A Case Of Redo Mitral Valve Replacement Via Right Minithoracotomy With COPD And Chronic Pleural Effusion.

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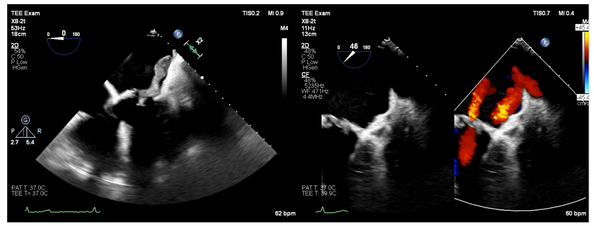
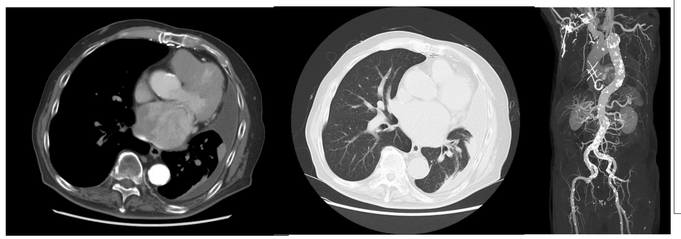
1.. Background and Indication for Redo MVR

- 79-year-old man with prior MVR (Epic 29 mm), TAP, Maze, and LAA closure in 2020(fullsternotomy).
- Presented with dyspnea; echo showed severe MSR due to bioprosthetic SVD.
- Comorbidities: COPD (on home O_2), chronic pleural effusion, CKD (G3b).
- Due to high resternotomy risk, redo MVR was performed via right minithoracotomy.

2. Preoperative examination

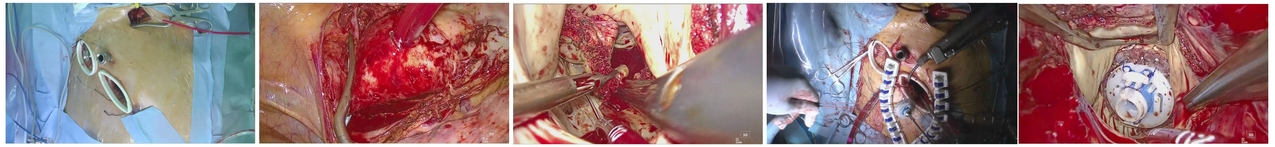


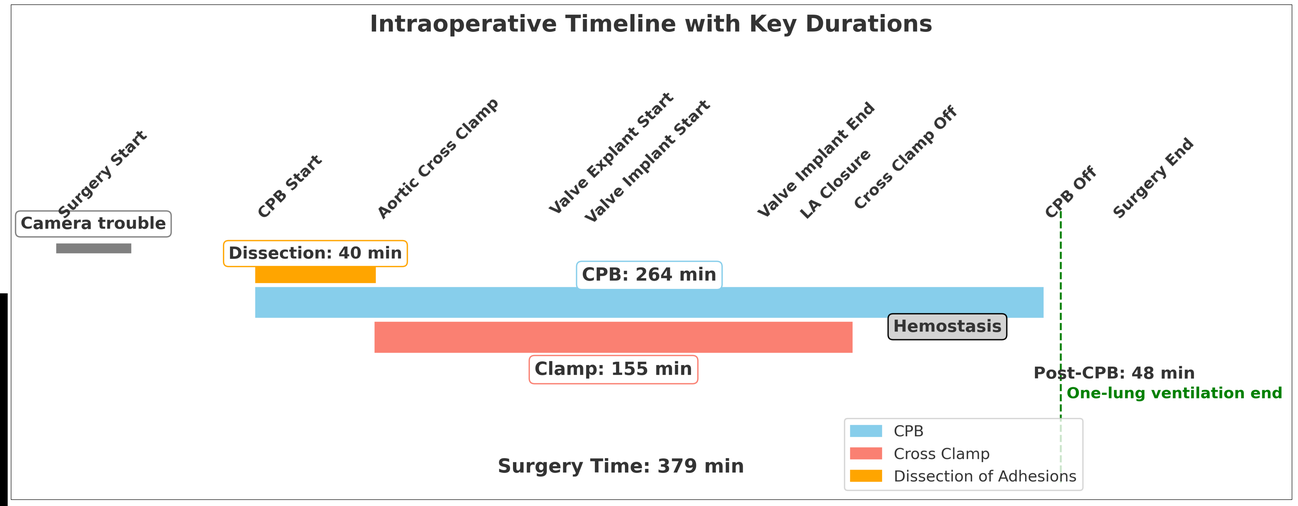


- Echo showed severe MSR due to bioprosthetic valve degeneration.
- CT revealed left pleural effusion and bilateral emphysematous changes.
- Pulmonary function test indicated COPD-related respiratory depression (FEV_1: 1.42 L, FEV_1%: 67%).

3. Operative Technique of MICS

- 3D endoscopic MICS was performed via 3 ports with 1 windows.
- CPB established via femoral artery(+ axilla a) and femoral vein.
- Operation time: 379 min (CPB: 264 min, ACC: 155 min).
- Dissection of adhesion was time-consuming but completed without transfusion.





4. Intraoperative Challenges & Solutions

- CPB was initiated before chest entry due to poor lung function.
- Axillary cannulation helped maintain SpO_2.
- Blunt dissection avoided annular injury during valve explantation.
- CPB weaning followed thorough hemostasis.
- Bilateral ventilation was temporarily resumed if SpO_2 dropped.
- Body temperature was lowered to 31℃ to prevent reexpansion pulmonary edema.
- If poor oxygenation, VV ECMO could be started.
- These steps ensured safe, minimally invasive surgery.

6. Postoperative Outcomes

- The postoperative course was uneventful.
- Extubated 17 hours after surgery and transferred to the ward on POD1.
- Echo showed good prosthetic valve function with no leakage.
- Discharged home on POD14, ambulatory and independent.

7. Discussion

- Right minithoracotomy avoided resternotomy and reduced respiratory burden.
- MICS was feasible even with poor pulmonary function.
- Careful planning enabled safe CPB weaning without prolonged one-lung ventilation.
- This case supports the value of MICS in high-risk redo patients.

8.Conclusion

- A patient with COPD and chronic pleural effusion and poor respiratory function underwent redo mitral valve replacement via a right minithoracotomy with good results.

Nakanaga H, et al. Temporary venovenous extracorporeal membrane oxygenation after cardiopulmonary bypass in minimally invasive cardiac surgery via right minithoracotomy. J Thorac Cardiovasc Surg Tech. 2023;20:99-104.