

Coronary Ostia Stenosis After Transcatheter Aortic Valve Implantation

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A frail 85-year-old woman with symptomatic severe aortic stenosis was evaluated for transcatheter aortic valve implantation (TAVI). The Society of Thoracic Surgeons (STS) risk score and the logistic EuroSCORE were 7.2% and 13.3%, respectively.

Based on extreme frailty and severe chronic kidney disease, the patient was considered nonsuitable for conventional surgery. Cardiac computed tomography and coronary angiography are shown in [Figure 1](#). Due to calcified and small (<7 mm) ilio-femoral

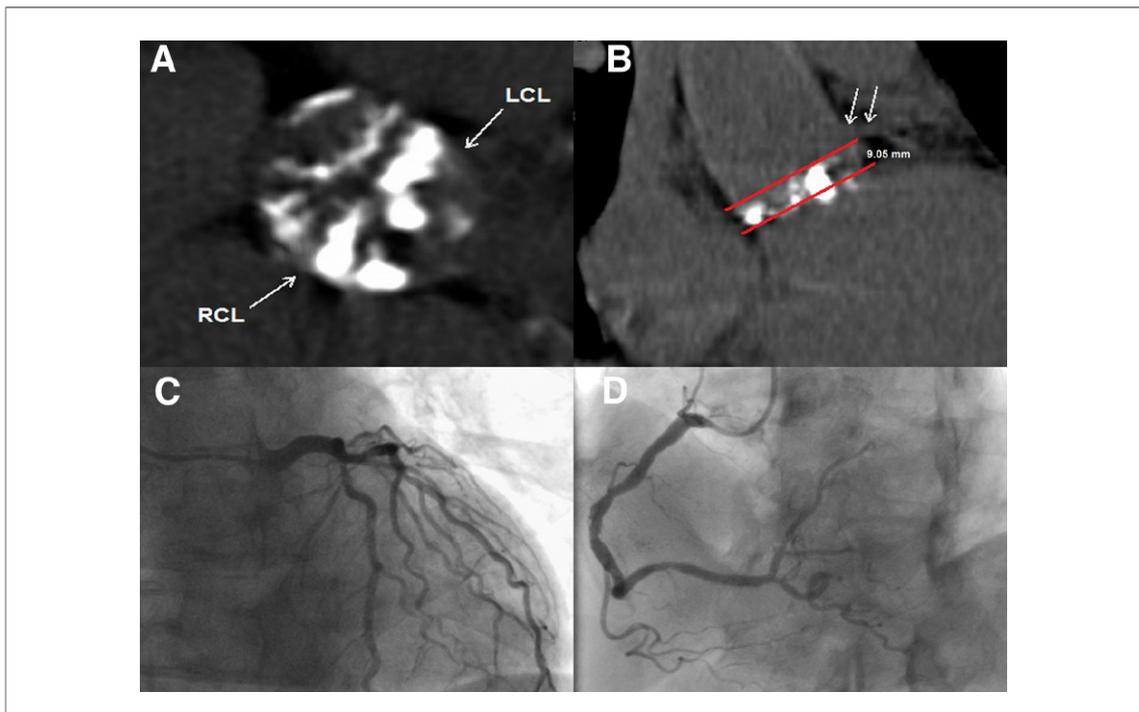


Figure 1. Baseline Computed Tomography and Coronary Angiography

(A) Computed tomography image showing the severity of aortic valve calcification (left coronary leaflet [LCL], right coronary leaflet [RCL]). (B) Computed tomography image showing the distance (red lines) between the insertion of the aortic leaflets and the origin of the left main coronary artery (white arrows). The distance between the insertion of the aortic leaflets and the origin of the right coronary artery was 11.5 mm. (C) Left coronary angiography showing the absence of left main coronary artery disease. (D) Right coronary angiography showing a moderate lesion (34% diameter stenosis by quantitative coronary angiography) at the origin of the right coronary artery.

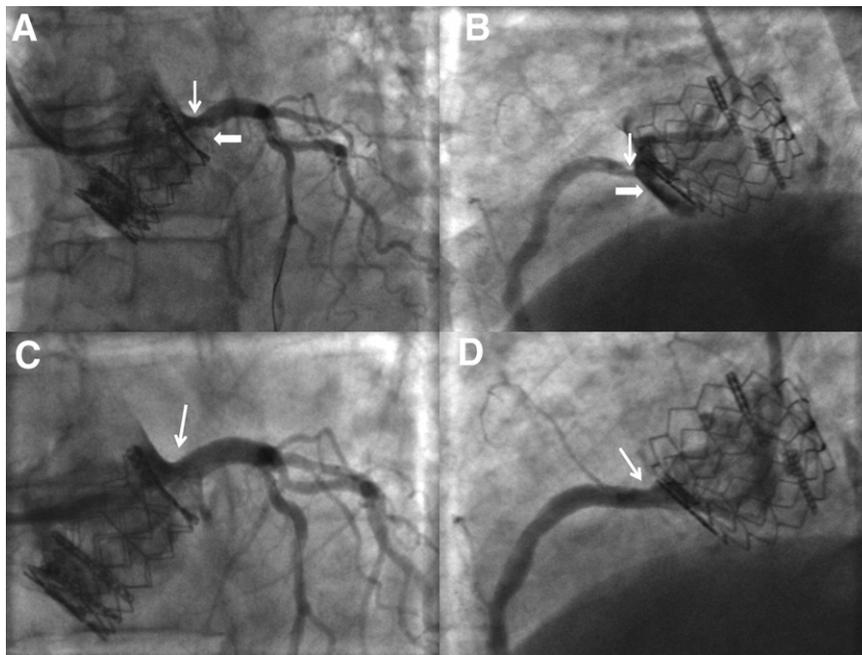


Figure 2. Coronary Angiography at 24 h After Transcatheter Aortic Valve Implantation

Coronary angiography images showing significant stenosis (**thin arrows**) of the left main coronary artery (LMCA) (**A**) and right coronary artery (RCA) (**B**) ostia secondary to the displacement of the calcified native aortic leaflets (**thick arrows**) toward the coronary ostia. Coronary angiography images after percutaneous coronary intervention showing the absence of residual stenosis (**thin arrows**) at the LMCA (**C**) and RCA (**D**) ostia. The distance between the LMCA and RCA ostia and the struts of the valve were 1.89 mm and 1.29 mm, respectively. The transcatheter aortic valve implantation procedure and immediate echocardiographic results are shown in [Online Videos 1, 2, 3, and 4](#). Coronary angiography and intervention are shown in [Online Videos 5, 6, 7, and 8](#).

arteries, the procedure was performed by transapical approach (1). A 26-mm Edwards-SAPIEN valve (Edwards Lifesciences, Inc., Irvine, California) was successfully implanted, although the valve was positioned in a high position with respect to the aortic annulus ([Online Videos 1, 2, 3, and 4](#)). Twenty-four hours after TAVI, the patient had chest-pain

with transient ST-segment changes. A coronary angiography showed significant stenosis of the left main coronary artery (LMCA) and right coronary artery (RCA) ostia secondary to the displacement of the calcified native aortic leaflets toward the coronary ostia ([Figs. 2A and 2B](#), [Online Videos 5 and 6](#)). Percutaneous coronary intervention was successfully performed

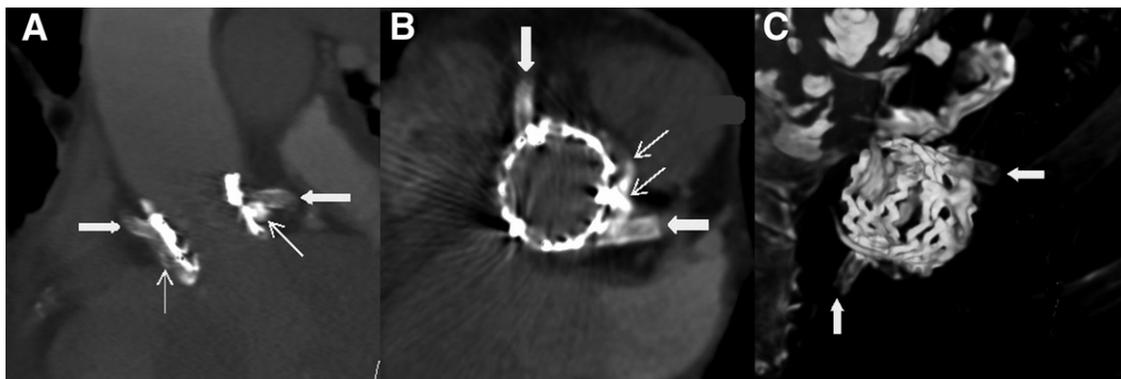


Figure 3. Computed Tomography at Hospital Discharge

Cardiac computed tomography images of the Edwards-SAPIEN valve and the 2 coronary stents (**thick arrows**) through the struts of the Edwards-SAPIEN valve stent (**A and B**); **thin arrows** highlight the calcified native aortic leaflets. Three-dimensional reconstruction (**C**) of the Edwards-SAPIEN valve with the 2 coronary stents (**thick arrows**) through the struts of the valve. A complementary transthoracic echocardiogram is shown in [Online Video 9](#).

in both LMCA and RCA ostia (Figs. 2C and 2D, Online Videos 7 and 8). A pre-discharge cardiac computed tomography and echocardiography are shown in Figure 3 and Online Video 9, respectively. At 6-month follow-up the patient was in functional class II without cardiovascular events.

LMCA stenosis is a potential complication of TAVI (2,3). This case shows that this complication can affect the 2 coronary ostia and become clinically evident in the sub-acute phase after TAVI. Also, it supports the feasibility of percutaneous coronary intervention through the struts of the implanted valve. The presence of a bulky calcified valve has been recognized as a risk factor for LMCA stenosis after TAVI, especially in those cases with a short distance (<8 mm) between the aortic leaflets and the coronary ostia (3,4). In these cases, dye injection at the time of balloon valvuloplasty might be useful to determine the relation of the extended leaflets to coronary ostia (3).

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Key Words: aortic stenosis ■ bioprosthesis ■ coronary angioplasty ■ percutaneous aortic valve implantation.

▶ APPENDIX

For supplementary Videos 1 to 9, please see the online version of this article.