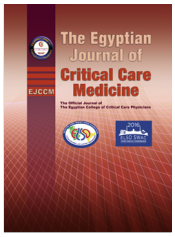
The Egyptian Journal of Critical Care Medicine (2016) 4, 39–42

The Egyptian College of Critical Care Physicians

The Egyptian Journal of Critical Care Medicine

http://ees.elsevier.com/ejccm
www.sciencedirect.com



CASE REPORT

Extracorporeal Membrane Oxygenation in a case of opioid-induced acute respiratory distress syndrome

Ahmad Abdalmohsen Said *, **Mohamed Khaled, Alia H. Abdalfattah, Akram M. Abdalbary**

Critical Care Department, Cairo University, Egypt

Received 20 January 2016; revised 20 February 2016; accepted 21 February 2016
Available online 28 February 2016

KEYWORDS

ARDS;
Opioid;
ECMO;
Hypoxemia

Abstract *Introduction:* Currently Extracorporeal Membrane Oxygenation (ECMO) is used for long-term support of respiratory and/or cardiac function, ECMO is primarily indicated for patients with temporary severe ventilation and/or oxygenation problems that they are unlikely to survive conventional lung protective mechanical ventilation.

Aim of the work: We describe our experience in the management of a case of opioid-induced acute respiratory distress syndrome with ECMO.

Methods: A 22 year old female, known Heroin addict, admitted with severe ARDS, failed to improve with conventional ventilation, Murray Lung Injury Score was 3.5, RESP score (8) was 4, underwent Veno-venous (V-V) ECMO via femoro-atrial approach using Maquet Cardiohelp console. The ECMO run duration was 12 days. Successful decannulation was done after weaning off ECMO by decreasing FiO_2 on ECMO, and continuing mechanical ventilation on pressure support ventilation.

Results: Successful weaning of ECMO on day 12 and successful extubation on day 14.

Conclusion: ECMO can be used safely and successfully in the treatment of Heroin induced ARDS.

* Corresponding author at: Cairo University, Critical Care, Kasr elainy, Cairo 00202, Egypt. Tel.: +20 201068187799.
E-mail addresses: as8090809@gmail.com, As8090809@yahoo.com (A.A. Said).

Peer review under responsibility of The Egyptian College of Critical Care Physicians.

Production and hosting by Elsevier

1. Introduction

Currently Extracorporeal Membrane Oxygenation (ECMO) is used for long-term support of respiratory and/or cardiac functions. ECMO is primarily indicated for patients with temporary severe ventilation and/or oxygenation problems who are unlikely to survive conventional lung protective mechanical ventilation [1,2]. Examples of such patients include those with

http://dx.doi.org/10.1016/j.ejccm.2016.02.007

the acute respiratory distress syndrome (ARDS) without major non-pulmonary organ failure who are failing mechanical ventilation or suffering from major barotrauma that hinders effective ventilation [3,4]. ECMO is most useful when the primary lung insult is reversible in the absence of the usual oxygen toxicity and barotraumas caused by conventional ventilatory support. In adults, the proof was clearly illustrated in the CESAR trial in 2009, which showed survival benefit in severe ARDS patients transferred to an ECMO center when compared to receiving standard therapy in their ICUs [5].

Opioid overdose has been implicated as a cause of ARDS [6]. Patients with opioid-induced non cardiogenic pulmonary edema (NCPE) or ARDS can have severe hypoxemia frequently needing invasive mechanical ventilation.

Our case demonstrates an infrequently seen respiratory complication in opioid overdose. Timely management decisions about adequate use of reversal agents and considering early mechanical ventilation in severely hypoxemic patients can be lifesaving, but when refractory hypoxia ensues on mechanical ventilation, ECMO support should be deployed [7].

2. Case report

A 22 year old female, heavy cigarette and shisha smoker, known Heroin addict, with a history of Deep venous thrombosis and pulmonary embolism 1 year prior to admission. The patient was admitted to a private hospital with progressive dyspnea and severe hypoxemia. Initial noninvasive ventilation failed to improve oxygenation, and the patient was invasively ventilated using lung protective strategy according to ARDS network guidelines. Chest X ray showed bilateral lung infiltrates (Fig. 1). The following day, surgical emphysema was noticed, and though pneumothorax wasn't clinically or radiologically relevant, bilateral intercostal tubes were inserted.

Arterial blood gas (ABG) analysis showed respiratory acidosis with pH 7.27, partial pressure of carbon dioxide ($PaCO_2$) at 55 mm Hg, partial pressure of oxygen (PaO_2) at 40 mm Hg, HCO_3 of 25 mEq/l and SpO_2 of 66%.

She was transferred to our center for the possibility of ECMO on 1st of March 2015. When admitted she was sedated, paralyzed and maintained on vasopressors (Norepinephrine 0.1 μg/kg/min) with stable hemodynamic profile (blood pressure 120/70 mm Hg, heart rate 125 beat/min, temperature 36.8 °C and Central Venous Pressure 8 cm H_2O). With intermittent sedation vacation done, she was fully conscious.

Murray Lung Injury Score was 3.5 (PaO_2/FIO_2 ratio was 36, 3 quadrants affected in CXR, PEEP was 16 cm H_2O and lung compliance was 18 ml/cm H_2O).

Laboratory profile showed normal serum electrolytes and renal function. TLC was 32 10^3/ml. Drug screening in urine which was sampled in the referring hospital was positive for opiates. Naloxone was empirically given in the referring hospital on admission with no significant clinical or radiologic improvement.

Prone positioning was tried with no improvement in oxygenation. Arterial blood gases showed pH 7.39, PCO_2 49 mm Hg, PO_2 36 mm Hg, HCO_3 27.9 mEq/l and O_2 saturation 68%.

Decision was taken to initiate Veno-venous (V-V) ECMO after her father's consent. The patient RESP score [8] was 4 (age 18–49 years, initiation of mechanical ventilation instituted within 48 h before initiation of ECMO, Neuromuscular blockers were used before initiation of ECMO) correlating with survival of 65–85%.

Percutaneous cannulation was done via femoro-femoral approach using drainage left femoral Maquet cannula (23f/38 cm) and return right femoral Maquet cannula (21f/55 cm). The cannulae position was verified with CXR and ultrasonography (Fig. 2). Maquet Cardiohelp console was utilized.

The flow during the first 24 h was about 120 ml/kg/min. Mechanical ventilation during ECMO was on pressure controlled ventilation with peak inspiratory pressure of 15 cm H_2O, PEEP 10 cm H_2O, and FiO_2 40%. Tidal volume ranged between 65 and 70 ml.

Anticoagulation with unfractionated heparin by intravenous infusion was initiated reaching a PTT of 50–60 s.

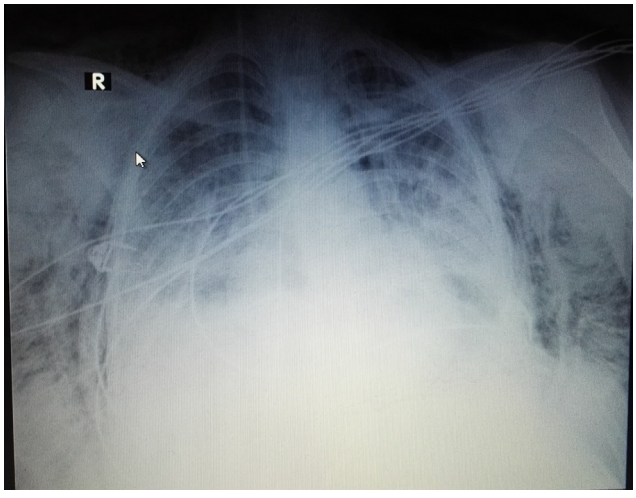


Figure 1 Chest X ray before institution of ECMO support.

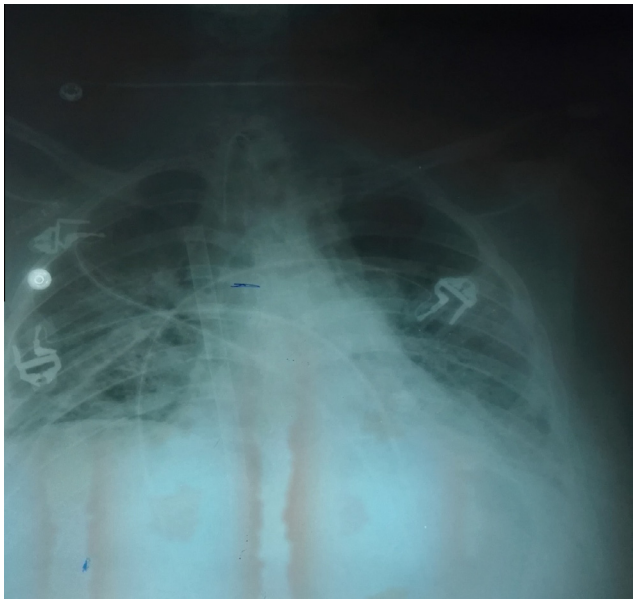


Figure 2 Chest X ray after improvement on ECMO support.