Management of residual lesions following surgery for congenital heart defects: Evidence versus judgment

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As rates of survival following surgery for congenital heart disease continue to improve, outcome metrics are shifting from survival to measures of morbidity, quality, and cost. The presence of residual lesions following intervention can have a significant influence on these metrics. Therefore, attention is being drawn to evidence-based data that could inform the decision making regarding the need and timing of reintervention to address residual lesions and optimize outcomes.

The work by Nathan and colleagues¹ provides a comprehensive analysis of a large cohort of patients undergoing surgery for congenital heart disease in an attempt to elucidate the effect of residual lesions and the timing of reintervention on postoperative length of stay, adverse events, and cost. Although at first glance the answer might seem obvious, the decision about repairing a residual lesion and its timing is commonly informed by many factors, including some we have no way to measure. In my view, the work by Nathan and colleagues¹ represents an important initial step to acquire the evidence necessary to inform these complex decisions, and allows us a better understanding of the effect of the timing of reintervention. However a number of factors—including patient features, criteria for reintervention, and the complexity of the procedure—play an important role in this decision and should not be underestimated. Is it the same to address moderate residual regurgitation after mitral valve repair in a school-aged child as it is to perform an intraoperative revision of a distal arch reconstruction for a 15 mm Hg gradient in a newborn infant after repair of a Taussig-Bing anomaly? Whereas we may have consensus on the first, different opinions may exist on the latter and we clearly need data to help us reach the best answer in each case. Many scenarios arise where better can be the enemy of good; therefore, it could be

misguided to conclude that correction of all residual lesions must be pursued immediately. Residual lesions tend to occur in the youngest and smallest patients with the most complex lesions. These individuals pose the most important challenges when it comes to imaging, access, and the technical aspects of surgery, particularly intracardiac repair. The stakes are high and the margin for error is slim. Consider the side effects and potential morbidity and mortality associated with prolonged and repeated operations, including extended duration of cardiopulmonary bypass, including myocardial ischemia. Therefore, deciding what reintervention and when to perform it is of paramount importance. In the youngest patients good data to help us discern between those residual lesions that should be addressed and those that could be tolerated would be most helpful. In the meantime, we must rely on the judgment of accomplished cardiac surgeons who possess substantial experience operating on neonates in achieving a favorable benefit-harm ratio.

In the cohort analyzed by Nathan and colleagues,¹ patients undergoing intraoperative reintervention (IO) were older, had simpler lesions, and had a high predominance of valve surgery at index operation. Not surprising is the fact that IO achieved similar outcomes to those in patients who did not have residual lesions and were clearly superior to those undergoing postoperative intervention (PO). In contrast, patients younger than age 1 year—most of whom underwent nonvalve-related procedure at the index operation—exhibited increased mortality when they required IO revision, illustrating that IO carries potential risks. In fact, subgroup analysis of patients with major residual lesions who underwent PO reintervention showed that these patients were younger, had a higher proportion of prematurity, had more complex conditions, and a worse outcome. These facts illustrate the higher complexity of those individuals who underwent PO reintervention, for which the matched analysis could not entirely control.

Despite these limitations, the work by Nathan and colleagues¹ is important and keeps us focused on the need for evidence to determine the effect of residual lesions following surgery for congenital heart defects and to define which ones should be addressed and when. I agree that intraoperative assessment of the adequacy of repair is important, generating data about what to do with this information is the true objective.

We all strive for a perfect surgical intervention, but not infrequently we face residual issues. For the time being, it

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is our judgment and experience that help us to walk the line between solving these issues and making matters worse. I look forward to the day when good evidence will facilitate these decisions.

Reference

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