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Commentary: Right ventricular outflow tract reconstruction during repair of truncus arteriosus: Everything old is new again

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Since the first successful repair of truncus arteriosus, perhaps the most widely discussed element of the operation has been the reconstruction of the right ventricular outflow tract (RVOT). The issue remains timely, and a look back at the evolution of surgical management may provide historical context. Berhendt and colleagues¹ reported the use of several techniques in their series of earliest survivors. The first patient underwent attempted direct right ventricle-to-pulmonary artery (RVPA) connection but died in the operating room. The second patient, in 1962, was managed with a valveless tube and was the first survivor. In 1968, McGoon and colleagues² reported successful repair using a homograft and predicted that this technique would “probably prove to be the method of choice.” In 1984, Ebert and colleagues³ described a sentinel series using porcine-valved conduits

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CENTRAL MESSAGE

For truncus repair, valveless right ventricular outflow tract reconstruction using left atrial appendage interposition can offer equivalent early survival and improved freedom from reintervention.

in young infants, commenting that while the “question continually arises as whether to use a valve or nonvalve conduit...[we believe] a valve conduit is preferable.” Recognizing the troubling pulmonary hypertension associated with delayed surgery, some pursued even earlier repair. For neonates, because porcine-valved conduits were typically oversized and homografts were scarce, Spicer and colleagues⁴ advocated for the use of valveless polytetrafluoroethylene conduits.⁴

In 1986, Reid and colleagues⁵ revisited the concept of direct connection, reporting successful repair with RVPA anastomosis and an anterior valveless patch. They argued that valve insertion was not mandatory and pointed to the potential advantages of growth and avoidance of conduit complications. Barbero-Marcial and colleagues⁶ subsequently described an innovative direct connection technique that left the pulmonary arteries in situ and included

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a monocusp. This 1990 report was the first to describe the use of the left atrial appendage (LAA) to bridge the RVPA gap and create a posterior bed of living tissue. Commenting on this technique in 1996, Hanley⁷ expressed concern that the potential for avoiding reoperations may come at the price of increased early mortality. He warned that “it would be wise to proceed with caution when parting ways with a proven technique” and reasserted that the “gold standard repair of neonatal truncus includes the use of a valved allograft.”

In the decades since then, numerous reports have compared valved and valveless RVOT reconstruction for truncus repair. Although valved homografts remain widely regarded as the favored option, other techniques have been cultivated, either through preference or necessity. Some studies have shown direct connection to provide equivalent survival and improved freedom from reoperation,⁸⁻¹⁰ whereas others have documented increased mortality.¹¹⁻¹³

In this issue of the *Journal*, Derridj and colleagues¹⁴ present the largest reported series of truncus repair using a direct connection with LAA interposition. To avoid the problems associated with stretching the pulmonary arteries to the ventricle, such as distortion of the pulmonary arteries or left coronary artery, the LAA is substituted as the back wall of the pathway. Although this experience admittedly involves selection bias, the results are excellent. The LAA technique demonstrated greatly improved freedom from re-intervention compared with valved conduit insertion, and, even more importantly, this long-term benefit was achieved without increased early mortality.

This report provides further evidence that autologous tissue techniques can provide increased freedom from reoperation. Furthermore, it specifically demonstrates that a valveless technique can be performed with early survival equivalent to the use of a valved conduit. For those without ready access to homografts, this strategy represents a viable alternative. For others, this option may still be attractive for its advantages in terms of growth potential and avoidance of

obligatory conduit changes.^{9,15} Naturally, before one can reap the future benefit of freedom from reoperation, one must first achieve early survival in the acute postoperative period. First things first: live for today.

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