were also found to have a fenestration at discharge. A better metric in my opinion would have been to use the discharge echocardiograms. Unfortunately, the survival data based on patency of an atrial fenestration on the discharge echocardiogram were not given for the entire cohort. However, for the fenestrated group, there were no survival differences based on patency of an ASD on the discharge echocardiogram.

As far as physiology is concerned, the authors point out that in the fenestrated group with an ASD seen on discharge echocardiogram, no significant differences in survival were seen based on if the atrial shunt was left-to-right compared with left-to-right and bidirectional. This finding does argue against a physiologic benefit for any residual ASD. In the end, I completely agree with the authors when they state that “routine practice of fenestration should be challenged.” Also, the authors found that RV-dominant AVSD had the greatest risk of death overall and that a fenestration increased that risk even more. They argue that a residual fenestration in this setting produces unpredictable physiology, with which I also wholeheartedly agree.

Obviously, the correct way to get to the right answer would be a randomized clinical trial. Given the heterogeneity of AVSD anatomy and the low mortality after surgery, this would require thousands of patients and will not be done anytime soon. We are again confronted with the tyranny of small numbers combined with high anatomic heterogeneity that plague our specialty. In the end, what the study found is a significant statistical association of intention to leave an ASD with worse survival, and not a causality. That is worth remembering.

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See Article page 1142.

Commentary: Does atrioventricular septal defect atrial fenestration treat the child ... or the surgeon?

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Dr Connor Callahan, the Kirklin/Ashburn Fellow from the Congenital Heart Surgeons' Society, has presented a provocative manuscript challenging the value of an

CENTRAL MESSAGE

In a Congenital Heart Surgeons' Society review of 581 patients undergoing atrioventricular septal defect repair the use of an intentional atrial fenestration was associated with an increased mortality risk.

intentionally created atrial fenestration in children undergoing biventricular repair of atrioventricular septal defect (AVSD).¹ This is a comprehensive review of 581 patients enrolled from 32 Congenital Heart Surgeons' Society

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FIGURE 1. Dramatic interinstitutional variation in frequency of atrial fenestration.

institutions. An atrial fenestration was created in 23% of the patients.

The patients with right or left dominant AVSD “in theory” may benefit from atrial fenestration by “offloading” the smaller ventricle. In patients with a balanced AVSD, the intent of atrial fenestration is to mitigate postoperative pulmonary hypertension. Unexpectedly, in all 3 anatomic categories, unbalanced right dominant, balanced, and unbalanced left dominant AVSD, the mortality was actually greater with an atrial fenestration; the 5-year survival was 83% in patients who were fenestrated versus 93% in those not fenestrated. There are several possible explanations for these findings: (1) atrial fenestration was used only in the most complex patients and the results would have been worse without the fenestration; (2) fenestration was detrimental and actually increased mortality; or (3) fenestration had no bearing on the outcome and since it was typically applied in more complex patients, its use was simply a marker for complexity.

I laud the authors for attempting to find the explanation for this paradox. They have certainly obtained a large number of patients and detailed data. Unfortunately, there are several underlying issues with the patient population and nonprospective nature of the analysis that obscures the ability to reach a definitive answer.

Analysis of institutional preference for atrial fenestration reveals wide interinstitution variability (Figure 1). Sixty percent of fenestrations (80/132) occurred at only 4 of 32 total sites. Two of those sites fenestrated nearly all patients and 2 sites fenestrated one-half of their patients. In contrast,

at 10 of 32 sites, no patients were fenestrated. Despite this substantial intersite variability in the application of fenestration, there was no significant intersite variability in mortality. Clearly, there is no “national” comprehensive strategy on use of an atrial fenestration, and wide institutional bias.

Also confounding the analysis is the finding that in patients who had an intentional fenestration created at the time of the operation, it was found to be actually open in only two-thirds of patients on their predischarge echo. Conversely, 18% of the patients who were thought to be nonfenestrated actually had a residual (unintended) atrial level shunt on their predischarge echo. This begs the question—what category should these patients be placed in for the analysis? Intention to treat or actual result? Further obscuring the potential value of a fenestration is the finding that there was no difference in survival between the different postoperative shunt directions (left-to-right, right-to-left, and bidirectional).

One definite take-away from the analysis is that patients with an intentionally created atrial fenestration at the time of surgery had increased surgical complexity. These were patients with unbalanced AVSD, previous pulmonary artery band, previous coarctation repair, additional cardiopulmonary bypass runs, and longer cardiopulmonary bypass times. I believe that the increased complexity made the surgeon appropriately concerned about the postoperative physiology but at the same time hopeful that an atrial fenestration would improve patient survival. Based on this review, that line of reasoning does not appear to be supported by the evidence. Unfortunately, there were not enough patients to allow for propensity-matched analysis. In addition, the multiple confounding issues I have noted with the data make reaching a definitive conclusion quite difficult. My own conclusion from reading this manuscript is that intentional atrial fenestration of patients with AVSD treats the surgeon—not the child. Intentional placement of an atrial fenestration in these patients is a marker for anatomic complexity—not an effective therapeutic strategy.

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