

## IMAGES IN INTERVENTION

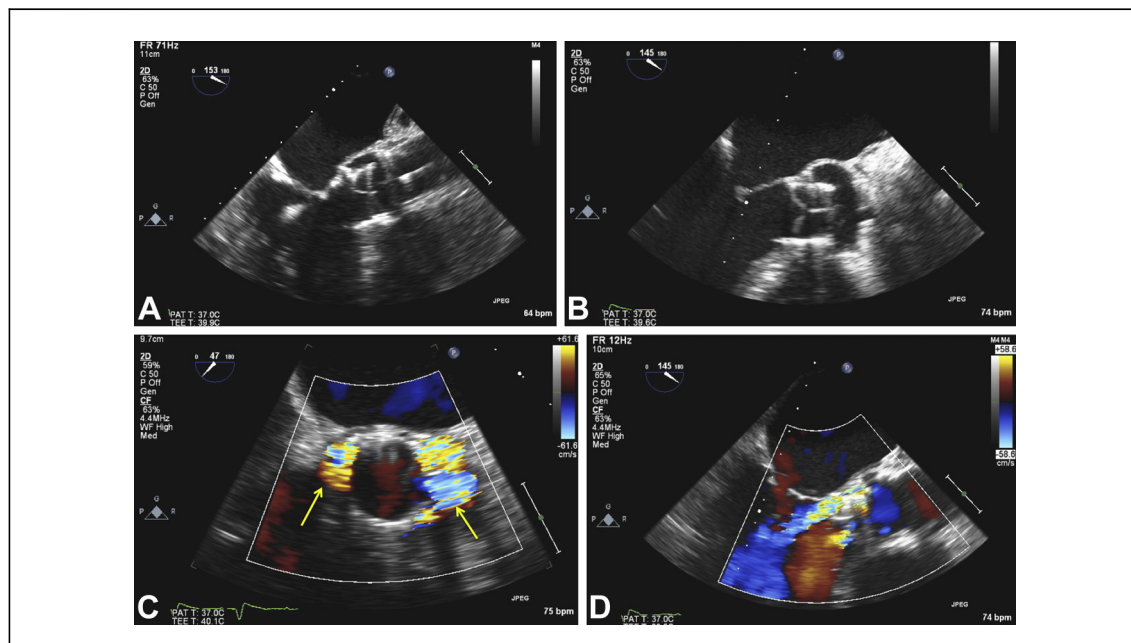
# Very Late Ventricular Displacement of Transcatheter Aortic Valve Resulting in Severe Paravalvular Regurgitation

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A 74-year-old man presented to our center with acute pulmonary edema. This was in the context of a transfemoral transcatheter aortic valve

replacement (TAVR) with a 26-mm Sapien XT valve (Edwards Lifesciences, Irvine, California), 63 days before. Mild paravalvular regurgitation



**Figure 1. Transesophageal Echocardiography**

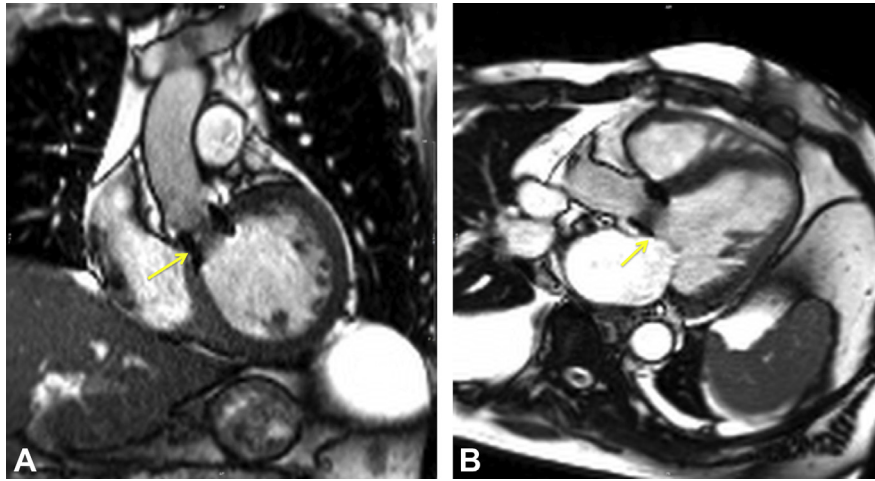
Long-axis view. **(A)** Transcatheter heart valve well positioned in the immediate post-procedure. **(B)** Downward displacement of transcatheter heart valve at 63 days post-procedure. **(C)** Short-axis view of the Sapien XT Valve (Edwards Lifesciences, Irvine, California). Severe paravalvular regurgitation (>20% circumference) with paravalvular jets between 1- and 5-o'clock and 9- and 11-o'clock orientation (**arrows**). **(D)** Long-axis view of the Sapien XT Valve. Doppler color flow mapping demonstrating severe paravalvular regurgitation 63 days post-procedure ([Online Video 1](#)).

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(PVR) had been noted both immediately after the procedure and before discharge on day 3, which remained unchanged on transthoracic echocardiography (TTE) on day 20.

Transesophageal echocardiography on this occasion confirmed severe PVR with ventricular



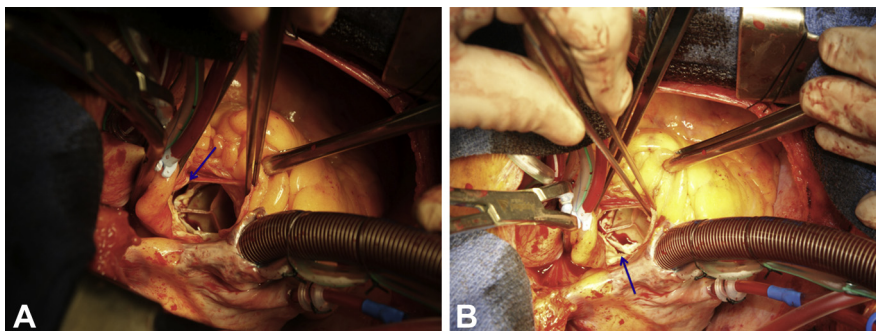
**Figure 2. Cardiac Magnetic Resonance Imaging Steady-State Free Precession Image**

Displacement of the transcatheter heart valve apically relative to the aortic annulus (arrow). (A) Left ventricular outflow long-axis plane. (B) Coronal plane (Online Video 2).

displacement of the Sapien XT valve (Figs. 1A to 1D, Online Video 1). Cardiac magnetic resonance imaging demonstrated an angulated valve to the long axis of the ascending aorta and aortic annulus (Figs. 2A and 2B, Online Video 2).

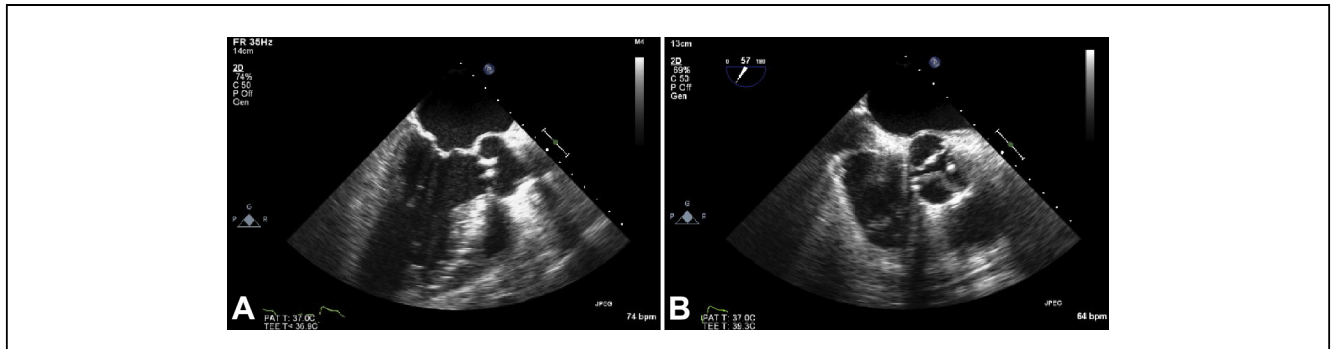
Repeat TAVR was not considered given the perceived risk of prolapsing the valve into the left ventricle and its low position relative to the aortic annulus. An open surgical valve replacement undertaken revealed ventricular migration of the valve to the point where the external curtain was located below the level of the aortic annulus (Figs. 3A and 3B, Online Video 3). The Sapien XT valve was explanted and replaced with a 25-mm Medtronic Mosaic bioprosthetic valve (Medtronic Inc., Minneapolis, Minnesota). The patient recovered after a prolonged complicated postoperative period.

Transcatheter aortic valve dislocation, albeit a rare phenomenon, has been documented both early (1) (<7 days) and late (2) (>30 days), but no incidences as delayed as this case have been reported. The mechanism of the late transcatheter aortic valve displacement resulting in severe PVR in this case was likely a combination of undersizing of the valve, the relative nonuniformity, and the paucity of annular calcification (Figs. 4A and 4B). A single imaging modality to assess the annulus was used then with 2-dimensional TEE, which may have underestimated the annular dimensions. The current practice of using complementary imaging modalities such as 2-dimensional TEE and multislice computed tomography will provide more accurate assessment of annular dimensions and degree of calcification, aiding in better valve size selection (3).



**Figure 3. Intraoperative Supra-aortic View**

(A) Nonapposition of the valve prosthesis and aortic annulus (11-o'clock orientation) as the etiology for severe paravalvular regurgitation (arrow). (B) Nonapposition of the valve prosthesis and aortic annulus (6-o'clock orientation) (arrow) (Online Video 3).



**Figure 4. Transesophageal Echocardiography**

(A) Long-axis view. Relative paucity of annular calcification. (B) Short-axis view. Relative nonuniformity of annular calcification.

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**Key Words:** paravalvular regurgitation ■ transcatheter aortic valve displacement ■ transcatheter aortic valve replacement.

#### ▶ APPENDIX

For accompanying videos and video legends, please see the online version of this article.