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EDITORIAL COMMENTARY

Valve-sparing root reimplantation and bicuspid aortic valve repair: Optimism and realism

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See related article on pages S22-8.

In this issue of the *Journal*, Bavaria and colleagues report the outcomes of aortic valve-sparing root reimplantation and leaflet repair in bicuspid and tricuspid aortic valves. Readers should find this article interesting for several reasons. The authors have provided an in-depth analysis of the aortic valve-repair groups with respect to baseline valve function, simplified methods of repair, and outcomes. The main focus of the study, however, is the bicuspid aortic valve-repair group.

This is an important paper that reports on aortic valve repair in relatively young patients. In this study, the mean age of patients was 46 ± 12 years in the bicuspid-aortic valve group and 45 ± 15 years in the tricuspid-aortic valve group. The obvious advantage of aortic valve repair in these patients in comparison with aortic valve replacement must be considered. In this age group, biological valves have limited durability; on the other hand, lifelong warfarin therapy necessitated by mechanical valves has its own set of related concerns.

The respective aortic valve-repair groups had similar baseline patient characteristics for the most part, but with a few important differences. Preoperative $\geq 2+$ aortic valve regurgitation was present in 96% of patients with a bicuspid aortic valve, but in only 54% of patients with a tricuspid aortic valve. As one would expect, the resultant left ventricular diastolic diameter was also greater in the bicuspid-aortic valve group (57 ± 10 mm vs 53 ± 7 mm).

The main operative difference in the 2 aortic valve-repair groups was the need for cusp repair. All patients (100%) received cusp repair in the bicuspid-aortic valve group,

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but only 7% did so in the tricuspid–aortic valve group. The University of Pennsylvania group has simplified their techniques of bicuspid–aortic valve repair to include mostly raphe release (85%) or cusp plication (90%); cusp resection (13%), polytetrafluoroethylene (Gore-Tex, a registered trademark of W. L. Gore & Associates, Inc, Flagstaff, Ariz) free-margin shortening (8%), and patch repair (0%) were seldom employed.

The reported outcomes were excellent. Actuarial freedom from mortality and aortic valve reoperation at 5 years were outstanding: 100% for both in the group who underwent bicuspid–aortic valve repair, and $99\% \pm 1\%$ and $97\% \pm 2\%$, respectively, in the group who underwent tricuspid–aortic valve repair. Although clinical and echocardiographic follow-up were 100% and 97%, respectively, no mention is made of duration of follow-up in the bicuspid–aortic valve group. And there's the rub, because “actuarial” is not “actual.” In the group who had bicuspid–aortic valve repair, 22 patients (55%) had 2-year follow-up, and only 10 (25%) had 4-year follow-up.

Will the University of Pennsylvania group's early reported success of bicuspid–aortic valve repair be durable? Long-term data from Svensson and colleagues¹ from the Cleveland Clinic are not overly optimistic. By 5 years of follow-up, in their analysis of 728 patients who underwent bicuspid–aortic valve repair (mean follow-up of 9.0 ± 6.2 years), 25% of patients had moderate aortic valve regurgitation, and 24% had severe aortic valve regurgitation.

Bicuspid–aortic valve repair may be a niche procedure. The concern relates to a study of the numbers. The University of Pennsylvania group reports 189 patients who underwent operations for aortic valve repair during the 9-year study period, or just over 5 cases per surgeon-author (ie, 4) per year; in the case of bicuspid–aortic valve repair, just over 1 case per surgeon-author per year. Is that adequate volume to develop and maintain expertise?

Bavaria and colleagues have reported provocative data about bicuspid–aortic valve repair. The obvious question is: Are the data adequate to support the idea that bicuspid–aortic valve repair is better than valve replacement? Some insight may be garnered from a comment that Dr Tyrone David made during the discussion of a presentation by Kvitting and colleagues.² Dr David stated: “I think we should be a bit more cautious with the reimplantation technique in bicuspid aortic valve. Actually, in any reimplantation, the cusps must be relatively normal for us to embark on this difficult operation.”

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