

# Large, Isolated Aortic Valve Aneurysm

Detected on Real-Time  
3-Dimensional Echocardiography

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**A** 36-year-old man presented with a 3-month history of palpitations, dizziness, and intermittent fever, for which antibiotic therapy had been prescribed. Cardiac auscultation revealed a 3/6 holodiastolic murmur at the left upper sternal border and no evidence of other abnormal results. The patient had no history of valvular endocarditis or connective-tissue abnormalities. Laboratory testing revealed a white blood cell count of  $9.53 \times 10^9/L$  and an erythrocyte sedimentation rate of 14 mm/hr. Blood cultures, taken 3 times, were negative. Two-dimensional transthoracic echocardiography (TTE) showed left ventricular enlargement and a large aneurysm of the right coronary cusp of the aortic valve in diastole (Fig. 1). Real-time 3-dimensional (3D) TTE showed that a pocket-like lesion protruded into the left ventricular outflow tract in diastole and disappeared in systole when viewed from the left ventricle (Fig. 2). Two-dimensional and color-flow Doppler transesophageal echocardiography (TEE) showed the aneurysm, severe aortic regurgitation, and no evidence of vegetation or perforation (Fig. 3). Real-time 3D TEE showed an aneurysm of the right coronary

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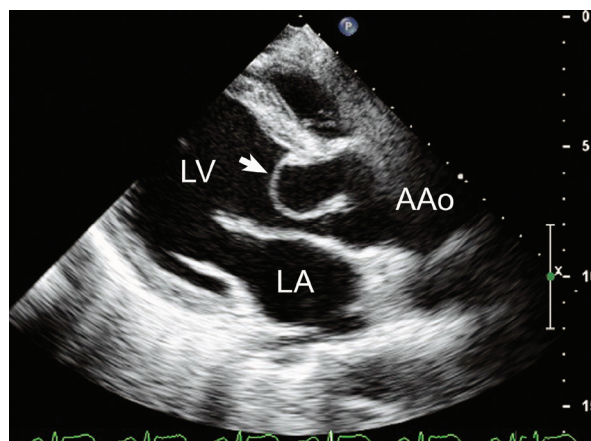
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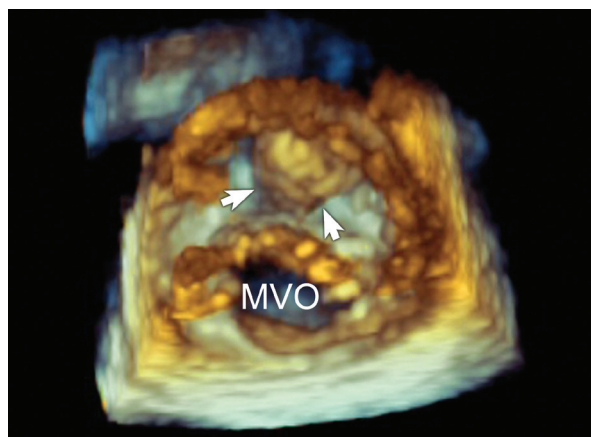
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**Fig. 1** Two-dimensional transthoracic echocardiogram shows left ventricular enlargement and a large aneurysm (arrow) of the right coronary cusp of the aortic valve in diastole.

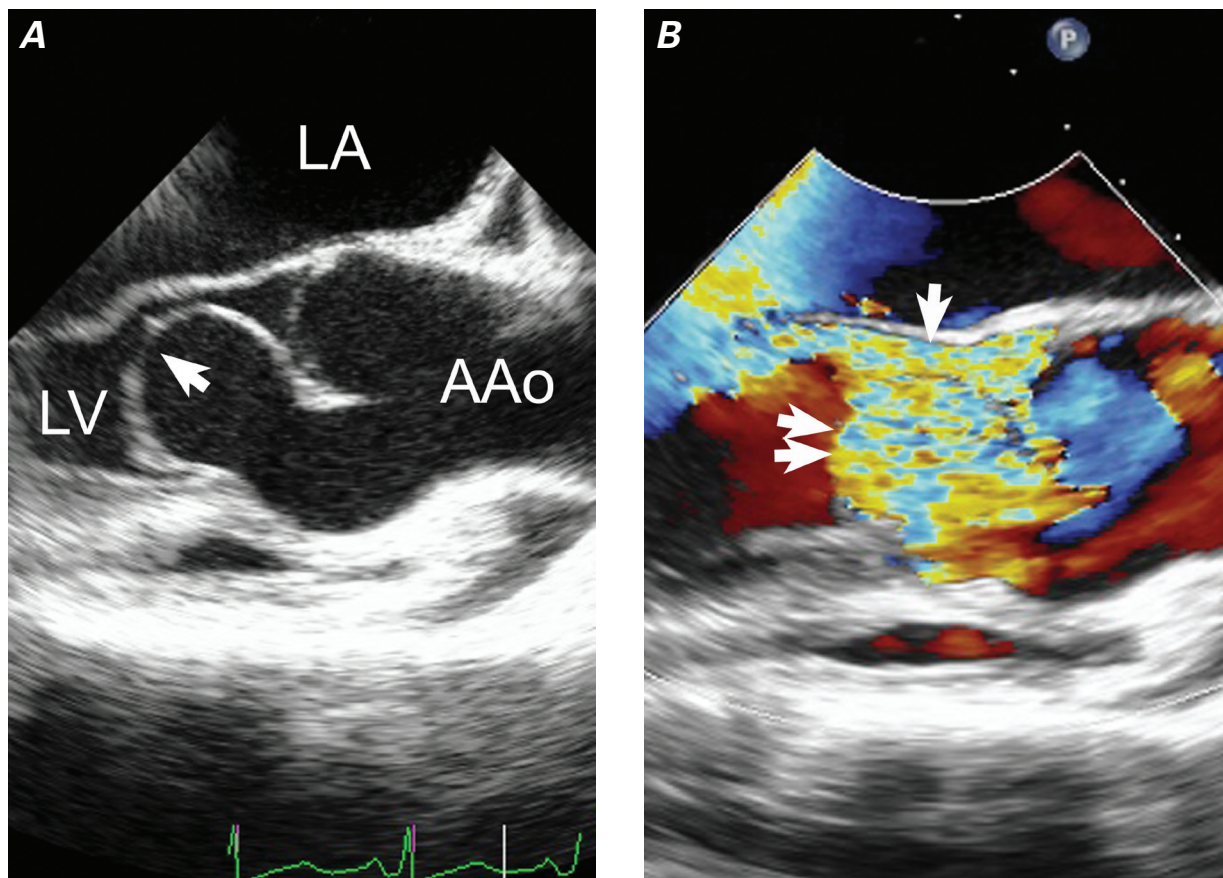
AAo = ascending aorta; LA = left atrium; LV = left ventricle



**Fig. 2** Real-time 3-dimensional transthoracic echocardiogram shows a pocket-like lesion (arrows) protruding into the left ventricular outflow tract in diastole, as viewed from the left ventricle.

MVO = mitral valve orifice

Real-time motion image is available at [www.texasheart.org/journal](http://www.texasheart.org/journal).



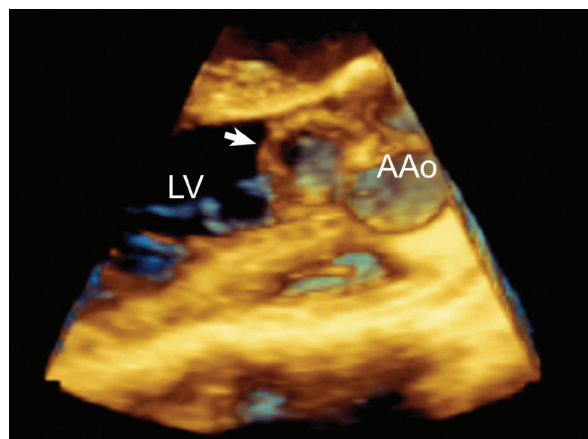
**Fig. 3** **A)** Two-dimensional and **B)** color-flow Doppler transesophageal echocardiograms show a large aneurysm (arrow) of the right coronary cusp of the aortic valve, severe aortic regurgitation, and no evidence of vegetation or perforation (arrows).

AAo = ascending aorta; LA = left atrium; LV = left ventricle

cusps of the aortic valve and persistence of the aneurysm during systole and diastole (Fig. 4). The surgical findings were confirmed echocardiographically, and aortic valve replacement was successfully performed.

### Comment

Aortic valve aneurysm is a rare cause of aortic regurgitation. Valve-leaflet aneurysm formation and leaflet perforation strongly suggest infective endocarditis (IE) and are best diagnosed with use of TEE. Prompt diagnosis and early surgical treatment can prevent complications such as embolization and rupture of the aneurysm. Blood culture-negative IE can occur in patients who have received antibiotic therapy; therefore, IE in our patient was possible, in accordance with the modified Duke criteria for the diagnosis of IE.<sup>1</sup> Several findings on echocardiography can provide evidence of IE, including vegetations, evidence of periannular tissue destruction (abscess), aneurysm, fistula, leaflet perforation, and valvular dehiscence. Benefits of 3D imaging include the realistic and unique comprehensive views of the cardiac valves.<sup>2</sup> However, in contrast with the ease of viewing the mitral valve, the detection of aortic valve



**Fig. 4** A 3-dimensional transesophageal echocardiogram shows an aneurysm (arrow) of the right coronary cusp of the aortic valve, in diastole.

AAo = ascending aorta; LV = left ventricle

Real-time motion image is available at [www.texasheart.org/journal](http://www.texasheart.org/journal).

disease with 3D echocardiography is limited, because the aortic leaflets are thinner and frequently present

with heavy calcification. Both circumstances result in dropout artifacts. Our case indicates that real-time 3D TTE and TEE can detect and enable the evaluation of an aneurysm of the aortic cusp.

## References

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1. Li JS, Sexton DJ, Mick N, Nettles R, Fowler VG Jr, Ryan T, et al. Proposed modifications to the Duke criteria for the diagnosis of infective endocarditis. *Clin Infect Dis* 2000;30(4): 633-8.
2. Lang RM, Mor-Avi V, Sugeng L, Nieman PS, Sahn DJ. Three-dimensional echocardiography: the benefits of the additional dimension. *J Am Coll Cardiol* 2006;48(10): 2053-69.