

Current outcomes of the bidirectional cavopulmonary anastomosis in single ventricle patients: analysis of risk factors for morbidity and mortality, and suitability for Fontan completion.

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Objectives:

The bidirectional cavopulmonary anastomosis (BCPA) is considered an essential step in staged palliation for univentricular heart. This single center review aims to identify risk factors for morbidity and mortality, the role of antegrade pulmonary flow (APF), and suitability for later Fontan.

Methods:

The records of 114 consecutive patients who underwent BCPA between 1992-2012, were reviewed to investigate risk factors for hospital mortality, reintubation, new drain insertion, prolonged intensive care (ICU) stay, and mortality before Fontan completion. Median age and weight at BCPA were 8 months (interquartile range (IQR) 5,7-14) and 6,9 kg (IQR 5,8-8,1). Ventricular dominance was left in 58%, 11% had bilateral caval veins. In 83% of patients, 1 to 3 interventions preceded the BCPA, with progressive increase of Norwood-type procedures over time.

Results:

Extubation occurred after a median of 4 hours (IQR 3-6), mean pleural drainage was $2,2 \pm 1,3$ days, and median ICU stay 2 days (IQR 2-3). Ten patients needed reintubation (8,8%), 15,8% received a new drain. Hospital mortality was 11,4%, mortality awaiting Fontan 5,3%; 71% of survivors underwent Fontan, 15% are alive waiting for completion, 4% evolved to 1,5 ventricle repair. Operative mortality was independently affected by lower age ($p=0,02$), longer bypass time ($p=0,04$), and particularly need for reintubation ($p=0,004$). Lower postoperative saturation, higher central venous pressure and transpulmonary gradient ($p=0,01$) were risk factors for new drain insertion. Higher preoperative pulmonary pressure correlated with increased need for inotropic support, prolonged drainage and longer intubation ($p=0,01$). Interstage mortality was mainly influenced by the ventricular function ($p=0,028$). Additional APF resulted in a lower lactate ($p=0,01$), higher saturations postoperatively and at discharge ($p=0,001$), however without influencing late outcomes.

Conclusion:

The interstage BCPA remains associated with adverse outcomes, mainly related to an increasing frequency of more complex UVH variations, leading to the need for BCPA at younger age. Considering the important effect of reintubation on operative mortality, perioperative surgical and medical management should focus on optimizing cardio-respiratory status. Once this selection step is taken, a successful Fontan completion can be expected if univentricular function can be maintained.