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UTILITY OF CARDIAC COMPUTED TOMOGRAPHY FOR ASSESSMENT OF PROSTHETIC AORTIC VALVE DYSFUNCTION WITH PANNUS FORMATION

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Case Report

A 61-year-old female with a history of atrial fibrillation, and a distant-history mechanical St. Jude's aortic valve replacement, presented after undergoing an episode of ventricular tachycardia and worsening heart failure. A transthoracic echocardiogram revealed a dilated left ventricle (LV) with moderately depressed ejection fraction (LVEF of 44%). The international normalized ratio (INR) was 2.1. The prosthetic valve could not be well visualized; however, the Doppler velocities were suggestive of prosthetic valve dysfunction (Figures 1A and 1B). A transesophageal

echocardiogram conducted to further elucidate the cause was nondiagnostic (Supplement 1). Cardiac multidetector computed tomography (MDCT) was performed to define the etiology of the valve dysfunction. This revealed a severe restricted motion of one of the leaflets (Supplement 2 and 3) as well as a small, low-density mass on the ventricular surface of the leaflet that had an attenuation consistent with that of soft tissue (Figure 2). Based on the clinical and MDCT information, the likely diagnosis was thought to be pannus. The patient underwent valve replacement surgery, and the pannus was confirmed (Figure 3).

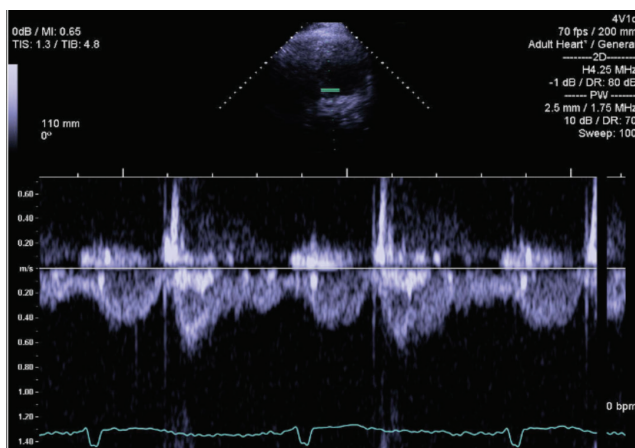
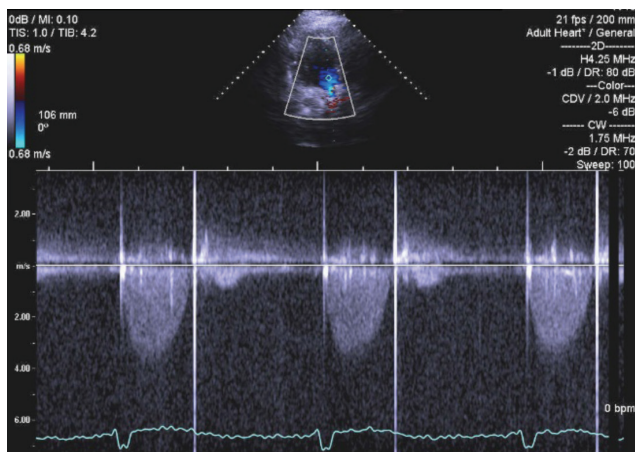
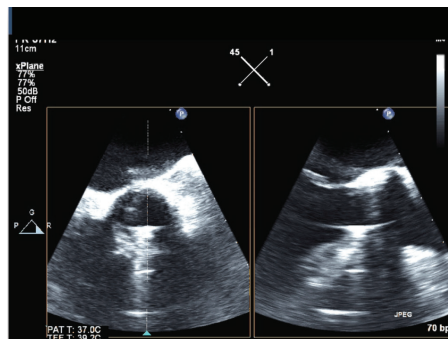


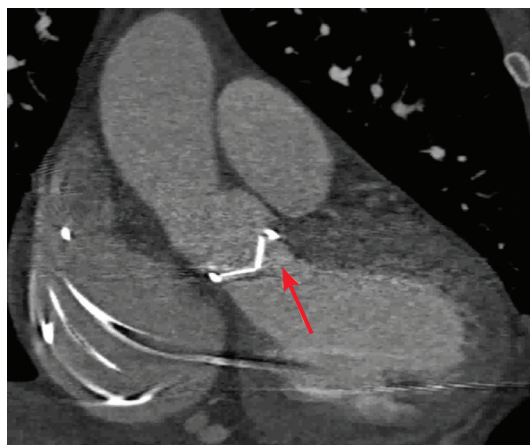
Figure 1. (A) Continuous wave Doppler across the aortic valve showing an increased gradient (peak 3.65m/s mean) across the aortic valve. (B) Pulse wave Doppler across LVOT (left ventricular outflow tract).



Supplement 1. Transesophageal echo with poor visualization of the aortic valve.



Supplement 2. CT images of prosthetic aortic valve.



Supplement 3. Coronal view of prosthetic aortic valve.

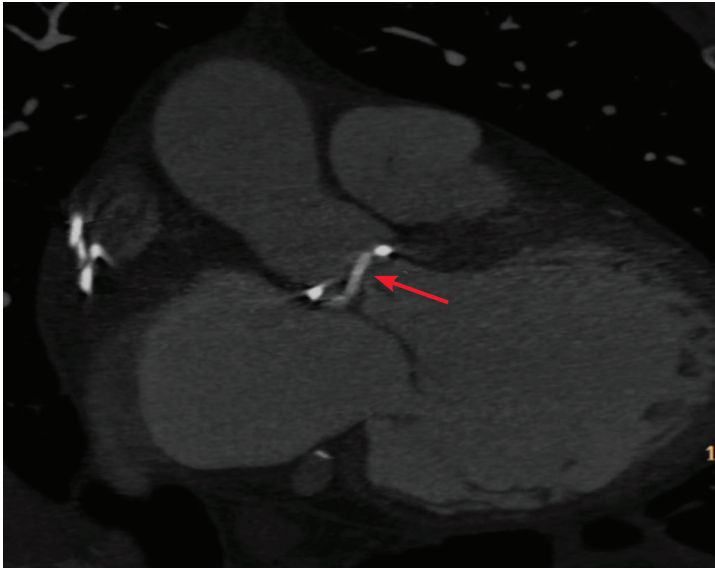


Figure 2. Arrow points to the soft tissue density noted on the ventricular surface.

Prosthetic mechanical aortic valve obstruction due to pannus formation is uncommon and has dire consequences.¹ Although echocardiography is commonly used and helpful in determining the etiology of the obstruction, there are limitations posed by attenuation and acoustic shadowing.² However, advancements in the realm of computed tomography, especially with MDCT, have made it a promising tool for assessing prosthetic aortic valve dysfunction and differentiating between a pannus and thrombus. The ability to differentiate between the two, pre-operatively, is helpful in deciding the treatment goals. Whereas operative management is the preferred treatment for pannus, thrombolysis is the common treatment for thrombus.³ Our case demonstrates how MDCT can prove to be a useful tool in the diagnosis of pannus.

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Keywords: aortic valve obstruction, computed tomography, cardiac multidetector computed tomography, MDCT

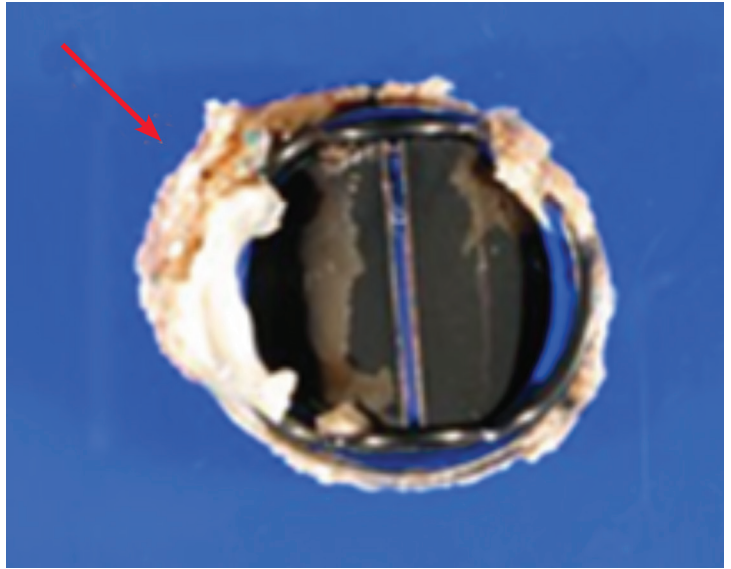


Figure 3. Explanted aortic valve showing pannus growth (arrow)

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