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AORTIC VALVE NEOCUSPIDIZATION: A BRIGHT FUTURE IN PEDIATRIC AORTIC VALVE SURGERY?



To the Editor:

We congratulate Ozaki and colleagues¹ on their study evaluating midterm results after aortic valve neocuspidization (AVNeo) with glutaraldehyde-treated autologous pericardium. In their cohort of 850 adult patients with various aortic valve diseases who underwent an aortic valve replacement during a period of 8 years, excellent results were reported in terms of actuarial freedom from death, cumulative incidence of reoperation, and recurrent moderate or greater aortic regurgitation.¹

The AVNeo procedure has therefore shown very promising results for adult patients. We would like to discuss the potential role of this procedure in the pediatric patient population with congenital aortic or truncal valve disease. Although we consider the Ross procedure, despite significant drawbacks such as the conversion of a 1-valve disease process to a 2-valve disease process and the risk of autograft dilation, to remain the general criterion standard, it is not always applicable (after truncus arteriosus repair, unusable pulmonary valve), or does not have reliable long-term results (indication of aortic insufficiency [AI] in children with enlarged aortic annulus, AI in children whose root is not large enough to have a definitive “adult-sized” reinforced Ross, AI after arterial switch procedure, connective tissue disease, rheumatic heart disease). Standard aortic valve repair procedures, including patch cusp augmentation, have not lived up to their expectations long term.² In contrast, the AVNeo procedure entails a complete removal of the abnormal leaflets and individual replacements with autologous pericardium. Each standardized pericardial cusp is

sewn up to the top of the commissure, which leads to a deep coaptation surface reaching up to the same horizontal plane as the commissure.¹ We believe that this increased length of coaptation should allow for physiologic growth of the valve annulus, which is of course of utmost importance in the pediatric population. The complete removal and replacement of the aortic cusps also yields greater flexibility in dealing with the various shapes of the aortic root in a congenital population and is particularly beneficial for patients with dilated aortic root related to truncus arteriosus or after arterial switch. In the series of Ozaki and colleagues,¹ reoperations were performed in only 15 patients after a mean follow-up of 53.7 ± 28.2 months, with a survival of 85.9% at 118 months. Even taking into consideration that patches degenerate faster in children, this leads us to speculate that the AVNeo procedure could potentially provide pediatric patients 10 to 15 years on average before the need for reoperation.

Of course, it remains to be seen exactly how these artificial cusps will behave in growing individuals, and whether the lack of annular stabilization in patients with conotruncal disease will lead to progressive aortic regurgitation. Our initial impression in performing this procedure in 10 children who were not good candidates for the Ross procedure has been very positive.

We thank Ozaki and colleagues¹ for bringing this new procedure to the pediatric field and hope that it will prove to be a true paradigm shift long-term in pediatric aortic valve disease.

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