

IMAGES IN INTERVENTION

Usefulness of Multislice Computed Tomography in Percutaneous Coronary Intervention Following Valve-in-Valve Transcatheter Aortic Valve Replacement



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An 88-year-old man with anginal symptoms, referred for percutaneous coronary intervention (PCI), had undergone valve-in-valve transcatheter aortic valve replacement (TAVR) with 23-mm Evolut R transcatheter heart valve (THV) (Medtronic, Dublin, Ireland) 4 years before due to severe aortic regurgitation caused by a failed bioprosthetic valve (21-mm Carpentier-Edwards PERIMOUNT [CEP], Edwards Lifesciences, Irvine, California). Nuclear myocardial perfusion imaging with single-photon emission tomography and multislice computed tomography (MSCT) showed localized ischemia with heavy calcification in the distal left anterior descending coronary artery (LAD) (Figures 1A to 1D, Video 1). MSCT depicted

the closest aligned cell and interference by the commissure, THV skirt, and CEP valve frame around the left coronary artery ostium (Figures 1E to 1H, Video 2) (1).

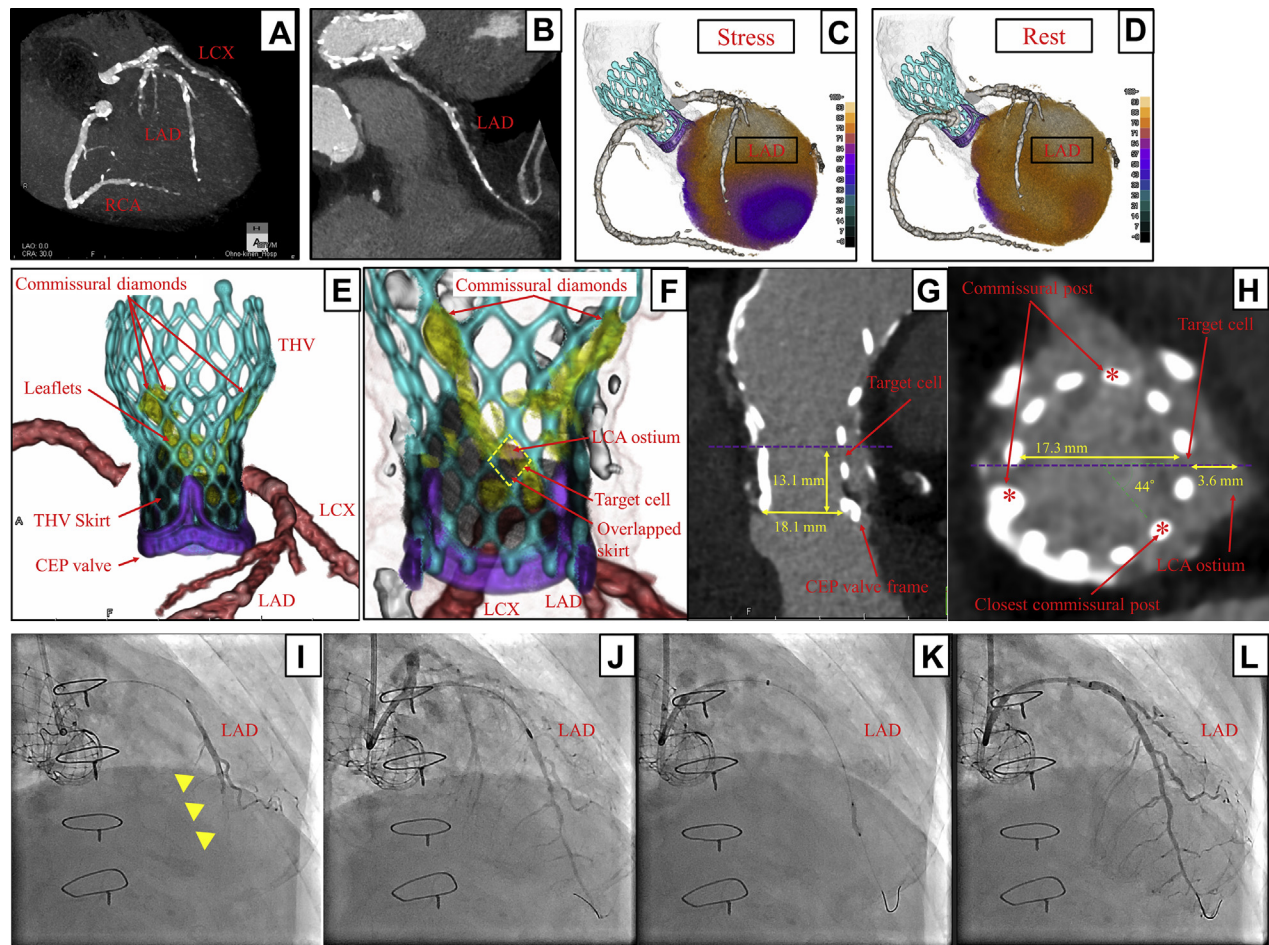
Thereafter, we successfully performed PCI with rotational atherectomy and drug-eluting stent implantation in the distal LAD (Figures 1I to 1L, Video 3). The patient was discharged 3 days later. Thus, PCI in the valve-in-valve setting is feasible with the aid of MSCT.

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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 *JACC: Cardiovascular Interventions* [author instructions page](#).

Manuscript received May 28, 2020; accepted June 9, 2020.

FIGURE 1 Pre-Procedural Assessment With Multiple Imaging Modalities and PCI After Valve-in-Valve TAVR

The maximum intensity projection (A) and curved planar reconstruction (B) disclose stenosed lesions with severe calcification in the distal left anterior descending coronary artery (LAD). Hybrid images of stress (C) and rest (D) single-photon emission computed tomography (CT) and multislice (MS) CT reveal anteroapical myocardial ischemia in the distal LAD (Video 1). Three-dimensional MSCT reconstruction of the valve-in-valve construct and its anatomy in relation to the coronary artery and aorta (E) (Video 2). En face view from inside the transcatheter heart valve (THV) indicating the closest cell (yellow-dashed square) as a potential access route overlapped partially by the THV skirt between 2 commissures (F). Corresponding longitudinal (G) and axial (H) projections through the aortic root (dotted violet lines in G and H). The target cell is 13.1 mm above the THV inflow because the skirt extends 13 mm from the inflow bottom. A 7-F Judkins left 3.5 guide catheter was semiselectively engaged after a 0.014-inch guidewire and a microcatheter advanced into the LAD via the semiopened cell close to the left coronary artery (LCA) ostium disclosing the occlusive lesion (yellow arrowheads) in the distal LAD (I) (Video 3). After the engagement in support with a 5-F guide extension catheter, rotational atherectomy is performed using a 1.25-mm burr (J) and the lesion is pre-dilated with a 2-mm cutting balloon (K) and deployment of a 2.25-mm stent with a final angiogram (L). CEP = Carpentier-Edwards PERIMOUNT valve; LCX = left circumflex coronary artery; PCI = percutaneous coronary intervention; RCA = right coronary artery; TAVR = transcatheter aortic valve replacement.

REFERENCE

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KEY WORDS multislice computed tomography, percutaneous coronary intervention, transcatheter aortic valve replacement

APPENDIX For supplemental videos, please see the online version of this paper.