Outcomes of Ventricular Septal Defect Enlargement during Biventricular Repair

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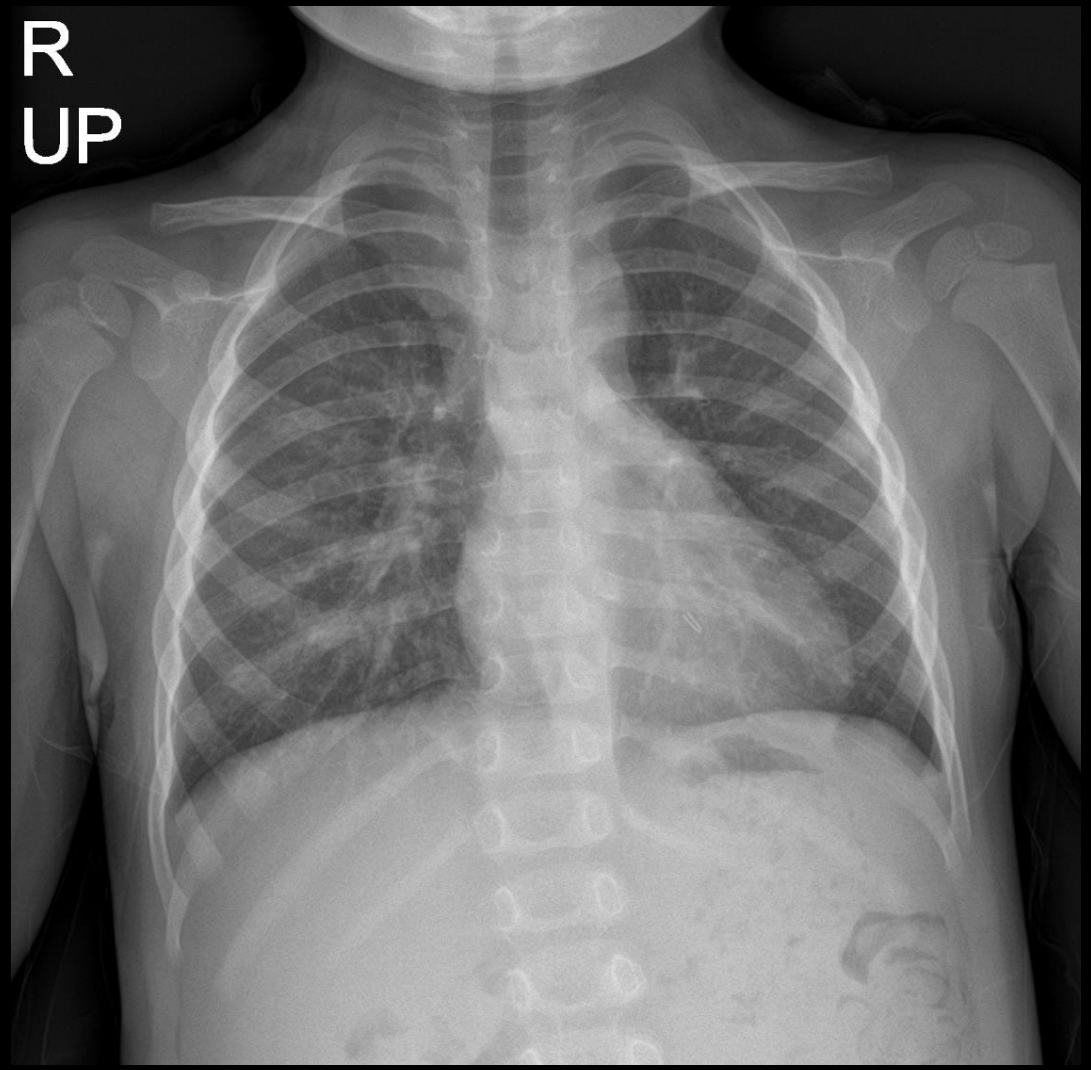
Disclosure

- I have no conflict of interest to disclose with respect to this presentation.

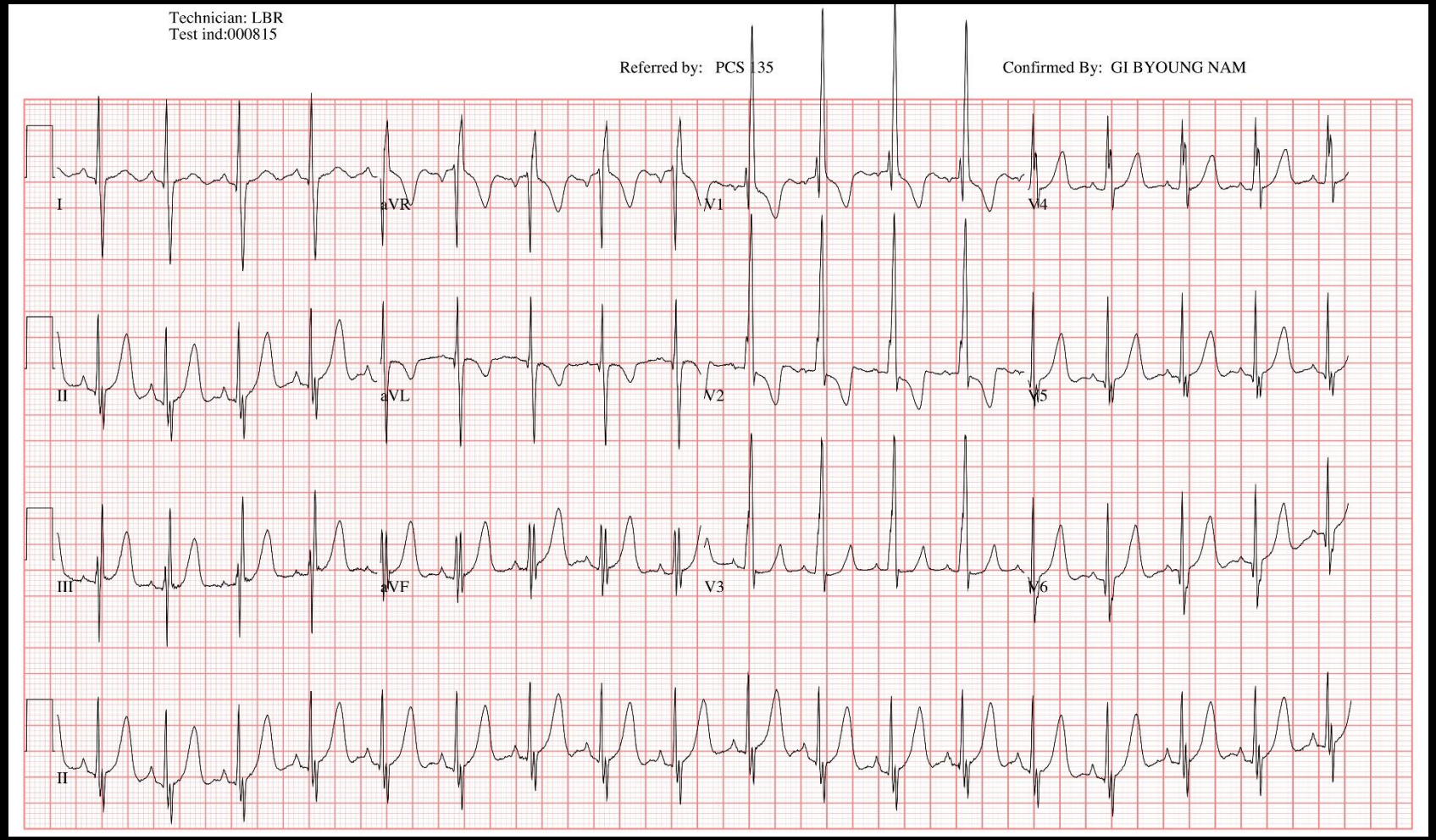
Case

- 2y6m, 16.1kg, boy
- Diagnosis
  - DORV with remote VSD
  - Restrictive VSD (aggravated)
- PMHx
  - s/p 2020.07.10 PAB
  - s/p 2021.04.16 BCPS (pulsatile), PA arterioplasty

Preop. CXR



Preop. ECG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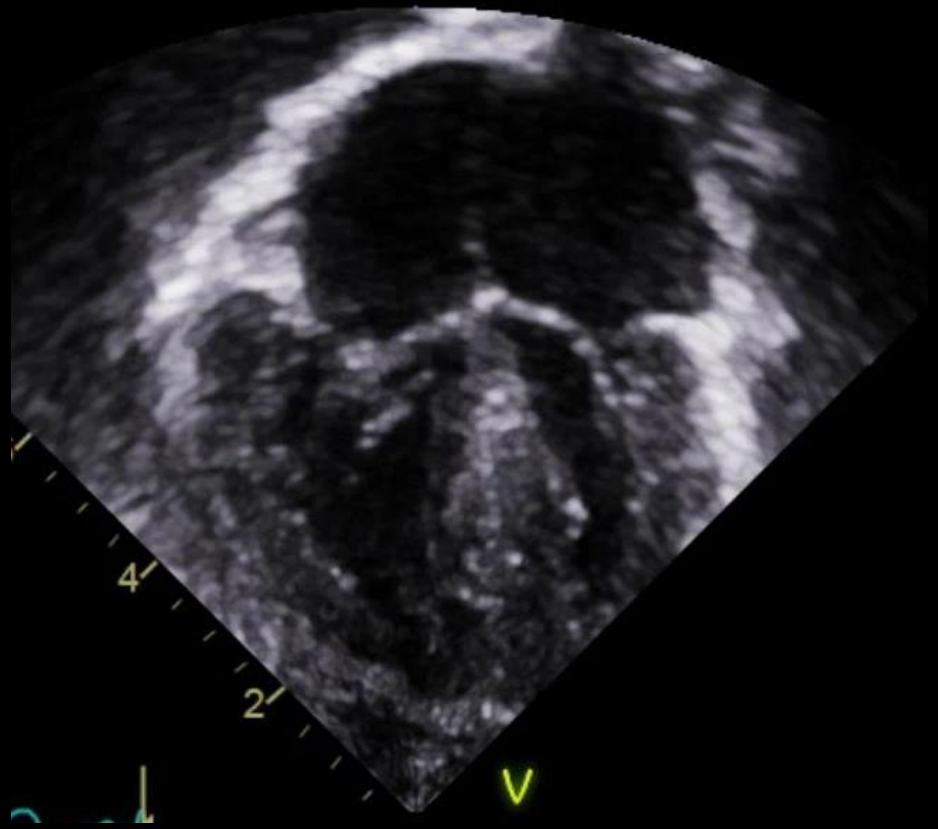
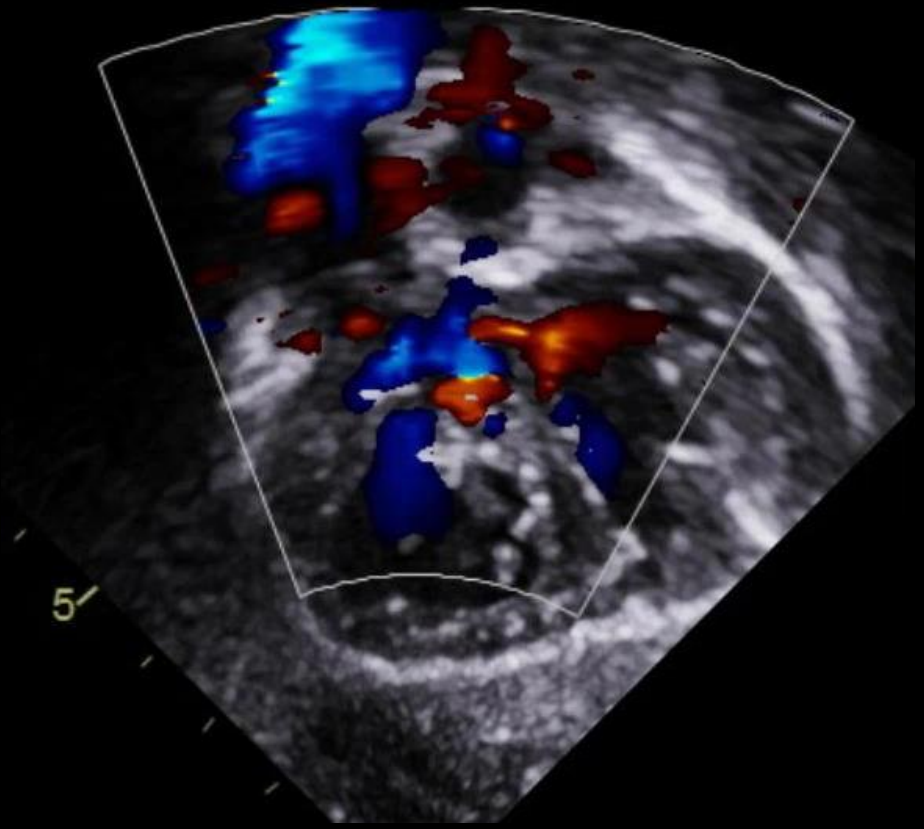
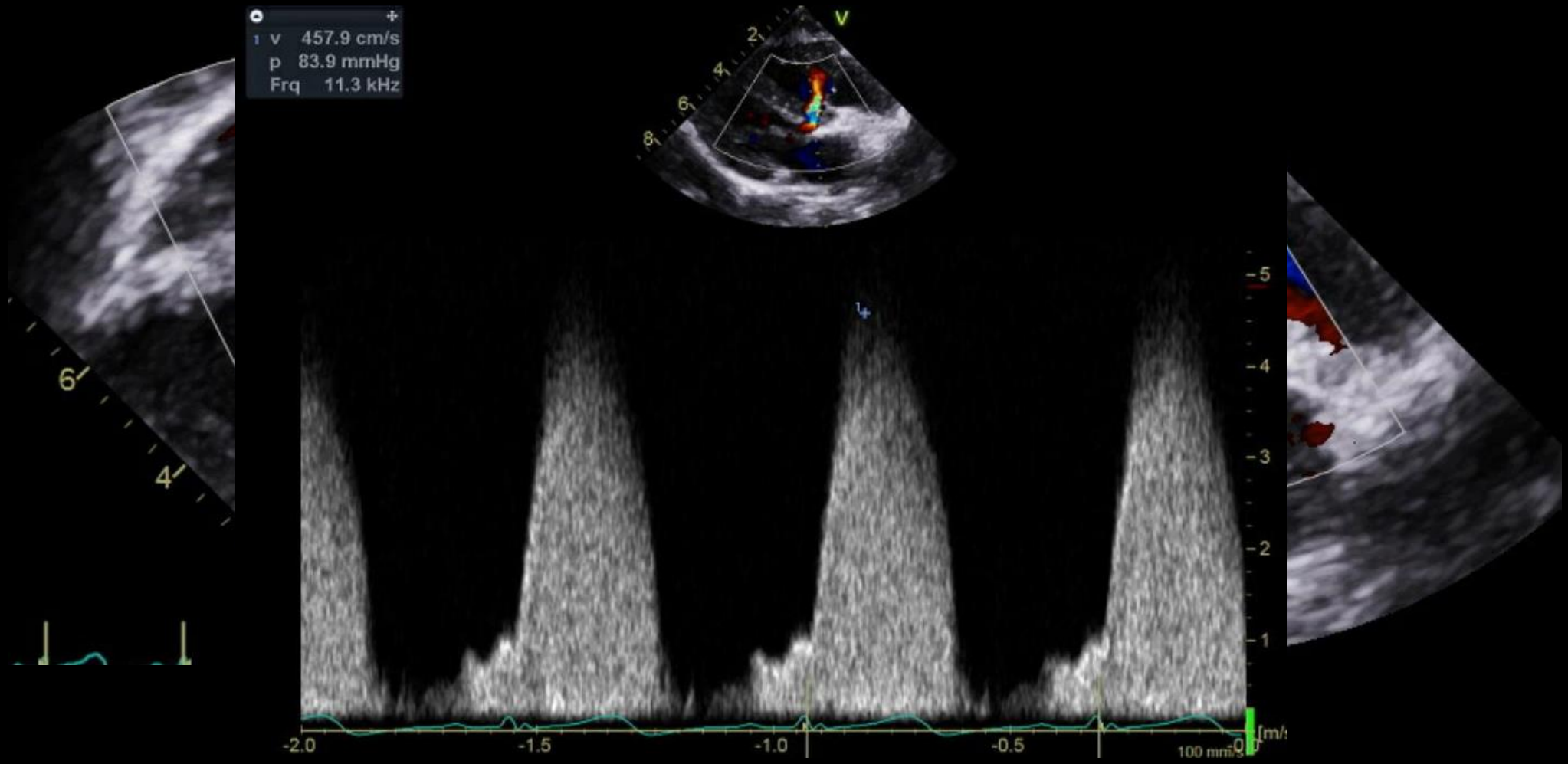
Test ind:000815
Referred by: PCS 135
Confirmed By: GI BYOUNG NAM
I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II

Preop. echo



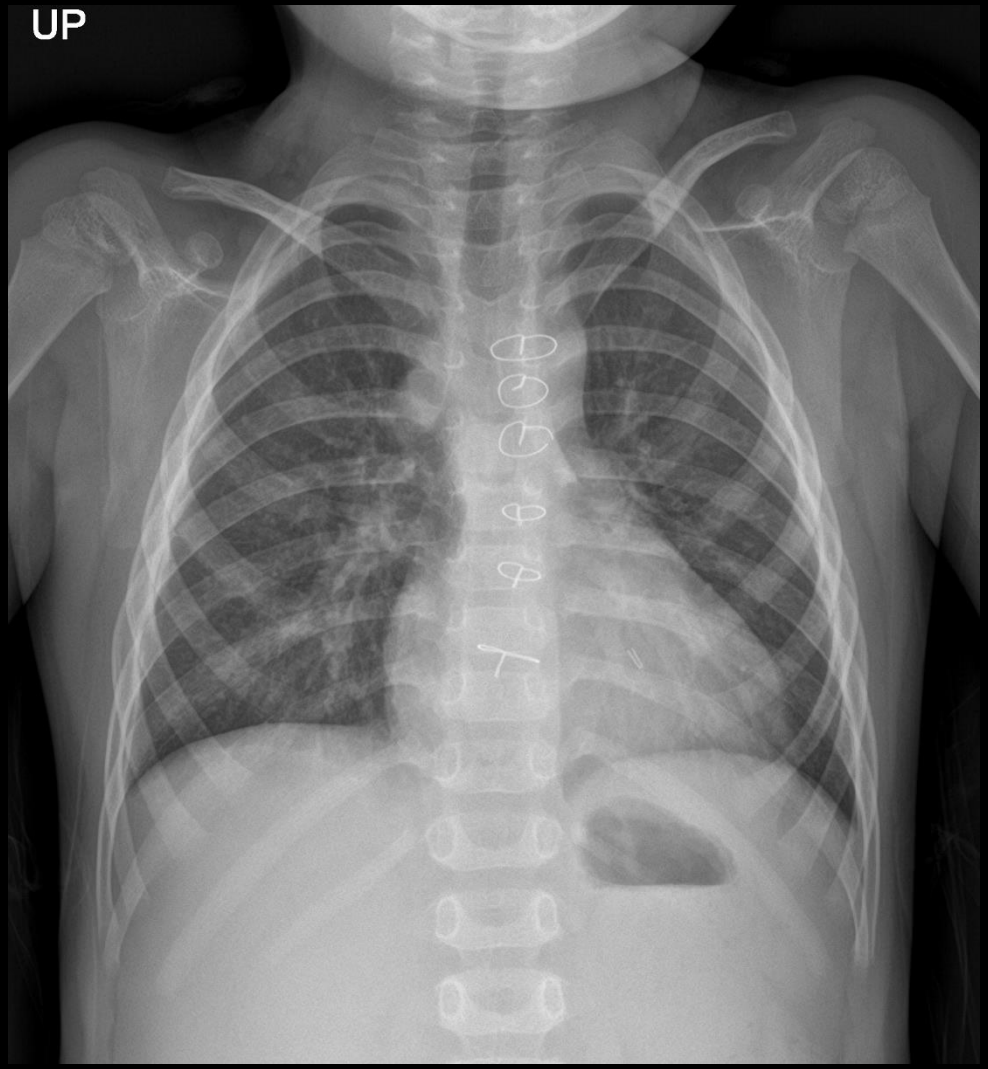


Preop. echo

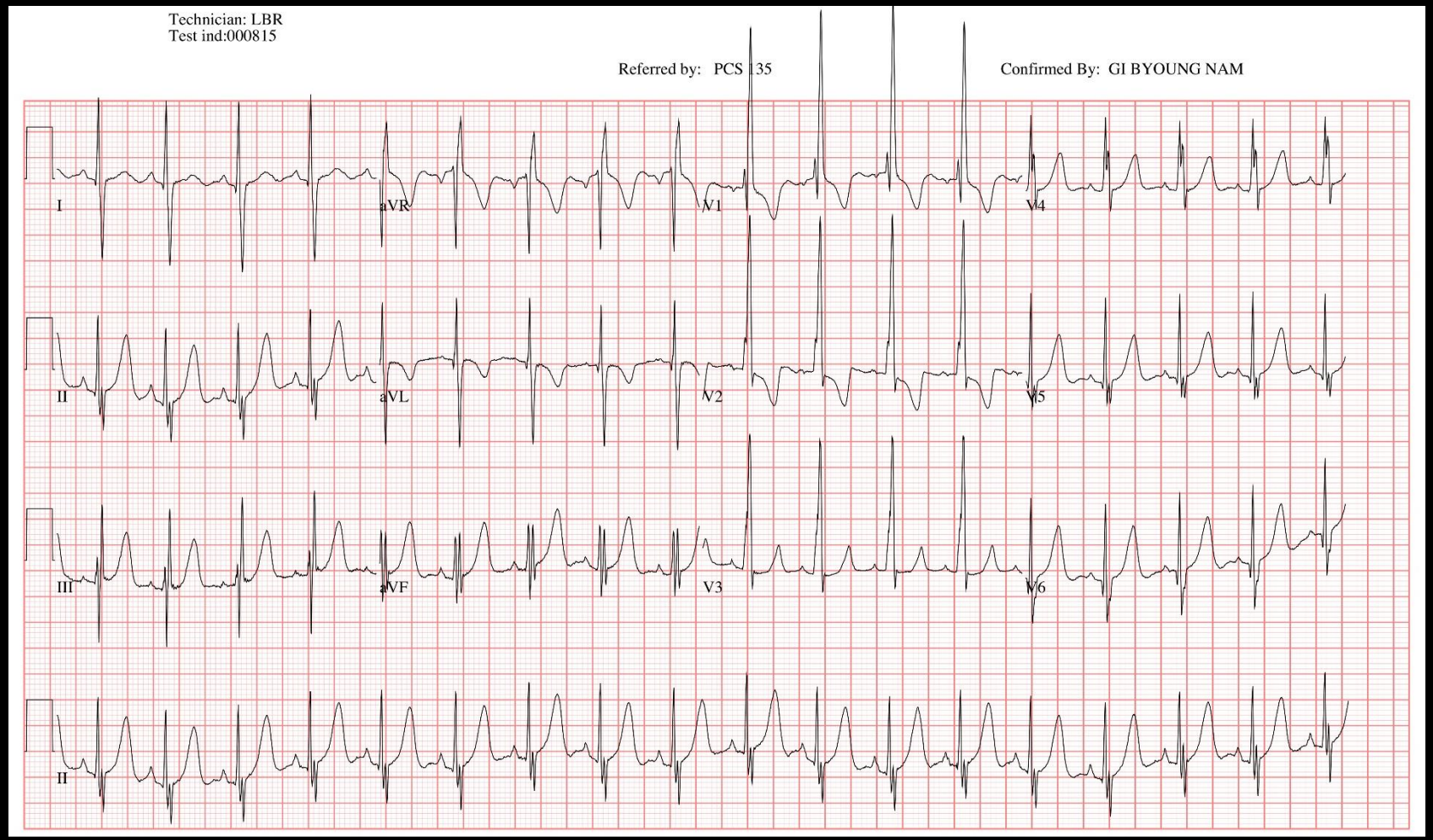


Preop. CT

F/U CXR (1y4m after op)



F/U ECG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I
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V1
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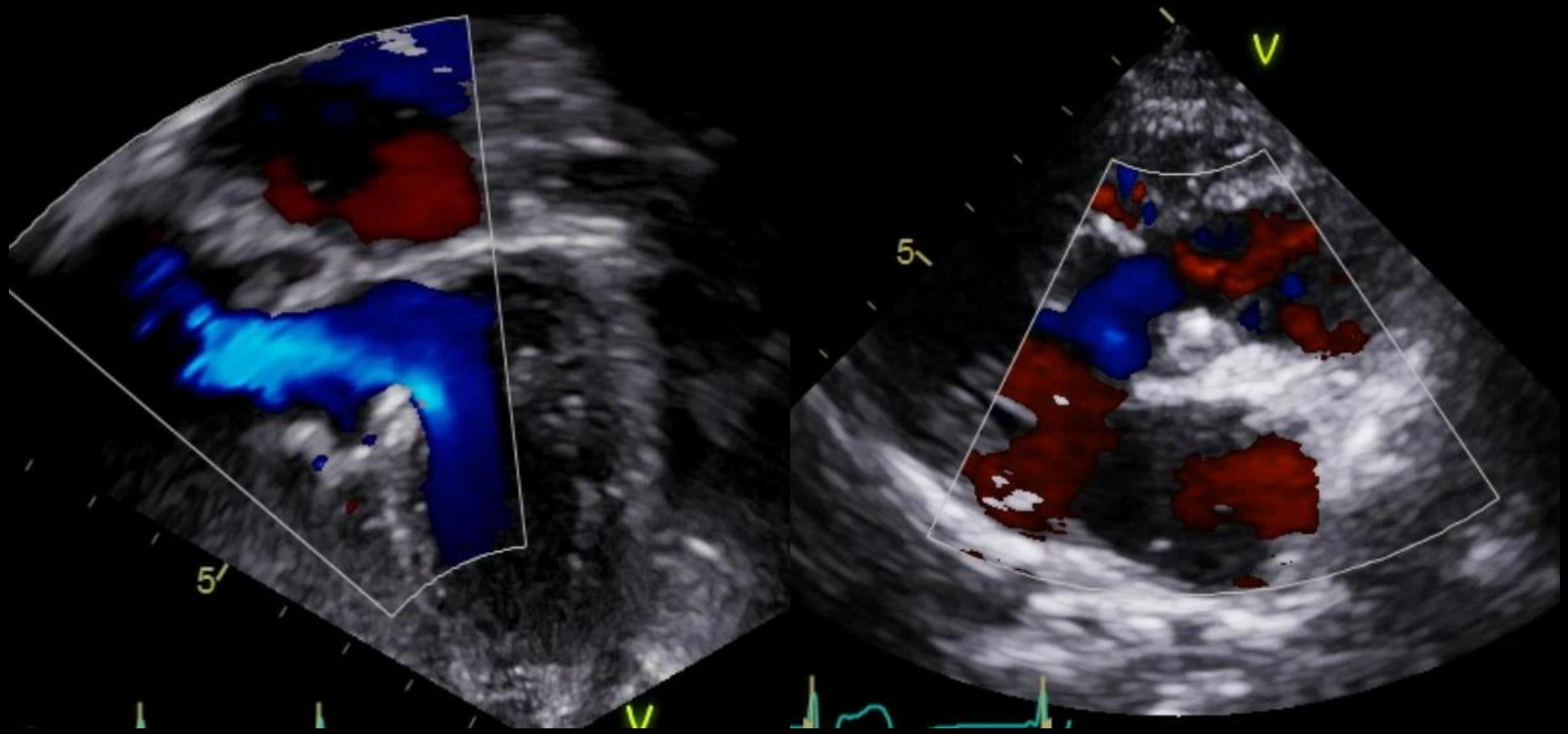
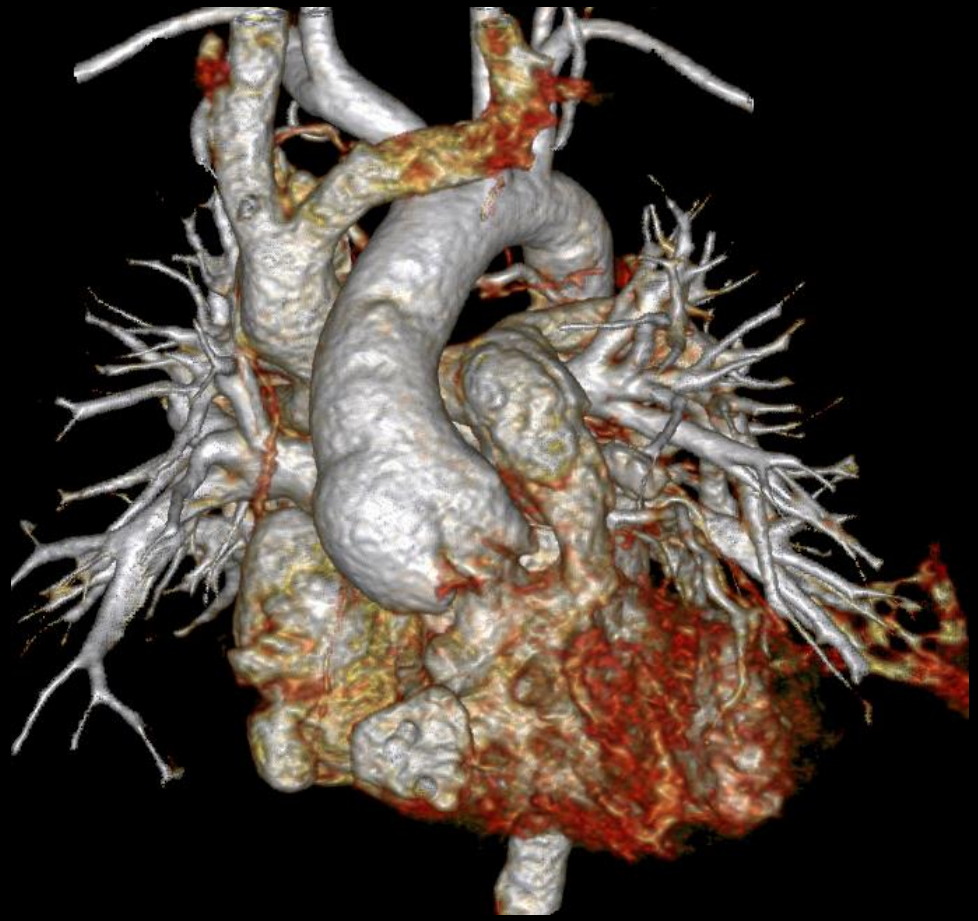
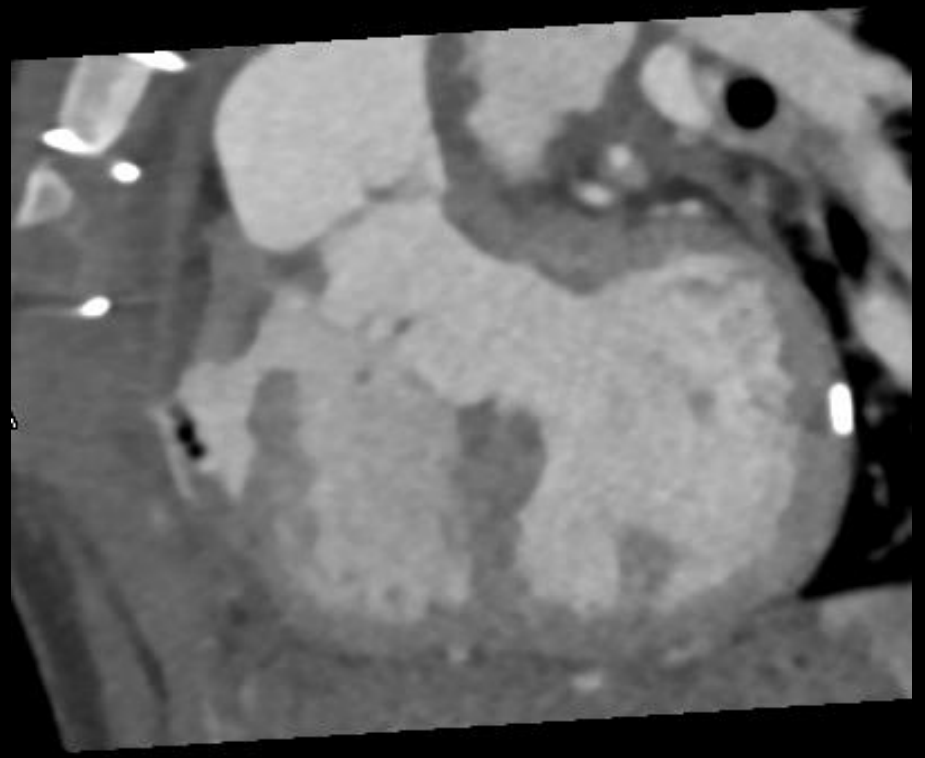
V2
V5
III
aVF
V3
V6
II

FU echo



FU CT (17d after op)





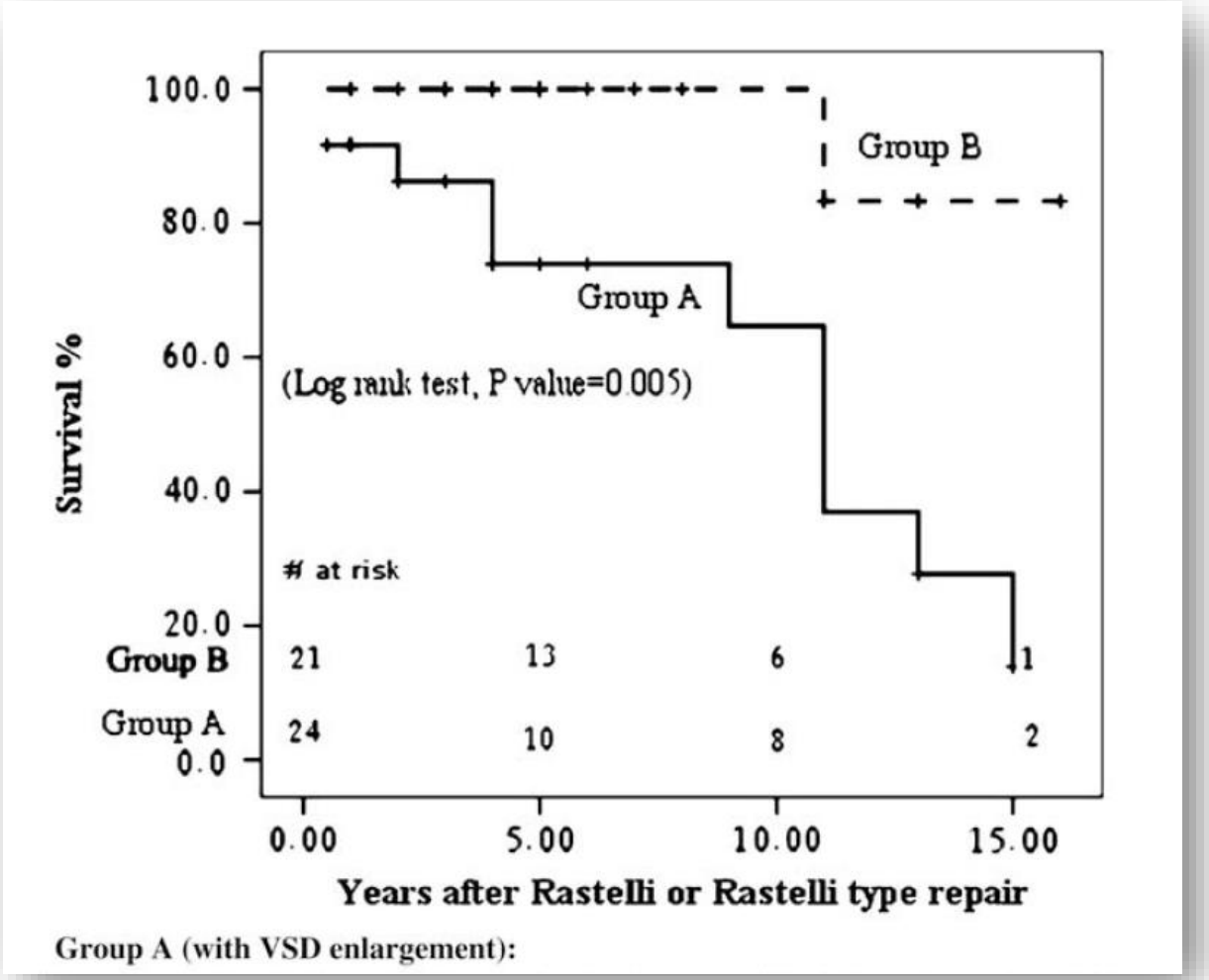
VSD enlargement: safe?

The effect of ventricular septal defect enlargement on the outcome of Rastelli or Rastelli-type repair

- 1991-2007, n=49 (28, 57%)
- Higher complication rate
  - Late ventricular dysfunction
  - Arrhythmia
  - Residual VSD

J Thorac Cardiovasc Surg 2009;138:390-6

VSD enlargement: safe?



J Thorac Cardiovasc Surg 2009;138:390-6

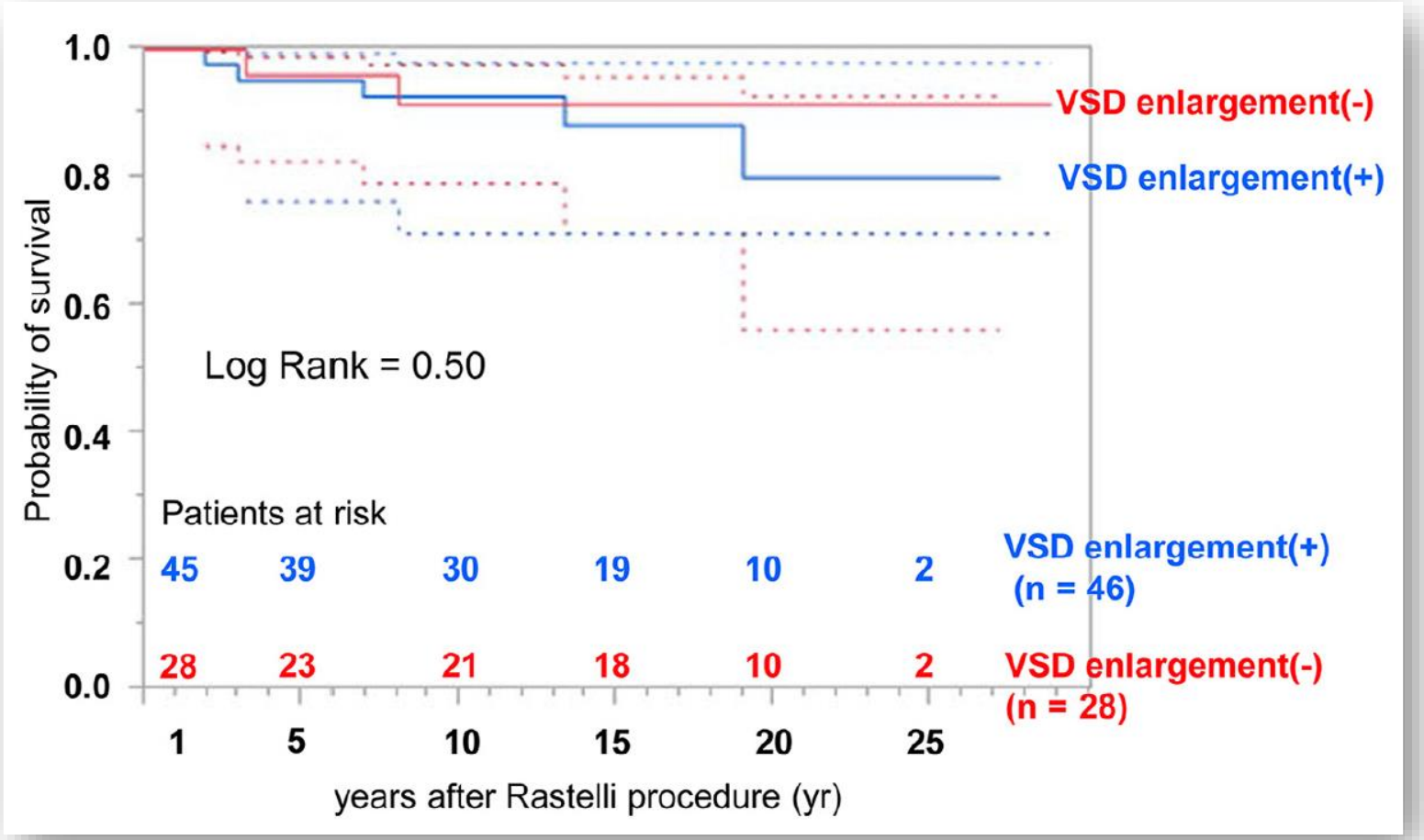
VSD enlargement: safe?

Long-term Effect of Enlargement of a Ventricular Septal Defect in the Rastelli Procedure

- 1979-2001, n=74 (46, 62%)
- No difference between groups
  - Ventricular function (Good)
  - Arrhythmia
  - Reoperation for late LVOTO

Semin Thorac Surg 2017;29:215-220

VSD enlargement: safe?



Semin Thorac Surg 2017;29:215-220

Objective

- To investigate clinical outcomes after ventricular septal defect (VSD) enlargement during biventricular repair

Methods

- From 2003 to 2024
- Patients (n=24) who underwent VSD enlargement during biventricular repair at a single institution
- Retrospective study of medical records
- Follow-up duration (median): 3.8 years (IQR, 1.3 - 6.3 years)

Methods

- Postoperative complications
  - Ventricular dysfunction: LV EF < 55%
  - Reoperations for LVOTO
  - Arrhythmia: CABV or ventricular arrhythmia
- Former half (n=12) / Recent half (n=12)
- Statistics
  - Survival analysis: K-M curve, log-rank test
  - Risk factor analysis: Cox proportional hazards model

Patient Characteristics

Variable	Values
Male	15 (62.5)
Age at repair (months)	11.8 (5.8-18.6)
Body weight at repair (kg)	8.3 (7.3-9.4)
Previous Op. History	16 (66.7)
PA banding	6 (25.0)
Systemic-to-pulmonary shunt	3 (12.5)
Norwood	3 (12.5)
Glenn	3 (12.5)
Others	3 (12.5)

Values are median (IQR) or number (%)

Operative detail

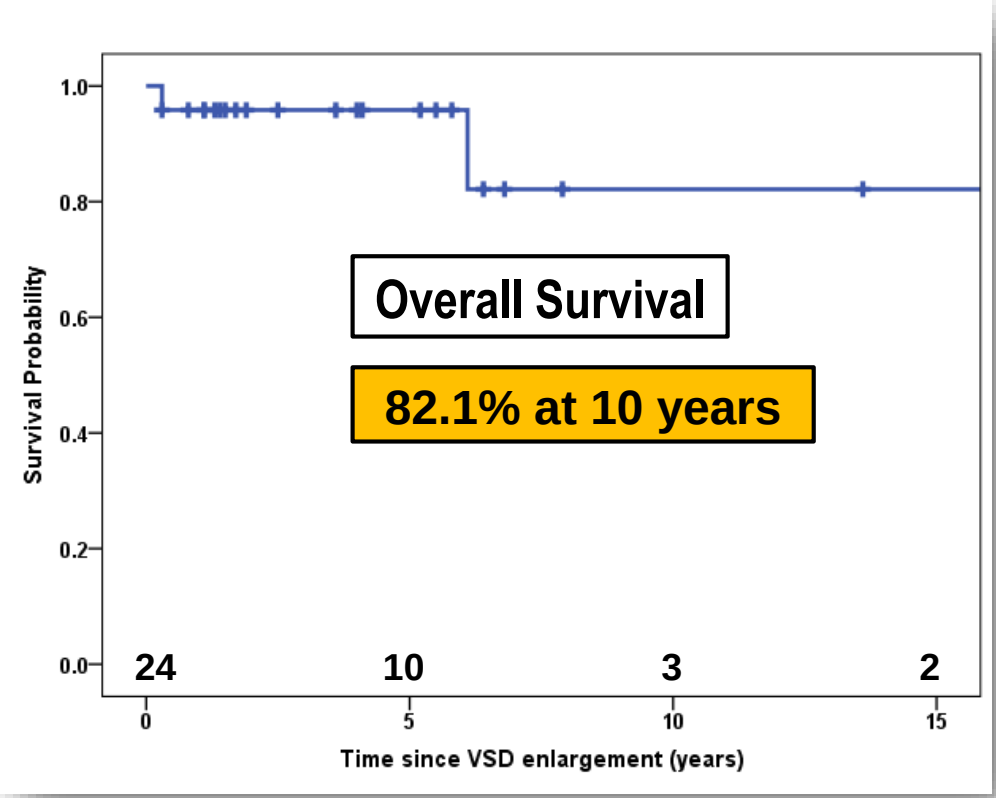
Variable	Values
Types of operation	
Rastelli operation	9 (37.5)
Intraventricular baffling	11 (45.8)
Yasui operation	4 (16.7)
Concomitant procedures	
PA arterioplasty	15 (62.5)
Arch repair	2 (8.3)
Arterial switch	1 (4.2)
AVR	1 (4.2)

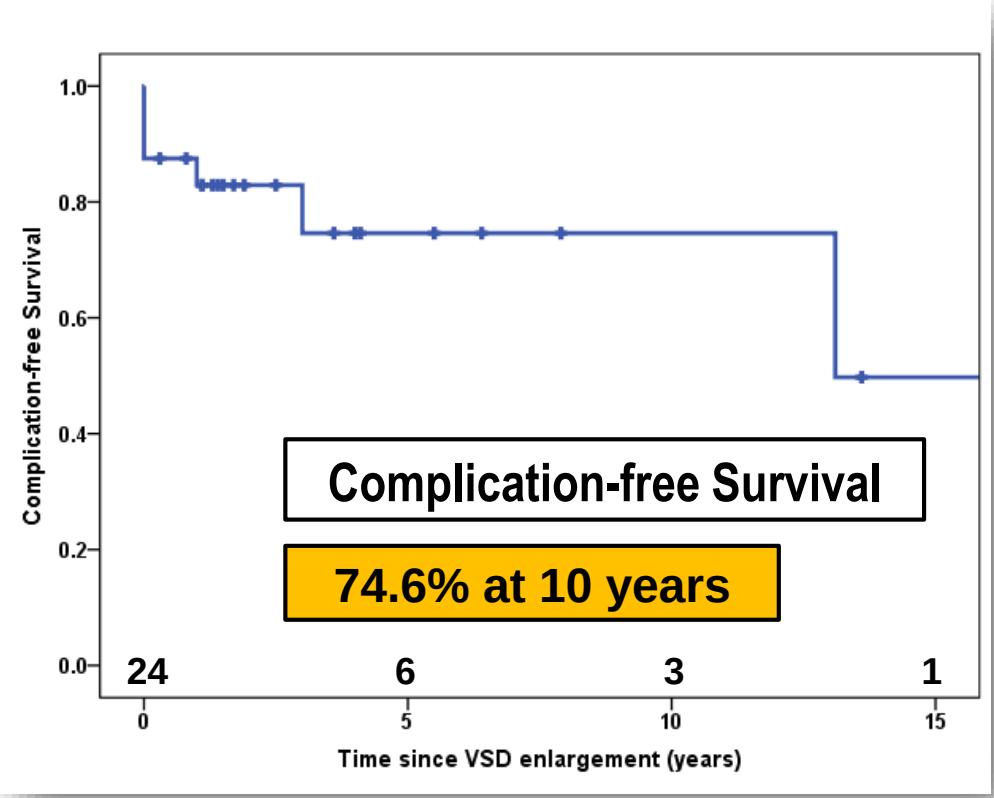
Values are median (IQR) or number (%)

Summary of Patients with Complications

Patient Number	VSD enlargement			Complications		
	Age (mon)	Wt (kg)	Operation	LV dysfunction	LVOTO	Arrhythmia
1	27.7	10.9	Intraventricular baffle, (ASO, Arch repair)	+		+
2	17.5	8.9	Intraventricular baffle		+	
3	17.4	9.2	Rastelli	+		
4	16.6	9.5	Rastelli		+	+
5	18.9	8.3	Intraventricular baffle		+	+
6	6.8	7.8	Rastelli			+

Results


Survival Probability
1.0
0.8
0.6
0.4
0.2
0.0
Overall Survival
82.1% at 10 years
24
10
3
2
0
5
10
15
Time since VSD enlargement (years)


Complication-free Survival
1.0
0.8
0.6
0.4
0.2
0.0
Complication-free Survival
74.6% at 10 years
24
6
3
1
0
5
10
15
Time since VSD enlargement (years)

Results

Associated factors: Not identified

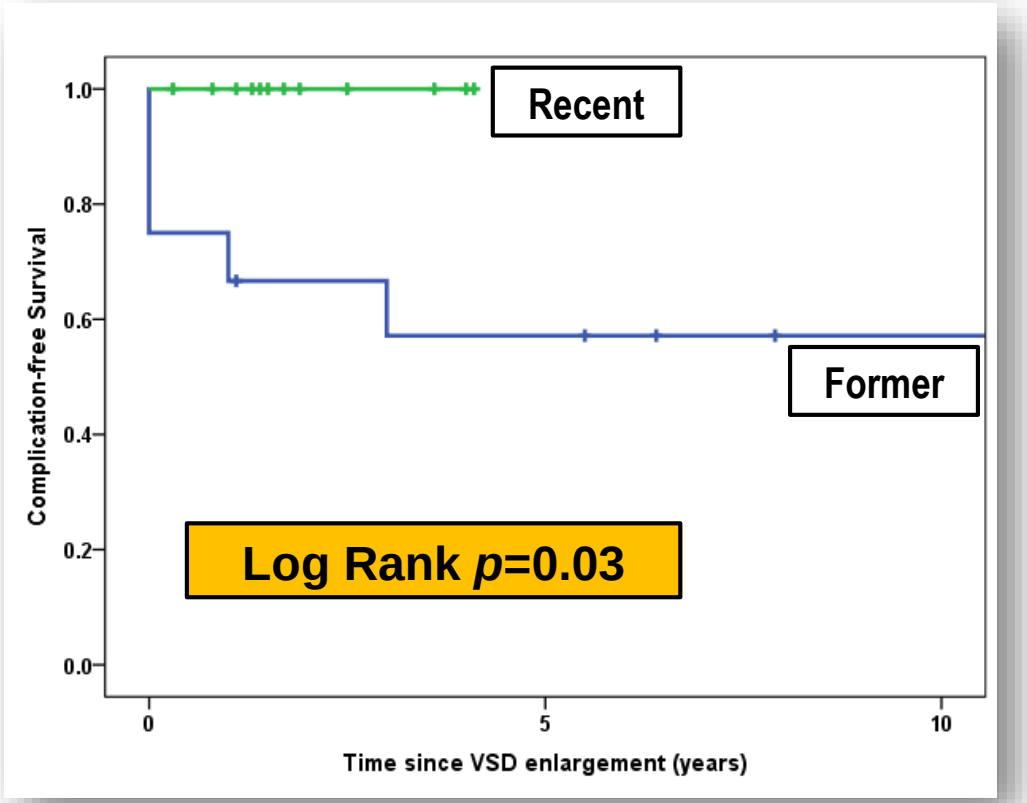
Sex / Age / Body weight

Op type / CPB time / ACC time

Postop. LV dysfunction

Postop. Arrhythmia

Reoperation for LVOTO



Limitations

- A small number of study
- No standardized indications and extent of VSD enlargement

Conclusions

- VSD enlargement during biventricular repair was associated with significant complications.
- LV dysfunction after VSD enlargement should be avoided to achieve excellent survival
- Long-term follow-up is mandatory to demonstrate improved outcomes after VSD enlargement

Thank you for your attention