

Factors Influencing Need for Late ASD Closure after Neonatal Repair of Severe Pulmonary Valve Obstruction and Intact Ventricular Septum

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Background: In neonates with critical pulmonary stenosis (CPS) or pulmonary atresia with intact ventricular septum (PAIVS), a nonrestrictive atrial septal defect (ASD) has been speculated to improve the initial clinical course after pulmonary valvotomy (PV) but some concerns exist in terms of its potentially longterm adverse effect on the right ventricle's (RV) growth and persistent desaturation due to right-to-left (R-L) shunt.

Objective: to assess the relationship between the size of ASD and the need for post-valvotomy reinterventions.

Method: Patients with PAIVS and CPS treated at our center during 2001- 2015 were reviewed. Exclusion criteria were associated cardiac malformations and hypoplastic RV deemed unsuitable for biventricular circulation. Clinical and echocardiographic data were retrieved from the hospital's databases.

Results: In total, 48 patients (18 with PAIVS and 30 CPS) were included. The median follow-up was 5 and 8 years, respectively. One patient with PAIVS died on day 3 after surgical valvotomy and Blalock-Taussig shunt (BTs). The majority (89%) of patients with PAIVS had surgical valvotomy whereas transcatheter valvotomy was used in the majority (87%) of patients with CPS. Palliation with BTs or PDA stenting was used in 13 (72%) patients with PAIVS and in 4 (13%) patients with CPS. Reintervention within 1 month after initial repair was needed in 4 (22%) patients with PAIVS and in 4 (13%) patients with CPS. Later reinterventions were performed in 11(61%) patients with PAIVS and in 10(33%) patients with CPS. Of these, 7 (39%) patients with PAIVS and 5 (17%) with CPS underwent ASD closure due to persistent resting desaturation. The latter did not correlate with ASD size after valvotomy ($p>0.1$). Initial palliation with BTs was the only variable associated with ASD device closure ($p=0.04$). No patient required univentricular conversion.

Conclusion: Neonatal biventricular repair for severe pulmonary valve obstruction has low mortality but significant need for late reinterventions, mostly consisting of ASD closure due to clinically significant desaturation secondary to R-L shunt. The use of aorto-pulmonary shunt, probably illustrating a more severe form of RV hypoplasia, but not the size of the ASD, predicts the need for later ASD closure due to desaturation.