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Bicuspid Aortic Valve Regurgitation: Quantification of Anatomic Regurgitant Orifice Area by 3D Transesophageal Echocardiography Reconstruction

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A 53-year-old man presented for routine clinical assessment to evaluate a longstanding systemic hypertension. Clinical exam was unremarkable. Transthoracic echocardiography (TTE) showed moderate aortic root dilatation (at sinus of Valsalva: 44 mm) compared to normal references for age and body surface area and an eccentric regurgitation of aortic valve. Two-dimensional (2D) transesophageal echocardiography (TEE) and three-dimensional (3D) TEE acquisitions were obtained with the same ultrasound unit that

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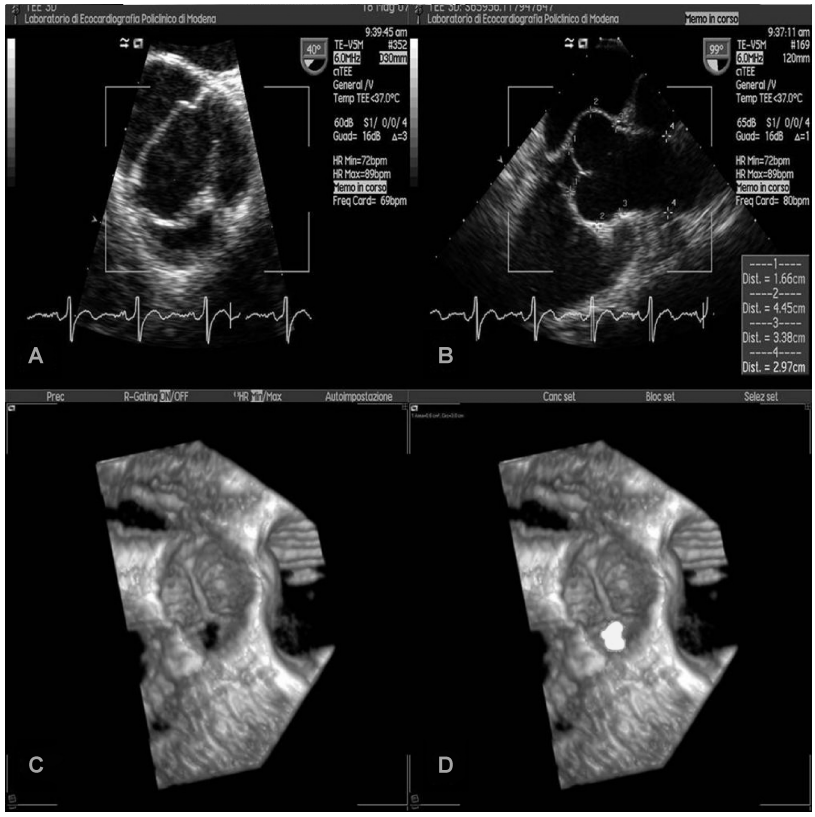

Figure 1. ***A.*** *2D TTE 40°: Bicuspid aortic valve with right and left cusp fusion.* ***B.*** *2D TEE 99°: Measures of aortic root.* ***C.*** *3D TEE reconstruction: Aortic valve in diastolic phase (aortic view)* ***D.*** *3D TEE reconstruction: Quantification of the AROA: 0.6 cm^2.*

incorporated 3D data acquisition software. In the echocardiography laboratory we performed the offline postprocessing and 3D reconstruction through a dedicated system (*four*Sight™ TEE View, Siemens, USA). By TEE exam we could diagnose a bicuspid aortic valve with fusion of the right and left cusps. The 3D TEE reconstruction allowed to quantify the anatomic regurgitant orifice area (AROA) of the aortic valve. By 2D TEE, the proximal isovelocity surface area was difficult to measure likely because of the eccentric regurgitant jet. According to the literature,[1–3] 3D TEE has limits, including the possibility of creating dropout echoes increasing the AROA as the result of reconstruction rather than real time. Nevertheless, in this patient 3D TEE was superior to 2D TEE since images are diagnostic.

To the best of our knowledge, few articles[4] reported AROA's quantification of a bicuspid aortic valve by 3D reconstruction in an adult patient.

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