An Unexpected Finding
Stuck Leaflet After Transapical Mitral Valve-in-Valve Implantation

Augusto D’Onofrio, MD, PhD,* Michele Gallo, MD,* Giuseppe Tarantini, MD, PhD,† Umberto Cucchin, MD, PhD,‡ Demetrio Pittarello, MD,§ Gino Gerosa, MD*†

Transapical mitral valve-in-valve (ViV) implantation was performed in an inoperable patient with a dysfunctional 29-mm Hancock II bioprosthesis (Medtronic, Minneapolis, Minnesota). The true internal diameter of the 29-mm Hancock II valve is 24 mm (1), thus a 26-mm Sapien-XT (Edwards

FIGURE 1 Fluoroscopic Image of Transapical Deployment of the 26-mm Edwards Sapien XT Bioprosthesis

(A) The 26-mm Edwards Sapien XT bioprosthesis is deployed into the stent of the 29-mm Hancock II valve. Post-deployment fluoroscopic image shows the final result (Online Video 1). (B) The “hour-glass” shape of the Sapien XT valve results from the discrepancy of size between the valves. Intraoperative transesophageal echocardiography shows normal leaflet motion in diastole (C) and in systole (D) with no residual mitral regurgitation.

From the *Division of Cardiac Surgery, University of Padova, Padova, Italy; †Division of Cardiology, University of Padova, Padova, Italy; and the ‡Division of Anesthesiology, University of Padova, Padova, Italy. Dr. D’Onofrio is a transapical aortic valve implantation proctor for Edwards Lifesciences. Prof. Gerosa is a transapical aortic valve implantation proctor for Edwards Lifesciences; and has received speaker’s fees from St. Jude Medical and HeartWire. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.
Lifesciences, Irvine, California) valve was implanted (Figures 1A and 1B, Online Video 1). The procedure was uneventful with no residual mitral regurgitation (Figures 1C and 1D). Warfarin was administered for permanent atrial fibrillation. Pre-discharge echocardiography showed a well-functioning Sapien-XT valve with normal motion of the 3 pericardial leaflets. At 6-months follow-up echocardiography, 1 of the 3 pericardial leaflets was stuck in the closed position, whereas the other 2 leaflets showed normal motion (Figures 2A and 2B, Online Video 2). The same finding was observed 12 months later (Figures 2C and 2D). The patient is in excellent clinical condition; her New York Heart Association functional class is I at follow-up, and mean transmitral gradient is only 5 mm Hg. Therefore, we decided to closely monitor the patient with no indications for further invasive treatment unless some changes in her clinical and/or echocardiographic status should occur. Although no images of valve thrombosis were found, this is the most likely etiology of the stuck leaflet. However, other possible mechanisms include noncoaxial deployment and incomplete opening of the Sapien-XT valve frame as a result of the size discrepancy. In particular, in this case, a suboptimal deployment of the transcatheter valve was observed: fluoroscopy showed an “hour-glass” shape of the Sapien-XT valve because of a too “atrial” final positioning (30% to 35% of the valve on the atrial side) (10% to 15% only of the valve on the atrial side)(1,2) that may also help in preventing atrial migration of the valve. Although transapical mitral ViV implantation is technically feasible (3,4), stuck valve leaflets is a potential complication that implanting physicians should be aware of.

**FIGURE 2** 3D-TEE at 6 and 12 Months

(A and B) Three-dimensional transesophageal echocardiography (3D-TEE) 6 months after the procedure shows a stuck valve leaflet (Online Video 2). After 12 months at 3D-TEE, we observed a similar condition (C and D). (Red asterisk indicates the stuck valve leaflet).

**REPRINT REQUESTS AND CORRESPONDENCE:** Dr. Augusto D’Onofrio, Division of Cardiac Surgery, Department of Cardiac, Thoracic and Vascular Sciences, Via Giustiniani 2, 35128 Padova, Italy. E-mail: adonofrio@hotmail.it.
REFERENCES


KEY WORDS complications, valve in valve, transcatheter valve implantation

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