Trans-aortic LV venting for ECPR patients

ECPR patients are at high risk of developing LV distension syndrome. The following patients should receive transaortic LV venting in the cath lab routinely at the end of the angiogram.

Patient selection

- Patients that remain with a pulse pressure less than 10mmg at the end of the procedure
- ***OR*** patients that fit the clinical syndrome with high LVEDP, low ejection fraction and early pulmonary oedema

LV vent placement

The catheter used can currently only be inserted in the cath lab by the cardiologist under fluoroscopy guidance.

Note: the catheter used (Cordis 8Fr XB3SH) is a specific coronary access catheter with 2 side holes - 'pigtail' appearance. ONLY if this catheter is not available a conventional 7Fr pigtail may be used.

The catheters are stored in the cath lab. It can ONLY be placed via the femoral artery, introduction via the radial access is NOT acceptable. Once placed in the mid-cavity of the left ventricle, the position of the catheter should be fixed, measured and documented. The connection to the ECMO circuit is the responsibility of the intensivist and described below. ***Equipment required: LV vent pack , ECMO pack, 3 sterile clamps***

Connection to ECMO circuit

Integration of LV vent into ECMO access limb

Prepare connector - sterile

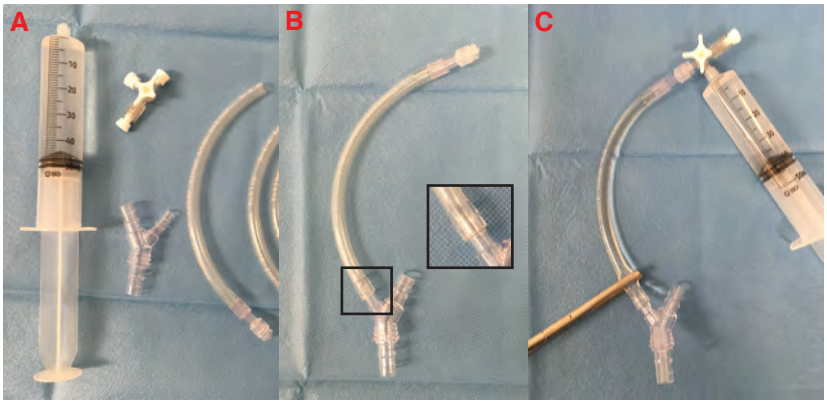
- Cut ¼ inch LV vent tubing to ***minimal length required*** to reach from pigtail catheter to 15-20cm below access cannula connection
- Push tubing onto ¼ inch end of Y-connector
- Make sure tubing is advanced at least 3mm beyond first ridge to allow application of cable tie later [B]
- Prime tubing by connecting a 50ml luer lock syringe via a 3-way connector apply clamp on primed ¼ inch limb

Splice into access limb of ECMO circuit

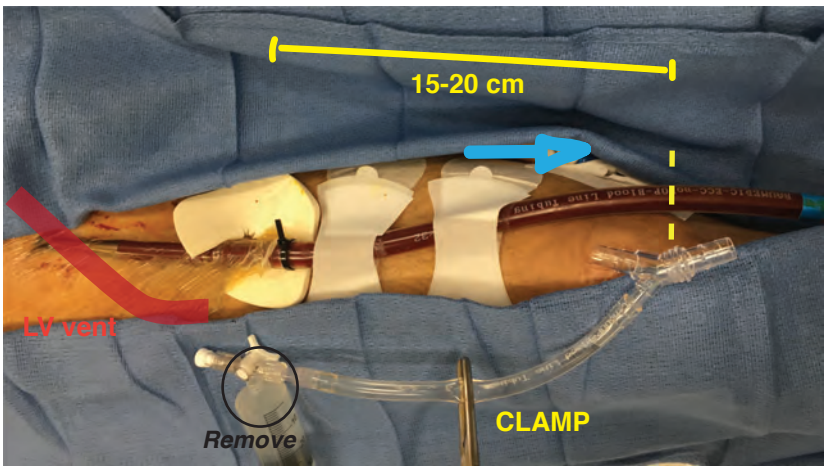
- Sterile preparation to clamp circuit 15-20cm below access cannula connection
- Clamp by a hand width above and below the intended cut
- Ensure the Y connector is inserted the correct direction with the single arm towards the console
- Perform underwater water seal for final connection - no air in connector
- **CLAMP must be on ¼ side arm**
- Remove clamps and go back on support

Connect 'pigtail' catheter

- Aspirate pigtail catheter, ensure flow
- Connect tightly to luer lock of ¼ inch tubing - **remove 3-way tap** (only for priming)
- Remove clamp and observe flow
- Cable tie 3 connections of Y-connector
- Attach separate ¼ flow meter probe to monitor flow



The LV vent pack contains the required equipment [A], the 1/4 inch tubing is cut to length and pushed onto the Y connector [B] to allow cable tie placement later. The side arm is primed via a 3-way tap and clamped. [C]



Overview of integration of the LV vent into the access limb of the ECMO circuit, see column on the left for detail.

Post procedure

Mandatory for patients with transaortic LV venting

- Flow meter attached to the ¼ inch tubing to monitor for clotting of the access limb
- Favouring heparin anticoagulation
- Early removal of catheter if clotting occurs
- Reassess and aim to remove after the first 12 - 24 hours
- Optimise medical management for LV distention

Further considerations

- All patients require the medical management steps of LV distension syndrome
- Patients without return of pulsatility within 12 hours need to be evaluated regarding the need for a surgical LV vent
- Alternate causes of loss of pulsatility need to be considered in parallel such as hypovolaemia and bleeding.