The basic tenets of the Norwood procedure remain constant; however, the operation itself continues to evolve. Technical refinements have greatly reduced the early issues with arch narrowing and anatomic coronary ischemia; however, the optimal method of pulmonary blood flow remains the Achilles’ heel of the operation. After early attempts with a right ventricle–to–pulmonary artery (RV-PA) conduit, the modified Blalock-Taussig shunt was adopted, which avoids any acute injury to the ventricle. Because of a number of geometric and hydrodynamic considerations, creating the optimal size shunt may be difficult, and the introduction of diastolic runoff may heighten the risk of coronary insufficiency and sudden death. The reintroduction of the RV-PA conduit into the neonatal palliation of hypoplastic left heart syndrome has been reported to improve early survival; its effects on right ventricular function and pulmonary artery growth, however, are still debated. The use of supported, nonvalved grafts placed through limited right ventricular incisions may help to reduce the injury to the ventricle and thus the need for postoperative interventions; however, early conduit regurgitation with resultant ventricular volume loading and anastomotic distortion and bleeding may still be a concern.

In this issue of the Journal, Kumar and associates report their experience with the use of a femoral vein homograft (FVH) as an RV-PA conduit in a series of 24 consecutive patients undergoing neonatal palliation for single-ventricle lesions. Overall survival was excellent, and there was a low risk of significant postoperative bleeding. Because of the distensibility of the FVH, external banding with a polytetrafluoroethylene graft was required in 4 patients. Nearly two-thirds of the conduits maintained their competency at 1 month after the surgery, and 33% did so at 3 months. Although Kumar and associates report good overall growth of the pulmonary arteries, more than 50% of patients required catheter-based reinterventions, a finding quite similar to reports of various other techniques used to create RV-PA conduits.

Kumar and associates claim that the greatest advantages of the FVH as RV-PA conduit are the reduction in conduit insufficiency and consequent preservation of right ventricular function as well as the enhanced growth of the branch pulmonary arteries. Their technique for proximal anastomosis of the FVH to the right ventricle still involves a sizeable right ventricular incision and circumferential suturing to the myocardium; it is therefore tempting to attribute any improvement in right ventricular function to the reduction in conduit regurgitant volume. Unfortunately, the measurement of right ventricular function used by Kumar and associates was qualitative, and their findings are not remarkably different from those of other series. In addition, there was no quantification of the reduction in regurgitant volume. Finally, the results of Kumar and associates must be viewed in contradistinction to those of others who have shown no identifiable benefit from a valved conduit. The properties ascribed to the FVH conduit can certainly contribute favorably to outcomes after the Norwood procedure. To claim benefit on the basis of a reduction in conduit insufficiency, we must first document the extent of this insufficiency in nonvalved conduits and provide more scientific measurements of right ventricular function. At that point, the use of the FVH conduit, despite its need for banding and reintervention, or perhaps the implementation of other ways to limit conduit insufficiency, such as internal fluid diodes, can be championed.

References


