Hope should not spring eternal

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Congenital surgeons should feel confident about implanting a pacemaker after 7 to 10 days.

Central Message

Atrioventricular block persisting beyond 10 days after surgery is highly unlikely to resolve, so why are congenital heart surgeons routinely waiting longer than that to implant a pacemaker?

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High-grade atrioventricular block (AVB) after congenital heart surgery is a dreaded complication affecting about 3% of patients. The study in this issue of the *Journal* by Romer and colleagues¹ provides a contemporary description of the patients, operations, and timing related to AVB that is more granular than previous work. Romer and colleagues¹ have used the Pediatric Cardiac Critical Care Consortium (PC4) registry to try to answer the million-dollar question that they pose: Who will need a PPM, and how long should we wait to implant it? In this analysis of more than 15,000 surgical hospitalizations from 25 congenital heart surgery referral centers, AVB occurred in 2.7% of cases, and in 1%, a PPM was implanted.

Most of the time, AVB was evident in the operating room (59%). Of those patients for whom this was true, 45.3% received a PPM, compared with 28.6% of patients who had AVB develop later in the intensive care unit. Not surprisingly, the highest PPM implantation rates were associated with patients with heterotaxy (2.2% PPM rate) and patients undergoing high-risk operations (defined a priori by the authors) (2.1% PPM rate) or Society of Thoracic Surgeons-European Association for Cardio-Thoracic Surgery (STAT) category 4 or 5 operations (1.6% PPM rate). Despite a laudable effort, Romer and colleagues¹ were unable to produce a reliable model for predicting the need for PPM during an index operation. They therefore do not recommend placement of wires or PPM in the operating room, even for the patients seemingly at highest risk.

The highlight of this study was the finding that for patients with transient AVB, 50% had resolution by day 2, 86% by day 7, and 94% by day 10. Although it is not possible from the PC4 registry to know how many patients had resolution of AVB after discharge with a PPM, and conversely how many patients had late development of AVB, these results should make us feel confident about moving forward with a PPM by day 10 of postoperative AVB. As Romer and colleagues¹ point out, however, only

62% of PPMs in this study were placed by 10 days. Why are we delaying the inevitable?

The decision making surrounding PPM implantation is worthy of further investigation. Romer and colleagues¹ observed significant variation across centers in the unadjusted incidence of AVB (0%-6%) and the frequency of PPM placement (0%-3%). Current recommendations by the American College of Cardiology, the American Heart Association, and the Heart Rhythm Society include PPM implantation for advanced persistent AVB "that is not expected to resolve."² As surgeons, we typically do have expectations for either recovery or permanent complete heart block, assumptions that are based on the conduct of the operation. This study was not designed to measure individual surgeon factors, however, such as the ability to predict which patients will have permanent surgical AVB and the decision making that drives PPM wait time. Future collaborations should aim to understand these decisions and to reduce PPM practice pattern variation. PC4 is committed to collaborative quality improvement across centers, and the study of Romer and colleagues¹ has identified an important initiative for the consortium to tackle next.

References

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