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Results of catheter interventions on ECMO circuit

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Objectives

To describe our institutional experience of performing cardiac catheterisation including intervention whilst on ECMO circuit.

Methods

All patients <16 years who underwent cardiac catheterisation whilst on ECMO between November 2010 and November 2018 were identified from the departmental database and a retrospective case note review carried out.

Results

During the study period 41 patients had 47 angiography/intervention on ECMO, of whom 11 had 14 procedures carried out via the arterial limb of the circuit the remaining had catheterisation using normal access.

The ECMO circuit is accessed by using a Y connector cut into the arterial ECMO tubing with an incorporated haemostatic valve through which the catheters are passed for angiography and interventional procedures.

Patients ages ranged from 1 day to 14 years (Median 9 months) with average weight of 15.7 kg (range 2.4-71.8).

Of the 41, 17 were univentricular (1 no palliation, 7 BT shunts, 6 Norwood stage 1,2 PA bands, 1 Nikkiadoh) and 7 had had biventricular repair (2 Ross procedure, 2 arterial switches, 1 double switch, 1 Fallot repair). Eight had cardiomyopathy, 8 had a heart transplant (4 cardiomyopathy, 1 TGA, 1 Shone complex and 1 HLHS). One had pulmonary hypertension.

41 patients had angiography all of which were diagnostic with 31 having a procedure 3 of which via the ECMO circuit (6 Atrial septostomy, 5 Left atrium decompressions, 4 cardiac biopsies, 3 Pulmonary artery stents, 5 shunt revascularisation stents, 2 Embolisations, and 1 SVC stent). Only one procedure, an atrial septostomy was unsuccessful.

There were no circuit related infections and no complications from procedures. Eight patients could not be weaned from ECMO, the remainder survived to PICU discharge.

Conclusions

Intervention is possible through the ECMO circuit whilst the patient is on ECMO. Access is an important consideration when performing catheterisation on ECMO and can be safely performed through the existing arterial limb of the ECMO circuit, and this provides the necessary access for diagnosis and therapeutic intervention