

The Mitral Cleft is not a Mystery for 3D Echocardiography

MARTÍN LOMBARDEO, CARLOS NOJEK ^{MTSAC}

These images correspond to a 40-year-old male patient (1.80 m² body surface) with a history of asymptomatic mitral regurgitation (interpreted as anterior mitral valve prolapse since childhood). He is an athlete (mid-distance runner, < 10 km). His physical activity is suspended, and a comprehensive global assessment by 2D/3D transthoracic echocardiography (TTE) and 2D/3D transesophageal echocardiography (TEE) is indicated. The left ventricular telediastolic and telesystolic diameters (TTE) were 54 mm (30 mm/m²) and 26 mm (14 mm/m²), respectively. Ejection fraction by 3D TTE was 61%. The regurgitant jet has a central origin but an eccentric (posterolateral) direction, with vena contracta of 7 mm and effective regurgitant orifice area of 0.58 cm² (end-systolic phase). A solution of continuity in the anterior leaflet was observed from the 2D TTE short axis (Figure 1, TT1 and TT2), confirming an anterior leaflet cleft observed by 3D TEE (Figure 1, 3D1 and 3D2). The anterior leaflet is enlarged and inserted at the same level of the septal tricuspid leaflet. A “dissection” image is shown, with the upper leaf inserted at the level of the interatrial septum, and the lower leaf in the perimembranous septum (Figure 1, TE1). An IV polygeline solution is infused without microbubble passage. Part of the unstructured anterior leaflet (without the normal anchor) crosses the left ventricular outflow tract (LVOT) and inserts in the proximal portion of the anterior septum, originating a slight obstruction (Figure 1, TE2). A multislice computed tomography coronary angiography is performed (as preoperative assessment), with images showing the cleft and partial anchor of the anterior leaflet, similar to those in 2D TTE and 2D/3D TEE (Figure 2, TC1, TC2, and TC3).

Surgical images show a cleft in the anterior mitral leaflet (Figure 2, C1 and C2), and its repair by simple closure (Figure 2, C3). The anchor area of the anterior leaflet was not repaired due to technical complexity and absence of left-to-right defect. It is thus a congenital mitral regurgitation due to a cleft of the anterior leaflet with slight obstruction in the LVOT caused by anomalous insertion of the remaining anterior leaflet tissue, within a “missing or incomplete” AV canal (without ASD ostium, with partial anchoring of AV valves, and incomplete AV canal). Postoperative follow-up showed mild mitral regurgitation. The patient currently practices sports without restrictions.

Conflicts of interest

None declared

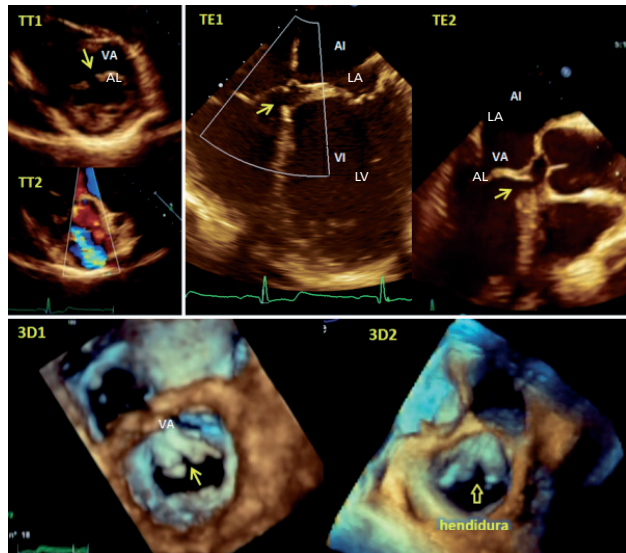


Fig. 1. TT1 and TT2. Color and colorless 2D TTE short axis. TE1. 2D TEE 4-chamber view. TE2. 2D TEE view at 120°. 3D1 and 3D2. 3D TEE images taken from a complete gated capture. AL: Anterior leaflet. LV: Left ventricle. LA: Left atrium.

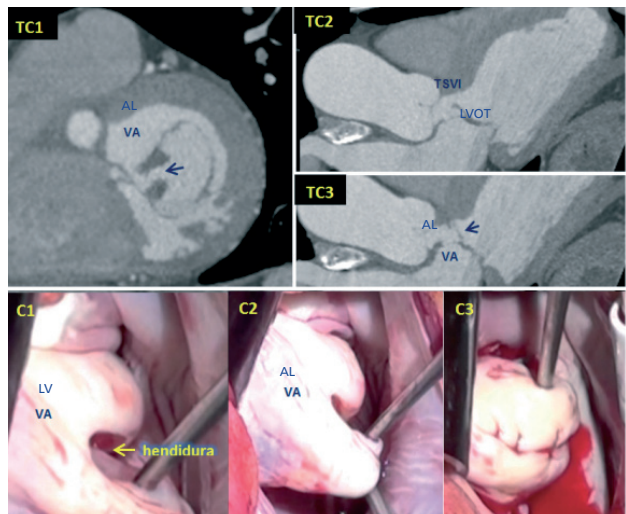


Fig. 2. TC1. Short axis image showing the cleft similar to that in the 2D TTE. TC2 and TC3. Remaining portion of the anterior leaflet (AL) crossing the left ventricular outflow tract (LVOT). C1 and C2. Images of the cleft during surgery. C3. Image of the closure and cleft repairment.