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Letter to the Editor

Valve in valve TAVI for degenerated Mitroflow is safe and feasible

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Surgical reoperation on a failed aortic prosthesis can carry significant morbidity and mortality [1] as such patients are usually old, frail, and have significant medical comorbidities. The introduction of transcatheter valves has provided a valuable treatment option in patients with failed aortic prosthesis and elevated surgical reoperation risk. Since the FDA approval for TAVI in degenerated surgical prosthesis, the number of patients undergoing aortic valve reoperation has dramatically decreased nationwide across United States [2]. Nevertheless, valve in valve (VIV) TAVI has its own limitations with 3–4% risk of coronary obstruction, elevated post-implantation transvalvular gradient, and patient prosthesis mismatch (PPM) [3]. Most of these limitations can be predicted and mitigated by thorough review of the patient specific anatomy and clinical condition to offer best available treatment modality: surgical reoperation or VIV TAVI (Fig. 1).

In this issue of IJC, Isaac Pascual and colleagues [4] published their early experience with VIV TAVI using self-expandable Medtronic transcatheter valves in symptomatic high-surgical risk patients with failed Mitroflow (Mitroflow, Sorin) prosthesis. This pilot single center prospective study included 45 patients with failed Mitroflow causing significant obstruction, regurgitation, or mixed disease. Mitroflow has a unique design with supra-annular long leaflets made from bovine pericardial tissue. The leaflets are externally mounted on the surgical valve stent increasing coronary obstruction risk during VIV TAVI. The authors successfully demonstrated the feasibility of VIV TAVI in failed Mitroflow prosthesis with no reported coronary obstruction or procedural mortality. Survival was achieved in 96% of patients at 30 days. The authors concluded that VIV TAVI with self-expandable valves is a valuable option for patients with failed Mitroflow prosthesis and high risk of surgical reoperation. However, these results should be viewed with caution.

In this study, 27 (60%) and 13 (29%) had moderate and severe PPM post-VIV TAVI respectively. The "defensive" strategy with surgical implantation of small-sized Mitroflow prosthesis as the authors stated and the high prevalence of baseline PPM were likely responsible for the increased post-TAVI PPM rates. Twenty percent of patients had pre-existing severe PPM which is significantly higher than the observed 7.6% rate of severe baseline PPM in the global Valve in Valve International Data (VIVD) registry. These findings are of importance as performing TAVI in patients with pre-existing PPM is unlikely to alleviate symptoms and it is associated with increased mortality and early valve deterioration [5]. Post-TAVI PPM can be predicted by careful pre-procedural assessment evaluating the existence of baseline PPM and measuring the projected post-TAVI effective orifice area using the reference values for transcatheter heart valves [6,7]. Maximizing hemodynamic results with surgical replacement after annular dilatation might still be the best available option to treat such patient with failed prosthesis and baseline PPM if the acute surgical risk is acceptable. In patients with extreme surgical risk, valve implantation with optimal shallow depth and surgical valve frame fracture using non-compliant balloon can potentially be used to reduce the risk of significant PPM [8]. The use of supra-annular positioned valves as utilized by the study authors can further maximize the effective orifice area and reduce the risk of PPM. Newer surgically implanted valves with self-expandable stent frame and fluoroscopic marker such as INSPIRIS valve (Edwards Lifesciences) can further optimize the VIV results.

All VIV TAVI were successfully performed without coronary occlusion despite having virtual transcatheter valve to coronary ostia distance (VTC) of 4.8 ± 2.7 mm. While the study results are encouraging, surgical valves with supra-annular and externally mounted leaflets still carry highest risk of coronary obstruction approaching 6.5% especially in the setting of short VTC distance [9]. Careful selection of candidates for VIV TAVI by the investigators could explain the low rate of coronary obstruction as 70 of the patients with failed Mitroflow prosthesis underwent surgical reoperation at their site in the same time period. The investigators also used coronary protection in 8 cases with elevated risk of coronary obstruction defined as VTC < 6 mm by the authors. The presence of coronary bypass grafts in some of the studied patients could have provided further protection and mitigated from coronary obstruction. Careful patient selection and procedural planning as demonstrated by the authors or use of Bioprosthetic Aortic Scallop

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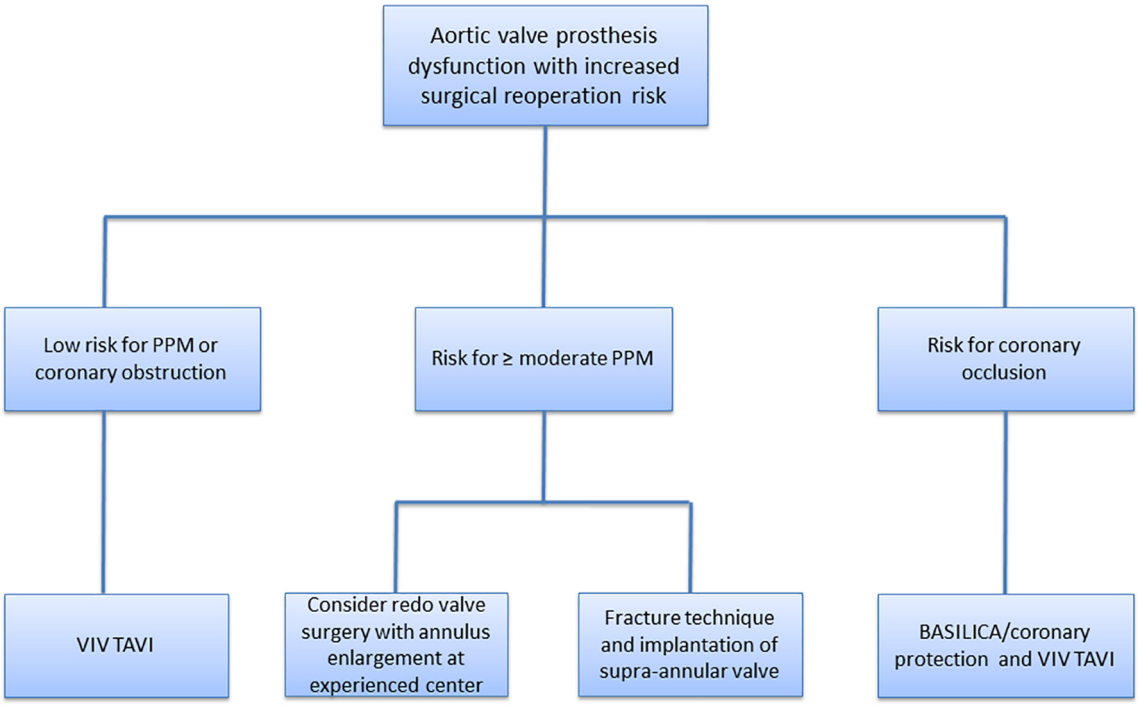

Fig. 1. Management algorithm of patients with failed bioprosthetic aortic valves and increased surgical risk. PPM, patient prosthesis mismatch; VIV TAVI, valve in valve transcatheter aortic valve implantation; BASILICA, Bioprosthetic Aortic Scallop Intentional Laceration to prevent Iatrogenic Coronary Artery obstruction.

Intentional Laceration to prevent Iatrogenic Coronary Artery obstruction (BASILICA) technique can potentially attenuate the risk of coronary artery occlusion.

In summary, the study by Pascual and colleagues adds useful information to the growing body of evidence indicating the safety, feasibility, and acceptable early outcomes of VIV TAVI in failed surgical bioprostheses with externally mounted supra-annular leaflets. With the growth of TAVI practice to include lower surgical risk patients, further emphasis on providing best aortic valve hemodynamics and lowering the risk of PPM will be fundemental in order to improve long-term clinical outcomes.

Disclosure

The authors report no relationships that could be construed as a conflict of interest.

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