Getting in the zone

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We have all heard the interviews of athletes after stellar performances: Jordan Spieth after his historic win at the Masters, Kobe Bryant after pouring in 81 points against the Raptors, and Tom Brady during any of his 4 Super Bowl victories. Despite their immense talent, they rarely feel that they have performed up to the full extent of their capabilities. However, for that brief period of time, they acknowledge that they neared perfection as they were “in the zone,” where the hole, the basket, or a receiver’s hands seemed 3 times larger than normal. Svensson and colleagues¹ provide us with the latest report in an accumulating body of literature demonstrating that aortic root surgeons are “getting in the zone” as well. And not just for 1 day or weekend.

With much cumulative experience, improved surgical technique, and statistical outcomes analysis, we are honing our ability to reproducibly reconstruct the aortic root. The authors¹ report on 957 patients, for whom 4 different techniques of root reconstruction were used: mechanical composite valve graft (CVG); biological CVG; valve-sparing aortic root reconstruction; and allograft root replacement. Overall, mortality in this group of patients was 0.7%, with a 1.4% incidence of permanent neurologic dysfunction, a 16-year period of being “in the zone” that even basketball great Michael Jordan would envy. They had 1 operative death in the younger cohorts, each of whom underwent either valve-sparing reconstruction (n = 261) or mechanical CVG (n = 156). Even in an older cohort that required biological CVG (n = 297), the operative mortality was still <1.5%.

What is most pleasing, however, is not these outstanding perioperative outcomes. Many high-volume centers with a focus on aortic disease are producing similar results.² Rather, the authors¹ have taken a deeper dive into their data to address a larger issue. As the final sentence of their introduction states: “On the basis of long-term outcomes and surveillance in an era favoring reparative techniques, is there still a place for mechanical and biologic composite grafts and allografts and, if so, what kind of patient at what time?” An algorithm outlining the authors’ considerations for choice of aortic root replacement accompanies their article and is worthy of review.

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Central Message

Aortic root surgery continues to improve, with outstanding results for elective cases. What is the proper procedure for each patient?

See Article page 764.

A few details remind us that much work remains to be done. The appropriate management of patients who have aortic root aneurysm and bicuspid aortic valve is still evolving. When the bicuspid aortic valve is associated with a dilated annulus and significant aortic insufficiency, a reoperation rate of 30% was seen at 5 years, even when patients were managed by these experienced practitioners. The fact that only 15% of all bicuspid aortic valve patients in this series underwent valve-sparing reconstruction (26 of 173) highlights the respect given to this problem.

Others have expressed similar concerns.³ Valve-sparing aortic root reconstruction in this setting may not always be appropriate, and the authors¹ suggest that careful consideration be given to mechanical CVG. The mechanical CVG patients may have slightly higher gradients across the valve, or may experience less left ventricular mass regression, but this option clearly provides the best opportunity to avoid reoperation. For elderly patients or those who have significant comorbidity, a biologic CVG provides an outstanding low-risk and durable solution.

In the future, a valve-in-valve transcatheter aortic valve replacement may permit younger biologic CVG patients to have an extended period of freedom from reoperation while avoiding the pitfalls of lifelong anticoagulation. Not surprisingly, allografts seem best reserved for destructive, native, or prosthetic valve endocarditis. As Svensson and colleagues succinctly stated: “long-term outcomes and surveillance” must guide “what kind of patient at what time.”

An ongoing commitment to meticulous surgery and data analysis may be the difference between getting in the zone for a brief period, and staying there.

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