104. Modified half-turned truncal switch operation for posterior transposition of the great arteries with left ventricular outflow tract obstruction

Objective: Transposition of the great arteries (TGA) or TGA-type double outlet right ventricle with left ventricular outflow tract (LVOT) obstruction involving the antero-posterior position of the great arteries are reportedly preferred indications for the half-turned truncal switch operation (HTTSO). We successfully applied the HTTSO with modification for this spectrum with side-by-side arrangement of the great arteries, and provided excellent outflow tracts of the right and left ventricles. In this modification, the detached pulmonary valve was implanted to the right ventricular outflow tract (RVOT) portion. The defect of the aortic valve at the RV inflow portion was filled with a flipped-up infundibular (IF) septal flap.

Case summary: A 2-year-10-month-old boy weighing 13.8 kg was diagnosed with posterior TGA with LVOT obstruction. The great arteries were arranged side-by-side with the aorta on the right. The pulmonary valve had bicuspid valvular stenosis accompanied with IF stenosis, and the ventricular septal defect (VSD) was located in the remote position. The aorta was transected about 10 mm above the sino-tubular junction. The pulmonary trunk was transected just below the bifurcation. Both coronary arterial cuffs were excised. The truncal block involving both semilunar valves was harvested en bloc. Both ends of the IF were resected longitudinally. The VSD was closed using a curved-designed ePTFE patch to prevent residual LVOT obstruction. The aortic valve was half-turned horizontally, and anastomosed to the LVOT orifice. The superior margin of the VSD patch was anastomosed to the IF septum. Both coronary cuffs were anastomosed to the corresponding aortic wall defects. The IF septal flap was flipped up and anastomosed to the aortic valve defect at the RV inflow portion. The ascending aorta was reconstructed by end-to-end anastomosis. The pulmonary valve obtained an adequate size by commissurotomy. The pulmonary valve was anastomosed to newly created orifice at the RVOT. The anterior wall of the neo-RVOT was augmented with the ePTFE patch. The distal stump of the pulmonary trunk was anastomosed directly to the pulmonary bifurcation. Postoperative CT showed excellent outflow tracts of the right and left ventricles.

Conclusion: The neo-RVOT orifice is located just in front of the LVOT in the common antero-posterior great artery arrangement of TGA; however, the aortic valvular defect is located at the inflow portion in a side-by-side great artery arrangement. Hence, the neo-RVOT orifice was created at the outflow portion instead of the inflow portion to prevent turbulent flow in the right ventricle. The aortic valvular defect at the RV inflow portion was closed with an autologous pedicle IF muscle flap. This modification of HTTSO is a useful technique for TGA with a side-by-side great artery arrangement, producing excellent outflow tracts of right and left ventricles.

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