

MINI-FOCUS ISSUE: VALVULAR HEART DISEASE

ADVANCED

IMAGING VIGNETTE: CLINICAL VIGNETTE

Repeat Transcatheter Aortic Valve Replacement and Follow-Up of Embolized Transcatheter Heart Valve After 13 Years



Abdul Rahman Ihdahid, MBBS, PhD, Janarthanan Sathananthan, MBC_HB, MPH, Richard Brown, MD, Philipp Blanke, MD, John G. Webb, MD

ABSTRACT

A 79-year-old woman was treated with a 23-mm balloon-expandable transcatheter heart valve (THV) that was initially complicated by an embolized THV requiring deployment in the descending aorta. She presented 13-years later with a degenerated bioprosthesis requiring redo THV. Pre-procedural computed tomography was important in highlighting underexpansion of the initial THV and open leaflets in the embolized valve. (**Level of Difficulty: Advanced.**)

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A 79-year-old woman presented in 2007 with severe aortic stenosis. Because she had a porcelain aorta, transfemoral transcatheter aortic valve replacement (TAVR) was attempted with a 23-mm Cribier-Edwards (Edwards Lifesciences, Irvine, California) transcatheter heart valve (THV). Computed tomography (CT) was not routinely used for the THV work-up in 2007, and sizing was determined on the basis of transthoracic echocardiography, which demonstrated a long-axis annulus diameter of 18 mm. A 23-mm Cribier-Edwards valve was chosen because this was the only available size. Hemodynamic instability was complicated by embolization of the THV, which was withdrawn using the balloon catheter to the descending aorta ([Video 1](#)). The patient was stabilized, and a second THV was successfully deployed. Between 2007 and 2020, the patient remained well and continued to live independently. Thirteen years after her initial TAVR, at the age of 92, she presented again with a failing THV, with severe intravalvular aortic regurgitation. The heart team recommended redo TAVR.

Pre-procedural CT showed that the failed 23-mm THV was underexpanded at the inflow, potentially because of the patient's small aortic annulus and calcification ([Figure 1](#)). The THV measured 19.7 mm, 21.3 mm, and 23 mm at the inflow, midpoint, and outflow, respectively. The leaflets of the ectopic valve in the descending aorta remained open throughout the cardiac cycle, without evidence of thrombus. The patient underwent redo TAVR with local anesthesia and percutaneous transfemoral access with a 20-mm Sapien 3 valve (Edwards Lifesciences), given the small inflow of the failed Cribier-Edwards valve. The delivery system of the Sapien 3 passed easily through the embolized valve in the descending aorta. Following redo TAVR the 20-mm Sapien 3

From the Centres for Heart Valve Innovation and for Cardiovascular Innovation, St. Paul's and Vancouver General Hospitals, Vancouver, Canada.

The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the [Author Center](#).

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**ABBREVIATIONS
AND ACRONYMS**

CT = computed tomography

TAVR = transcatheter aortic valve replacement

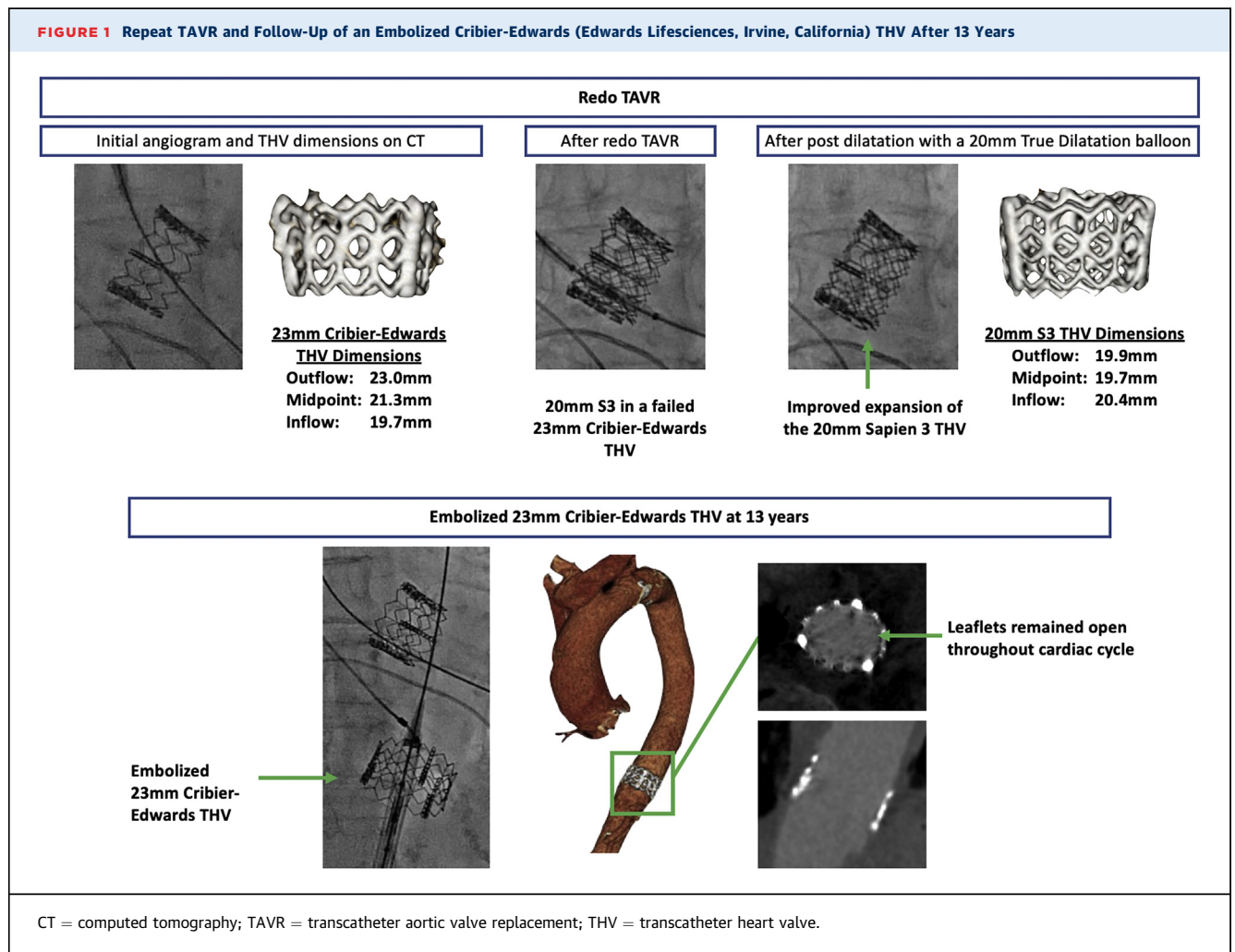
THV = transcatheter heart valve

valve appeared underexpanded, with full expansion following high-pressure post-dilatation with a 20-mm True Dilatation balloon (Bard Vascular Inc., Tempe, Arizona). After the procedure, the transaortic mean gradient was 7 mm Hg, with trivial paravalvular regurgitation. The patient was discharged home the following day. Post-procedure CT demonstrated good expansion of the 20-mm Sapien 3 valve with a diameter at the inflow, midpoint, and outflow of the THV of 19.9 mm, 19.7 mm, and 20.4 mm, respectively.

DISCUSSION

The treatment of failed THVs with repeat TAVR and the long-term implications of embolized THVs are poorly understood (1,2). This case highlights that redo TAVR can be performed safely and with good hemodynamic results. Importantly, the leaflets of the embolized THV in this case remained open and did not compromise the ability to perform redo TAVR. CT assessment of failed THVs is important to guide sizing when performing redo TAVR.

FIGURE 1 Repeat TAVR and Follow-Up of an Embolized Cribier-Edwards (Edwards Lifesciences, Irvine, California) THV After 13 Years



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ADDRESS FOR CORRESPONDENCE: Dr. John G. Webb, Centres for Heart Valve Innovation and for Cardiovascular Innovation, St. Paul's Hospital, 1081 Burrard Street, Vancouver BC V6Z 1Y6, Canada. E-mail: johngraydonwebb@gmail.com.

REFERENCES

1. Murdoch D, Webb J, Ye J, et al. Transcatheter aortic valve replacement. Ten years later. *N Engl J Med* 2019;380:1773-4.
2. Al Ali AM, Altwegg L, Horlick EM, et al. Prevention and management of transcatheter balloon-expandable aortic valve malposition. *Catheter Cardiovasc Interv* 2008;72:573-8.

KEY WORDS aortic stenosis, redo TAVR, transcatheter aortic valve replacement (TAVR)

 **APPENDIX** For a supplemental video, please see the online version of this paper.