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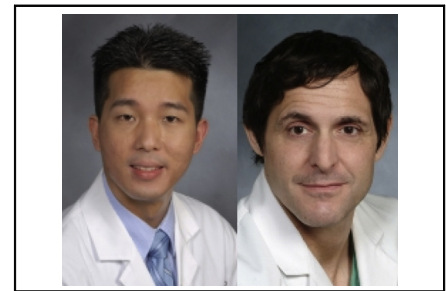


Commentary: Aortic root enlargement: Just because we can, does that mean we should?

Christopher Lau, MD, and Mario Gaudino, MD

Aortic root enlargement (ARE) during aortic valve replacement in patients with small aortic annulus is a controversial topic that has garnered a large body of literature that has failed to provide consistent evidence of meaningful long-term benefit to the patient. This is largely due to the retrospective nature of existing studies, which inherently have significant selection and treatment allocation bias. The theoretical advantages of ARE with the Nicks, Manouagian, or other root-enlarging techniques are chiefly due to the benefit of placing a larger-size valve, thereby helping to avoid patient-prosthesis mismatch (PPM). However, widespread application of ARE techniques in small aortic roots has not occurred for several reasons: lack of experience in performing ARE, technical difficulty of the procedure, a perceived increased risk of perioperative complications, and the existence of contradictory evidence of whether or not PPM actually matters.

Chowdhury and colleagues¹ present a series of 115 patients who underwent ARE using the standard or modified Nicks procedure with unfixed autologous pericardium. To strengthen the repair, the authors add a second layer to the subannular suture line and use buttressing felt pledgets to fixate the valve to the annulus and patch. Perioperative complications were rare, and early imaging showed no root aneurysm or pseudoaneurysm formation. The results with the authors' technique are excellent. However, the median age of the cohort was only 30 years and a majority received mechanical valves, so the results may not be applicable to all patients. The longer operative and ischemic times associated with ARE have the potential to adversely affect the



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CENTRAL MESSAGE

Aortic root enlargement can be performed safely in experienced hands, but it may not improve long-term outcomes in all patients with small aortic roots.

outcome of patients with more comorbidities, advanced age, or need for concomitant procedures.

Although some earlier studies have found an increased risk of perioperative complications such as mortality and hemorrhage with ARE,² most recent studies have shown no difference in operative outcomes compared with conventional aortic valve replacement.³⁻⁵ However, in complex cases requiring concomitant procedures, the added complexity of ARE cumulatively increases the risk of mortality.³ Clearly, surgeons experienced in ARE can perform the procedure without significantly increased risk but can any general cardiac surgeon do the same and should we recommend the routine use of ARE?

The answer may lie in the concept of PPM but there remains no consensus in the literature. Some authors have found that severe PPM is rare and even when present, does not lead to significant difference in survival,^{6,7} left ventricular mass regression, or class III or IV heart failure symptoms.⁷ Meanwhile, a Society of Thoracic Surgeons Database study found that moderate or severe PPM was common (54% and 11%, respectively) and any degree of PPM resulted in decreased survival and increased heart failure readmission and reoperations.⁸ Yet others have found that PPM only increases mortality in certain patients with impaired ventricular function, older age, or concomitant procedures.⁹

It is obvious that enlarging the root will allow for a larger prosthesis and reduction in PPM. However, surgeons must remember that the ultimate goal is not only to reduce PPM but also to achieve the best long-term outcomes without compromising operative risk or performing

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unnecessary procedures. Just because we can does not mean that we should. It remains to be seen which populations of patients will truly benefit from ARE and the techniques described by the authors.

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