



Avoidance Of Intubation For A Lung Transplant Candidate Using Extracorporeal Carbon Dioxide Removal With The Hemolung® During An Acute COPD Exacerbation

- A CASE REPORT -

M. Irlbeck¹, M. Zoller¹, T. Weig¹ Presenting author T. Klaus¹

¹Department of Anaesthesiology, Hospital of the University of Munich, Munich, Germany

INTRODUCTION

The Hemolung® is a new, minimally invasive, ECCO2R device which utilizes venovenous cannulation through a single, dual-lumen, 15.5 Fr catheter, and provides partial CO2 removal at blood flows of 350 – 550 mL/min.

CLINICAL SUMMARY

Patient

A 57 year old female with severe COPD (GOLD grade 4) awaiting lung transplant was admitted to the ICU at the University Hospital of Munich-Grosshadern with an acute exacerbation requiring noninvasive ventilatory (NIV) support. Following ICU admission, the patient deteriorated over the next 24 hours on NIV with increasing dyspnea, hypercapnia and marked increase in work of breathing. Avoidance of intubation and invasive mechanical ventilation was essential to maintain the patient's good general condition while waitlisted for lung transplantation.

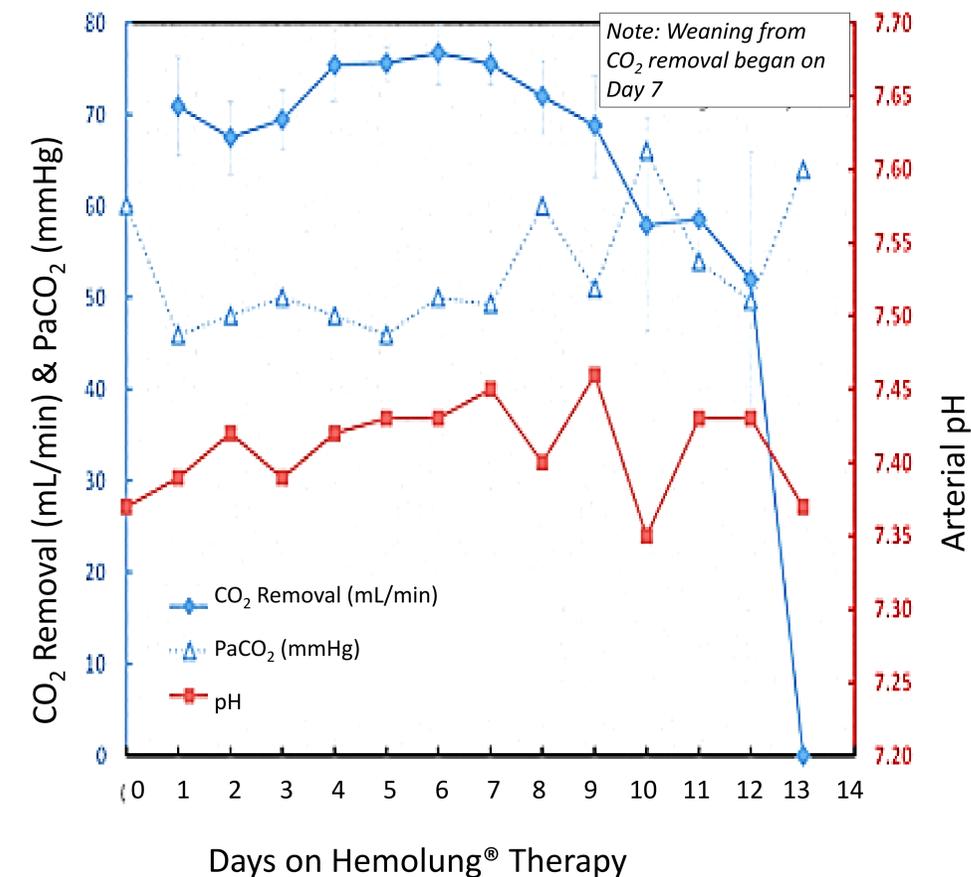
Methods

The patient was placed on ECCO2R using the Hemolung® Respiratory Assist System (Pittsburgh, Pennsylvania). Ultrasound guided cannulation was performed via the right internal jugular vein in a semi-upright position since supine position was not tolerated by the patient. Anticoagulation was initially achieved using unfractionated heparin with a target aPTT of 40 – 50 seconds.

Results

Within 24 hours of ECCO2R initiation, arterial CO2 tension decreased from 60.1 to 46 mmHg, and within 48 hours, pH increased from 7.37 to 7.42. While on Hemolung® therapy, the patient was able to breathe spontaneously for 19 – 24 hours per day. Dyspnea and work of breathing were diminished and the patient was able to eat with sufficient daily intake of calories after 24 hours. Participation in active rehabilitation and physical therapy was maintained after 24 hours. On Day 7, weaning from ECCO2R began by reducing the rate of CO2 removal over the course of 5 days based on patient response. The patient was fully weaned on Day 12, and was discharged from the ICU 5 days later to the intermediate care ward of the referring hospital. During the first day of therapy, platelet count dropped from a baseline of 177 to 72 x 10⁹/liter. Anticoagulation was switched to Argatroban due to suspected HIT, which was subsequently tested to be negative. Function of the initial extracorporeal circuit was sufficient throughout the 13 days of treatment.

Effect of Hemolung® CO₂ Removal on Blood Gases



CONCLUSION

Use of ECCO2R with the Hemolung® device succeeded in avoiding the need for intubation in a lung transplant candidate experiencing an acute exacerbation of COPD.