

IMAGES IN INTERVENTION

Overestimation of Paravalvular Leak With Edwards SAPIEN 3 Transcatheter Aortic Valve Replacement



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An 88-year-old woman with a history of severe aortic stenosis presented for a transcatheter aortic valve replacement (TAVR). A pre-TAVR computed tomography angiogram showed an aortic annular area of 385 mm² and an average diameter of 22.1 mm (Figure 1A). The patient underwent an uncomplicated transfemoral #23 SAPIEN 3 valve (Edwards Lifesciences, Irvine, California) implantation.

The presence of a paravalvular leak (PVL) after TAVR may be associated with increased mortality (1). However, the assessment of paravalvular aortic regurgitation (AR) after TAVR is challenging. One of the widely used criteria for grading a PVL suggested by the Valve Academic Research Consortium (VARC-2) uses the circumferential extent of the prosthetic valve PVL (i.e., <10% indicates mild PVL, 10% to 29% indicates moderate PVL, and ≥30% indicates severe PVL) (2). The balloon-expandable Edwards SAPIEN 3 transcatheter heart valve has a novel design with an outer skirt to reduce PVL after TAVR.

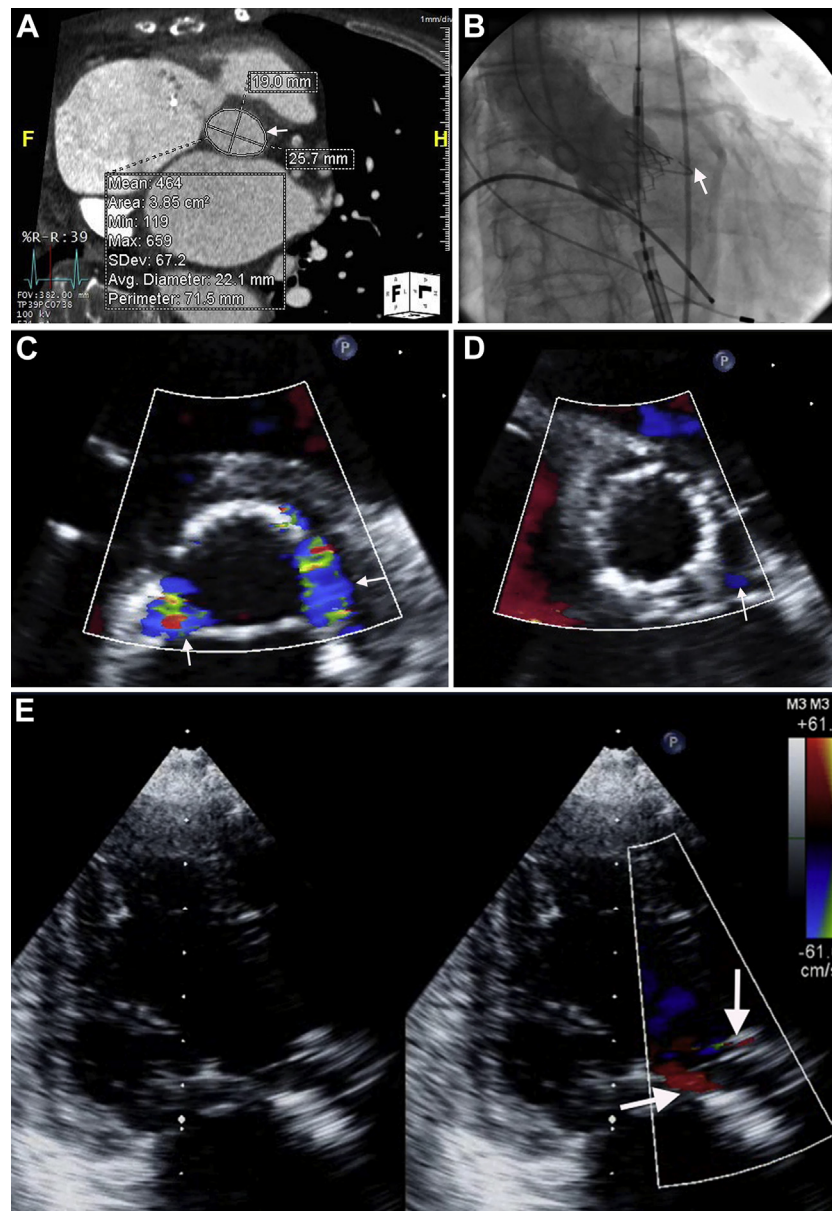
In our patient, aortography immediately after TAVR revealed mild PVL (Figure 1B, Online Video 1).

Transthoracic echocardiography performed the next day suggested severe PVL based on a >30% circumferential extent of PVL in the parasternal short-axis (PSAX) view obtained just above the level of the skirt of the SAPIEN 3 valve (Figure 1C, Online Video 2). However, the apical 3-chamber view and PSAX view obtained just below the level of the skirt showed only mild PVL (Figure 1D, Online Video 3 and Figure 1E, Online Video 4). The prominent circumferential diastolic color flow signal noted in the aortic root (at and above the skirt of the SAPIEN 3 valve) may lead to overestimation of PVL. The echocardiographic assessment of PVL must be done from multiple views. The evaluation of the circumferential extent of PVL must be carefully performed below the aortic annulus and the skirt of the SAPIEN 3 valve to avoid overestimation of severity of PVL.

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FIGURE 1 A Discrepant Amount of Paravalvular Leak at Differing Points on Echocardiography After SAPIEN 3 Valve Implantation

(A) A computed tomography angiogram was obtained showing appropriate annular sizing for #23 SAPIEN 3 device (Edwards Lifesciences, Irvine, California). **Arrow** indicates the aortic annulus area (3.85 cm²) pre-TAVR implantation. (B) A post-TAVR angiogram showed minimal PVL. The **arrow** indicates minimal PVL ([Online Video 1](#)). (C) Parasternal short-axis view on post-procedure day 1 revealed severe PVL. **Arrows** indicate severe PVL ([Online Video 2](#)). (D) Minimal PVL more posteriorly on post-procedure day 1. **Arrow** indicates minimal PVL ([Online Video 3](#)). (E) Minimal PVL was confirmed by other views. **Arrows** indicate minimal PVL ([Online Video 4](#)). PVL = paravalvular leak; TAVR = transcatheter aortic valve replacement.

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KEY WORDS paravalvular leak, SAPIEN 3, transcatheter aortic valve replacement

 **APPENDIX** For supplemental videos and their legends, please see the online version of this article.