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Commentary: Data zenith

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The article “Long-term outcomes of aortic root operations in the United States among Medicare beneficiaries” in this issue of the *Journal*,¹ written by esteemed aortic surgeons Yerokun and colleagues, represents the culmination of countless hours of work by numerous surgeons dedicated to quality improvement.^{2,3} Linking data from the Society of Thoracic Surgeons and Medicare databases, the authors analyze real-world contemporary outcomes in 4173 patients out to 7 years, finally allowing for meaningful conclusions about the downstream effects of our surgical interventions on the aortic root. Three observations can be made about current root procedures.

First, the long-term outcomes from mechanical valve modified Bentall procedures showed surprisingly higher than expected rates of both stroke (12.9%) and bleeding (20%) at 7 years,¹ making alternative procedures more attractive in the Medicare population. Importantly, the risk-adjusted mortality at 7 years was higher in the mechanical valve group compared with the biologic valve groups in this elderly population.

Second, the authors demonstrate that surgeons have already begun to use more stented bioprosthetic valves as part of modified “bio-Bentall” procedures (increasing from 17% of cases in 2004 to 35% of cases in 2013), presumably in anticipation of future transcatheter aortic valve replacement (TAVR). Bioprosthetic valve failure rates, cited at 7% at 6 years, pose less of a concern in the era of TAVR,⁴ with stented valves having technical advantages for later TAVR over stentless valves, which lack radiopaque markers.

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Combining Society of Thoracic Surgeons and Medicare databases demonstrates long-term advantages of and preference for the stented Bio-Bentall. More reproducible aortic valve sparing techniques may offer further benefits.

Finally, the article provides additional important information about “valve-sparing” root procedures, which remain the preferred choice at major aortic centers (including a non-statistically significant survival benefit and a statistically significant reduction in stroke rate cited by the authors).¹ However, when valve-sparing operations are performed at multiple centers, there is a notable failure rate (3% requiring valve reintervention at 7 years in this study).¹ The success of these operations currently depends on the intraoperative assessment and technical expertise of experienced surgeons. Schäfers has highlighted the importance of standardizing the analysis and repair techniques to maintain reproducibility between surgeons and centers.⁵ Our center has adopted the “Florida sleeve” procedure, which is less technically complex than other aortic valve-sparing techniques, can be expected to have higher reproducibility, and has 98% freedom from reoperation out to 8 years.⁶

In summary, we are indebted to the work of Yerokun and colleagues and the other many Society of Thoracic Surgeons database champions,^{2,3} who with their foresight to combine forces with the Medicare database have achieved a “data zenith,” providing critical data and feedback about longitudinal outcomes that will enable us to refine the

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choices of operative procedures for patients moving forward.

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Commentary: The root of the matter

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In this edition of the *Journal*, Yerokun and colleagues¹ use the power of linking Medicare claims data with the Society of Thoracic Surgeons database to provide insight into long-term outcomes of aortic root replacement (ARR) in Medicare beneficiaries. From 2004 to 2014, notable trends included more than a doubling in the use of stented bioprosthetic Bentall with decreasing use of mechanical Bentall, stentless Bentall, and valve-sparing root replacement (VSRR). These trends likely have been driven by the potential of valve-in-valve (ViV) transcatheter aortic valve replacement (TAVR) as a treatment for valve degeneration. As the authors discuss, modes of failure vary among the ARR options, and although a bioprosthetic Bentall has perhaps the most certainty for degeneration, it also poses the least technical difficulties for transcatheter therapy.

Another potential contributing factor is our field's continuous commitment to improving long-term outcomes. Here perhaps the impact of previous studies on practice patterns may be seen in the findings and recommendations in the

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The findings of a study on aortic root operation outcomes may reflect the influence of previous literature on practice patterns; application should consider the age of the patient and implications for future interventions.

previous literature, which are echoed by the findings of Yerokun and colleagues: a higher reoperation rate with VSRR and worse survival and stroke with mechanical Bentall.^{2,3}

Some aspects of these decision pathways remain speculative, however. The mean follow-up of this study was only 5.0 years. Just as modes of failure vary, so too does the timing. Should we also consider the durability reoperation in our calculus? Within the midterm range, the higher reoperation rate of VSRR may prompt reticence to use this approach, but the jury is still out on how ViV TAVR compares to redo root operation for VSRR or stentless Bentall. Technical insights into bioprosthetic valve fracture have

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