Commentary: Arterial switch and arch repair: One plus one doesn't always equal two

Chun Soo Park, MD, PhD

From the Division of Pediatric Cardiac Surgery, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea.

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Address for reprints: Chun Soo Park, MD, PhD, Division of Pediatric Cardiac Surgery, Asan Medical Center, University of Ulsan College of Medicine, New Building, 88, Olympic-Ro 43-Gil, Songpa-Gu, Seoul, Korea 05505 (E-mail: chunsoo@amc.seoul.kr or hopang1974@hanmail.net).

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Chun Soo Park, MD, PhD

Central Message

Technical simplification of arch repair using regular protocol renders complex transposition simpler, but more is needed to reduce the incidence of subsequent reintervention.

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The arterial switch operation, a well-known success story in pediatric cardiac surgery, became the standard treatment for transposition in the late 1980s, after strenuous efforts by different groups for more than a decade since its first documented success.¹ The Melbourne group, an important player in the development of arterial switch,² has contributed to improving surgical outcomes for the transposition of the great arteries. In this issue of the *Journal*, Fricke and his colleagues from Melbourne³ have made another contribution to these complex transpositions.

Despite a marked improvement in surgical outcomes after arterial switch, attributable to a refinement of techniques, a better understanding of anatomic features, and enhancement of cardiopulmonary bypass and perioperative management, the arterial switch operation is still challenging in the presence of arch obstruction. Outcomes of repair for the transposition of great arteries or arch obstruction are generally favorable in most contemporary series. However, when combined, outcomes are poorer than either individual outcome; that is, “one plus one is less than two.” Anatomic complexity arising from size discrepancies between 2 great arteries and the frequent association of unfavorable great artery relationships or coronary anatomy renders arterial switch a daunting procedure concomitant with arch repair and can negatively affect outcomes.

Several technical modifications have been proposed for different aspects of the procedure to achieve better outcomes despite anatomical complexity in this disease combination, including arch repair. Although native tissue-to-tissue repair is feasible, patch use is preferred owing to low rates of recurrence via minimized anastomotic tension and even sizing of the arch, ascending aorta, and aortic root.^{4,5} In the present study, however, authors showed that their current practice, native tissue-to-tissue repair, was acceptable in terms of recoarctation compared with patch aortoplasty. Extensive

dissection of the descending aorta, dividing 3 pairs of intercostal arteries and performing neoaortic sinus reduction to fit the caliber of the aortic root to the ascending aorta, is key to successful arch reconstruction without a patch. This finding should encourage surgeons to proceed with accustomed arch repair, rendering the entire procedure less challenging.

The main concern following repair is the development of right ventricular outflow tract obstruction (RVOTO), which was related to a large proportion of reinterventions in this study. Although some factors related to RVOTO, such as small aortic annulus and Taussig-Bing anomaly were identified^{6,7} and effective relief of RVOTO by intervention is the rule rather than the exception, whether to manipulate the RVOT during repair is still a matter of debate. This article may leave readers noting a lack of analysis regarding RVOTO.

Nonetheless, authors ought to be commended for maintaining low early mortality and the absence of late death throughout the study period in this historical cohort. That most causes of death were myocardial failure likely related to coronary malperfusion, which could be overcome by amassing knowledge regarding safe coronary transfer is also encouraging. These findings support repair of this complex transposition as though it were a simple transposition in terms of early mortality. Finally, “one plus one can be more than two.”

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