PALLIATIVE STENTING OF CRITICAL SYSTEMATIC VEIN OBSTRUCTION IN NEWBORNS WITH TOTAL ANOMALOUS PULMONARY VENOUS RETURN

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Aim:

To present two clinical cases of palliative treatment in newborns with critical obstruction of the venous outflow with in terms of total anomalous pulmonary venous return. Small infants with severe congestive pulmonary insufficiency underwent palliative stenting for systemic vein obstruction with good clinical outcome.

Materials and methods:

In 2022 in V.A. Almazov National Medical Research Center two endovascular interventions were performed for critical obstruction of the systemic veins in patients with a total anomalous pulmonary venous return (both patients were newborns, at the time of the intervention no more than 12 hours after delivery, gestational age 29 and 41 weeks, newborn weight 2400 and 3160 grams). Both children were in critical state due to respiratory failure, hypoxemia (saturation up to 60%) and signs of pulmonary edema and were transferred to mechanical ventilation in the first hours after birth. Concomitant intracardiac anomalies were observed in both cases. In the first case: the single inlet double outlet right single ventricle, moderate subpulmonary stenosis. In the second case non-obstructive double outlet right single ventricle, intact interatrial septum, obstruction of the persistent vertical vein. In both cases, the stenotic systemic vein was the only drain from the pulmonary venous collector. The systolic gradient in the constriction area in both patients was more than 14 mm Hg, and the blood flow velocity reached 3 m/s. In both cases an indication for palliative stenting as a primary intervention was the critical condition of the newborns. In the first case, stenting was performed through the femoral vein; in the second case the stenotic systemic vein (persistent vertical vein) was accessed through the left jugular vein. Stenting was performed with peripheral stents (10x18 mm in first case, 8x15 mm - in the second) via the 4 Fr sheath.

Results:

The technical success of stenting was achieved in both cases. After the procedure, the pressure gradient during invasive measurement (PV collector /SVC) was less than 2 mm Hg. Pressure in the PV collector in both cases was 12 mm Hg. According to the ECHO data, the blood flow velocity in the stented area was 1.2 m/s. Saturation increased up to 90%. In a patient with a persistent vertical vein, taking into account the absence of obstruction in the pulmonary artery outflow tract, narrowing of the PA was performed. The duration of stay in the ICU after palliative stenting was 7 and 10 days.

Conclusion:

Stenting of critical systemic vein obstruction in critically ill neonates with total anomalous pulmonary venous return as a primary intervention is technically possible and can be used as a bridge for the next stage of surgical correction.