Editorial comment

Common arterial trunk repair without extracardiac conduit: technically feasible, potentially advantageous

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Nemoto and collaborators report a small series of 10 infants, who underwent primary complete repair of common arterial trunk without an extracardiac conduit [1]. One patient died early and, after a median follow-up of 54 months, only one patient required re-operation for left pulmonary artery stenosis. The authors should be congratulated for achieving these encouraging results and their article raises several questions.

1. Is pulmonary valve insertion mandatory?

During repair of the common arterial trunk, the technique commonly used to reconstruct the right ventricular outflow tract (RVOT) is to implant a valved conduit (heterograft or homograft) between the right ventricular incision and the pulmonary bifurcation. This technique is still the procedure of choice in most pediatric cardiac centers. The primary rationale to support this practice is to insert a competent pulmonary valve. This is considered as critical to overcome during the postoperative period the deleterious effects of pulmonary hypertension and pulmonary hypertensive crises. The drawbacks of any extracardiac valved conduit are, however, important; multiple re-operations are usually required; stenosis of the pulmonary bifurcation may occur, preventing adequate growth of the pulmonary arteries.

Actually, there is a growing evidence that pulmonary hypertensive problems can be, in most cases, prevented (early repair during the first month of life, improvements in cardiopulmonary bypass, and immediate postoperative management) or managed efficiently (inhaled nitric oxide or sildenafil). The presence of a competent pulmonary valve is not mandatory and satisfactory early results can be obtained with a partially competent monocuspid valve and, even, without any valve [2,3].

2. Is it possible to reconstruct the RVOT without conduit?

Several techniques have been reported to allow reconstruction of the right ventricle-to-pulmonary artery continuity without a prosthetic conduit. Lecompte described direct reimplantation of the pulmonary bifurcation after extensive mobilization of the pulmonary arteries, with or without anterior translocation [4]. Tran Viet reported the use of a segment of the common arterial trunk to reconstruct the posterior wall of the neopulmonary trunk and recommended anterior translocation of the pulmonary bifurcation [5]. In the technique described by Barbero-Marcial, the left atrial appendage is interposed between the right ventricular incision and the pulmonary bifurcation to reconstruct the posterior wall of the pulmonary trunk [6]. In the present article, the Tran Viet technique is used but anterior translocation is avoided. In all these techniques, the posterior wall of the reconstructed RVOT is made of autologous tissue and, therefore, preserves a potential for growth. A monocuspid valve may be constructed or, alternatively, the RVOT may be left valveless.

Our own experience has shown that anterior translocation of the pulmonary bifurcation is, in most cases, not necessary and that direct reimplantation may be associated with an increased risk of stenosis of the pulmonary bifurcation [3]. Tran Viet’s technique requires shortening of the reconstructed ascending aorta, which may promote posterior compression of the right pulmonary artery. The present article does not report such complications but a longer follow-up is necessary. We, therefore, favor the use of the left atrial appendage to reconstruct the posterior wall of the RVOT.

3. Does repair without conduit improve the late outcome?

The data which are available in the literature (including the present report) show that, on a midterm basis, repair of common arterial trunk without conduit decreases the need for re-intervention for RVOT stenosis and may promote an adequate growth of the pulmonary arterial tree [2,3,7]. Some early re-operations are needed because the monocuspid valve becomes calcified and obstructive. This is the reason why we think that the implantation of a monocuspid valve can and should be avoided in most patients. The presence of a competent monocuspid valve may, however, be useful in some patients with an increased risk of postoperative pulmonary hypertension (e.g., infants beyond the neonatal period). Long-term data are still lacking. The late incidence of re-intervention for RVOT obstruction or pulmonary valve implantation remains to be determined.

Nevertheless, the present article provides further evidence that primary repair without conduit may become the procedure of choice in patients with common arterial trunk.

References


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