

Transcatheter closure of secundum ASD using Occlutech Figulla - N device in symptomatic children younger than 2 years of age.

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Surgical repair of atrial septal defects (ASD) is a safe and widely accepted procedure with negligible mortality, however it is associated with morbidity, discomfort and a thoracotomy scar.

Today, with advances in percutaneous device technology, percutaneous closure has proved to be a safe technique to close ASDs.

Although transcatheter closure of ASDs is well established in children. There is scarce data available on the transcatheter closure of large ASDs in symptomatic children younger than 2 years of age. In this study we aimed to evaluate the safety and efficiency of The Occlutech Figulla device in this subset of patients.

## **Patients and methods:**

This was a retrospective study comprising 17 children less than 2 years of age who underwent percutaneous transcatheter closure using the Occlutech Figulla occluder for secundum ASD between February 2010 and February 2011

## Demographics and clinical data

	<b>Mean</b>	<b>SD</b>
Age (mo.)	10.3	3.7
Weight (Kg)	7.4	1.3
HR (bpm)	127	12
Time between diagnosis and closure (mo.)	2.2	3.6
	<b>No</b>	<b>%</b>
Male	9	47
Female	8	53
Cardiomegaly	16	94
Hepatomegaly	3	18
Captopril+ Frusemide	13	77

Pre-operative assessments included an ECG, chest X- ray, and TTE. Complete blood counts, PT, PC, PTT, INR . Elective closure was performed if the children met these criteria on TTE:

- 1) The presence of an ostium secundum ASD with left to right shunt.
- 2) Rims of  $>5$  mm.
- 3) RA and RVD.
- 4) ASD size  $>7$ mm.
- 5) Adequate Interatrial septal length.

Closure was performed under TEE guidance and pre-medication with heparin with a dose of 100 U/Kg.

A device size 1-2 mm larger than the ASD diameter was selected.

After one night hospital stay , all patients were discharged on Aspirin 5mg/Kg for 6 months.

Prophylaxis for infective endocarditis was advocated during the first six months.

# Echocardiographic/device Parameters parameters

	Mean	SD
<b>TTE:</b>		
RAD (mm)	15.4	3.2
RVEDD (mm)	22.3	4.6
ESPAP (mmHg)	54	18
ASD size (mm)	15.4	2.7
<b>TEE:</b>		
ASD size (mm)	17.1	1.9
IAS length (mm)	27.3	5.1
	<b>No</b>	<b>%</b>
IAS aneurysm	1	6
Fenestrated ASD	2	11.7
	<b>Mean</b>	<b>SD</b>
Device size (mm)	17.8	3.6
Procedure time (min.)	64.7	19.3



Follow up examinations including ECG and TTE were scheduled at 1, 3,6 and 12 months after the procedure.13 patients were followed up for 1 year, 3 patients were followed up for 6 months and only one was followed up for 3 months.

	<b>Before closure Mean/SD</b>	<b>6 mo. F-up Mean/SD</b>	<b>P-value</b>
<b>RAD (mm)</b>	<b>15.4 /±3.2</b>	<b>13.7/±4.7</b>	<b>0.062</b>
<b>RVEDD (mm)</b>	<b>22.3/ ±4.6</b>	<b>14.7/±1.6</b>	<b>0.003*</b>
<b>ESPAP (mm)</b>	<b>54/±1.8</b>	<b>28.1/± 2.2</b>	<b>0.00047*</b>

Device placement was successful in all the patients including the two girls with fenestrated ASDs that were closed with a single device (21mm and 24mm respectively).

- No case of embolization was recorded.
- No residual flow was detected all through the F-up period.

No cardiac perforation, pericardial effusion, infective endocarditis, device erosion, embolization, thrombus formation, or malposition of the device was observed. No device damage.

Three patients; 3/17(17.6%) developed mild insignificant mitral regurgitation median peak gradient was 16.3mmHg 1 month after closure that resolved spontaneously at 6 months follow up.

Complications were seen in 2/17 patients (11.8%) but none affected the procedural success.

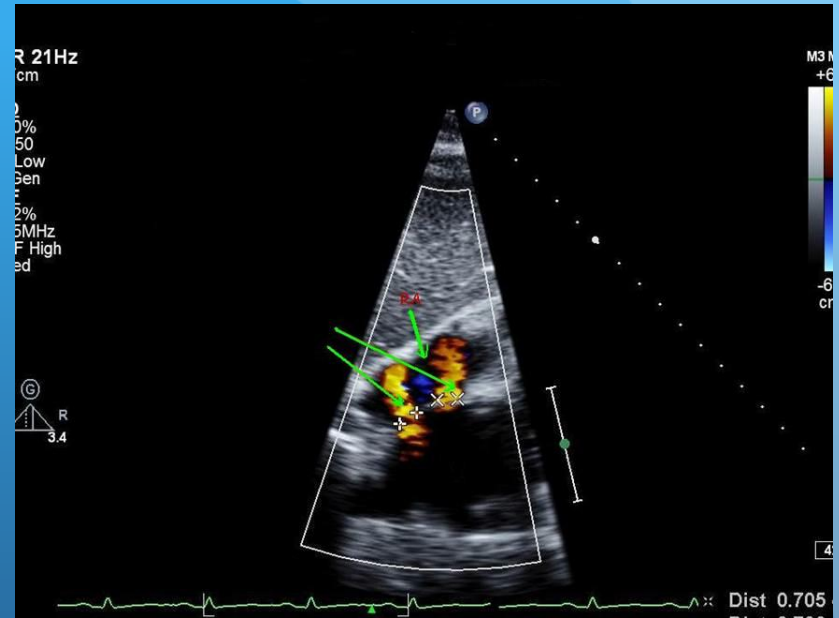
First patient (4 months old, body weight: 6.8 Kg, ASD size 14mm by TEE) developed transient sinus tachycardia that resolved spontaneously.

The second patient developed groin hematoma and minor femoral vein thrombosis (20 months old, body weight 8.5 Kg, ASD size 19 mm by TEE) three hours after the procedure, treated medically. It resolved on the 4th postoperative day

Rodaina Mohammed, 7 months old female child, suffered failure to thrive : 5.2Kg when first seen (11/2010), history of 3 attacks of bronchopneumonia and hospital admissions.

- On P/E; HR was 120bpm, RR was 38/min, Chest was clear at the time of examination and there was 2 fingers soft hepatomegaly.

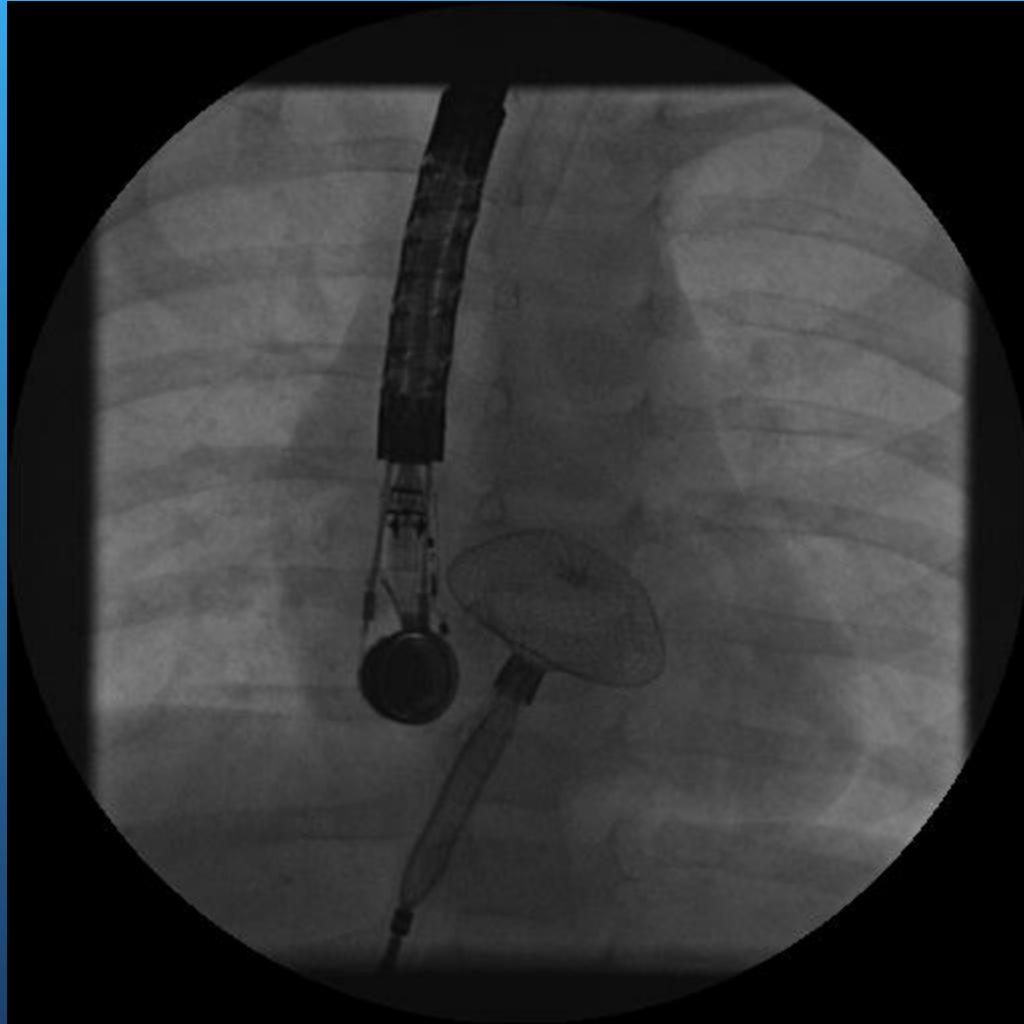
- TTE revealed; Multifenestrated ASD comprised of 2 ASDs; 4mm and 7mm with 4 mm septal tissue in Between .



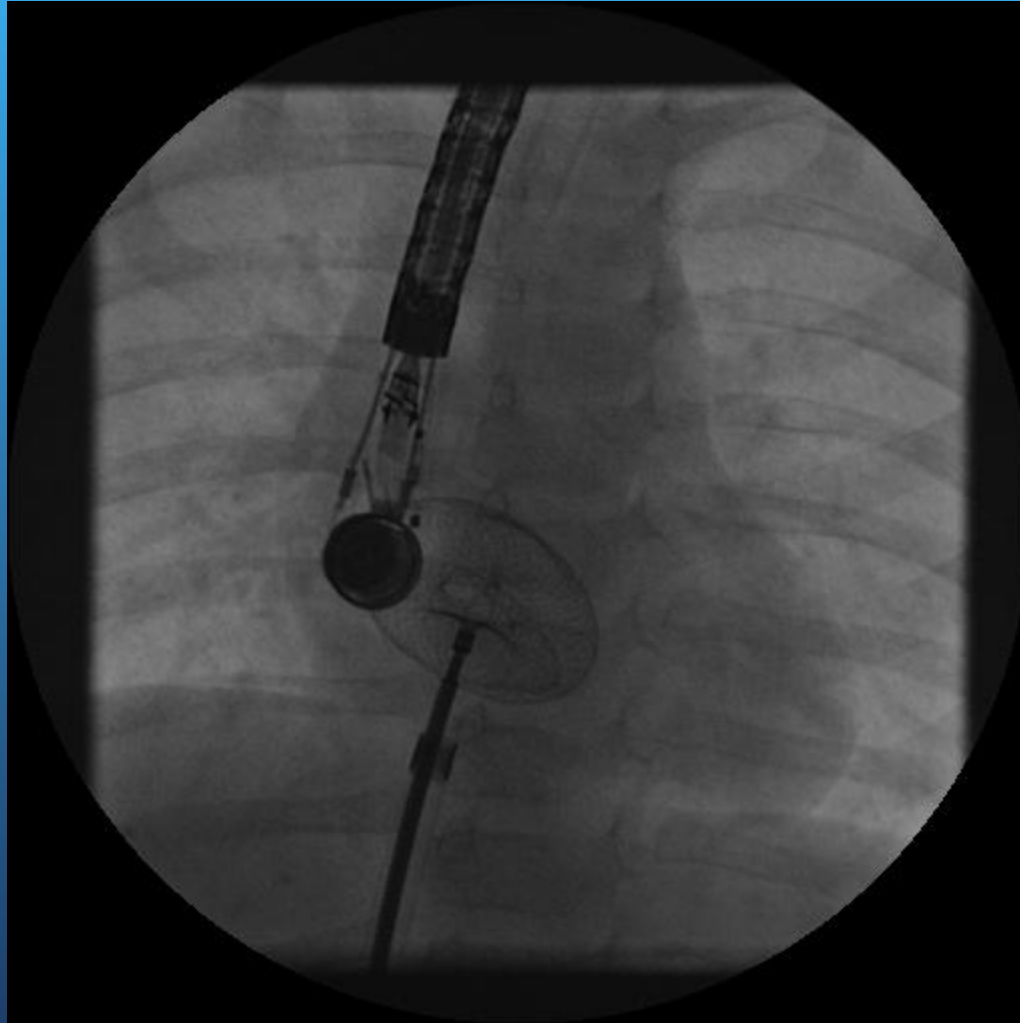
The overall defect size was 18mm. RVEDD was 15 mm. TR II, with ESPAP of 55 mmHg.

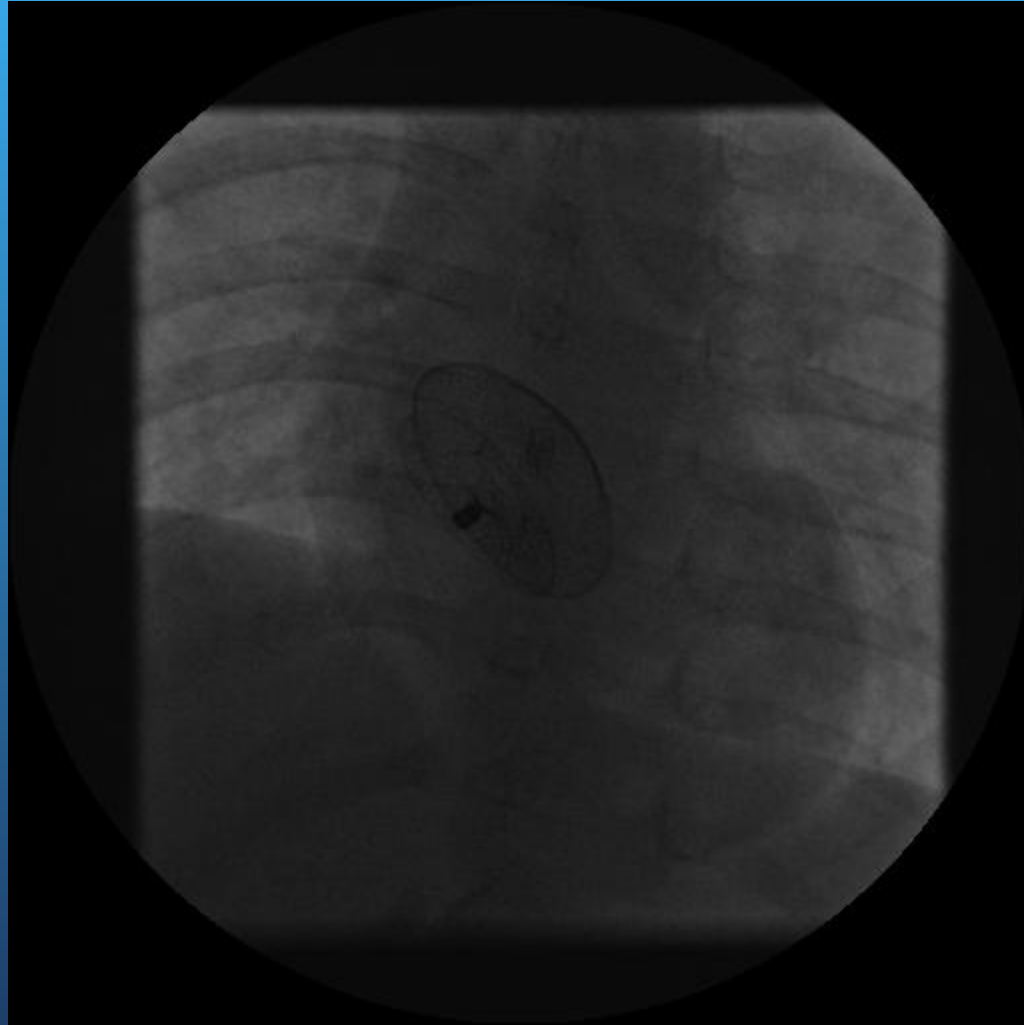
By TEE was performed. The two defects measured 4mm and 6mm and total defect size measured by TEE was 14mm. Total IAS measured 29mm.

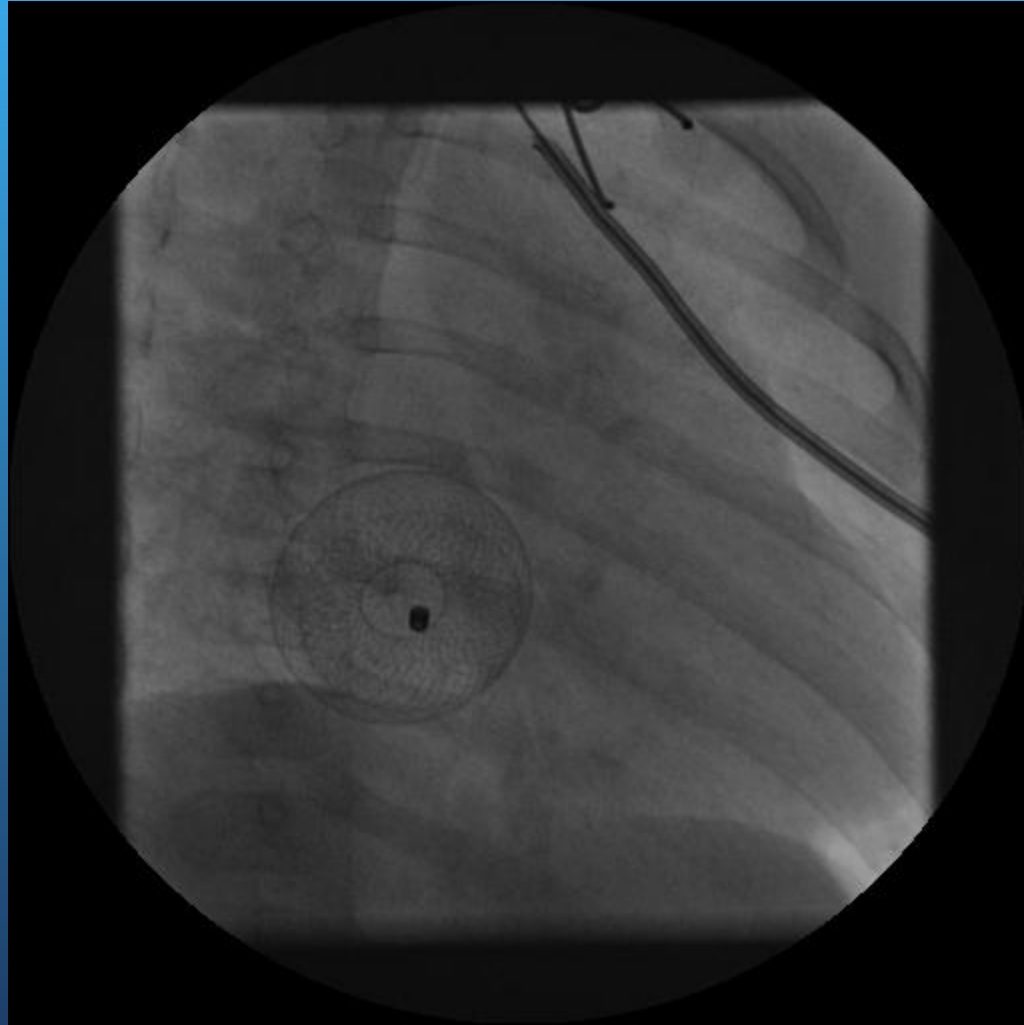
-12 mm Occlutech Figulla-N device (a LT atrial disc size of 26 mm), long and short 11 Fr Cook<sup>®</sup> sheaths were used .



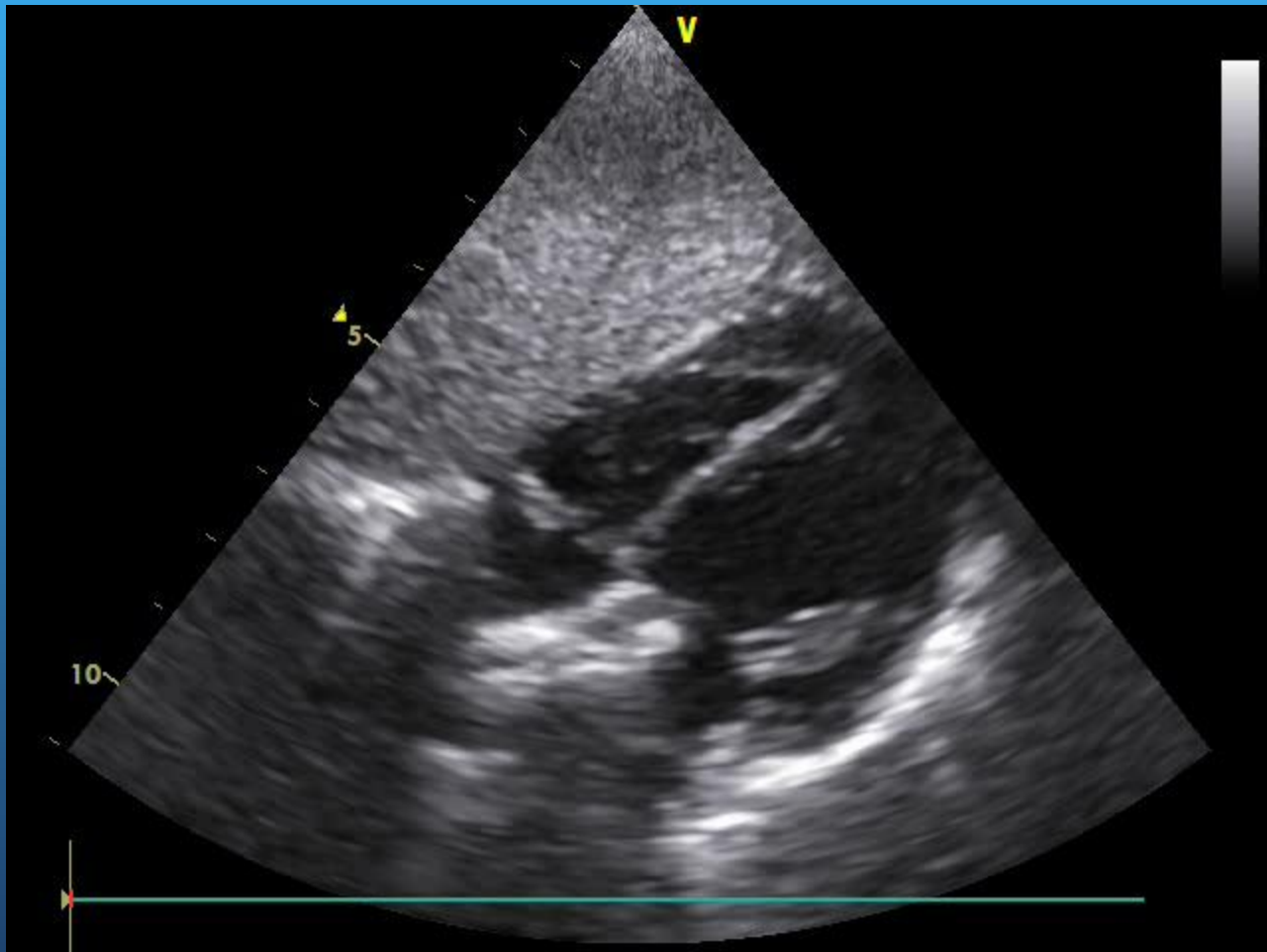


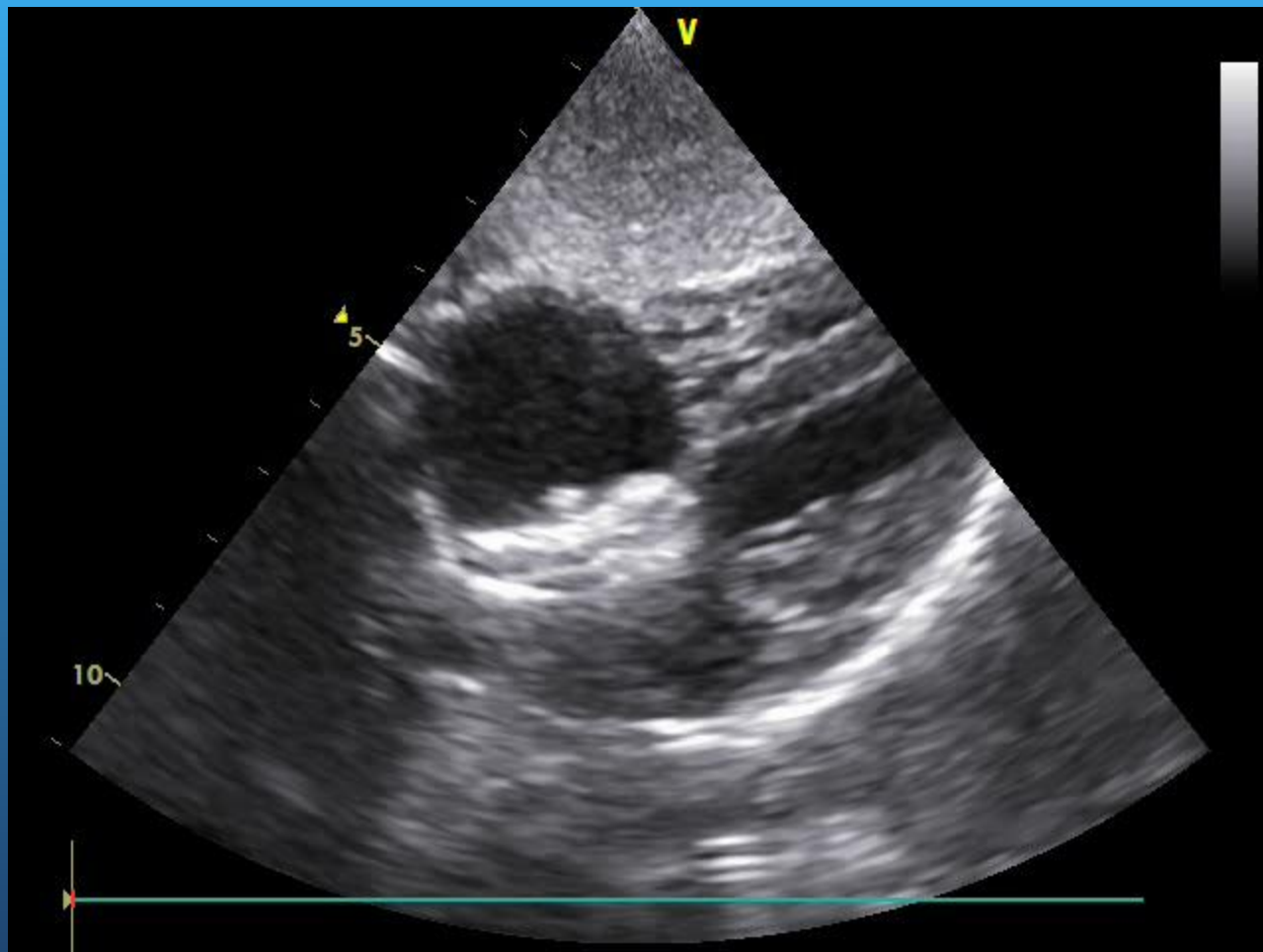


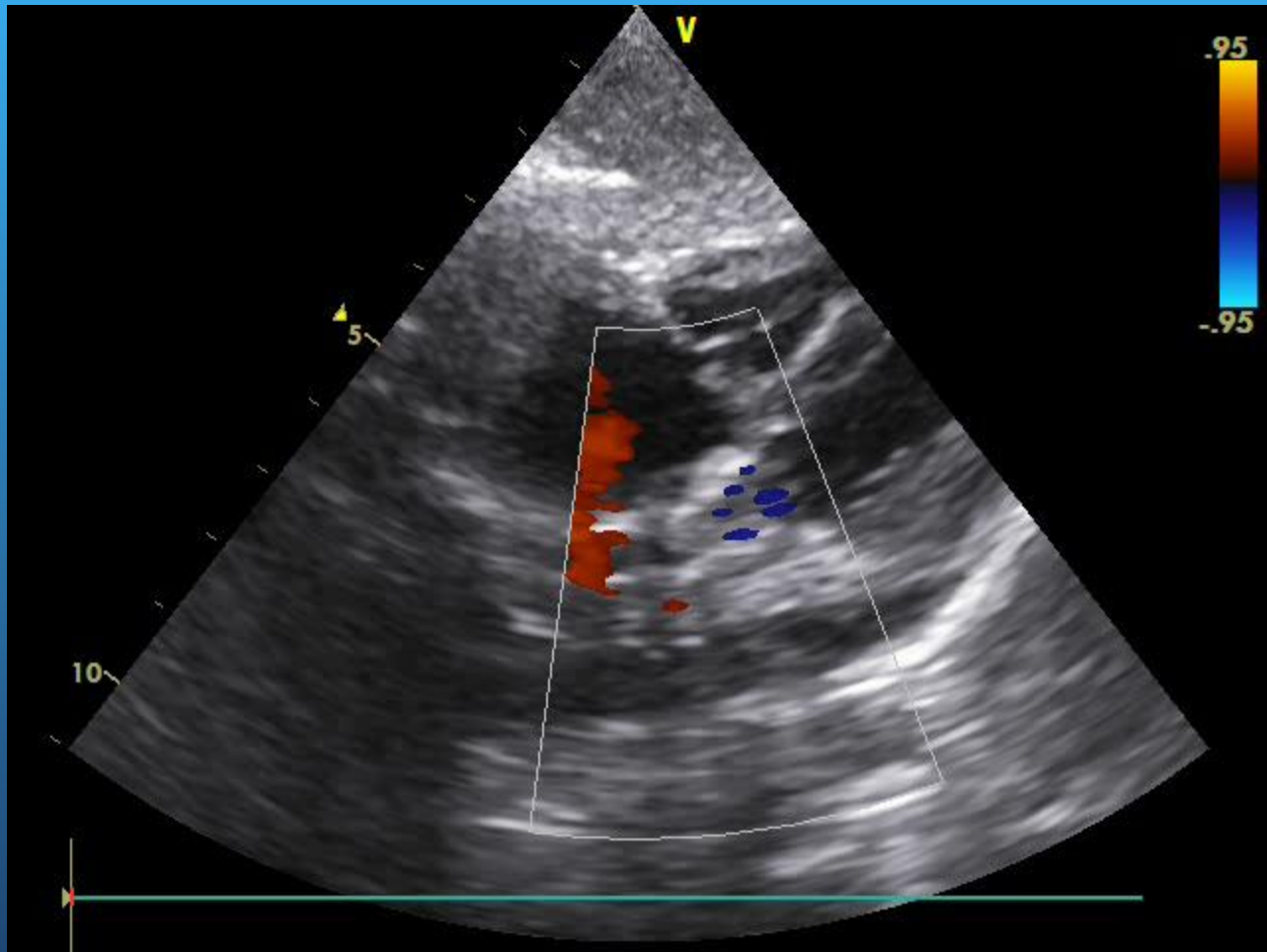






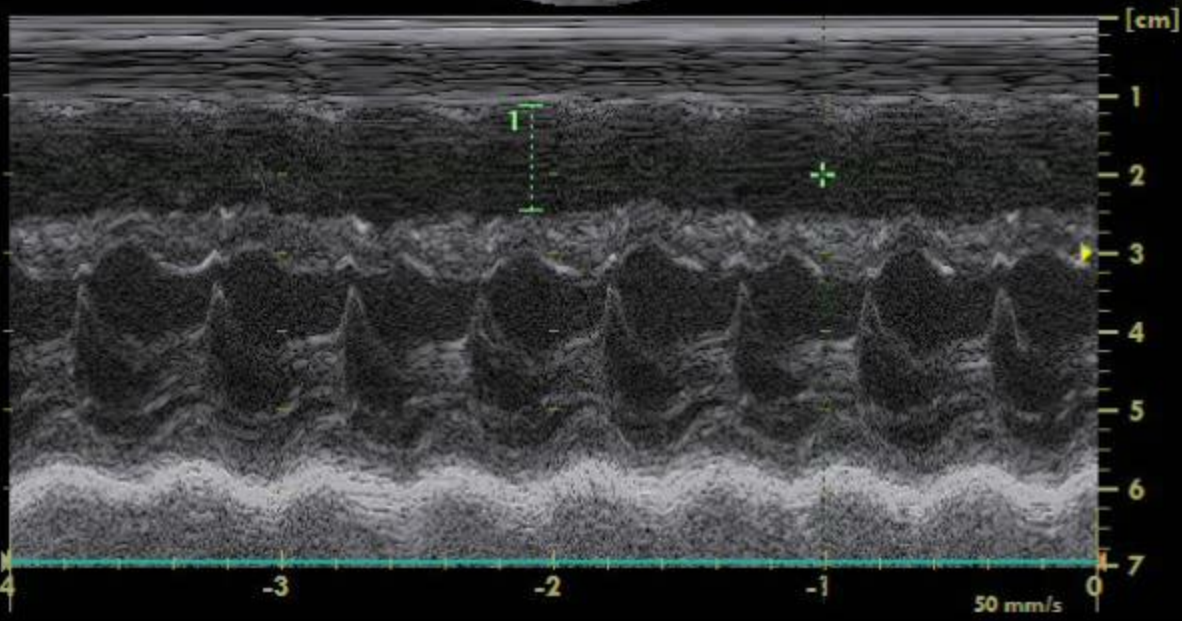






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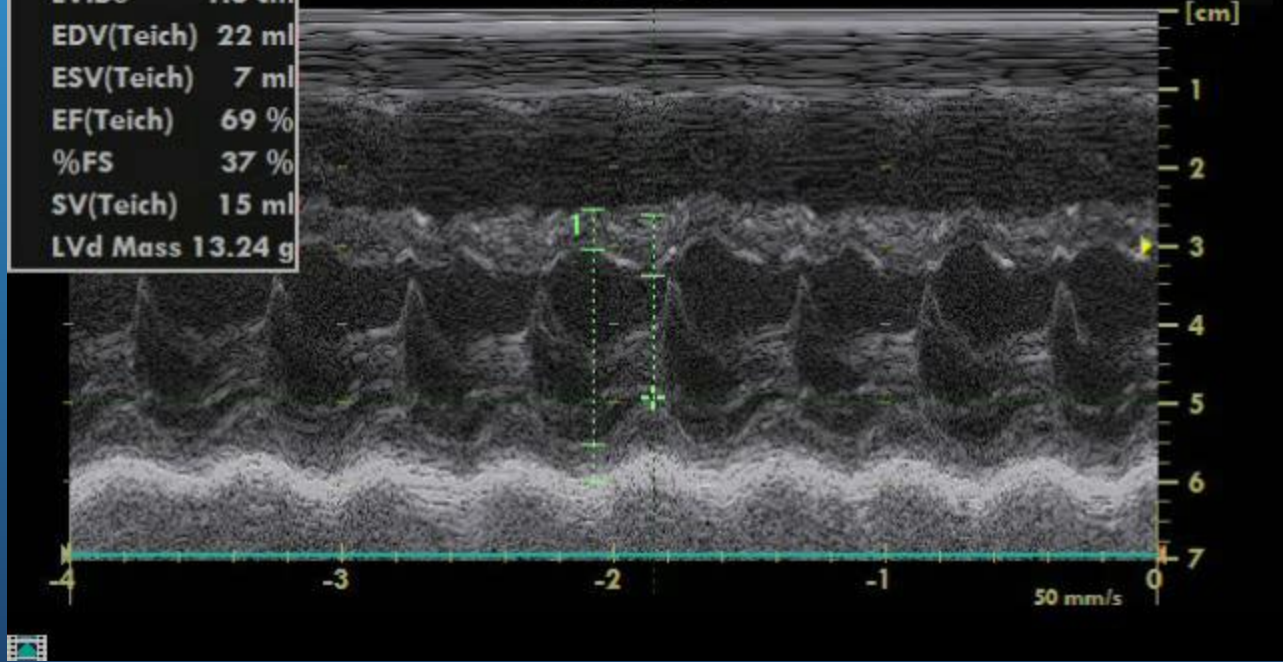
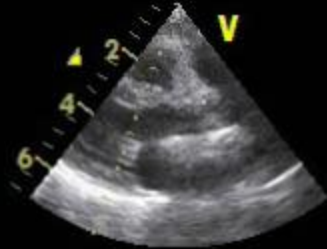
1 RVIDd 1.3 cm

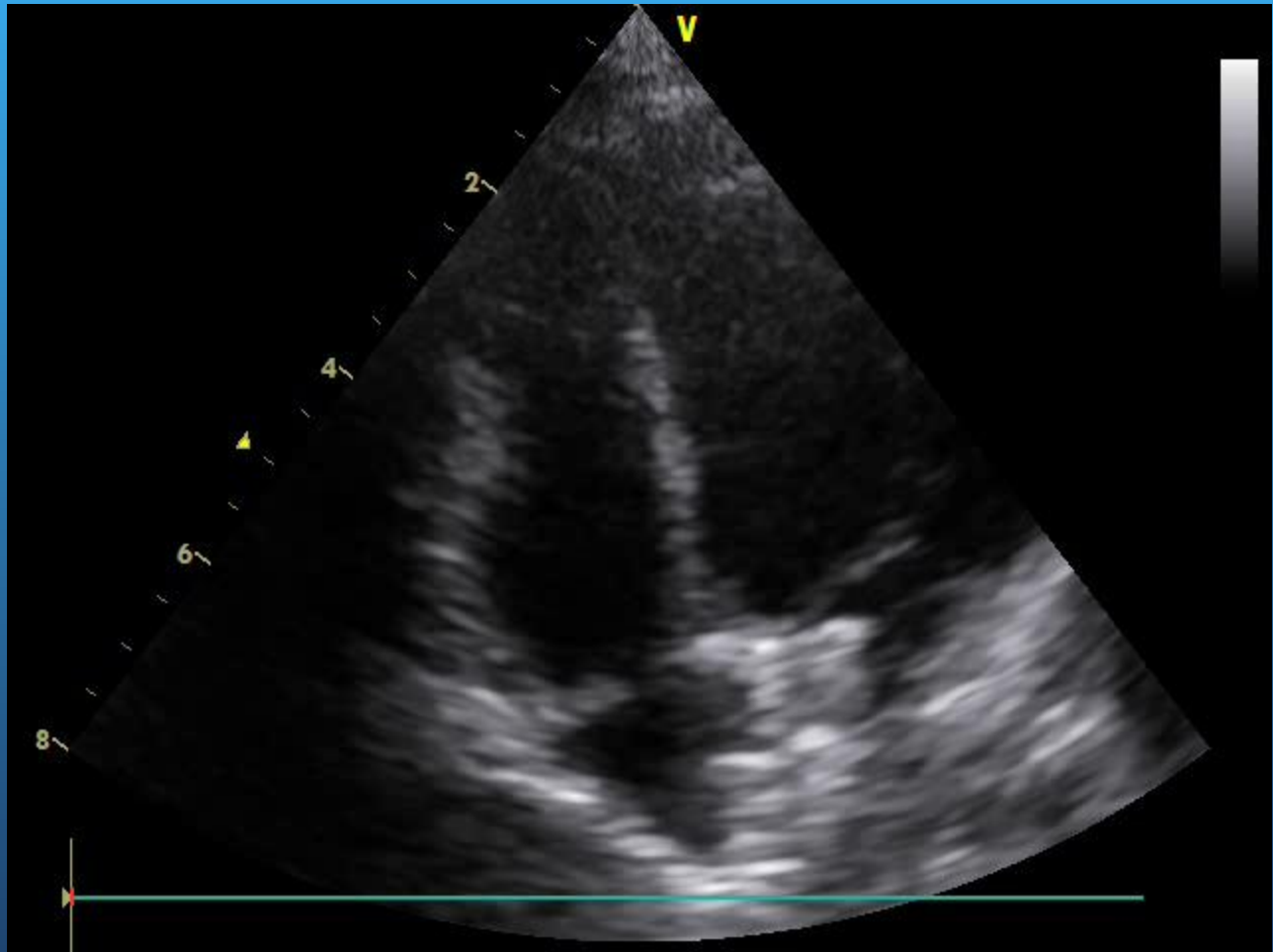


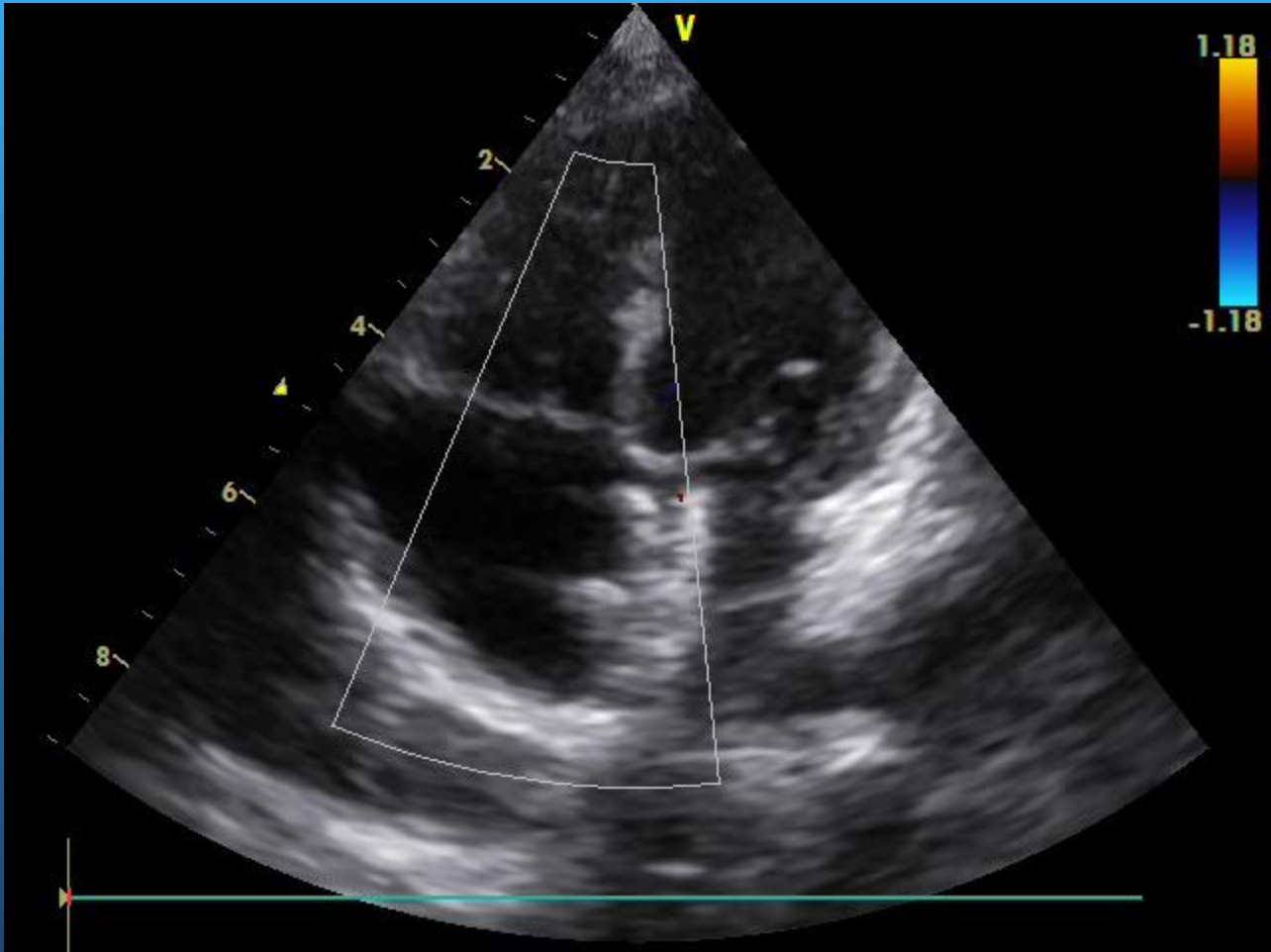


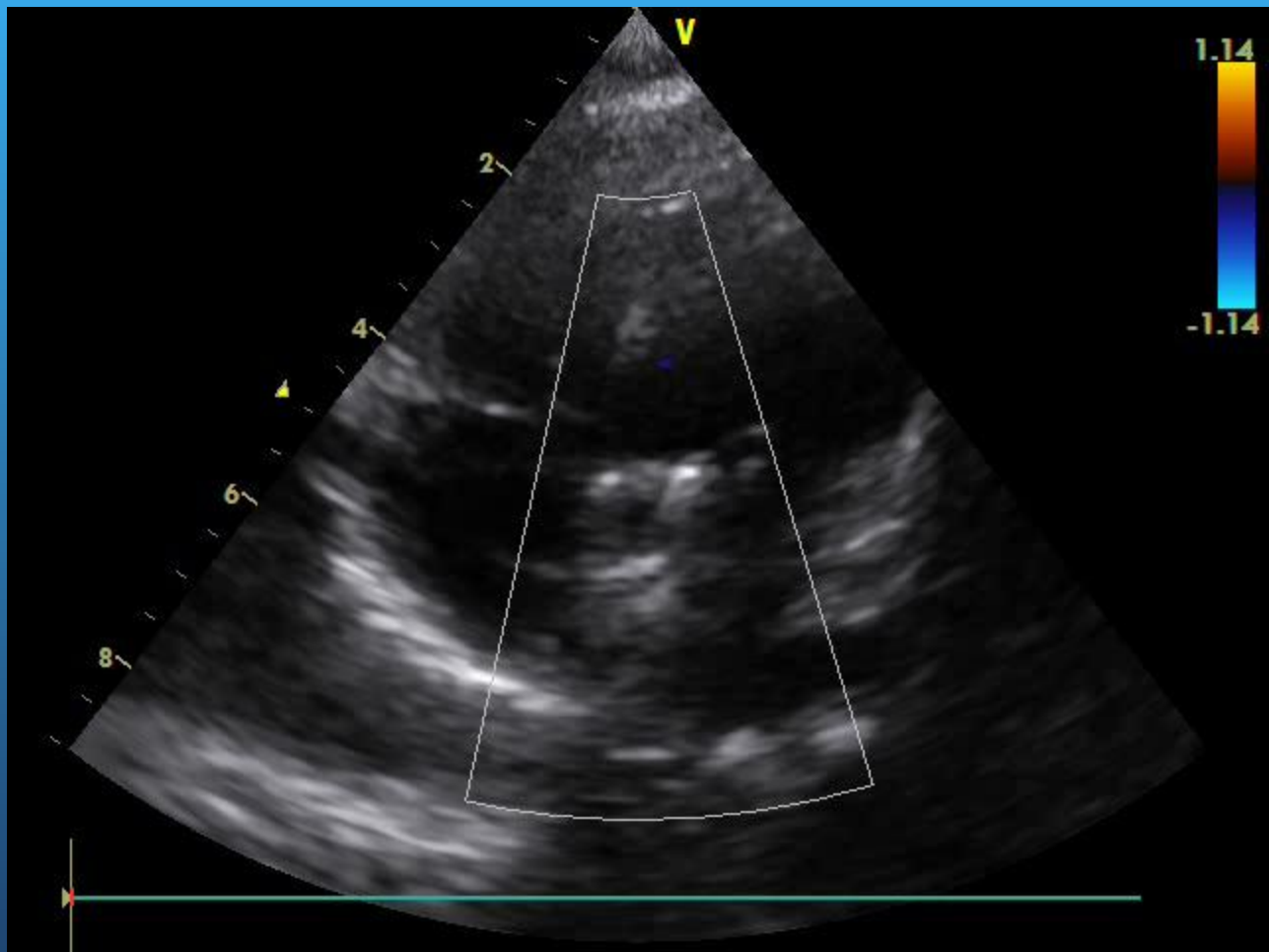
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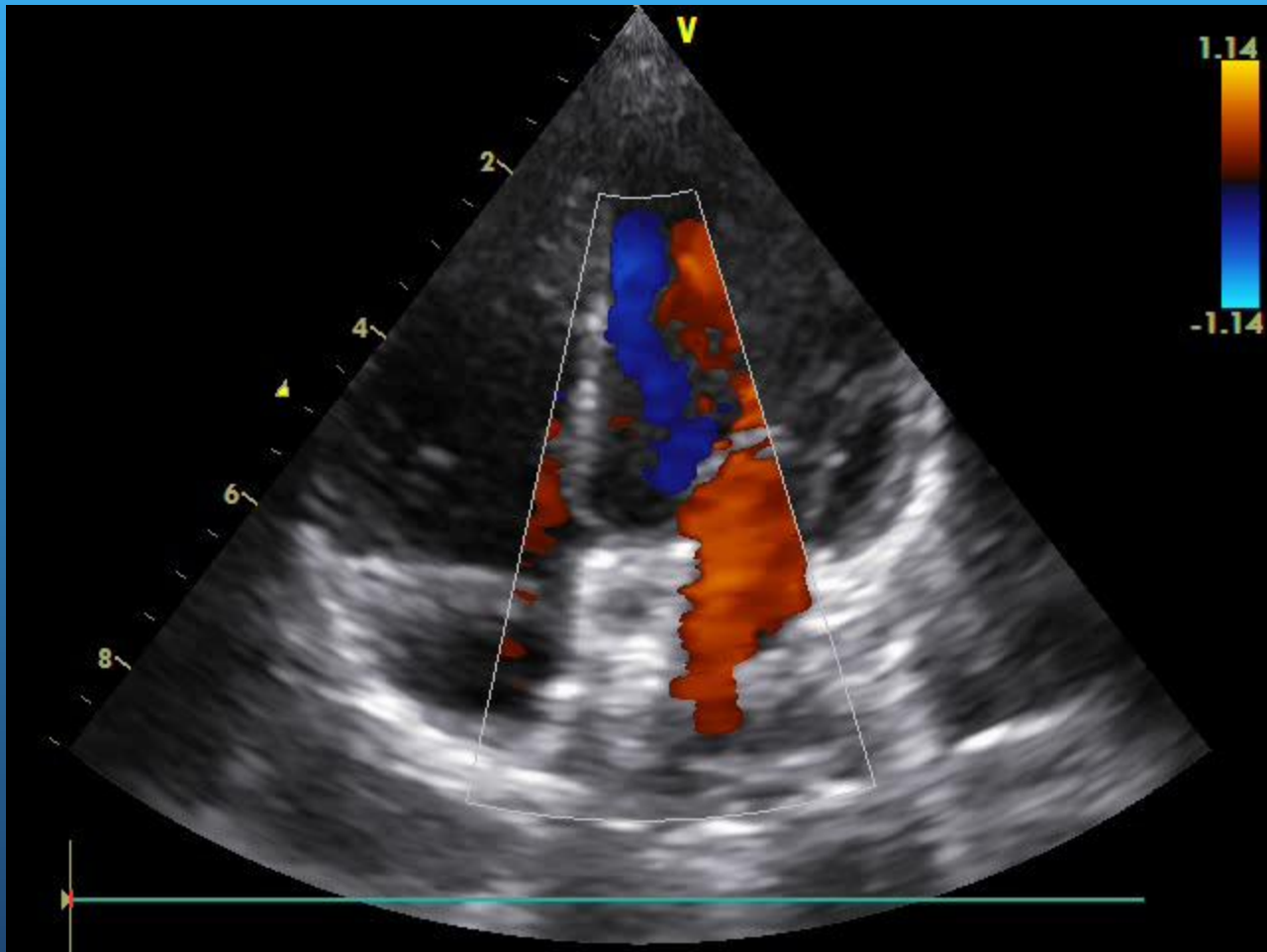
1	IVSd	0.5 cm
	LVIDd	2.5 cm
	LVPWd	0.5 cm
	IVSs	0.8 cm
	LVIDs	1.6 cm
	EDV(Teich)	22 ml
	ESV(Teich)	7 ml
	EF(Teich)	69 %
	%FS	37 %
	SV(Teich)	15 ml
	LVd Mass	13.24 g

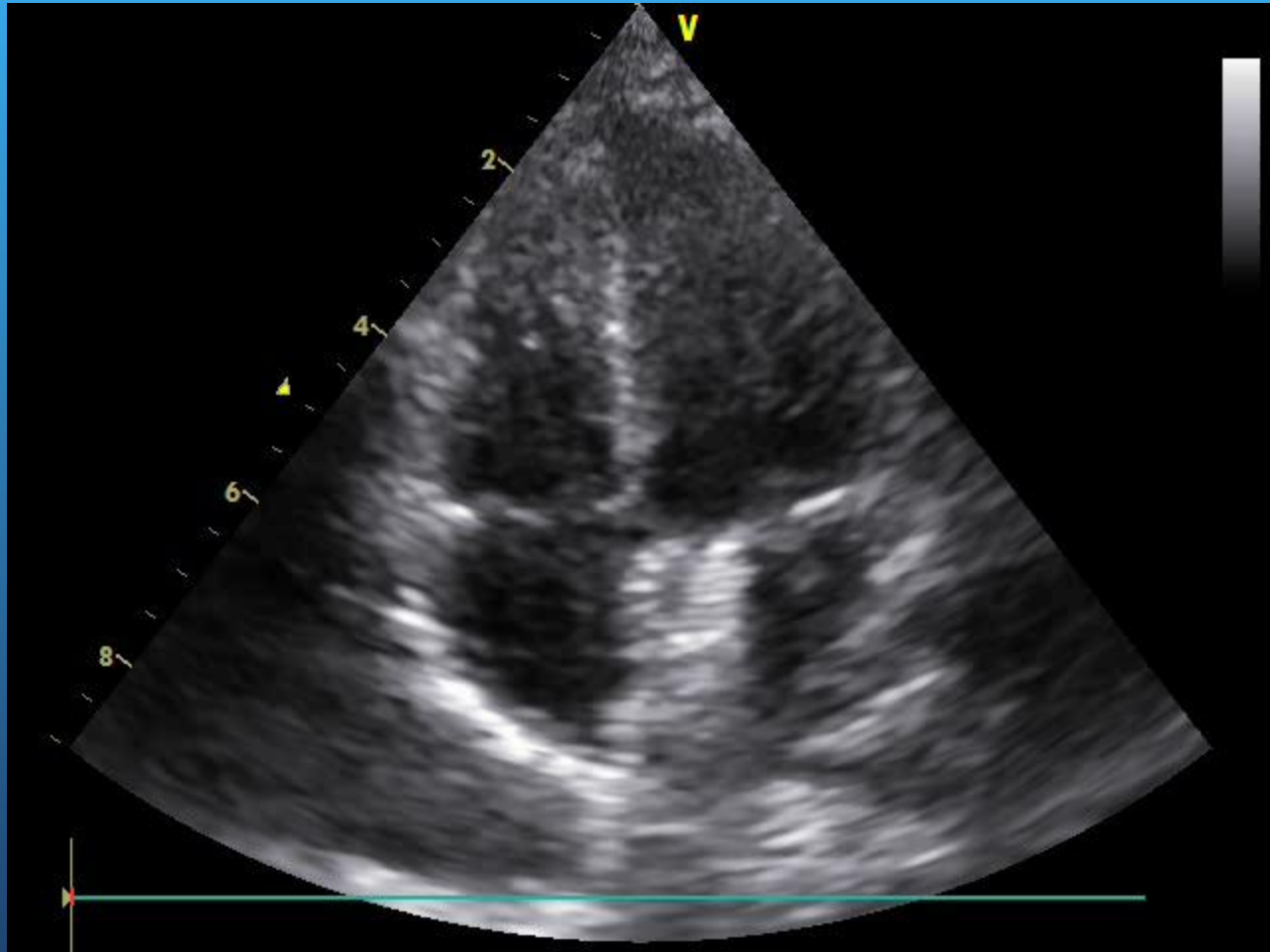












- TTE performed 6 months post-operatively ,  
RVEDD declined to 12mm. ESPAP dropped  
to 35 mmHg.

-No MR or AR.

\*Rodaina has gained 2.7 kg  
of weight in 5 months and  
now she is a happy 1 year old weighing 8Kg .



**Thank you**