

## 4th Annual ELSO-SWAC Conference Proceedings

# Air transport on ECMO: An Indian experience

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<http://dx.doi.org/10.5339/qmj.2017.swacelso.52>

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Cite this article as: Nalwad S, Sardar RS. Air transport on ECMO: An Indian experience, Qatar Medical Journal, 4th Annual ELSO-SWAC Conference Proceedings 2017:52 <http://dx.doi.org/10.5339/qmj.2017.swacelso.52>

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This study reports India's first international extracorporeal membrane oxygenation (ECMO) transfer as a joint operation between Hamad Medical Corporation (HMC) (Doha, Qatar), International Critical Care Air Transfer Team (ICATT), and Apollo Hospital (Chennai, India).

Severe respiratory failure (SRF) patients can be transferred safely, and there may be a survival advantage in transferring such patients to regional centers of expertise.<sup>1</sup> Patients can also be transported between facilities while on ECMO.<sup>2</sup> In the case reported below, ECMO was initiated as a bridge for lung transplant,<sup>3</sup> which is currently not a procedure available in Qatar. ECMO support as a bridge for these patients could provide acceptable 1-year survival.<sup>4</sup> It is also important to note that newer ECMO pumps are small and compact, and can safely be used to transfer patients by air.<sup>5</sup>

The first contact between the HMC and ICATT teams was made a month prior to the transfer of an ECMO patient due for the lung transplant. The patient was a middle-aged male with a very complicated and stormy ICU course, known to have interstitial lung disease (ILD) and ECMO-dependent referred for lung transplant.

The patient issues were:

1. Advanced ILD
2. ECMO-dependent
3. Resolving septic shock
4. Frequent sepsis with multiple organisms, bacterial and fungal
5. Hemothorax
6. Pneumomediastinum
7. Deep vein thrombosis
8. Low body mass index (BMI) of 19 kg/m<sup>2</sup>
9. Pulmonary embolism
10. Bilateral brain microhemorrhages

The challenges were:

1. Air logistic
2. Cost
3. Long-distance ECMO transfer (Qatar to India)
4. Complicated patient factor
5. Poor understanding of ECMO among airport authorities
6. Pump exchange on arrival

There were initial discussions for the ECMO team from India to aeromedically retrieve the patient from Doha, but considering the cost factor, it was more economically viable for the ECMO team from Doha to perform the transfer and return by the same carrier. An appropriate aircraft was chosen to fit all the equipment and the mobile ECMO team.

Preparation of an appropriately staffed and equipped intensive care unit (ICU) ambulance ("Mobile ECMO unit") along with patient stabilization was performed before the transfer to the airport. A bed in the receiving ICU in India was arranged. A mobile communication application was used from the onset of the transfer to communicate among all the relevant team members, referring hospital, receiving hospital, and the aviation team. It included the intensivists, transplant surgeons, ECMO specialists, perfusionists, logistical lead, and the transplant co-coordinator. The patient was mobilized from the medical ICU in Doha to the mobile ECMO unit, while in India the airport and receiving hospital team

re-visited the entire operation from the landing to the airport exit of the ambulance to the hospital. Passport details of the patient and team from Doha were obtained and the immigration officer at Chennai airport, India, was appraised about the criticality and the complexity of the operation. A fully loaded ECMO capable ambulance was mobilized with the full team and stationed at the airport, pre-empting and preparing for a possible pump exchange in the event of any possible complication. Nine hours after leaving the hospital, the team from Doha safely landed with the stable patient. Following multiple negotiations, permission for the tarmac transfer of the patient from the air ambulance to the land ambulance was obtained. The patient arrived safely in at Apollo Hospital, Chennai, India, nearly 6 h after leaving the HMC's MICU.

Keywords: ECMO, airborne, lung transplant, inter-facility transfer

## ACKNOWLEDGEMENTS

The authors would like to express their gratitude to Dr Ibrahim Fawzy Hassan, Hamad Medical Corporation, Doha, Qatar, and Dr Paul Ramesh Thangaraj, Apollo Hospitals, Chennai, India.

## REFERENCES

1. Gebremichael M, Borg U, Habashi NM, Cottingham C, Cunsolo L, McCunn M, Reynolds HN. Interhospital transport of the extremely ill patient: The mobile intensive care unit. *Crit Care Med*. 2000;28(1):79–85.
2. Vaja R, Chauhan I, Joshi V, Salmasi Y, Porter R, Faulkner G, Harvey C. Five-year experience with mobile adult extracorporeal membrane oxygenation in a tertiary referral center. *J Crit Care*. 2015;30(6):1195–1198, DOI: 10.1016/j.jcrc.2015.07.032. Epub 2015 Aug 4.
3. Bermudez CA, Rocha RV, Zaldonis D, Bhama JK, Crespo MM, Shigemura N, Pilewski JM, Sappington PL, Boujoukos AJ, Toyoda Y. Extracorporeal membrane oxygenation as a bridge to lung transplant: Midterm outcomes. *Ann Thorac Surg*. 2011;92(4):1226–1231.
4. Chiumel D, Coppola S, Froio S, Colombo A, Del Sorbo L. Extracorporeal life support as bridge to lung transplantation: A systematic review. *Crit Care*. 2015;19:1–10, DOI: 10.1186/s13054-014-0686-7.
5. Lunz D, Philipp A, Judemann K, Amann M, Foltan M, Schmid C, Graf B, Zausig YA. First experience with the deltastream (R) DP3 in venovenous extracorporeal membrane oxygenation and air-supported inter-hospital transport. *Interactive Cardiovasc Thorac Surg*. 2013;17(5):1–5.