Polymyxin B hemoperfusion therapy and extracorporeal CO_2 removal in a patient with COVID-19: a case report

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Case presentation: A 54-year-old man with a medical history of obesity and hypertension developed fever, cough and diarrhea presented at the emergency department with fever and severe respiratory failure. The patient was asthenic and dyspneic and was immediately intubated and transferred to the ICU. Critical care management was initiated, including mechanical ventilation and vasopressors. A swab test for SARS-Cov-2 infection resulted positive. Tocilizumab and antibiotics therapy were initiated. Blood cultures resulted positive for multi-resistant Gram-negative infection (*Acinetobacter*). Endotoxic shock was suspected (endotoxin activity assay, EAA, 0.92 EU), and two treatments with Polymyxin B hemoperfusion (Toraymyxin®, Toray Medical Co., Ltd., Tokyo, Japan) were performed in 48 h. After two sessions the patient's clinical condition improved, EAA, procalcitonin, CRP and IL-6 decreased. Hemodynamic parameters also improved with increase in MAP and noradrenaline was suspended. However, a week later the patient's conditions deteriorated. The patient became hypercapnic and in order to facilitate ultraprotective ventilation, extracorporeal CO_2 removal therapy was initiated and continued for 6 days resulting in improved $PaCO_2$ and increase of pH. The patient was hospitalized in the ICU for 113 days and was then admitted to a rehabilitation facility.

Conclusion We have presented a case of COVID-19 complicated with septic shock and ARDS who in critical moments was treated with Polymyxin B Hemoperfusion and ECCO2R.

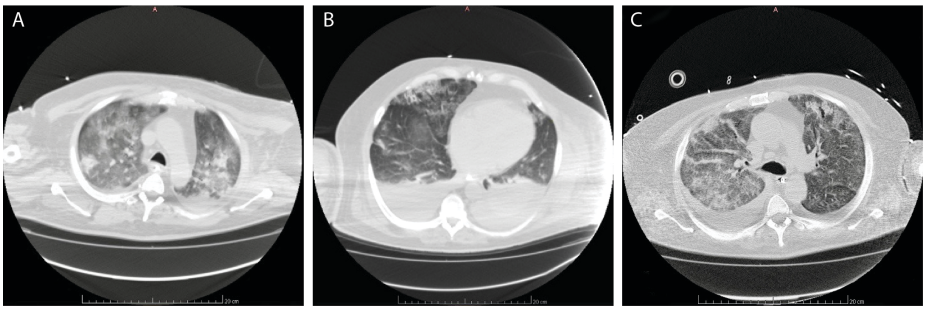

Figure 1: **Chest CT scans. A)** Initial CT scan showing ground-glass opacities with interlobular septal thickening (crazy paving). **B)** Second CT scan showing a tendency of consolidation of bilateral pleural effusion. **C)** Third CT scan (follow-up) showing a net reduction of ground glass opacities and pleural effusion.