Long-term outcomes in patients undergoing transcatheter aortic valve implantation: insights on clinical outcomes and prognostic markers from a large cohort of patients

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Transcatheter Aortic valve Replacement (TAVR) has emerged as paradigm shift in the treatment of patients with severe symptomatic aortic stenosis. Clinical and performance data on long-term TAVR are still limited. The aim of this study was to determine the survival and the factors predicting mortality after TAVR with the first and second generation of prostheses.

Methods: From April 2008 to December 2019, the auto-expandible prostheses were implanted in 765 patients with symptomatic severe aortic stenosis with deemed high risk. The first generation prostheses included CoreValve and Accutrak System and the second prostheses included Evolut R and Pro.

Results: The mean age was 79.4±6.6 years. The logistic EuroSCORE and STS score were 17.1±11% and 5.7±3.9%, respectively. The implantation success rate was 98.87%. In-hospital mortality was 3.7%, and the combined endpoint of death, vascular complications, myocardial infarction or stroke had a rate of 15.1%.

The clinical outcomes in according to prosthesis generation were, for pacemaker requirement (CoreValve vs. Accutrak system vs. Evolut R vs. and Evolut pro) 35.3% vs. 26.1% vs. 14.3% vs. 14%, p=0.001; and the paravalvular aortic regurgitation, were: none 28% vs. 44.8% vs. 43.3% vs. 58; mild 40% vs. 32.3% vs. 30.8% vs. 35.2%; moderate 32% vs. 20.3 vs. 23.9% vs. 5.7%; severe 0% vs. 2.6% vs. 0% vs. 1.1, p 0.001

The late mortality (beyond 30 days) was 35.9%. Survival at 1, 3, 5, 7 and 9 years were 88.9%, 76.1%, 61.1%, 44% and 32.6% respectively, after a mean follow-up of 42.3±27 months. The NYHA functional class improved from 3.1±0.6 to 1.77±0.7 in the follow-up.

At 5 years, 5 patients had severe prosthetic valve dysfunction (severe stenosis and moderate transvalvular regurgitation

The predictors of cumulative mortality were: Charlson index [HR 1.25 (95% CI 1.077–1.461), p=0.004], Readmision Heart Failure [HR 3.02 (95% CI 1.554–5.879), p=0.001], stroke post-TAVR [HR 3.472 (95% CI 1.115–10.53), p=0.032], residual aortic regurgitation [HR 1.45 (95% CI 1.093–1.934), p=0,010], and severe pulmonary hypertension [HR –0.983 (95% CI 0.645–0.423) p=0.032].

Conclusions: TAVR is associated with significant survival benefit throughout 3.09 years of follow-up. Survival during follow-up depends particularly among patients with associated comorbidities and cardiac markers such as aortic regurgitation or pulmonary hypertension