Importance of live three-dimensional transoesophageal echocardiography in the early recognition of an asymptomatic but extensive annular and left ventricular outflow track rupture following transcatheter aortic valve replacement

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An 83-year-old woman with severe aortic stenosis underwent transcatheter aortic valve replacement (TAVR) using a 29-mm (annulus = 543 mm²) Edwards Sapien XT prosthesis (Edwards Lifesciences, Irvine, CA, USA) (Panel A).

Following the uneventful deployment under three-dimensional transoesophageal echocardiographic (3D-TEE; Philips Epiq 7, Philips Medical System, Andover, MA, USA) guidance, an angiographically undetected shunt (Panel B; see Supplementary data online, Video S1) from the left ventricular outflow tract to the right ventricle (RV) and a continuous flow from the anterior aortic root to the RV outflow tract were noticed (Panels C, arrows, and D; see Supplementary data online, Video S2). 3D-TEE demonstrated a large annular defect (2.1 × 0.8 cm) extending from the ventricular septum (ventricular septal defect shunt) to the aortic root (aorto-to-RV shunt) (Panel E [asterisk]; see Supplementary data online, Video S3).

Given the complexity and extension of this annular rupture (Panel F [asterisk]; see Supplementary data online, Video S4), a decision was made to perform an emergent surgical repair with a pericardial patch (Panel G, arrowheads) and standard aortic valve replacement. A small residual shunt was observed at 1-month follow-up (Panel H, arrow; see Supplementary data online, Video S5).

In the present case, rapid and precise identification of this rare and life-threatening complication by 3D-TEE demonstrated excellent pathological correlation with direct surgical inspection, and was crucial in optimal management of the patient. This case reinforces the value of live imaging during TAVR.

Ao, aorta; IVS, interventricular septum; CW, continuous wave; LA, left atrium; LVOT, left ventricular outflow tract; MDCT, multidetector computed tomography; RV, right ventricle; VSD, ventricular septal defect.

Conflict of interest: P.G. has received speaker fees from Edwards Lifesciences.

Supplementary data are available at European Heart Journal — Cardiovascular Imaging online.

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