

ECMO in the perioperative course of pediatric heart surgery

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The aim of this study was to assess the results of ECMO as a perioperative support in children with congenital heart disease (CHD) during and after open-heart surgery.

Material and methods: All patients aged < 18years at surgery who needed ECMO support from 2004 to 2011, were included in the study. Clinical and biological data, demographics and outcomes were retrospectively reviewed.

Results: Twenty-seven patients (19 males) (i.e. 0.5% of total pediatric cardiac surgical procedures performed per year), aged 3days to 18years (mean 1.6years) were placed on ECMO, per-operatively in 10 (37%, for failure to wean off bypass) or during the early postoperative course in 17 (8 < 24th hour, 9 > 24th hour) for cardiac arrest (33%) or low cardiac output (30%). Surgical repair included: severe form of tetralogy of Fallot (4), complex arterial switch operation (7), complex left heart obstruction (5), Rastelli (4), ALCAPA (1), cavopulmonary anastomosis (3) and miscellaneous (3). Twelve cases were in-hospital preoperatively, of whom 7 were dependent on mechanical ventilatory support.

Five patients died while on ECMO because of multi organ failure (4) or pulmonary hypertension (1).

Main complications during support included hemorrhages (15 cases), renal failure requiring peritoneal dialysis (14), hemolysis (13), canulas thrombosis (6), and strokes (4). Only 3 cases were free from complication. Duration of ECMO was 5.4 ± 3.6 days (1 to 16, median 5), of CICU stay 26 ± 16 days (10 to 69, median 22). Survival to ECMO was 81.5% (22 patients) and overall survival was 59% (16).

Significant predictive factors for mortality were: preoperative clinical status (in-hospital: 25% in alive patients versus 73% in deceased cases, $p= 0.01$), lactates level at onset of ECMO (mean 6 versus 10, $p= 0.004$) and duration of aortic clamp (mean 70 versus 110mn, $p= 0.05$).

Conclusion: This study shows that post-cardiotomy ECMO in children is a valuable therapeutic option as a bridge to recovery, despite high frequency of complications on support.