

Timing of the investigations before bidirectional cavopulmonary anastomosis

Cavigelli-Brunner A. (1+2), Öhman A. (1), Wåhlander H. (1), Mellander M. (1)
Department of Paediatric Cardiology, The Queen Silvia Children's Hospital, Sahlgrenska University Hospital, Göteborg, Sweden (1); Division of Cardiology, University Children's Hospital Zurich, Switzerland (2)

Objective: The bidirectional cavopulmonary anastomosis (BDCPA) is a well-established step performed in the single-ventricle pathway. Before accomplishing a BDCPA a cardiac catheterization is routinely performed at our centre. We sought to assess which patients were declined for BDCPA after the initial invasive evaluation and, whether the decision to delay BDCPA resulted in further growth of the pulmonary arteries or amelioration of the hemodynamics.

Patients and methods: 104 consecutive infants with single-ventricle physiology planned for BDCPA were included in this retrospective analysis. 55 patients had a single right, 44 a single left and 5 an undetermined ventricle. A BT shunt had been performed in 41, a Sano shunt in 35 and a central shunt in 7 children; 14 children had a pulmonary artery band and 7 had no previous operations.

Results: Median age at the first catheterization was 137 days (range 46-379). Children with Sano shunts were investigated significantly earlier than those with BT shunts (median 125d versus 138d, $p=0.01$), oxygen saturation did not differ between the shunt types.

In 15 patients (14%) BDCPA was postponed because of small pulmonary arteries ($N=7$), high pulmonary artery pressure ($N=8$) or resistance ($N=3$), high transpulmonary gradient ($N=5$) or because of an intervention ($N=6$); 6 of them had a Sano shunt. They were all reevaluated with a second catheterization 19-520 days later (median 131). This investigation did not show additional growth of the central pulmonary arteries (median McGoon 2,0 versus 2,0, Nakata 179 versus 163), but the median transpulmonary gradient was significantly reduced (8 versus 6, $p=0.003$), while median pulmonary artery pressure (16mmHg versus 14mmHg) and resistance (3,0WUxm² versus 2,0WUxm²) tended to be lower. Ventricular function was preserved and atrioventricular-valve regurgitation was not aggravated.

BDCPA was completed by 91 children at a median age of 220 days (range 87-680), with one early postoperative death. Overall interstage mortality was 9.7% (10 children) and 3 patients underwent transplantation.

Conclusions: Delaying BDCPA in selected children leads to reductions of pulmonary artery pressure, pulmonary vascular resistance and transpulmonary gradient without signs of impaired ventricular function. However central pulmonary arteries do not seem to grow further.