

## Acute vascular complications of femoral venoarterial ECMO; a single center retrospective study

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**Funding Acknowledgements:** Type of funding sources: None.

**Background:** Emergent veno-arterial extracorporeal membrane oxygenation (VA-ECMO) is increasingly used to provide rapid cardiopulmonary resuscitation in adult patients with refractory cardiogenic shock. Femoral arterial cannulation may result in ipsilateral limb ischemia due to reduced distal blood flow below the insertion point of the cannula. We retrospectively studied adult patients supported with femoral VA-ECMO for cardiogenic shock between 2015 and 2019 at our tertiary care hospital.

**Results:** The study included 65 adult patients supported on femoral VA-ECMO for refractory cardiogenic shock. The studied patients had a mean age of  $37.9 \pm 14.87$  years, mostly males (70.8%), a mean BSA of  $1.77 \pm 0.27$  m<sup>2</sup> and a mean BMI of  $26.1 \pm 6.7$  kg/m<sup>2</sup>. Twenty one (32.3%) patients developed acute lower limb ischemia. Femoral thrombectomy and angioplasty were done in 20 (30.8%) patients. Four (6.2%) patients developed limb compartmental syndrome and fasciotomy was done. Amputation of toes was done in one patient. The vascular complications included cannulation site bleeding in 24.6% of patients, femoral arteriovenous fistula in one patient and large pseudoaneurysm after ECMO decannulation and required vascular surgical repair. Three (4.6%) patients developed chronic limb ischemia manifestations after hospital discharge. The patients who developed acute limb ischemia had significantly frequent AKI ( $p < 0.001$ ) without significant use of haemodialysis ( $p = 0.07$ ) and longer ICU stay ( $p = 0.028$ ) compared to the patients without limb ischemia. The hospital mortality occurred in 29 (44.6%) patients without significant difference between the patients with and without acute limb ischemia. The occurrence of acute limb ischemia was significantly correlated with failed percutaneous femoral cannulation ( $p = 0.039$ ) while there was no significant statistical correlation between the cut-down technique and occurrence of limb ischemia ( $p = 0.053$ ). The occurrence of femoral cannulation site bleeding was significantly correlated with failed percutaneous cannulation ( $p = 0.001$ ) and cut-down technique ( $p = 0.001$ ).

**Conclusion:** Acute vascular complications are frequent after femoral VA-ECMO. Failed percutaneous femoral cannulation has been, in this study identified as the most important risk factor for acute limb ischemia and cannulation site bleeding. Recommendation: A careful approach during femoral cannulation is recommended to prevent occurrence of acute limb ischemia and femoral cannulation site bleeding.

Abstract Figure. Cannulation approaches of VA-ECMO.

