

Mitral Valve Leaflet Dissection and Aneurysm Secondary to Bicuspid Aortic Valve Regurgitation

An asymptomatic 47-year-old male with bicuspid aortic valve (BAV) was referred for a transesophageal echocardiogram (TEE) to assess aortic regurgitation. The patient had no notable medical history. Transesophageal echocardiogram revealed a BAV with fusion of the left and right coronary leaflets (Figure 1A) (Supplementary Video 1), but 3 sinuses of Valsalva, and moderate aortic regurgitation [Vena Contracta (VC) 5 mm, 3-dimensional VC area 0.3 cm², PISA Effective Regurgitant Orifice Area 0.1 cm², Regurgitant Volume 16 mL, without holo-diastolic flow reversal in the descending thoracic aorta]. Concomitantly, trivial mitral valve regurgitation was diagnosed. The mitral valve annulus and the coaptation line had normal size, location, and function. However, the A2 scallop of the anterior leaflet was aneurysmal and dissected (Figure 1D and E) (Supplementary Videos 2 and 3). Noteworthy, the regurgitant jet of the BAV was directed toward the A2 scallop of the anterior mitral valve leaflet, generating the hypothesis that the high-velocity eccentric jet of aortic regurgitation impinging the area of the anterior mitral valve leaflet generated the leaflet dissection and aneurysm (Figure 1B and C) (Supplementary Videos 4-6). The billowing height of the A2 scallop aneurysm was measured at 6.9 mm. In the literature, only a few cases of mitral valve prolapse associated with BAV have been described; however, none of those reported dissection of the mitral valve. This case highlights the relevance of eccentric aortic regurgitation due to BAV leading to the mechanical complication of the dissection and aneurysm of the anterior mitral valve leaflet diagnosed by 3-dimensional TEE, which may hold significant implications for its etiology, prognosis, and surgical management.

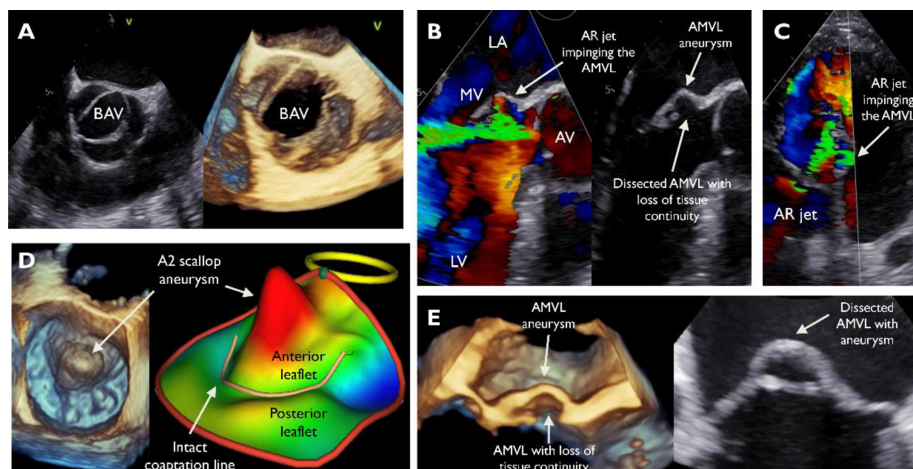


Figure 1. Transesophageal echocardiographic assessment of a bicuspid aortic valve. Mitral valve leaflet dissection and aneurysm secondary to bicuspid aortic valve regurgitation.

E-PAGE ORIGINAL IMAGE



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Supplementary Video 1: 3D TEE imaging of the aortic valve revealing a bicuspid morphology with left-right coronary cusp fusion.

Supplementary Video 2: 3D TEE imaging of the mitral valve, viewed from the left atrial side (surgical perspective), revealing an aneurysmal and dissected A2 scallop of the anterior mitral leaflet.

Supplementary Video 3: 3D TEE imaging of the mitral valve with color Doppler demonstrating trivial mitral valve regurgitation.

Supplementary Video 4: TEE midesophageal long-axis view of mitral and aortic valves.

Supplementary Video 5: TEE midesophageal long-axis view with color Doppler demonstrating a high-velocity eccentric jet of aortic regurgitation impinging the area of the anterior mitral valve leaflet, generated the leaflet dissection and aneurysm.

Supplementary Video 6: A deep transgastric TEE view with color Doppler, demonstrating an eccentric aortic regurgitation jet directed towards A2 scallop of the anterior mitral leaflet.