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Extubated VV-ECMO for COVID-19 ARDS in an Immunosuppressed Pediatric Renal Transplant Patient

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Background

- Children less likely than adults to have severe COVID-19 and rarely require ECMO
- Pediatric solid organ transplant recipients rarely require ECMO with COVID-19
- Immunomodulation with COVID-19 disease is not well described in pediatric population
- We present an immunosuppressed pediatric patient with COVID-19-related ARDS who had an excellent outcome on VV-ECMO

Immunomodulation

Transplant

- Baseline immunosuppression regimen: mycophenolate, tacrolimus, prednisone
- Lab testing showed severely impaired B cell function
- Mycophenolate and tacrolimus dosing weaned on admission, then mycophenolate stopped later in course
- Immunosuppression resumed after COVID-19 PCR negative

COVID-19

- Received dexamethasone, remdesivir, tocilizumab and convalescent plasma for acute COVID-19
- Later in course, received anakinra, IVIG, methylprednisolone for concern of MIS-C
- COVID-19 PCRs and cycle threshold levels followed weekly (Figure 1)

Clinical Course

- 11 yo F s/p renal transplant admitted with COVID-19 pneumonia
- Intubated hospital day (HD) 19 for hypoxemia
- Hypoxemia refractory to prone positioning, nitric oxide, neuromuscular blockade
- Cannulated to VV ECMO on HD 28 with 27 Fr Avalon
- Bivalirudin used as anticoagulant with zero circuit interventions required
- Tandem CRRT required x4 days only, transplanted kidney function maintained throughout
- Extubated to HFNC 5 days after ECMO cannulation
- Neurosedatives weaned, enabled participation in pulmonary clearance & physical rehab

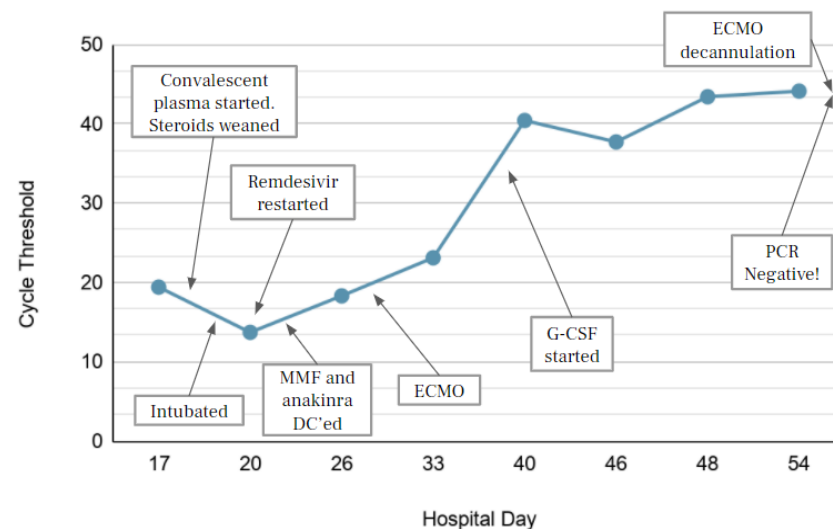


Figure 1. COVID-19 PCR cycle threshold times by hospital day with notable events.

Clinical Course Continued

- Decannulated HD 61 on HFNC after 33 days of VV ECMO
- Discharged home without supplemental oxygen on HD 104

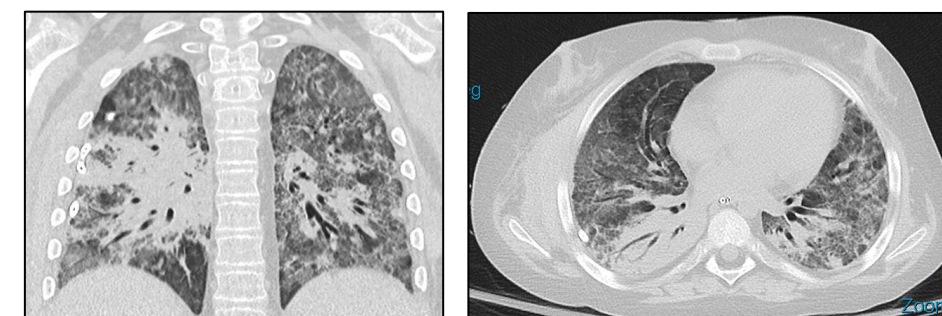


Figure 2. CT chest images from HD 25.

Summary

- VV ECMO can be a safe and effective therapy for pediatric COVID-19 ARDS, even in the setting of immunosuppression
- Immunomodulation requires special attention in the setting of COVID-19

References

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