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Commentary: Rapid deployment versus conventional tissue valves ... and the beat goes on

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Based on currently available data, the principal indications for use of rapid deployment (sutureless) aortic valve prostheses (RDV) remain incompletely defined. There is convincing evidence from single- and multi-institutional studies and from meta-analyses that, when compared with conventional bioprosthetic aortic valves for open aortic valve replacement, RDVs are associated with modest but significant reductions in the duration of cardiopulmonary bypass and aortic occlusion.¹⁻⁶ Comparative observational studies, however, have also documented a greater prevalence of permanent pacemaker implantation with RDVs and no appreciable differences in early or medium-term survival between the 2 valve types.^{2,3,5,6}

In this issue of the *Journal*, White and colleagues⁷ compare the early and later outcomes of 590 propensity-matched patients undergoing aortic valve replacement with the LivaNova Percival S sutureless prosthesis (n = 295), with any of 5 commercially available stented or stentless aortic bioprostheses (n = 295). The choice of a particular prosthesis was at the discretion of the operating surgeon, and no other selection criteria were reported. The cardiopulmonary bypass and aortic occlusion times were significantly shorter and the need for a permanent pacemaker was significantly greater among the patients in the RDV group. The rates of new-onset atrial fibrillation and acute kidney injury were significantly lower in the RDV group, but this did not result in shorter intensive care unit or hospital lengths of stay. There were no differences in early- and medium-term survival between the 2 groups. Re-hospitalization rates for myocardial infarction, stroke,

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CENTRAL MESSAGE

Conclusive information regarding which patients derive substantial benefit from use of a rapid deployment aortic valve is lacking.

transient ischemic attack, and heart failure were substantially greater in the RDV group, although not all of the differences reached statistical significance. No information regarding postoperative antiplatelet or anticoagulation regimens was provided.

The study by White and colleagues⁷ does not provide information on which patients, if any, are likely to derive benefit from use of an RDV. Only 3% of the patients had a previous open cardiac surgical procedure. Thirty percent of the patients in the study underwent a combined procedure, and separate analysis of this potentially greater-risk subgroup might have provided useful information on which patients would benefit from use of this prosthesis. In 2016, an International Expert Panel recommended that RDVs should be considered in patients with comorbidities, old age, calcified aortic roots, porcelain aortas, previous aortic homograft or stentless valve procedures, small aortic roots, and for combined procedures.⁸ With the exception of comorbidities and combined procedures, the prevalence of the remaining conditions was not documented in the study of White and colleagues.⁷ Until the results from prospective randomized trial become available (at least one is underway [PERSIST AVR trial, NCT02673697]), and given the short-term complication rates and long-term detrimental effects of permanent pacemaker implantation on survival after surgical aortic valve replacement,⁹ uncertainty regarding long-term durability of RDVs, and information regarding relative costs, it seems prudent at present to restrict use of RDVs to patients with the aforementioned conditions.

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Commentary: Defining the role for rapid deployment valves in aortic valve disease

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As cardiac surgery evolves with minimally invasive technology, defining a therapy's precise role in achieving better patient outcomes is paramount to its utility. Rapid deployment valves (RDVs) represents 1 such technology attempting to find its niche in the surgical management of aortic valve pathology. RDVs fall between conventional surgical repair of aortic valves and transcatheter aortic valve replacement; sutureless replacement offers quicker implantation time in open repair while allowing for resection or modification of diseased tissue not afforded in transcatheter-based therapy. Retrospective reviews and meta-analyses have demonstrated shorter cardiopulmonary

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CENTRAL MESSAGE

Further studies are needed to identify specific indications for rapid deployment valve use over conventional valve replacement techniques in treating aortic valve disease.

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bypass times in RDVs compared with conventional open repair but have noted significantly greater rates of conduction disorders requiring pacemaker insertion.^{1,2} Conversely, RDV use compared with transcatheter aortic valve replacement has shown diminished rates of paravalvular leaks and improved 30-day survival but increased rates of in-hospital complications.³

White and colleagues⁴ attempt to better identify the precise role for RDVs through their own retrospective institutional experience with the Perceval S (Sorin Group Italia Srl, Saluggia, Italy) RDV compared with conventional tissue repair. After normalizing groups through inverse