Commentary: Achieving “symmetrical” annular geometry during bicuspid aortic valve repair

J. Scott Rankin, MD, and Marek A. Deja, MD

“Prosthetic rings of a suitable shape and size are necessary to perform a measured annuloplasty which will restore the normal [geometric] contour—and thereby both a normal orifice area and optimum function of the valve.”
—Alain Carpentier, MD, 1980

Carpentier first emphasized the importance of remodeling a valve annulus to an idealized geometric contour as the first step in cardiac valve repair. While this concept is now established for mitral and tricuspid valve reconstruction, it also holds for repair of aortic valves with insufficiency. In this issue of the Journal, Shraer and associates present a career series of 343 bicuspid aortic valve (BAV) repairs performed over an 18-year period. The authors employed an external subcoronary ring to reduce annular dimensions and included additional sinotubular junction ring remodeling in the latter series—in most patients arranging sutures to achieve 180° “symmetrical” commissural geometry for both rings. Repairability rate was 81.3%. As with other BAV repair series, outcomes were excellent, establishing valve repair as the primary treatment for insufficient BAVs. An important aspect of this series was the observation that creating 180° symmetrical annular geometry was associated with lower aortic insufficiency recurrence rates and less reoperation after 9 years. If 180° commissures could be established during repair, the negative influences of preoperative asymmetry were eliminated, leading to improved valve opening, better central flow, and lower transvalvular gradients. The addition of sinotubular remodeling had a stabilizing effect on valve outcomes.

The method of establishing commissural symmetry varies among surgeons, with a similar symmetrical basal suture placement when reimplantation techniques are employed. Others use a circular suture with selective plication of the fused sinus, which improves clinical and hemodynamic outcomes, similar to the approach by Shraer and associates. Our technique creates an internal remodeling annuloplasty with a 180° geometric ring (Figure 1). The uniform 180° commissural geometry provided by the geometric ring allows autologous repair of all BAV configurations, including “very asymmetric” valves, intermediate-type BAVs, and all variants of unicuspid valves. When needed, the addition of leaflet patching using autologous aortic wall (Myers JL, Clark JB, James TW, Downs E, Hasan SM, unpublished data) allows virtually 100% of BAV pathologies to be repaired with excellent late outcomes. Finally, the article by Shraer and associates, along with others referenced, provides solid data to refute suggestions that BAV repair with asymmetrical leaflet configurations have any advantages in current practice. In summary, the article by Shraer and associates presents an excellent series of BAV repairs by thoughtful

From the Department of Cardiovascular and Thoracic Surgery, West Virginia University, Morgantown WV; and Department of Cardiac Surgery, Medical University of Silesia, Katowice, Poland.

Disclosures: Dr Rankin is a consultant for BioStable Science and Engineering, Inc. Dr Deja 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 Dec 15, 2022; accepted for publication Dec 16, 2022.
Address for reprints: J. Scott Rankin, MD, Department of Cardiovascular and Thoracic Surgery, West Virginia University, 1 Medical Center Dr, Box 8003, Morgantown, WV 26506 (E-mail: jsrankinmd@cs.com).
J Thorac Cardiovasc Surg 2023; ■:1-2
0022-5223/36.00
Copyright © 2022 by The American Association for Thoracic Surgery

Annular Remodeling to “Symmetrical” Geometry during Bicuspid Aortic Valve Repair

Central Message
Bicuspid valves frequently have 3 equal sinuses, which poses problems in repairing to a 2-leaflleth morphology. The annulus should be remodeling to a 180° commissural geometry to optimize valve function.
surgical investigators, and there is much to be learned from this experience.

References