

TAVI-in-TAVI — Is this the future?

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While an increasing number of younger patients with longer life-expectancy receive transcatheter aortic valve implantation (TAVI), one can assume that patients will outlive their bioprostheses. Thus, repeat interventions after TAVI are expected to rise dramatically. Presented herein are two cases of failed transcatheter heart valves (THV), treated effectively with transcatheter aortic valve-in-valve implantation (TAVI-in-TAVI).

The first, a 75-year-old woman that presented with clinical (exercise-induced dyspnea) and the echocardiographic (aortic valve area [AVA] was 0.75 cm², AVA index 0.43 cm²/m², paravalvular regurgitation) symptoms of bioprosthetic valve failure (BVF), a Sapien XT 23 mm, which was implanted in 2013. Transfemoral TAVI-in-TAVI using the self-expandable Portico 23 mm, THV was performed resulting in a precise implantation (Fig. 1A). Post-operative echocardiography showed an excellent hemodynamic result (AVA 1.62 cm², AVA index 1.04 cm²/m², without para-prosthetic leak), the patient reported symptom improvement and after 7 days was discharged.

The second, a 71-year-old man with clinical symptoms (exercise-induced dyspnea) of heart

failure (NYHA III, ejection fraction 27%) and echocardiographically confirmed severe aortic regurgitation caused mostly by para-prosthetic leak (BVF, CoreValve 29 mm, implanted into the bicuspid valve in 2013). The Heart Team decided to proceed with transfemoral TAVI-in-TAVI using the balloon-expandable Sapien 3 29 mm bioprosthesis (Fig. 1B). Optimal implantation was achieved, post-operative echocardiography showed correct function of implanted bioprosthesis; the para-prosthetic leak disappeared and gradient was < 10 mmHg. The patient was discharged after 6 days.

Taking into consideration the expanding recommendations and rapid growth of TAVI it can be expected that increasingly more BVFs and subsequent TAVI-in-TAVI procedures will occur. Hemodynamics with desired low trans-prosthetic gradient and possible future coronary access should be taken into consideration for optimal clinical effect. TAVI-in-TAVI procedures may also carry an elevated risk of debris embolizing to the brain, however, embolic protection devices can be a potential solution to decrease cerebral embolization and the associated neurological complications.

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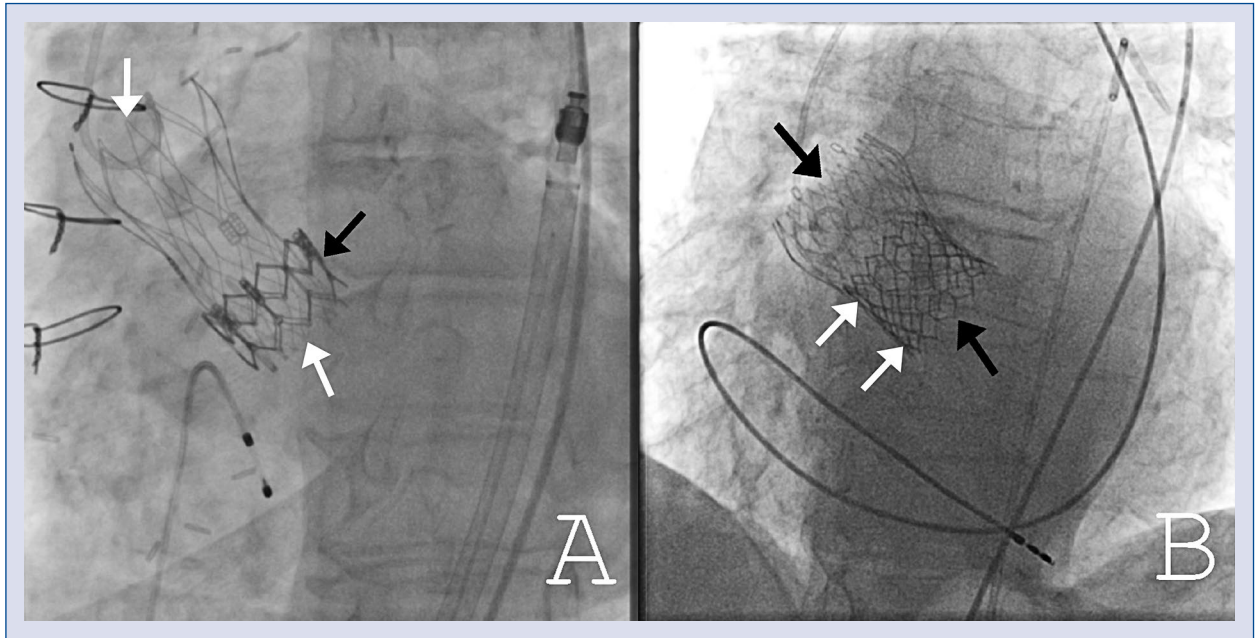


Figure 1. A. Portico 23 mm (upper and lower edge marked by white arrows) implanted into the failing Sapien XT 23 mm (marked by black arrow); **B.** Edwards Sapien 3 29 mm (marked by white arrows) implanted into CoreValve 29 mm (upper and lower edge marked by black arrows).