Patient characteristics and long-term outcomes in patients undergoing transcatheter aortic valve implantation in a failed surgical prosthesis versus in a native valve

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Background: Valve-in-valve transcatheter aortic valve implantation (TAVI) is an increasingly used treatment for failed surgical aortic prosthesis, but data from clinical practice are limited.

Purpose: We examined patient characteristics and outcomes of patients undergoing TAVI in a surgical valve compared with patients undergoing TAVI in a native valve.

Methods: Patients undergoing TAVI from January 1, 2008, to December 31, 2020, were identified using Danish nationwide registries.

Results: In total, 6070 patients undergoing TAVI were identified; 247 (4%) patients had a history of SAVR (The valve-in-valve cohort). Patients with valve-in-valve-TAVI were younger but had a greater burden of cardiovascular comorbidities compared with patients with native-valve-TAVI. The cumulative 30-day risk of death was 2.4% (95% CI: 1.0% to 5.0%) in patients with valve-in-valve-TAVI and 2.7% (95% CI: 2.3% to 3.1%) in patients with native-valve-TAVI (Figure 1A). Correspondingly, the cumulative 5-year risk of death was 42.5% (95% CI: 34.2% to 50.6%) and 44.8% (95% CI: 43.2% to 46.4%), respectively. Within 30 days post-procedure, 11 (0.2%) patients with valve-in-valve-TAVI and 748 (13.8%) patients with native-valve-TAVI, had a pacemaker implantation. In multivariable Cox proportional hazard analysis, patients with valve-in-valve TAVI did not have a significantly different risk of rehospitalization from any cause compared to patients with native valve TAVI at 30 days (HR 0.80 [95% CI 0.58-1.10]) and at 5 years (HR 0.85 [95% CI 0.73-1.00]) (Figure 1B). Furthermore, in adjusted analysis, valve-in-valve-TAVI was not associated with significantly different risk of death at 30 days (Hazard ratio (HR)= 0.98, 95% CI 0.43-2.22) and 5 years (HR=0.81, 95% CI 0.64-1.03) compared with native-valve-TAVI.

Conclusions: TAVI in a failed surgical aortic prosthesis as compared to TAVI in a native valve, was not associated with significantly different short- and long-term mortality. Although these findings to some extent reflect thorough patient selection, valve-in-valve-TAVI appears to be a safe procedure.
Figure 1: Mortality and Readmissions After TAVI in a Failed Surgical Aortic Prosthesis versus in a Native valve

A) Mortality in patients with TAVI in a failed surgical aortic prosthesis or in a native valve  B) Readmissions in patients with TAVI in a failed surgical aortic prosthesis or in a native valve. **Abbreviations:** TAVI transcatheter aortic valve implantation; SAVR surgical aortic valve replacement.