

Commentary: Valve-sparing root replacement in patients with bicuspid versus tricuspid aortic valves: Is the comparison apples to apples?



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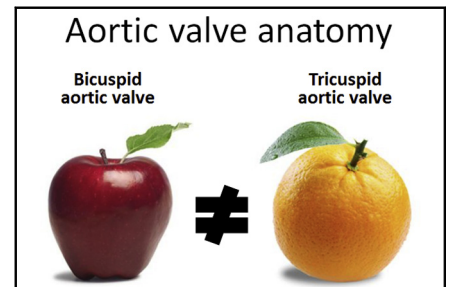
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Readers of the *Journal* should find interest in this study about aortic-valve sparing root replacement for root aneurysm from the team at the Toronto General Hospital.¹ The analysis focused on valve repair in 45 patients with bicuspid aortic valve anatomy. A control group included 288 patients with tricuspid aortic valve anatomy. The present series adds to the growing body of literature on valve-sparing root replacement in patients with bicuspid and tricuspid aortic valve anatomy.²

The primary analysis was performed on a propensity-matched dataset in an attempt to mitigate known differences in patient characteristics between the bicuspid and tricuspid aortic valve groups (45 bicuspid valve patients to 135 tricuspid valve patients; 1:3 matching). Despite the matching, important clinical differences persisted in the prevalence of Marfan syndrome (bicuspid valve group 9% vs tricuspid valve group 53%; $P < .001$) and aortic regurgitation (bicuspid valve group 78% vs tricuspid valve group 61%; $P = .03$).

Anatomic differences in the 2 valve types likely resulted in the use of different repair techniques between the groups. This included any cusp repaired (bicuspid valve group 79% vs tricuspid valve group 45%; $P < .001$), any cusp plicated (bicuspid valve group 76% vs tricuspid valve group 35%; $P < .001$), any cusp shorted by plication (bicuspid valve group 76% vs tricuspid valve group 35%; $P < .001$), and creation of neo-aortic sinus (bicuspid valve group 46% vs tricuspid valve group 58%; $P = .007$).

In the bicuspid valve group, the median follow-up was 5.6 years (Interquartile range 3.3-9.6 years), which included echocardiography in 98% of patients without terminal events during the most recent 3 years. The authors report excellent 10-year outcomes: freedom from mortality was 100%, cumulative incidence of moderate/severe aortic valve regurgitation was 6.5%, cumulative incidence of repeat aortic valve operation was 4.2%, and cumulative



Comparing bicuspid and tricuspid aortic valve repair is like comparing apples and oranges.

Central Message

Good outcomes are possible with valve-sparing root replacement in bicuspid and tricuspid aortic valves. Anatomic differences in the 2 groups require tailoring of the operative procedure.

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incidence of valve-related events was 20.5%. These event rates were similar to those in the control group.

There are several important lessons to be learned from this study. First, it is clear that bicuspid and tricuspid valve patients are clinically and anatomically different. It is likely that no amount of statistical massage can compensate for the differences. Second, despite the differences, outcomes were excellent in both groups. And third, in the hands of these world-class surgeons, most patients with bicuspid aortic valve anatomy were not candidates for a valve-sparing approach. In this series, only 7% of the patients with bicuspid aortic valve anatomy who received root replacement had a valve-sparing approach.

The present study supports the long-term durability of valve-sparing root replacement in a highly selected group of patients with bicuspid aortic valve anatomy.² The recipe for success includes minimal valve calcification, no restricted cusp motion, no need for cusp patch augmentation or replacement, and anatomy otherwise conducive to valve reimplantation—an apparently uncommon confluence of findings. Valve-sparing root replacement is possible, but surgical judgment and experience are paramount to successful outcomes.

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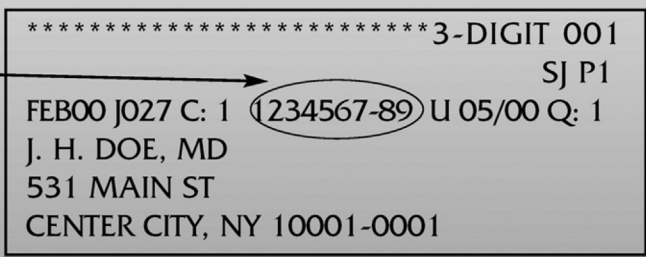
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