Commentary: The story of an appendage: From being the less important part of the heart to becoming the cornerstone of a repair

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Repairing the common arterial trunk requires separation of the pulmonary arteries from the systemic circulation and creating continuity between the right ventricle and the pulmonary arteries. Generally, reconstruction is performed using a valved conduit to avoid pulmonary valve regurgitation, which, in association with pulmonary artery hypertension, may worsen postoperative right ventricular failure. There are 2 well-known arguments against using a valved conduit in neonates: early degeneration and the need for reintervention as the neonate outgrows it. These 2 simultaneous processes are responsible for the high reoperation rate, the Achilles heel of this repair.

In this issue of the Journal, Derridj and colleagues assess the outcomes of a technique that uses the left atrial appendage (LAA) to reconstruct the right ventricular outflow tract’s posterior wall and compare these outcomes with those of reconstruction with a valve (ie, xenograft or homograft). The LAA is small and less important than the heart, but it is the cornerstone of the right outflow tract reconstruction of the truncus arteriosus to avoid reoperation for conduit replacement. In Derridj and colleagues’ 18 years of experience, 125 truncus were repaired, using a valve in 60% of the cases and the LAA in 40%. In the LAA technique, the appendage is used to construct the posterior wall and provide continuity between the pulmonary arteries and the right ventriculotomy. Meanwhile, the anterior aspect is reconstructed with a patch, maintaining free pulmonary regurgitation. The authors did not find any difference in early postoperative mortality between a competent pulmonary valve and free pulmonary regurgitation, such as with LAA reconstruction. They admit that this technique should be considered only when “optimal postoperative conditions are available and in particular the presence of an experienced ICU team with excellent knowledge of pulmonary regurgitation and pulmonary hypertension,” suggesting that such excellent results are deeply dependent on postoperative management and might not be replicable everywhere. The LAA group had a higher rate of 10-year freedom from reoperation than the valved repair group (73% vs 17%), indicating that the valve in the pulmonary position is a determinant for reoperation along with tricuspid regurgitation and DiGeorge syndrome.

The authors’ findings are essential and need to be disseminated, especially to those centers in which access to a valved conduit or homograft is challenging for socioeconomic reasons. Although this is reassuring, a word of caution is needed regarding LAA repair: the problematic postoperative management and real long-term complications should not be underestimated. One of the most cumbersome questions is how to treat the long-term pulmonary valve insufficiency. Either surgical or percutaneous pulmonary valve implantation requires a posterior wall that allows suturing or delivery, and the LAA might not be suitable. Thus, the initial advantage of using the LAA may become the most relevant drawback. Only time will allow us to understand the equipoise between the 2 approaches.
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 colleagues\(^1\) 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 colleagues\(^2\) reported successful repair using a homograft and predicted that this technique would “probably prove to be the method of choice.” In 1984, Ebert and colleagues\(^3\) described a sentinel series using porcine-valved conduits 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 colleagues\(^4\) advocated for the use of valveless polytetrafluoroethylene conduits.\(^4\)

In 1986, Reid and colleagues\(^5\) 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 colleagues\(^6\) subsequently described an innovative direct connection technique that left the pulmonary arteries in situ and included...