

IMAGING VIGNETTE

INTERMEDIATE

CLINICAL VIGNETTE

# Accessory Mitral Valve Tissue and Internal Mammary Artery Stenosis



## Unique Considerations After Cardiac Arrest

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### ABSTRACT

A man with recurrent syncope and remote aortic coarctation repair experienced cardiac arrest with exercise stress testing. Critical coronary stenosis was discovered. Further evaluation revealed accessory mitral valve tissue and internal mammary artery occlusion. These rare abnormalities, not previously reported together, presented challenges to treatment. (**Level of Difficulty: Intermediate.**) (J Am Coll Cardiol Case Rep 2022;4:167-169) © 2022 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

A 63-year-old man presented with exertional chest discomfort. His history included impaired fasting glucose, hypertension, recurrent syncopal events for decades, abnormal mitral valve on echocardiogram, and surgical aortic coarctation repair at age 10. His blood pressure was 140/80 mmHg, and his heart rate was 65 beats per minute with normal heart sounds and symmetrical extremity pulses. During exercise stress testing, there were no ischemic symptoms or electrocardiogram changes while he was walking. In recovery, he experienced polymorphic ventricular tachycardia (**Figures 1A and 1B**) and became unresponsive and pulseless. Prompt resuscitation enabled the return of spontaneous circulation.

Cardiac catheterization revealed severe, multivessel coronary artery stenosis, including the left main coronary (**Video 1**), with a left ventricular ejection fraction of 50%. Coronary artery bypass grafting (CABG) was recommended. Coarctation repair was patent by CT angiogram. A preoperative transthoracic echocardiogram (**Video 2**) and an intraoperative transesophageal echocardiogram characterized accessory mitral valve tissue (AMVT), with an elongated, sail-like anterior mitral leaflet (**Figures 1C to 1E**). The AMVT caused mild mitral regurgitation, no mitral stenosis, and no left ventricular outflow tract (LVOT) obstruction at multiple hemodynamic and preload states (**Videos 3 and 4**). Two abnormally positioned but distinct papillary muscles were identified (**Video 5**).

Internal mammary artery (IMAs) harvesting was attempted. The right IMA was completely stenosed with atherosclerosis (**Figure 1F**). The left IMA contained severe atherosclerosis proximally. Ultimately, successful multivessel CABG was completed, including a free graft from a patent midsegment of the left IMA. With no LVOT obstruction, our patient's AMVT was thought to be asymptomatic. His lifelong recurrent syncope was

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**ABBREVIATIONS  
AND ACRONYMS**

**AMVT** = accessory mitral valve tissue

**CABG** = coronary artery bypass grafting

**IMA** = internal mammary artery

**LVOT** = left ventricular outflow tract

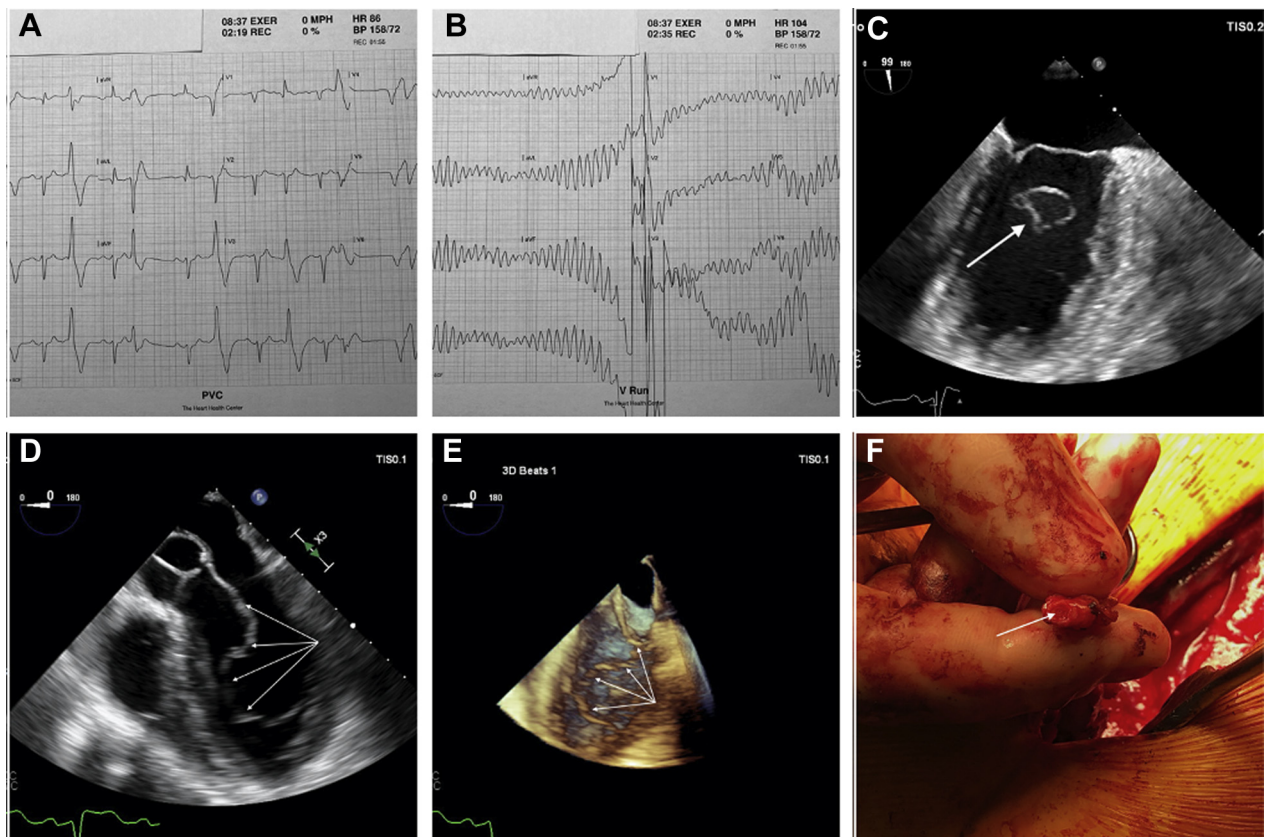
thought to be likely neurocardiogenic and not due to the accessory mitral tissue. Therefore, we elected no surgical modification of the mitral valve during CABG, as recommended by previous authors.<sup>1,2</sup> The patient recovered well postoperatively.

**DISCUSSION**

Accessory mitral valve tissue may result from an endocardial cushion defect, whose incidence is estimated at 1 in 26,000 echocardiograms.<sup>3</sup> AMVT is often associated with other cardiovascular anomalies but with coincident aortic coarctation in only 5% of cases. On histopathologic analysis, redundant mitral cusps and chords may appear normal, or fibrosed, dysplastic, and fenestrated.<sup>1,2</sup> Distinct papillary muscles discriminate AMVT from a parachute mitral valve, traditionally defined by a single papillary muscle.<sup>1</sup> AMVT may be discovered incidentally by echocardiography. Alternatively, billowing accessory mitral tissue may produce LVOT obstruction, resulting in chest pain, lightheadedness, syncope, ventricular arrhythmias, or cerebrovascular events.<sup>1,2</sup> After our patient's ischemic cardiac arrest, the coincident diagnosis of AMVT presented challenges to treatment planning.

Internal mammary arteries (IMAs) are favored conduits for CABG. Atherosclerotic IMA stenosis is uncommon even in the setting of significant coronary obstruction. However, IMA stenosis may result from aortic coarctation,<sup>3</sup> thought to be due to high arterial flow through IMAs acting as systemic collaterals circumventing

**FIGURE 1** Ventricular Arrhythmia, Accessory Mitral Valve Tissue, and Internal Mammary Artery Stenosis



Electrocardiograms (A) in stress test recovery show sinus rhythm with premature ventricular contractions degrade to polymorphic ventricular tachycardia (B). The accessory anterior mitral leaflet is partially seen as a circle (C, arrow) in some views and seen completely in other two-dimensional (D, arrows) and three-dimensional (E, arrows) transesophageal echocardiogram views. During bypass surgery a section of the right internal mammary artery is occluded with atherosclerosis (F, arrow).

the coarctation. Chest computed tomographic angiography to assess IMAs might assist CABG planning in patients with current or prior aortic coarctation.

To our knowledge, this is the first reported case involving both of the above rarities: accessory mitral valve tissue and atherosclerotic stenosis of the internal mammary arteries.

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 **APPENDIX** For supplemental videos, please see the online version of this article.

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**KEY WORDS** cardiac arrest, coronary artery bypass grafting, echocardiogram, internal thoracic artery, mitral valve disease, transesophageal echocardiogram