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The role of preoperative catheterization in TCPC candidates

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Introduction: Assessment of patients before operation with Total CavoPulmonary Connection (TCPC) traditionally includes a cardiac catheterization with angiography to evaluate the pulmonary arteries and measure pulmonary artery pressure (PAP). Magnetic resonance imaging and computed tomography are evolving as reliable techniques for non-invasive evaluation and the necessity of routine catheterization is questioned.

Objectives: To evaluate the necessity of a routine cardiac catheterization before TCPC.

Methods: We reviewed 50 consecutive patients undergoing TCPC. Risk factors known prior to preoperative assessment (\geq moderate AV insufficiency, \geq moderate ventricular dysfunction, pulmonary artery branch stenosis, postoperative complications after Glenn operation) were reviewed. Hemodynamic data from bidirectional Glenn operation, catheterization and TCPC were collected, as well as assessment methods and outcome. Adverse outcome was defined as death within 30 days, transplantation, take down, ICU time >10days, pleural drainage >15 days or catheterization within 30 days.

Results: 30-days-survival was 100%. A total of 16 patients (31%) had adverse outcome, mainly prolonged time with pleural effusions. In total, 44 catheterizations, 5 MRI and 4 CT examinations were performed.

Comparison of hemodynamic data between patients with adverse and normal outcome revealed that patients with adverse outcome had significantly higher PAP at Glenn operation, but not at catheterization. Pre- and postoperative PAP at TCPC was also significantly higher in the group with adverse outcome. The transpulmonary gradient was significantly higher postoperative at TCPC in the group with adverse outcome, but not preoperative or at Glenn operation.

Conclusions: Invasive hemodynamic data from a catheterization did not add determinant information in any patient. As pressure measurements done at the time of the Glenn operation correlated well with intraoperative measurements before TCPC, the preoperative catheterization is not indicated for measurement of PAP.

Hemodynamic data from previous Glenn operation may be used as a reliable measurement of PAP and as a predictor of adverse outcome after TCPC.

A catheterization should be performed as part of preoperative assessment only if an intervention is needed or there is a suspicion of deteriorated hemodynamics after the Glenn operation, in other cases noninvasive methods are sufficient.