

Implantation of Melody Valve in Mitral Position in an Infant: The First Case Report from Korea

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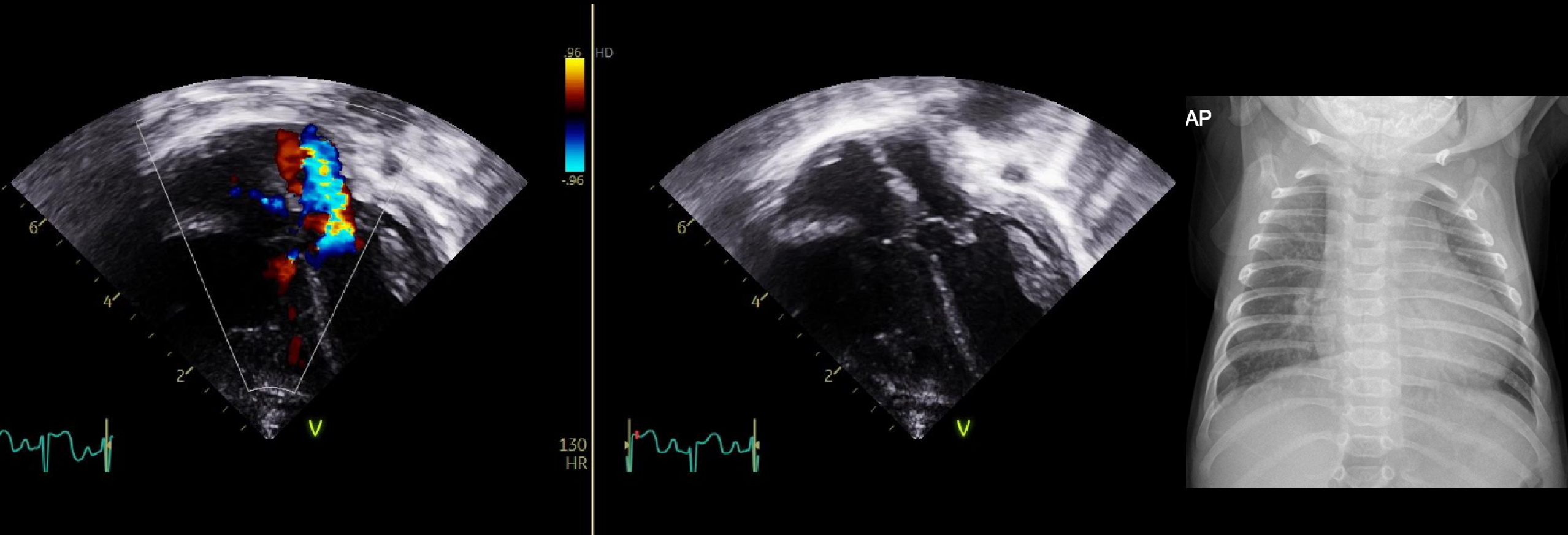
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Case

- **8 mo girl who had undergone MVR with SJM 19mm presented to ER**
- **Chief complaints**
 - Vomiting
 - 4 times since last night
 - Parents reported absent clicking sound of the valve

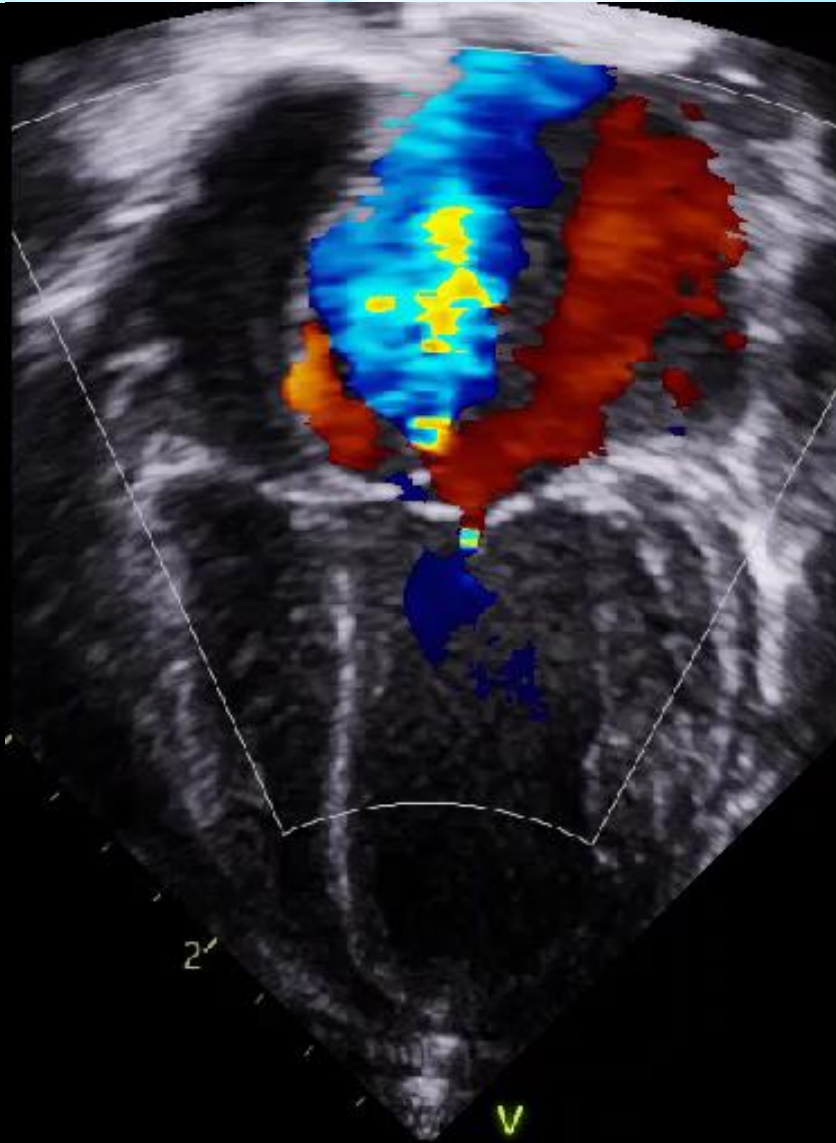
Past medical history



- **Complete AVSD (Rastelli type A)**

→ Repair with modified 1-patch technique (2 months of age)

Past medical history



- **Lt. AVV Regurgitation**
 - **Lt. AVVR repair (POD #21)**
 - Cleft repair
 - Left superior bridging leaflet augmentation with autologous pericardium
- **AVVR recurred (POD #35)**
 - **Lt. AVV replacement**
 - SJM aortic valve 19mm at supra-annular position

Past medical history

- **Readmission for SDH**

- PT(INR) prolongation

- PT(INR) 13.15 → Warfarin stop

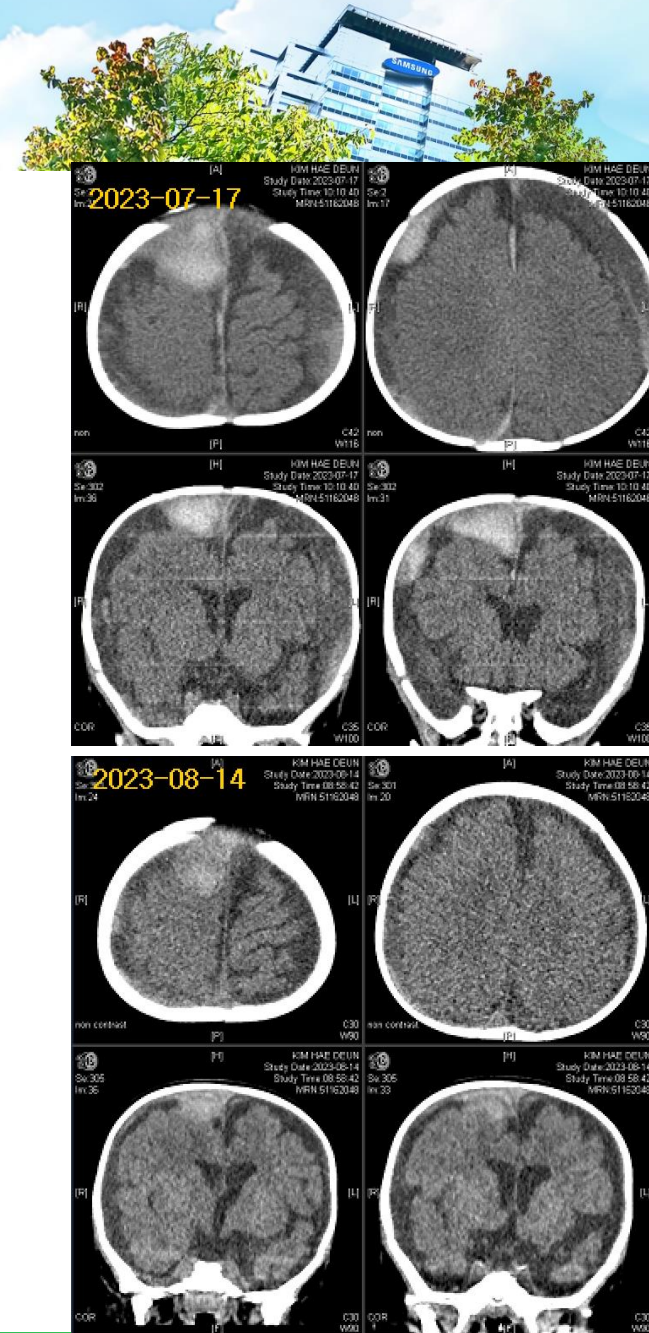
- Anticoagulation

- HD #7: Heparin continuous infusion (aPTT target: 55~60s)
 - HD #29: Warfarin restart

- **2nd readmission for recurred SDH**

- Anticoagulation

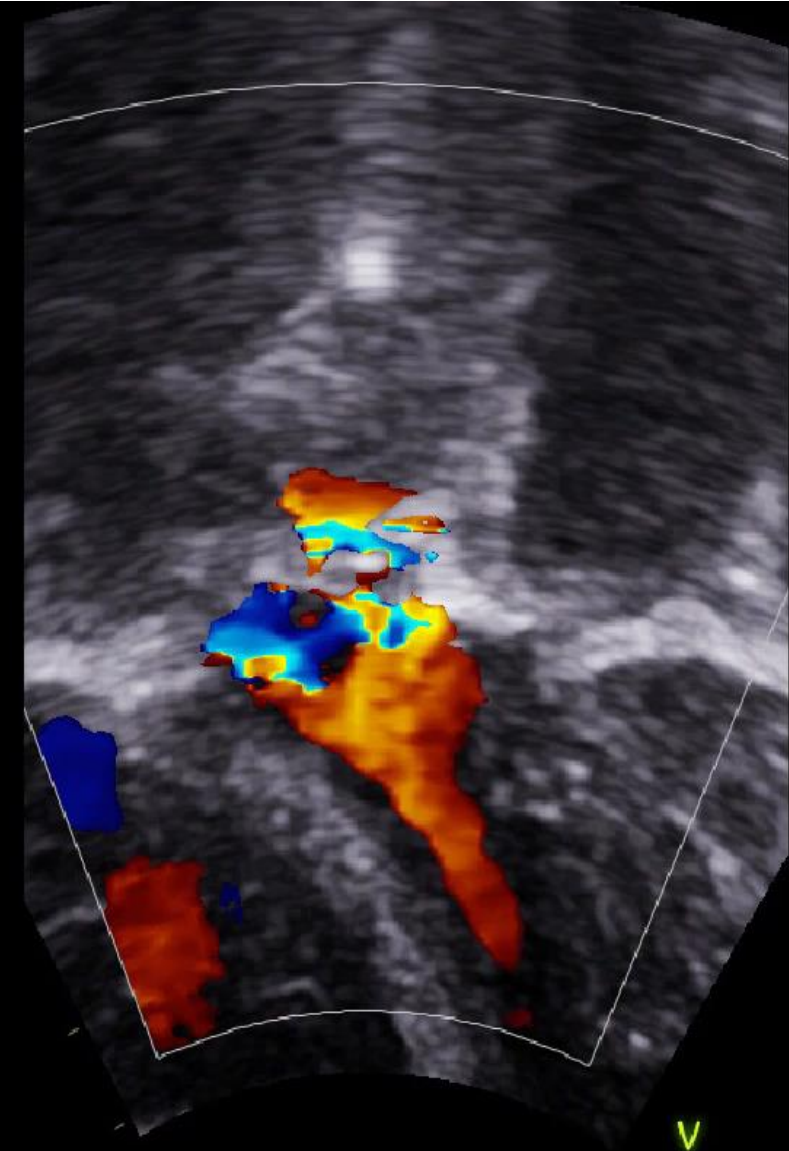
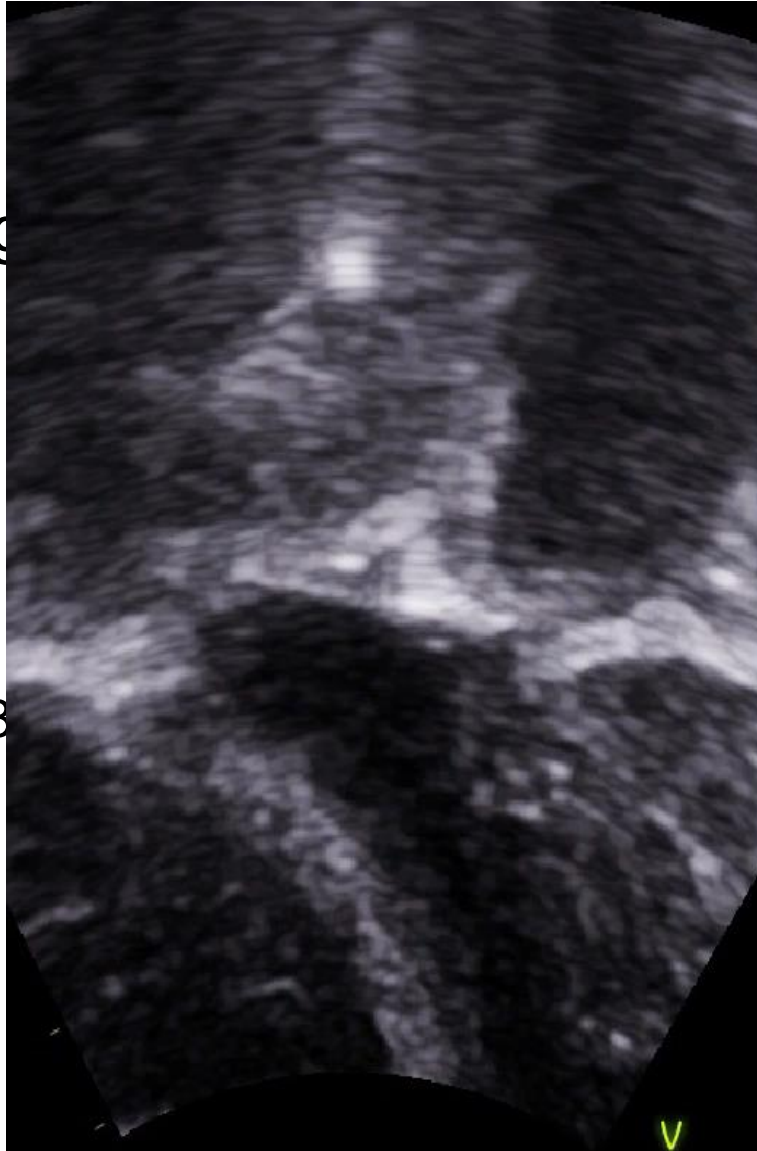
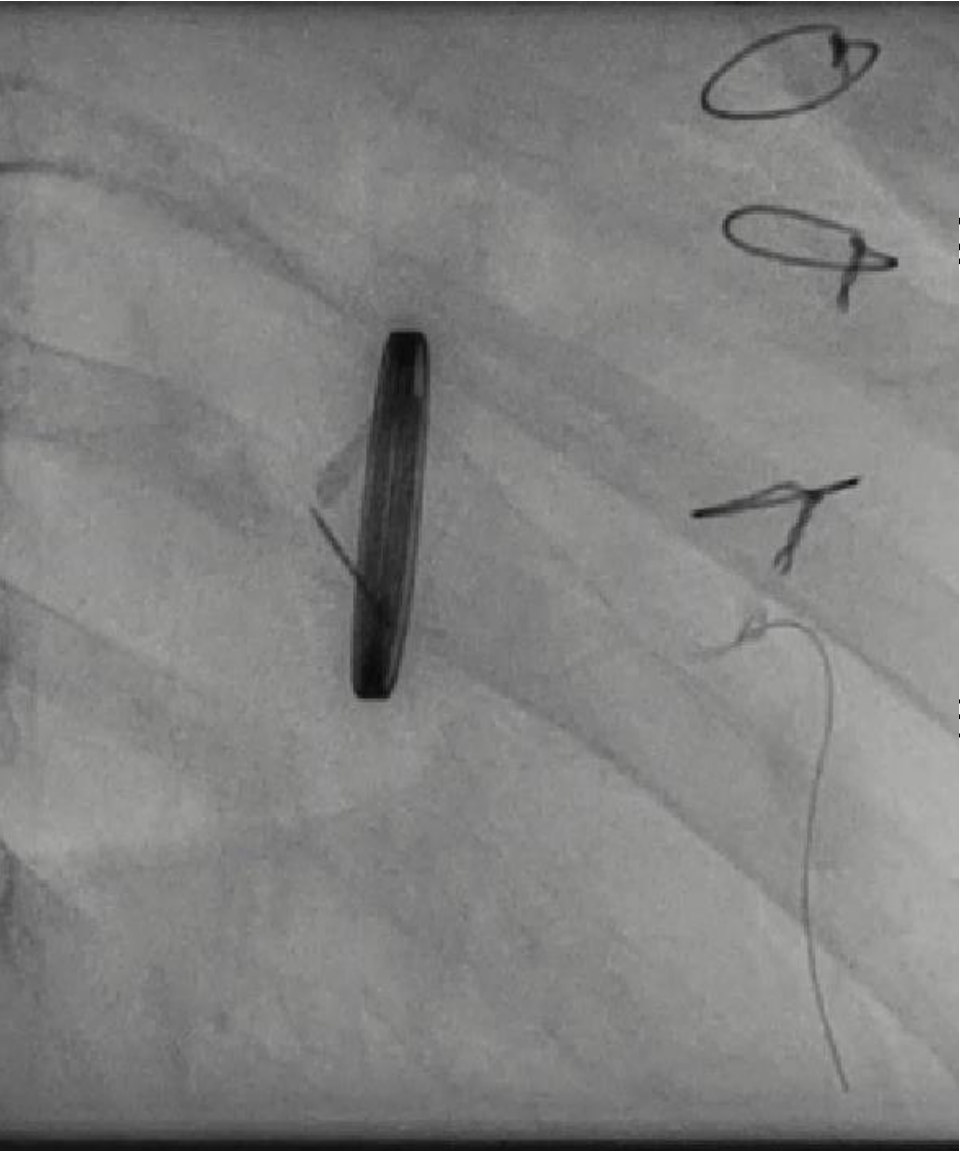
- Heparin continuous infusion
 - HD #8: Warfarin restart



Case Presentation

- **8 mo girl**
 - 2 days after last discharge
 - Vomiting
 - Absent valve click
 - Coagulation profile
 - aPTT 43.7s / PT(INR) 1.37

Case Presentation

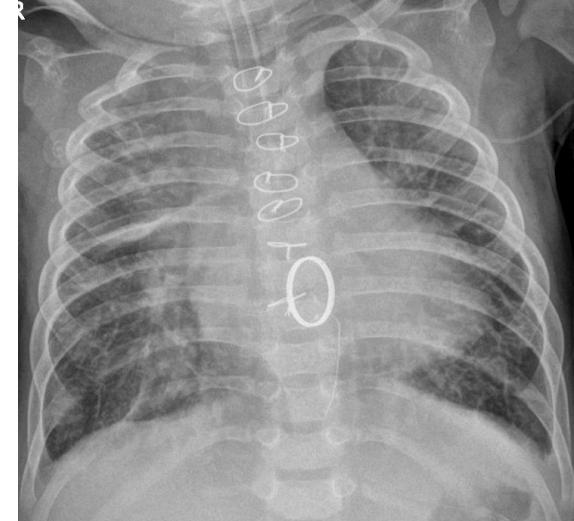


Initial management

- **ICU admission**
 - Prosthetic valve failure
 - Cardiogenic shock with pulmonary edema
- **ECMO with CRRT**
- **Deeply sedated**
- **tPA thrombolysis**
- **Heparinization**

PLAN

Redo MVR



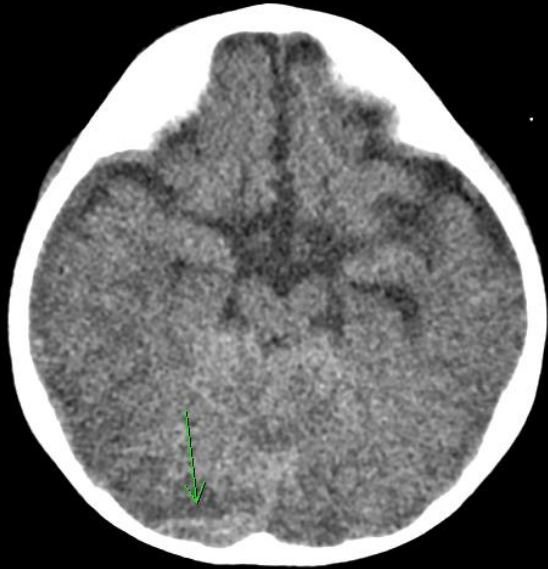
Obstacles

- **Brain hemorrhage on HD #5 (SDH, ICH)**
 - Epileptiform discharge on EEG
 - **Alveolar hemorrhage**
 - Airway obstruction
- **Redo surgery was delayed**
- Heparinization was stopped
 - Weekly brain CT f/u
 - ECMO circuit changes

Obstacles



[A]

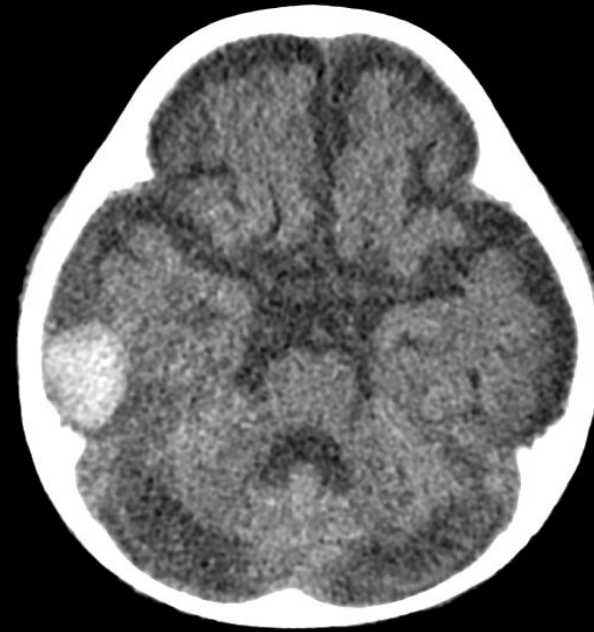


HD #5

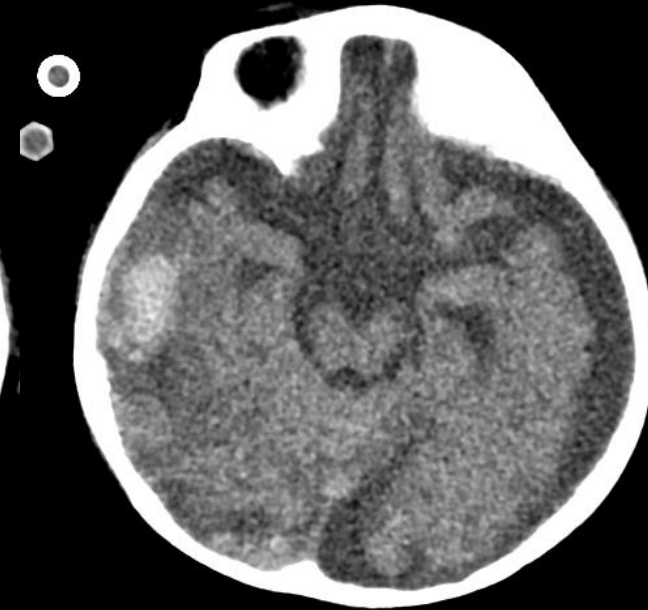
[A]



HD #13



HD #20



HD #34

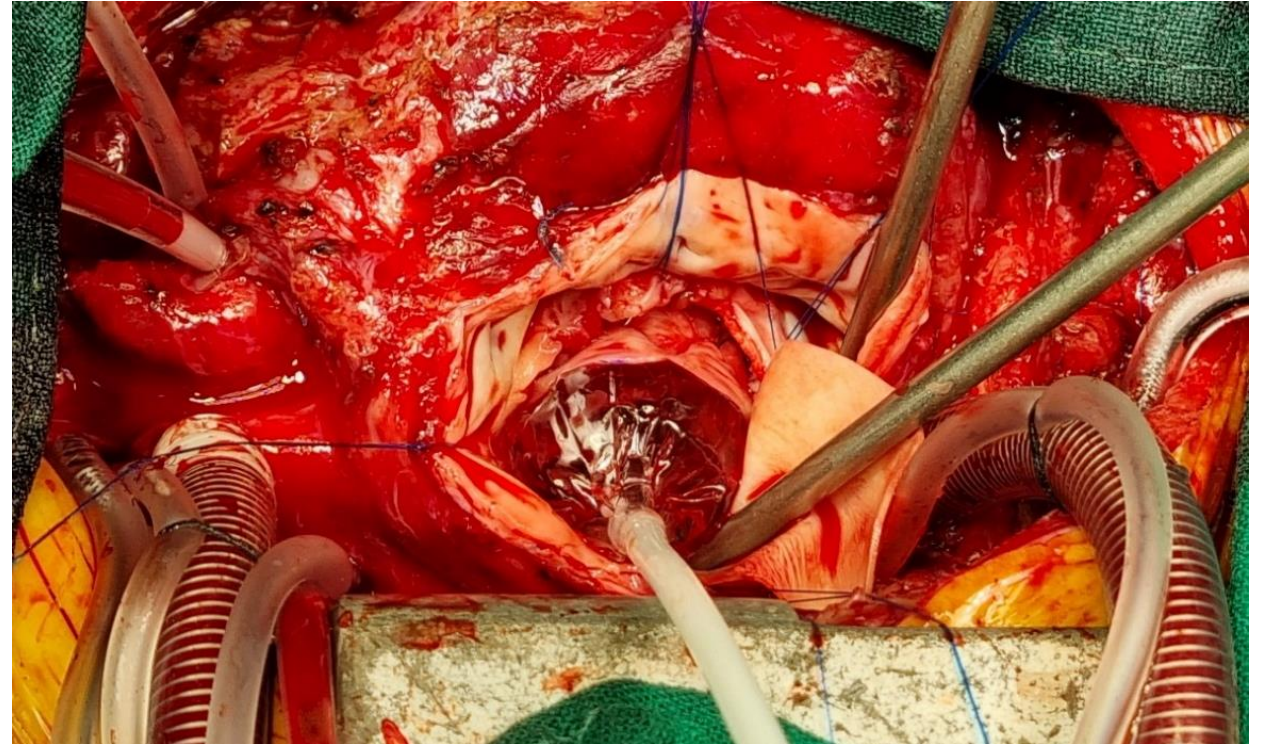
Breakthrough



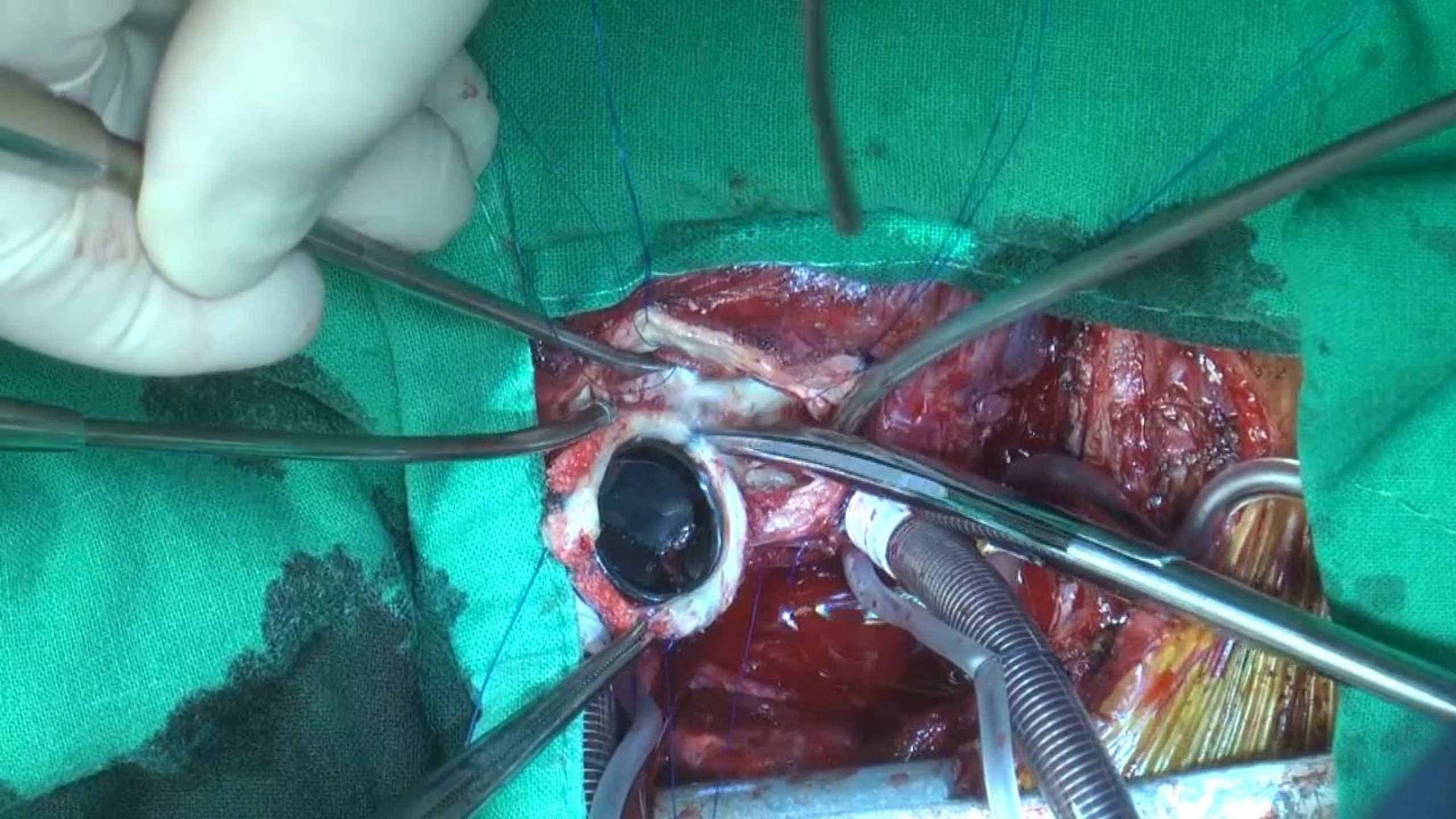
- **On HD #31, without additional brain hemorrhage, redo MVR with Melody® valve was performed**
- **Melody® valve (Medtronic, Minneapolis, MN, USA)**
 - Bovine Jugular Vein Conduit
 - Advantages
 - Avoid anticoagulation
 - Possibility of further ballooning

Surgical Details

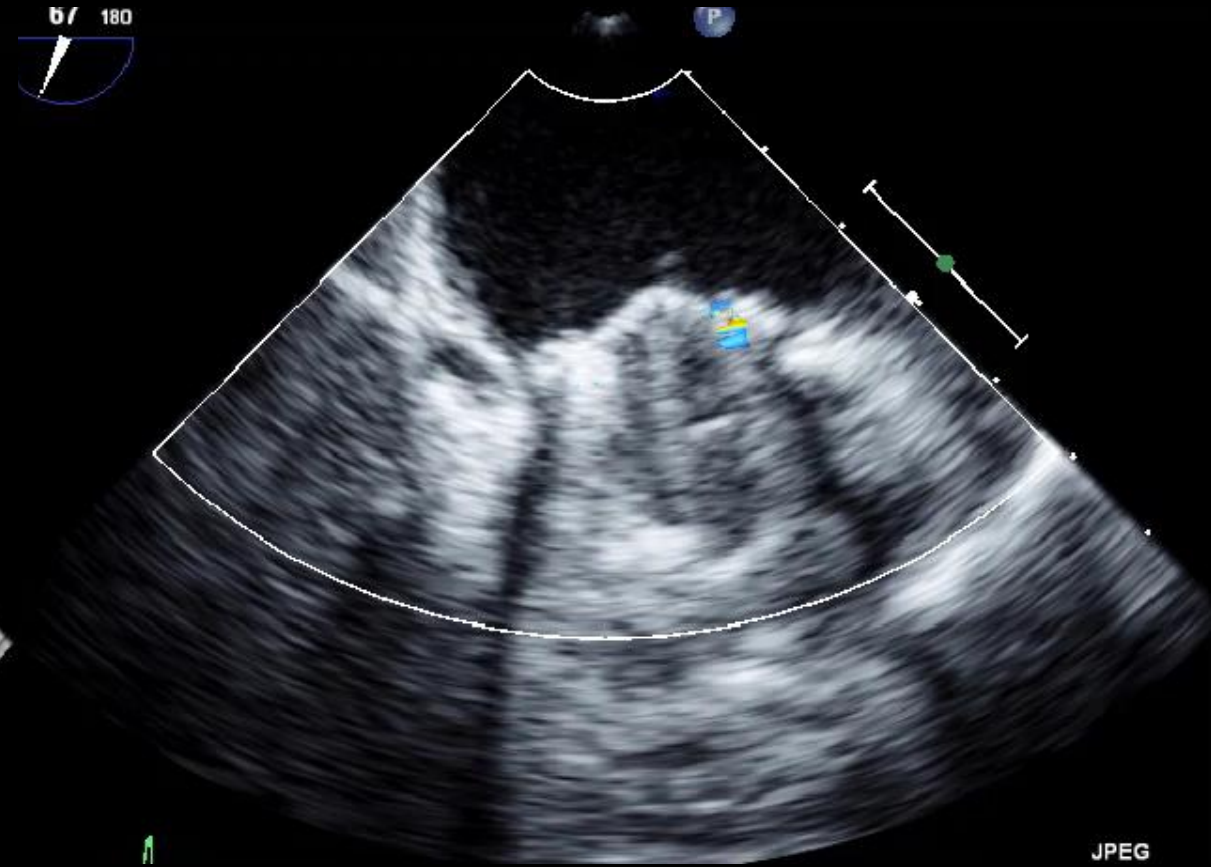
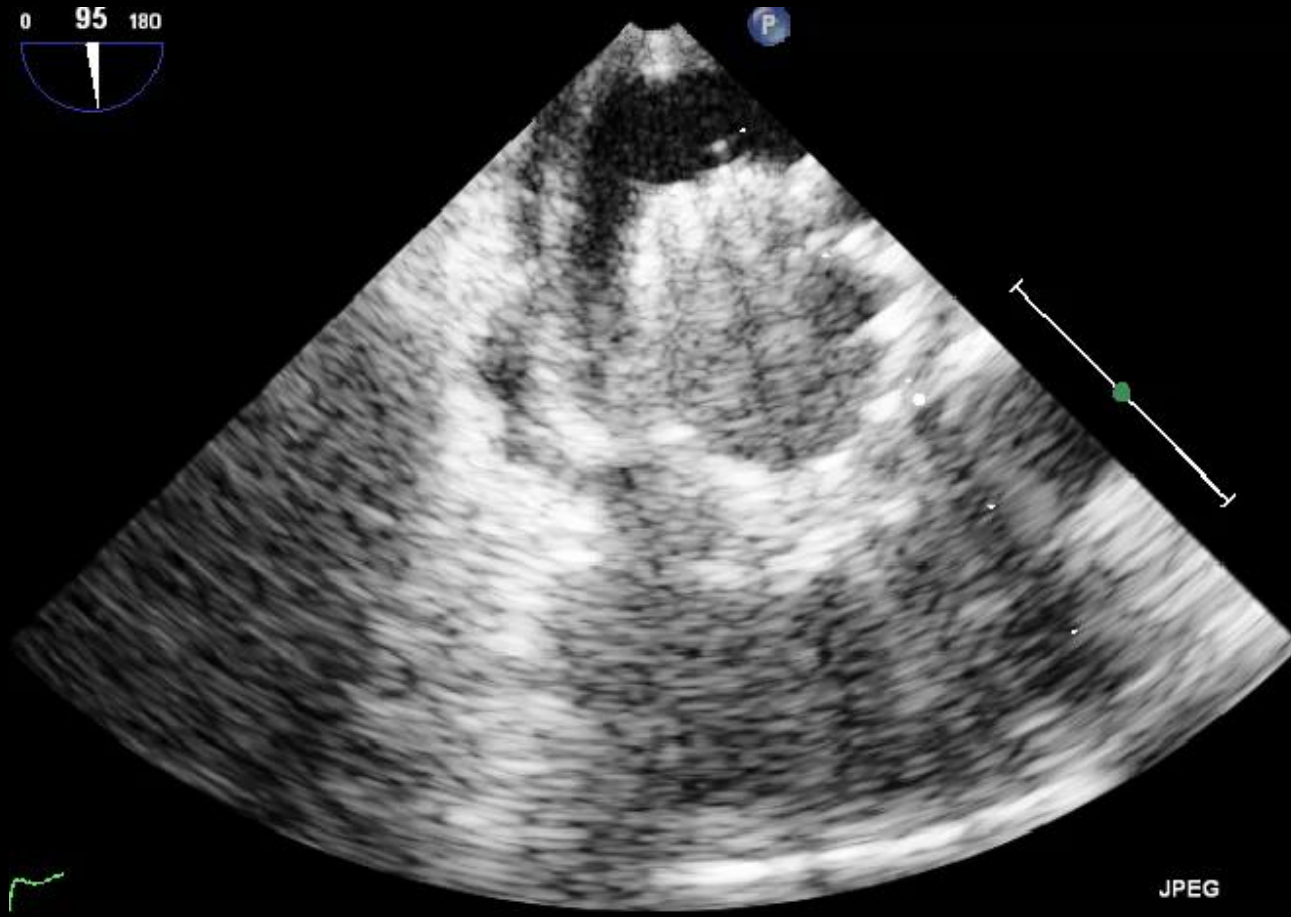
- **Folding crowns**
- **Sewing ring creation**
 - Bovine pericardial strip
- **No LVOT side incision**



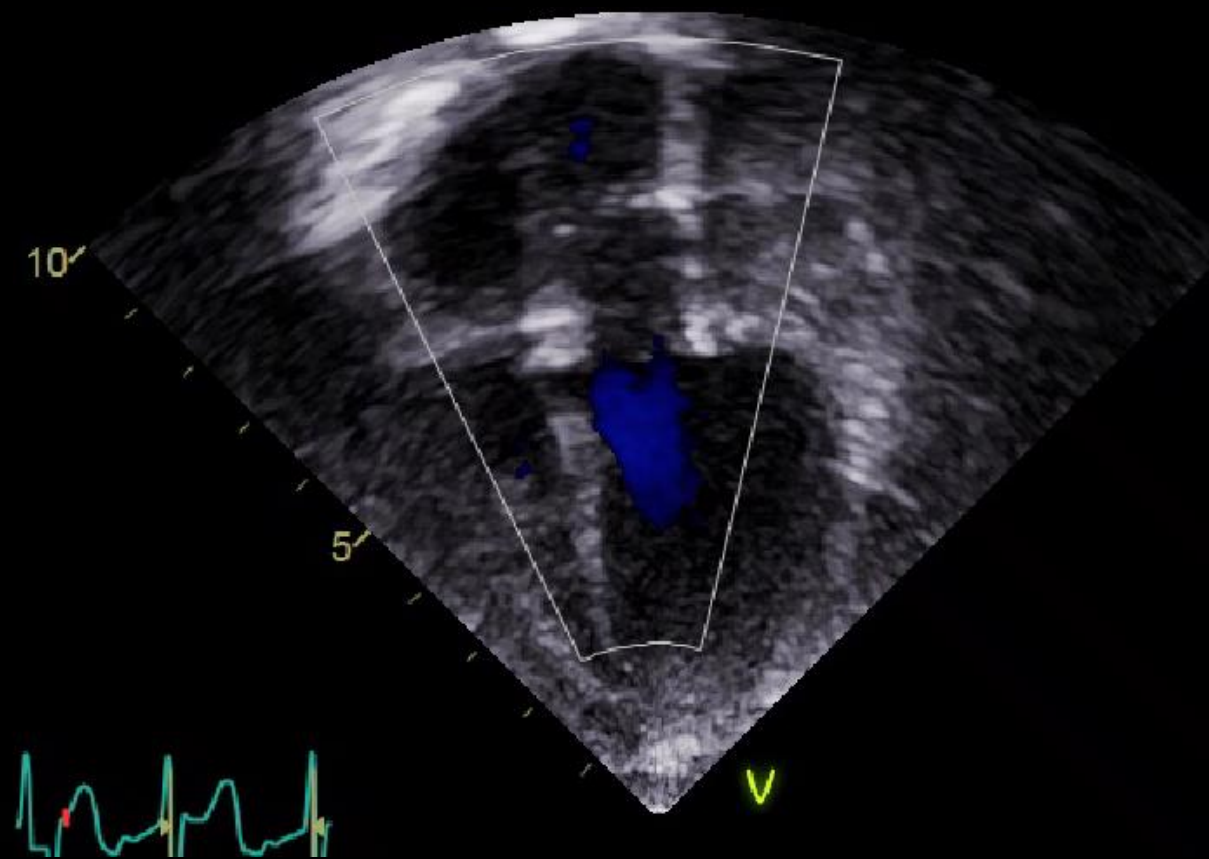
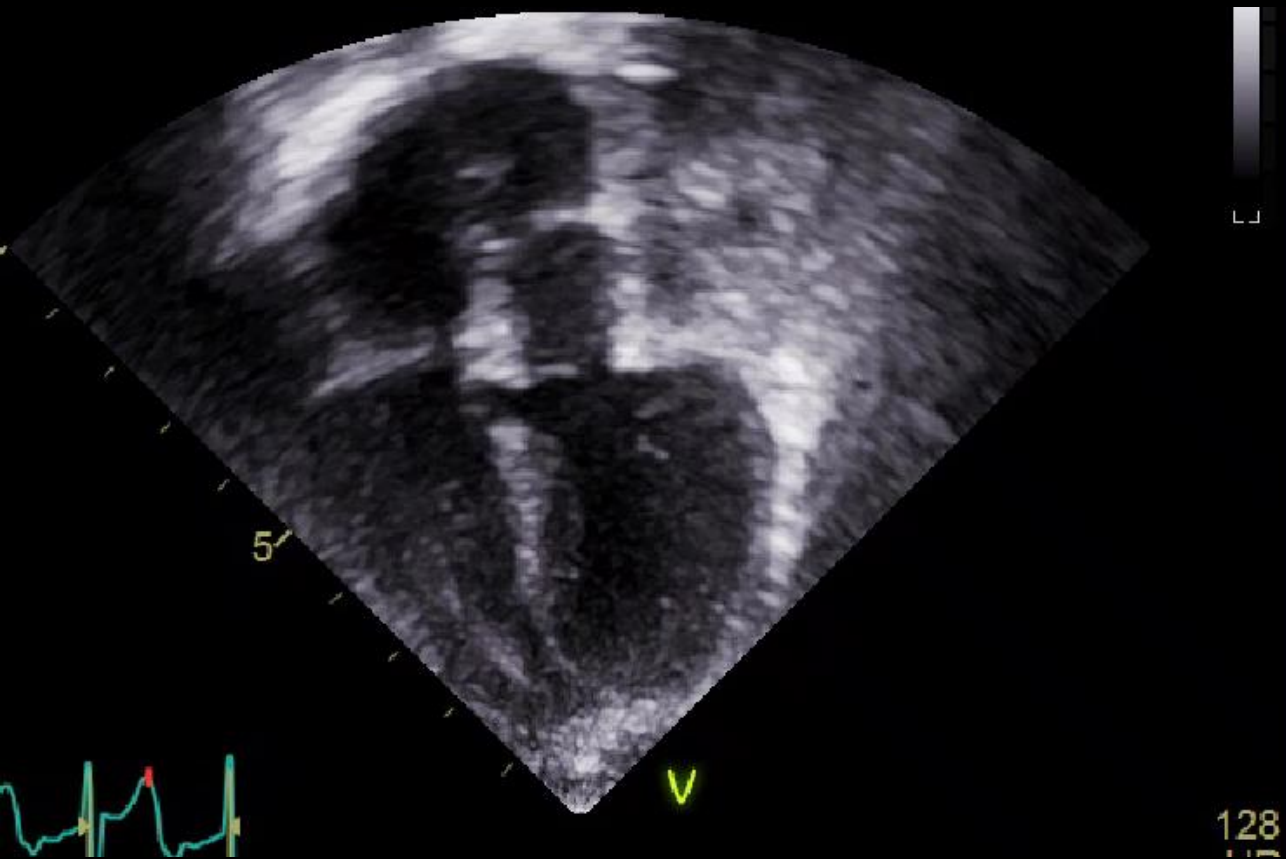
**Balloon dilation
3.5mm fenestration**



Intraoperative TEE

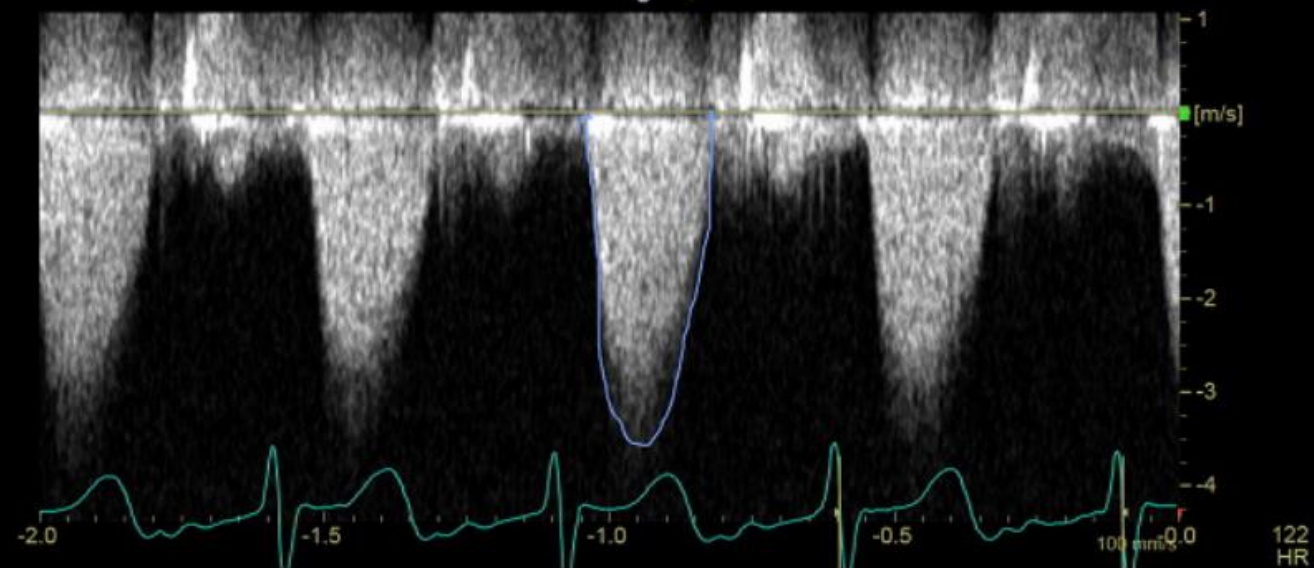
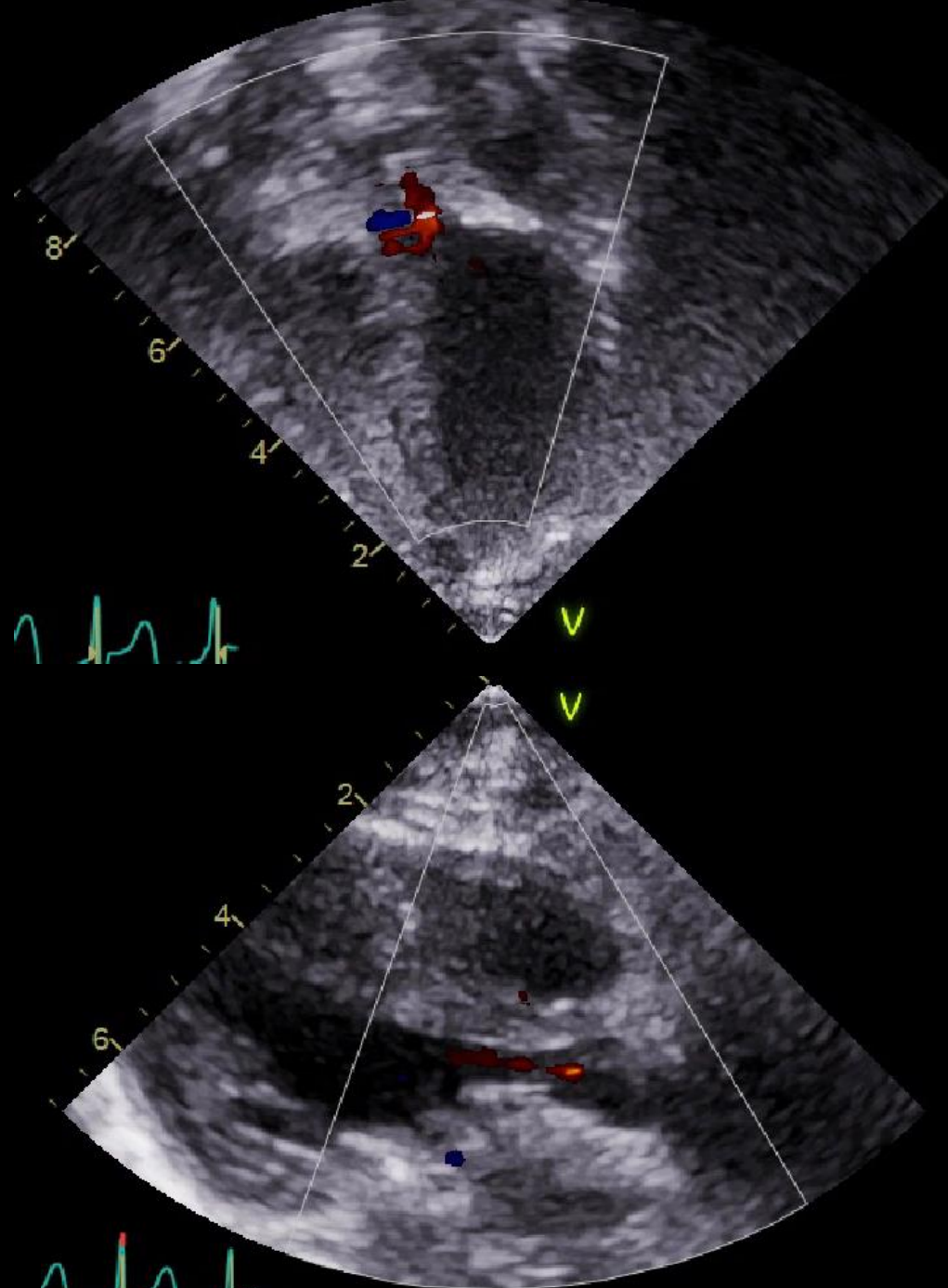


Postoperative EchoCG



Se: 0
Im: 28 (F1/1)

AV Vmax	3.57 m/s
AV Vmean	2.70 m/s
AV maxPG	51.00 mmHg
AV meanPG	32.58 mmHg
AV Env.TI	218.84 ms
AV VTI	59.16 cm





MVR in Infants

- **Suboptimal options**

- Bio-prosthesis
- Homograft
- Ross II (Aurograft)



Unavailable size, Durability ↓, Calcification

Limited experience in infants

- **Viable options**

- Mechanical valve
- **Bovine Jugular Vein Conduit**
 - Melody® valve (Medtronic, Minneapolis, MN, USA)



Bovine jugular vein conduit (Melody®)

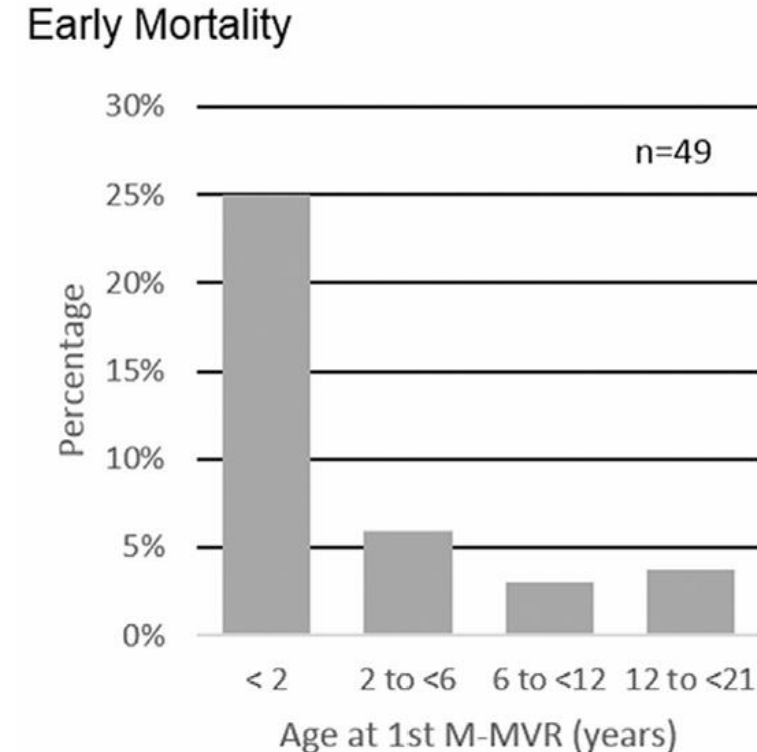
MVR in Infants

- **MVR with mechanical valve in Infant**

- Inevitable for unrepairable cases
- Early mortality ↑
- Reintervention ↑

- **Challenges**

- Limited prosthesis options
 - Especially for annuls size <15mm
- Younger age is a risk factor

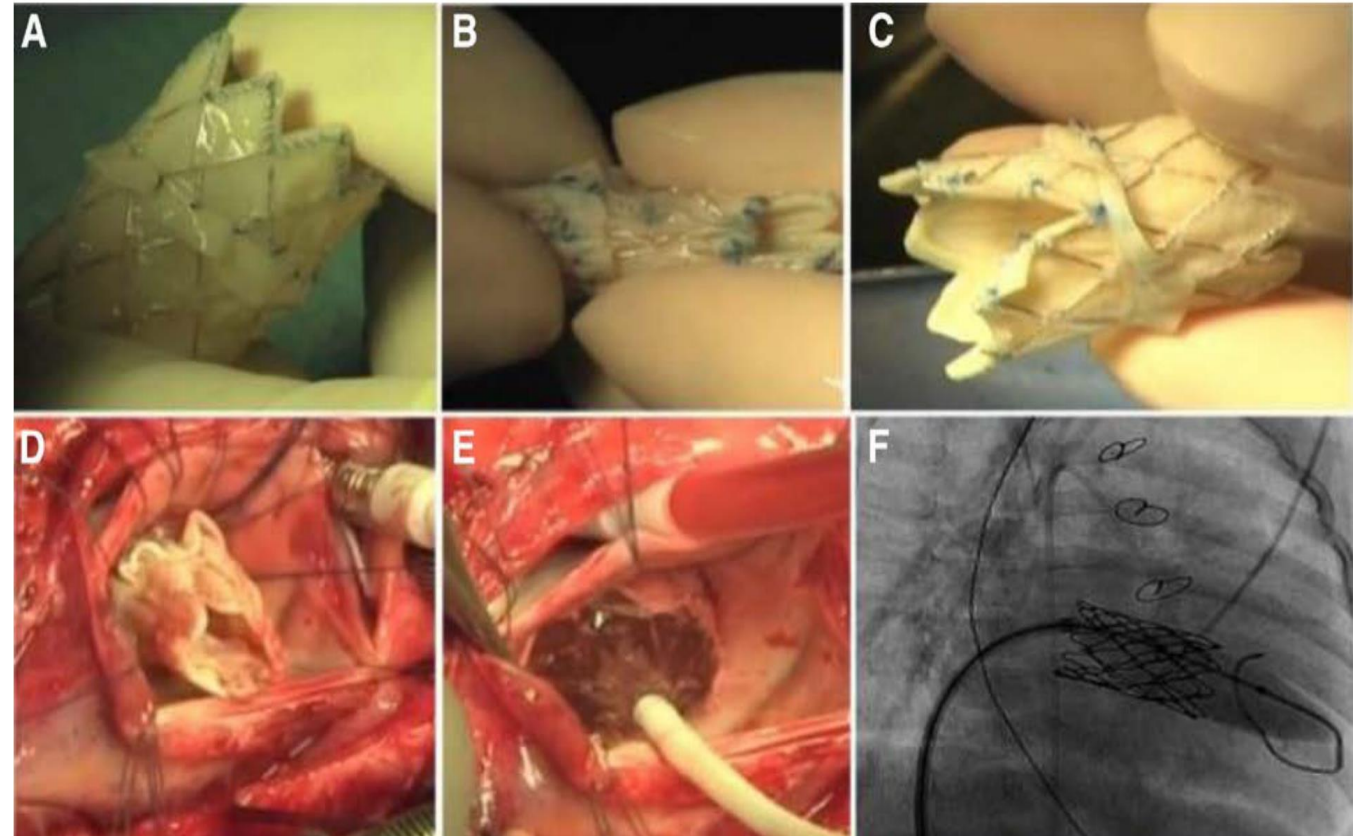


Association of age and mortality after MVR:
data from the PCCC

(Ann Thorac Surg 2019;107:143–50)

Surgical Melody® Valve Implantation

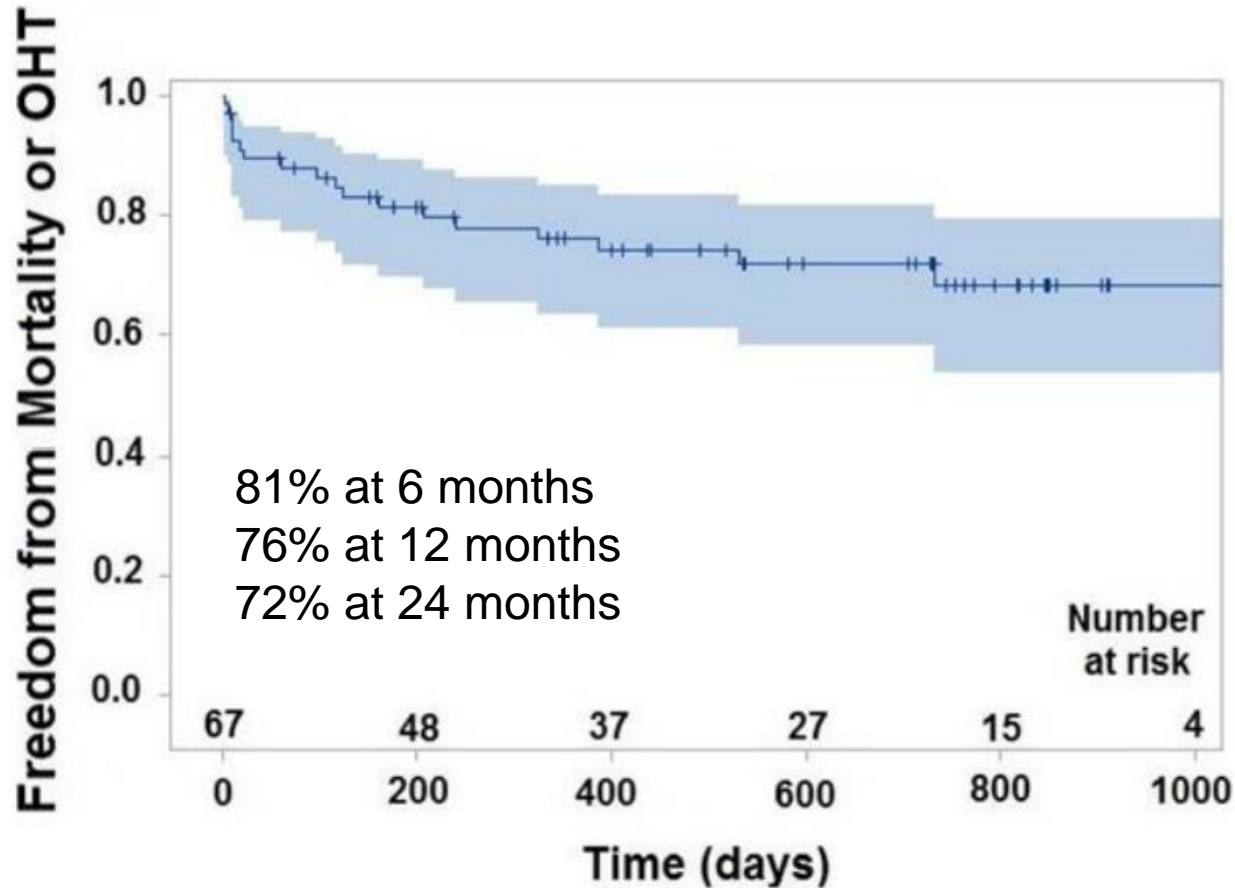
- **Since 2012, Boston group**
- **Advantages**
 - Favorable short-term outcomes
 - Possibility of serial ballooning
 - Avoid anticoagulation
- **Risks**
 - Paravalvular leakage
 - LVOTO
 - Pulmonary vein obstruction
 - Ventricular pseudoaneurysm



Surgical Melody® Valve Implantation

(*Circ Cardiovasc Interv.* 2018;11:e0071450)

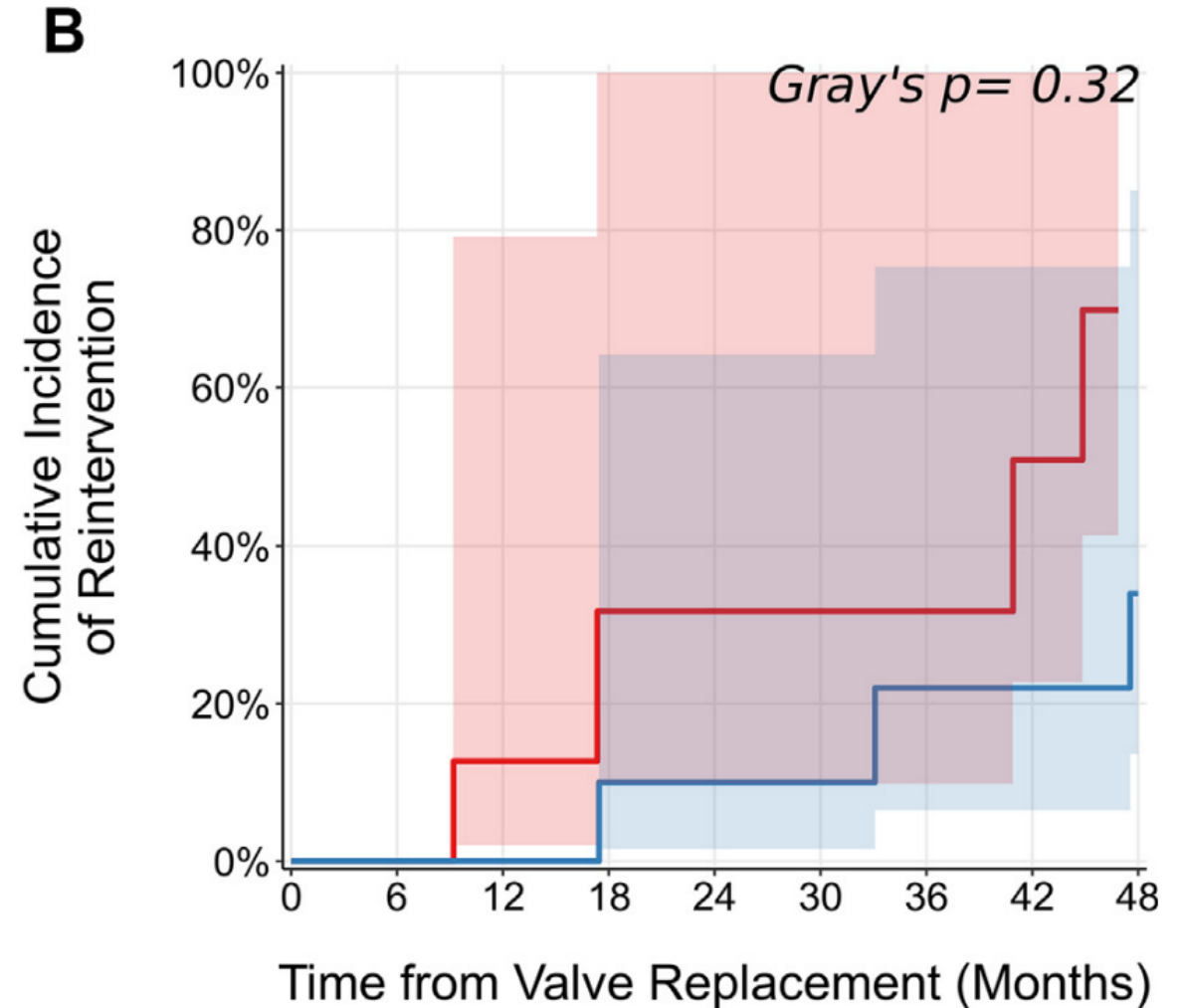
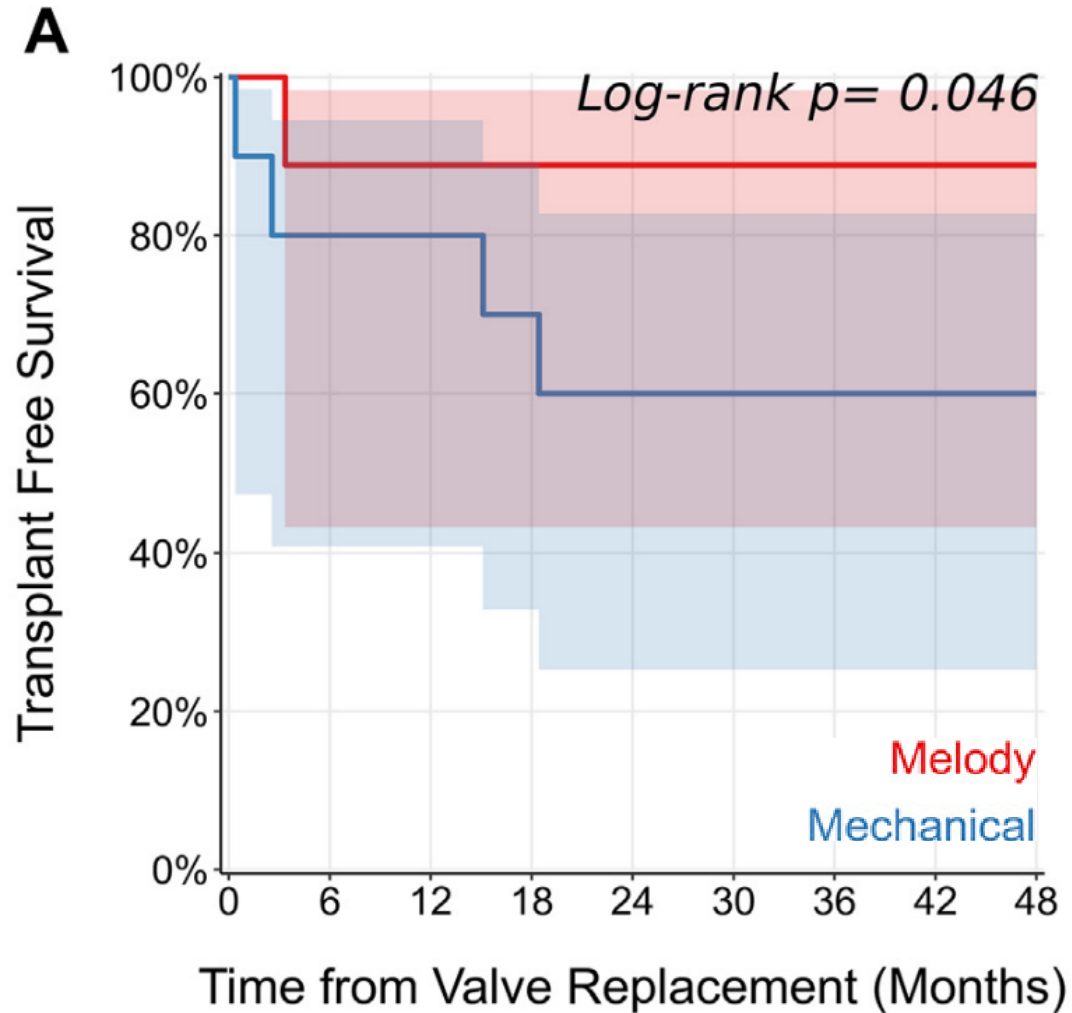
Surgical Melody® Valve Implantation



- 68 patients (mitral=59, tricuspid=9)
- Age at implantation: Median 8.6 mo
- Mortality cases
 - Mitral: 9 (n=59) Tricuspid: 4 (n=9)
 - Salvation from ECMO: 5 died (n=6)
- Complications
 - LVOT obstruction: 7/68
 - Re-operation: 2
 - Perforation with central regurgitation: 4

(Circ Cardiovasc Interv. 2018;11:e007145.)

Surgical Melody® Valve Implantation



For Aged <1

(Ann Thorac Surg 2023;115:778-83)

Thank You For your attention

