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Commentary: Repair for rheumatic mitral valve in children: Good early results, poor long-term durability

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Rheumatic mitral disease in children poses a significant challenge. The rheumatic mitral valve is inherently difficult to repair and may be subject to further bouts of valvulitis. As the results of mitral valve replacement in young children are particularly poor, surgeons tend to go to great lengths to achieve an adequate repair.^{1,2}

In this context, Ananthanarayanan and colleagues³ present an important paper in this issue of the *Journal*, reviewing the outcomes of mitral surgery in 106 children with rheumatic mitral disease with median age of 13 years. They demonstrated excellent early results, with an operative mortality of 1%, and repair achieved in 96% (102/106) of patients. The mean follow-up was 26 months. Overall survival was 96%, and freedom from significant mitral regurgitation was 89% at 2-year follow-up with 44 patients at risk. The majority of their patients had mitral regurgitation (78.4%), with the remainder (21.6%) having mitral stenosis. Patients with stenotic lesions more often required pericardial patch augmentation and had greater residual gradients at follow-up.

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CENTRAL MESSAGE

Rheumatic mitral valve repair can be repaired in children with good early results but poor long-term durability.

It is now clear that good short-term results could be obtained after mitral valve repair in children with rheumatic heart disease. Recently published results from the Royal Children's Hospital in Melbourne achieved in 79 patients with median age 11 years demonstrated similar early outcomes, with no operative mortality, 100% survival, and 90% freedom from significant mitral regurgitation at 2 years.⁴ However, there was progressive failure of the mitral valve repair in long-term follow-up. Although survival was 83% at 15 years, freedom from reoperation was 49%, and freedom from significant mitral valve deterioration was only 28%. In particular, patients with restriction of the anterior leaflet and those who require augmentation of the posterior leaflet had poorer outcomes. These results highlighted the Achilles heel of mitral valve repair for rheumatic mitral disease: early success belies the high rate of late failure. Unfortunately, the repair of the rheumatic mitral valve in children is not durable long term.

The alternative for these children is mechanical valve replacement. Results of mechanical mitral valve replacement in children are generally poor, with early mortality of 10%, and 20-year survival of 70%.¹ Conversely, the results in children older than 10 year of age are somewhat better.^{1,5} In 76 children aged 10 to 14 years who underwent mitral valve replacement, survival was 85% and freedom from reoperation on the mitral valve was 65% at 15 years' follow-up.⁵ However, if reliable anticoagulation cannot be achieved, there is a considerably greater risk of

complications, with valve thrombosis as high as 14% per patient year.⁶ These concerns may be somewhat mitigated with the OnX mechanical prosthesis (On-X Life Technologies, Austin, Tex), which has been shown to have a relatively low rate of thrombotic complications despite unreliable anticoagulation, albeit in a group of young adults.⁷

We should be encouraged by the broad group of patients in whom repair is feasible and the excellent survival of the cohort. However, a large proportion of these repairs will not be durable in the long term. Given the similar survival achieved with mechanical replacement, perhaps we need to heed the adage long applied to degenerative mitral valve disease: good surgeons know which valves *can* be repaired; great surgeons know which valves *should* be repaired. It appears that patients with restricted anterior leaflet motion and those who require patch augmentation have poorer outcomes. These patients may benefit from mitral valve replacement rather than repair. In those patients who we do repair, we need to ensure strict secondary prevention to avoid ongoing damage from recurrent episodes of rheumatic fever. In adolescents, particularly in those who

can accommodate an adult-size mitral prosthesis, it might be beneficial to replace the valve rather than attempt complex repair, as the latter may not be durable long term. Time will tell.

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