Valve-sparing aortic root replacement and the bicuspid aortic valve: The details matter

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Disclosures: Author has nothing to disclose with regard to commercial support.

Received for publication Dec 18, 2017; accepted for publication Dec 27, 2017; available ahead of print Jan 19, 2018.

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J Thorac Cardiovasc Surg 2018;155:1412-3

0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2017.12.105>

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Central Message

Long-term survival after valve-sparing root replacement is excellent. Rigorous analysis of surgical technique and patient factors may reduce reoperations for those with a BAV.

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In this issue of the *Journal*, Klotz and colleagues¹ report their experience with valve-sparing aortic root replacement (VSRR). They operated on 315 patients over a 20-year period (type A dissections were excluded) and reported near normal survival when comparing those having remodeling (n = 101) or reimplantation (n = 214) with equivalent members of an age- and gender-matched German population. The approximately 75% 15-year survival for the overall cohort is admirable and comparable to that reported by David and colleagues² (77.9% 15-year survival) in a similarly sized cohort undergoing reimplantation VSRR over a similar period of time. The need for reoperation in the Klotz series was not significantly different at 10-year follow-up regardless of whether patients underwent remodeling or reimplantation (5.8% vs 11.7%, $P = .65$). The presence of a bicuspid aortic valve (BAV) also was not predictive of the need for reoperation at 10 years (tricuspid aortic valve 9.8% vs BAV 5.3%, $P = .13$). Given the concerns for long-term valve function after VSRR, it was disappointing to not see late echocardiographic data substantiating the durability of native valve function. Nonetheless, these results, combined with the excellent perioperative outcomes, lend additional support to VSRR as a viable option for a wide range of aortic root pathology.

However, the authors' central message highlights their concerns for a substantially increased need for reoperation in the second postoperative decade in patients receiving VSRR in the setting of a BAV. By using Landmark analysis, they reported a cumulative incidence of reoperation of 48.4% at 16 years, a disturbingly high need for reoperation that far exceeds any previously reported.³ The authors are to be commended for their thoughtful discussion on how to improve outcomes for patients with BAV in need of root replacement surgery. Ultimately, however, they suggest that perhaps one should take a closer look at a Bentall procedure as a more appropriate option in this setting.⁴ Is it appropriate to caution patients with BAV that the chances of reoperation at 15 years are approximately 50/50 (remember only 3 patients of 315 were 15 years out) or

are there data telling us to delve into the nuances of this complex procedure and keep grinding it out?

In the largest series to date examining short- and long-term outcomes in patients with BAV undergoing VSRR, Schneider and colleagues³ reported a 21.7% cumulative incidence of reoperation at 15 years in 357 patients using a remodeling technique. Aortic regurgitation and stenosis both contributed to late valve failure. Furthermore, aortic valve calcification (hazard ratio, 4.34) and use of pericardial patch for partial cusp replacement (hazard ratio, 4.00) were identified as strong predictors of the need for reoperation on multiple regression analysis. These authors, like others, have taken a deep dive into VSRR for BAV and continue to modify their technique to improve results. Commissural orientation,⁵ effective leaflet height,⁶ the addition of an annuloplasty to remodeling techniques,⁷ and even the use of a graft with neosinuses rather than a straight one⁸ may all be important to further reduce the incidence of late valve failure and the need for reoperation. We owe it to our patients to continue this rigorous analysis and creative alteration of surgical technique to help patients avoid the long-term issues associated with valve replacement therapy.⁹

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