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Valve-in-valve TAVI: the new standard therapy for failing bioprosthetic valves?

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Surgical aortic valve replacement (SAVR) remains the standard of care in younger patients at low operative risk, with a clear trend towards a more liberal indication for the implantation of bioprosthetic valves even in patients younger than 65 years old. Consequently, the number of patients who will outlive the lifetime of a bioprosthesis is expected to grow. Limited durability due to structural valve deterioration remains the principal limitation of bioprosthetic aortic valve replacement. Lifetime incidences of repeat SAVR up to 45% have been reported, depending on age at first SAVR[1].

Until recently, redo SAVR has been the standard of care for failing bioprostheses. However, compared to SAVR in a native valve, this procedure is linked to higher operative mortality and morbidity[2]. Valve-in-valve (ViV) transcatheter aortic valve implantation (TAVI) has been introduced as an alternative to surgery in patients unsuitable for reoperation or at particularly increased operative risk, with growing experience over recent years[3,4]. Whether TAVI, which recently evolved as the standard of care in elderly patients and those at increased operative risk, is also a valuable treatment option for patients with failing aortic valve bioprostheses still remains a matter of debate.

In this issue of EuroIntervention, Majmundar et al[5] report the results of a retrospective cohort study based on a large administrative database comparing the outcomes of 6,769 patients with failed aortic bioprostheses undergoing ViV TAVI or redo SAVR. Baseline criteria were substantially different, with ViV TAVI patients being older (79 vs 65 years) and presenting with a higher comorbidity burden. Nonetheless, relevant in-hospital outcomes including mortality (1.2% vs 3.4%), bleeding (29.7% vs 67.7%), cardiorespiratory complications (9.3% vs 26.5%), and length of hospital stay were significantly lower in patients receiving ViV TAVI as compared to those undergoing repeat SAVR. These differences remained after propensity score adjustments for baseline characteristics. In contrast, ViV TAVI was associated with significantly higher rates of 30-day (16.1% vs 11.5%) and six-month (33.8% vs 24.5%) hospital readmission.

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This study significantly extends previous knowledge by giving a representative insight into trends and outcomes of current clinical practice. The large sample size, based on an administrative dataset including both ViV TAVI and redo SAVR procedures, limits the risk of selection bias. Compared to a recently published analysis based on the same database but covering an earlier time period, outcomes appear to have improved, most likely reflecting growing operator experience, improved patient selection and the advent of next generation prostheses. Despite the fact that ViV TAVI patients were substantially older and sicker, mortality remained lower, which suggests that the safety of this approach as compared to redo surgery is potentially underestimated. The higher rate of hospital readmission is likely to be a result of the higher burden of comorbidities in these patients.

Regardless of these clearly impressive results, several limitations of the current analysis need to be taken into account. Since the outcomes were based on the International Classification of Diseases codes, data on predicted surgical risk, functional outcomes, or haemodynamics are lacking. For example, valvular gradients are not listed. These are a critical determinant for the long-term prognosis of patients undergoing this procedure, in particular in those of younger age and with a higher level of activity[6]. The small size of the initially implanted bioprosthesis, severe prosthesis-patient-mismatch and small aortic root are predictors of adverse outcome after ViV TAVI[4], which – so far – can only in part be overcome with modern implantation techniques and the choice of the prosthesis. The favourable data on mortality in the ViV TAVI group probably also reflect that a number of patients with unfavourable anatomy for ViV TAVI, but a higher surgical risk, had to be treated surgically, which may have led to the higher mortality rates in the SAVR group.

To summarise, the study reaffirms the safety of ViV TAVI in selected patients with failed aortic bioprostheses and impressively supports the role of transcatheter aortic valve therapies. This study calls for prospective, randomised data to clarify whether this treatment option is indeed superior with respect to mortality and durability in this constantly growing group of patients.

Conflict of interest statement

The authors have no conficts of interest to declare in relation to the content of this editorial.

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