THE ANATOLIAN JOURNAL OF CARDIOLOGY



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 gortic reguraitation. 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 highvelocity 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.

Data Availability Statement: The imaging data and other materials supporting the findings of this submission are available from the corresponding author upon reasonable request.

Informed Consent: All relevant parties have provided informed consent for their involvement in this study and for the publication of the submitted work.

Declaration of Interests: The authors have no conflicts of interest to declare.

Funding: The authors declare that this study received no financial support.

Supplementary Videos 1-5: 3D TEE imaging of the aortic valve revealing a bicuspid morphology with left-right coronary cusp fusion.

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

E-PAGE ORIGINAL IMAGE



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Cite this article as: Baltagianni E, Anastasiou V, Giannakoulas G, Ziakas A, Kamperidis V. Mitral valve leaflet dissection and aneurysm secondary to bicuspid aortic valve regurgitation. Anatol J Cardiol. 2025;XX(X):1-2.

DOI:10.14744/AnatolJCardiol.2025.5885



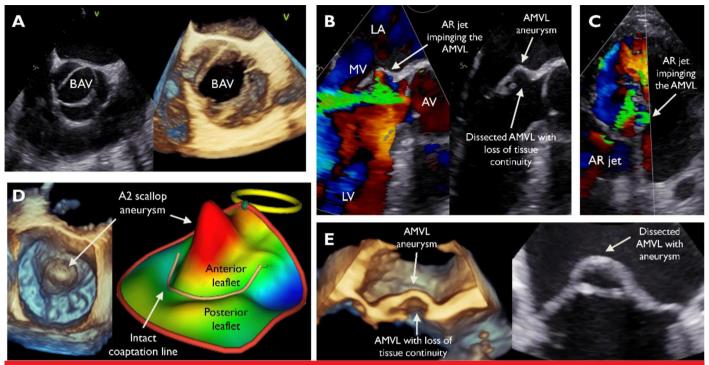


Figure 1. Transesophageal echocardiographic assessment of bicuspid aortic valve-induced anterior mitral leaflet aneurysm and dissection.