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Summary: The stage I hybrid palliation procedure provides a less invasive option, avoiding early exposure to CPB and its associated morbidity. We present a case of successful hybrid palliation in a LBW preemie, otherwise too small for CPB and surgical intervention with complex CHD.

Case Report: A 9 day old, 1.2kg ASA PS IV former 28+6/7 premature neonate with congenital hypothyroidism, respiratory failure and postnatal diagnosis of VSD with left-to-right shunting, aortic arch hypoplasia, and severe LVOT obstruction presented for hybrid palliation involving pulmonary artery band(PAB) and PDA stent via median sternotomy in the cardiac catheterization lab. Norwood palliation and aortic arch advancement with PAB were considered, but were contraindicated due to patient size and the need for CPB. The patient underwent general anesthesia (with an ICU ventilator), maintained on fentanyl and neuromuscular blockade, and prostaglandins were continued until the PDA stent was placed. The patient required PRBC, calcium chloride and sodium bicarbonate boluses. Hemodynamic support with epinephrine was initiated intra-operatively and weaned postoperatively. The patient was transferred to the ICU with a relatively uncomplicated postoperative course despite his extreme prematurity. This patient has since undergone a two-ventricle repair at 8 months of age and continues to do well at home.

Discussion: A stage I hybrid palliation involving placement of a PDA stent and branch PAB requires a multidisciplinary approach with pediatric cardiac surgeons, interventional cardiologists and anesthesia. Despite advances in pediatric cardiac surgery and perioperative care, prematurity (<34 weeks gestation), low birth weight (<2.5kg), poor ventricular function, and the presence of a small ascending aorta increase risks for serious morbidity or mortality at the time of stage I (Norwood) palliation. These risks are secondary to CPB, DHCA, multiple blood transfusions, prolonged intensive care, decreased immune function and diastolic dysfunction frequent with neonates. Thus, the hybrid palliation offers a less invasive and less traumatic procedure with more rapid recovery of hemodynamics.

Possible complications following a hybrid palliation include distortion of the pulmonary arteries from PAB placement, a comprehensive second-stage operation, and possible retrograde coarctation of the aorta. However, outcomes between Norwood and hybrid palliation are equivocal. Overall, the hybrid palliation proved to be a successful step allowing eventual two-ventricle repair in this premature low birth weight neonate with complex cardiac disease.

References:

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