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Percutaneous dilation of pulmonary arteries in the patients after Norwood procedure- its utility before the Fontan completion

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Introduction. In a significant number of patients after the Norwood procedure there is observed hypoplasia of the left pulmonary artery, It is the reason of pulmonary hipoperfusion, development of collaterals and elevation of pulmonary pressure in the contralateraly branch.
Material and methods. During last 5 years there were 48 hospitalized children after the Norwood procedure and hemiFontan/Glenn operation. The pulmonary hipoplasia with hipoperfusion were confirmed in 28 patients aged 31,8 ± 12,3 months. They were catheterized with intention of percutaneous dilation of pulmonary arteries (21,7 ±v8,5 months after hemi Fontan/Glenn procedure).
Results. The average diameter of the pulmonary stenosis was 3,5 ± 1,4mm. 30 stents (Genesis- 17, Formula- 7, Valeo- 6) were implanted successfully. The diameter of stenotic vassel increased to 8,4 ± 2,0mm, McGoon index increased from 1,3 ± 0,3 to 1,9 ± 0,4. The pulmonary pressure in the right pulmonary artery decreased from 16,2 ± 2.5 to 15.2 ± 1,8 mmHg. The balloon predilation was performed in 3 patients: in 2 patients it was completly ineffective, and in 1 patient- the dissection of the vessel wall appeared. The stents were implanted subsequently. Simultaneous additional percutaneous procedures were performed in 21 patients: angioplasty of the connection of neoaorta with aorta in 12, stent implantaion in 3, percutaneous closure of collateral in 11 and dilation of interatrial defect in 1 pt. During follow-up, 7 patients required additional stents implantation (Genesis-2, Formula-3, Valeo-2): in 4 - due to the appearance of the peripheral pulmonary stenosis, in 1 - due to the rupture of the previously implanted stent and in 2 due to stenosis in stent. The Fontan operation was performed in 16 pts, 6 pts have good conditions (after catheterization) and are waiting for this operation and 5 pts were disqualified. There were 6 deaths: 4 in short time after Fontan operation, 1- 1,5 year after Fontan operation due to cerebral stoke and 1 after heart transplantation.
Conclusion: Hypoplasia of the pulmonary arteries is a common problem that occurs after Norwood operation. The percutaneous implantation of stents is effective treatment of this complication in majority of patients with this problem.