Is an aortic tissue valve the best choice for young adults?

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Central Message

Valve technology and new procedures have recently been introduced into practice, changing our strategy and offering radical new options.

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The report in this issue of the *Journal* by Schnittman and colleagues,¹ “Bioprosthetic Aortic Valve Replacement: Revisiting Prosthesis Choice in Patients Younger Than 50 Years Old,” details an analysis of the California and New York state databases. Schnittman and colleagues¹ identified patients between 18 and 50 years of age who underwent a tissue or mechanical aortic valve replacement from 1997 to 2006. After propensity score matching, the analysis of the 15 years of data is reported.

Schnittman and colleagues¹ report a significant increase in the use of bioprosthetic valves, from 14% to 47%. There was no survival difference with bioprosthetic versus mechanical aortic valves in the propensity score-matched cohort: actuarial 15-year survivals were 79.0% (95% confidence interval [CI], 75.8%-81.8%) and 81.5% (95% CI, 78.5%-84.2%), respectively (hazard ratio [HR], 1.14; 95% CI, 0.93-1.40; $P = .20$). No interaction was found between age and prosthesis choice with respect to survival (P interaction = .16). After bioprosthetic valve replacement, stroke rates were lower (5.4%; 95% CI, 3.8%-7.2% vs 8.1%; 95% CI, 6.3%-10.2%; HR, 0.62; 95% CI, 0.43-0.91), and bleeding rates were lower (4.2%; 95% CI, 3.0%-5.6% vs 8.4%; 95% CI, 6.6%-10.4%; HR, 0.48; 95% CI, 0.33-0.69). Reoperation rates at 15 years were higher for bioprosthetic valve replacement (24.5%; 95% CI, 21.3%-27.8%) than for mechanical valve replacement (9.3%; 95% CI, 7.2%-11.7%; HR, 5.9; 95% CI, 3.2-11.0).

The increased use of bioprosthetic valves in this patient population, who have traditionally been treated with mechanical valves, is documented by the findings from this study. These data will help surgeons in the process of informed consent by providing data from the era before transcatheter aortic valve replacement and aortic valve-in-valve rereplacement. Shared decision making with

informed consent is an important process that each surgeon must tailor individually with each preoperative patient encounter.

But how relevant are the data from this study? In the current era, the need for valve reoperation with sternotomy is decreased, even as the valve-in-valve strategy, approved and currently in clinical practice with balloon-expandable bioprosthetic valves, reduces cardiopulmonary bypass and cardioplegic arrest. This strategy will clearly change the procedural mortality and morbidity, and thus the risk profile, of the repeat procedure. The increase in bioprosthetic durability is not known; however, the early data appear favorable.

With this article, Schnittman and colleagues¹ have made an important contribution to our literature. The data were captured from the California and New York state databases, so the information is derived from the real-world practice of aortic valve replacement. The utility of large databases that can capture follow-up of patients through time is undeniable.

New valve technology and new procedures have recently been introduced into our practice, changing our strategy and offering radically new options. The clinical practice of transcatheter aortic valve replacement is growing exponentially. Trials in low-risk populations are underway, but clinical practice will not wait for the long-term data to support the valve-in-valve repeat procedure option. Future

data like those analyzed by Schnittman and colleagues¹ will ultimately inform us whether the promise of the bioprosthesis trend will be fulfilled, further improving the results from those seen here. The reduced risk of reoperation and the advantage of reduced stroke and bleeding rates may further favor the bioprosthetic option. The long-term survival is also likely to favor the use of bioprostheses as reoperation is replaced by the valve-in-valve option.

This is an exciting time for the study of valve choice and late results. The future of bioprosthetic valves improving life for young patients is very promising.

Reference

1. Schnittman S, Adams DH, Itagaki S, Toyoda N, Egorova NN, Chikwe J. Bioprosthetic aortic valve replacement: revisiting prosthesis choice in patients younger than 50 years old. *J Thorac Cardiovasc Surg*. 2018;155:539-47.

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