Cardiac Catheterization via an Arterial ECMO Cannula in a 2-Month-Old Infant: Technical Considerations and Clinical Challenges—A Case Report

Authors

Angelica Ortiz-Cordoba[1], Andrés Felipe Rubio-Duarte[2,3], Juliana Ballesteros Trillos[1], Justo Santiago Peña[3]

Affiliations

1. ECMO and Ventricular Assistance Program, Cardiovascular Institute, Hospital Internacional de Colombia HIC – Fundación Cardiovascular de Colombia FCV – Fundación Universitaria FCV, Santander, Colombia.
2. Epidemiology and Data Analysis Unit, Hospital Internacional de Colombia HIC – Fundación Cardiovascular de Colombia FCV – Fundación Universitaria FCV, Santander, Colombia.
3. Congenital and Pediatric Heart Diseases Center, Cardiovascular Institute, Hospital Internacional de Colombia HIC – Fundación Cardiovascular de Colombia FCV – Fundación Universitaria FCV, Santander, Colombia.

Background Cardiac catheterization in infants receiving venoarterial extracorporeal membrane oxygenation (VA-ECMO) is technically challenging because of limited vascular access, indwelling cannulas, anticoagulation, and increased risk of vascular injury.

Objective

s To describe the feasibility and technical considerations of performing therapeutic cardiac catheterization through an arterial ECMO cannula in a critically ill infant with complex congenital heart disease.

Methods

A 2-month-old female infant (4.1 kg) with Ebstein anomaly underwent a modified Starnes procedure with placement of a modified Blalock–Taussig shunt (mBTS). Following postoperative mBTS thrombosis and cardiac arrest, peripheral VA-ECMO support was established using carotid arterial and jugular venous cannulation. Persistent hypoxemia and suspected shunt restenosis prompted repeat therapeutic cardiac catheterization. The arterial ECMO cannula was used as vascular access through a Y-connector and integrated hemostatic valve system.

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Results

Angiography demonstrated distal mBTS stenosis at its junction with the pulmonary arteries. Balloon angioplasty and implantation of a 4 × 12-mm stent were successfully performed, restoring adequate shunt flow. Subsequent pulmonary angiography revealed proximal left pulmonary artery stenosis, which was treated with implantation of two 5 × 12-mm stents. The procedure was completed without complications, maintaining stable hemodynamics and adequate pulmonary blood flow.

Conclusion

Cardiac catheterization through the arterial ECMO cannula was feasible and safe in this infant receiving VA-ECMO support. This approach may represent a practical alternative when conventional vascular access is limited or high risk, avoiding additional arterial puncture and facilitating urgent transcatheter interventions.

References

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