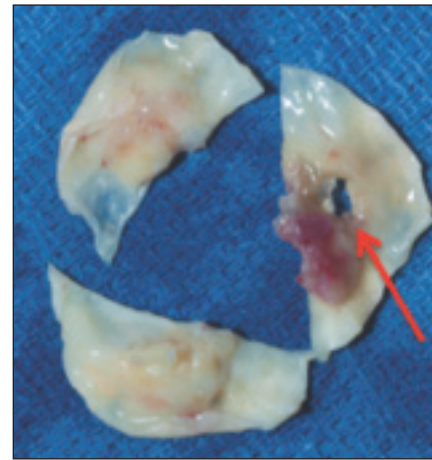
**Figure 1:** Parasternal long axis view on TTE shows large vegetation (red arrow)



**Figure 2:** (a) Vegetation not seen on TEE (b) Acute severe aortic regurgitation seen on TEE (red arrow)



**Figure 3:** (a) Aortic leaflet perforation (red arrow) noted on RT-3DTEE (b) Origin of the eccentric AR (red arrow) from the site of the perforation



**Figure 4:** Gross specimen of excised aortic valve. The red arrow shows the site of perforation

### Discussion

Acute severe AR is a surgical emergency that requires a timely diagnosis. It could be mistaken for a number of acute conditions such as sepsis, pneumonia, nonvalvular heart failure.<sup>[3]</sup> Endocarditis, aortic dissection (type A), ruptured fenestration, blunt chest trauma, and prosthetic valve dysfunction are few important causes of AR. TEE is able to accurately diagnose acute AR if TTE is inconclusive. TEE not only diagnoses the acute regurgitation but is able to provide with the likely mechanism and severity of the regurgitation as well. Furthermore, TEE is helpful to surgeons in terms of planning of operative repair options.

The treatment of acute severe AR is surgery; however, in the meanwhile, medical management is used to stabilize the patient. The key medical therapy is aimed at reduction of afterload to improve forward flow and then, inotropes are used to increase the cardiac output. These patients are critically ill and anesthetizing them is a significant challenge, usually the surgical team is present in the operating room in case if the patient needs

an emergency cardiovascular support. Surgical options depend upon the mechanism of the disease, anatomy, and long-term outcomes.<sup>[4]</sup>

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### Conflict of interest

There are no conflicts of interest.

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