

Successful administration of venovenous extracorporeal membrane oxygenation through the modified Blalock–Taussig operation in an infant with graft dysfunction after the Norwood procedure

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Dear editor

Insufficient pulmonary blood flow through a right ventricle-to-pulmonary artery conduit following the Norwood procedure is remediable by adding a modified Blalock–Taussig shunt (MBTS).¹ First, however, perioperative hypoxemia must be managed. Venovenous extracorporeal membrane oxygenation (VV-ECMO) is likely to be a useful method for respiratory support in such cases.^{2,3} We present the case of a 2-month-old patient with graft dysfunction after the Norwood procedure who underwent MBTS with VV-ECMO support.

Case report

Due to graft dysfunction after the Norwood operation, a 2-month-old female infant (height 49 cm, weight 3.1 kg) was scheduled for an emergency right MBTS. VV-ECMO was also planned to avoid the risk of perioperative hypoxemia. After anesthetic induction, an 8 Fr bicaval dual-lumen catheter (GamCath® pediatric catheter; Gambro, Lund, Sweden) was placed in the right internal jugular vein under ultrasound guidance and VV-ECMO was implemented.^{4,5} Transesophageal echocardiography was used to evaluate the ventricular function and volume status, along with the hemodynamics. Upon initiation of VV-ECMO, the drainage flow volume temporarily decreased. A volume challenge was immediately performed with 5% albumin to achieve an appropriate preload. The hemodynamic responses were monitored by transesophageal echocardiography.⁶ The VV-ECMO circuit became stable after the volume load. The VV-ECMO flow rate was maintained at 150 mL/min, with the rotor at 3000 rpm. During right pulmonary artery clamping, the oxygen saturation improved to approximately 90%, with a pO_2 of 313 mmHg on a FiO_2 of 1. The MBTS was successfully performed. Subsequent VV-ECMO weaning was uneventful. VV-ECMO was finally withdrawn due to persistent stability of the patient's hemodynamic status.

Conclusion

VV-ECMO is an effective management strategy not only for adults but also for infants with refractory cardiorespiratory failure. Based on our experience with this patient,

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VV-ECMO provides useful respiratory support to avoid hypoxemia during MBTS operation in infants with graft dysfunction after the Norwood procedure.

Disclosure

The authors report no conflicts of interest in this work.

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