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Commentary: Selective sinus replacement: If it ain't broke don't fix it?

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Continuous innovation, as a series of incremental changes to the things we do every day, is essential to advance modern surgical practices. Urbanski and colleagues¹ report the largest series of selective sinus replacement with long-term outcomes in 669 patients. Their technique involves selective repair of 1, 2, or 3 pathological sinuses of Valsalva and reconstruction of pathological cusps, foregoing annular intervention. The 30-day mortality of 0.6% and estimated freedom from relevant aortic insufficiency (AI) of $94\% \pm 3\%$ at 15 years compares favorably. We commend the authors for their excellent follow-up of their cohort, with only 3 patients lost to follow-up in a mean duration of 7.1 ± 4.1 years.

The authors' surgical technique is an adaptation of the remodeling technique; modifications include the neosinuses being sewn independently of each other. Emphasis is made on not changing the root geometry, maintaining inter-commissural distances, and in turn, avoiding valve prolapse. However, 69% of patients had moderate or more AI at baseline, necessitating 454 cusp interventions. The authors indicate the use of cusp patch plasty to resolve residual coaptation issues. Pericardial patch plasty is a strong risk factor for failure and reoperation following aortic valve repair, or valve-sparing operations.^{2,3} In contrast, such observations have not been seen for simple cusp plications for cusp prolapse. Therefore, further investigations are

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Selective sinus repair, as a modification of current valve-sparing root replacement techniques, is an innovative approach to individualized aortic root repair.

needed to explore the differences in the pericardial patch techniques used by the authors.

Another component of the authors' proposed technique is the absence of an annuloplasty. Strong evidence exists that an untreated dilated aortic annulus >25 to 28 mm is an independent risk factor for failure.³⁻⁵ The basal ring is stabilized automatically with the reimplantation technique. With the remodeling approach, a plethora of annuloplasty techniques have been introduced to perform the same purpose. Urbanski and colleagues¹ report an average preoperative aortic annular diameter of 27 ± 3 mm, ranging from 19 to 35 mm. The large annular sizes were not stabilized; therefore, questions remain regarding how further annular dilatation was prevented, and how results will evolve in very-long-term follow-up. Additionally, because only 24% of patients underwent late computed tomography angiography, stability of the annulus and neosinuses are incompletely understood. It is also important to note that only 8% of patients in the series had Marfan syndrome, and no other connective tissue disorders were reported. Therefore, both the fate of the unsupported annulus and that of the preserved sinuses are unknown in this population.

Considerable efforts have been made to standardize aortic root surgery since introduction of the original reimplantation and remodeling techniques. These include careful analysis of the functional aortic annulus to better understand pathogenesis, and intraoperative measurements with transesophageal echocardiograph correlation. Despite encouragingly low rates of morbidity, mortality, or AI grade ≥ 3 , a limitation of this study remains its reproducibility. A concerted effort by the authors to define the criteria by

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Disclosures: The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication Sept 28, 2021; revisions received Sept 28, 2021; accepted for publication Sept 29, 2021.

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J Thorac Cardiovasc Surg 2021; ■:1-2

0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2021.09.057>

which it is decided whether 1, 2, or 3 sinuses of Valsalva will be replaced will assist in the duplicability of their technique. We look forward to this group's reports of ongoing follow-up in this innovative cohort.

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