

IMAGES IN INTERVENTION

Simultaneous TAVR and Left Main “Chimney” Stenting in a Patient With Low Left Main Height



Marco Spaziano, MD,^a Mariama Akodad, MD,^a Thomas Hovasse, MD,^a Thierry Lefèvre, MD,^a Erik Bouvier, MD,^b Bernard Chevalier, MD^a

An 82-year-old woman was referred for transcatheter aortic valve replacement (TAVR) following hospitalizations for heart failure due to severe aortic stenosis. She was deemed inoperable by the heart team because of her age and her limited mobility due to multiple sclerosis. Preprocedural computed tomography scan revealed a bicuspid aortic valve (type 1 with N-L [noncoronary-left coronary cusp] raphe), dilated aortic root, and anomalous origin of the left main coronary artery (LM) adjacent to the raphe, 4 mm above the annulus (Figures 1A to 1C).

Given the high risk of obstruction, the LM was wired from the radial approach, and a 3.5 × 38-mm Xience everolimus-eluting stent (Abbott Vascular, Santa Clara, California) was positioned beyond the ostium (Figure 1D). After pre-dilatation, a 29-mm Evolut-R valve (CoreValve EvolutR, Medtronic, Dublin, Ireland) was partially deployed. An aortogram showed severe pinching of the ostial LM and slow flow in the left anterior coronary artery (LAD) (Figure 1E). The stent was pulled back to position the distal marker just proximal to the LM bifurcation carina and deployed (Figure 1F). The valve was then released, but appeared constrained (Figure 1G). In

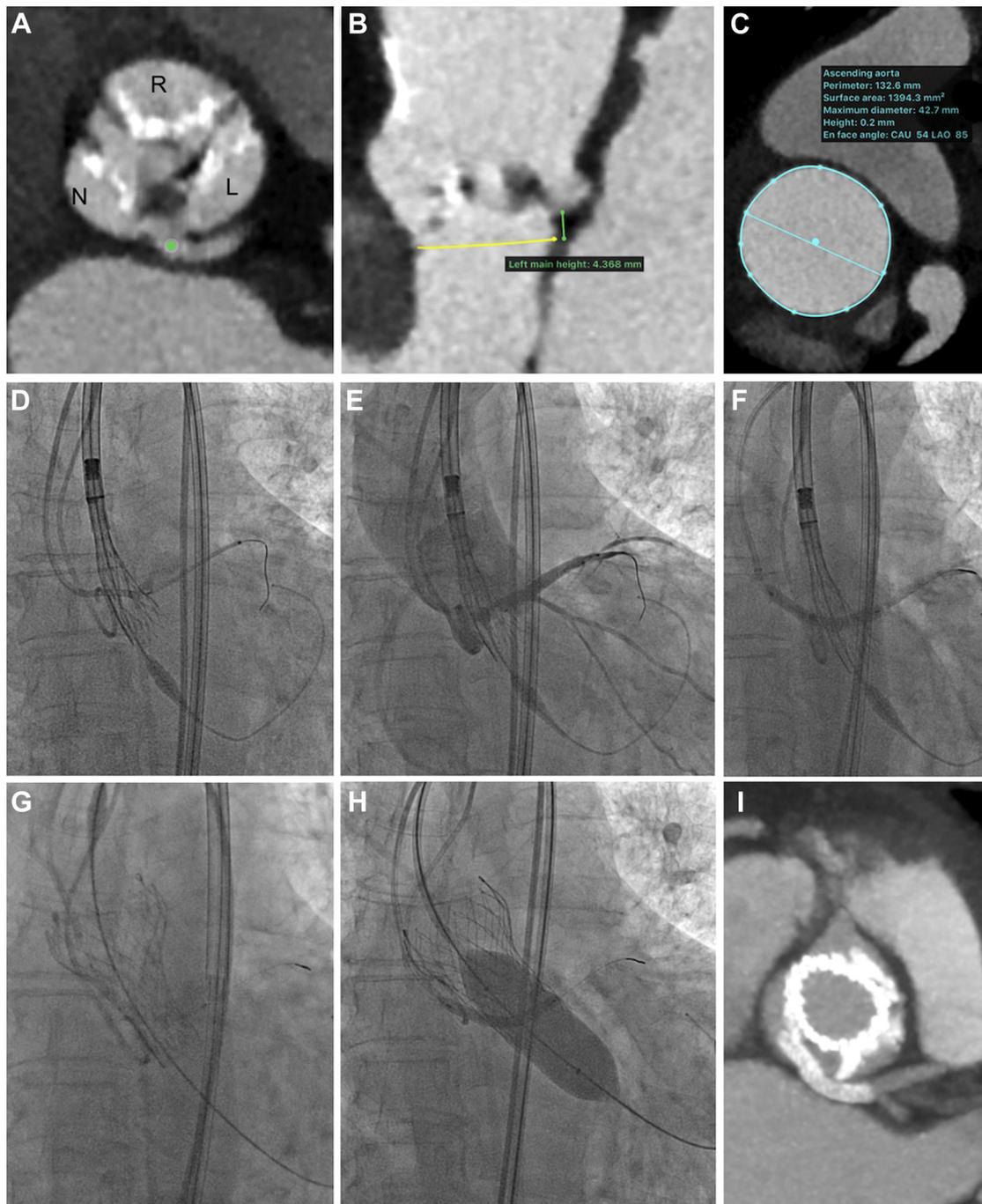
order not to crush the “chimney stent” during valve post-dilatation, a “kissing” was performed with simultaneous inflation of the stent balloon and a 20-mm Edwards balloon selected according to the intercommissural distance (Figure 1H, Online Video 1). Final showed normal valve function and LM patency. We selected a 38-mm stent to have optimal LM coverage and to have the proximal part of the stent above the leaflets of the prosthesis, to ensure LM patency. Postprocedural computed tomography revealed good stent patency and little interaction between stent and valve (Figure 1I, Online Video 2).

TAVR is challenging in patients with low coronaries because of the risk of obstruction (1,2). The usefulness of LM protection has been demonstrated in a small series (3). This is the first report to our knowledge of “chimney” stenting of the LM followed by kissing post-dilatation during TAVR. This can be a useful strategy for patients with nonstenotic, but low, coronaries.

ADDRESS FOR CORRESPONDENCE: Dr. Mariama Akodad, Interventional Cardiology, Institut Cardiovasculaire Paris Sud, 6 Avenue du Noyer Lambert, 91100 Massy, France. E-mail: akodadmyriam@gmail.com.

From the ^aInterventional Cardiology Department, Ramsay Générale de Santé, Institut Cardiovasculaire Paris Sud, Massy, France; and the ^bDepartment of Cardiology, Ramsay Générale de Santé, Institut Cardiovasculaire Paris Sud, Massy, France. Dr. Akodad has received research grants from Edwards Lifesciences and Medtronic. Dr. Lefèvre has been a proctor for Edwards Lifesciences and Abbott Vascular. Dr. Chevalier has been a proctor for Medtronic. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose. The first 2 authors contributed equally to this work.

Manuscript received April 12, 2017; revised manuscript received May 22, 2017, accepted June 20, 2017.

FIGURE 1 Simultaneous TAVR and LM "Chimney" Stenting in a Patient With Low LM Height

(A to C) Pre-procedural CT scan (multiplanar reconstruction). (A) Plane above the aortic annulus showing a bicuspid aortic valve (N-L raphe) and anomalous LM (green dot). There was no coronary artery disease otherwise. (B) Coaxial aortic annulus (yellow line) and LM height (green line). Annulus perimeter was 77.0 mm. (C) Ascending aorta. (D) Stent positioned beyond the ostial LM and initiation of valve deployment. (E) Aortogram showing LM pinching and slow flow down the LAD. (F) Stent pulled back and deployed at 16 atm with distal marker just proximal of LM bifurcation. (G) Valve released showing significant underexpansion. (H) "Kissing" with stent balloon and valvuloplasty balloon ([Online Video 1](#)). (I) Post-procedural CT scan at the level of the LM showing normal stent appearance ([Online Video 2](#)). CT = computed tomography; L = left coronary cusp; LAD = left anterior descending coronary artery; LM = left main coronary artery; N = noncoronary cusp; R = right coronary cusp; TAVR = transcatheter aortic valve replacement.

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KEY WORDS chimney stenting, low coronary implantation, TAVR

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