Clinical Cardiology

Is Percutaneous Femoral Cannulation for Veno-Arterial ECMO Associated With More Limb Ischemia?A Meta-Analysis

Viraj Panchal (MD)[1], Dhruvil Patel (MD)[2], Rushi Patel (MD)[3], Meenakshi Reddy Yathindra (MD)[1], Anusha Reddy (MD)[1], Harshitha Polu (MD)[1], Mathew Mathew (MD)[1]

[1] NYMC's Roxborough Memorial Hospital, Philadelphia, PA, USA

[2] Trinity Health Oakland/Wayne State University, Pontiac, MI, USA

[3] Baptist Hospital of Southeast Texas, Beaumont, TX, USA

Background: Percutaneous femoral arterial cannulation has largely replaced surgical cut-down for veno-arterial extracorporeal membrane oxygenation (VA-ECMO). A large registry reported more limb ischemia but lower mortality with percutaneous access; whether these findings hold in institutional cohorts is unclear.

Methods: We performed a meta-analysis of observational studies comparing percutaneous with surgical femoral arterial cannulation in adults receiving femoro-femoral VA-ECMO for cardiogenic shock, postcardiotomy shock or extracorporeal cardiopulmonary resuscitation. Arms were classified by arterial technique. Outcomes were limb ischemia, amputation and in-hospital mortality. Odds ratios (OR) were pooled with Mantel–Haenszel random-effects models, and the international registry was compared with institutional cohorts. Registry per-arm complication denominators were reconstructed from reported percentages.

Results: Seven cohorts with 14,185 patients were included (one international registry, n=12,592; six institutional cohorts, n=1,593). Limb ischemia did not differ overall (6 studies; OR 0.91, 95% CI 0.56–1.49; I^2 69%). Excess limb ischemia was confined to the registry (OR 1.60, 1.24–2.07), where its authors found it was no longer significant after adjustment (adjusted OR 1.28, 0.93–1.62); institutional cohorts showed no excess (5 studies; OR 0.73, 0.51–1.02; I^2 0%; subgroup difference $p<0.001$). Amputation was rare and did not differ (3 studies; OR 1.44, 0.88–2.34). In-hospital mortality did not differ overall (4 studies; OR 1.05, 0.77–1.43; I^2 60%). The registry favoured percutaneous access (OR 0.82, 0.76–0.89), whereas institutional cohorts did not (3 studies; OR 1.26, 0.94–1.70; subgroup difference $p=0.007$). Including two further cohorts that reported 30-day mortality, the overall OR was 0.91 (0.74–1.13).

Conclusions: Percutaneous femoral cannulation for VA-ECMO was not associated with more limb ischemia, amputation or in-hospital mortality than surgical cut-down. Both the limb-ischemia excess and the survival advantage previously associated with percutaneous access came from a single registry and were not reproduced in institutional cohorts. Randomised and ECPR-specific data are needed.

Figure. Percutaneous versus surgical femoral arterial cannulation: registry versus institutional cohorts

