

IMAGES IN INTERVENTION

Transfemoral Aortic Valve Implantation With Pre-Existent Mechanical Mitral Prosthesis

Evidence of Feasibility

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An 82-year-old woman was referred to our institution for treatment of a severe aortic stenosis (valve area 0.5 cm², mean aortic gradient 45 mm Hg, left ventricular ejection fraction 45%) because of recent pulmonary edema.

She had a history of hypertension, atrial fibrillation, and transient ischemic attack. Twenty-five years ago, she underwent a mitral valve replacement with a Lillehei-Kaster prosthesis. Angiogram showed no significant coronary artery disease.

The risk of operative mortality for conventional surgery was 26.5% according to the Society of Thoracic Surgeons Score. The patient was considered as a high-surgical-risk candidate, and she was evaluated for transcatheter aortic valve implantation (TAVI).

Aortic annulus assessed by transesophageal echocardiography (TEE) was 21 mm. Femoral and iliac arteries evaluated by angiography and multislice computed tomography were straight with internal diameters >8 mm and mild calcifications. The TAVI by a transfemoral approach with a 23 mm balloon-expandable valve was planned.

Several concerns raised before the procedure include the following: 1) the possibility of under-expansion of the aortic prosthesis in relation to the noncompliant mechanical mitral prosthesis close to the aortic annulus (the distance measured by TEE between aortic annulus and mechanical mitral prosthesis was 9.7 mm) (Fig. 1A); 2) the risk of embolization of the device caused by a kind of “watermelon seeding” effect; and 3) the risk of postoperative dysfunction of the mitral prosthesis in case of conflict

between its pivoting disc and the distal edge of the aortic prosthesis.

The procedure was performed under general anesthesia, fluoroscopy, and TEE guidance. Balloon aortic valvuloplasty with a 23-mm balloon showed a good expansion and stability of the balloon and no conflict with the mitral prosthesis (Fig. 1B, Online Video 1). A 23-mm Edwards Sapien valve (Edwards Lifesciences, Inc., Irvine, California) was then implanted (Online Video 2). Immediate fluoroscopic and TEE control showed normal mitral and aortic prosthesis functions with only grade 1 aortic paravalvular leak (Figs. 1C and 1D, Online Video 3). The patient was discharged 7 days after the procedure without any complications.

At 1-month follow-up, she was in New York Heart Association functional class II. Transthoracic echocardiography showed a correct position and function of the aortic and mitral valves.

A TAVI with a transapical approach with a balloon-expandable aortic valve, in a patient with mechanical mitral valve prosthesis, has recently been reported (1). This case demonstrates the feasibility of a transfemoral approach in such a situation.

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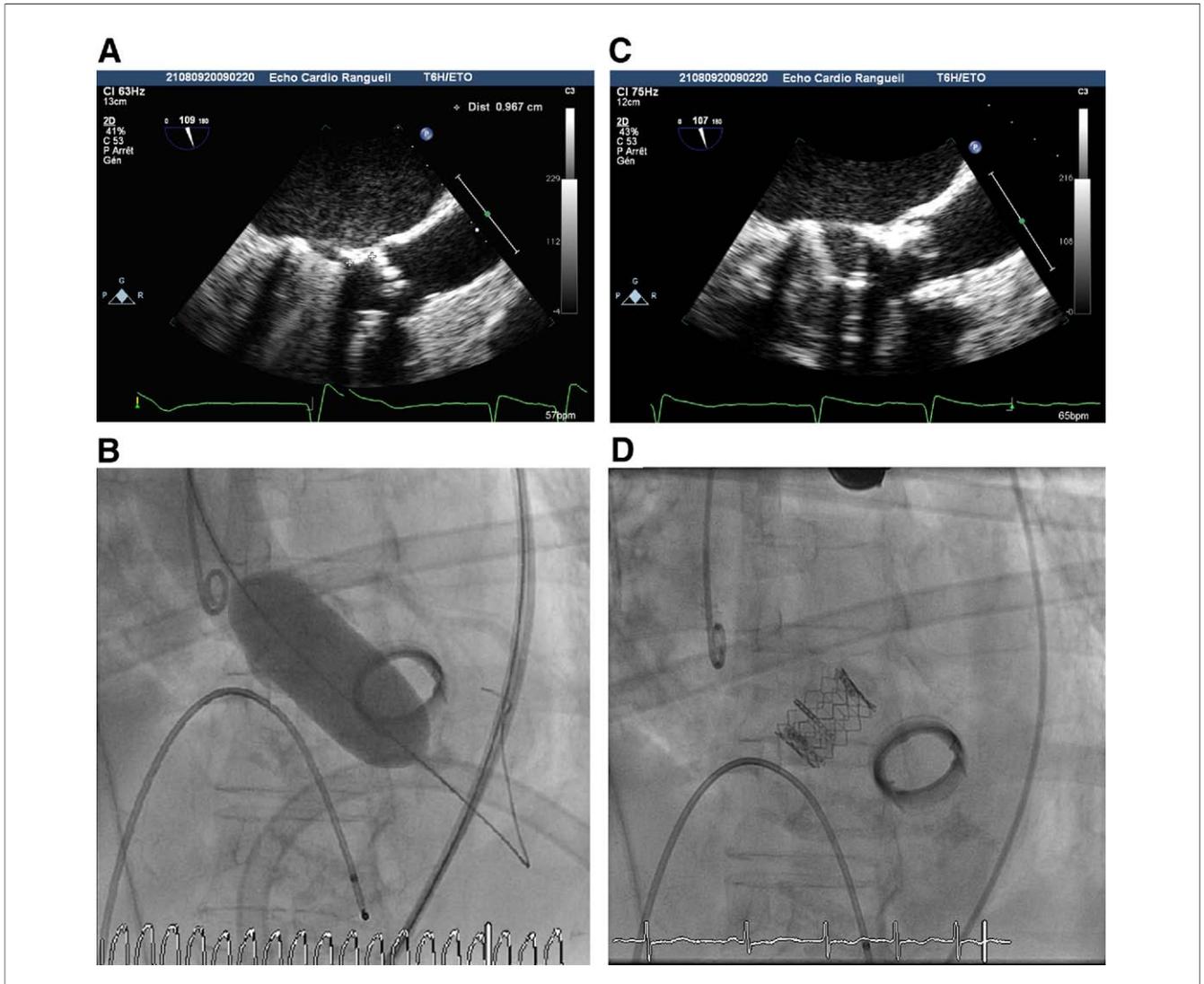


Figure 1. Steps of Transcatheter Aortic Valve Implantation Procedure Under TEE and Fluoroscopic Guidance

(A) Long-axis transesophageal echocardiography (TEE) view showing the 9.7-mm distance between aortic annulus and mitral prosthesis. (B) Balloon aortic valvuloplasty showing stability and normal expansion of the 23-mm balloon ([Online Videos 1 and 2](#)). (C) Long-axis TEE view of normal position and function of the aortic and mitral prosthesis ([Online Video 3](#)). (D) Fluoroscopic view of normal position and function of the aortic and mitral prosthesis.

▶ APPENDIX

For supplementary videos, please see the online version of this article.