Think Quick!

Make the Diagnosis with Just One Clip

Bonita Anderson

Clip #1

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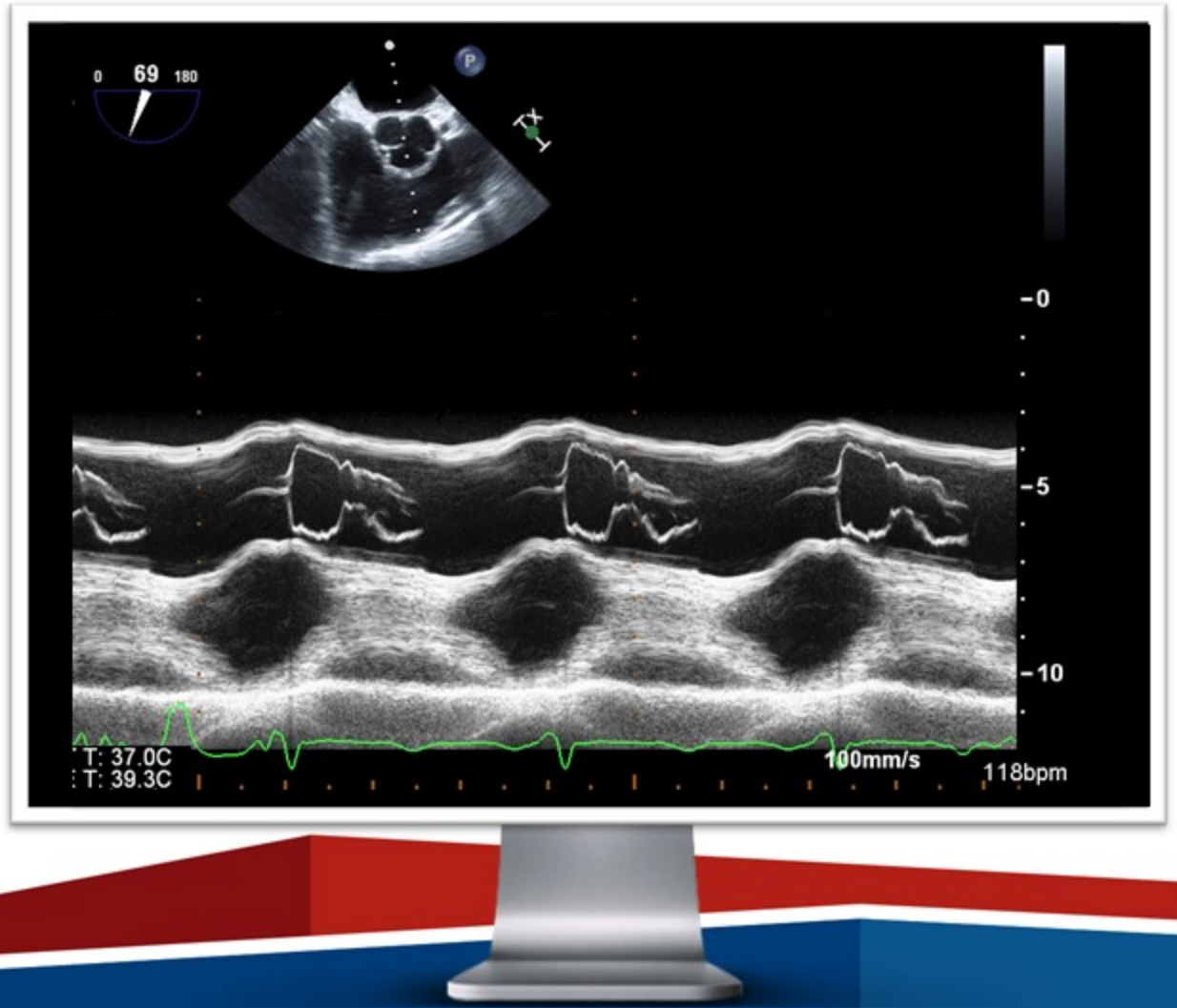
This aortic valve M-mode was acquired on a 69 yo male.



What is the diagnosis?

1. Acute, severe AR
2. Bicuspid AV
3. LVOT obstruction
4. Poor cardiac output

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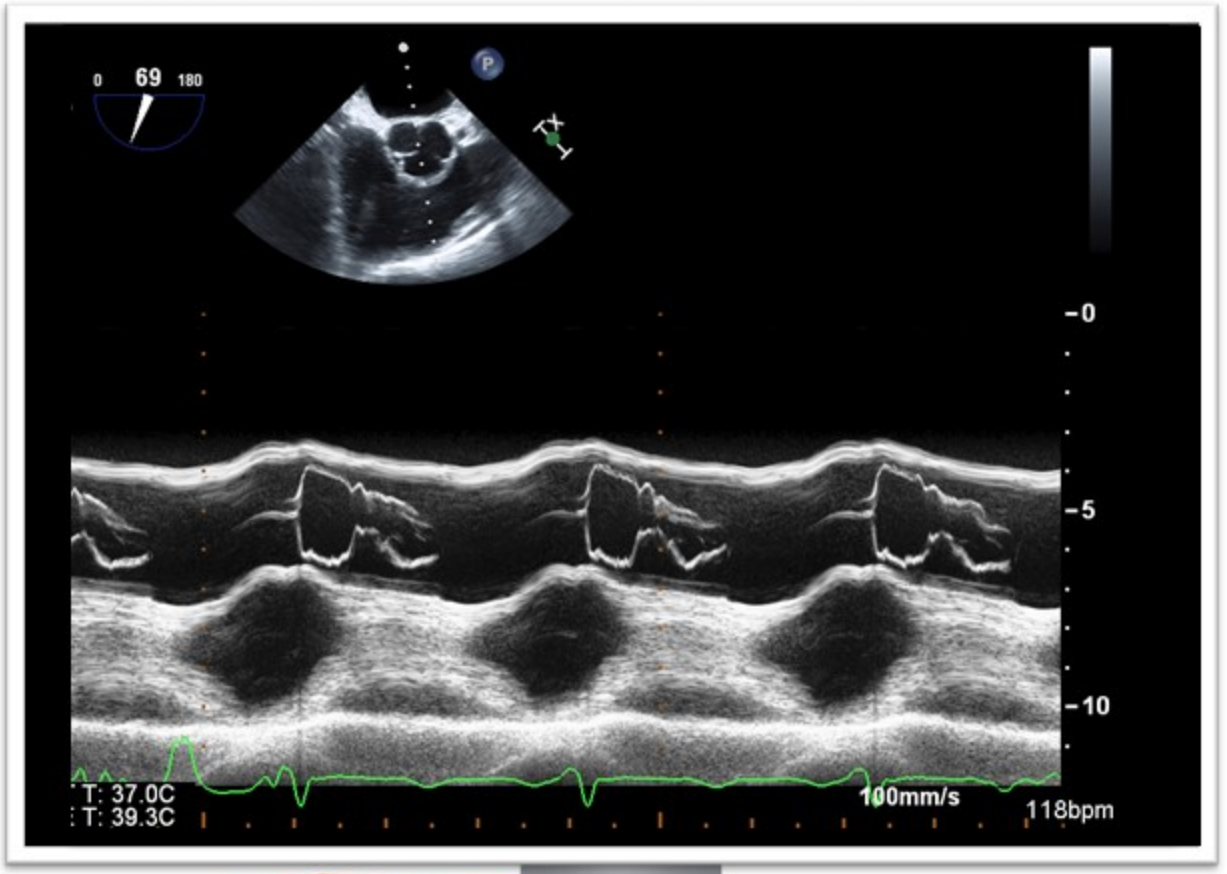
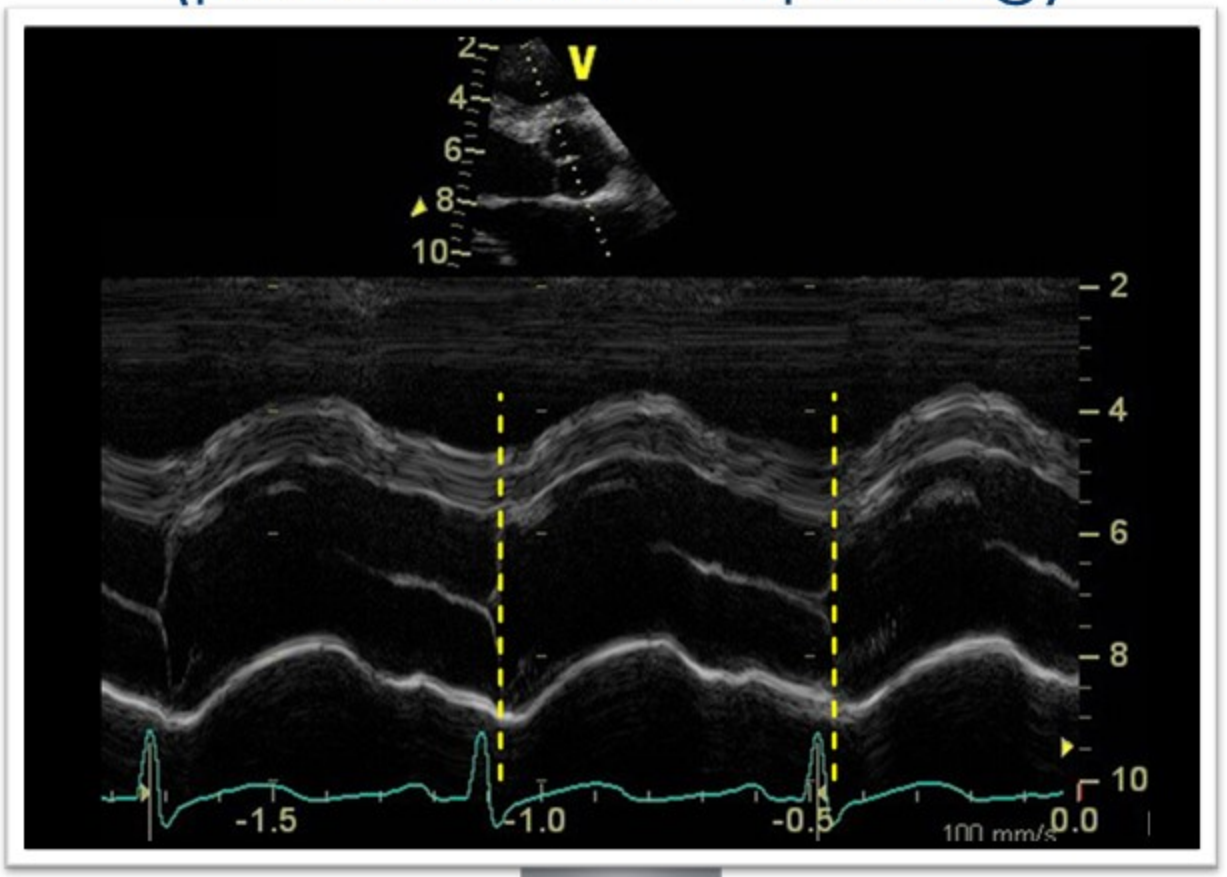
Our example
Not acute severe AR



Acute, severe AR
(premature AV opening)



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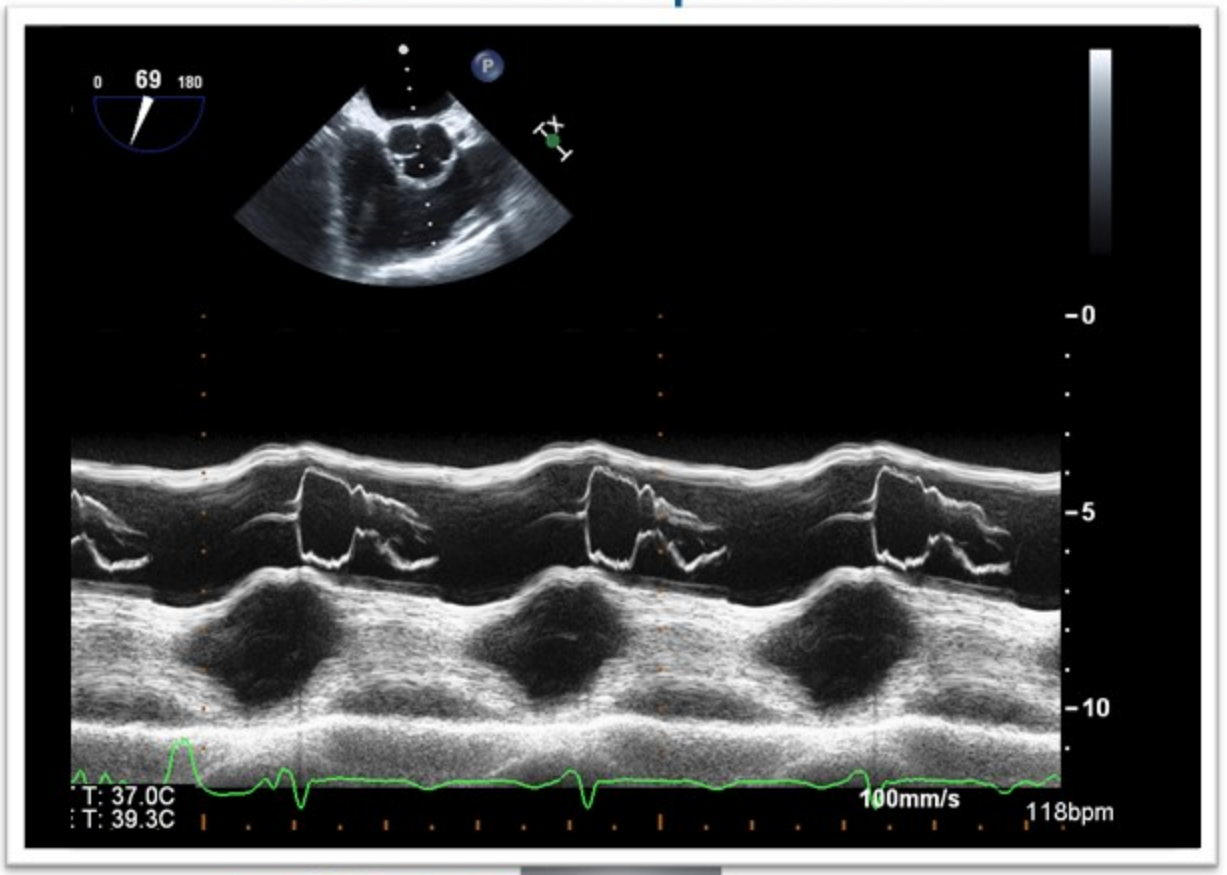
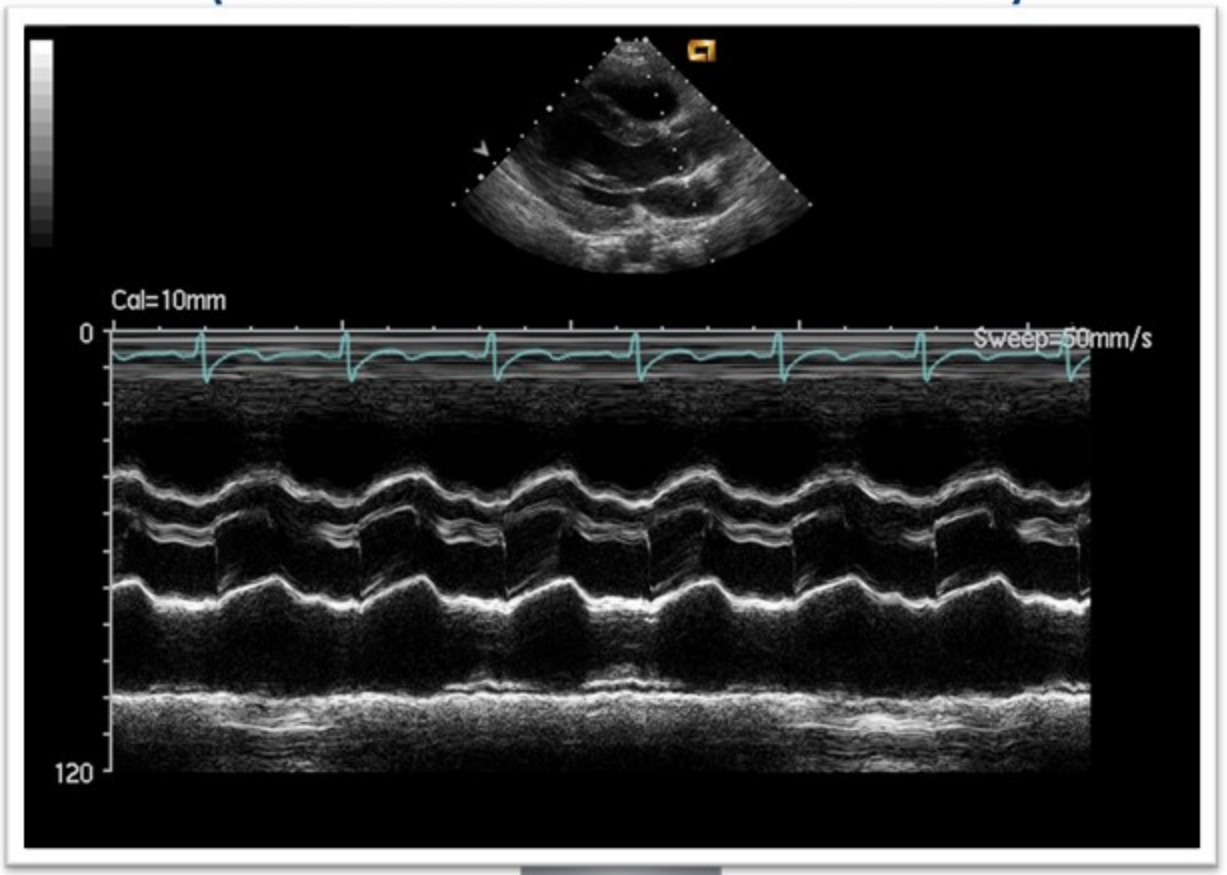
Our example **Not** Bicuspid AV



Bicuspid AV (eccentric AV closure)



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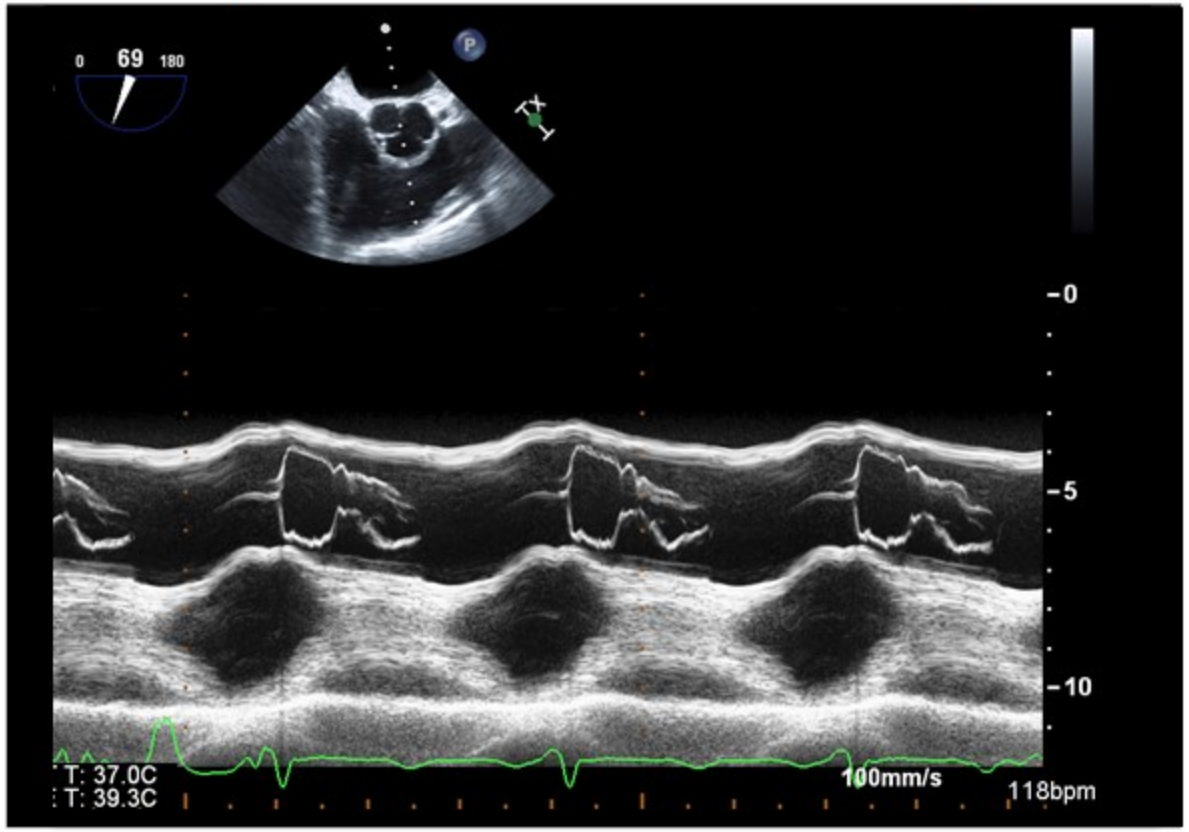
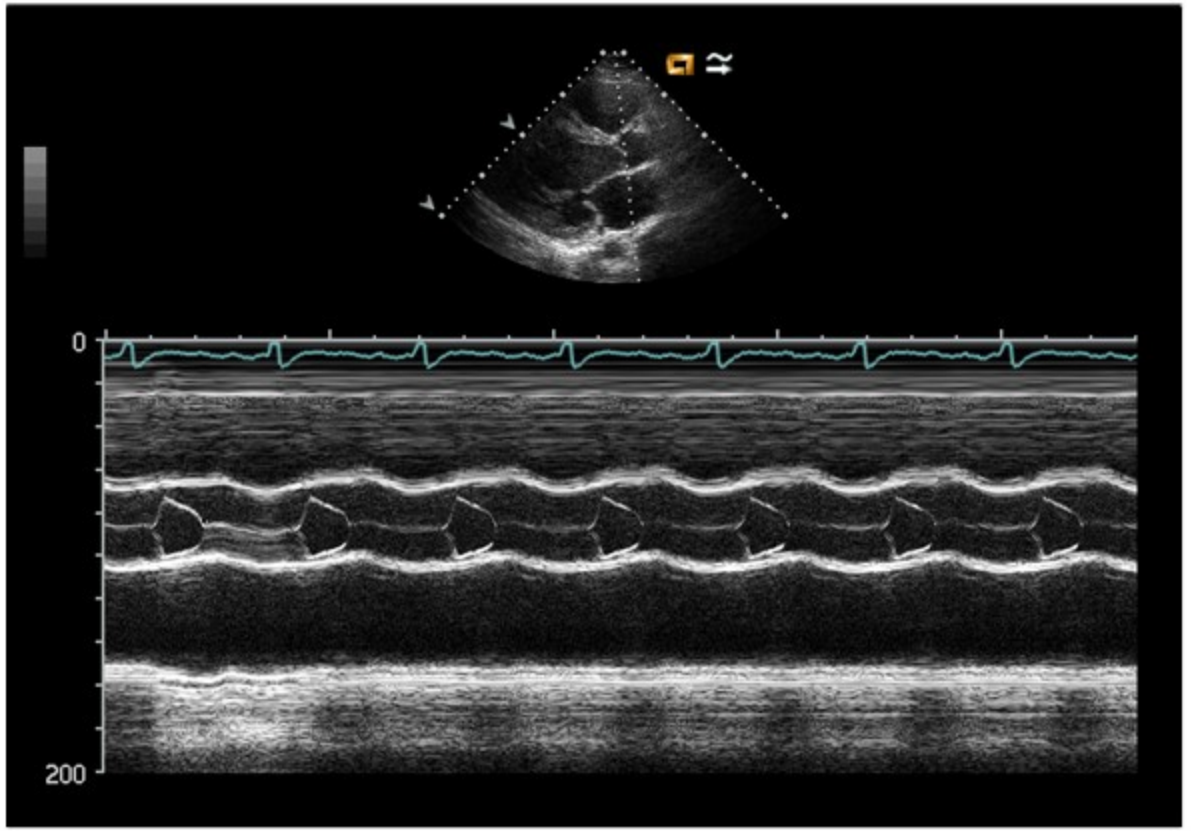
Our example
Not poor cardiac output



Poor cardiac output
(gradual AV closure)



Clip #1

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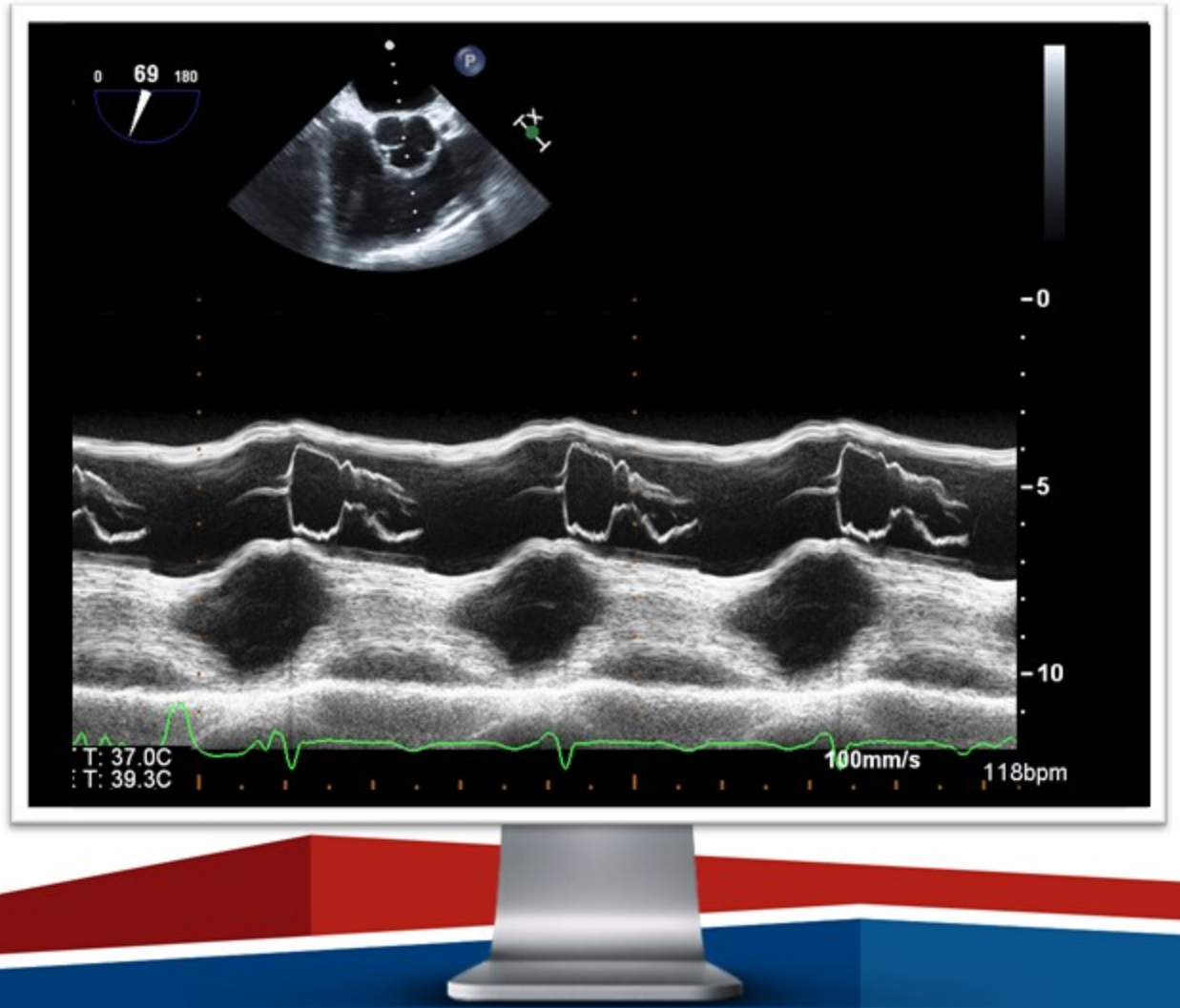
This aortic valve M-mode was acquired on a 69 yo male.

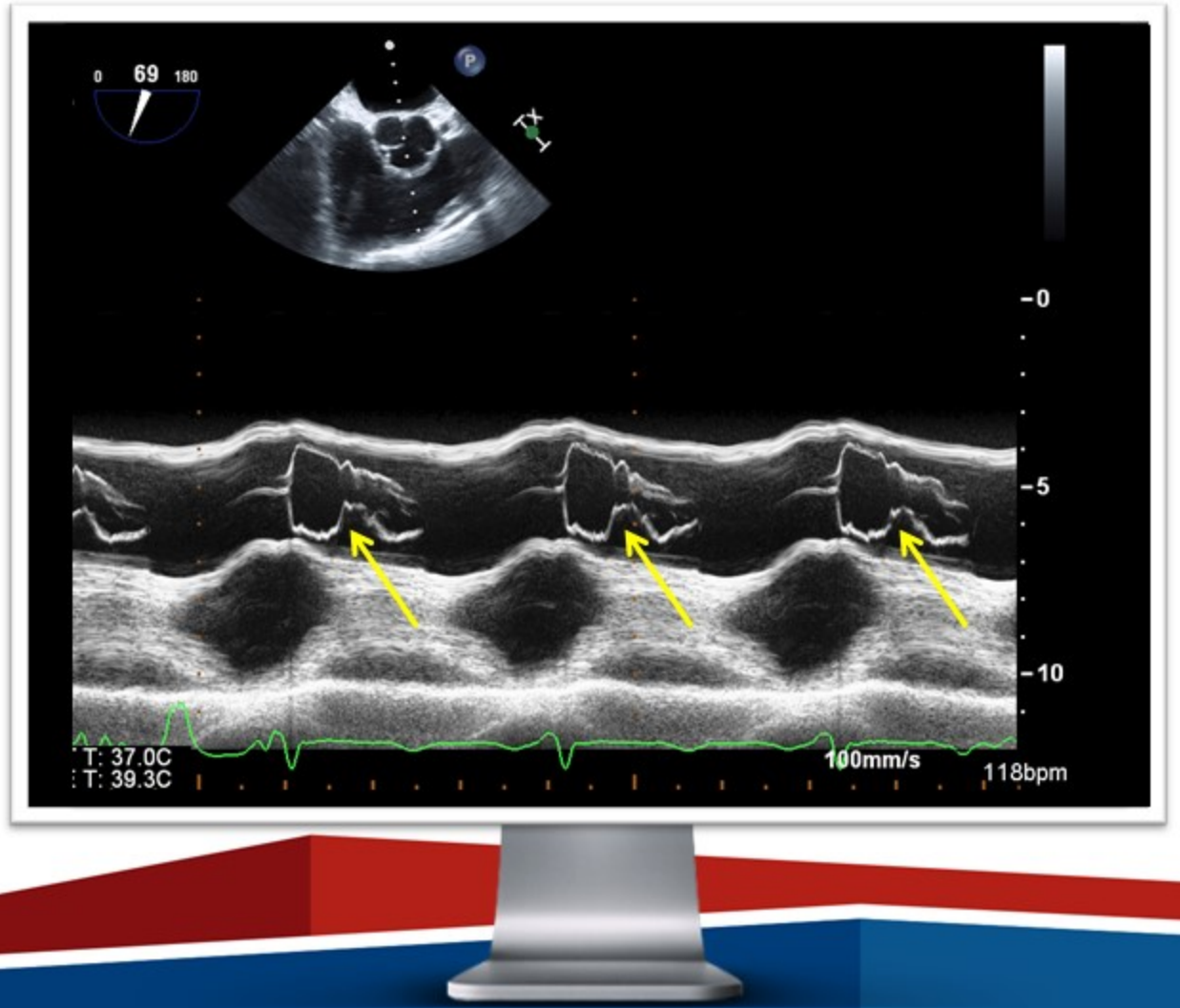


What is the diagnosis?

1. Acute, severe AR
2. Bicuspid AV
3. **LVOT obstruction**
4. Poor cardiac output

Clip #1

Mid-systolic AV closure 2° to **dynamic** LVOT obstruction



- Abrupt AV closure before end-systole indicates sub-aortic obstruction
- Mid-systolic (as opposed to early systolic) closure indicates dynamic LVOT obstruction

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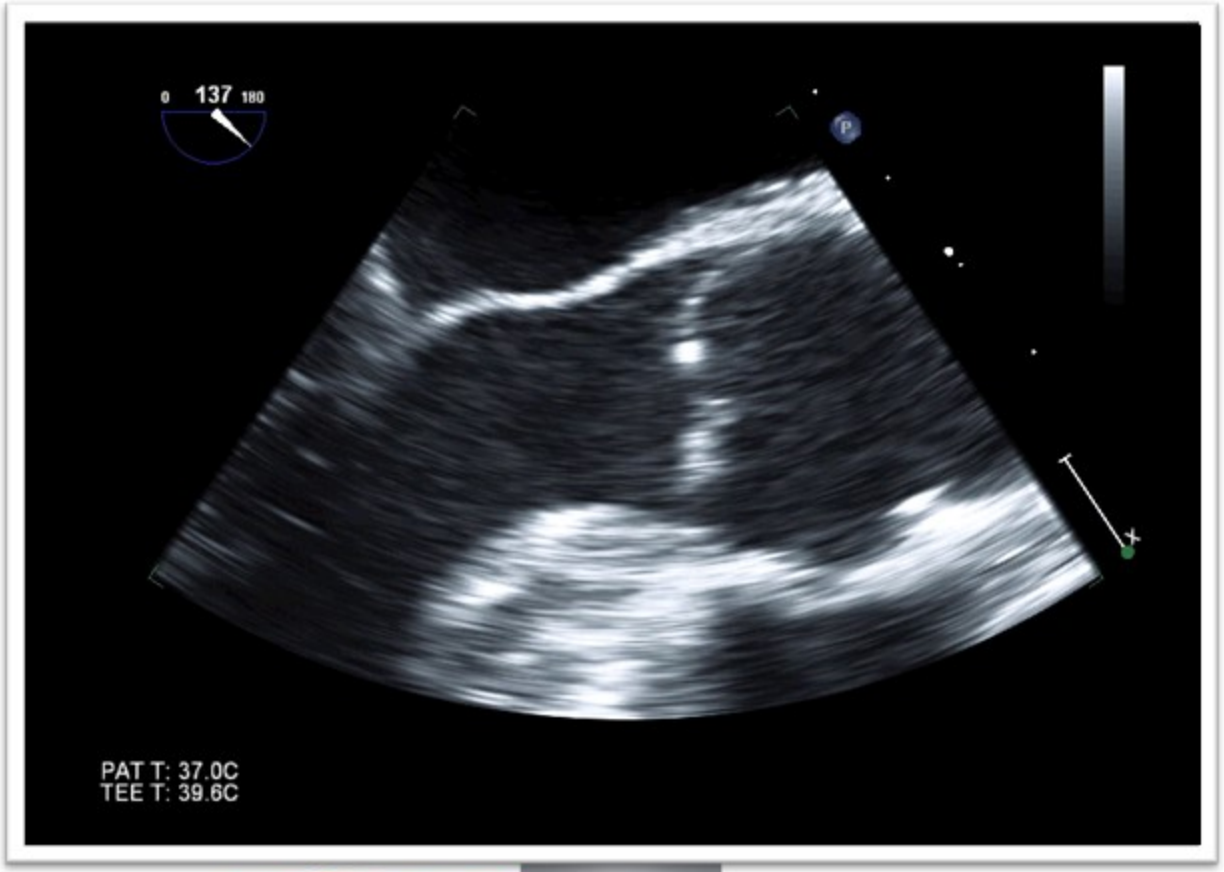
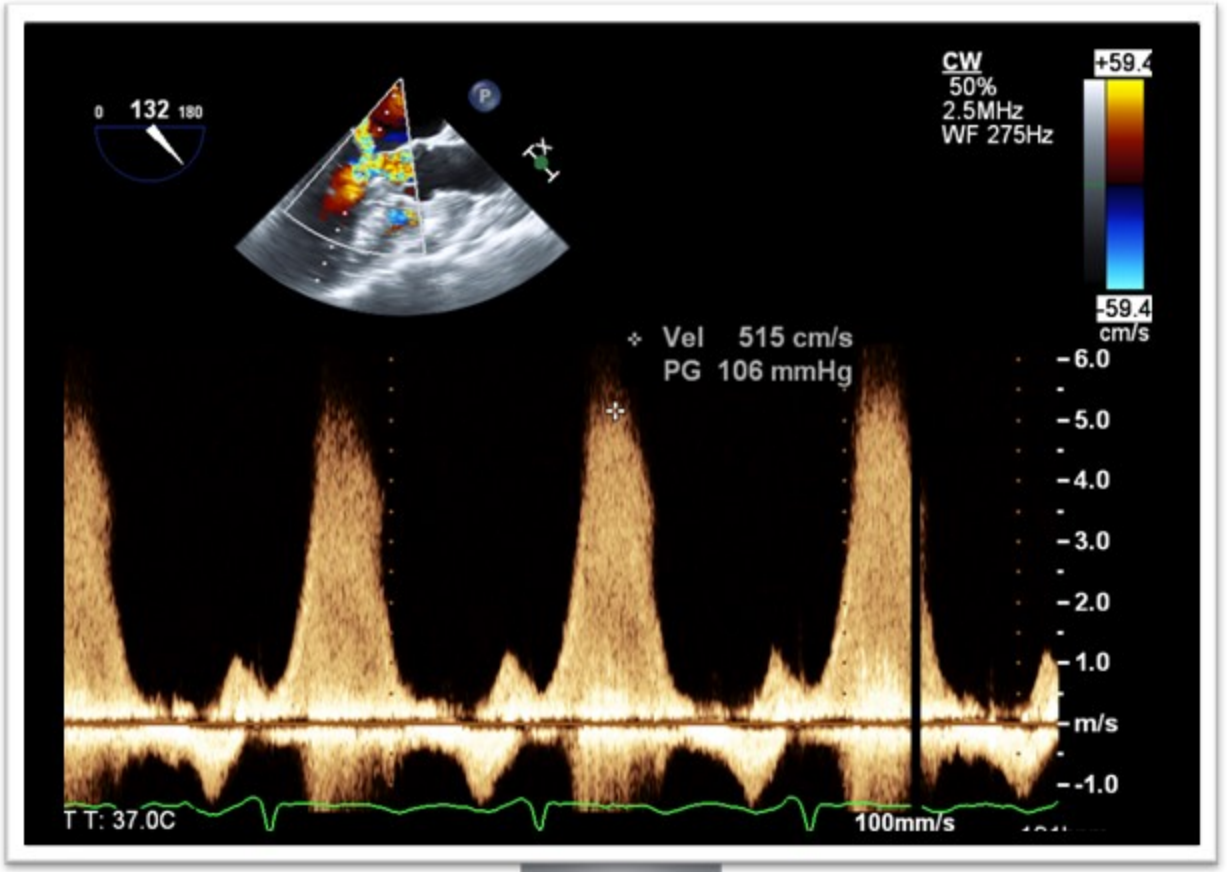
ASH with SAM anterior ML Mid-systolic AV closure



Dynamic LVOT obstruction



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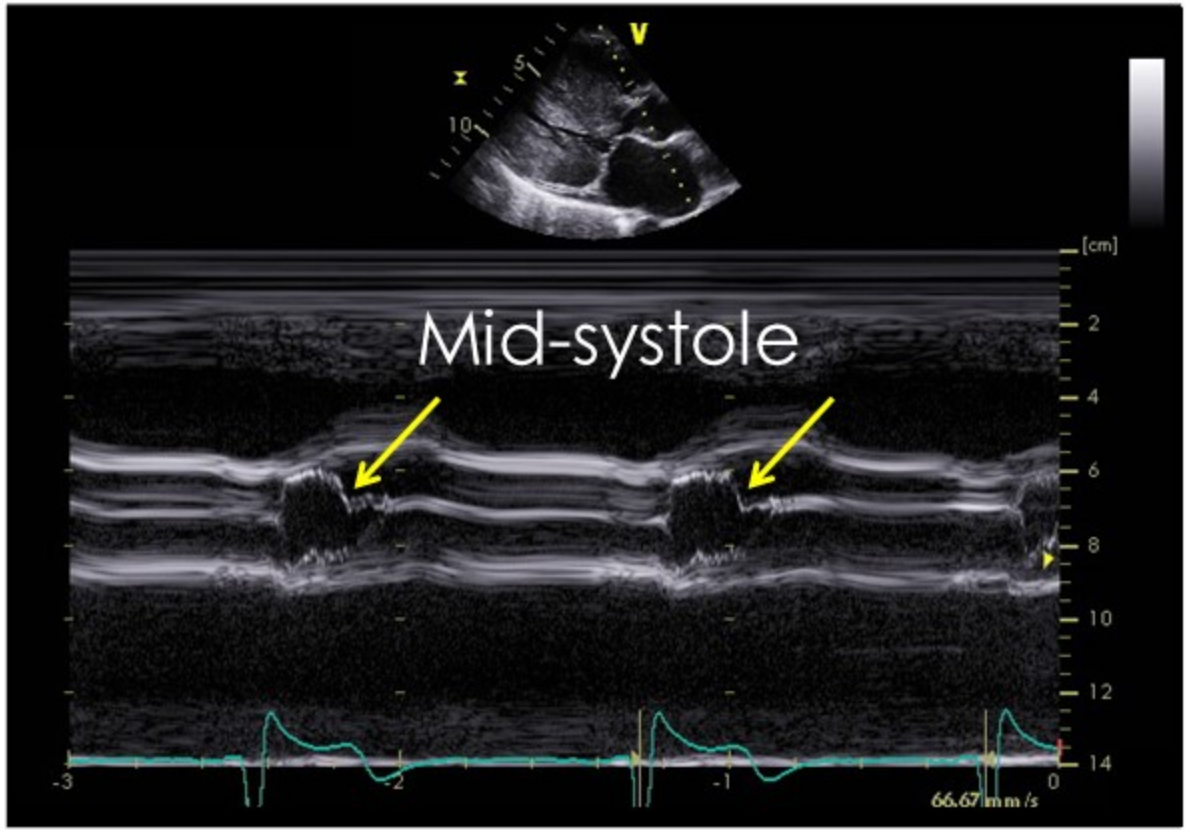
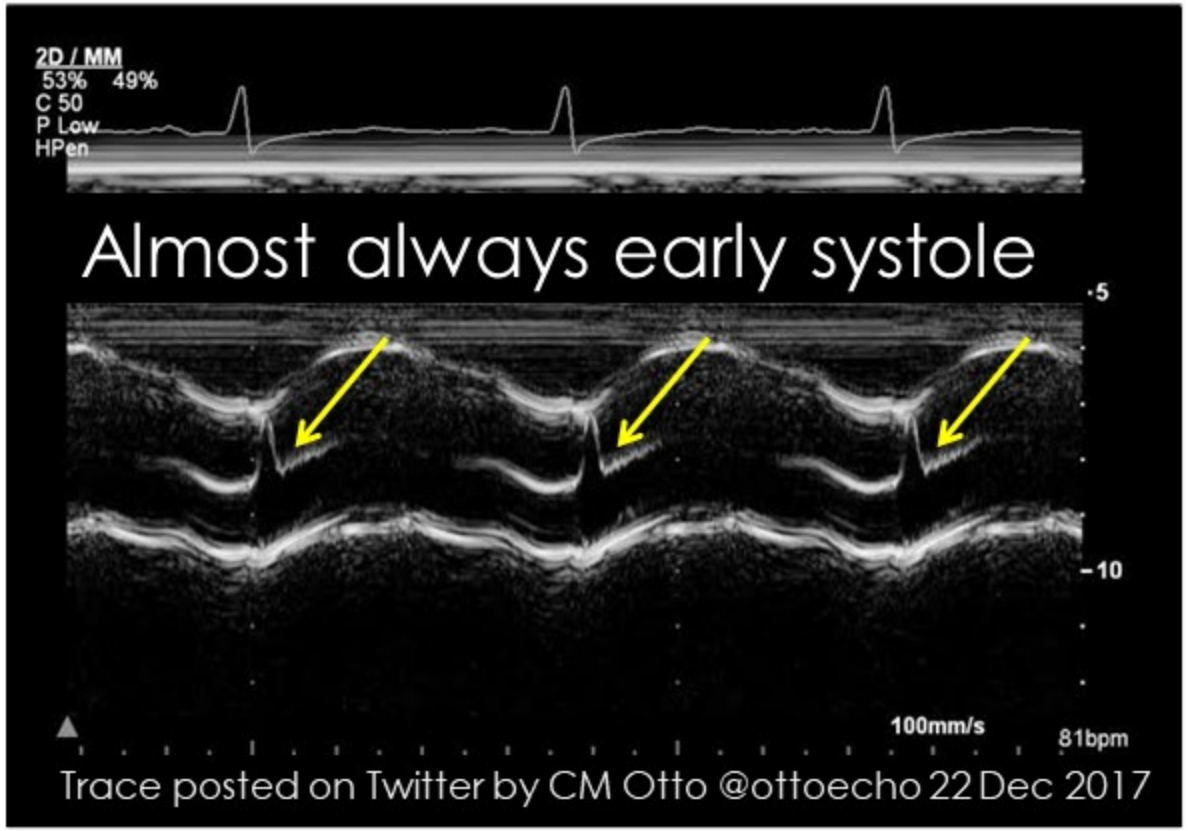
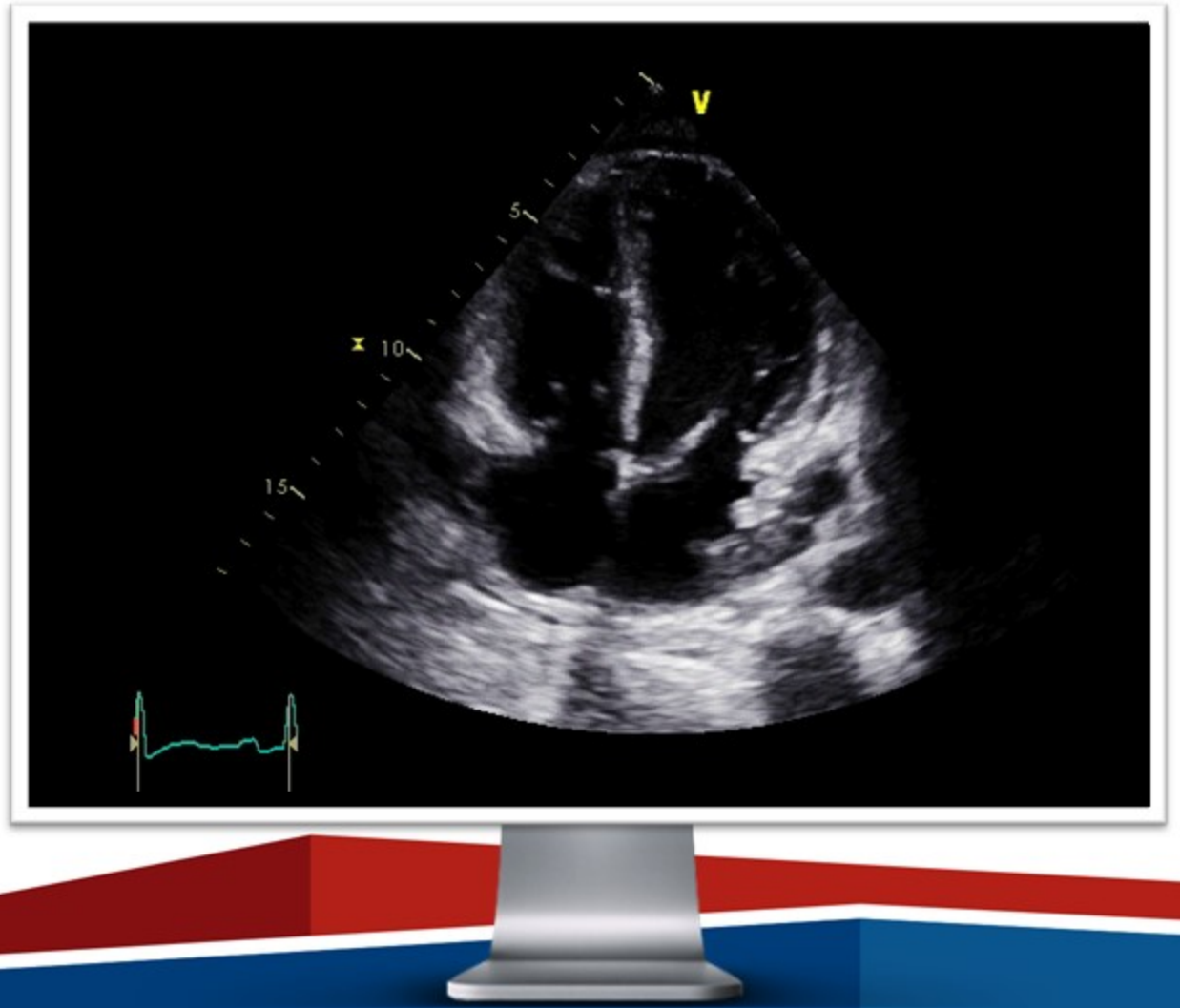
Dynamic (e.g. HOCM)



Fixed (e.g. subaortic membrane)



Clip #2



What's the finding?

1. LA appendage thrombus
2. Pulmonary venous thrombus
3. Papillary fibroelastoma on the coumadin ridge
4. Lung or mediastinal tumor with invasion

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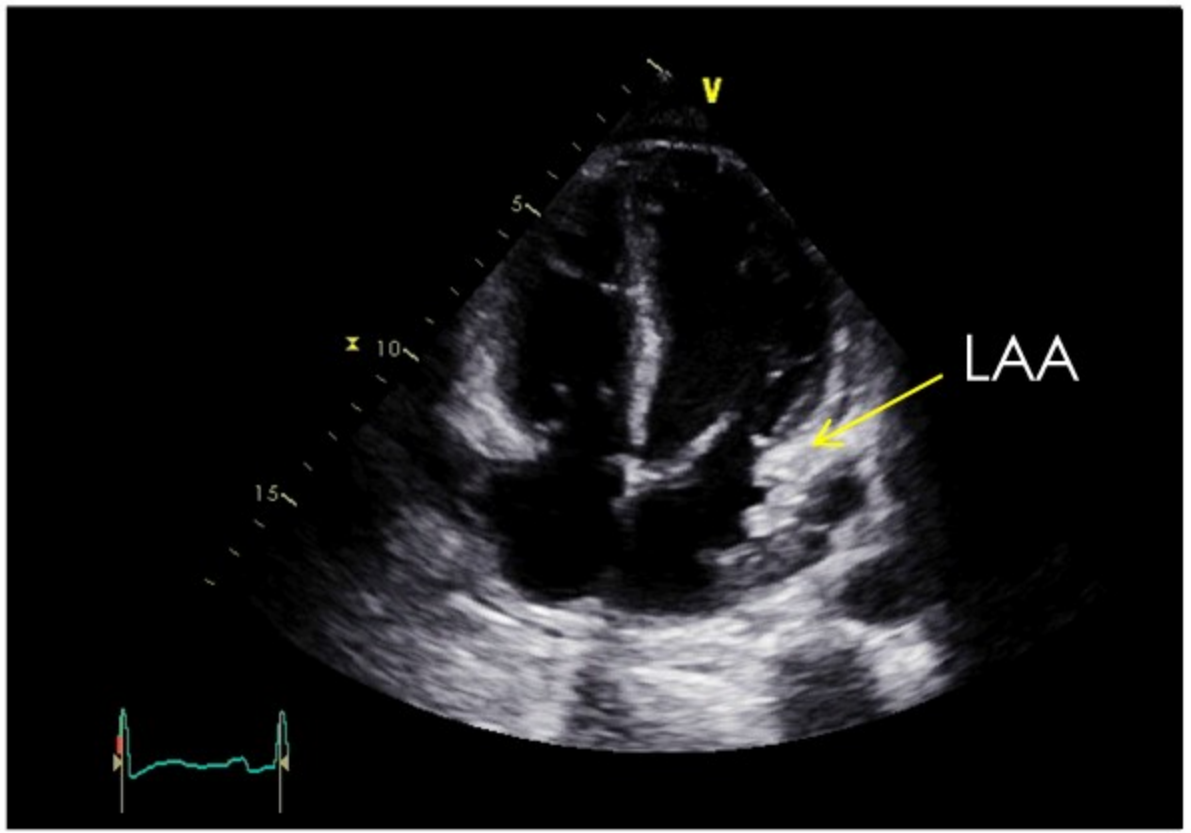
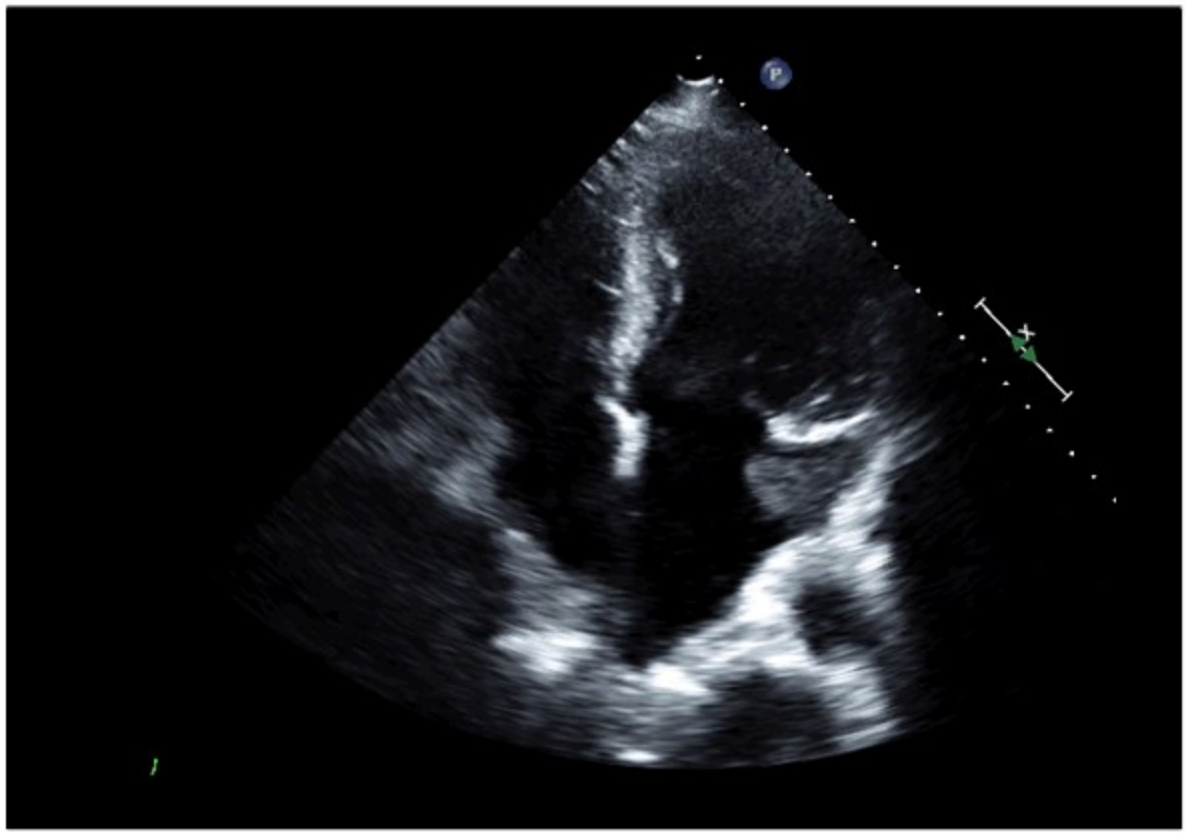
Our example **Not** LAA Thrombus



LAA thrombus



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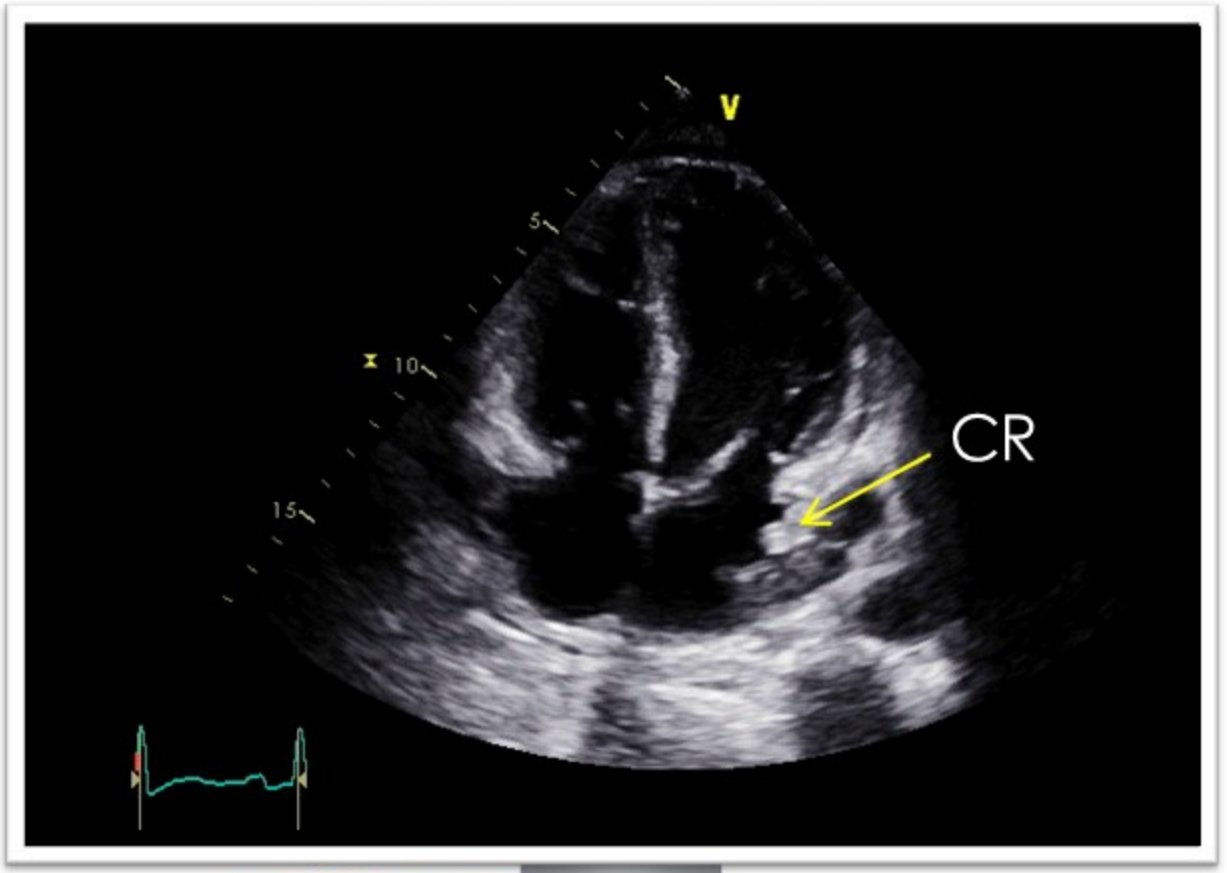
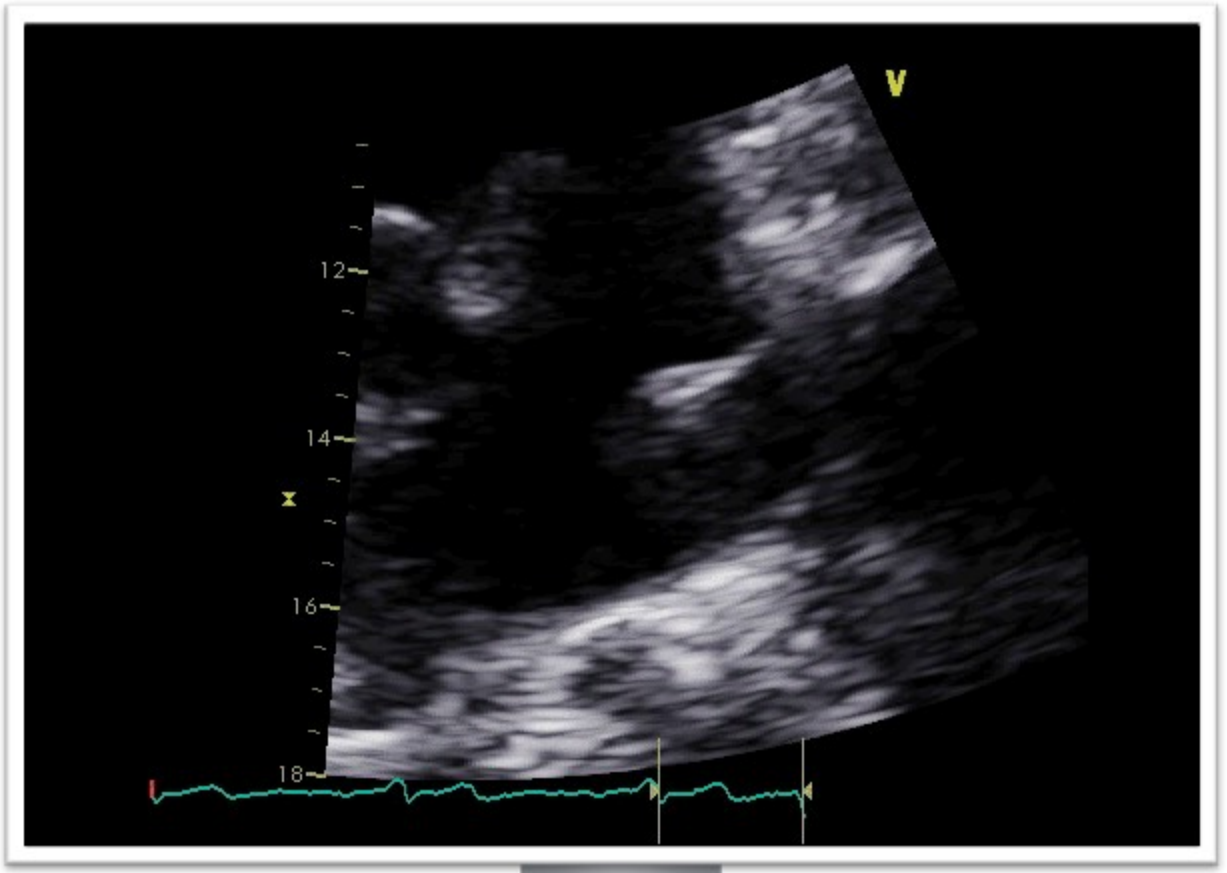
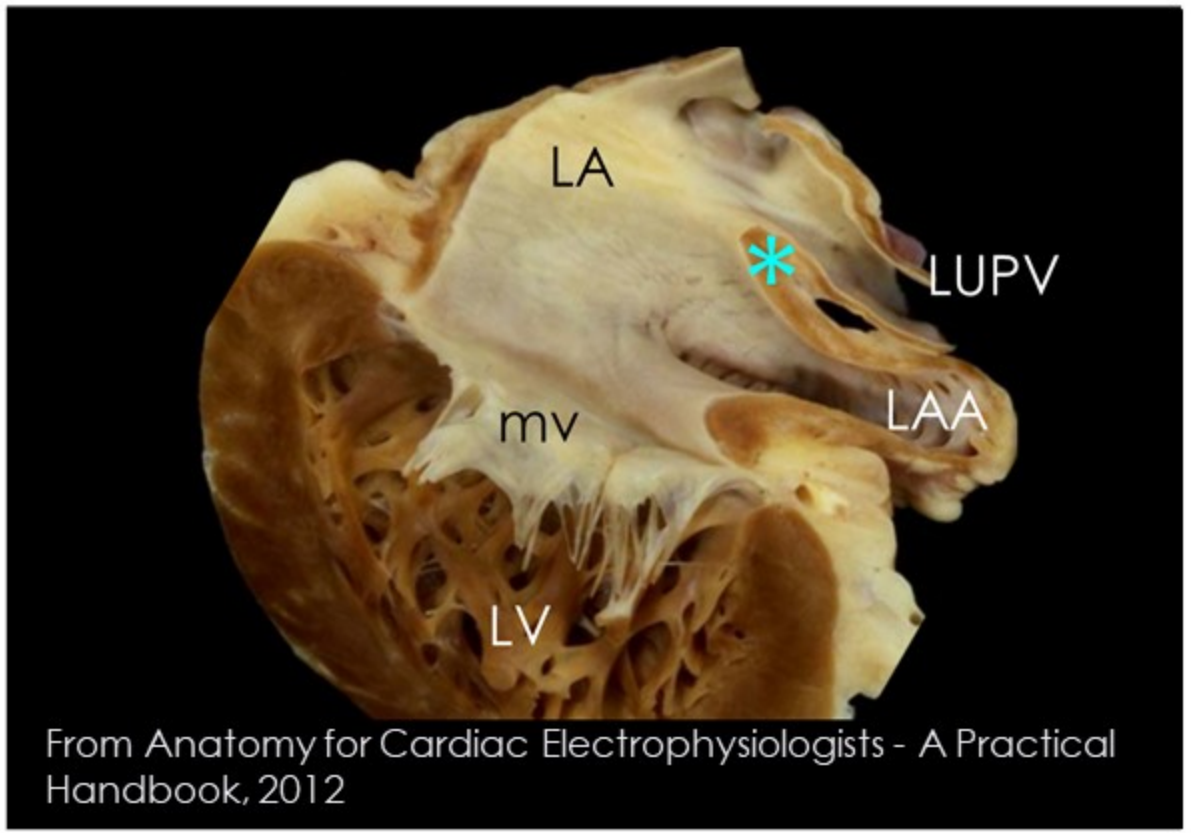
Our example
Not PFE on CR



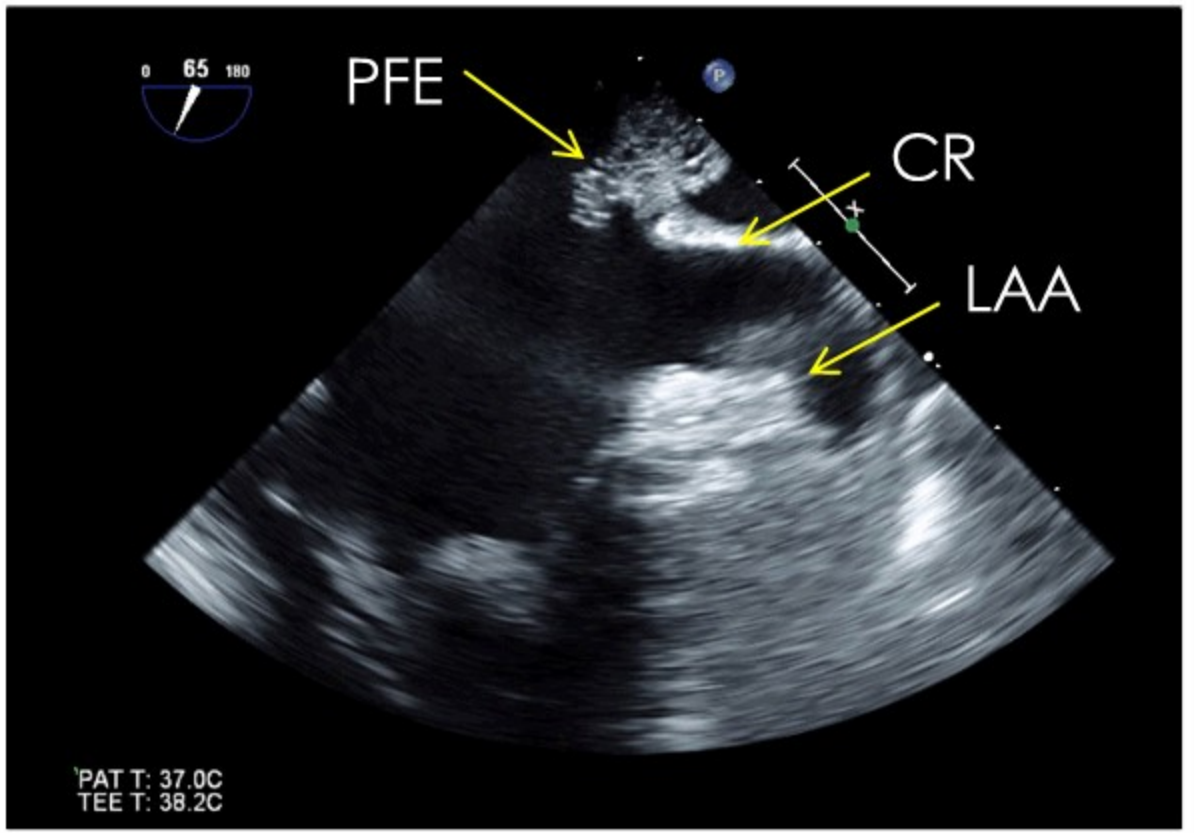
PFE on coumadin ridge
(zoomed ap4-ch)



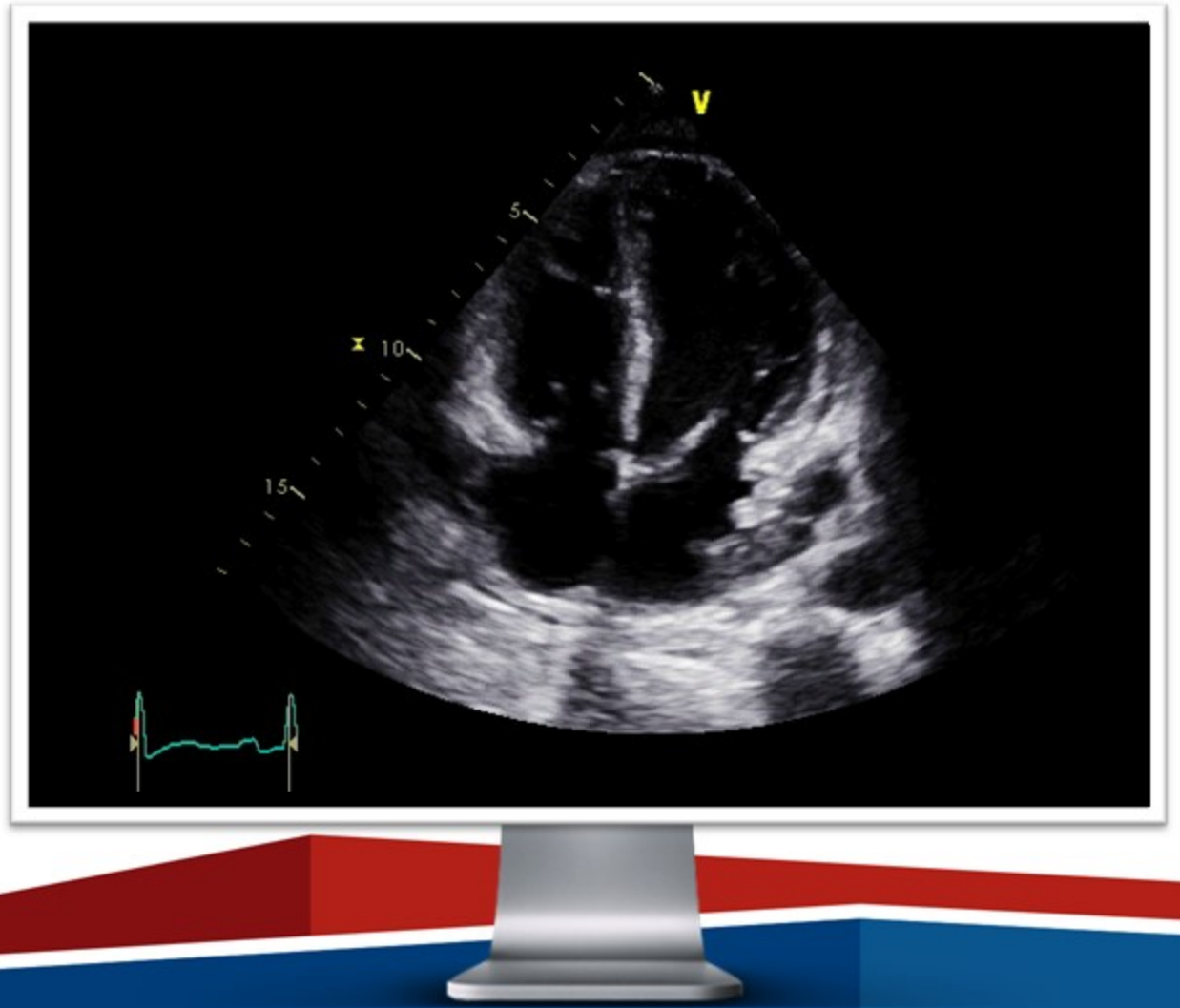
Coumadin ridge (CR)



PFE on CR (TEE)



Clip #2



What's the finding?

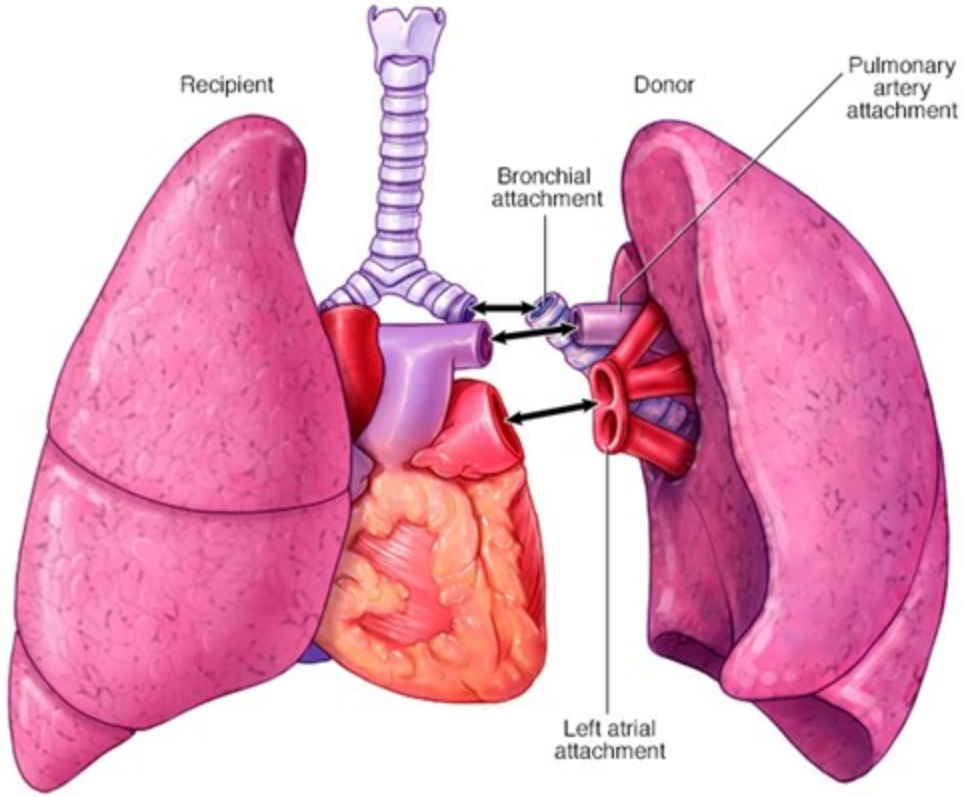
1. LA appendage thrombus
2. **Pulmonary venous endocarditis**
3. Papillary fibroelastoma on coumadin ridge
4. **Lung or mediastinal tumor with invasion**

Clip #2

30 yo male

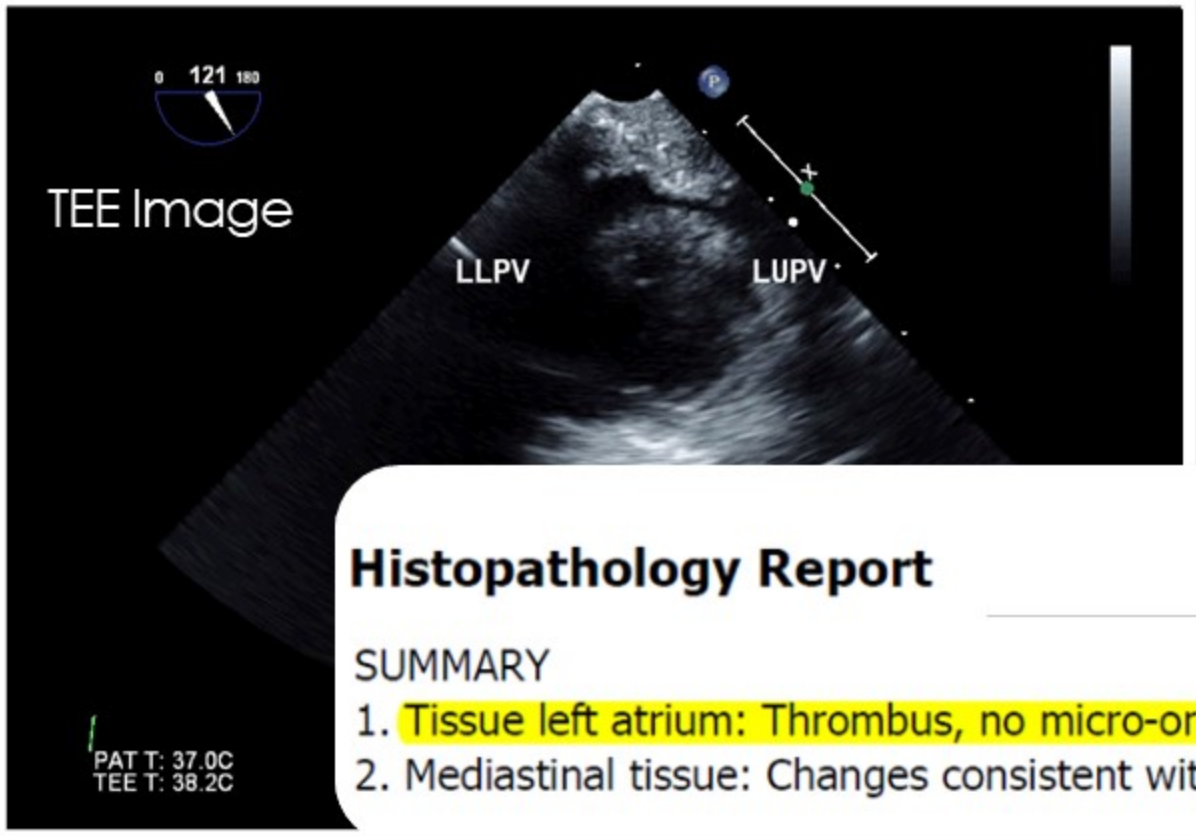
3 months post BSS lung Tx (cystic fibrosis)

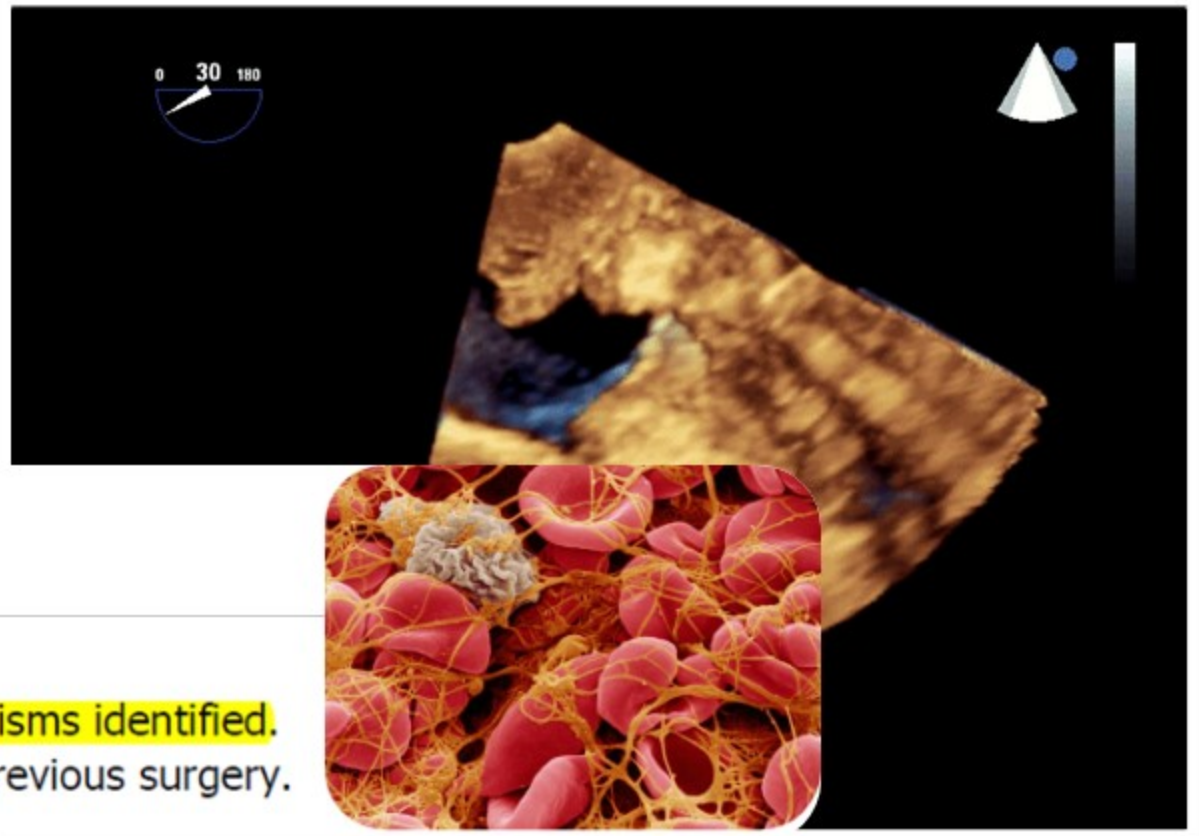
Developed mediastinitis 2° to pseudomonas aeruginosa



https://www.mayoclinic.org/tests-procedures/lung-transplant/multimedia/lung-transplant/img-20006021

Differentials include vegetation/endocarditis or thrombus





Histopathology Report

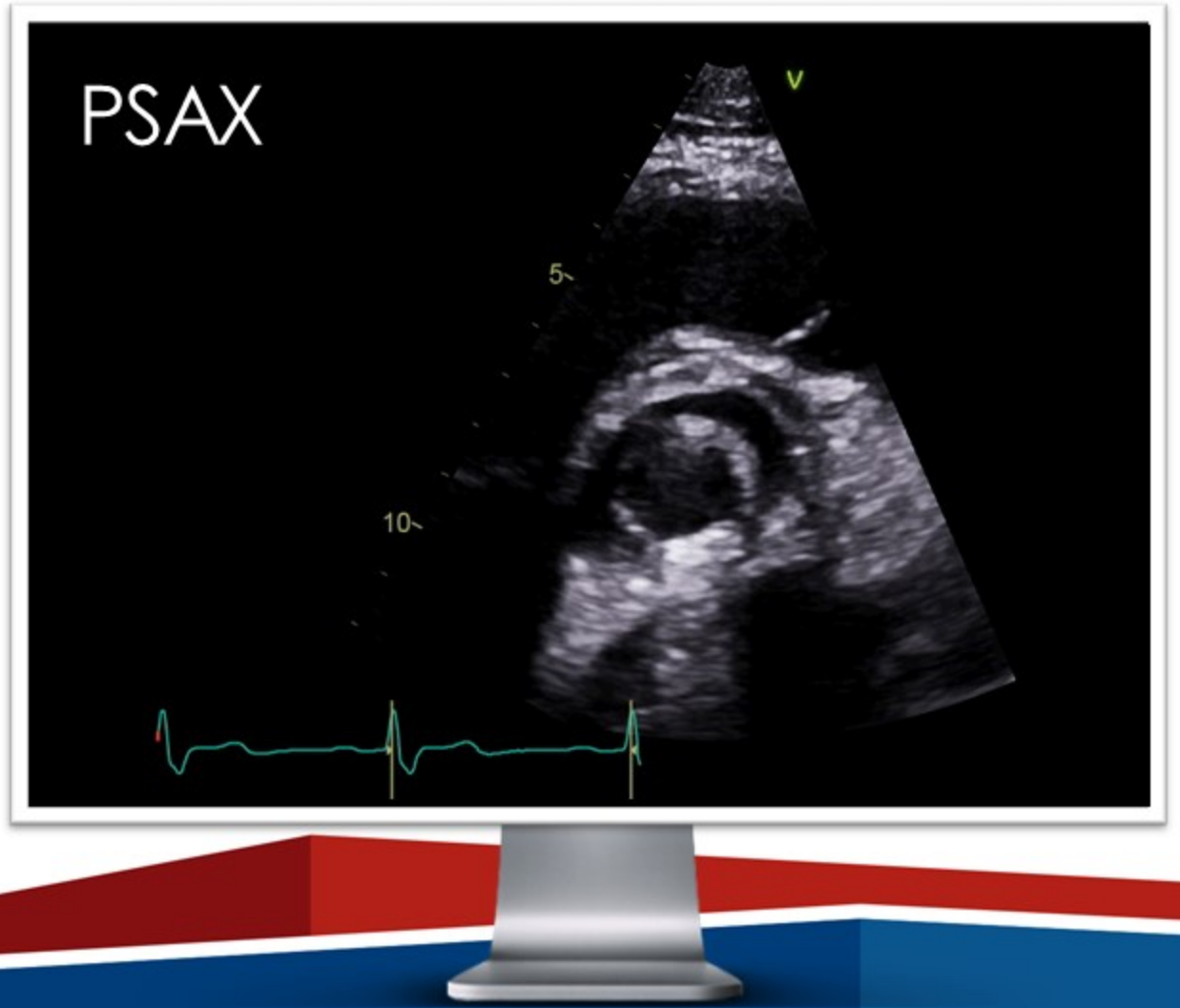
SUMMARY

1. Tissue left atrium: Thrombus, no micro-organisms identified.
2. Mediastinal tissue: Changes consistent with previous surgery.

Interpretation of images includes consideration of patient history and the specific clinical context.

Clip #3

41 yo male with a prior David procedure (2013) & 25 mm ATS AVR for 4/4 AR (2018) presents for a routine echo.

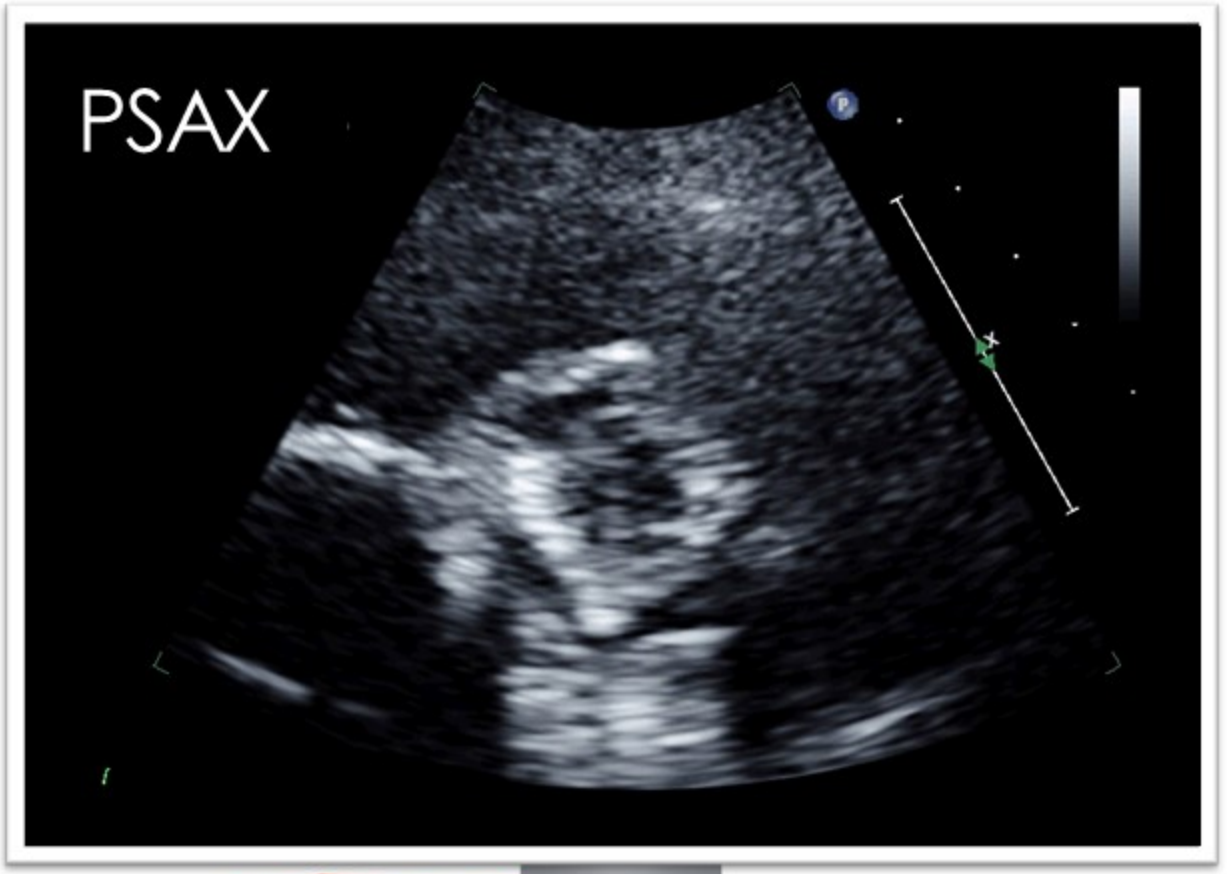


Does this appearance:

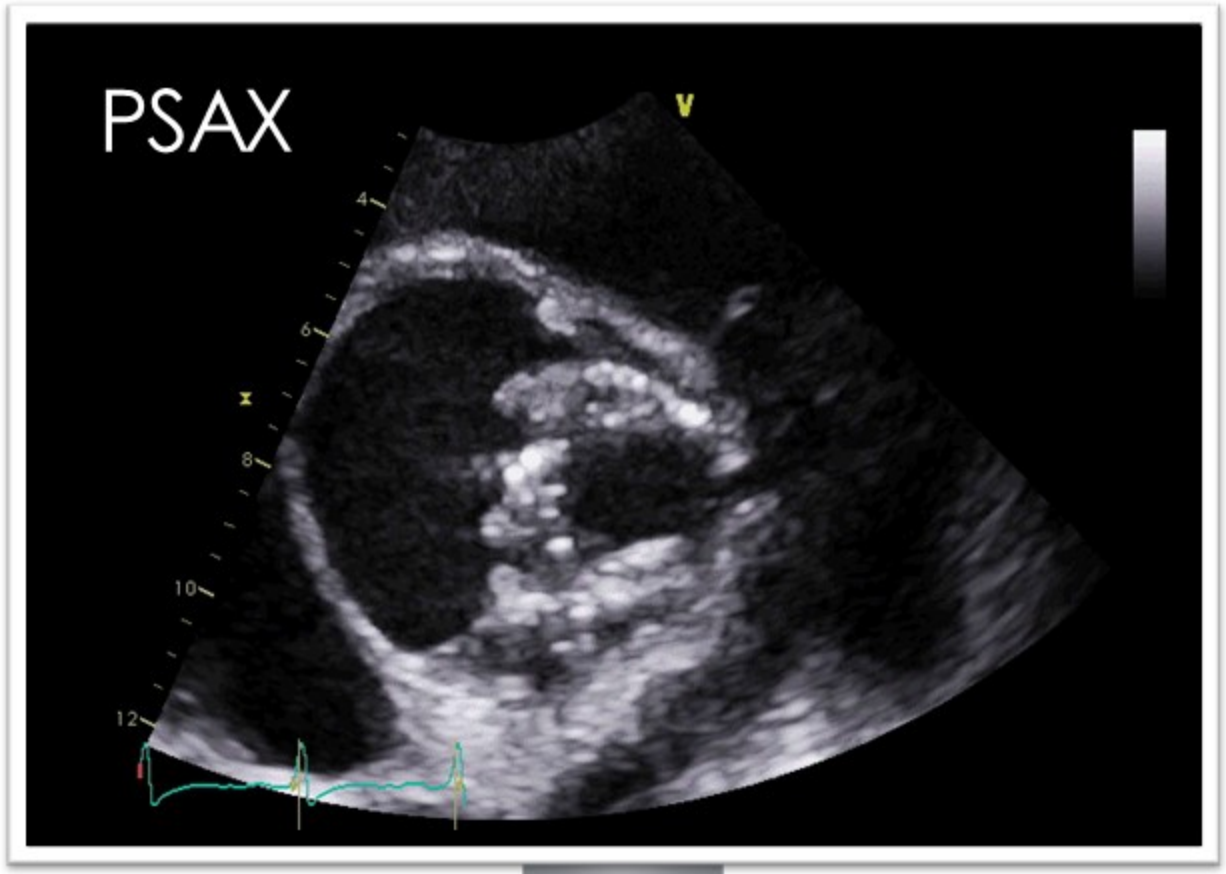
1. Not worry you at all
2. Worry you a little
3. Worry you a lot
4. Worry you heaps – call the OR now!

2 different patients

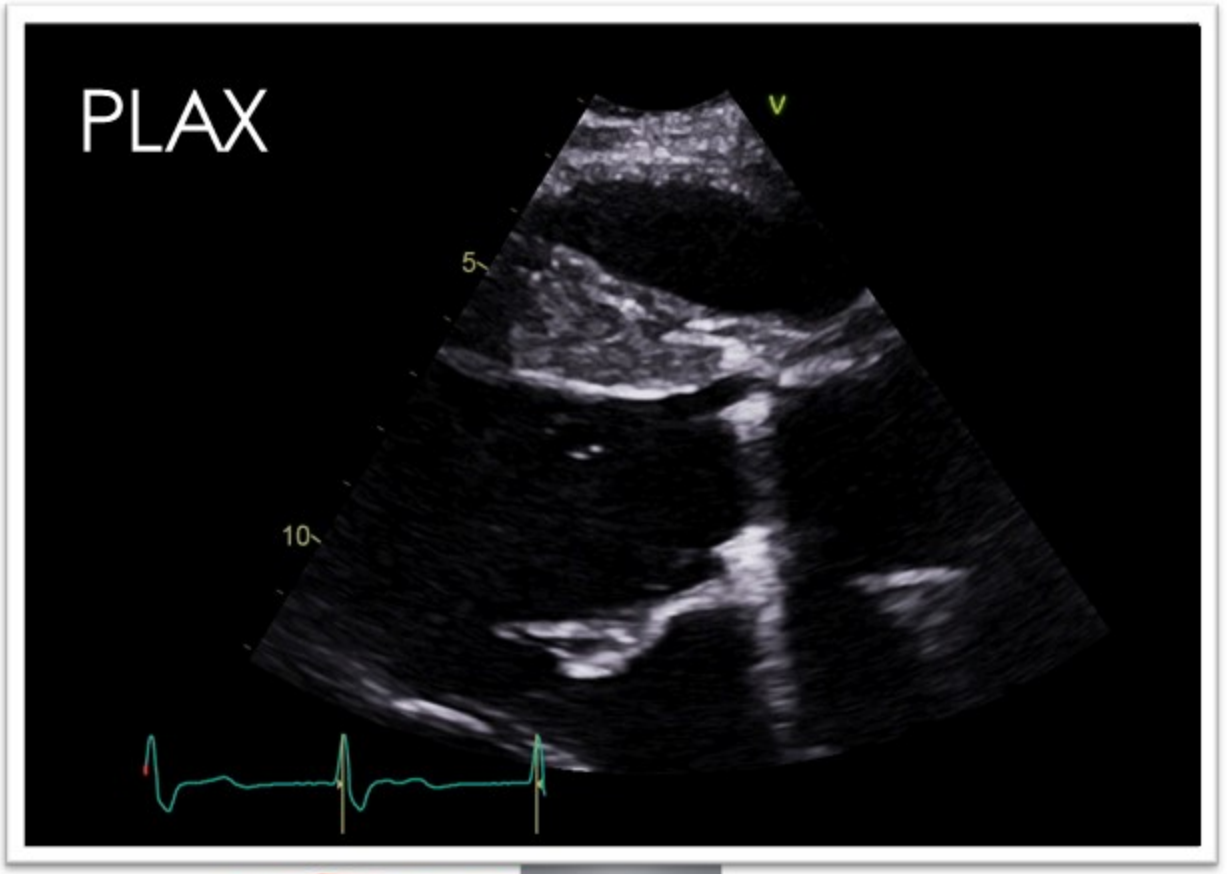
Total AVR Dehiscence

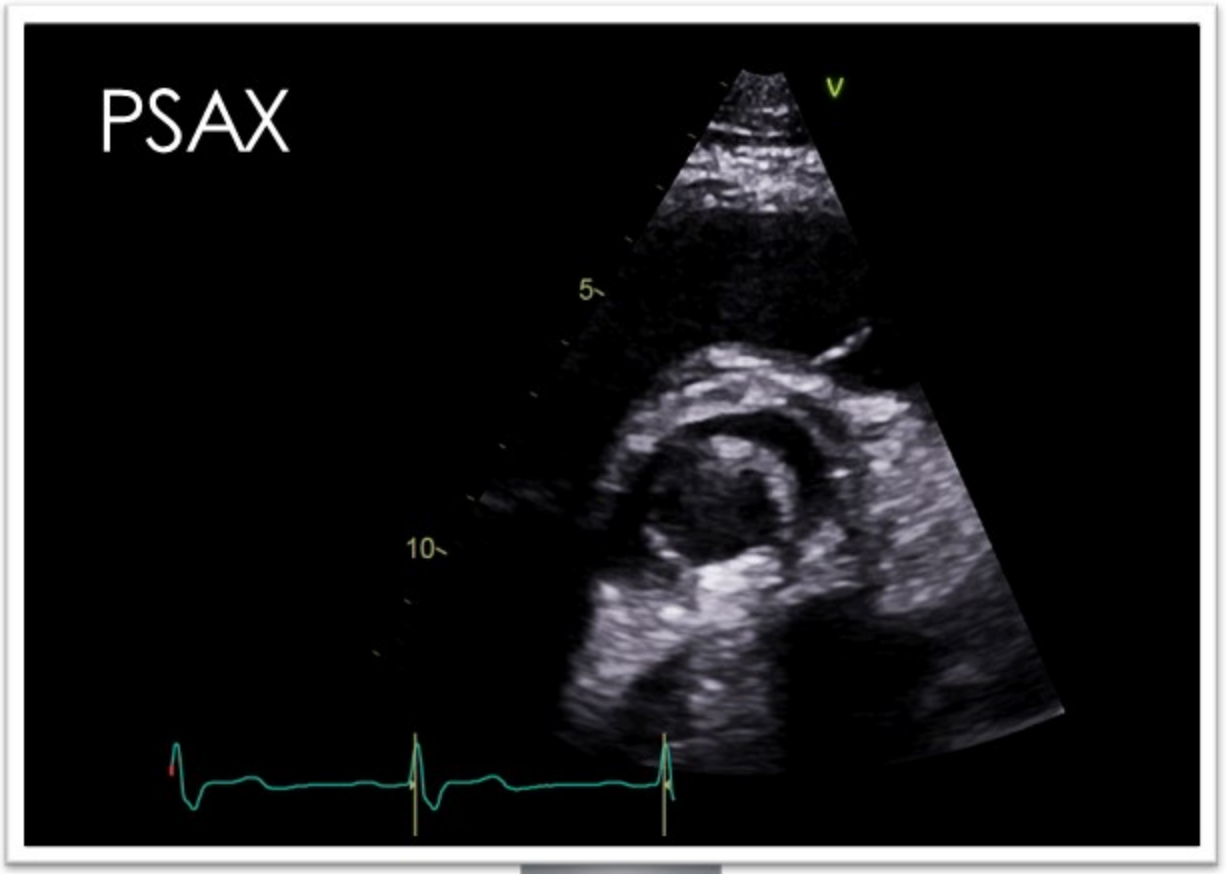


Para-aortic pseudoaneurysm



Back to our patient….





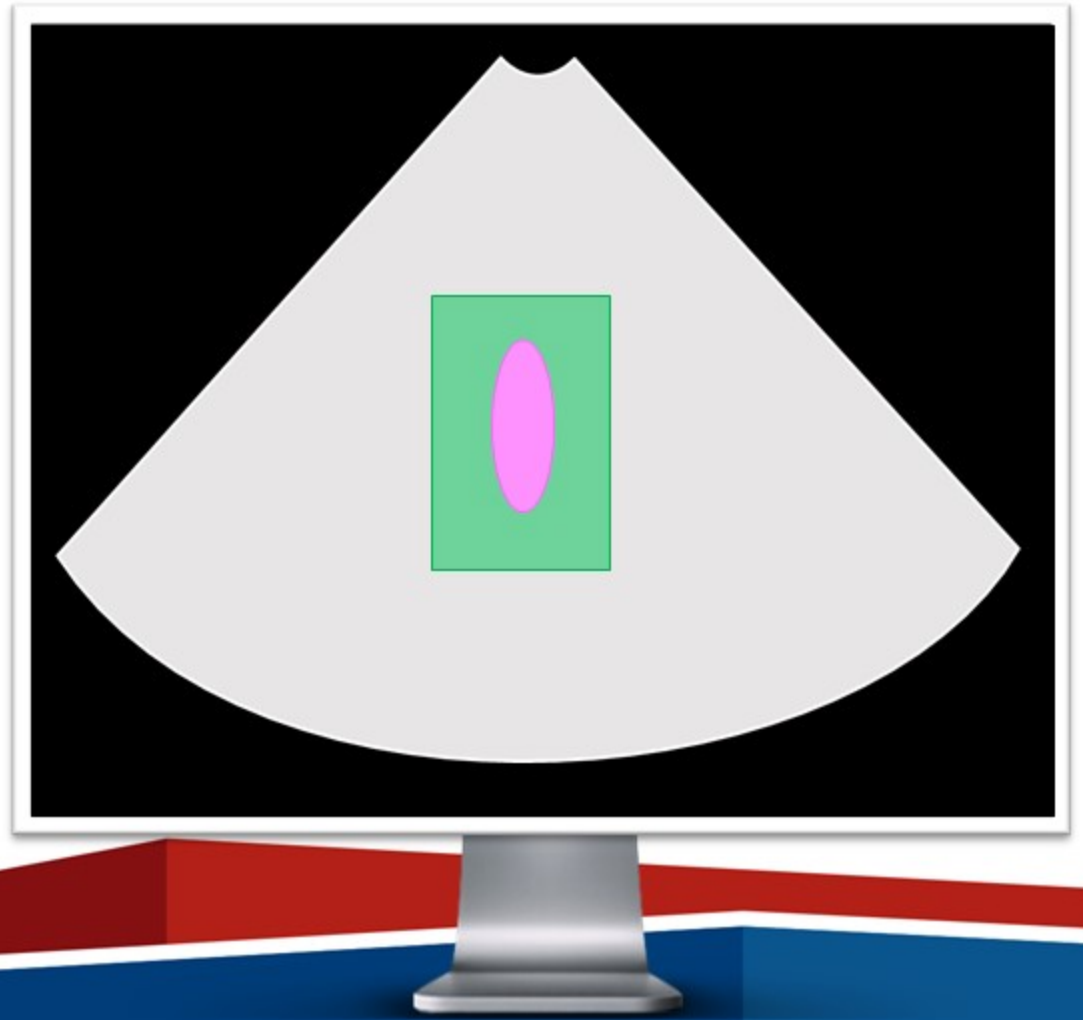
Machines perception of imaging plane thickness

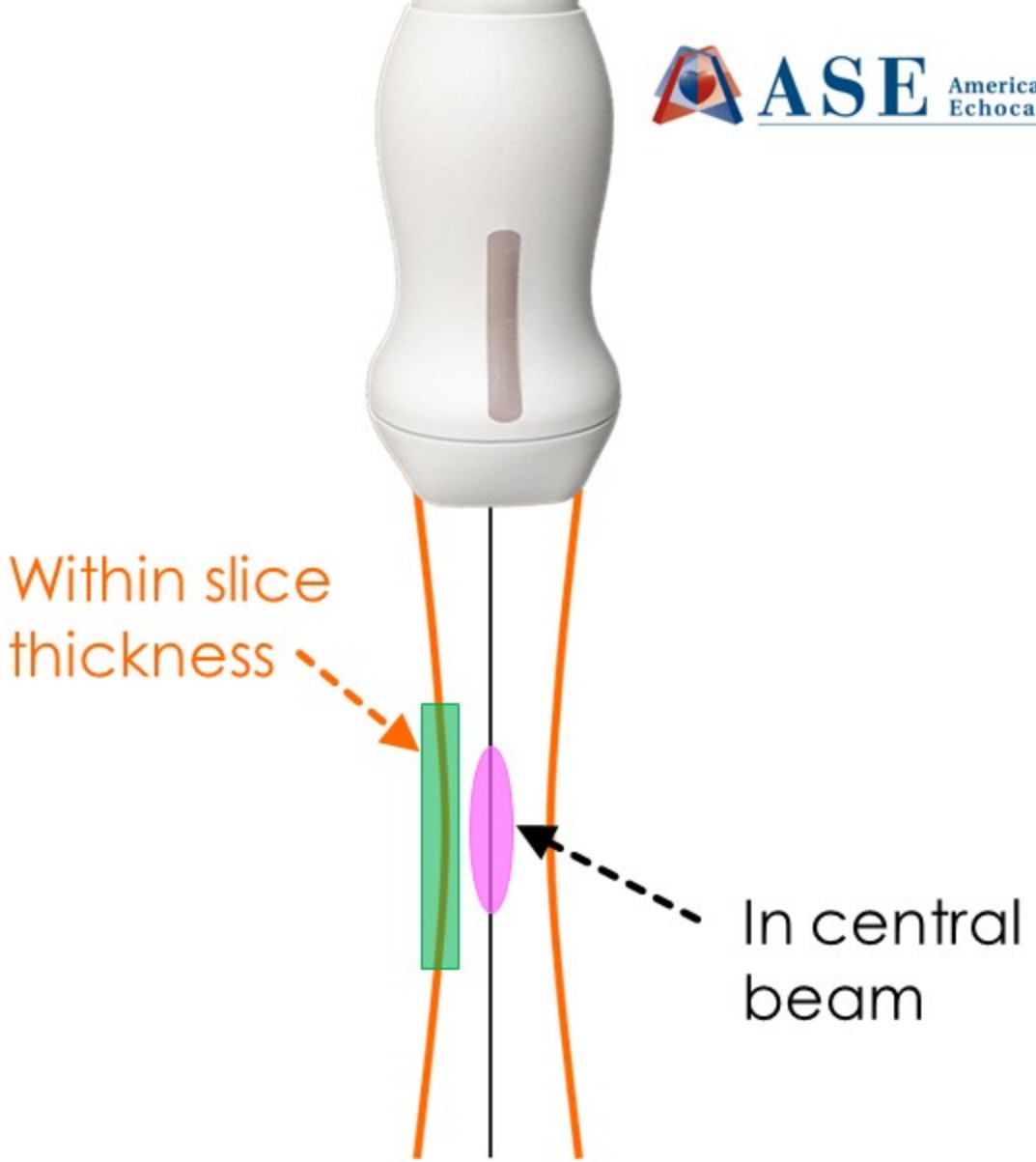
Actual imaging plane thickness

(Slice thickness)

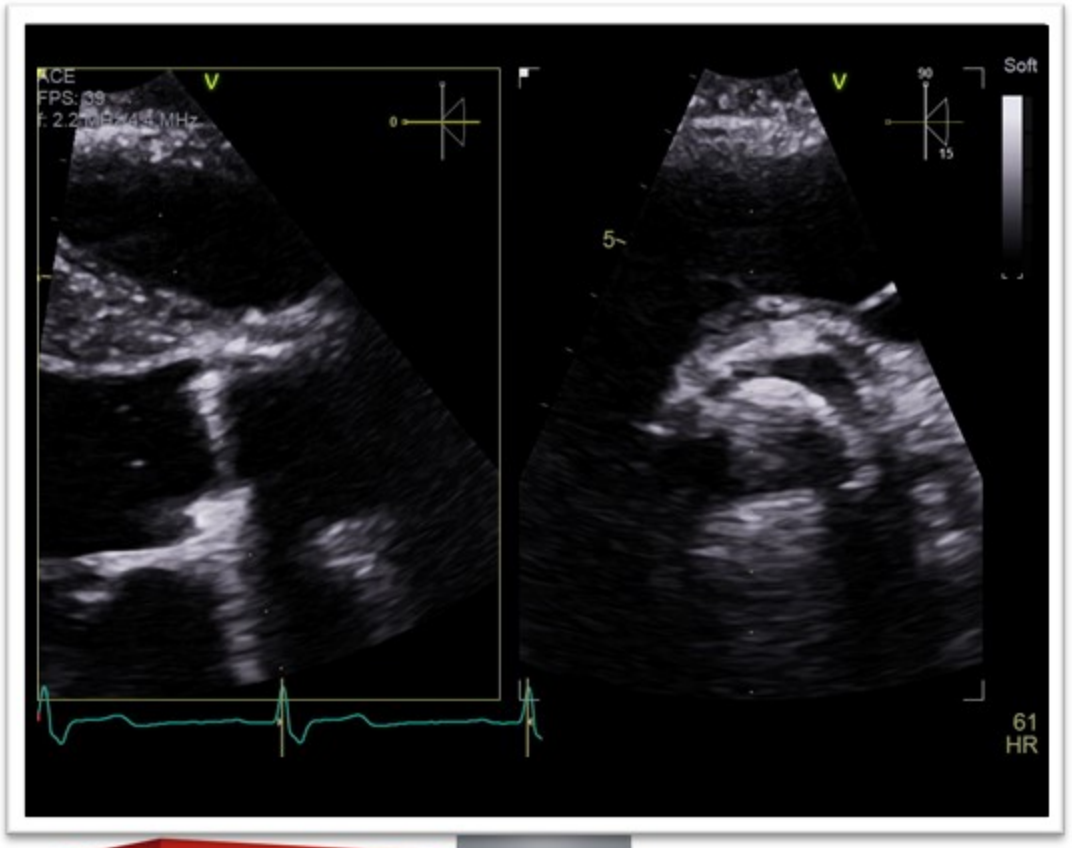
a.k.a. Elevation plane or Z plane

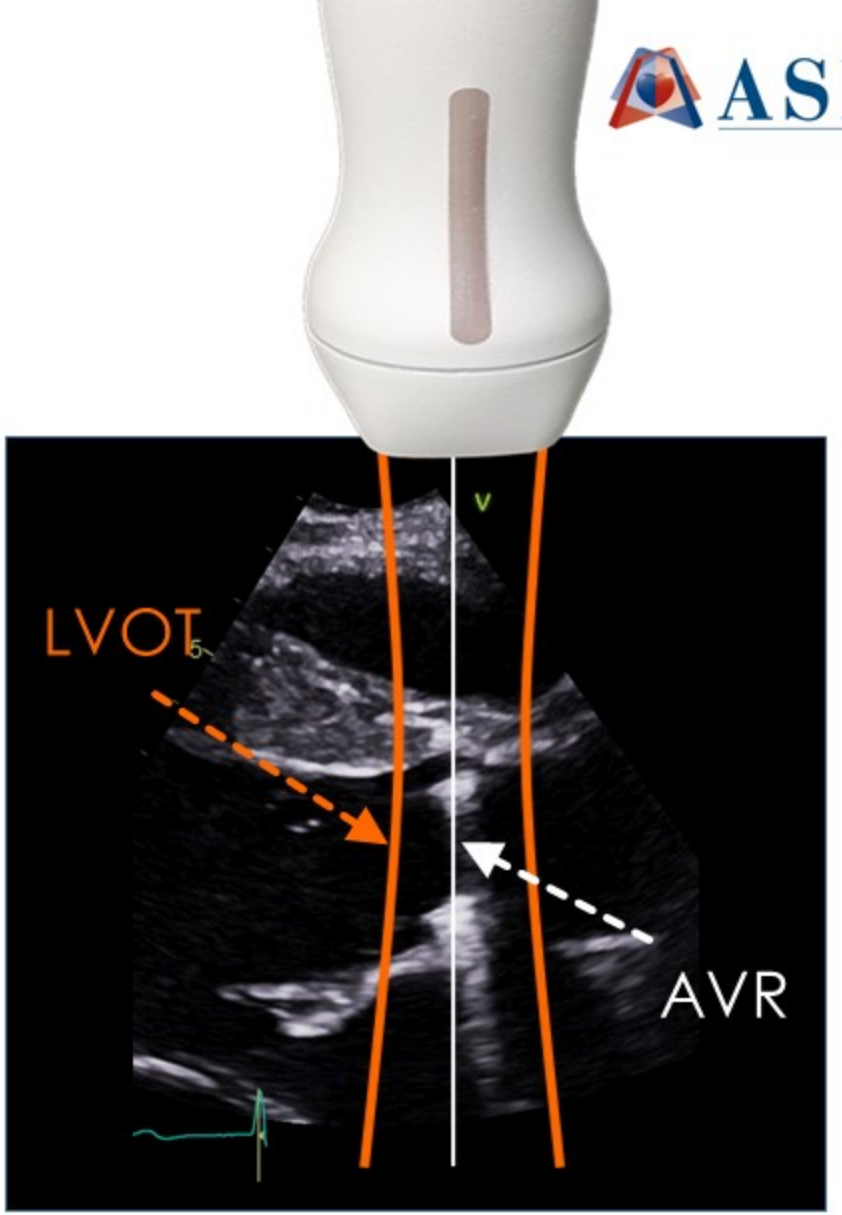
Image Display





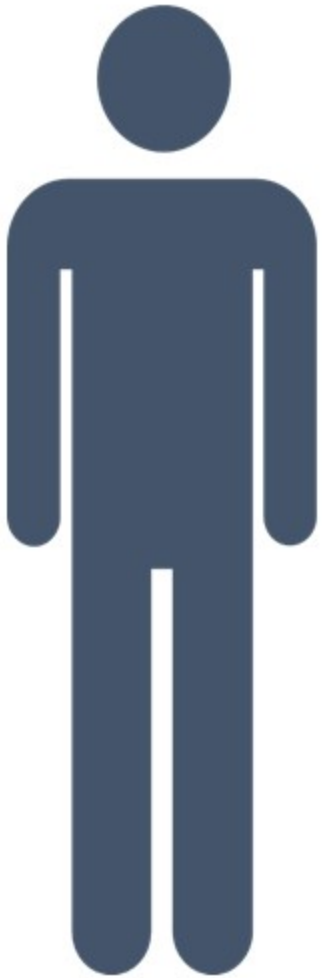
Our Patient





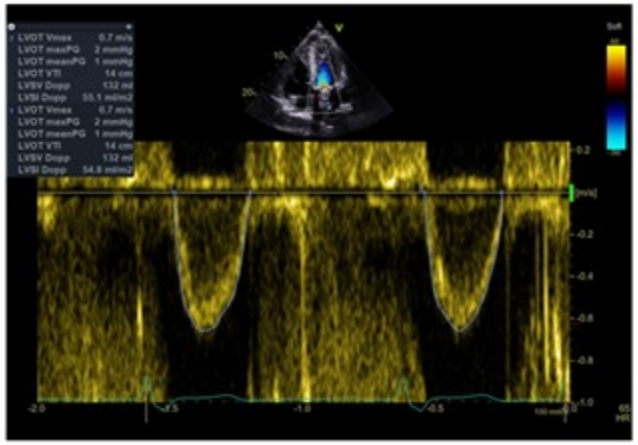
Very worrying!

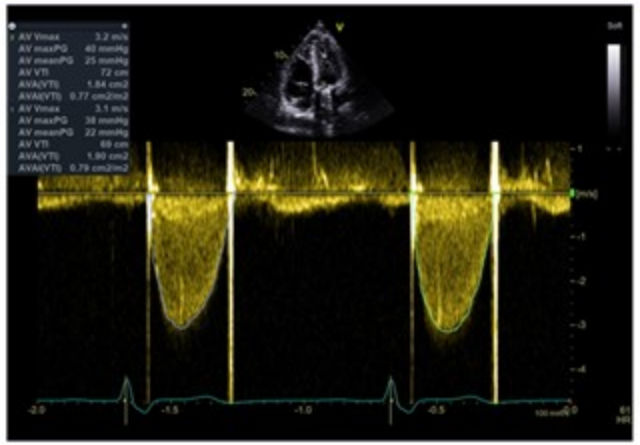
Not worrying



6'3" (193 cm)
247 lbs (112 kg)
BSA 2.43 m^2

25 mm

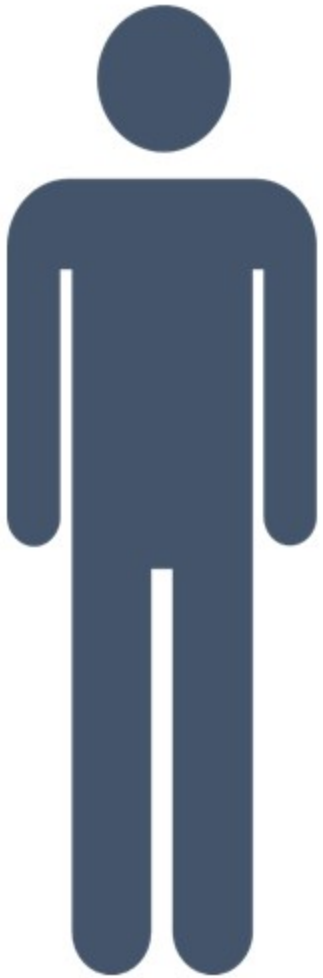




AVA = 1.87 cm^2
AVAI = 0.78 cm^2/m^2

Mild-moderate PPM

Risk of PPM



6'3" (193 cm)
247 lbs (112 kg)
BSA 2.43 m^2

25 mm

	EOAi by Prosthesis size (mm)					
Prosthesis size (mm	19	21	23	25	27	29
Average EOA (cm^2)	1.1	1.3	1.5	1.8	2.3	2.7
BSA (m^2)						
0.6	1.83	2.17	2.50	3.00	3.83	4.50
0.7	1.57	1.86	2.14	2.57	3.29	3.86
0.8	1.38	1.63	1.88	2.25	2.88	3.38
0.9	1.22	1.44	1.67	2.00	2.56	3.00
1	1.10	1.30	1.50	1.80	2.30	2.70
1.1	1.00	1.18	1.36	1.64	2.09	2.45
1.2	0.92	1.08	1.25	1.50	1.92	2.25
1.3	0.85	1.00	1.15	1.38	1.77	2.08
1.4	0.79	0.93	1.07	1.29	1.64	1.93
1.5	0.73	0.87	1.00	1.20	1.53	1.80
1.6	0.69	0.81	0.94	1.13	1.44	1.69
1.7	0.65	0.76	0.88	1.06	1.35	1.59
1.8	0.61	0.72	0.83	1.00	1.28	1.50
1.9	0.58	0.68	0.79	0.95	1.21	1.42
2	0.55	0.65	0.75	0.90	1.15	1.35
2.1	0.52	0.62	0.71	0.86	1.10	1.29
2.2	0.50	0.59	0.68	0.82	1.05	1.23
2.3	0.48	0.57	0.65	0.78	1.00	1.17
2.4	0.46	0.54	0.63	0.75	0.96	1.13
2.5	0.44	0.52	0.60	0.72	0.92	1.08

iEOA > 0.85 cm^2/m^2

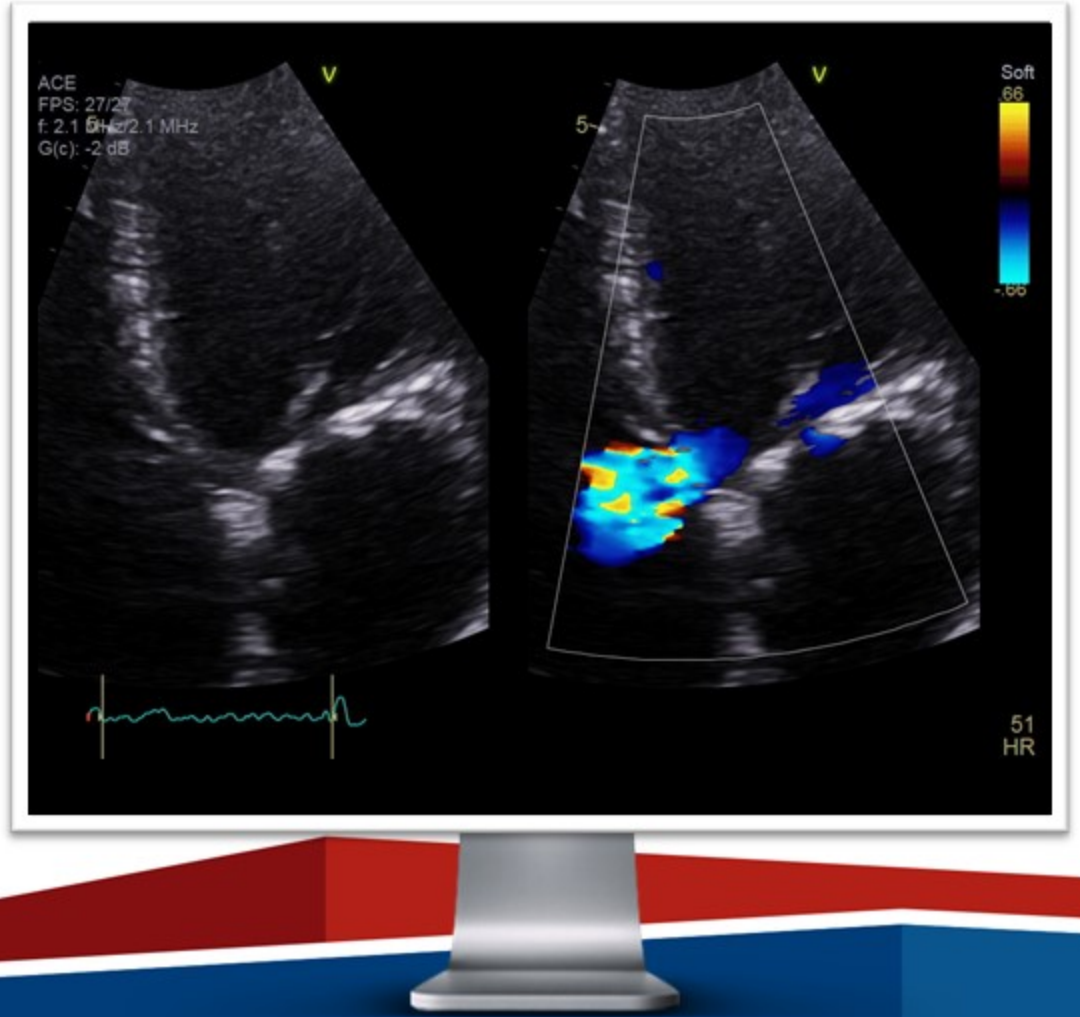
Borderline

Risk of PPM

P Pibarot and J G Dumesnil. Heart. 2006 Aug; 92(8): 1022–1029.

Clip #4

A 42 yo male post AVR + MV annuloplasty. History of coarctation repair as neonate, PDA ligation & secundum ASD repair at 9 mths

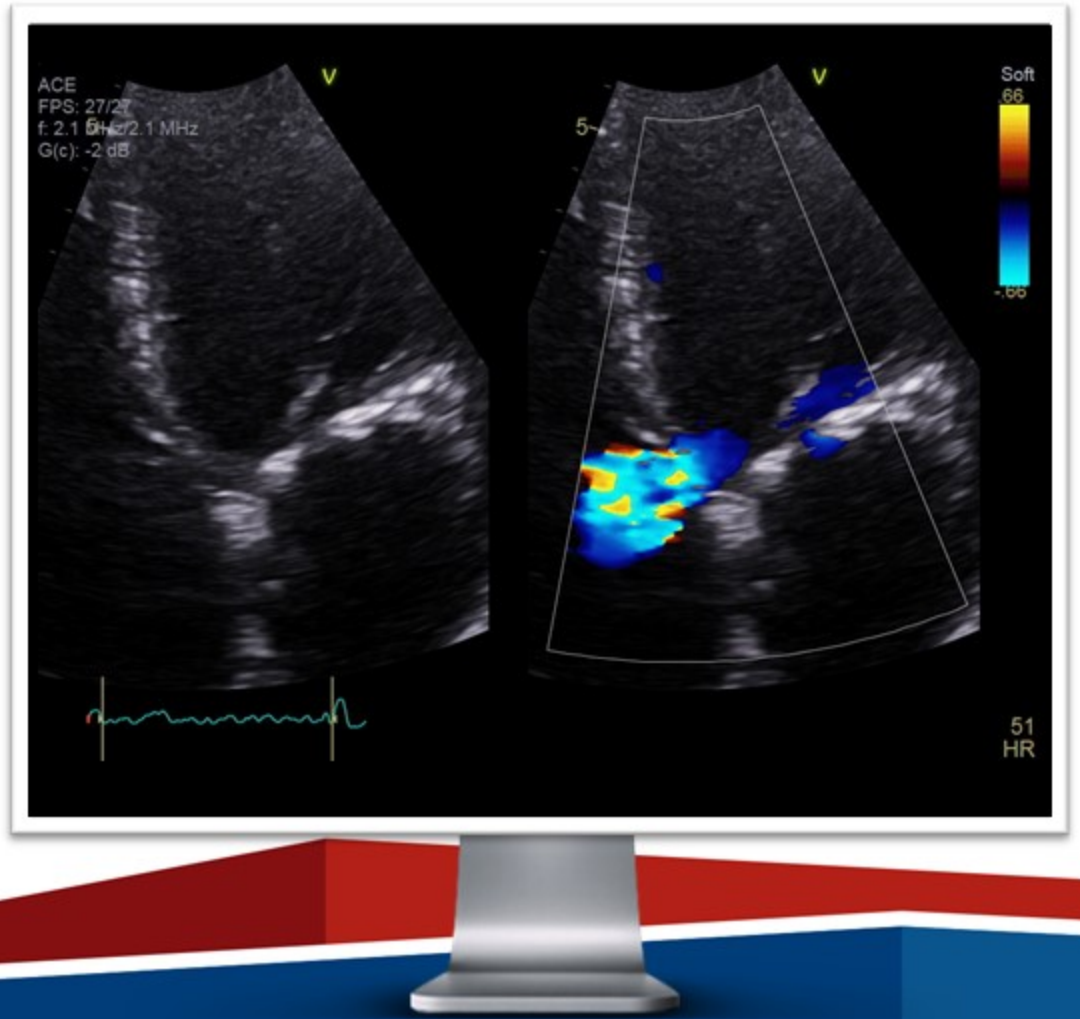


What's the origin of this color jet?

1. Gerbode defect
2. Anomalous coronary artery
3. Eccentric (paravalvular) AR
4. Residual ASD

Clip #4

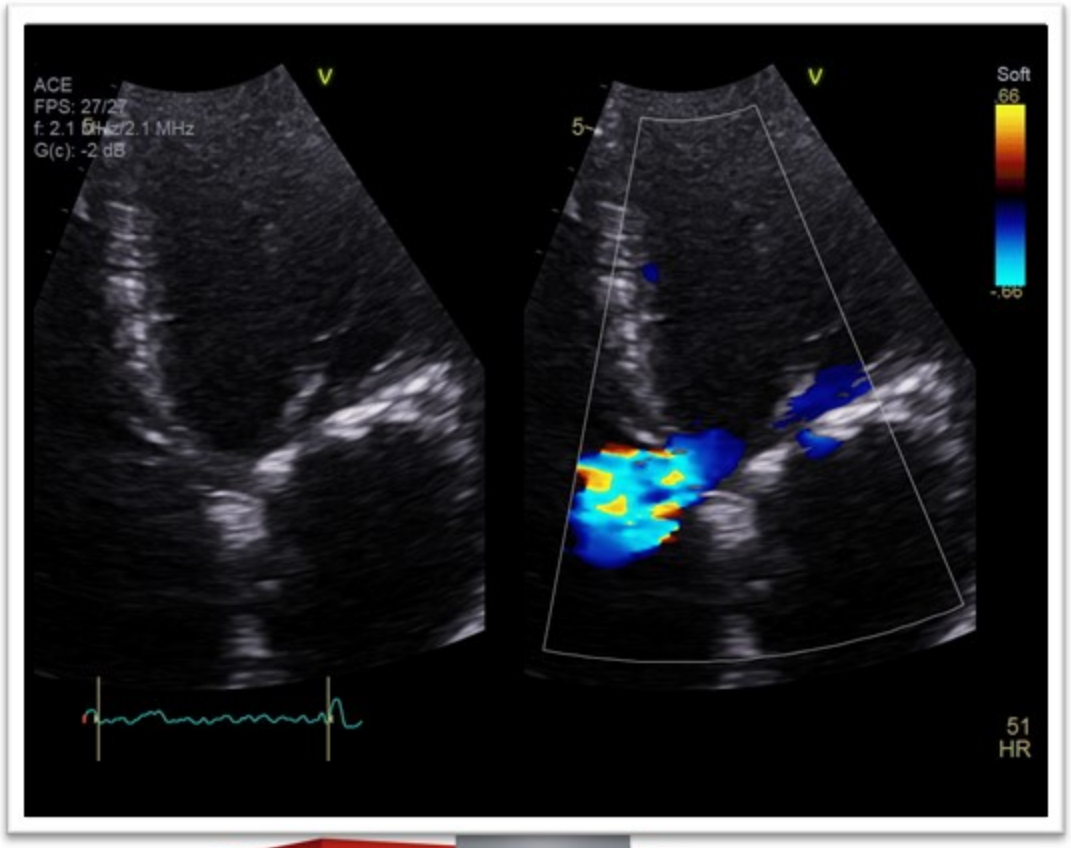
A 42 yo male post AVR + MV annuloplasty. History of coarctation repair as neonate, PDA ligation & secundum ASD repair at 9 mths



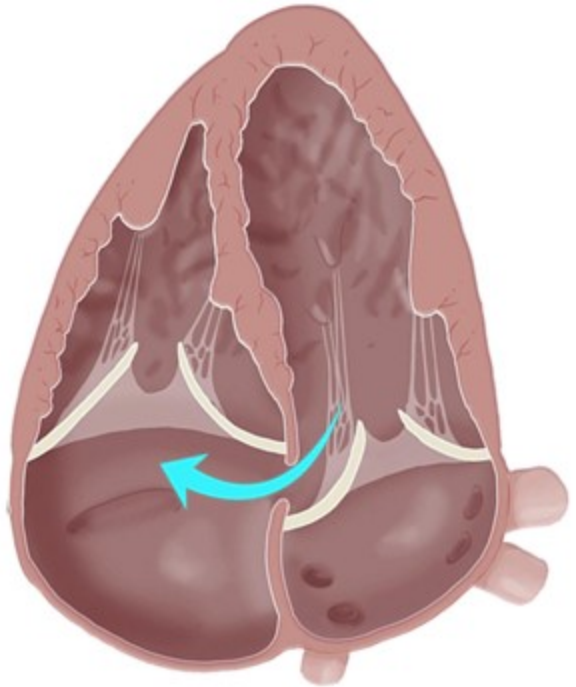
What's the origin of this color jet?

1. **Gerbode defect**
2. Anomalous coronary artery
3. Eccentric (paravalvular) AR
4. Residual ASD

Gerbode defect (A.K.A. AV septal defect)



Systole (LV-to-RA) shunt
LVSP >> RAP



Diastole (RA-to-LV) shunt
RAP > LVDP

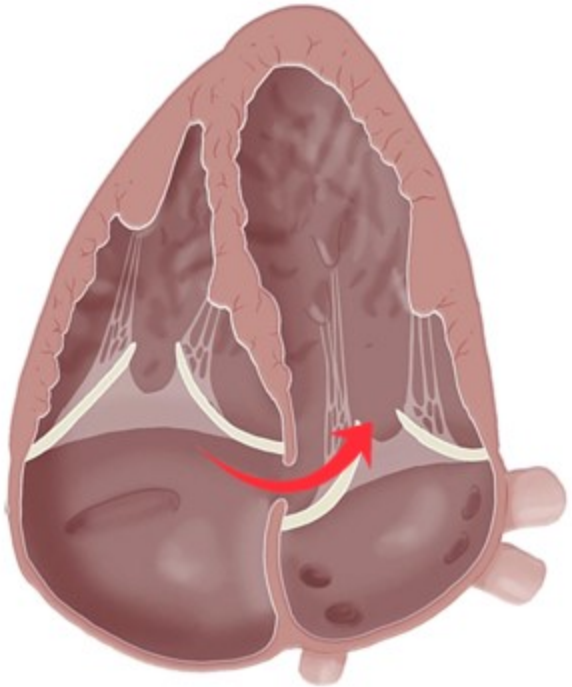
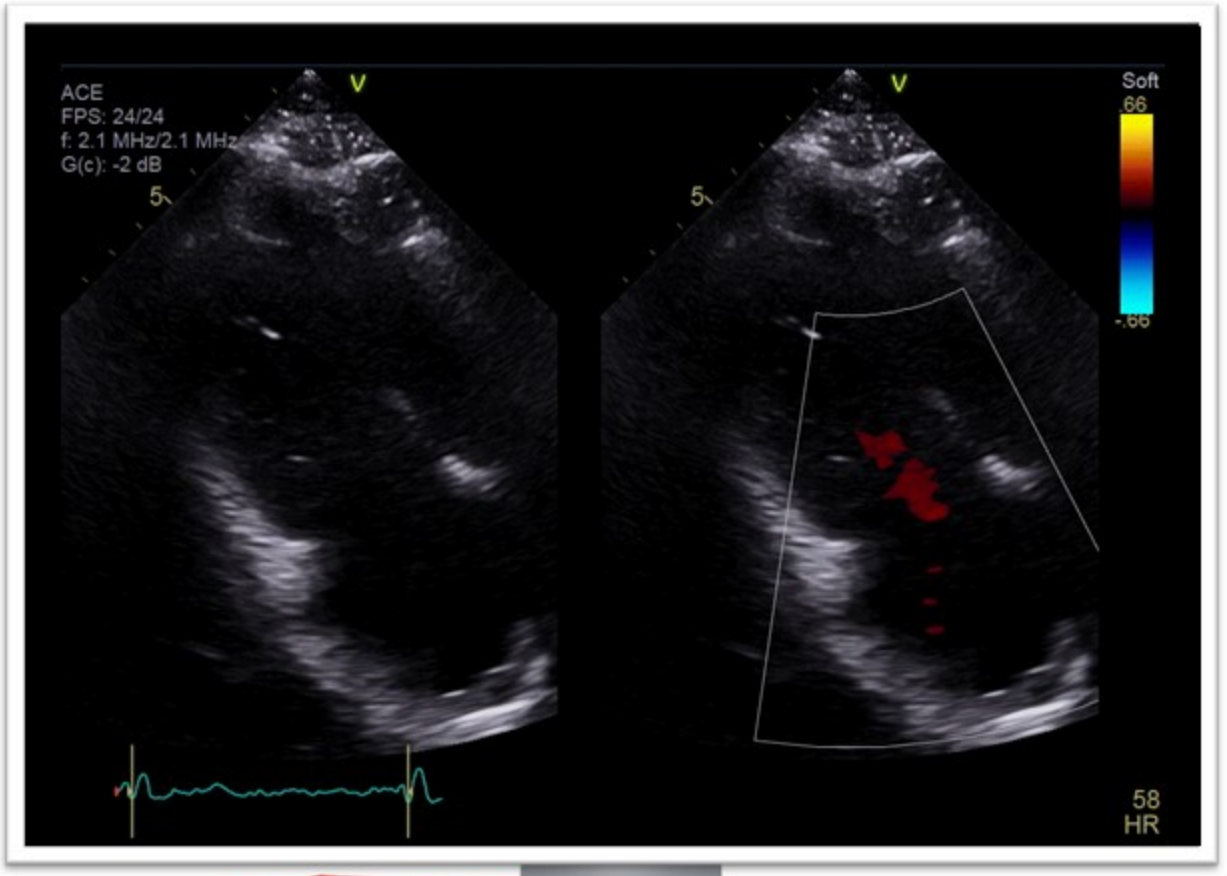
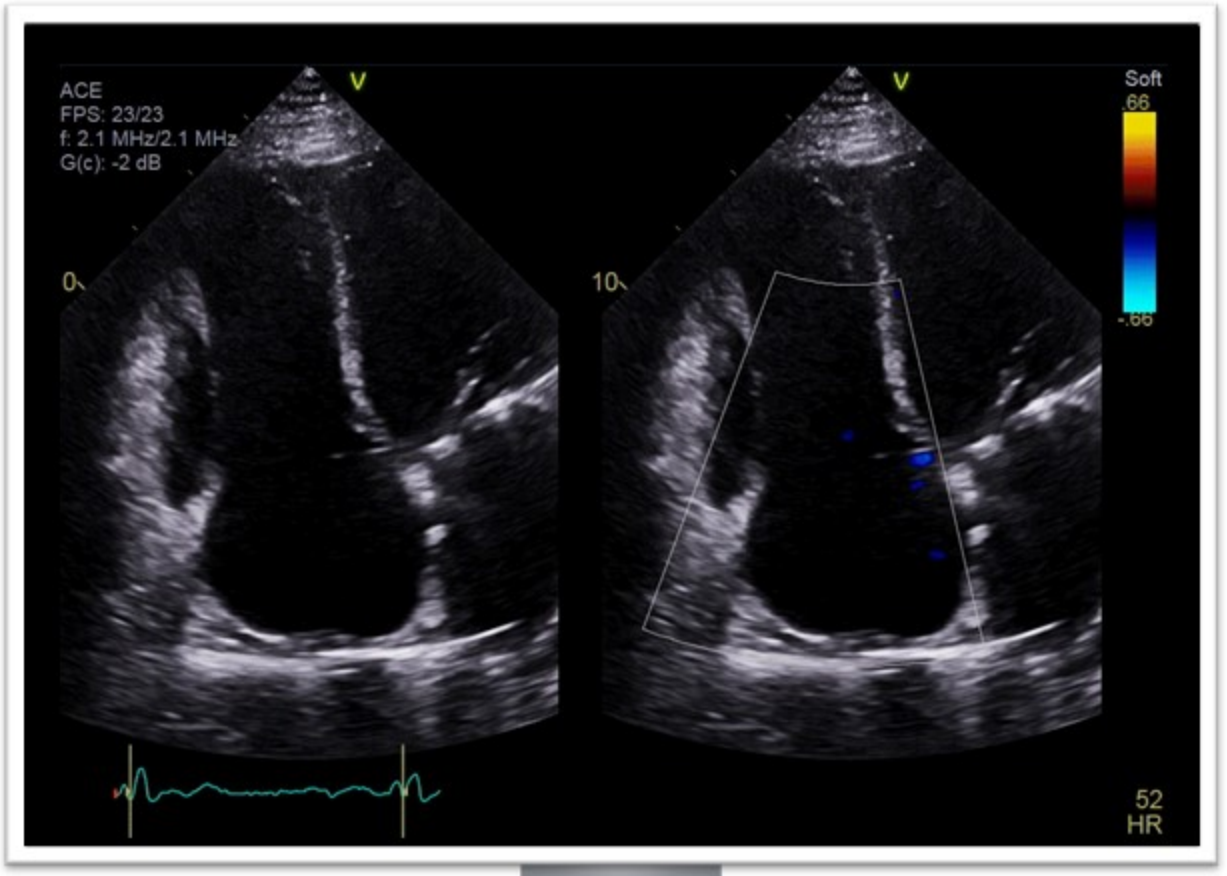


Illustration adapted from Saker E, et al. J Saudi Heart Assoc. 2017 Oct;29(4):283-292.

↑ RAP due to severe TR ± RV dysfunction





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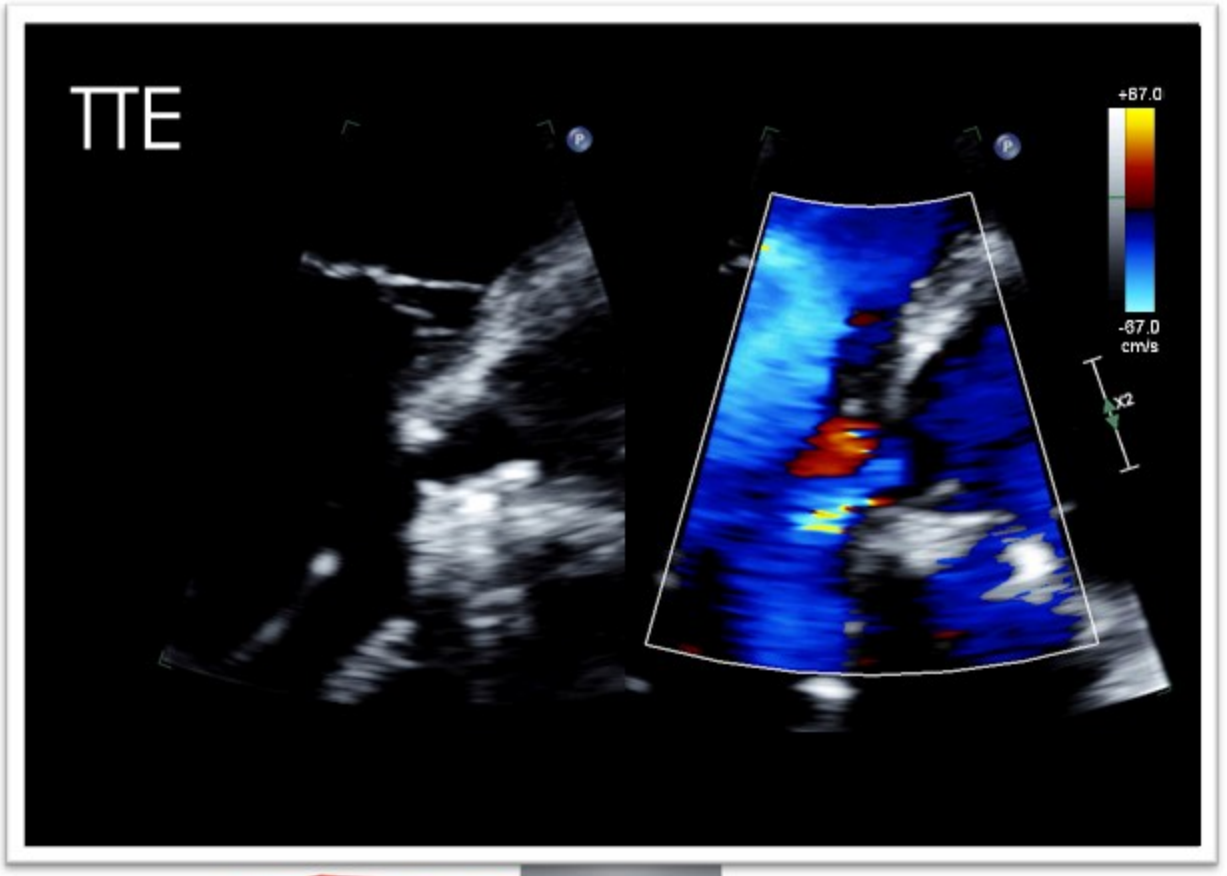
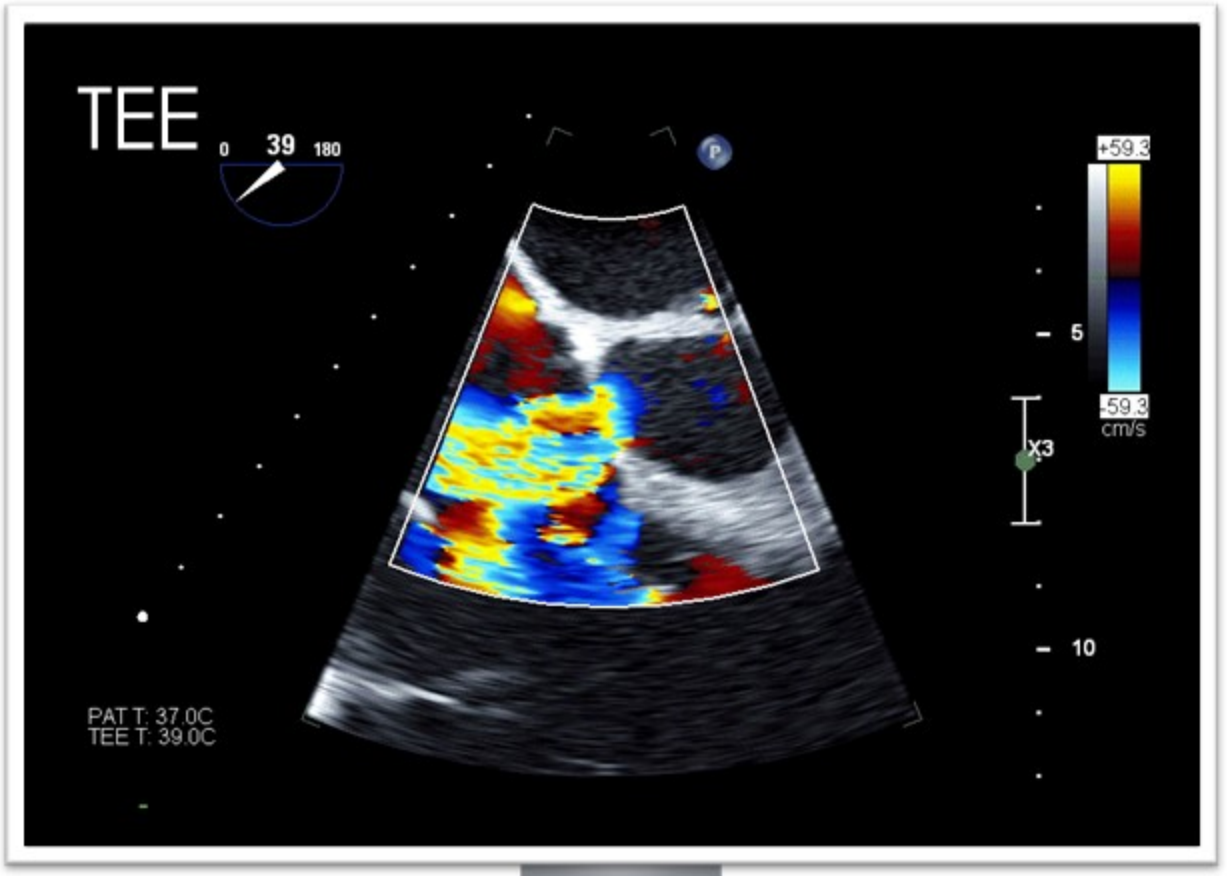
Off-axis imaging crucial to diagnosis





Clip #5

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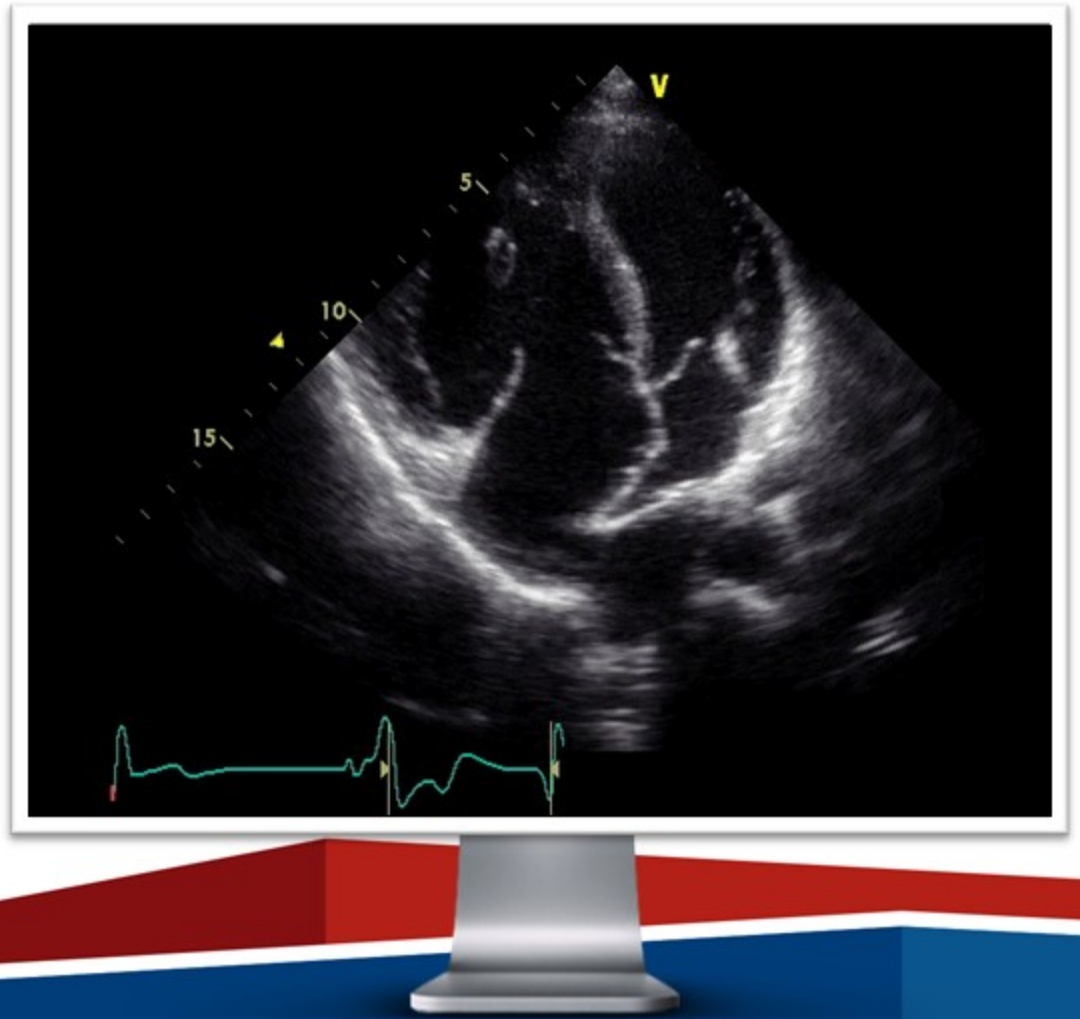
A 23 yo male with "congenital heart disease" presents for an echocardiogram.



What's the most likely diagnosis?

1. Cor triatriatum sinister
2. Large superior sinus venous ASD
3. Senning repair for d-TGA
4. Total anomalous pulmonary venous connection

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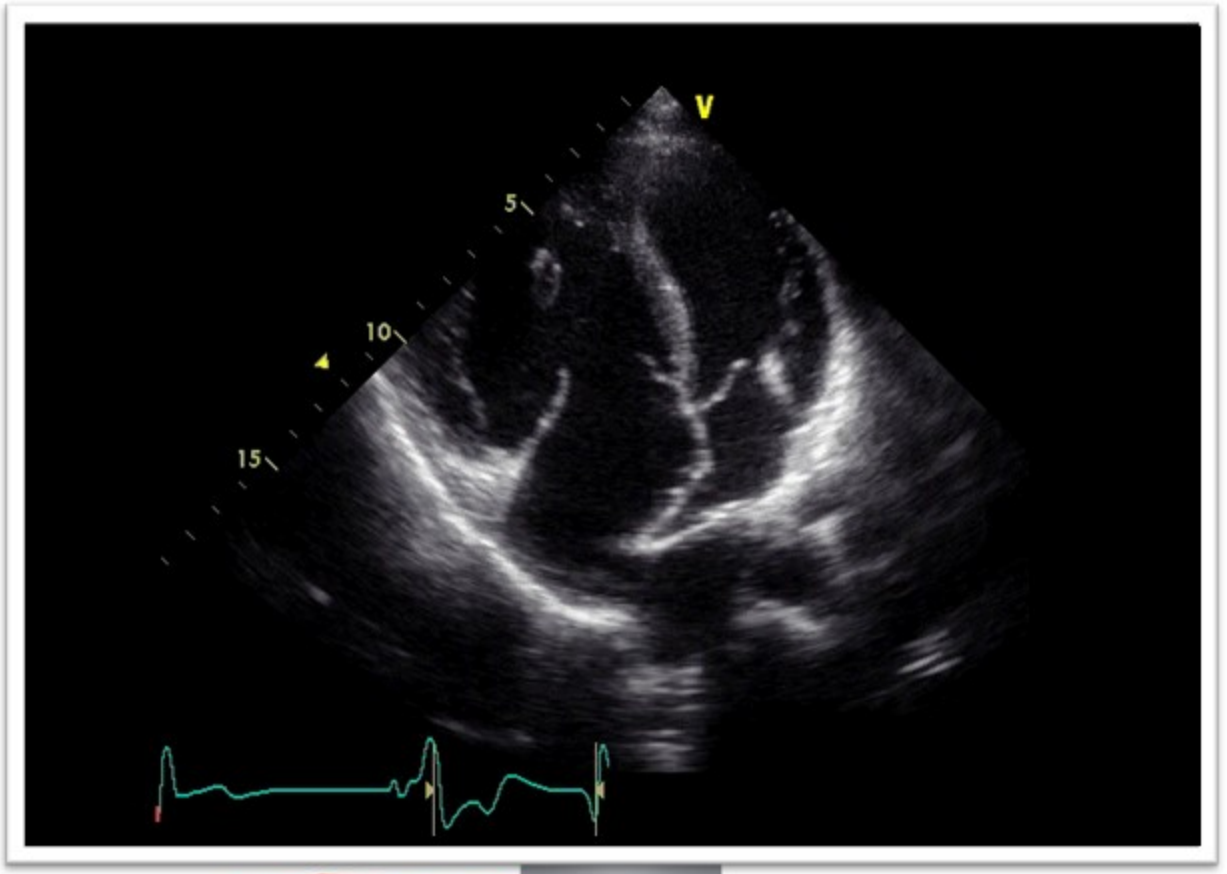
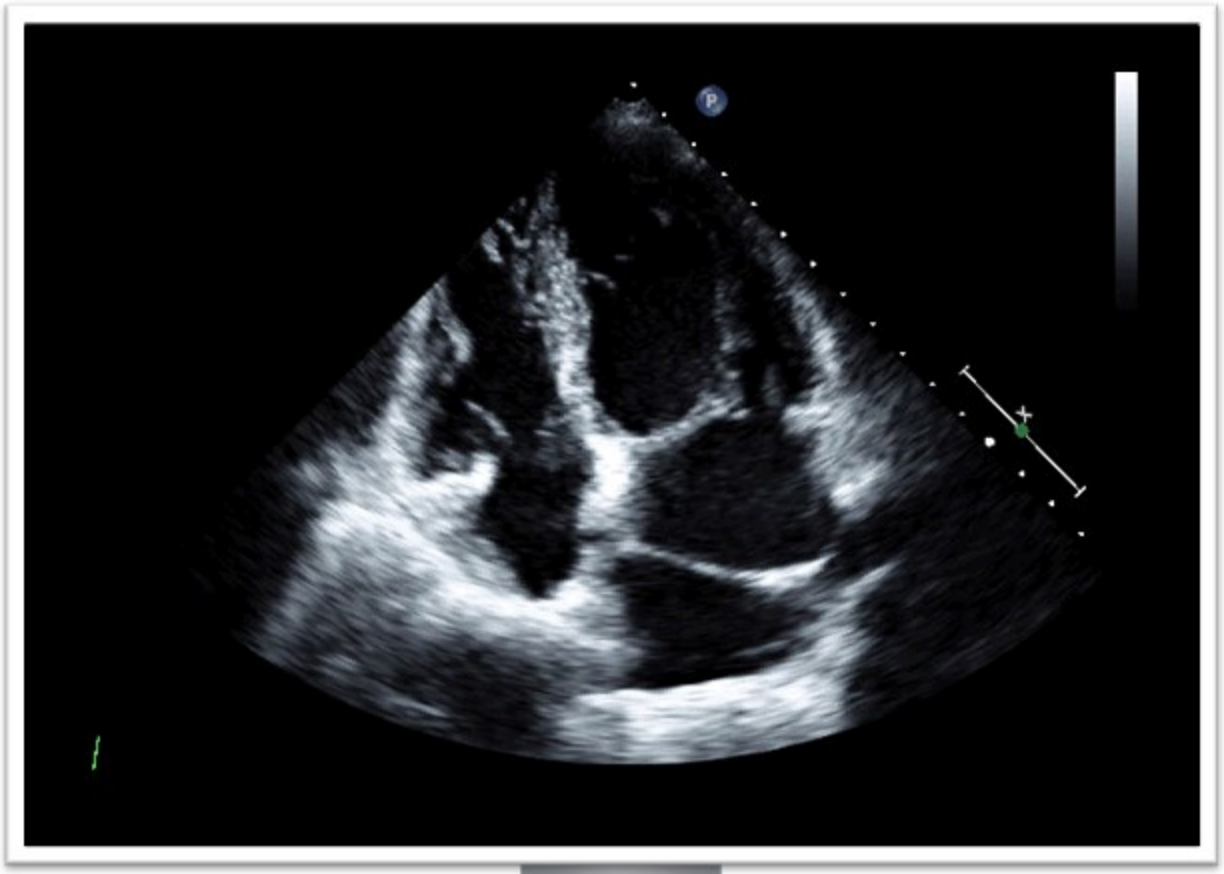
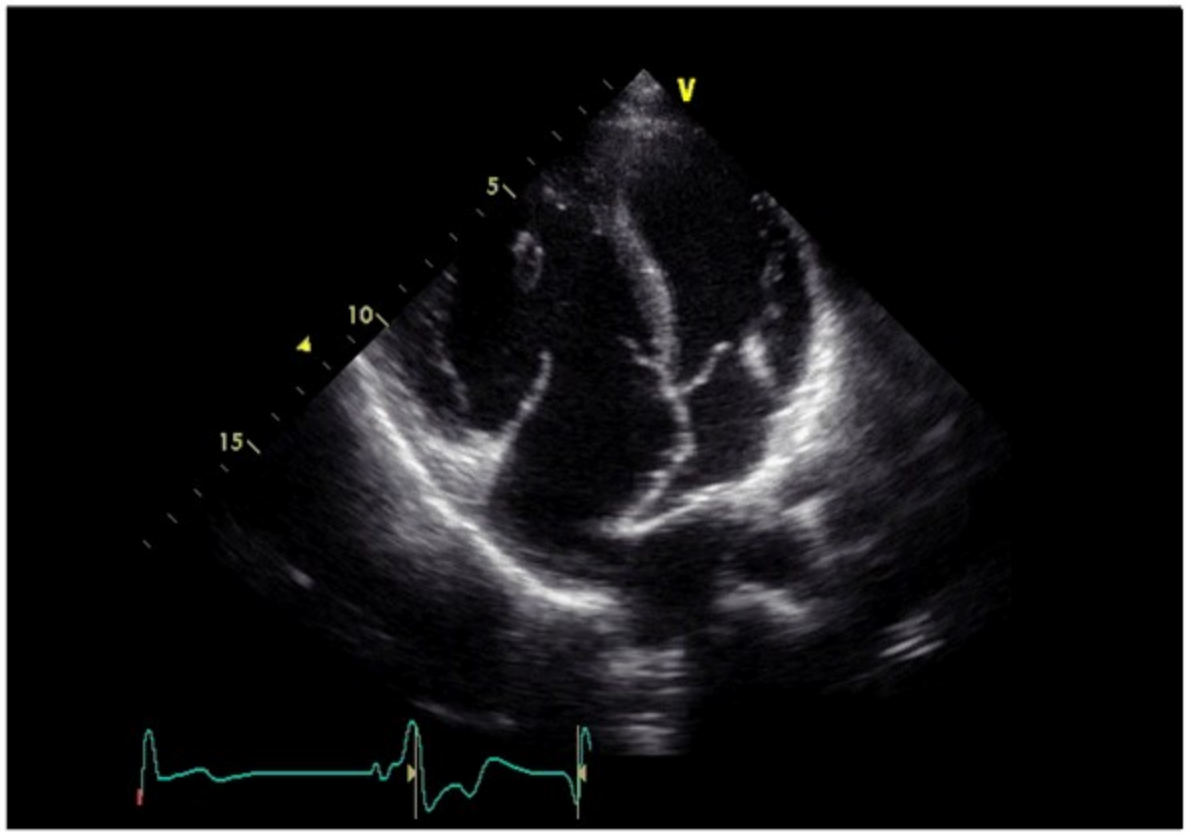
Our example
Not cor triatriatum sinister



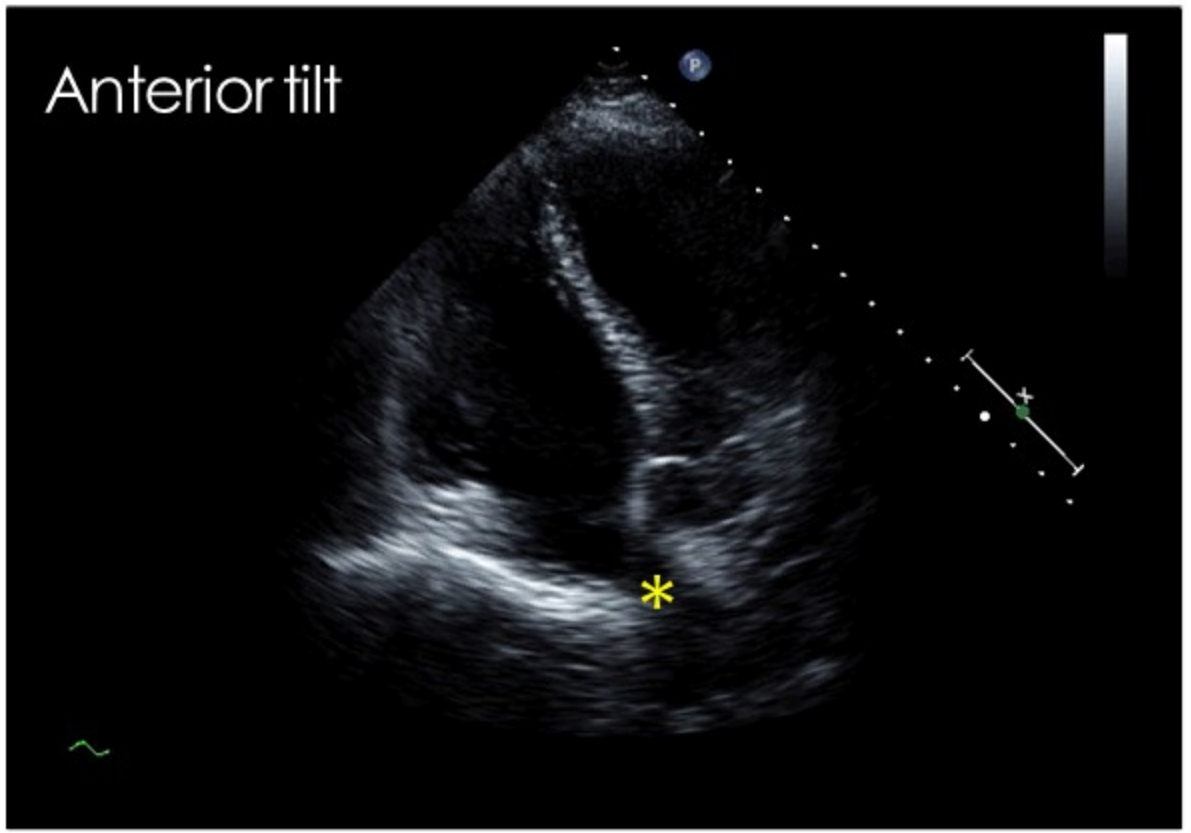
Cor triatriatum sinister



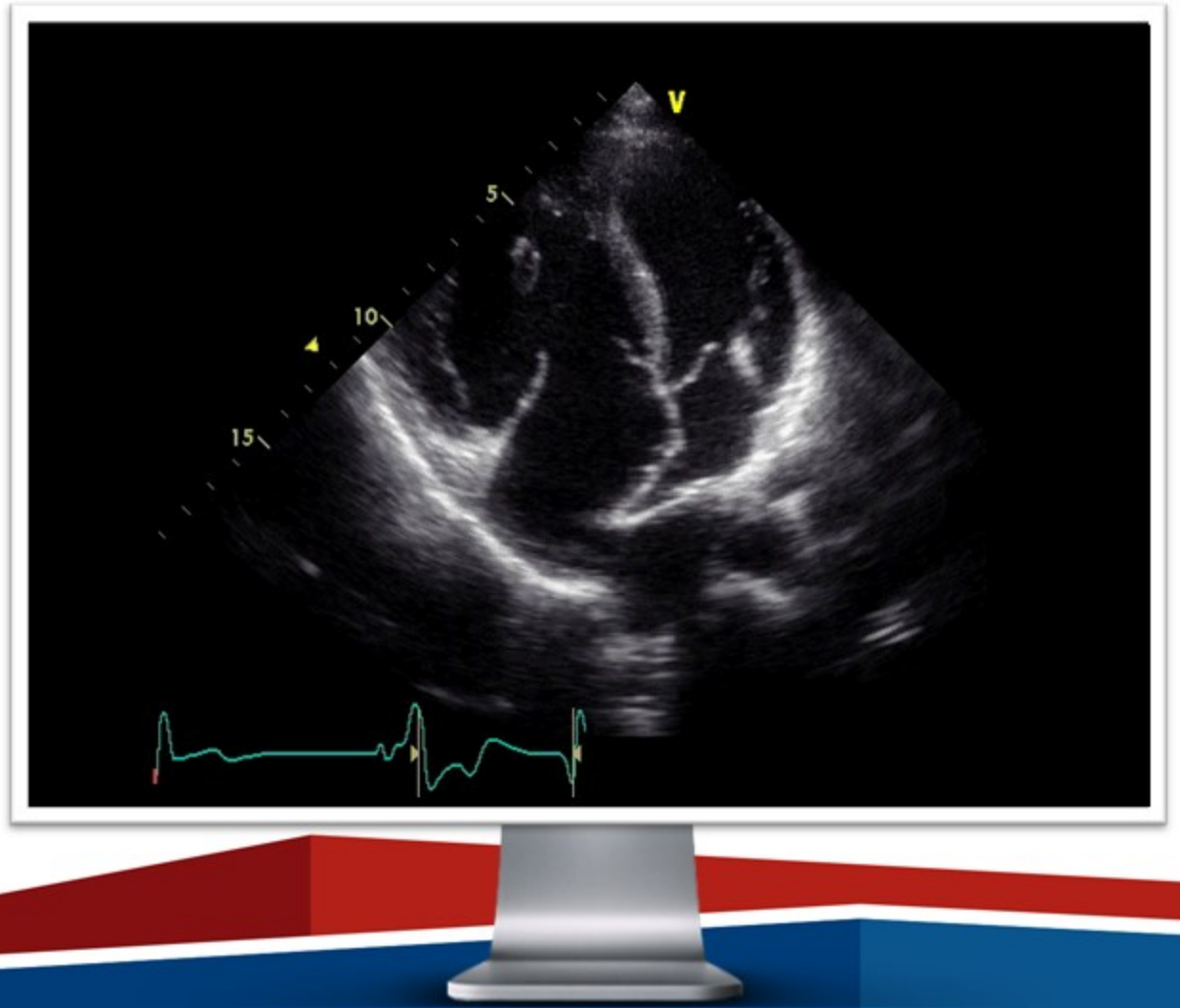
Our example
Not superior SV ASD



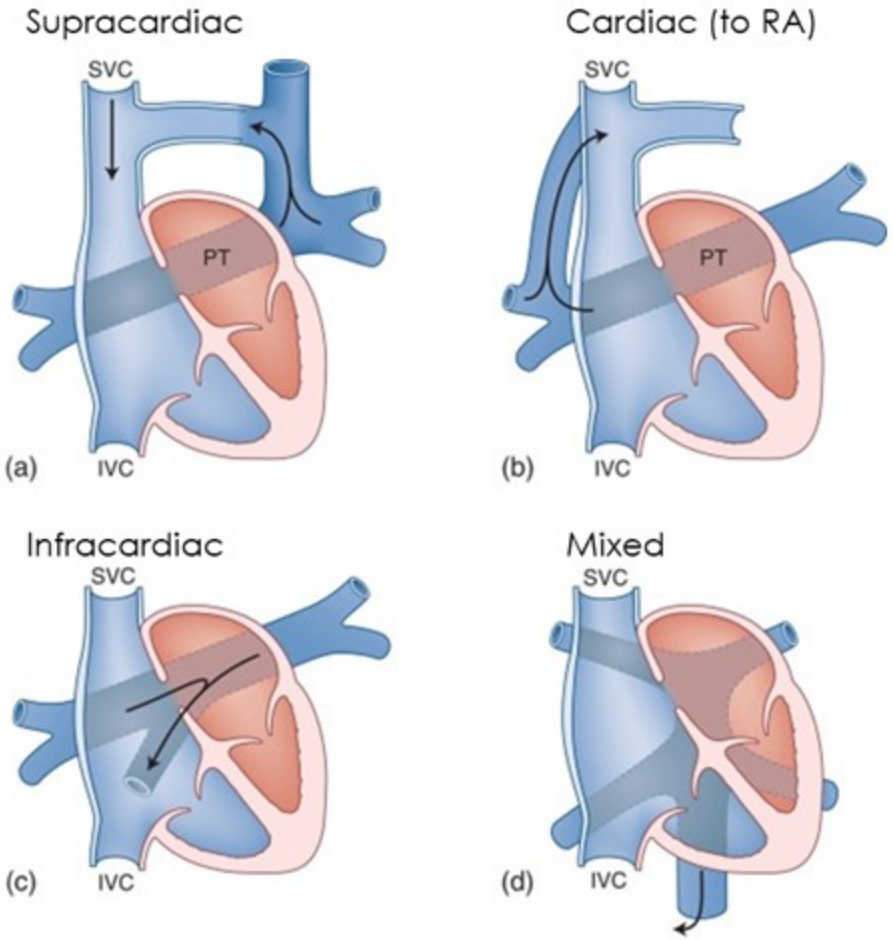
Superior SV ASD



Our example
Not TAPVC



TAPVC



From Congenital Heart Disease. G. Ottaviani, L.M. Buja, in Cardiovascular Pathology (Fourth Edition), p. 629, 2016

Clip #5

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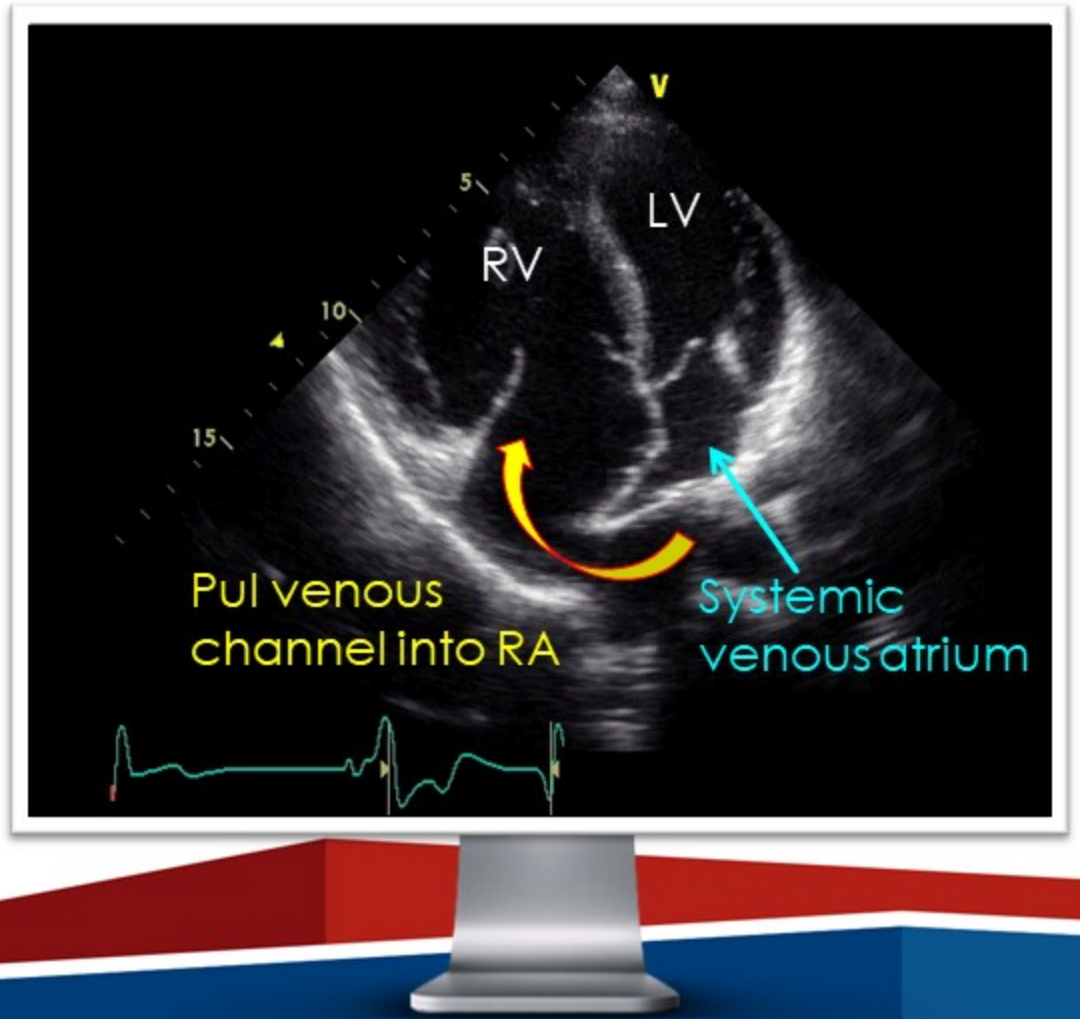
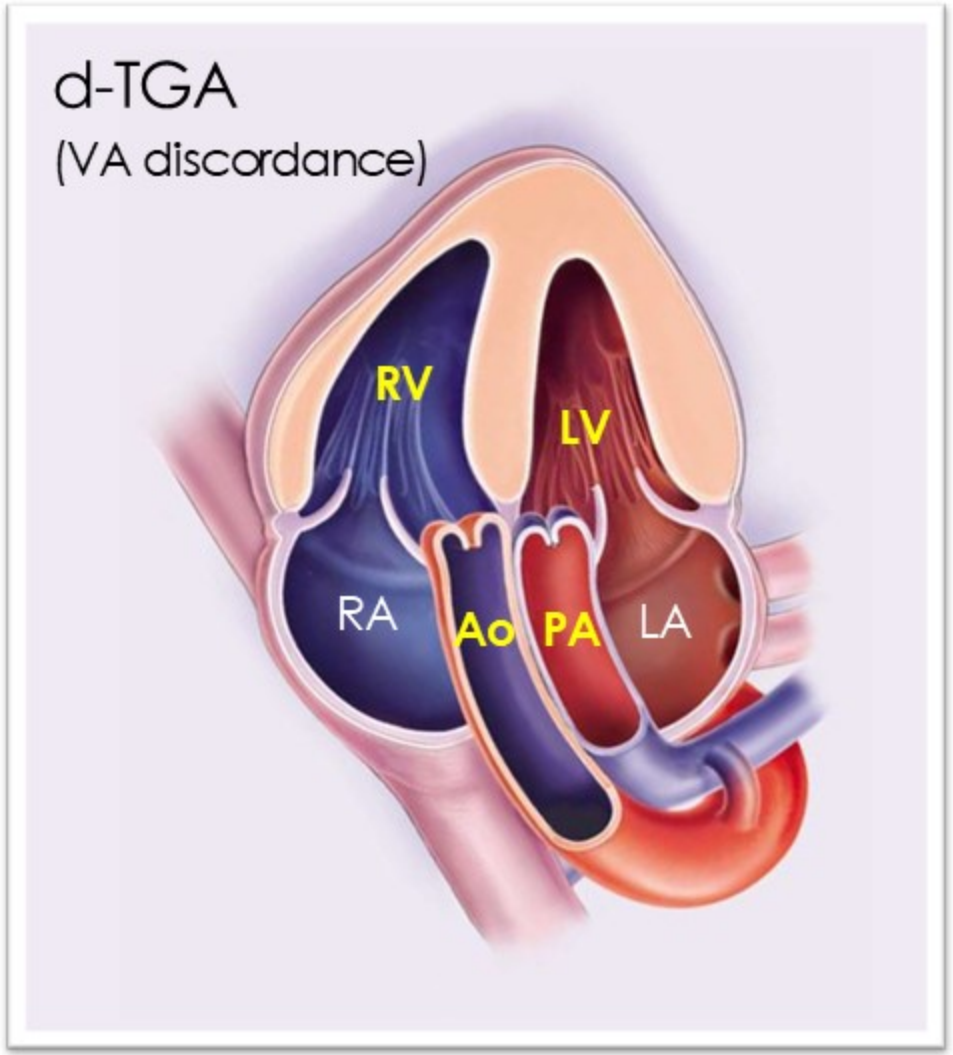
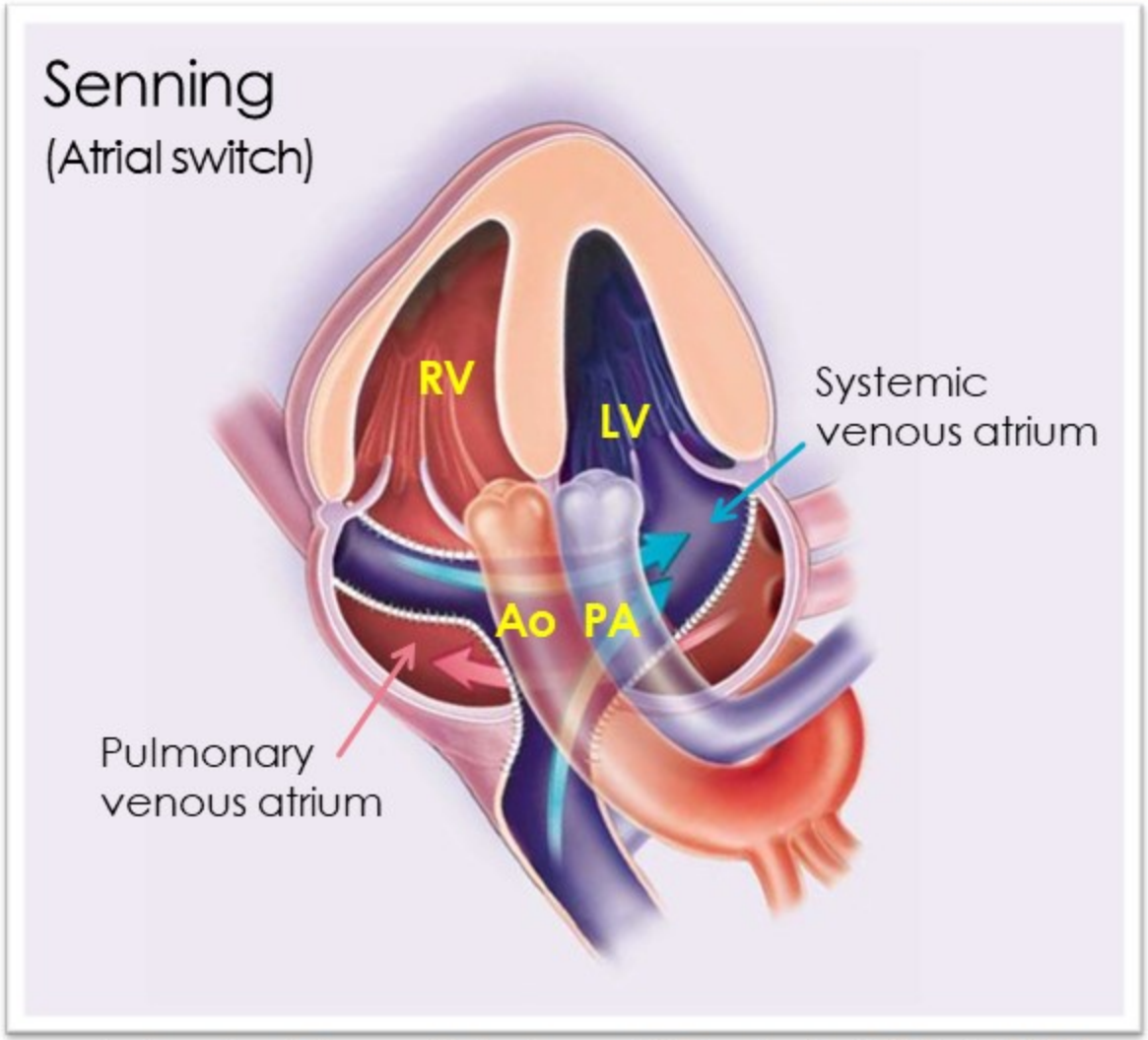
A 23 yo male with "congenital heart disease" presents for an echocardiogram.



What's the most likely diagnosis?

1. Cor triatriatum sinister
2. Large superior sinus venous ASD
3. **Senning repair for d-TGA**
4. Total anomalous pulmonary venous connection





Adapted from Brickner ME, et al. NEJM 2000; 342(5):334-342

Clip #5

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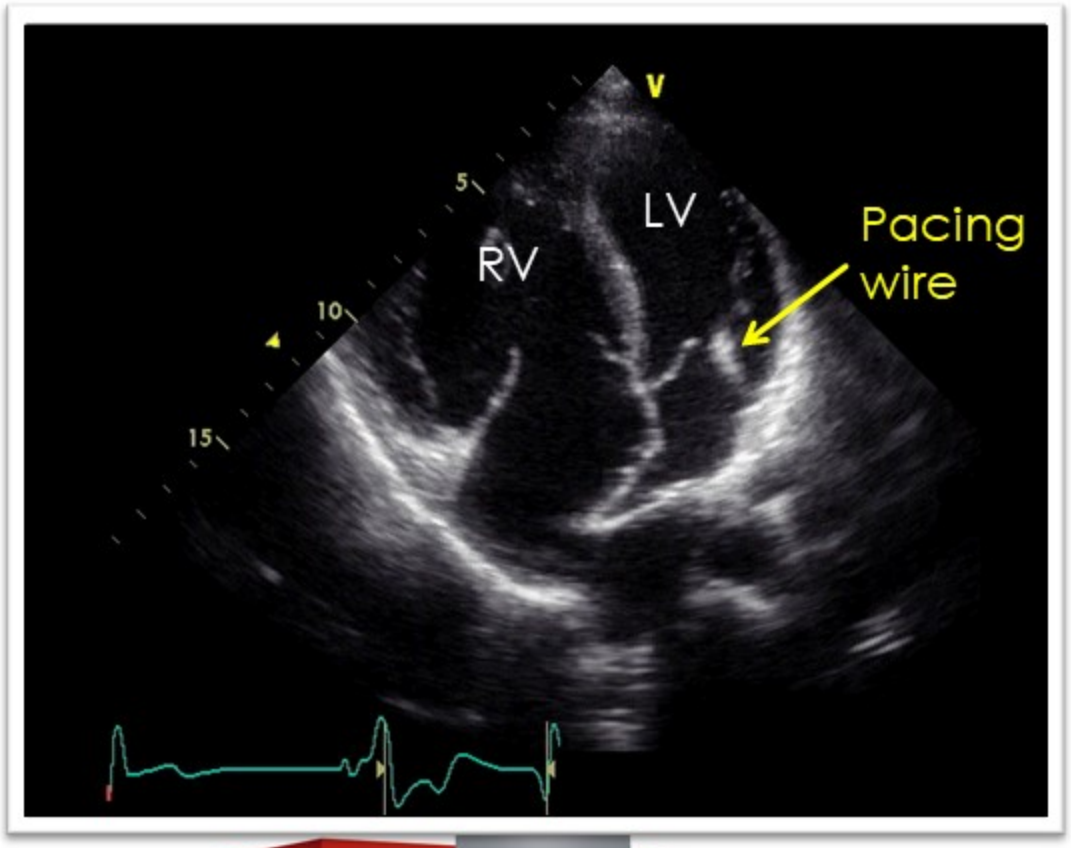
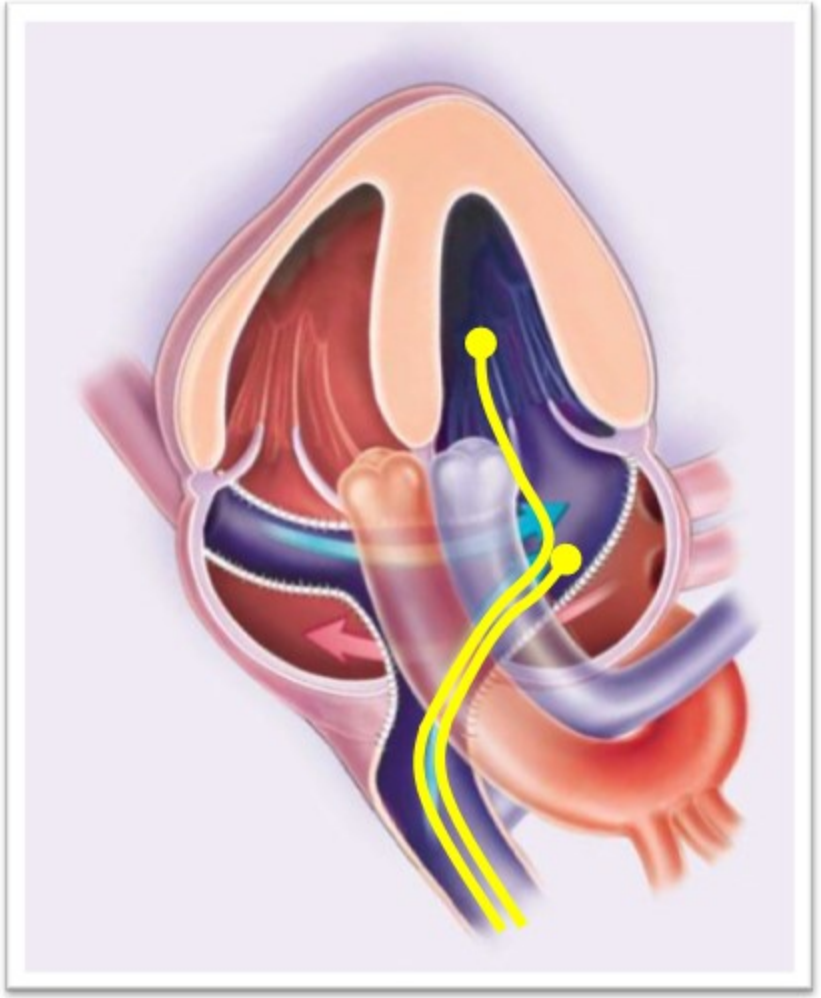
Clue: pacing wire in LV





CASE
Cardiovascular Imaging Case Reports

Results (357 votes)

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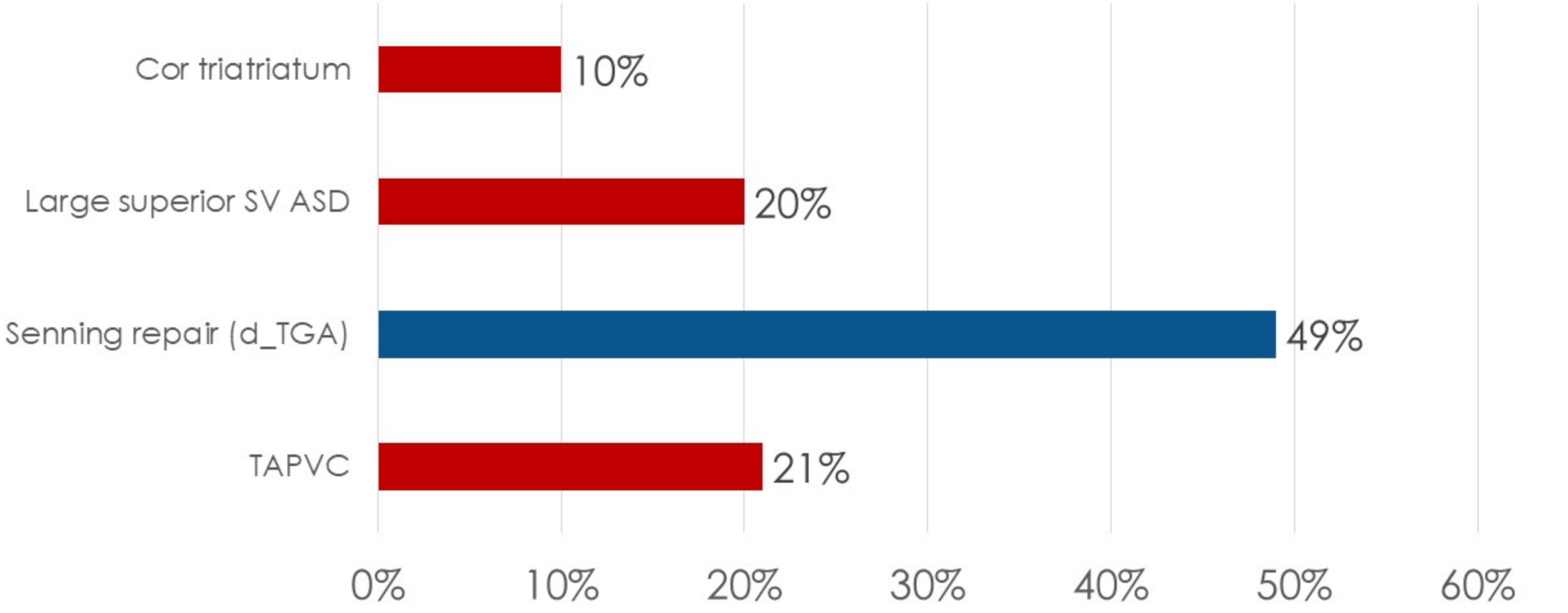
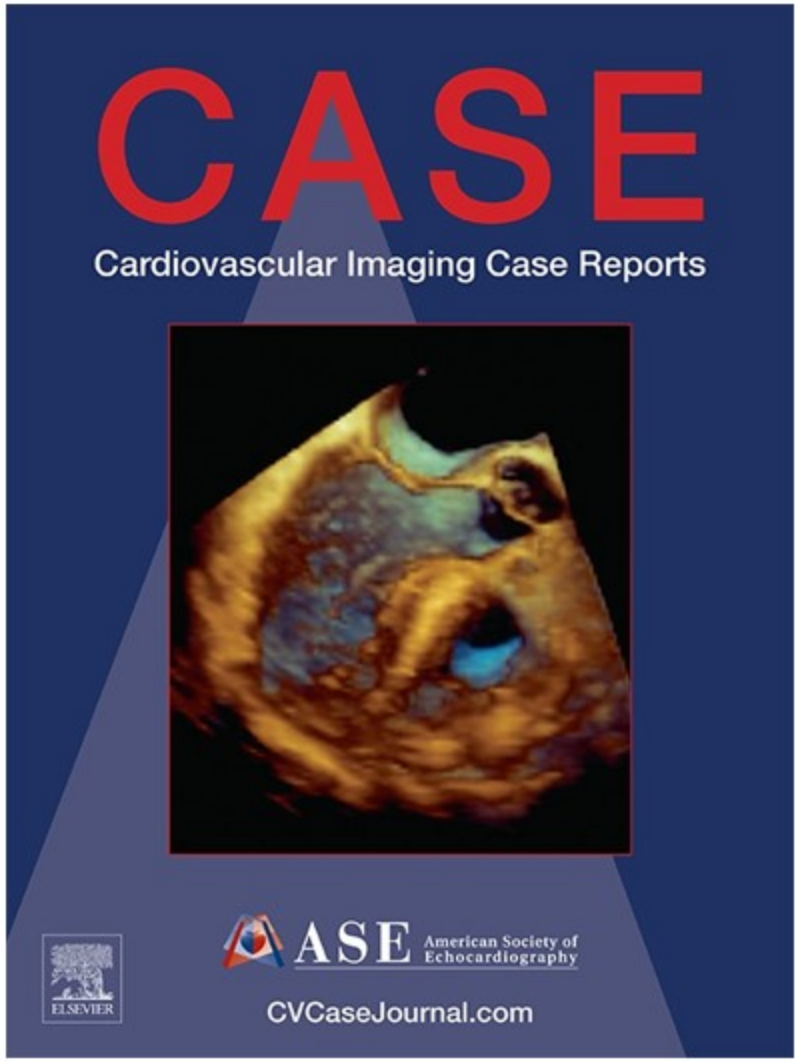


https://www.cvcasejournal.com/content/quiz-results-archive (2017)



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http://www.cvcasejournal.com/

If you have a mystery image…

Submit it to CASE Managing Editor Deborah R. Meyer - *"What is the Image?"*
dmeyer@asecho.org

If your image is chosen, you will receive an ASE guideline poster of your choice