Prosthesis-patient mismatch after aortic valve in valve procedure: incidence, predictors and clinical outcomes

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Background. Transcatheter aortic valve-in-valve (TAVI ViV) implantation is an appealing treatment option for patients with degenerated bioprostheses. However, elevated residual gradients after TAVI ViV procedure are very common. These are an unwanted effects of prosthesis-patient mismatch (PPM). Currently, the actual incidenceof PPM, its predictors and its clinical outcomes have not been completely investigated.

Purpose. The aims of this study was to investigate the incidence, predictors and clinical outcome of PPM and therefore of elevated gradients after TAVI ViV.

Methods. 75 patients (age 78 ± 9 years, 36 male), who underwent TAVI-ViV due to failed aortic biological valve (60 stented, 15 stentless), were enrolled. Mechanism of bioprosthetic valve failure was stenosis (34 cases, 45%), regurgitation (24 cases, 32%) or combination (17 cases, 23%). Elevated residual gradients were defined as a mean DP> 20 mmHg. PPM was identified by the indexed effective orifice area (EOAi) measured by echocardiography (moderate PPM if 0.65 < EOAi < 0.85 cm^2/m^2; severe PPM if EOAi < 0.6 cm^2/m^2).

Results. ViV TAVI was feasible in all patients, 33 patients (44%) were implanted with a balloon-expandable valve and 42 (56%) with a self-expandable valve. Post-procedural post-ballooning was performed in 16 out of 42 patients (38%) receiving a self-expandable valve. Post-operative mean DP> 20 mmHg was found in 35 patients (48%). Moderate PPM was found in 24 cases (33%) and severe PPM in 15 (20%). A logistic regression analyses identified small size of surgical prosthesis (size < 23 mm) [OR: 6.061(2.127-17.267), p = 0.001] and failed stented valve [OR: 20.727(2.522-170.364), p = 0.005] as independent predictors for the occurrence PPM. Interestingly PPM did not affect early and 1 years mortality (1 years mortality 1.3 %), while mortality was higher in pts with stentless prostheses (9%)

Conclusions. PPM is a frequent finding after ViV procedures. Despite elevated residual gradients, TAVI ViV resolved prosthetic dysfunction and PPM did not affect mortality. Therefore, this procedure represents a promising new option for patients with failed biological prosthetic valves.