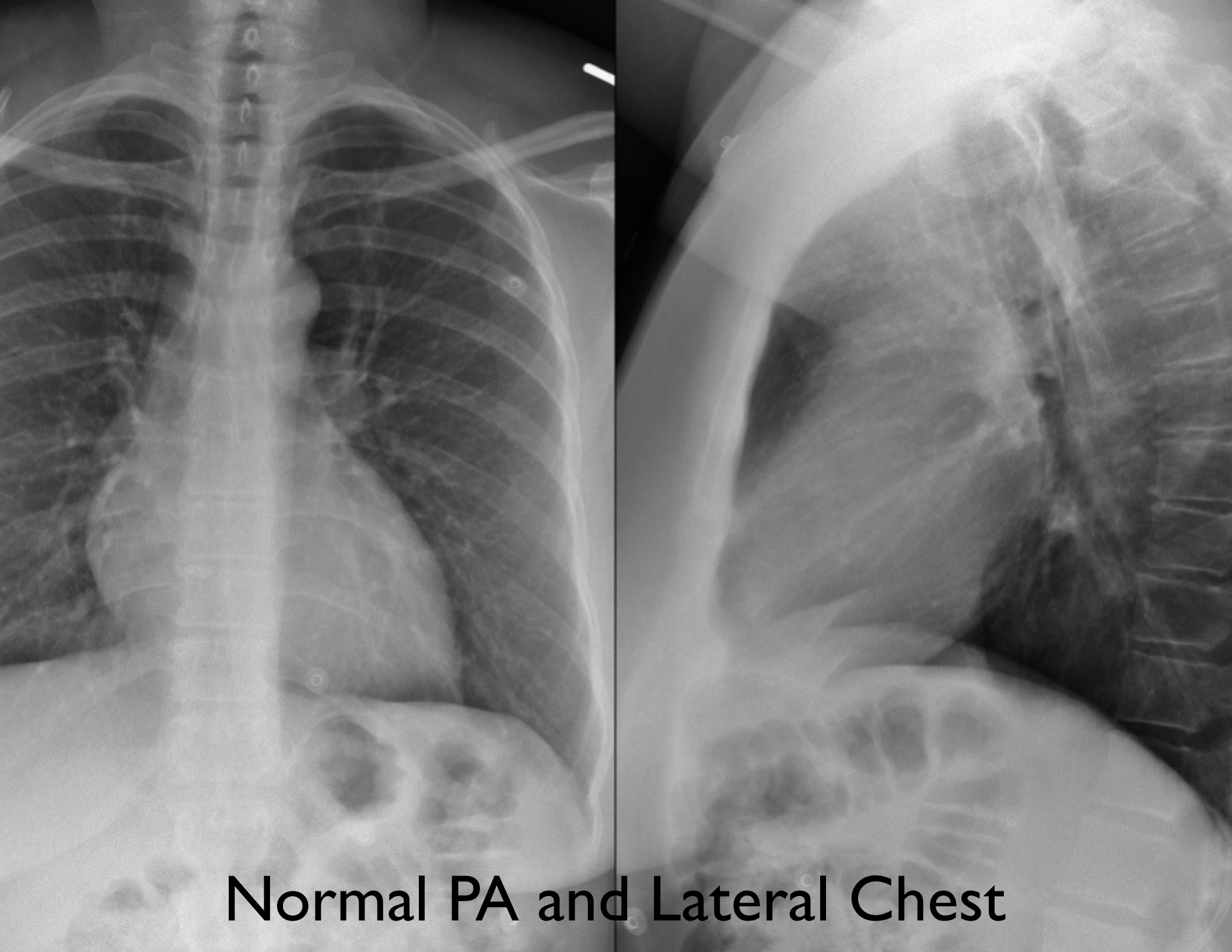
Rad Lab 2: Chest and Cardiovascular Unknowns

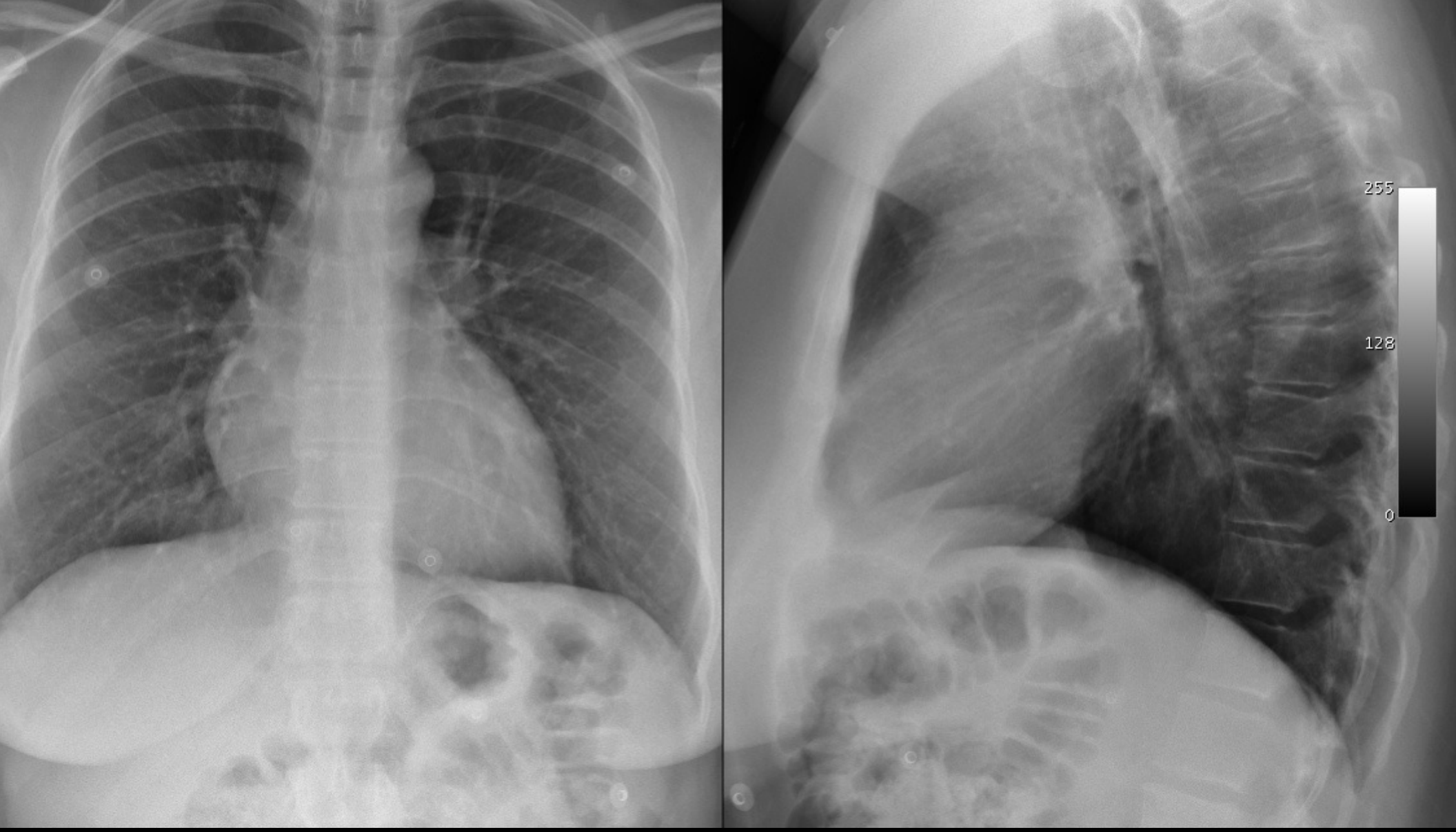
Peter Clarke, MD, Don Di Salvo, MD
and Angela Giardino, MD
Harvard Medical School
Brigham and Women's Hospital
Dana Farber Cancer Institute

Goals

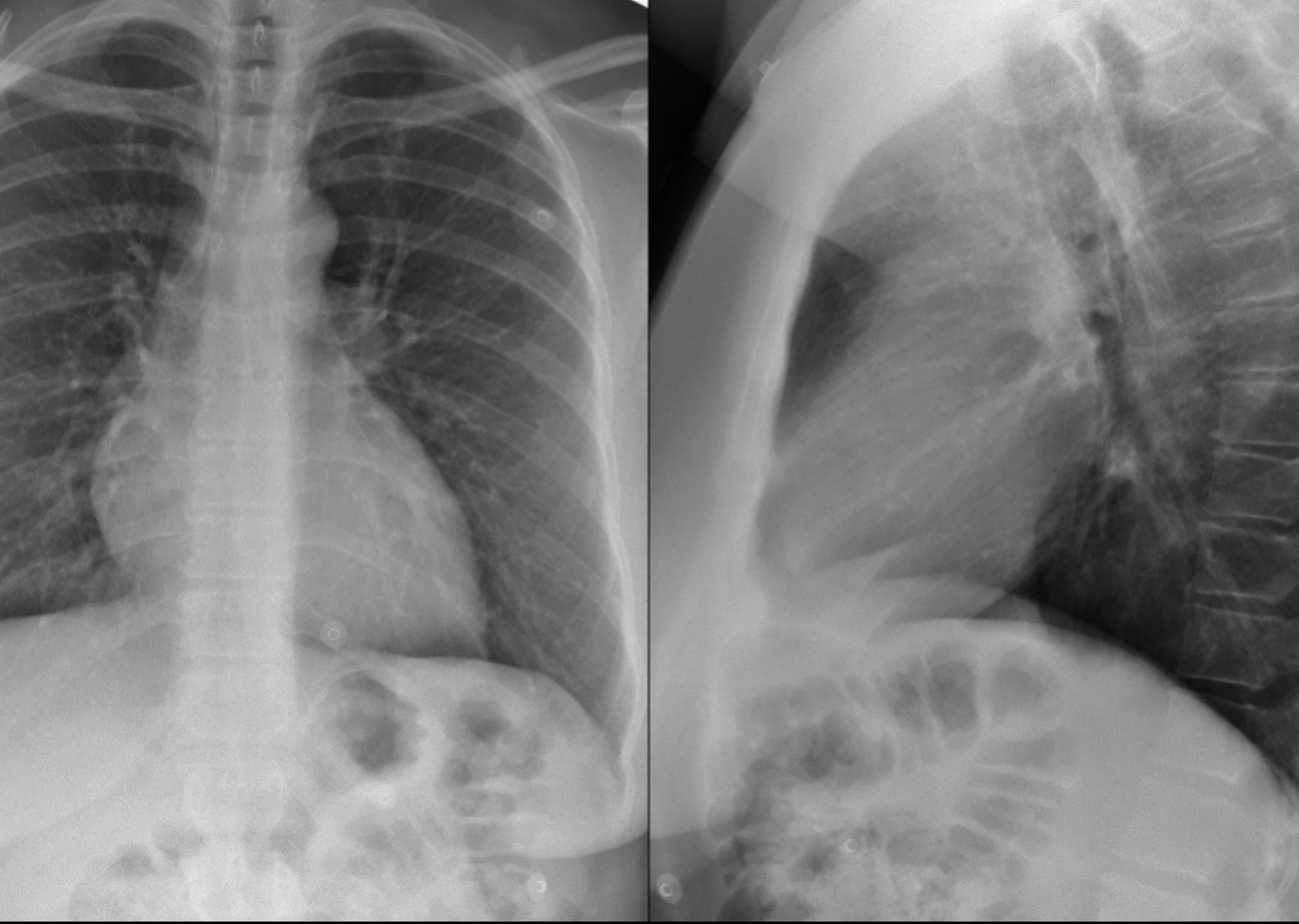
- Acquire an approach to chest interpretation
- Identify normal heart size, chamber enlargement, mediastinal anatomy
- Diagnose a few common chest abnormalities



Normal PA and Lateral Chest



- cardiothoracic ratio?
- borders of atria and ventricles?
- aortic knob?
- pulmonary arteries?



•What are those round opacities with central rings?
•Are they in the lungs?

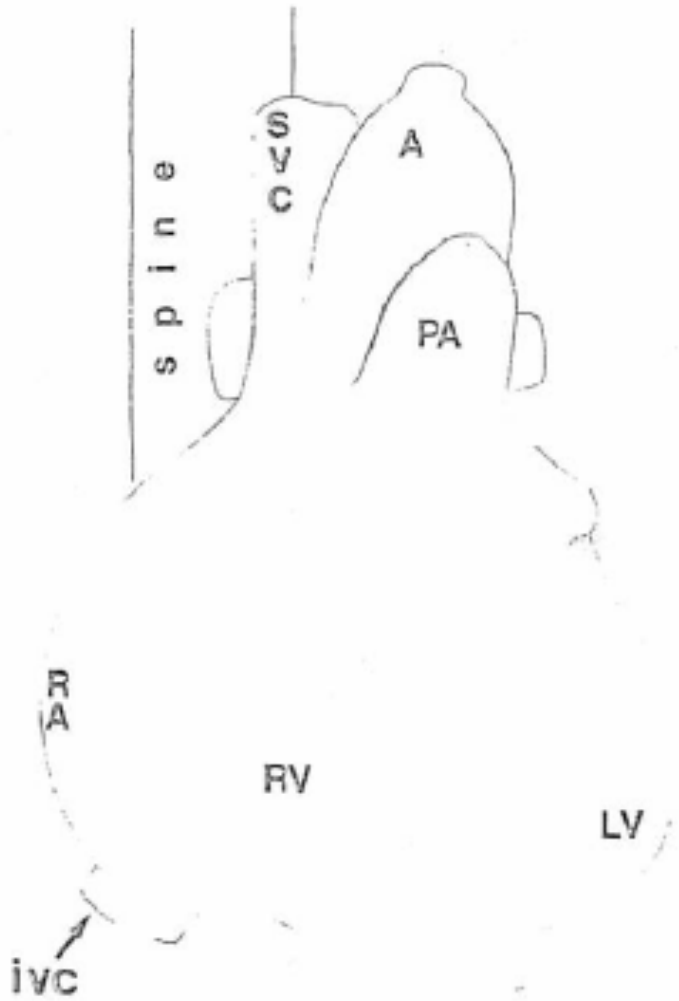


Figure 10-22B. Surface of the heart as it would appear on a routine frontal chest film.

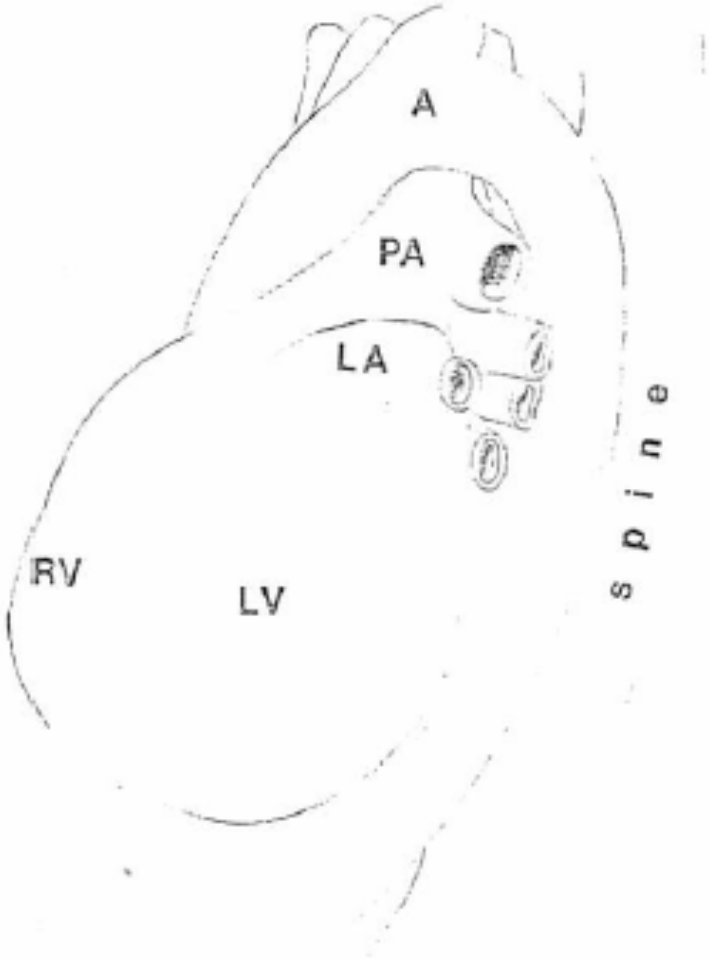
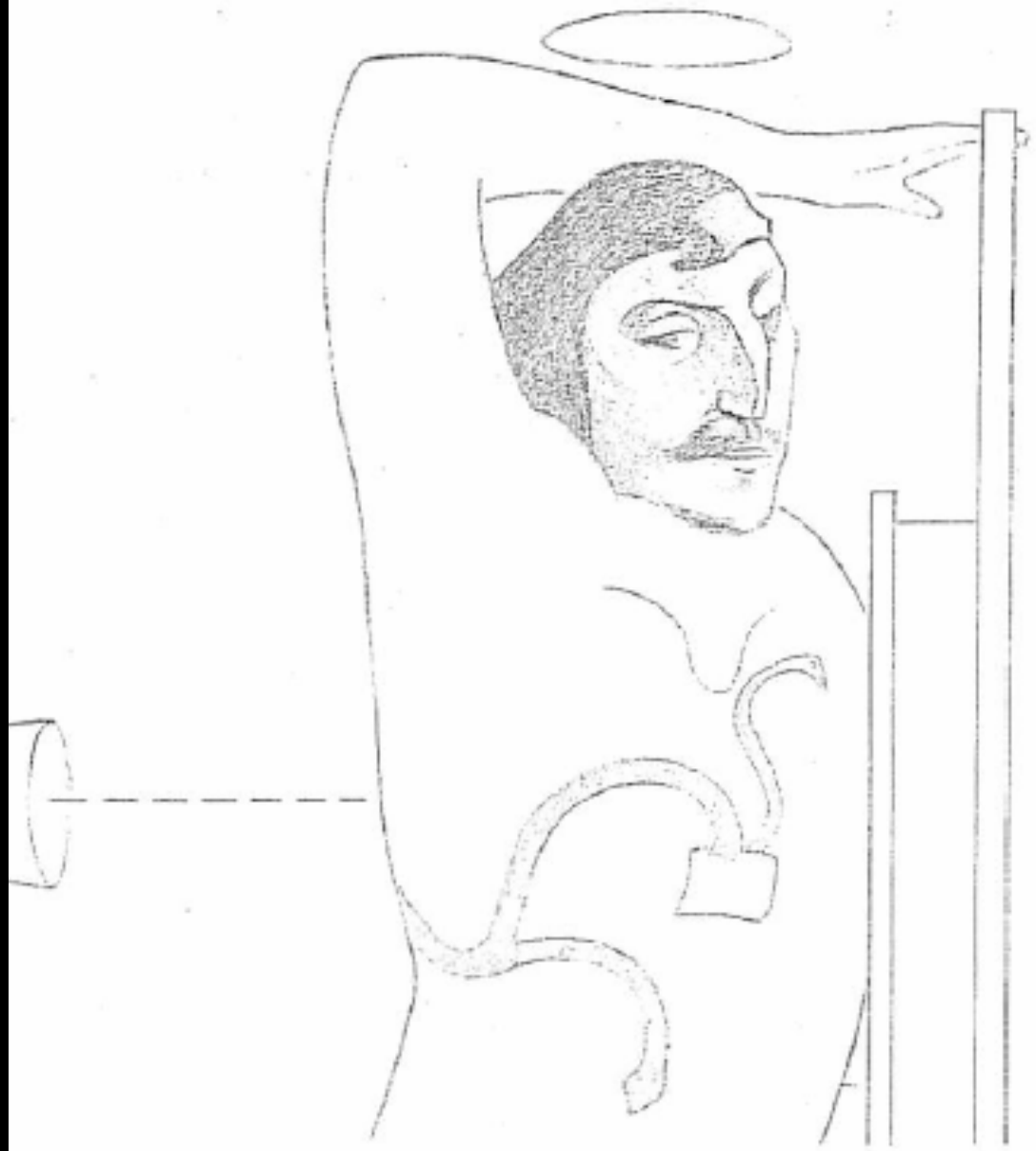


Figure 10-22C. Orientation of the heart for a left anterior oblique view. Figures 10-25 and 10-26 (*below*) show you how the patient is oriented with the left anterolateral surface of the chest closest to the cassette.



ıre 10-25

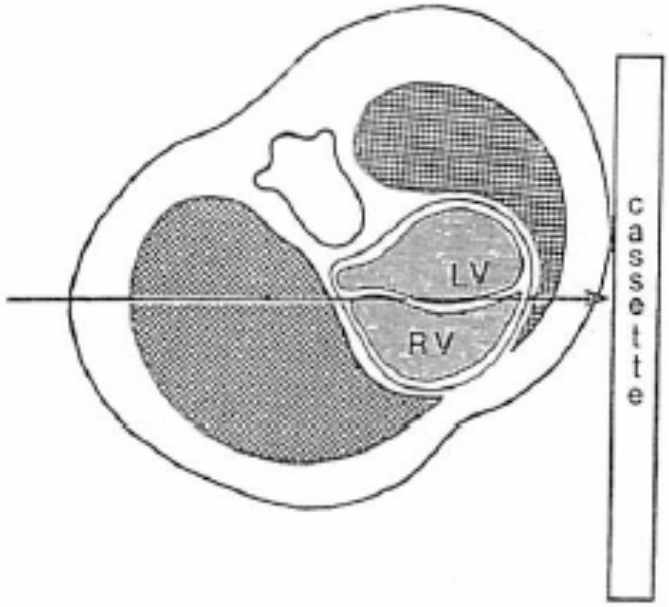
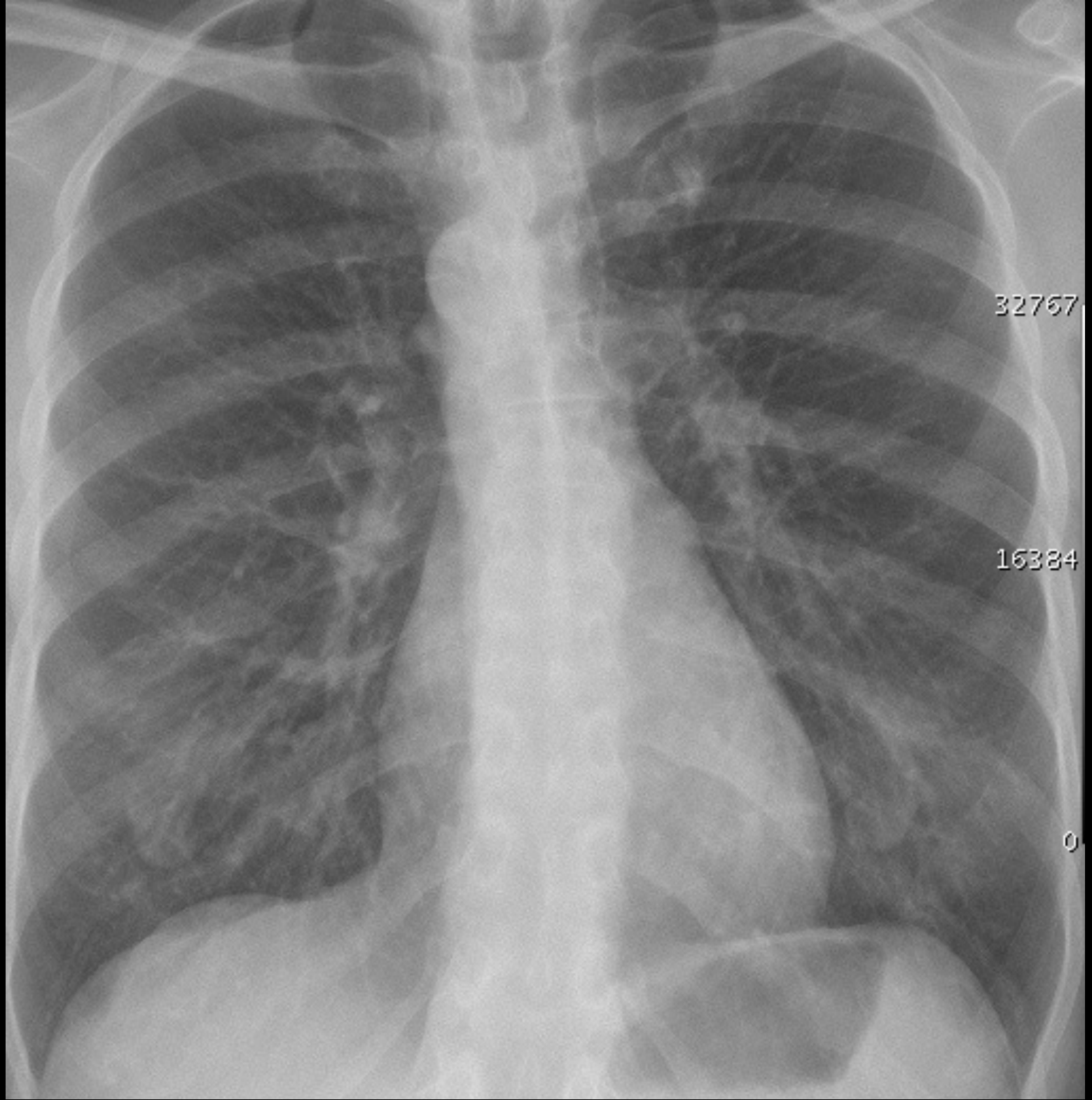


Figure 10-26


32767
16384
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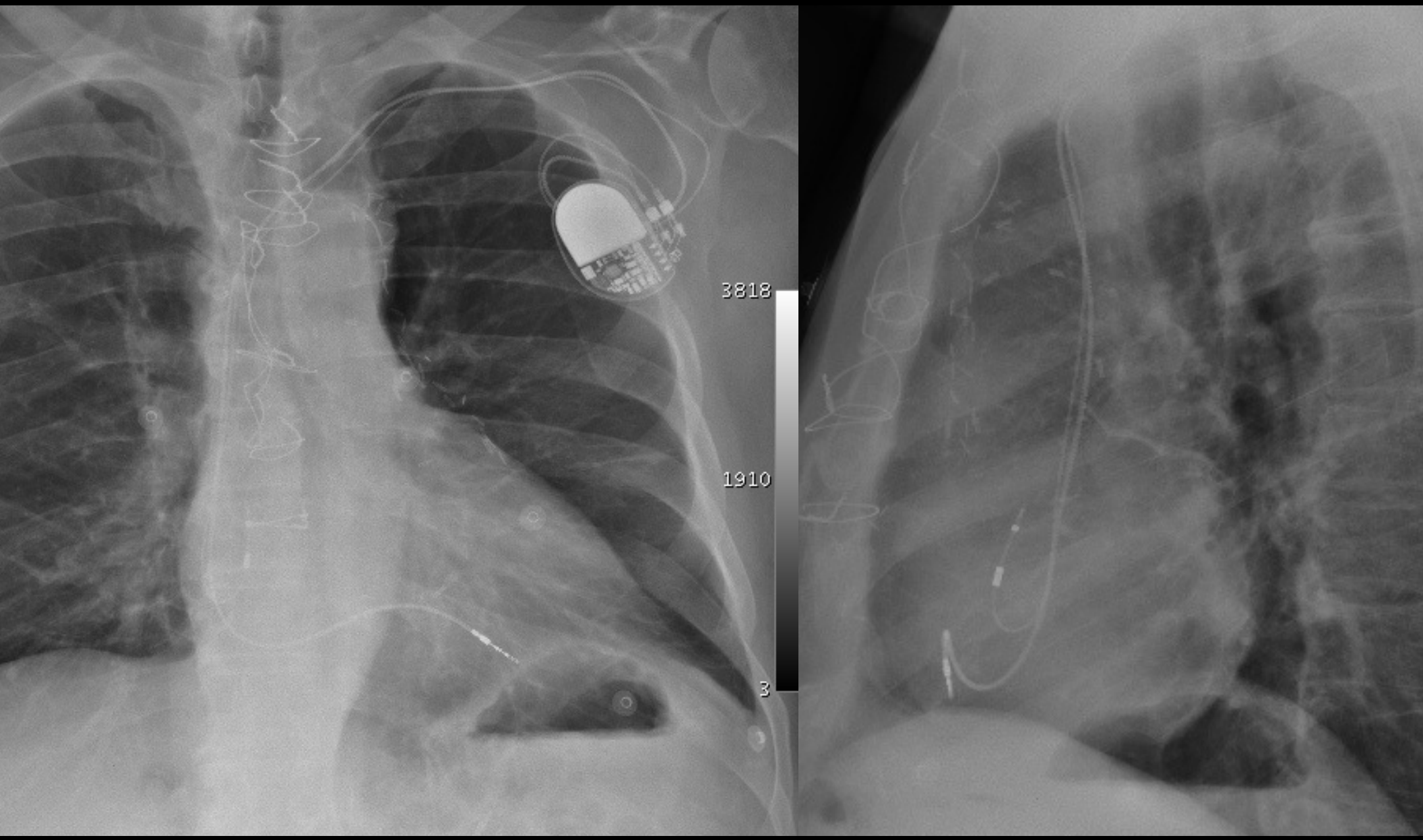
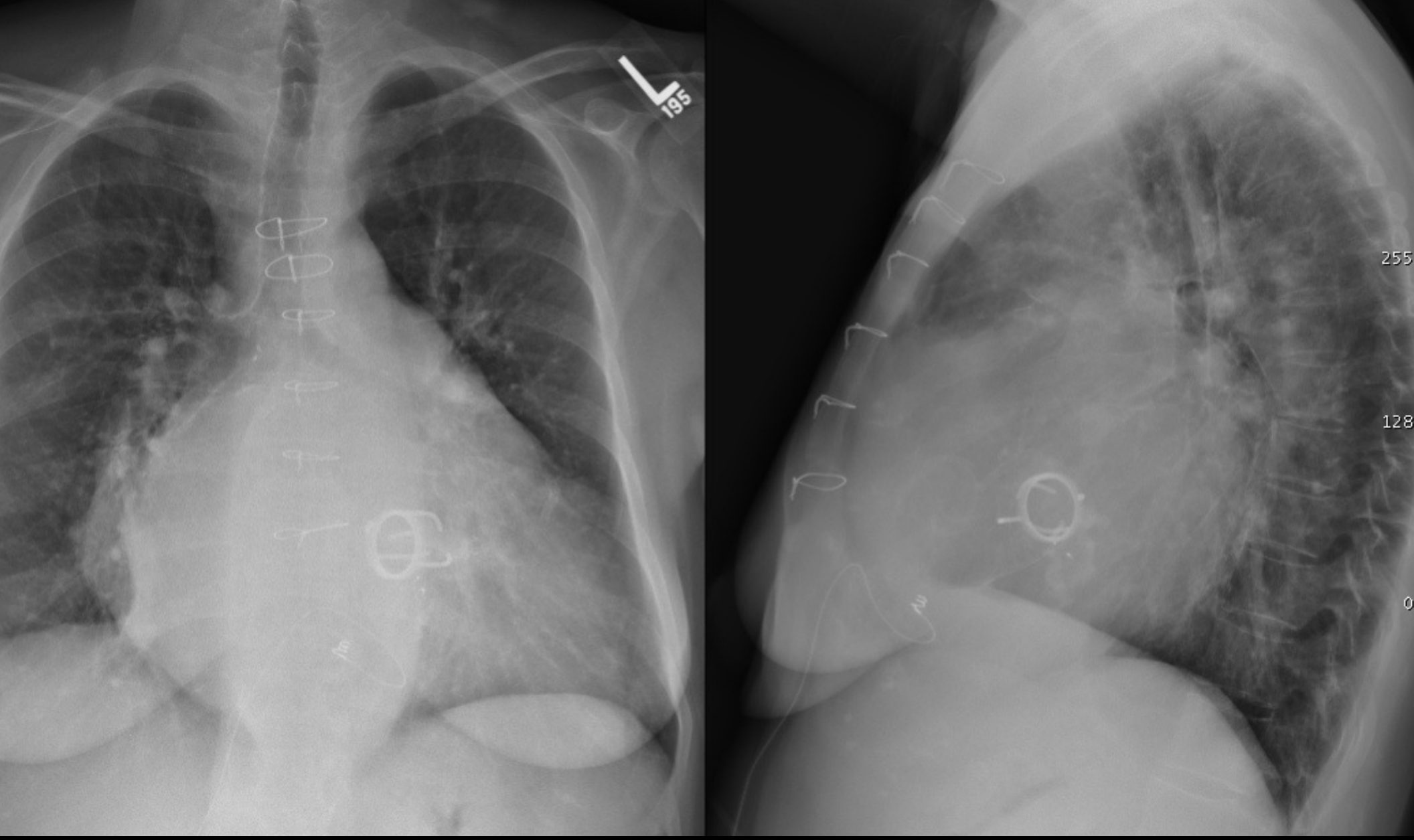


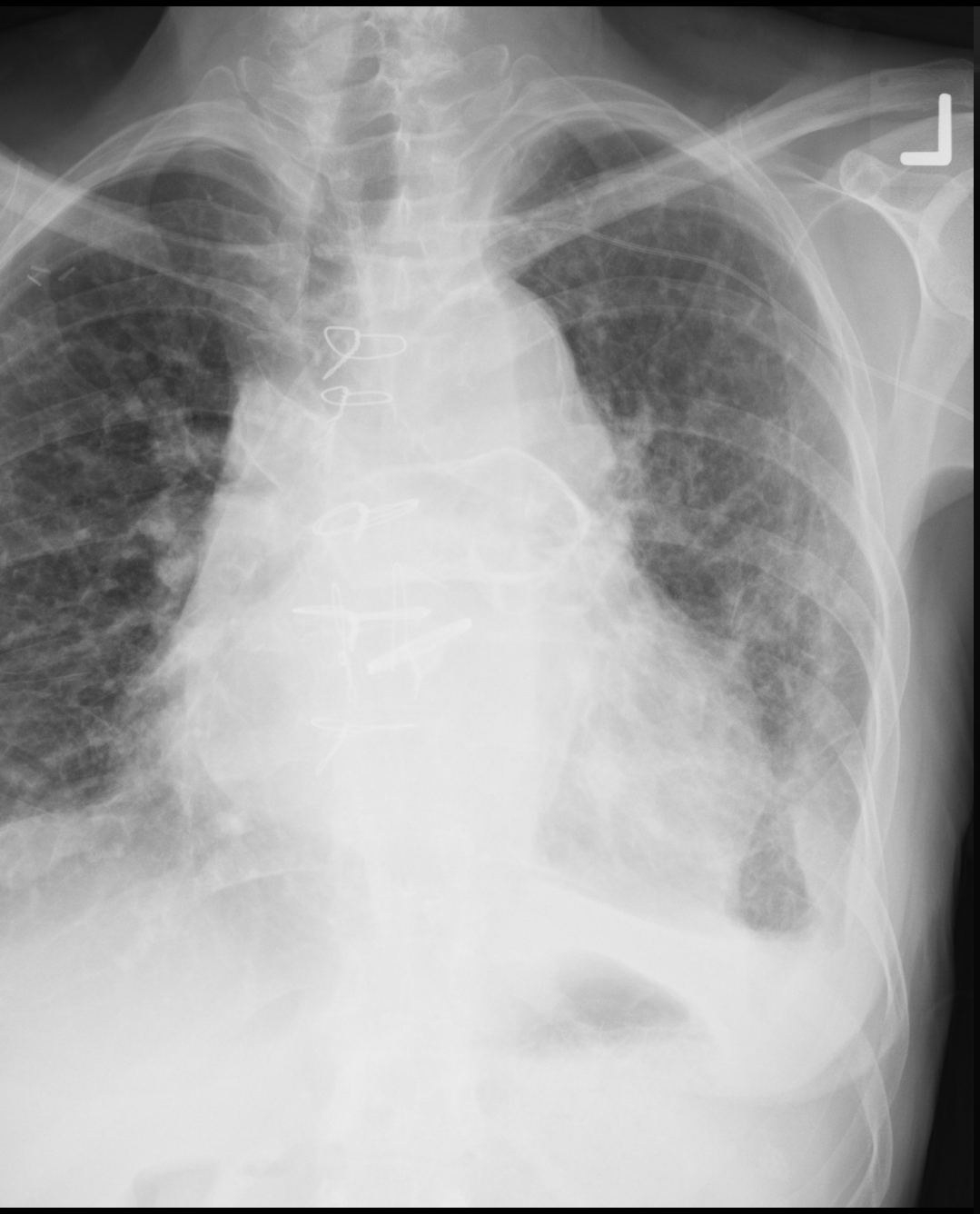
- Can you name two procedures this patient has undergone?
- Identify the course of the wires
- What chambers of the heart are the wires in?



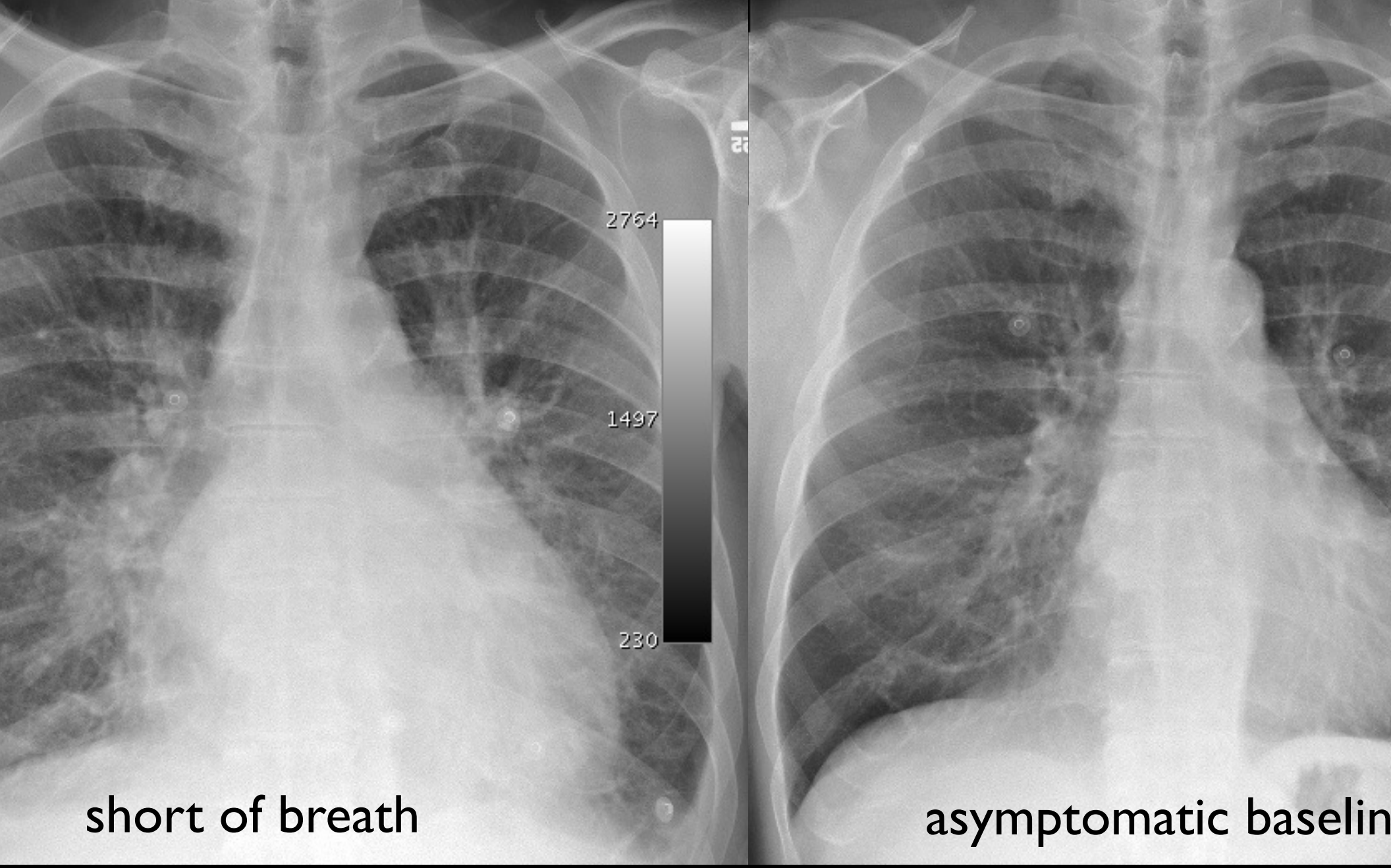
•Is this heart enlarged (cardiothoracic ratio)?

ou outline each chamber on both the PA and lateral c

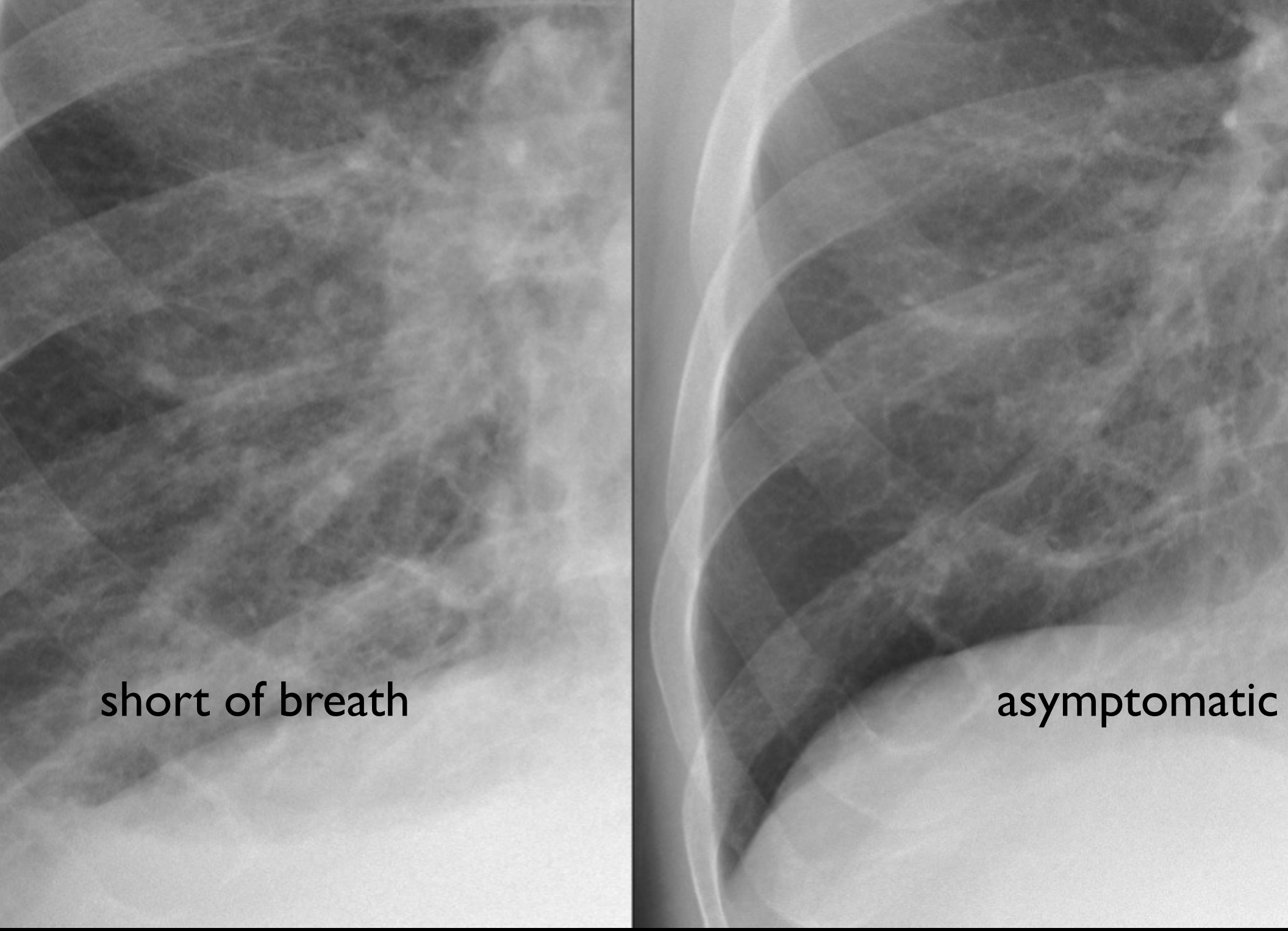
•What procedure has *this* patient undergone?



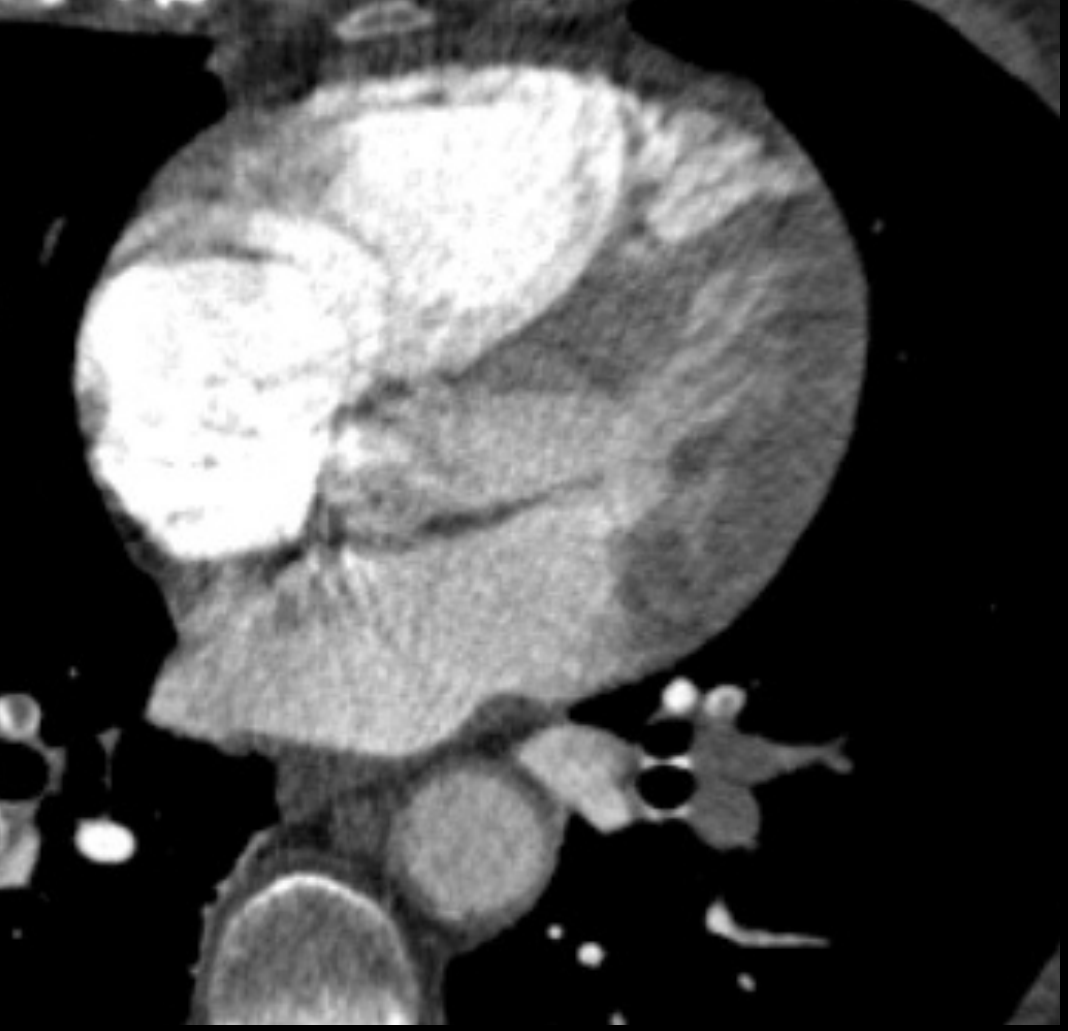
- What valve was replaced?

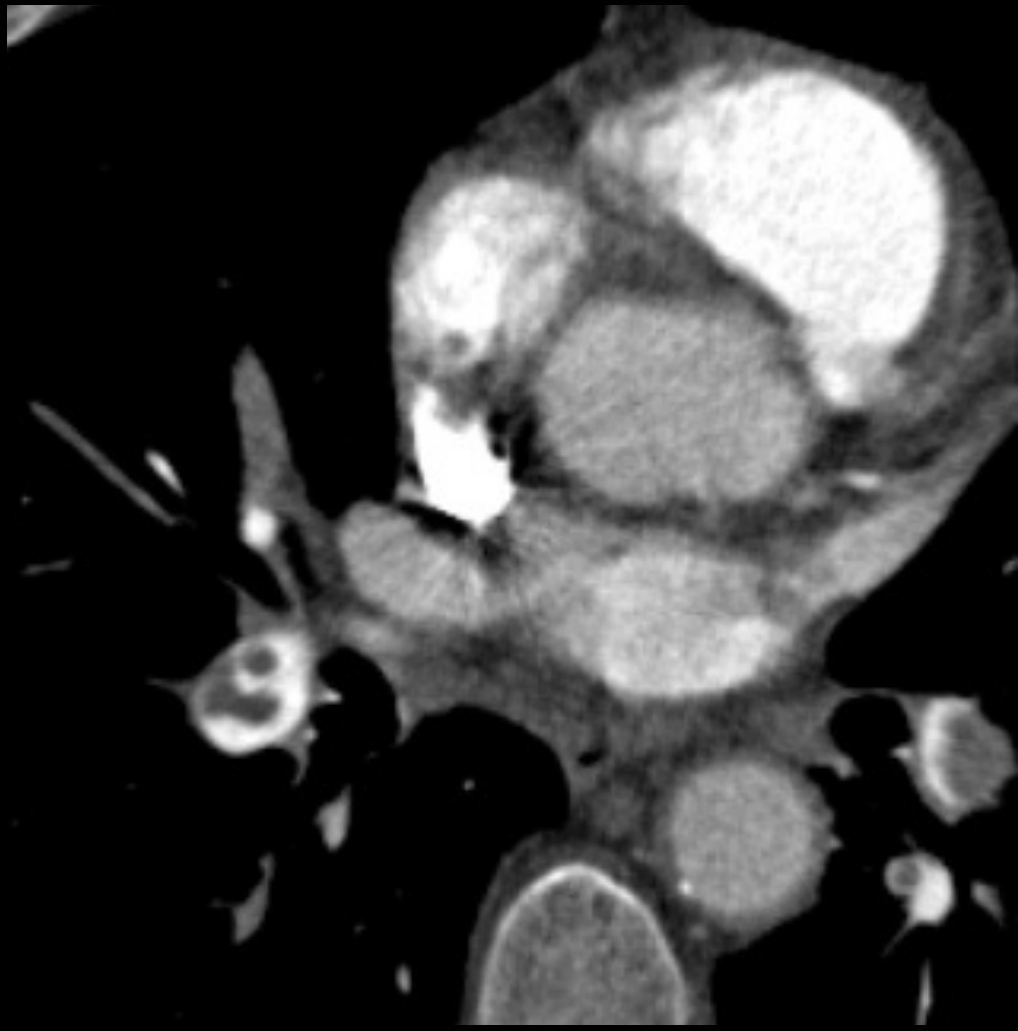


- Explain changes in heart and chamber size
- Contrast the caliber of pulmonary vessels
- What changes at the costophrenic angles do you see?



•Compare the costophrenic sulci.





tory: Acute shortness of breath and chest p

- This scan was done with IV contrast.
- Which chambers are best enhanced?
- Identify and explain the rings of high attenuation

coronal views

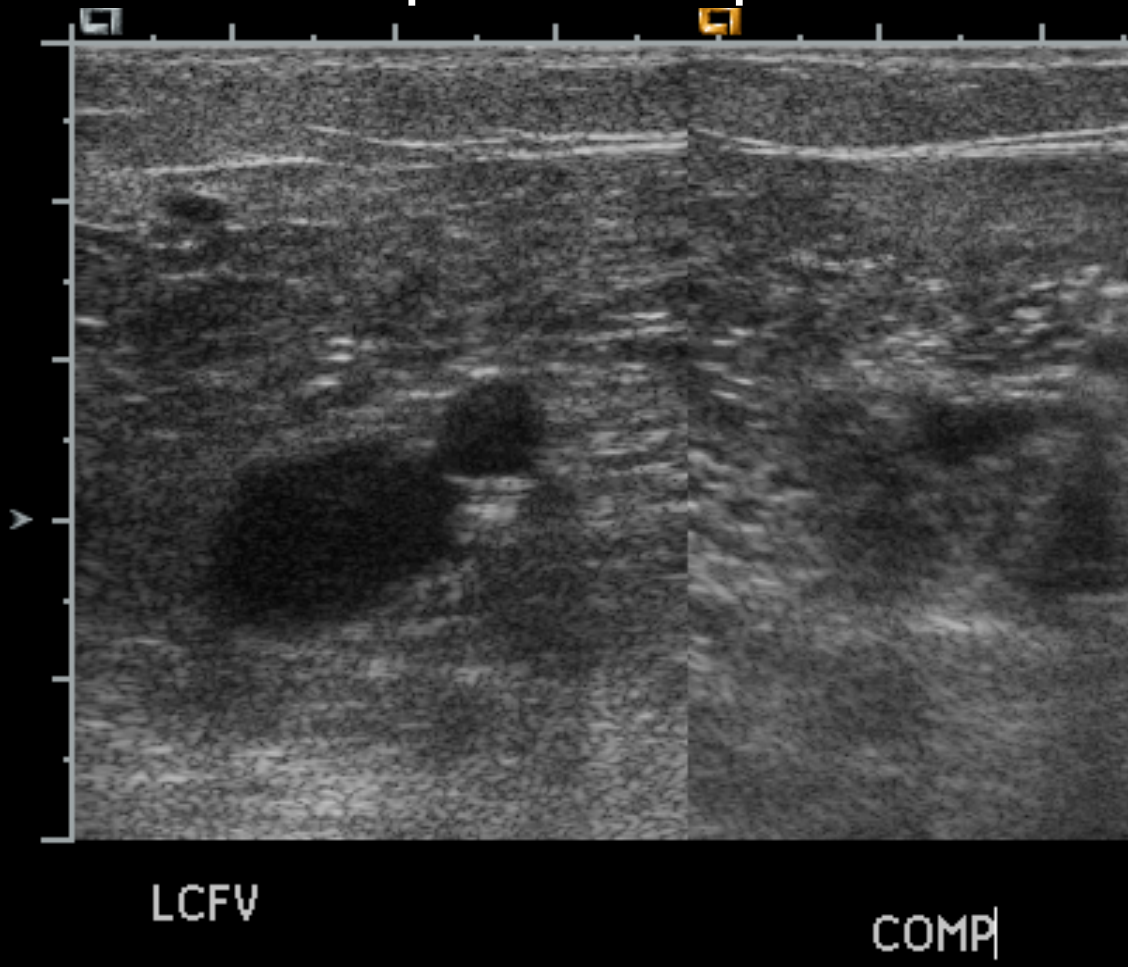
hich arm did the patient receive
e injection of contrast?
Explain

Can you identify the aorta?
Why is it less opacified than other v

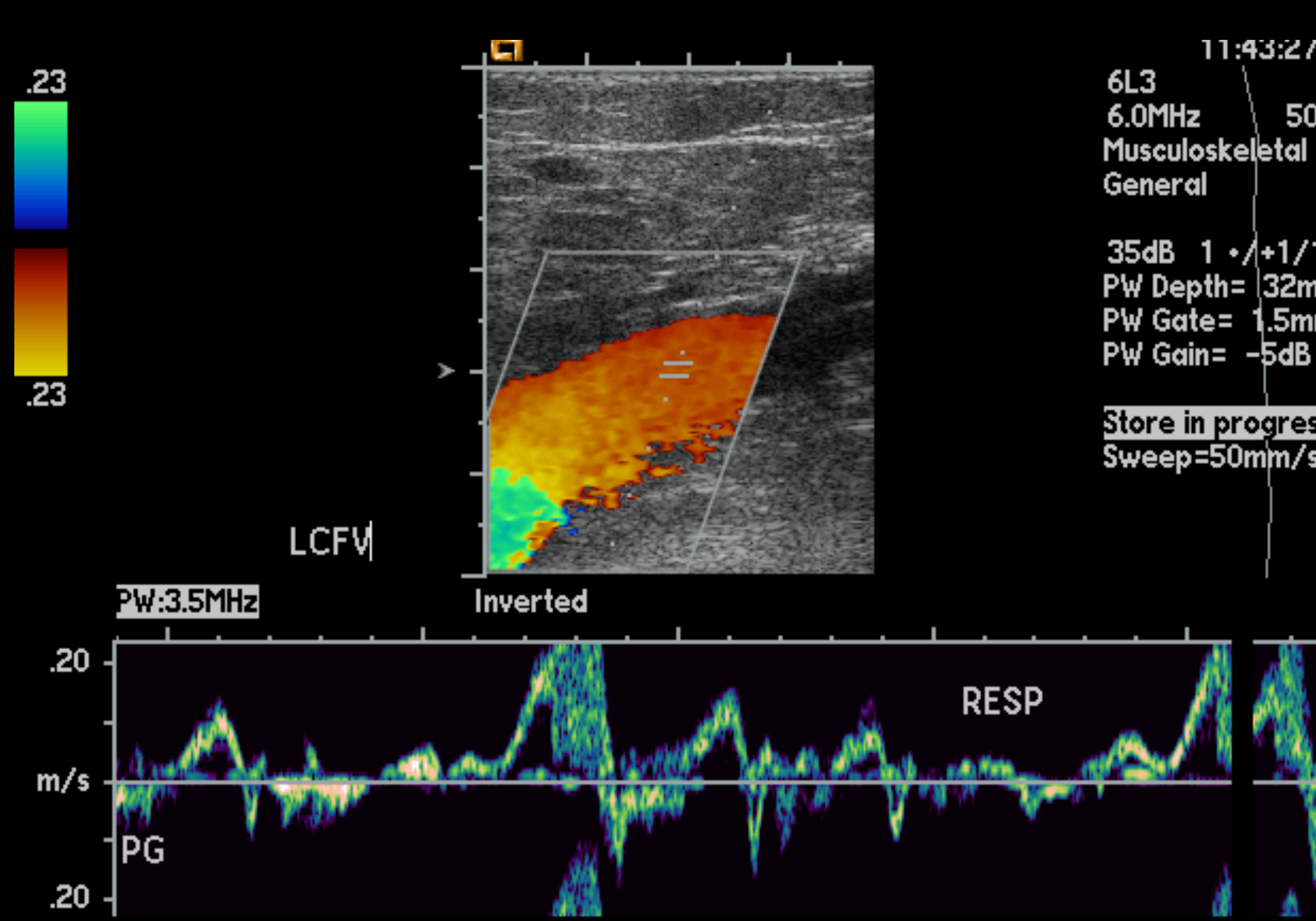
uld this diagnosis have been possible without intravenous cont

Compression “clip”

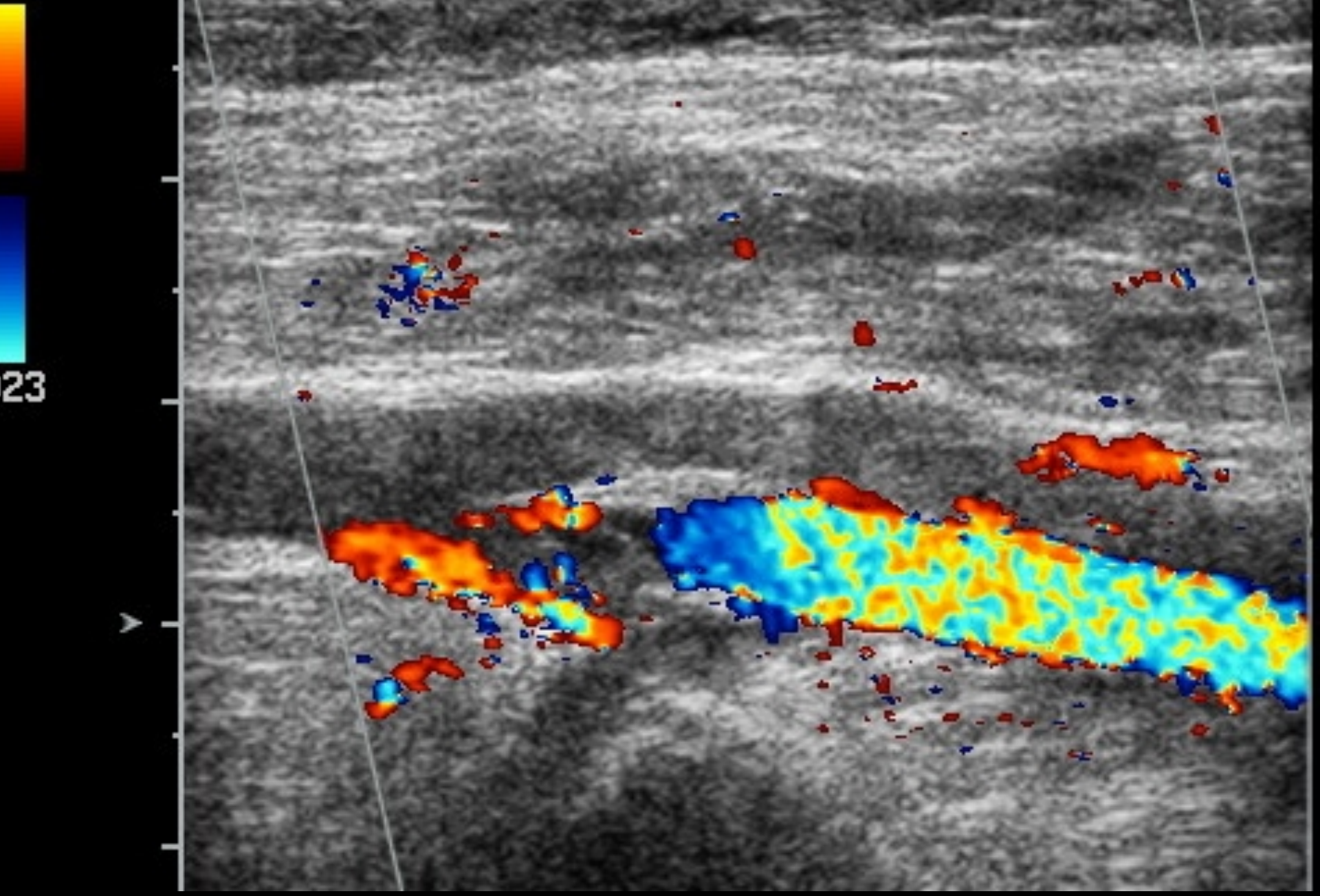
Compression “split-screen st



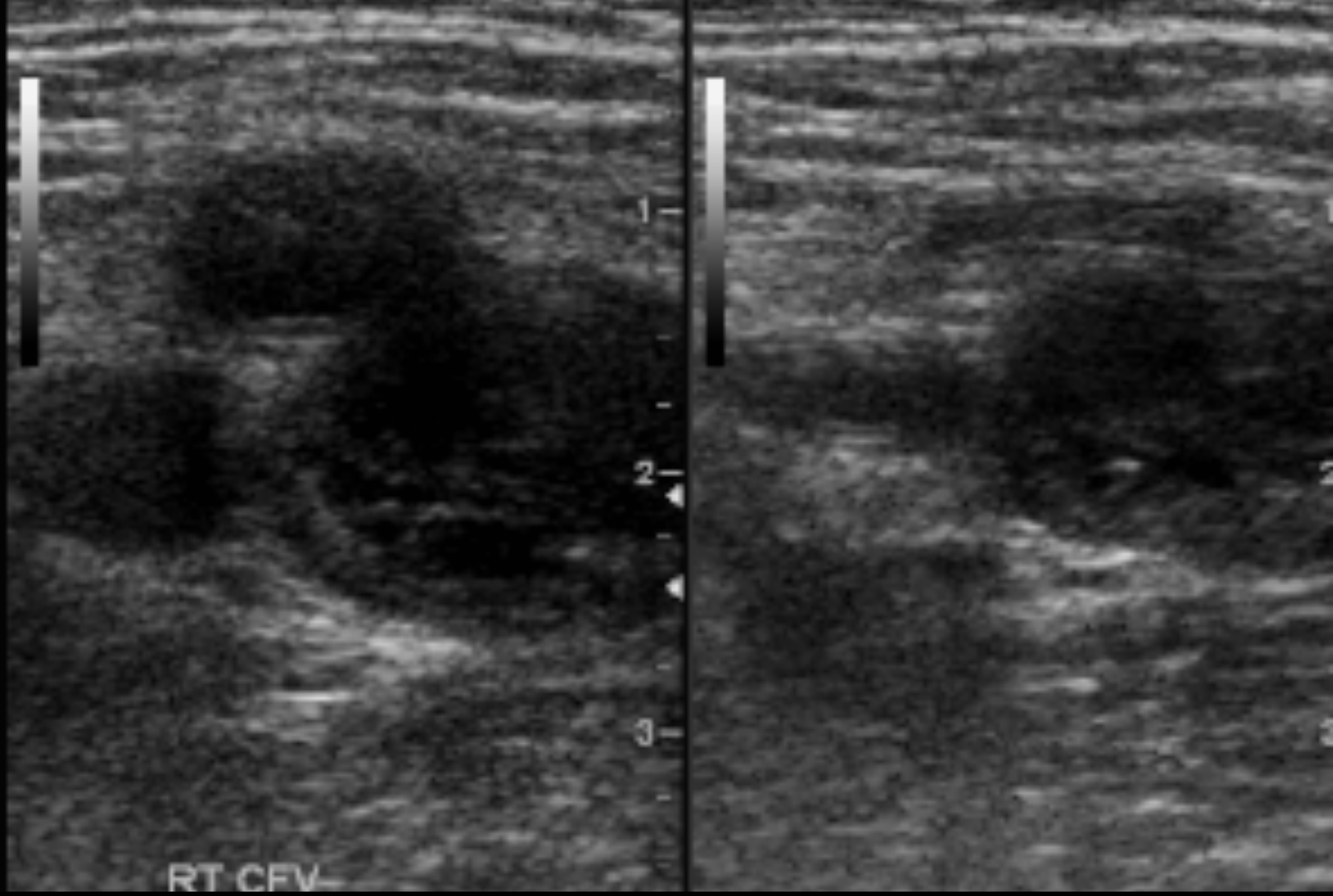
Name 3 ways we can distinguish the



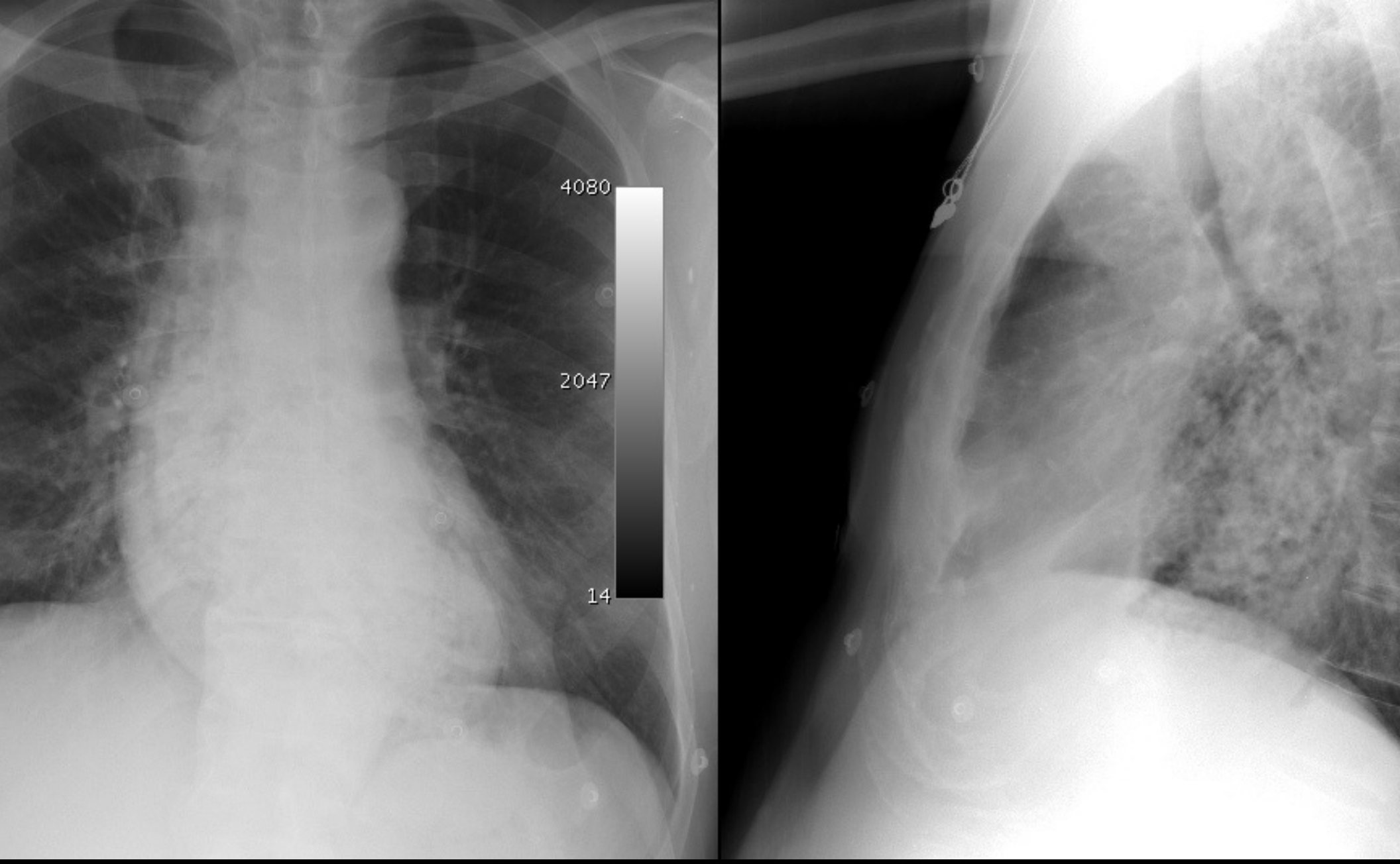
w is a venous waveform different from an arterial wavefo



Absent color flow



Absent compressibility



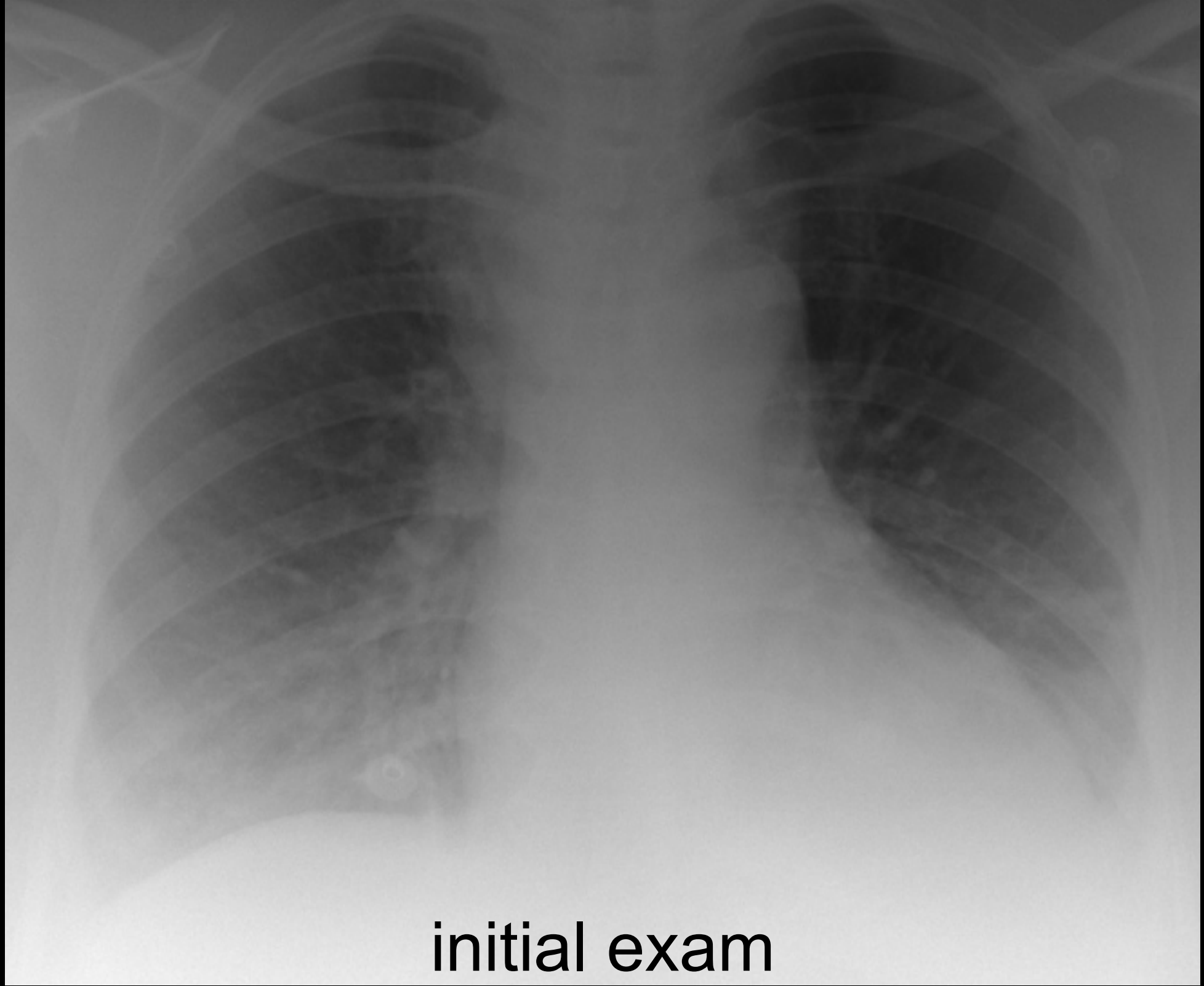
History: Swallowing Problems

ribe the opacity of the mediastinum. How is it different from no

Same patient: What modality is this, and what planes are these

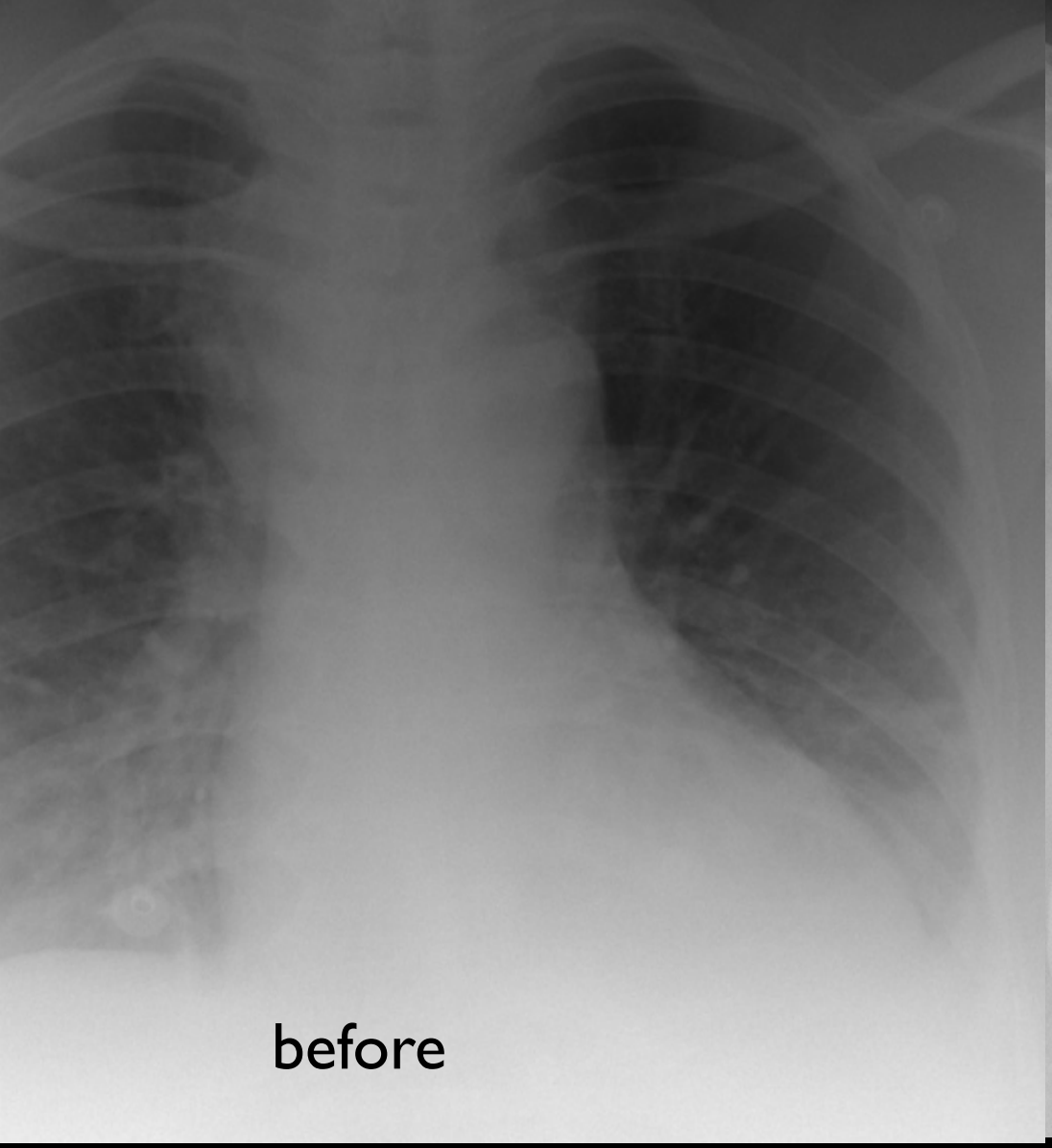
•Explain the mottled appearance of the abnormality

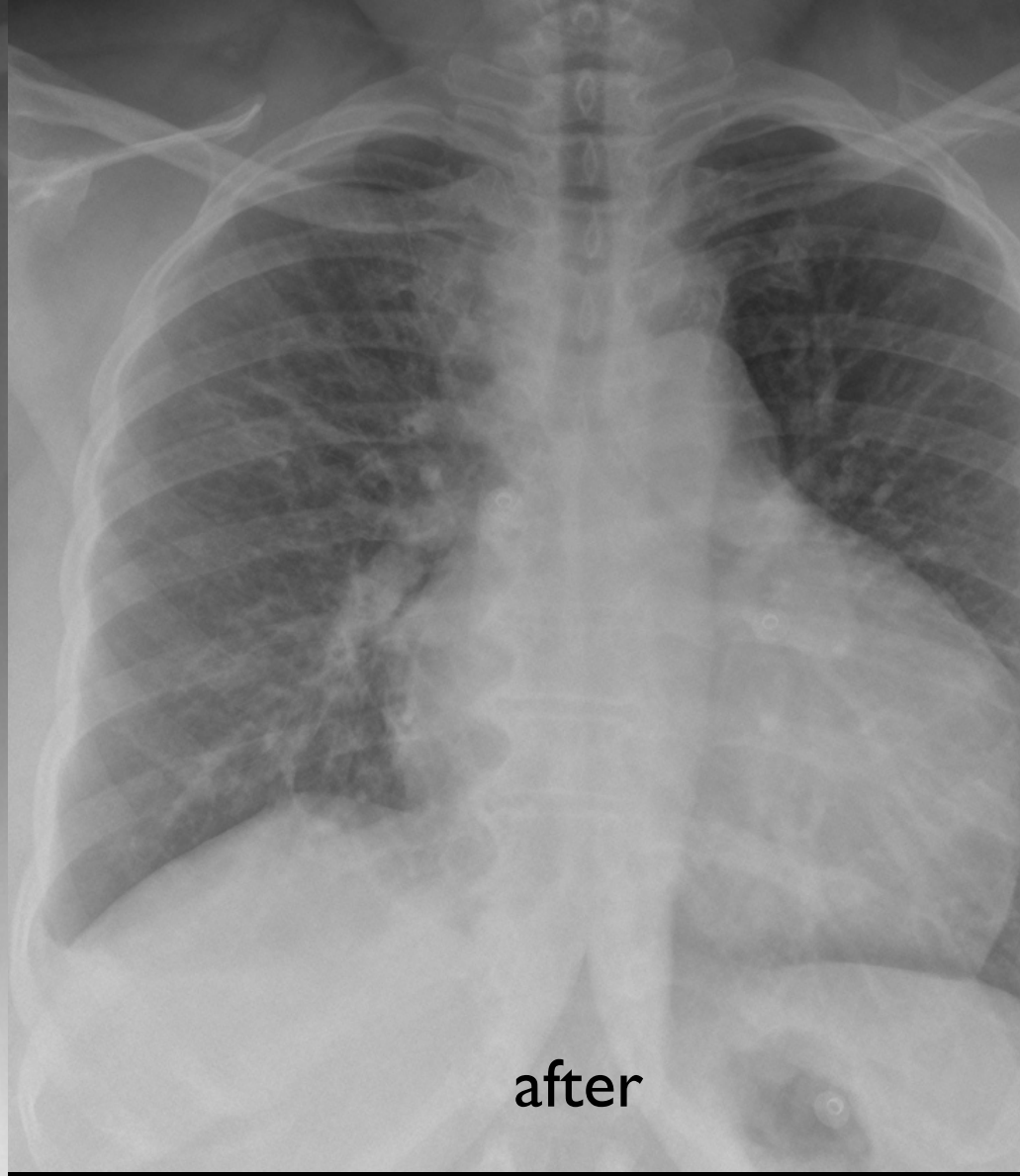
w does the image to your right explain why the abnormality was
equally well seen on both images of the chest x ray?


initial exam

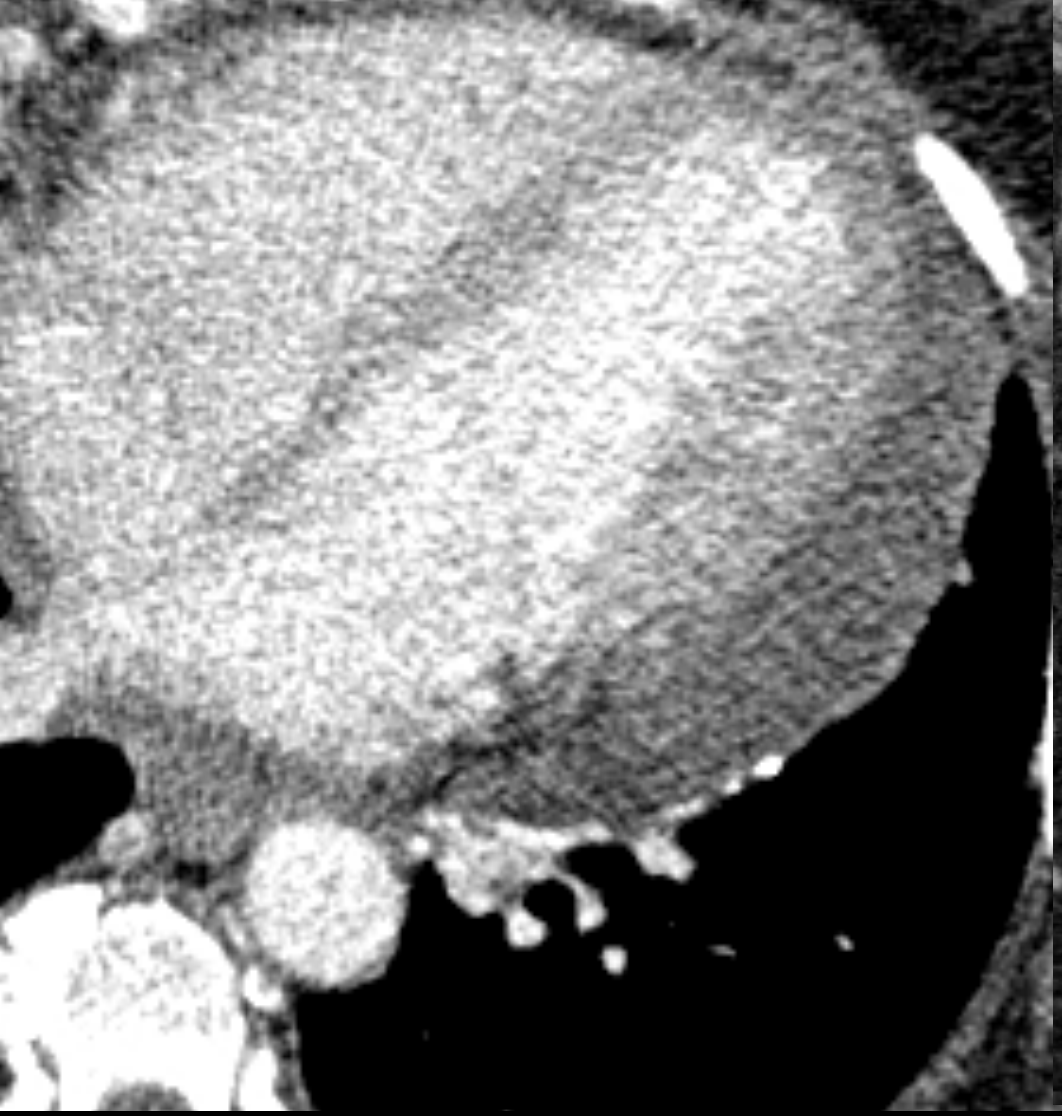
Patient returns with chest pain

- Do you see a change in the cardiac silhouette?



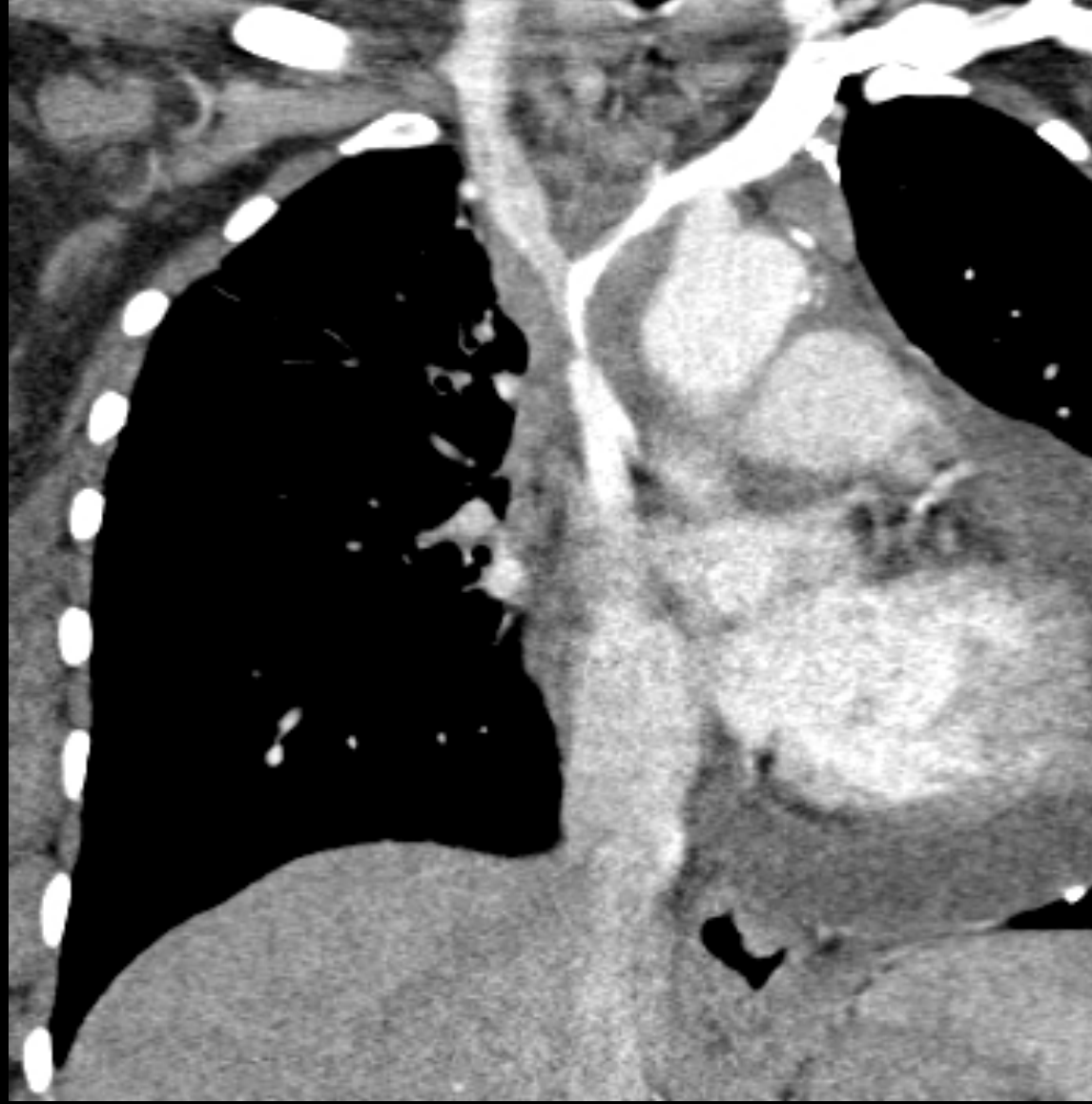


ote differences both in size and shape of th
cardiac silhouette

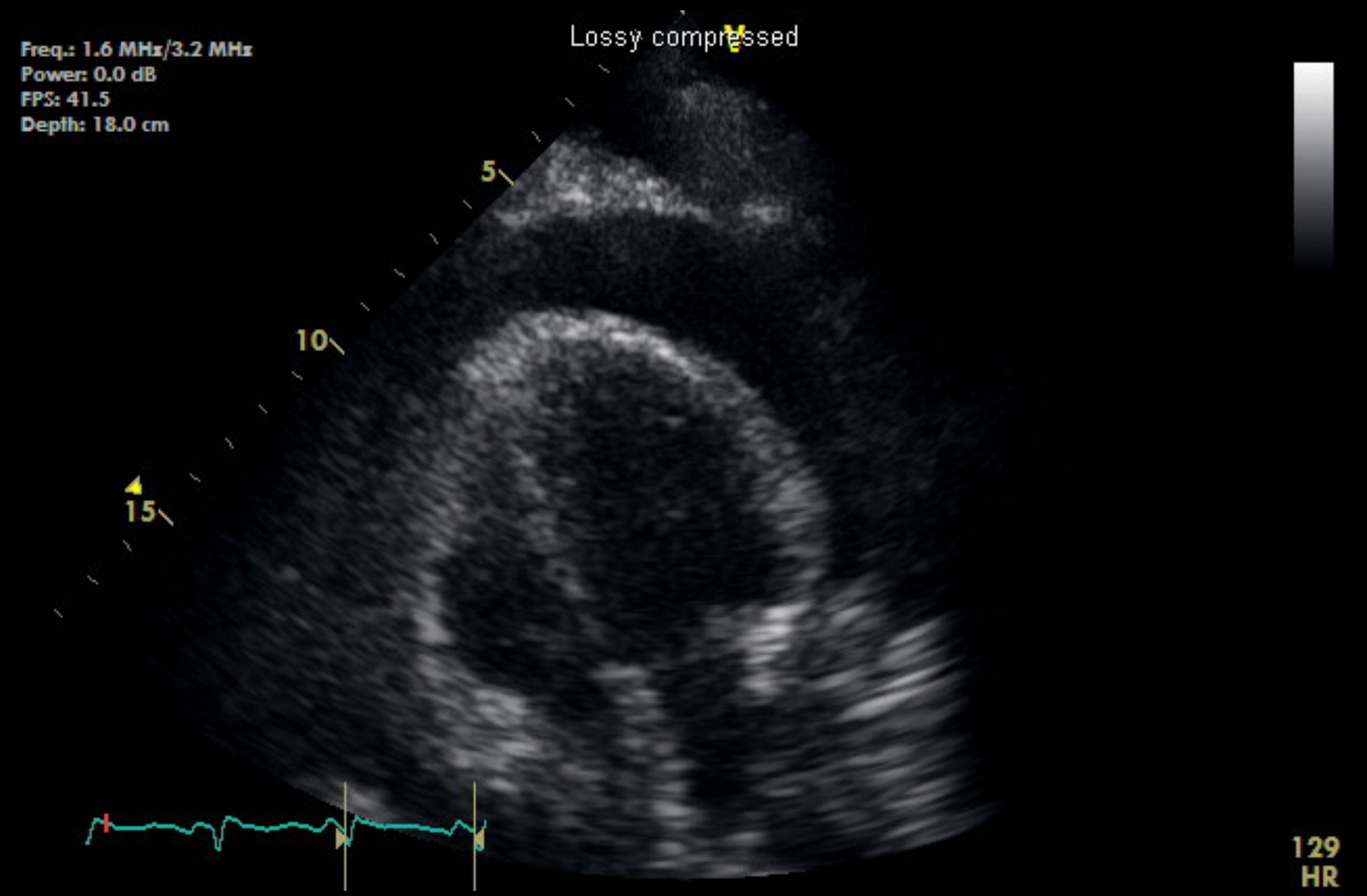


A CT was performed. Can you now explain the change in the cardiac silhouette?

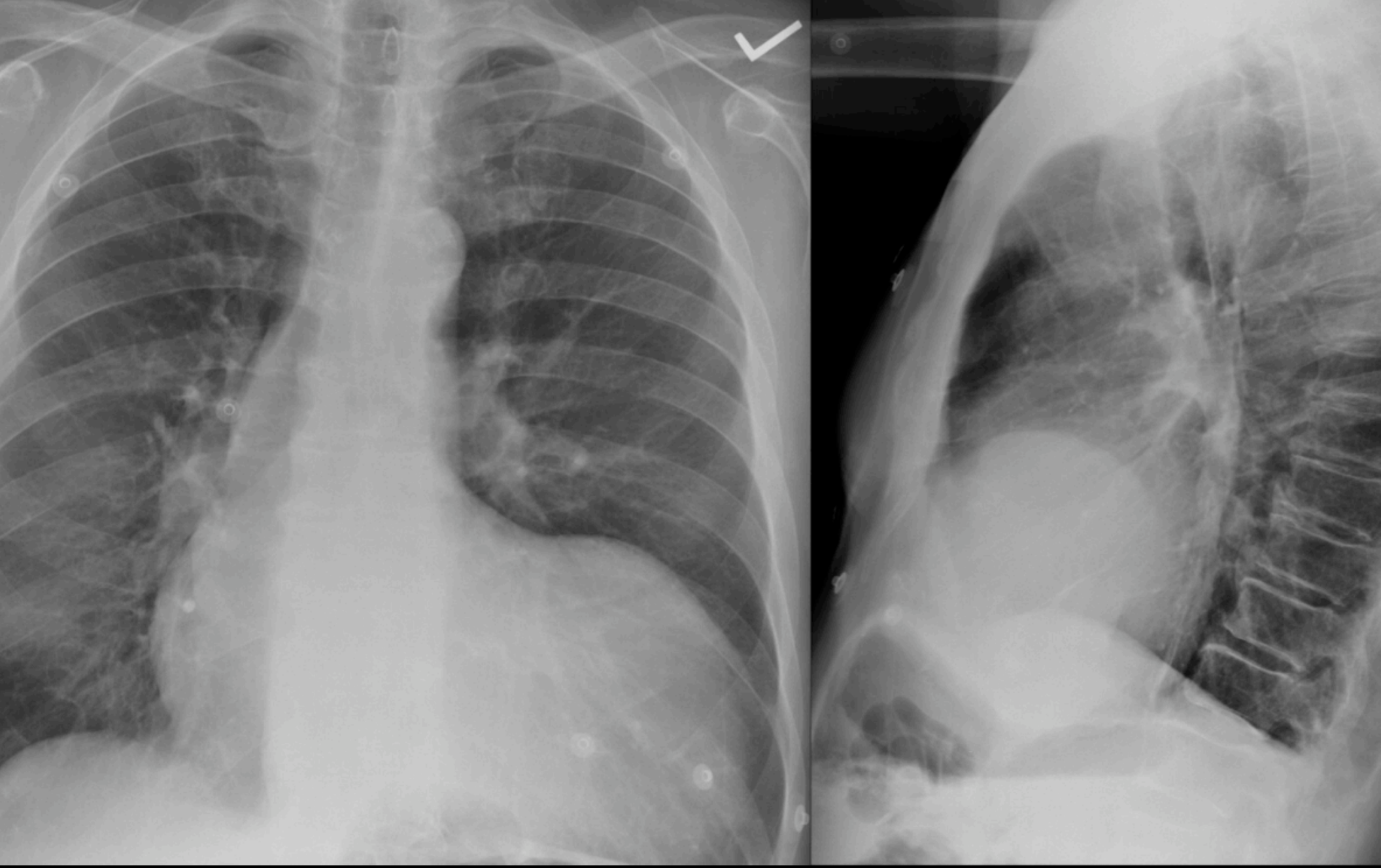
hat is happening at the confluence of the superior vena cav



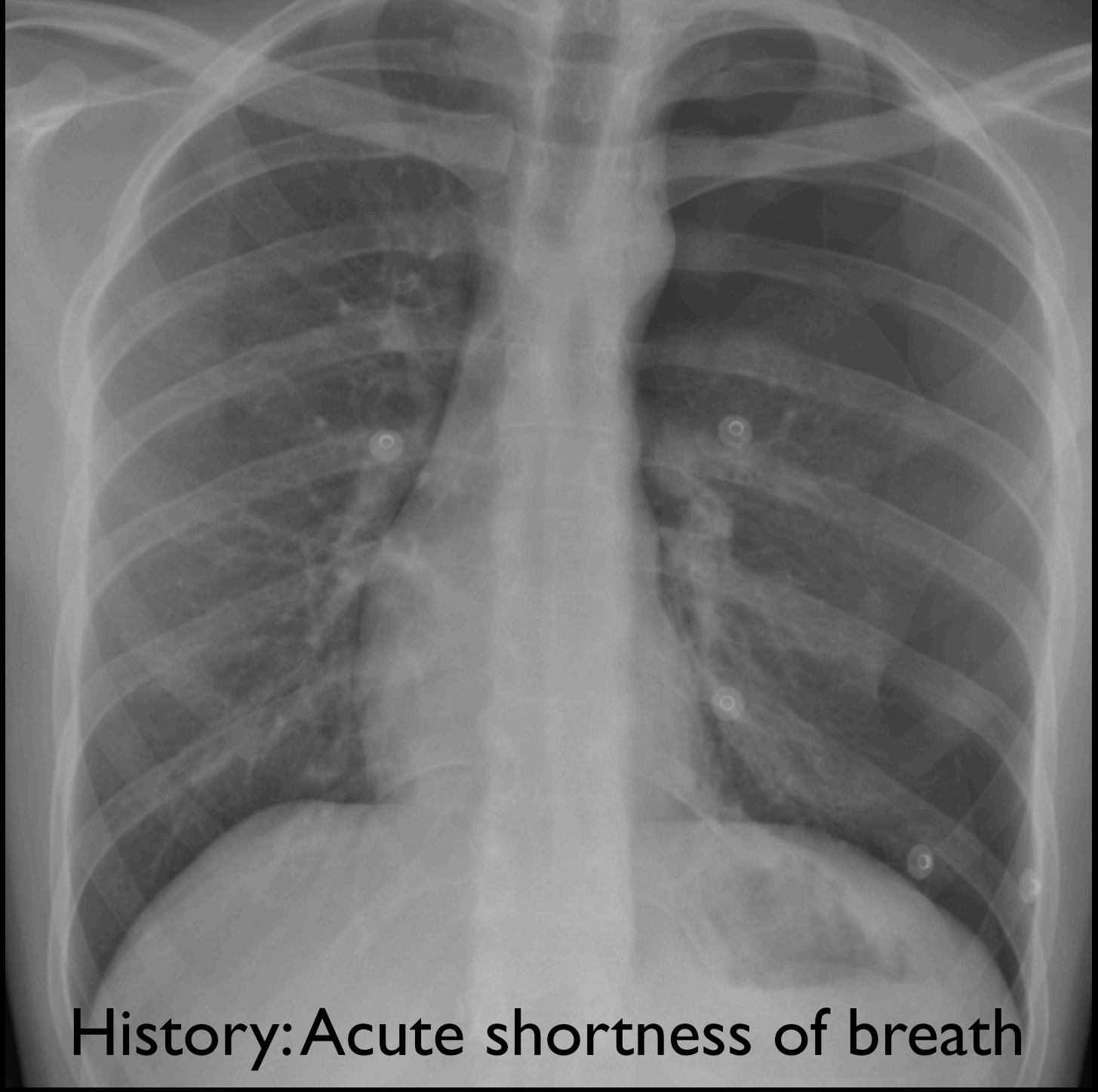
Why is this diagnosis only apparent on the C
and not the chest x ray?



- Another way to make the diagnosis

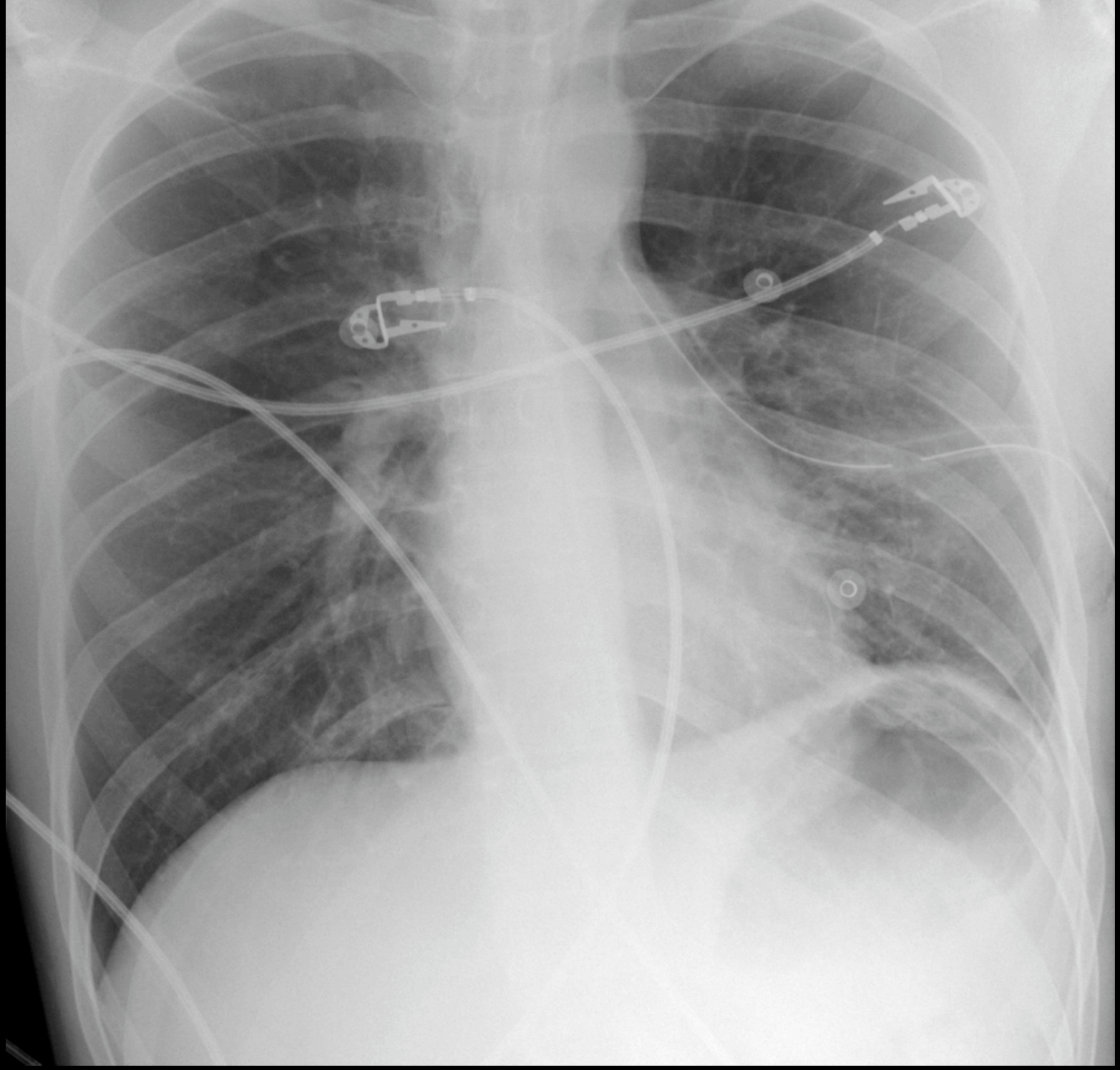


History of intermittent shortness of breath after a myocardial infarction several years ago

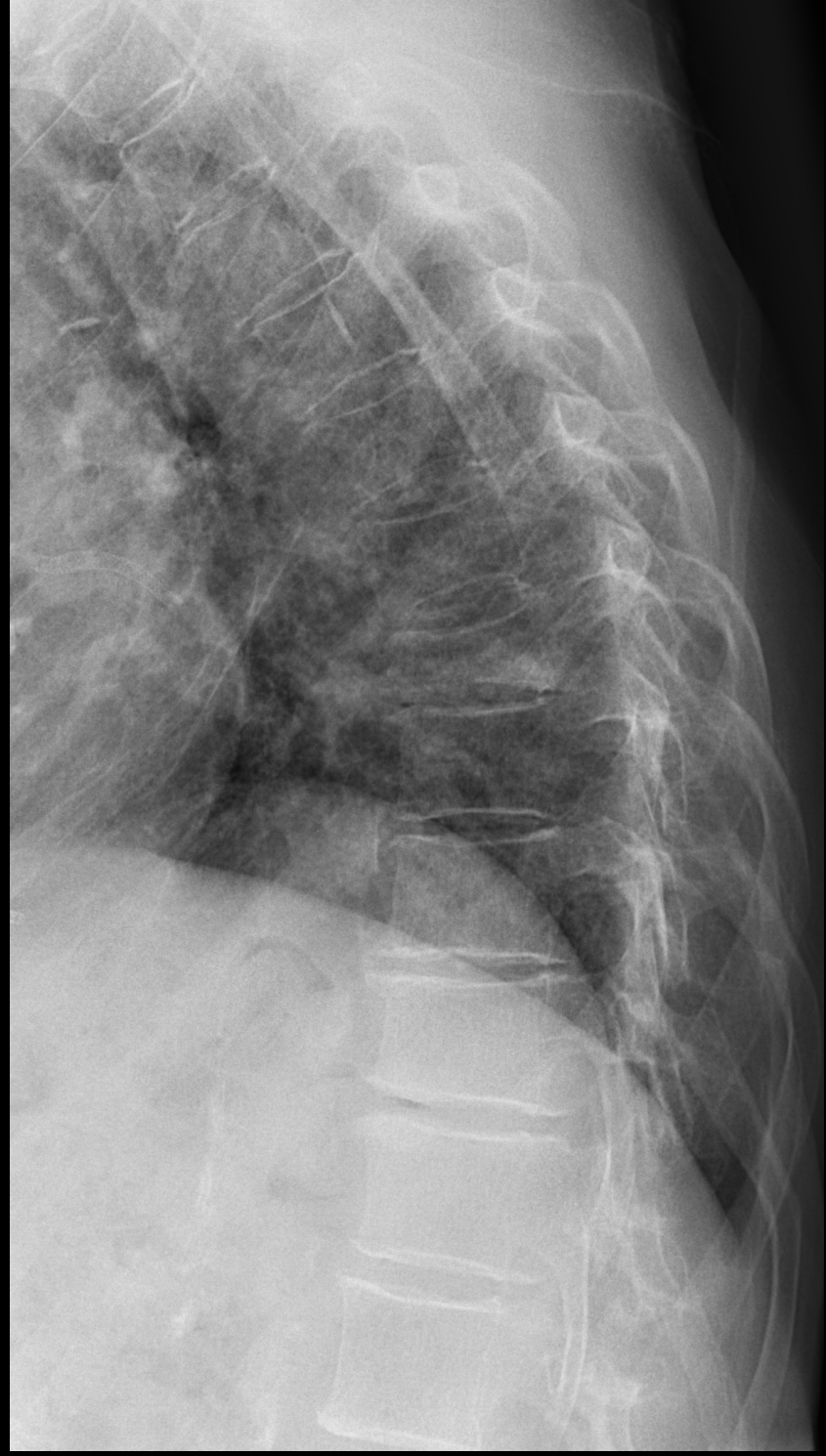


•Explain any abnormal lucency

•Why is there shift of the mediastinum?

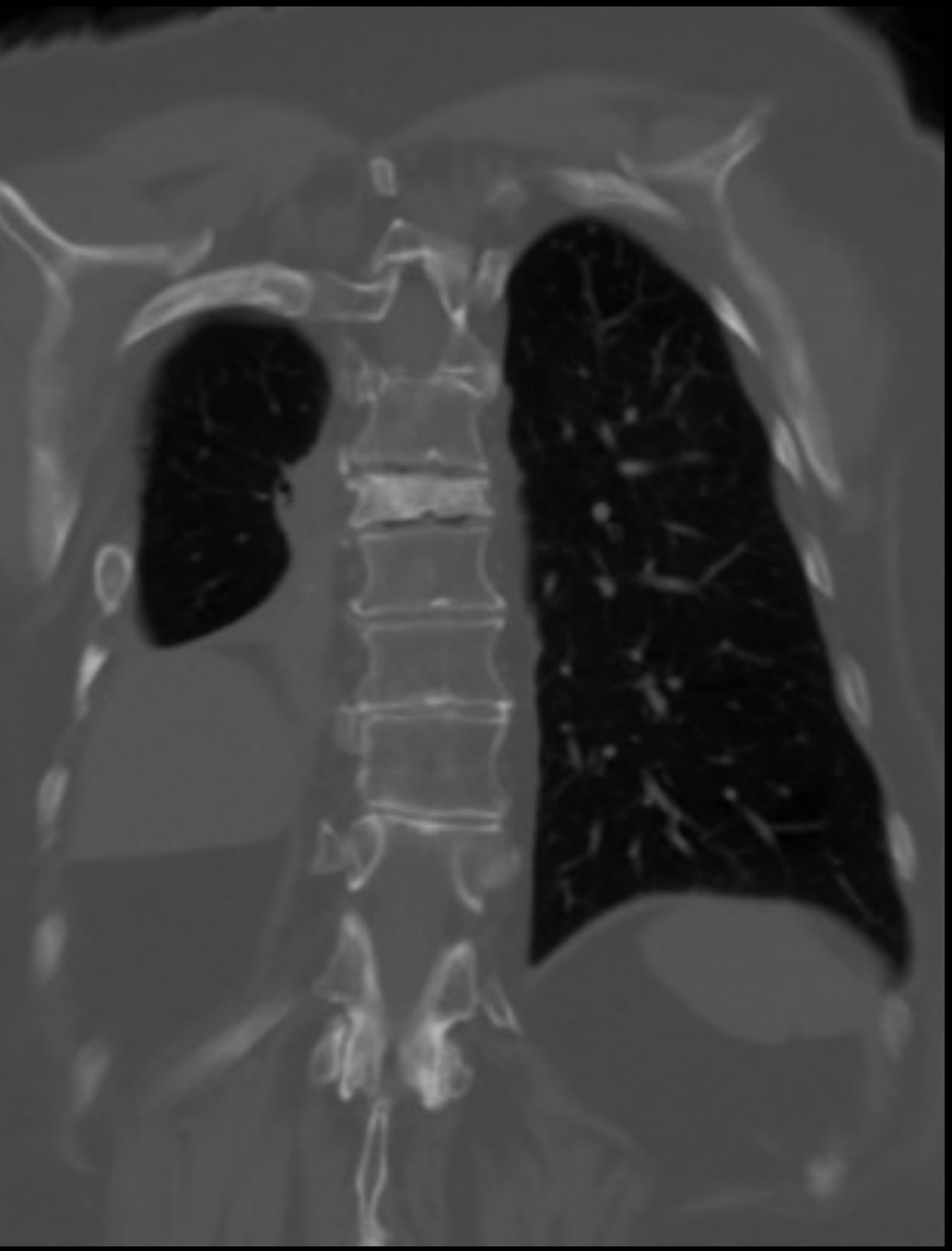


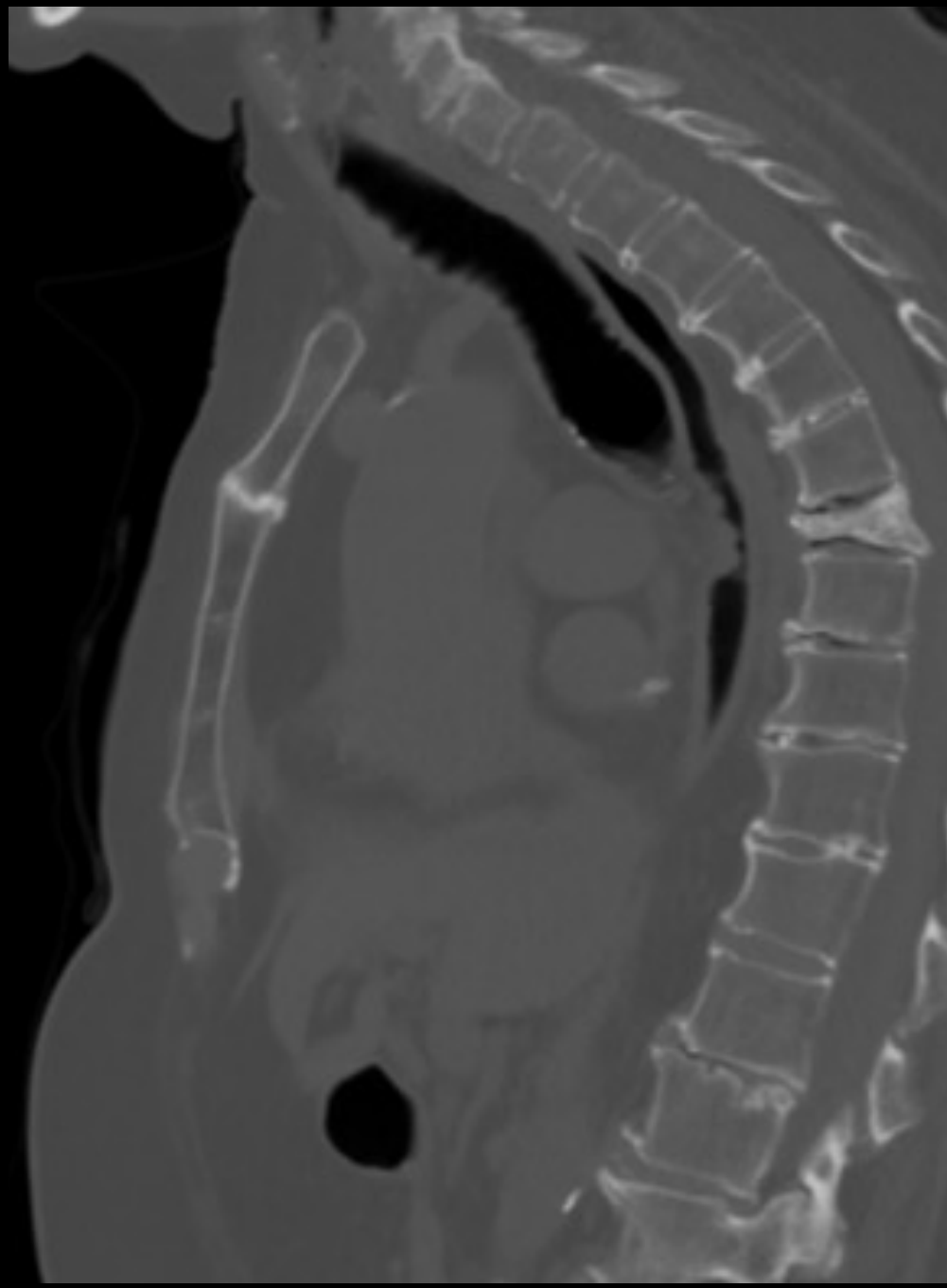
What was the diagnosis?



- What is the abnormality?

Companion Case





- What imaging modality is this?

[redacted]	
Identifier 2:	
Postal Code:	
Sex:	Female
Ethnicity:	White
Height:	60.0 in
Weight:	110.0 lb
DOB:	06/06/1952
Age:	62
Menopause Age:	62
Referring Physician:	PARENT MD, JENNIFER

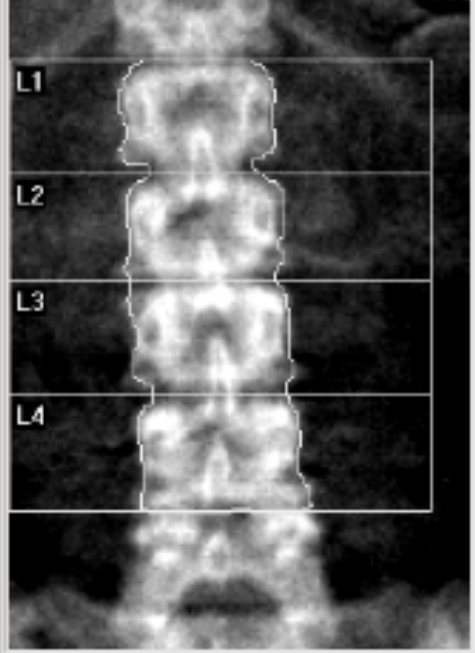
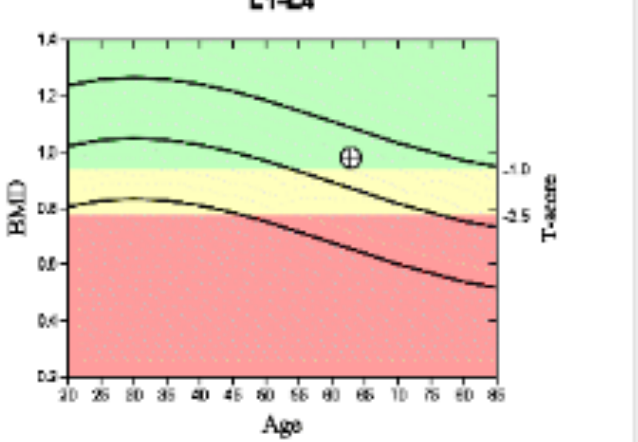


Image not for diagnostic use

116 x 124

b = 1.150, 60 = 47.0



T-score vs. White Female, Z-score vs. White Female. Source:BMD:CS/Hologic

Scan Information

Scan Date:	May 22, 2015 - A05221509
Scan Type:	x Lumbar Spine
Analysis Date:	05/22/2015 09:33
Analysis Protocol:	Spine
Report Date:	05/22/2015 09:33
Institution:	BWH/MGH Healthcare Center
Operator:	POC
Model:	Discovery A (S/N84040)
Comment:	
Software version:	13.3

Results Summary:

Region	Area[cm²]	BMC[(g)]	BMD[g/cm²]	T-score	PR (Peak Reference)	Z-score	AM (Age Matched)
L1	12.36	10.94	0.885	-1.0	89	0.5	106
L2	12.14	11.80	0.972	-0.5	95	1.1	114
L3	13.25	13.85	1.045	-0.4	96	1.3	116
L4	14.40	14.43	1.002	-0.5	94	1.2	115
Total	**52.15**	**51.03**	**0.978**	**-0.6**	**93**	**1.0**	**113**

Total BMD CV 1.0%, ACF = 1.035, BCF = 1.021, TH = 5.837

Fracture Risk: Not Increased, WHO Classification: Normal

Comment:

HOLOGIC®

Postal Code:	
Sex:	Female
Ethnicity:	White
Height:	60.0 in
Weight:	110.0 lb
DOB:	06/06/1952
Age:	62
Menopause Age:	62
Referring Physician:	PARENT MD, JENNIFER

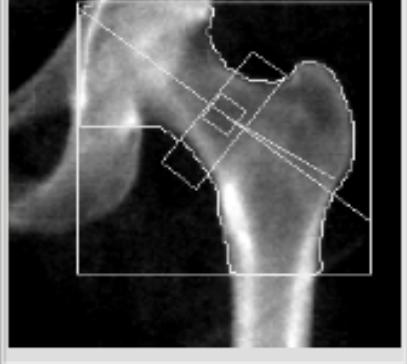
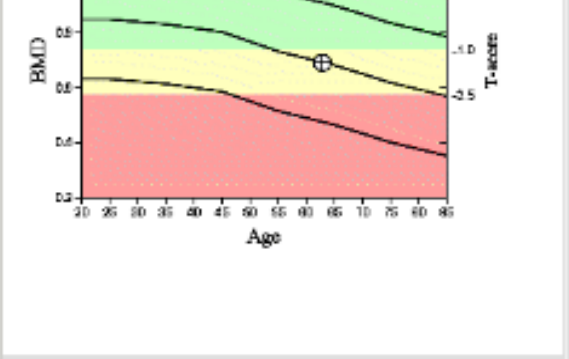


Image not for diagnostic use

95 x 92

NECK: 40 x 15

k = 1.150, 60 = 49.9



T-score vs. White Female; Z-score vs. White Female. Source:BMD CS/NHANES

Scan Information

Scan Date:	May 22, 2015 - A0522150A
Scan Type:	x Left Hip
Analysis Date:	05/22/2015 09:32
Analysis Protocol:	Hip
Report Date:	05/22/2015 09:33
Institution:	BWH/MGH Healthcare Center
Operator:	POC
Model:	Discovery A (S/N84040)
Comment:	
Software version:	13.3

HOLOGIC®

Results Summary:

Region	Area[cm²]	BMC[(g)]	BMD[g/cm²]	T-score	PR (Peak Reference)	Z-score	AM (Age Matched)
Neck	4.87	3.37	0.692	-1.4	81	0.0	100
Total	28.18	26.33	0.934	-0.1	99	1.0	116

Total BMD CV 1.0%, ACF = 1.035, BCF = 1.021, TH = 5.187

WHO Classification: Osteopenia

FRAX® WHO Fracture Risk Assessment Tool

10-year Fracture Risk[1]	
Major Osteoporotic Fracture	7.6%
Hip Fracture	0.7%
Reported Risk Factors: US (Caucasian), Neck BMD=0.692, BMI=21.5	

[1] FRAX® Version 3.01. Fracture probability calculated for an untreated patient. Fracture probability may be lower if the patient has received treatment

Can osteoporosis be diagnosed clinically?

What are the WHO criteria for the classifications of normal, oste