

BALLOON DILATATION OF CRITICAL AORTIC STENOSIS THROUGH ECMO CANNULA IN A NEONATE

Christoph Happel,¹ Sebastian Tietge,² Philipp Beerbaum,²

¹ Medizinische Hochschule Hannover; Interventional Cardiology of Congenital Heart Defects; Pediatric Cardiology and Intensive Care Medicine, ² Medical School Hannover

HISTORY AND CLINICAL PRESENTATION

We report a case of a female neonate who presented with critical aortic stenosis in cardiogenic shock on day 10 after birth. The patient was primarily discharged from the obstetrics department after initial uneventful adaptation after birth. A heart defect was not known prior to birth. The patient was seen at an external pediatric department and presented with tachypnea, prolonged capillary refill time and exhaustion during feeding. She quickly deteriorated and was intubated and ventilated. After primarily assuming a neonatal sepsis echocardiography revealed a duct dependent systemic circulation and she was put on alprostadil and transferred to our hospital. On admission the baby presented with signs of severe systemic hypoperfusion with capillary refill time ≥ 6 s, deteriorated blood gas with a minimal pH of 6.8 and a lactate ≥ 20 mmol/l.

IMAGING

On admission the patient showed a heavily impaired systolic LV function with minimal antegrade flow via a stenotic aortic valve and a PDA dependent systemic circulation with a hypertrophic and dilated RV. The patient was immediately put on AV-ECMO (cannulas in right carotid artery [8F] and right jugular vein [12F]). On day 14 after birth heart catheterization was performed confirming the diagnosis of critical aortic stenosis.

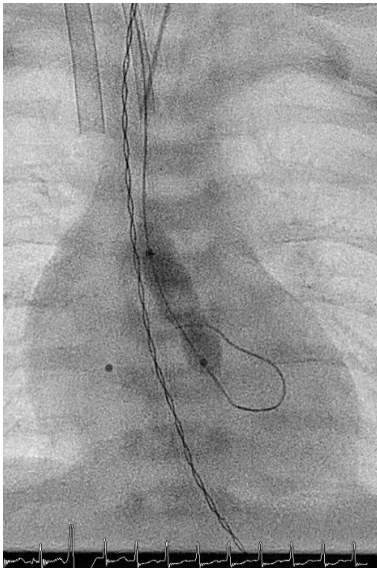
INDICATION FOR INTERVENTION

Critical aortic stenosis with left ventricular failure and ductus dependent systemic circulation on ECMO awaiting balloon dilatation of the aortic valve.



INTERVENTION

In neonates the groin vessels, especially the arteries, are at high risk for perfusion deficit after catheterization. In low cardiac output this risk might be even more increased. Therefore, we modified the ECMO circuit with a valve in the arterial line next to the cannula in the carotid artery and performed aortic balloon valvuloplasty (Tyshak balloon, 7mm, 2cm, 4atm) through the ECMO cannula. The ECMO did not need to be stopped during the dilatation and no remarkable reduction in flow was performed. The intervention was successful without any complications. The follow-up was uneventful. The patient was weaned from ECMO on day 16 after birth and discharged from hospital on day 36 with a minimal aortic insufficiency and a peak velocity of 1.5m/s. The patient is now 12 months old and did not need any further interventions so far.



LEARNING POINTS OF THE PROCEDURE

Balloon dilatation through the cannula of an AV-ECMO in neonates is feasible and safe. It protects the groin vessels of small babies when heart catheterization is required.