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300 plus days on ECMO – lessons learned

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Background: Veno-venous extracorporeal membrane oxygenation (VV-ECMO) provides the respiratory support in acute severe respiratory failure until the underlying acute lung pathology improves.^{1,2}

VV-ECMO support for > 100 days is rare and in most situations requires a destination therapy of lung transplant.^{3,4} This may not be an option in some centers. We had our longest ECMO case of > 300 days with severe residual fibrotic lung disease and inability to wean off ECMO. This presentation briefly discusses the multifaceted challenges and lessons learned from this experience.

Discussion/lessons learned: Prolonged ECMO can lead to various challenges, some of which are briefly described below.

1. General ECMO-related issues: These are more common due to prolonged ECMO run and include membrane failure, thrombosis, DIC, etc. Right ventricular failure may prove to be a terminal event in these patients.
2. Rare ECMO-related issues: Prolonged heparin therapy may lead to osteoporosis and heparin-induced thrombocytopenia (HIT). Our patient had positive HIT and was managed with prolonged argatroban therapy.
3. Unusual complications: Extensive fibrocavitary lung disease can lead to large lung cavities impairing gas exchange. Percutaneous pleuropulmonary procedures are at high risk during ECMO. We performed percutaneous drainage of a large bullous lesion without any untoward event. Unexpected hypoglycemia and type II lactic acidosis were also unusual events in our patient. Potential etiologies and management of these rare events will be discussed during the presentation.
4. Team morale and psychosocial support: Prolonged ECMO patient care with no destination therapy can be extremely stressful for care givers. Frequent debriefing sessions may help to mitigate these issues. Formal personal psychological support should be readily

available to all team members to mitigate stress-related complications.

5. Skin integrity and musculoskeletal function: Besides the adequate nutrition, mobility and muscle exercises are extremely important to maintain musculoskeletal functional status. We were actively mobilizing our patient while on ECMO to prevent these complications.

6. Psychosocial issues for the patient: Prolonged ECMO, ICU stay, limited mobility, and limited family connections are a rich recipe for depression and other psychosocial issues. Team members from patient's country, birthday and other celebrations, involvement of embassy staff, and use of social media to communicate with the family back home may help to mitigate some of these issues.

7. Ethical and other considerations: ECMO to "nowhere" creates tension among the team members due to different views about the ongoing care of these patients.⁵ Consideration of withdrawal of care is a major ethical issue and needs to be resolved by involvement of all team members, local ethics

committee, religious scholars' input, consideration of local policies, and input from the patient and any available family members.

8. ECMO to "nowhere" to "somewhere": Exploration for non-regional transplant centers and resolution of financial constraints by support from the local embassy, social services support, hospital administration, charitable organization, and conducting fund-raising activities.

Conclusion: Prolonged ECMO therapy poses its unique challenges. Good team dynamics, frequent debriefing sessions, and ethic consultations are extremely important during care of these patients. Innovative solutions and collaboration with regional and distant transplant centers may provide an opportunity for destination therapy in these patients.

Keywords: VV-ECMO, prolonged ECMO, RV failure, ECMO to nowhere, ethics

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