Commentary: Emergent arterial switch for critically ill babies with transposition

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Among the most important advances over the past 2 decades in the field of congenital heart surgery has been the development and refinement of emergency extracorporeal membrane oxygenation (ECMO). Whether dealing with cardiac arrest after surgery or arrival in the middle of the night of an undiagnosed neonate, generic arteriovenous ECMO smoothly instituted by a coordinated experienced team has become the hallmark of every high quality, busy congenital program. ECMO allows for stabilization, thoughtful and accurate diagnosis, and time to develop a longer-term plan. But there are downsides as well. It is resource-intensive and it carries risks, most importantly the risk of stroke.

Hussey and colleagues1 from Children’s Hospital in Auckland, New Zealand, present an alternative approach to generic ECMO for neonates or young infants with transposition who arrive at a cardiac center profoundly cyanosed, acidic, and close to cardiac arrest. Is it preferable to stabilize such a baby, complete a comprehensive diagnostic workup in the light of day when experienced cardiology staff are available and proceed with corrective surgery when rested and appropriately experienced surgical staff are available? Hussey and colleagues1 demonstrate that such a baby can be taken to an operating room, stabilized on standard cardiopulmonary bypass, and undergo an emergency arterial switch operation with excellent results. Their retrospective review of the outcomes of surgery for babies with transposition with intact ventricular septum extends over a 21 year period from 1996 to 2017. The report should be viewed in the context of the vast area over which the Auckland program manages patients coming from remote Polynesian islands thousands of miles away in the Pacific as well as the 1000-mile north/south length of New Zealand’s 2 major islands. Auckland is the only congenital surgical center over this entire territory. The Auckland group had only 1 early mortality among the 247 nonemergency arterial switch procedures while there were 2 deaths among the 25 emergency cases. The latter are the unfortunate babies who remained persistently hypoxic in spite of a prostaglandin infusion and often a balloon septostomy. The underlying causes were most commonly persistent pulmonary hypertension of the newborn infant and delayed diagnosis.

The authors concede that they cannot statistically prove that their approach is preferable to the alternative of generic ECMO, which they did not use in any of their patients, but undoubtedly the results stand by themselves as a testament to their surgical skills and their choice of surgical strategy.

Another inference that perhaps can be drawn from the report relates to the optimal timing of corrective surgery for transposition, which has been debated vigorously. Many of the very sick babies in the report from New Zealand, including those flown thousands of miles across the South Pacific were older by the time of their diagnosis and whether operated on in an emergency situation or electively, overall would likely have been at higher risk of an adverse outcome, including death. Thus an analysis of the Auckland experience suggests that older age at surgery is...
a risk factor and the conclusion could be drawn that surgery at a younger age is critically important for excellent outcome. Is it really possible to differentiate by multivariate analysis the effects of age per se in days versus the risk of a less-prepared ventricle, thicker atrial septum, concomitant sepsis, and emergency surgery?

The Auckland team deserves our respect for exemplary outcomes for a group of critically ill patients and for challenging the generic application of ECMO without careful consideration of the risks versus benefits of an alternative approach like immediate repair.

Reference