The effect of permanent pacemaker implantation following transcatheter aortic valve implantation upon survival

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Purpose: Transcatheter aortic valve implantation (TAVI) is often followed by conduction abnormalities, leading to a permanent pacemaker implantation (PPI). Data regarding the clinical impact of PPI following TAVI is yet to be established.

Methods: Patients with severe and symptomatic aortic stenosis [effective orifice area (EOA) $\leq 1cm^2$] referred for TAVI at our institution were consecutively enrolled. Prospectively collected demographic, laboratory and echocardiographic data were retrospectively analyzed. Patients were stratified into two groups according to the need for PPI after TAVI and were followed up postoperatively with clinical and echocardiographic assessment. Primary clinical endpoint was all-cause mortality, as defined by the criteria proposed by the Valve Academic Research Consortium 2.

Results: In total, 292 patients were included (male: 50.2%, mean age: 80±7.6 years) in our study. Of these, 109 (37.5%) underwent PPI simultaneously or shortly after TAVI. The median follow-up period was 27.3 In this period, all-cause mortality showed no significant difference between patients with and those without PPI after TAVI (log-rank p=0.756), even after excluding patients with a pre-existing pacemaker from the analysis. Subgroup analysis also showed no difference in survival between patients with low ejection fraction (<50%) and those with preserved (≥50%) receiving a permanent pacemaker after TAVR (log-rank p=0.269). Taking into consideration factors that were found to associate to PPI in univariate analysis (pre TAVI - ejection fraction, pulmonary artery systolic pressure and New York Heart Association functional class) in a multivariate model, pre TAVI pulmonary artery systolic pressure was found to be an independent predictor of peri-procedural PPI [Exp(B): 0.977, 95% Confidence Interval: 0.957–0.998, B=−0.023, p=0.029]. Pre-TAVI conduction abnormalities and the degree of aortic annulus calcification, as assessed by computed-tomography, were not found to predict PPI after TAVI.

Conclusion: PPI following TAVI was not associated with survival at 27 months of follow-up, independently from the pre TAVI ejection fraction.
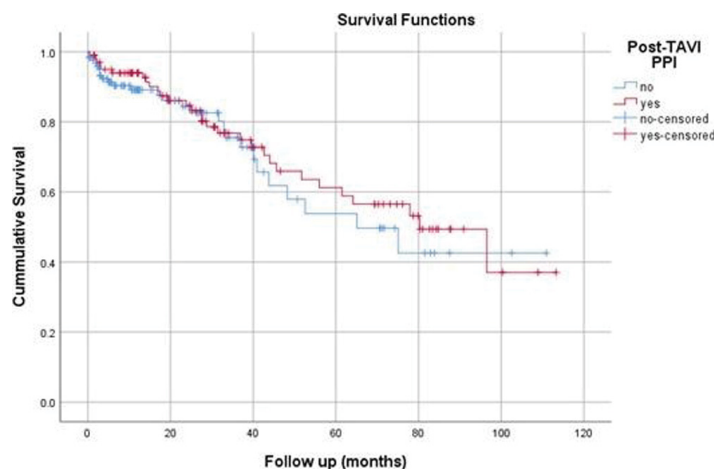
Figure 1