

IMAGES IN INTERVENTION

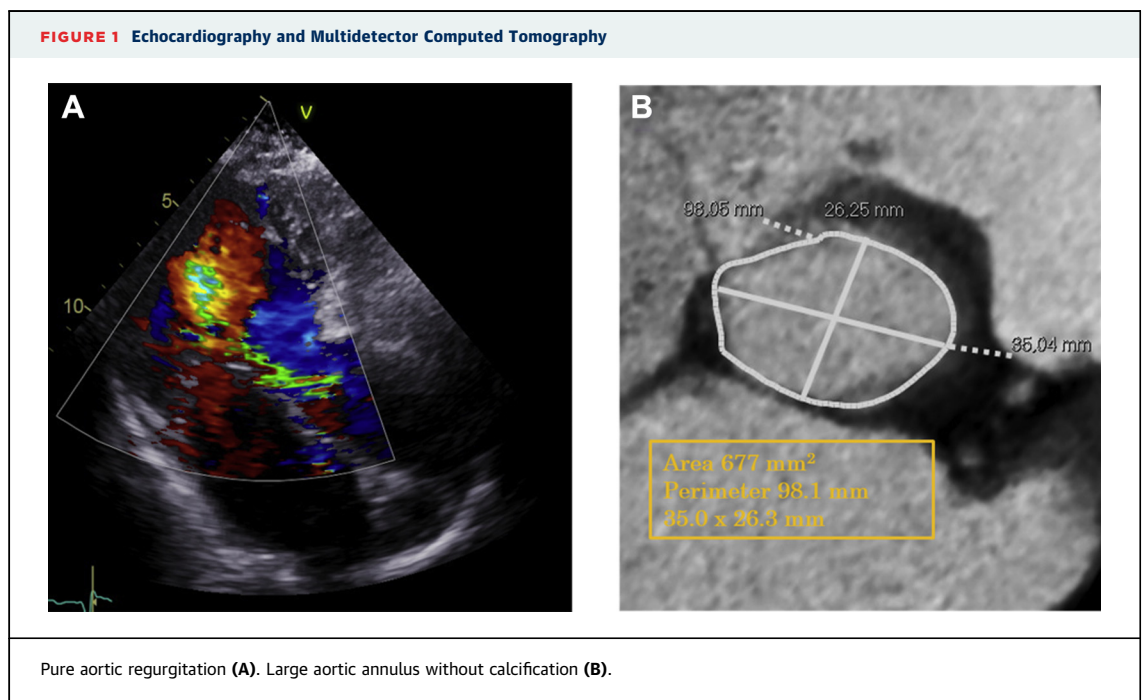
Rescue Valve-in-Valve Transcatheter Aortic Valve Replacement for Pure Aortic Regurgitation

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A 74-year-old man was transferred to our institution due to severe aortic regurgitation (AR) (Figure 1A) and heart failure. Because of his background characteristics, including a prior pulmonary embolism, amputation of lower extremity due to squamous cell carcinoma, active *methicillin-resistant Staphylococcus aureus* infection, the patient was considered to be at high risk for conventional

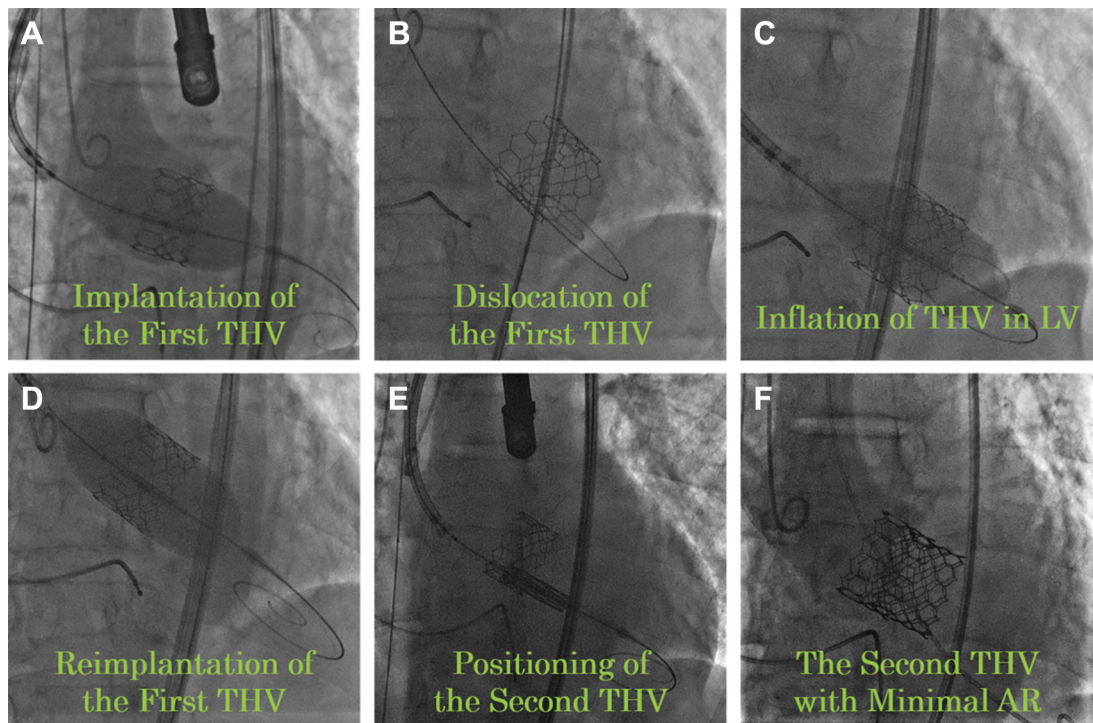
surgery. Hence, we decided to perform transcatheter aortic valve replacement (TAVR).

Multidetector computed tomography showed a large aortic annulus (annulus area of 677 mm², annulus perimeter of 98.1 mm) with no calcification (Figure 1B). Therefore, we prepared the second transcatheter heart valve (THV) for rescue valve-in-valve procedure.



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FIGURE 2 Transcatheter Aortic Valve Replacement

Implantation of the first transcatheter heart valve (THV) (A). Dislocation of the first THV into left ventricle (B). Inflation of the first THV in left ventricle (C). Reimplantation of the first THV in the aortic position (D). Implantation of the second THV overlapped with the first THV (E). Successfully implanted the second THV with minimal aortic regurgitation (F).

Transfemoral TAVR was performed under general anesthesia. A 29-mm Sapien 3 (Edwards Lifesciences, Irvine, California) was implanted with overfilling of the deployment balloon with 5.5 ml of additional volume (Figure 2A). Implanted THV remained in the aortic position for few seconds, then dislocated to the left ventricle (Figure 2B). He developed pulseless electrical activity and we immediately initiated cardiopulmonary resuscitation. We inflated the delivery balloon in the left ventricle (Figure 2C) and pulled up the THV to the aortic position. The THV was implanted again with overfilling of 10.0 ml of additional volume to overexpand THV maximally (Figure 2D). This time, THV stayed in the aortic position. However, significant AR remained due to the high implanted position and hemodynamics sustained unstable. Therefore, we immediately implanted the second 29-mm SAPIEN 3 with overfilling of 5.5 ml of additional volume (Figure 2E) lower than the first THV. After the implantation of the second THV, aortography showed minimal AR (Figure 2F) and the hemodynamic status stabilized. The subsequent post-operative course was

uneventful, and the patient was discharged with no sequela on post-operative day 8.

TAVR for pure AR remains challenging, particularly for patients with large aortic annulus. As expected, the first THV dislocated into the left ventricle and resulted in hemodynamic collapse. However, we performed a rescue valve-in-valve procedure immediately, because this known complication was taken into consideration during planning. Because of the lack of calcification in the aortic annulus in pure AR, TAVR for pure AR is technically difficult. Therefore, we must undertake this procedure with the utmost preparation.

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