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ECMO for a polytrauma patient without systemic anticoagulation

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Background: ECMO has been successfully used to support patients with trauma-induced respiratory failure. Here, we present the successful application of ECMO in a patient with life-threatening polytrauma following a road traffic accident complicated by severe acute respiratory failure.[1]

Methods: This is a retrospective case report, and approval for presentation has been obtained from the department and can be submitted upon request. The patient was 20 years old and found at the roadside after being hit by a vehicle. The patient was rushed into the ED by an ambulance, where the trachea was intubated due to the low Glasgow Coma Score. A trauma CT scan revealed severe head injury with possible diffuse axonal injury. The scan also confirmed fractures of the mandible, left transfers process of L3,4,5 and first sacral vertebrae, pelvis and comminuted fracture of the right tibia and fibula. The patient was admitted to the Trauma Intensive Care Unit (TICU). A subsequent head CT scan showed multiple hemorrhagic contusions and cerebral edema. The patient underwent ventriculostomy and intracranial pressure (ICP) monitoring insertion, and was treated by neuroprotective interventions including sedation, paralysis, hypothermia, and hyperosmolar therapy. Unfortunately, the patient developed ventilator-associated pneumonia (VAP), which resulted in severe ARDS. Despite appropriate antibiotics, lung-protective ventilation, rescue inhaled nitric oxide, and high-frequency oscillatory ventilation (HFOV), the patient continued to have severe respiratory failure. The patient was evaluated for rescue ECMO despite severe neurological injury.[2] Veno-venous ECMO was initiated using percutaneous femoral–jugular configuration with a 25 French access cannula in the inferior vena cava and a 21 French return cannula in the right internal

jugular vein.[3] Throughout the ECMO run, no systemic anticoagulation was used, except the initial 5,000 units heparin administered during cannulation.[4] Percutaneous tracheostomy was placed and the patient was weaned off ECMO over the next week. ECMO decannulation was performed on day 7 and decannulation of tracheostomy on day 18 of ICU admission with good neurological outcome, and transferred for rehabilitation.

Conclusion: ECMO may be an acceptable therapy for patients with profound respiratory failure secondary to trauma and intracranial pathology, contraindicating the use of systemic anticoagulation.[1,5] Neurological prognosis is difficult to predict in patients with intracranial pathology and multiple organ dysfunction.[2,6] Axonal injury based on imaging studies may not predict neurological recovery in individual patients, and salvage therapies, including ECMO, should not be denied in these patients.[6,7]

Keywords: ECMO, systemic anticoagulation, axonal brain injury, poly-trauma, VAP

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