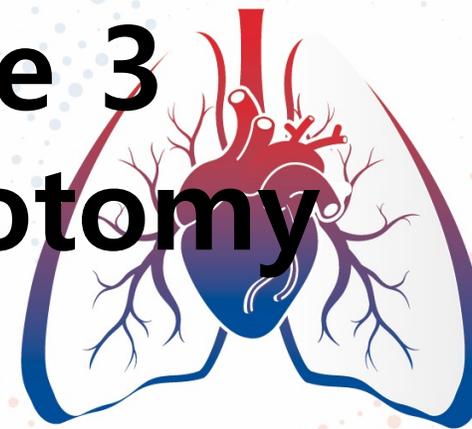


2023 대한심장혈관흉부외과학회

제55차 추계학술대회 & APELSO 2023

2023. 11. 02 (Thu) - 11. 04 (Sat), 그랜드 인터컨티넨탈 파르나스 서울

Left Ventricular Assist Device Exchange From Heartmate II to Heartmate 3 Through Bilateral Anterior Thoracotomy



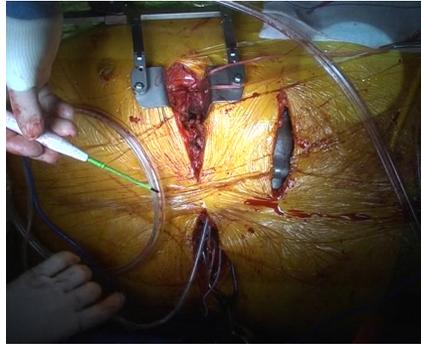
- Pump thrombosis has been reported in old-generation continuous-flow left ventricular assist devices.
- There is a lack of clear guidelines regarding the management of pump thrombosis, including indications and the surgical approach for pump exchange.
- Redo-sternotomy is frequently used for LVAD pump exchange, however, redo-sternotomy is known to be associated with an increased risk of injury to cardiovascular structures and adverse outcomes.
- We report a case of a patient with LVAD exchange from HM II to HM 3 through bilateral anterior thoracotomy approach.

- A 78-year-old man underwent LVAD (HM II) implantation on 2020, for destination therapy due to advanced DCMP.
- On May 2023, the patient presented with high LVAD flow (11.8L/min), high power (5.3 watts), and an elevated lactate dehydrogenase (LD) level of 693 IU/L and admitted for evaluation.

- Initial chest X-ray, CT scan, and echocardiography did not reveal any indications of LVAD thrombosis or flow obstruction.
- There was also no significant change in cardiac function and no anomalies such as changes in urine color, renal function, or elevated bilirubin.
- We initiated heparinization and conducted close observation of the patient's progress.

- On HD #3, we restarted warfarin with a target INR range of 2 to 2.5.
- On HD #9, LD level was elevated to 1121 IU/L, and microscopic hematuria was found.
- On HD #13, LVAD exchange from HM II to HM3 was performed.

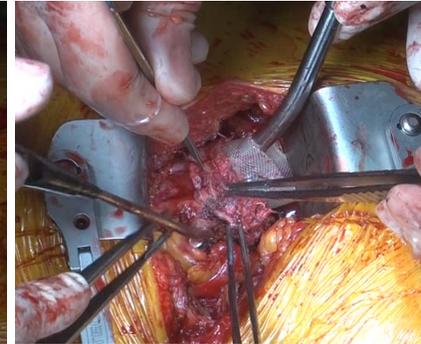
- Bilateral anterior thoracotomy
 - We approached inflow cannula and outflow graft via bilateral anterior thoracotomy through the 5th ICS. Additional left anterior thoracotomy at 7th ICS was performed to expose the HM II pump.
- Pump exchange from HM II to HM 3
 - The fixations between the HM II inflow cannula and LV apical sewing ring were removed after clamping the outflow graft. The inflow cannula was separated from the apical sewing ring. HM II inflow cannula was disconnected from the pump and no visible thrombus was observed inside the pump.
 - Previous HM II sewing ring on LV apex was completely removed, and a new HM 3 sewing ring was sutured in place.
 - HM II outflow graft was cut, and the HM II pump was removed completely. The new HM 3 pump was inserted into thoracic cavity through 7th ICS incision, and new outflow graft was connected to the previous graft with end-to-end anastomosis.



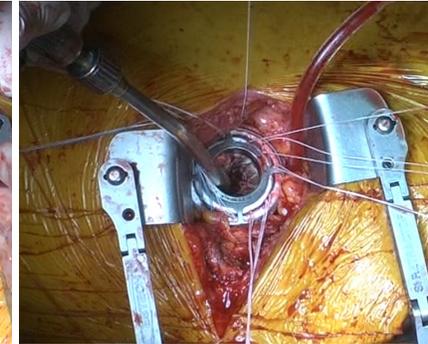
**Bilateral anterior
thoracotomy**



**HM II inflow cannula
separated**



**HM II sewing ring
completely removed**



HM 3 sewing ring inserted



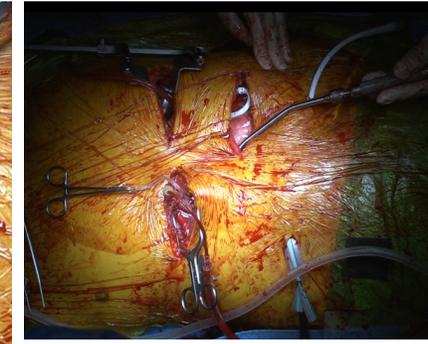
HM II pump removed



HM 3 pump inserted



**HM 3 outflow graft
connected to previous graft**



Pump exchange done

- This is the first case report describing a pump exchange from HM II to HM 3 using a bilateral thoracotomy approach in Korea.
- Pump exchange from HM II to HM 3 can be performed with bilateral thoracotomy approach without significant complications.
- Thoracotomy approach offers potential benefits compared to sternotomy, such as decreased transfusion, reduced risk of RV failure, and shorter hospital stay.