

Re-Interventions in pulmonary arteries during the classical Fontan palliation pathway

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Objective: The pulmonary vascular bed is of great importance for the univentricular circulation on the long run. Pulmonary arteries in Fontan patients may be affected by previous shunts and bandings, they may kink or being compressed through aortic arch reconstruction. This study wants to review the prevalence of both surgical and catheter based treatment of pulmonary artery obstructions in all Fontan patients treated in our institution between the first operation and six months after TCPC.

Methods: From 10/2000 to 12/2010 123 consecutive patients followed the classical Fontan pathway in our institution. The diagnoses were HLHS in 57, other left-sided obstructions requiring Norwood or Damus-Kaye-Stansel in 22 and HRHS in 34 patients. PAB was done in 11 patients, but not in advance of hybrid procedures.

A RMBTS was placed in 45, a Sano-Konduit in 38 patients. Bidirectional Glenn was performed between 2,5 and 5 months, extracardiac Fontan with a median body-weight of 14kg (10-17). All but 13 patients received a 4mm fenestration, which was closed interventionally six months later, whereas the unfenestrated group underwent diagnostic angiography. Surgical charts and catheterization datas were retrospectively analyzed.

Results: 17 patients (13,8%) had to be treated for pulmonary artery stenosis (LPA: 15, RPA: 2). 5 patients underwent surgical PA patch-enlargement during Glenn or TCPC, all of them received stents later on. 12 patients were treated interventionally, the RPA obstructions (previous BTS) by ballon-dilatation, the LPA cases (compression by reconstructed aortic arch) with stenting. Median age at treatment was 54 months (2-105), median age at last catheterization 7,8 years (3,2-31). Only 6 procedures out of routine were necessary.

Discussion: Obstructions of the pulmonary vessels may impair the in itself reduced growth potential of the vascular bed and may lead to sequelae like PLE and plastic bronchitis. Repeated interventions are necessary in selected cases to provide good vessel size till adulthood. The fact, that the vast majority of our group (86%) did not show any relevant obstructions may be promising and set in comparison to new hybrid strategies in the future.