

Aortic valve repair—lessons to be learned

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Provenance: This is a Guest Editorial commissioned by Section Editor Busheng Zhang, PhD, MD (Department of Cardiac Surgery, Shanghai Chest Hospital, Shanghai Jiaotong University, Shanghai, China).

Comment on: Schneider U, Feldner SK, Hofmann C, *et al.* Two decades of experience with root remodeling and valve repair for bicuspid aortic valves. *J Thorac Cardiovasc Surg* 2017;153:S65-S71.

Submitted Apr 26, 2017. Accepted for publication May 16, 2017.

doi: 10.21037/atm.2017.06.01

View this article at: <http://dx.doi.org/10.21037/atm.2017.06.01>

We read with a great interest recent manuscript by Schneider and colleagues (1) published at *The Journal of Thoracic and Cardiovascular Surgery*. This manuscript reports on a very large consecutive cohort of patients with bicuspid aortic valve (BAV) regurgitation who underwent aortic valve repair and simultaneous aortic root remodeling at a single institution. The authors should be congratulated for their pioneering work while inventing a very durable and reproducible surgical technique for the treatment of patients with BAV regurgitation and concomitant aortopathy. Conventional surgical treatment of acquired aortic valve disease has been the replacement of aortic valve and/or aorta (2) with a mechanical prosthesis which exposed the patients for a life-long risk of thromboembolic and bleeding events. The avoidance of life-long anticoagulation and very low infection risk emerged as major advantages supporting the valve-sparing strategy in BAV disease. The reported 21.7% prevalence of aortic valve reoperations at 15 years (1) reflects the ups and downs of the evolving surgical technique, while continuing refinements in the procedural steps as well as in the patient selection were required. Several morphological features of cusp tissue (i.e., cusp calcification and the need for cusp replacement using pericardial patch) emerged as negative predictors, associated with the long-term post-repair failures. Therefore, careful patient selection seems to be crucial to maintain excellent long-term results. Furthermore, several technical modifications (i.e., changing the commissural orientation close to 180 degree, introduction of the

suture annuloplasty (3) and the concept of effective height measurement) represent major intellectual steps which led to the continuing refinement and better reproducibility of aortic valve repair over time.

Despite including the data from the very early stage of this evolving aortic valve repair technique, the need for reoperation was still significantly lower as compared to bio-prostheses in this young BAV cohort reported by Schneider *et al.* (1). Une *et al.* (4) showed an excellent durability of aortic valve bio-prosthesis in patients younger than 60 years during the first 10 postoperative years. However, there is a major deterioration in bio-prosthesis durability at 15 and 20 years and the freedom of aortic valve reoperation goes down to 65% and 29%, respectively. Therefore, given very low risk of endocarditis and development of aortic stenosis in the first 15 years after aortic valve repair with simultaneous root remodeling, it seems to be reasonable to preserve the native regurgitant BAV instead of implanting a bio-prosthesis in young adults.

All BAV patients were treated by aortic root remodeling in this series (1). David *et al.* (5) reported his experience using a re-implantation technique in a large cohort of patients with a reported freedom of reoperation of 97% at 20 years. However, since only 14% of included patients had a BAV and the primary disease was predominantly aortic root aneurysm, the results of this study cannot be reasonably compared with those of the Homburg group (1).

Overall, BAV repair in combination with root remodeling is associated with very appropriate long-term

results. However, a prospective comparison with a similar cohort of patients treated by reimplantation technique would be reasonable. Furthermore, an appropriate selection of patients for aortic valve repair is the key factor for long-term durability and the word of caution is still important while repairing the extensively deteriorated aortic valves. In addition, further research is needed to address the issue of stabilization of aortic valve annulus to reproducibly restore normal aortic valve function.

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Cite this article as: Petersen J, Girdauskas E. Aortic valve repair—lessons to be learned. *Ann Transl Med* 2017;5(17):356. doi: 10.21037/atm.2017.06.01

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