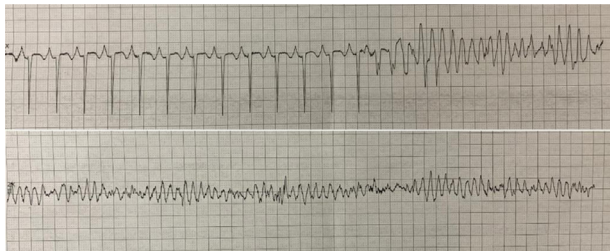




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Across Two Bridges to a Heart Transplant*J.J. Thomas CVTS, Lisie Heart Institute, Kochi, India.*

Introduction: Cardiac Transplantation still remains the standard care for end stage heart failure. Availability of donor hearts often prolong the waiting period and the patients may succumb to the disease. This is a major problem in developing nations like India where the donor pool is quite low compared to the recipient pool. Extra Corporeal Membrane Oxygenator (ECMO) and Ventricular Assist Devices (VAD) are effective bridges to transplant in patients who can no longer be waiting with optimal medical therapy alone. We herein describe a patient who was successfully bridged using ECMO and BiVAD (Biventricular Assist Device) to a cardiac transplant. This was the first case in our state and probably in the country wherein a BiVAD was successfully used as a bridge to transplant.

Case Report: A 32 year old male who worked as a software engineer developed ischemic DCM (Dilated CardioMyopathy) following a massive anterior wall myocardial infarction in 2015. Progressive cardiac failure was followed by hepatic and renal dysfunction at which point he was referred for a heart transplant. He suffered a cardiac arrest with intractable ventricular tachycardias and necessitated insertion of an ECMO. A central ECMO with aortic and bi-atrial cannulas was instituted and he was enlisted for an urgent transplant. 5 days later, this was converted into a BiVAD with centrifugal full magnetic levitated system (CentriMag, Abbott). The patient was maintained on BiVAD for 14 days with the cannulas exiting through subcutaneous tunnels and sternum approximated. He was extubated and mobilized in the intensive care room. A standard biatrial orthotopic heart transplant was performed and the BiVAD was successfully weaned off. The patient had a prolonged hospital stay due to multidrug resistant bugs that grew in urine and sputum. He is now 4 years post transplant and is doing well with no evidences of rejection and maintained on standard immunosuppression.

Summary: ECMO and VAD are useful tools in stabilizing and optimizing patients for heart transplant when they are no longer stable on maximal medical therapy. They are effective bridges to transplant although the cost is quite formidable in developing nations wherein cost of health care is still primarily borne by the patient.

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ECMO for Critically Ill COVID-19 with ARDS: A Case Series

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Introduction: Venovenous extracorporeal membrane oxygenation (VV-ECMO) as bridge to recovery in critically ill COVID-19 continues to be commonly utilized strategy in cases with persistent respiratory failure refractory to traditional ventilation support

Case Report: We report 5 cases of severe acute respiratory syndrome coronavirus-2 infection (SARS-CoV-2) who were treated with ECMO (Table 1). All 5 cases presented with fever, cough and shortness of breath and a positive nasopharyngeal swab for SARS-CoV-2 on admission. Case 1, 2, 3 and 5 patients were hypoxemic with saturation less than 90% on admission and decompensated rapidly, whereas Case 4 decompensated

after day 14. Mechanical ventilation failed to provide adequate oxygenation in all 5 cases; case 2,3 and 5 were started on recruitment measures with proning while it was not possible for case 1 owing to morbid obesity. Proning was not possible in the case 4 as patient became severely hypoxemic while patient was undergoing mechanical thrombectomy. The case 1-4 remained on ECMO for 19, 17, 17 and 2 days respectively. All except case 2 had improvement in APACHEII and SOFA score after ECMO initiation. All 5 patients had elevated inflammatory markers of serum ferritin, D-dimer, Lactate dehydrogenase (LDH), C-reactive protein (CRP) which trended down after a few days of ECMO initiation. All 5 patients received high dose steroids during their stay in the ICU. Case 4 and 5 passed away after compassionate extubation. Case 1-3 had prolonged hospital course with complication of hospital acquired pneumonia requiring multiple courses of broad-spectrum antibiotics.

Summary: Our observational report of 5 patients reports the use of ECMO in critically ill SARS-CoV-2 with ARDS and difficult to maintain saturation despite mechanical ventilation and proning with recovery for 3 patients. However, given the lack of ECMO centers; this is not a readily available option. Further studies are warranted to investigate the role of ECMO in SARS-CoV-2 and careful identification of appropriate candidates.

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Multiple Bridging: Recovery, Decision, Transplantation, Recovery

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Introduction: This case describes multiple forms of short term mechanical circulatory support (sMCS) used sequentially in the same patient, and illustrates the role of different clinical goals of sMCS.

Case Report: A 59 year old man with previous coronary artery bypass surgery attended with troponin positive acute coronary syndrome. After workup, he went for PCI to a native coronary chronic total occlusion using anterograde/retrograde wires. Unfortunately, the left internal mammary graft was dissected, and he suffered cardiac arrest.

Day 0: Impella CP as bridge to recovery: During resuscitation an Impella CP was placed via his right femoral artery and resolved circulatory arrest. Further PCI was performed to the LIMA ostium with restoration of flow. He was transferred to ITU.

Day 3: Peripheral VA-ECMO as bridge to decision: His clinical status improved, but he remained in shock. His support was upgraded to peripheral veno-arterial (VA) extra-corporeal membrane oxygenation (ECMO), leaving the Impella in place as an LV vent.

Day 14: BiVAD as bridge to transplantation: He remained MCS-dependent, and had no absolute contraindications to advanced therapies. He went to theatre for implantation of bilateral short term ventricular assist devices (BI-VAD) to optimise his organ support prior to transplantation. He was placed on the super-urgent waiting list. He had intermittent ventricular fibrillation but continued to mobilise on the ITU.

Day 48: Transplantation and bridge to recovery with central ECMO: After 34 days on BiVAD, he underwent orthotopic cardiac transplantation. Due to vasoplegia and RV dysfunction, he was weaned from cardiopulmonary bypass onto central ECMO.

Day 50: Weaning support - percutaneous RVAD as bridge to recovery: There was persistent RV dysfunction. Central ECMO was exchanged for a Protek RVAD.

Day 56: Explant of RVAD: His status continued to improve. The RVAD was weaned and explanted after 6 days.

Day 73: Discharge home: He required intense physiotherapy. After 73 days in hospital he was discharged home. At the time of submission he is alive at 291 days post transplant.

Summary: This man's successful outcome was facilitated by judicious use of sMCS, on each occasion with a clear strategy in mind. Surgically implanted and percutaneous modes were used. Collaboration between