Venovenous ECMO as a rescue tool in acute respiratory failure during LVAD implantation in a patient with Cardiogenic Shock

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We report a case of a 48 year-old gentleman with past history of non-ischemic severely dilated CMP, persistent AF, S/P CRT-D and both alcohol and tobacco abuser who was transferred to us for possible advanced heart failure therapy after being admitted with acute decompensated heart failure and rapidly progressed to cardiogenic shock with multi-organs dysfunction including renal failure, hepatic failure and cerebral hypoperfusion. Upon arrival, he was started on dialysis and placed on VA ECMO to provide full hemodynamic support as a bridge to decision. His RV function was mildly to moderately impaired. LVAD was inserted one week after admission due to failure to wean VA ECMO despite significant inotropic support. During surgery for LVAD, VA ECMO was shifted to VV ECMO; as a rescue procedure for intraoperative pulmonary edema and severe resistant hypoxia. Intraoperative TEE showed no worsening RV systolic dysfunction but worsening of pulmonary HTN. Insertion of the VV ECMO occurred via the left femoral vein (LFV) cannula and right internal jug IJ cannula under TEE. Over the next 4 days, there were many challenges which were total atelectasis of left lung twice (resolved through bronchoscopic lavage with clot removal) and transient renal shutdown required continuous renal replacement therapy. Bedside echo was frequently the corner stone to evaluate the pulmonary artery pressure and RV dimensions and systolic function especially after resolution of lung issue to decide removal of VV ECMO. VV ECMO has been successfully removed successfully in the 5th day. There is no prior reported case of using VV ECMO for acute respiratory failure during VAD surgery. In our patient: VV ECMO was helpful to pass the acute respiratory failure phase but unfortunately because of Left lung’s atelectasis caused by blood clot, its removal was postponed until day 4 postoperatively otherwise it should be removed as soon as possible to avoid vascular complications and infection.

Learning objectives: (1) VV ECMO could be a rescue procedure in case of acute respiratory failure during VAD surgery, (2) Right side invasive monitoring and bedside echo evaluation are helpful tool to decide removal of the VV ECMO, (3) LVAD can be used as a bridge to decision.