Commentary: When does aortic valve repair become a root replacement?

Andrew L. Mesher, MD, and T. Brett Reece, MD

From the Division of Cardiothoracic Surgery, Department of Surgery, University of Colorado, Aurora, Colo.

Disclosures: Authors have nothing to disclose with regard to commercial support.

Received for publication Feb 26, 2019; accepted for publication Feb 27, 2019; available ahead of print April 17, 2019.

Address for reprints: T. Brett Reece, MD, Mail Stop C310, 12631 E 17th Ave, Aurora, CO 80045 (E-mail: brett.reece@ucdenver.edu).

J Thorac Cardiovasc Surg 2019;158:e29

0022-5223/\$36.00

Copyright © 2019 by The American Association for Thoracic Surgery

<https://doi.org/10.1016/j.jtcvs.2019.02.101>

The accompanying article by Ikeno and colleagues¹ from Kobe demonstrates the utility of the valve-sparing root procedure in repairing a regurgitant valve, in this case the novelty being the complex quadricuspid valve repair. They describe repair including the excision of the cleft leading to the quadricuspid nature of the valve. They justify root replacement by indexing of the root size to their small patient size. Although they state explicitly that the procedure is indicated by indexing the root diameter to the patient's size, this case brings up the idea of where does root replacement fall in the spectrum of aortic valve repair. It begs the question of applicability of root intervention to repair the valve.

The current iteration of aortic valve repair really began with Dr David's valve-sparing root procedures and Dr Yacoub's root remodeling.^{2,3} Even these began with pure indications of aortic root aneurysms involving competent 3 leaflet valves, but they have evolved to take on less than normal valves. This drive pushed along the ideas of aortic leaflet manipulation beginning with free margin support and plication. Valve-sparing root repair has now expanded to include bicuspid aortic valves and severely regurgitant valves with excellent outcomes.

As experience accrued with valve-sparing roots, the principles of aortic valve repair have been refined most clearly by El Khoury and de Kerchove.⁴ The cause of the leaking valve can depend on annular dilatation, sinotubular junction effacement, or leaflet pathologies. Per El Khoury and de Kerchove's⁴ systematic approach, each of these issues is addressed by specific tactics to restore competence to the valve. Specifically, annular dilatation requires annular stabilization, most commonly with a valve-sparing root replacement, although internal stabilization has become an entity as well.^{5,6} However, the annulus dilatation sufficient to cause significant valve dysfunction is commonly less than the size that would be an indication for aortic root replacement. Thus, the stabilization using more formal root replacement as the aortic annuloplasty

T. Brett Reece, MD

Central Message

With the evolution of aortic valve repair, root intervention without a specific root indication must be considered a part of the procedure if the long-term aortic valve repair is durable.

See Article page e25.

may be an indicated part of the valve repair in the absence of a 4- to 5.5-cm root diameter.

Ikeno and colleagues¹ illustrate very well how this approach is feasible. But the question that will be answered over time is whether the full root intervention should be an accepted part of aortic valve repair or whether the root adds unnecessary risk to a valve-specific intervention. The question will only be answered with long-term results demonstrating the durability of aortic valve repair with root stabilization relative to any potential increased risk of the more complex procedure.

References

1. Ikeno Y, Yamanaka K, Tanaka H, Okita Y. Aortic valve repair using valve-sparing root replacement for asymmetric quadricuspid aortic valve and conversion into symmetric tricuspid valve. *J Thorac Cardiovasc Surg.* 2019;158:e25-7.
2. David TE, Feindel CM. An aortic valve-sparing operation for patients with aortic incompetence and aneurysm of the ascending aorta. *J Thorac Cardiovasc Surg.* 1992;103:617-22.
3. Yacoub MH, Gehle P, Chandrasekaran V, Birks EJ, Child A, Radley-Smith R. Late results of a valve-preserving operation in patients with aneurysms of the ascending aorta and root. *J Thorac Cardiovasc Surg.* 1998;115:1080-90.
4. El Khoury G, de Kerchove L. Principles of aortic valve repair. *J Thorac Cardiovasc Surg.* 2013;145(3 Suppl):S26-9.
5. Lansac E, Di Cerna I, Sleilaty G, Crozat EA, Bouchot O, Hacini R, et al. An aortic ring: from physiologic reconstruction of the root to a standardized approach for aortic valve repair. *J Thorac Cardiovasc Surg.* 2010;140(6 Suppl):S28-35; discussion S45-51.
6. Jasinski M, Rankin S. Aortic valve annuloplasty with the HAART geometric ring and ascending aorta replacement. *Multimed Man Cardiothorac Surg.* 2018;2018.