

Radiology of the respiratory/cardiac diseases (part 2)

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*60 year old male
presenting to emergency
with chest pain.*



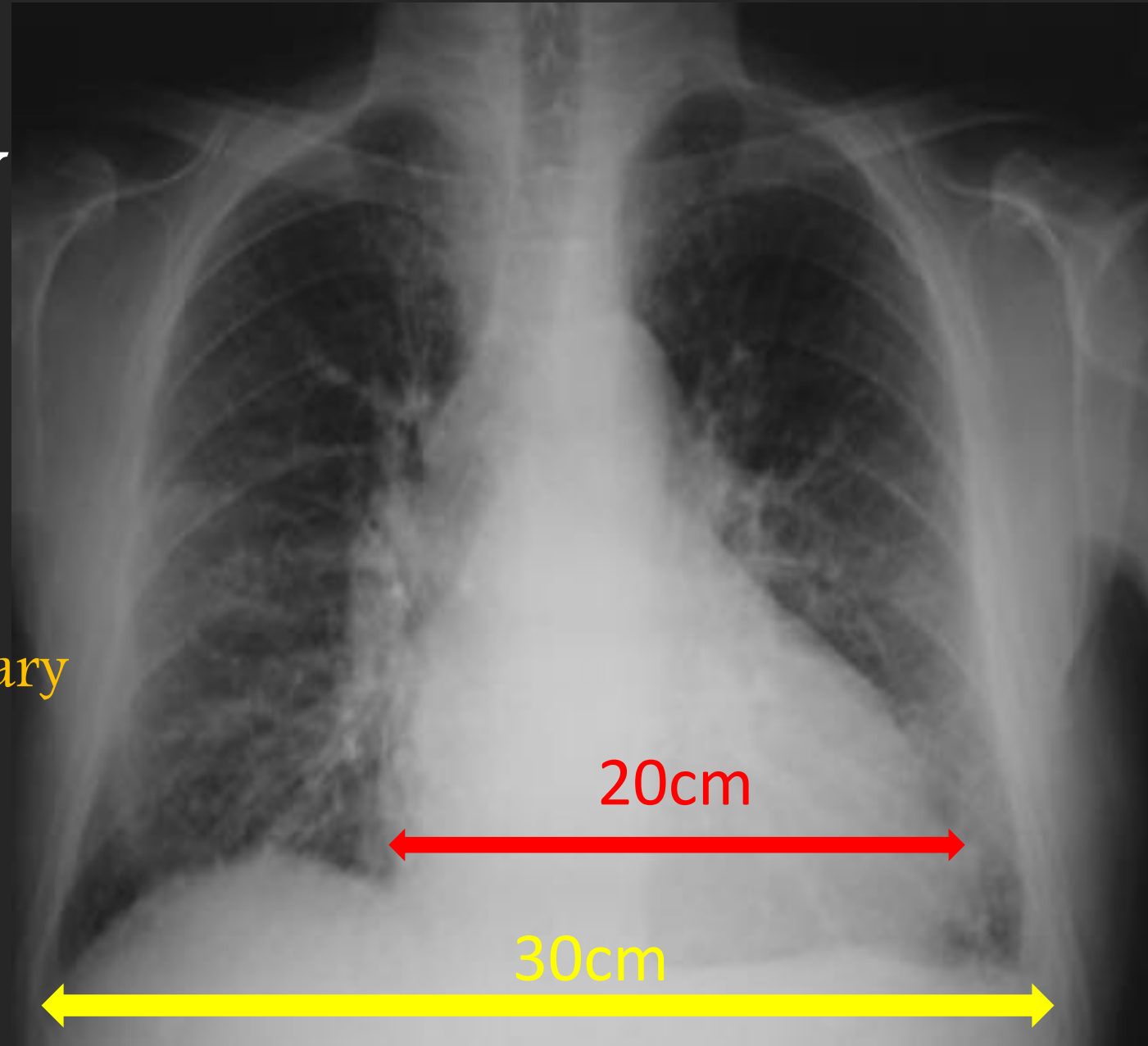
*60 year old male
presenting to emergency
with chest pain.*

- Is the heart normal ?
- Are the lungs normal ?



*60 year old male
presenting to emergency
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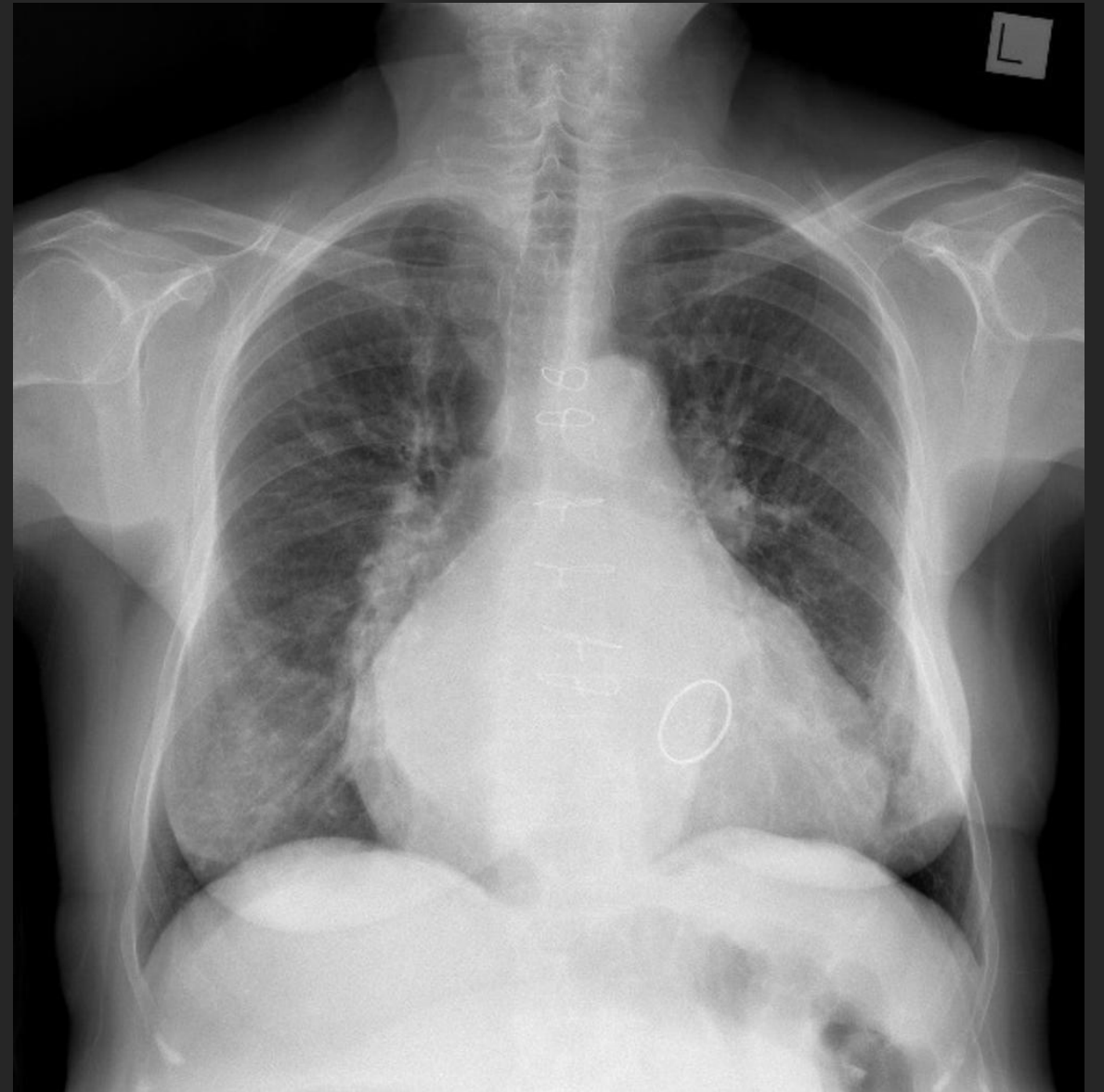
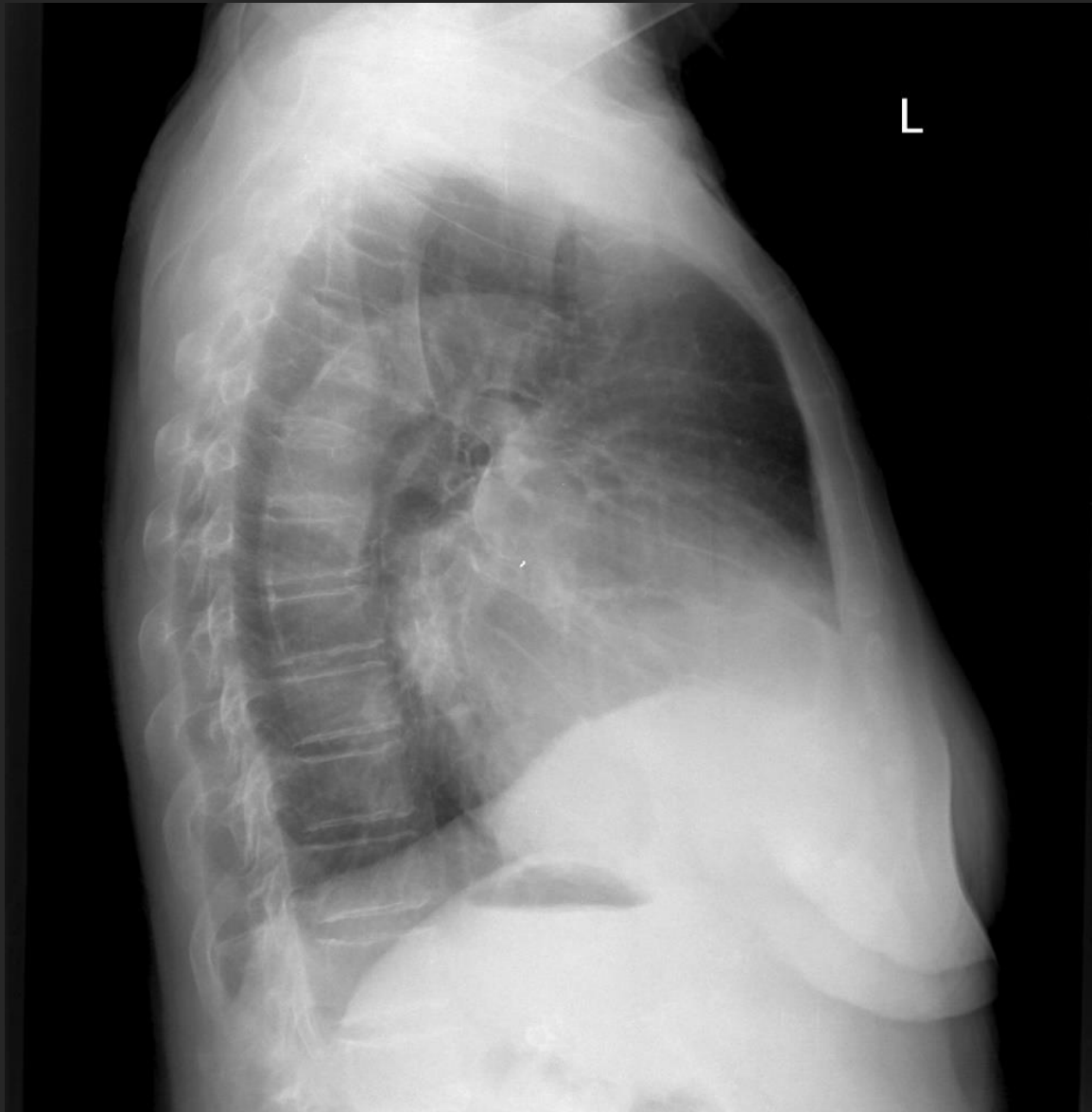
- Is the heart normal? **Enlarged**
- Are the lungs normal? **Pulmonary edema + left + pleural effusion**



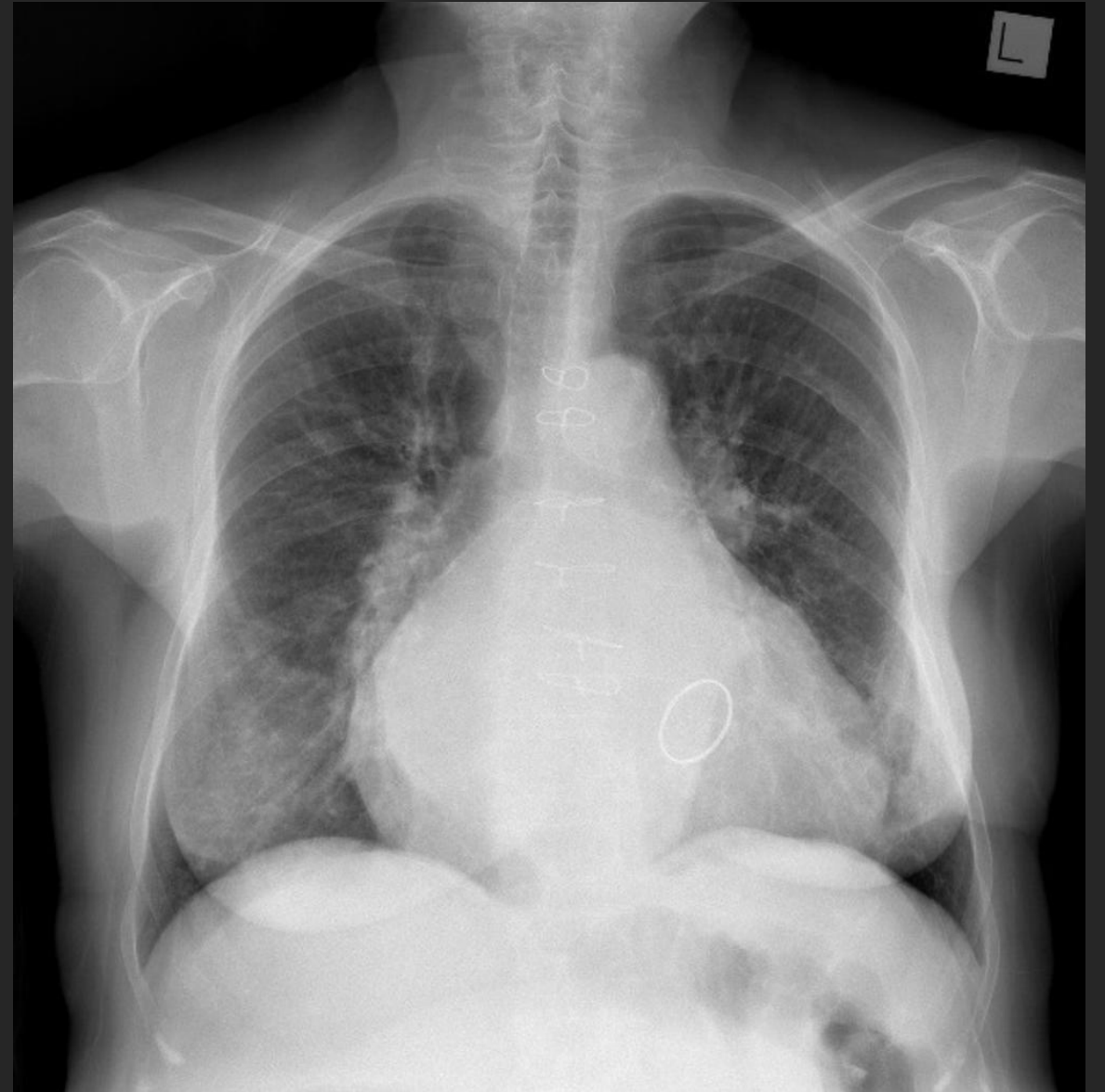
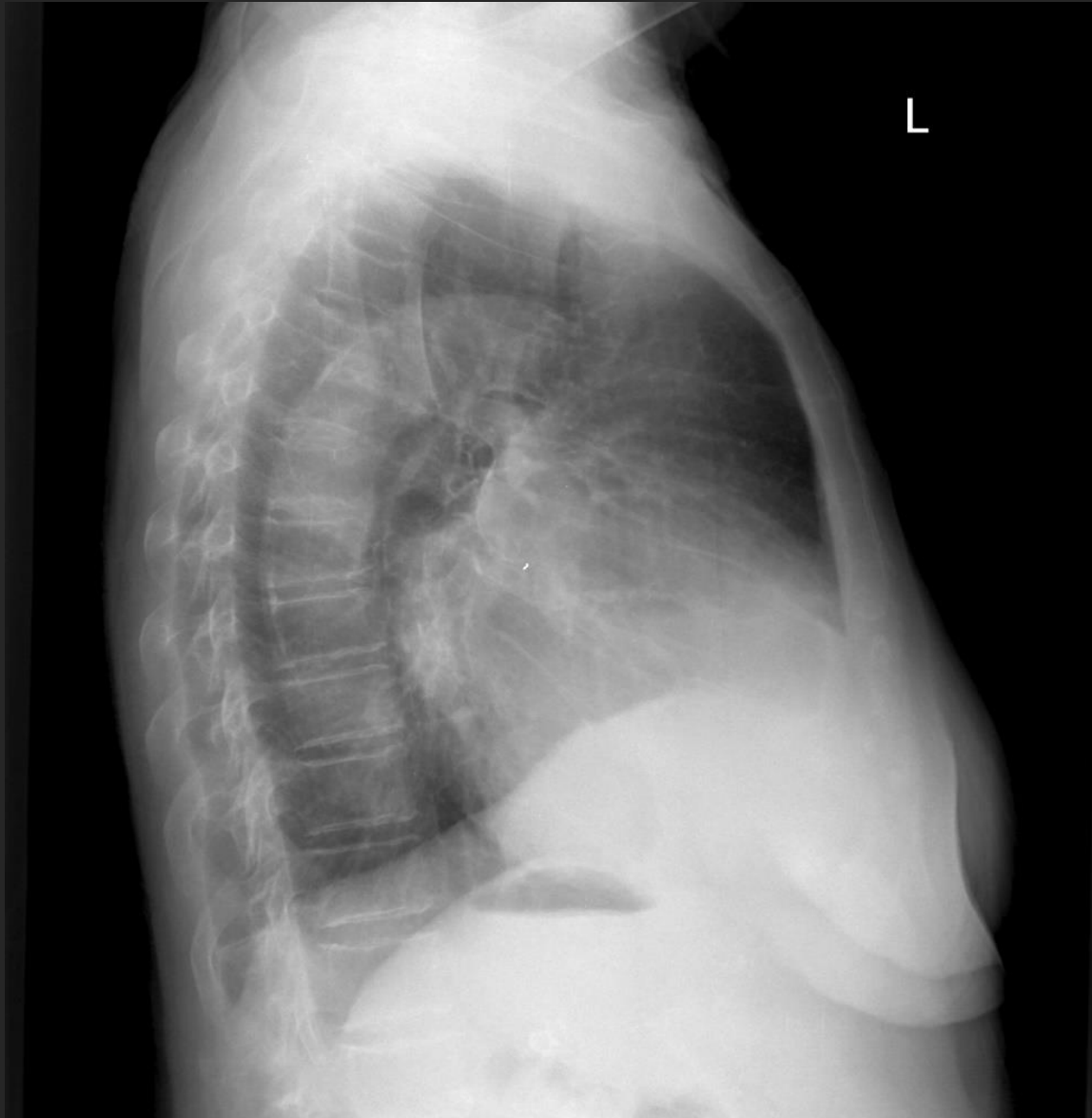
Heart Enlargement on x-ray (causes):

- Congestive heart failure.
- Ischaemic heart disease.
- Valvular disease.
- Myocarditis.
- Cardiomyopathy.
- **Congenital heart disorders:** e.g. ASD, VSD, PDA, coarctation of the aorta, Ebstein anomaly, tetralogy of Fallot.
- **Pulmonary disease** (leading to right-sided enlargement).
- **Systemic disease:** e.g. Hypertension (left ventricular hypertrophy), renal failure, anaemia
- **Physiology:** e.g. normal “athletic” heart, pregnancy.
- Pericardial effusion.

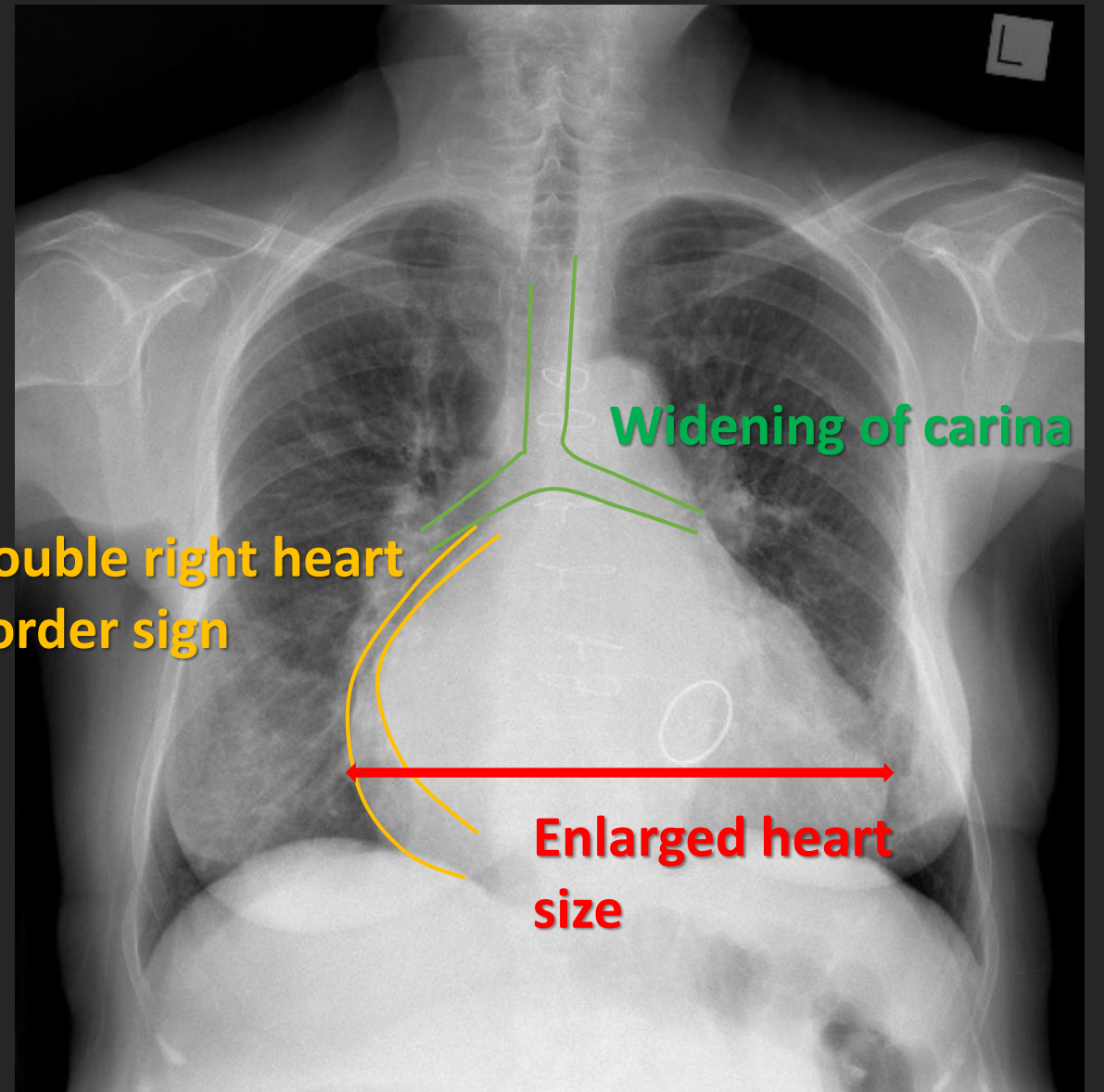
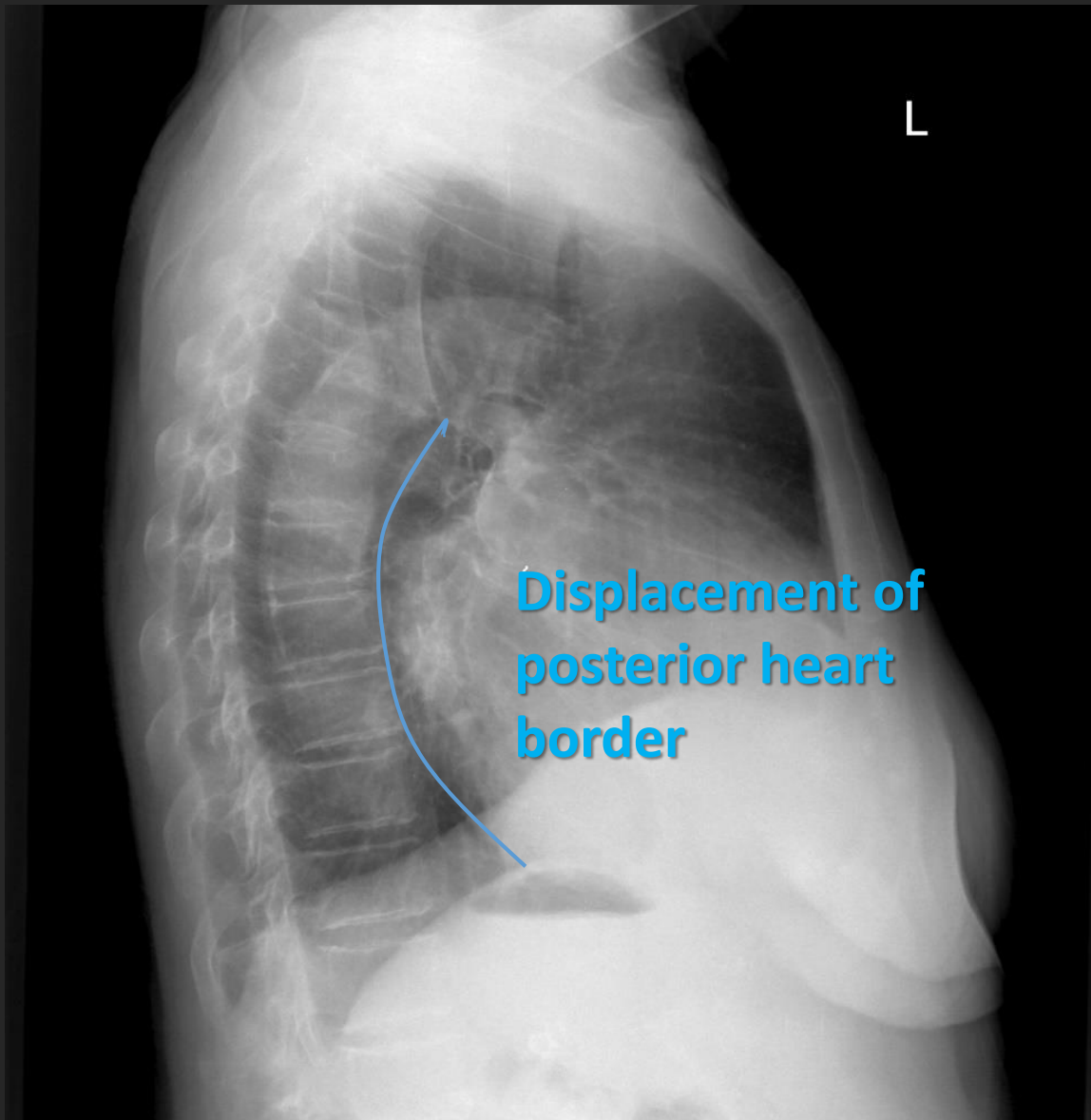
Which heart chamber is enlarged ?



Which heart chamber is enlarged ? **Left atrium**



Signs of Left atrium (x-ray)



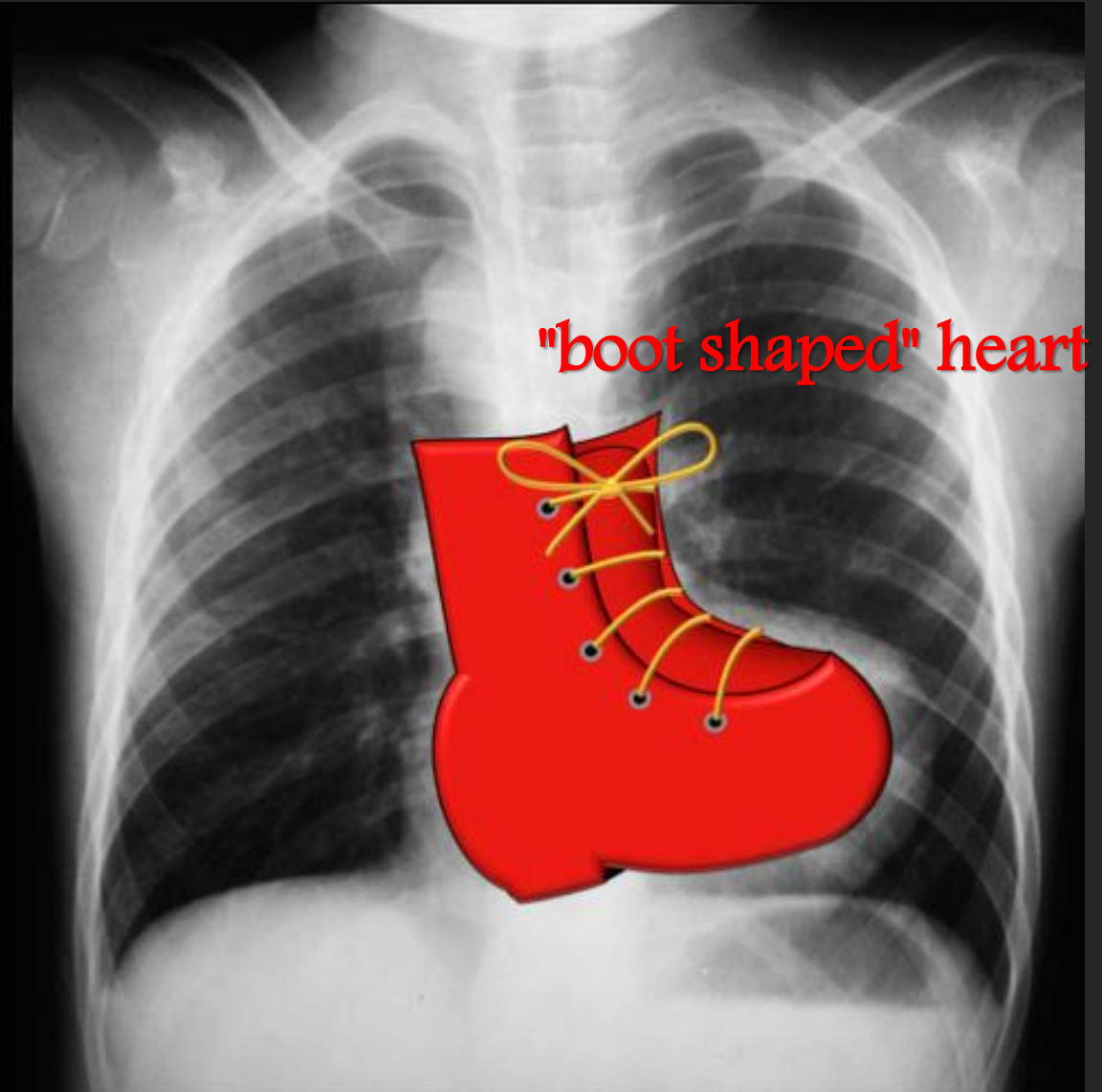
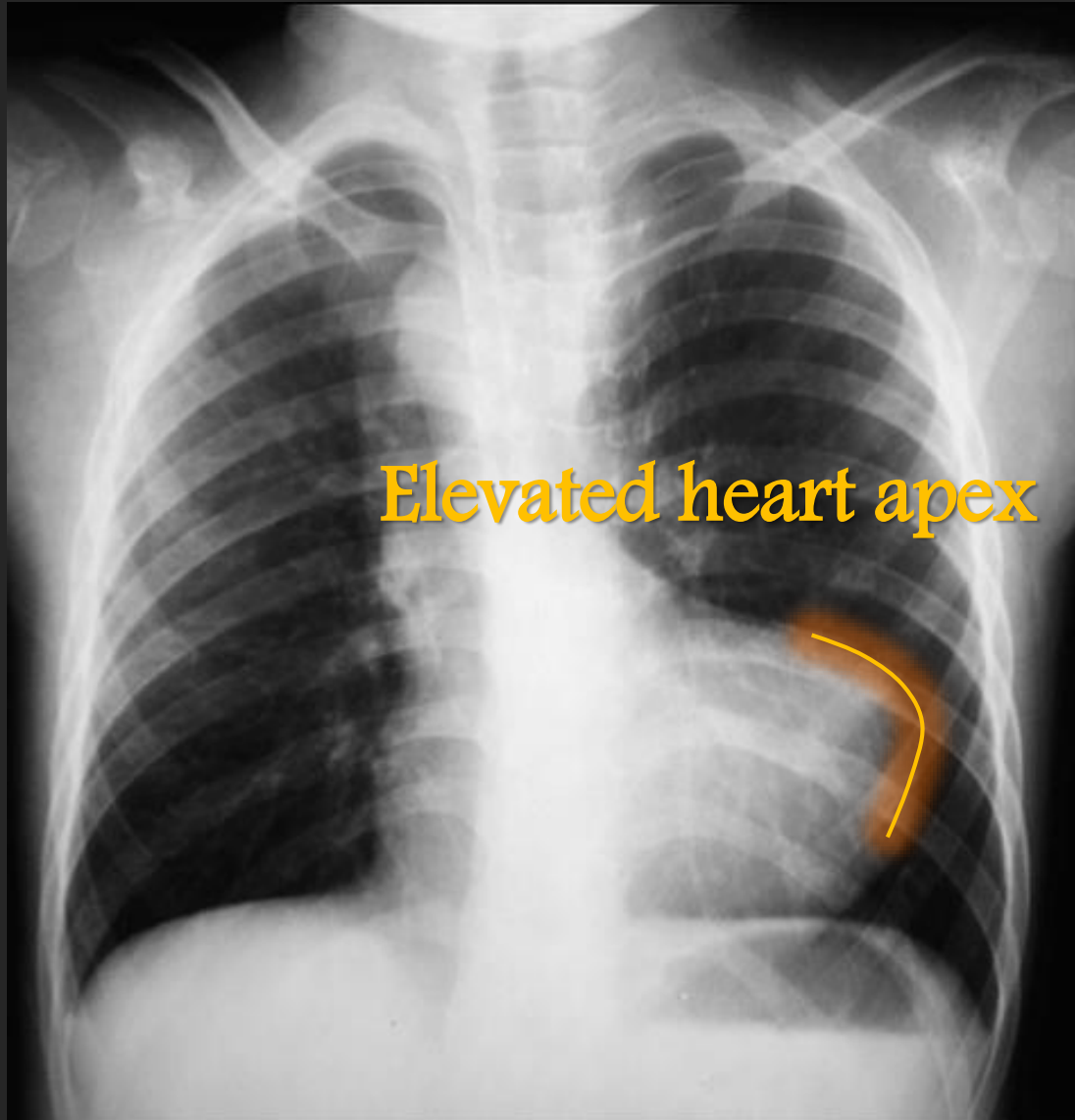
Which heart chamber is enlarged ?



Which heart chamber is enlarged ? **Right ventricle**



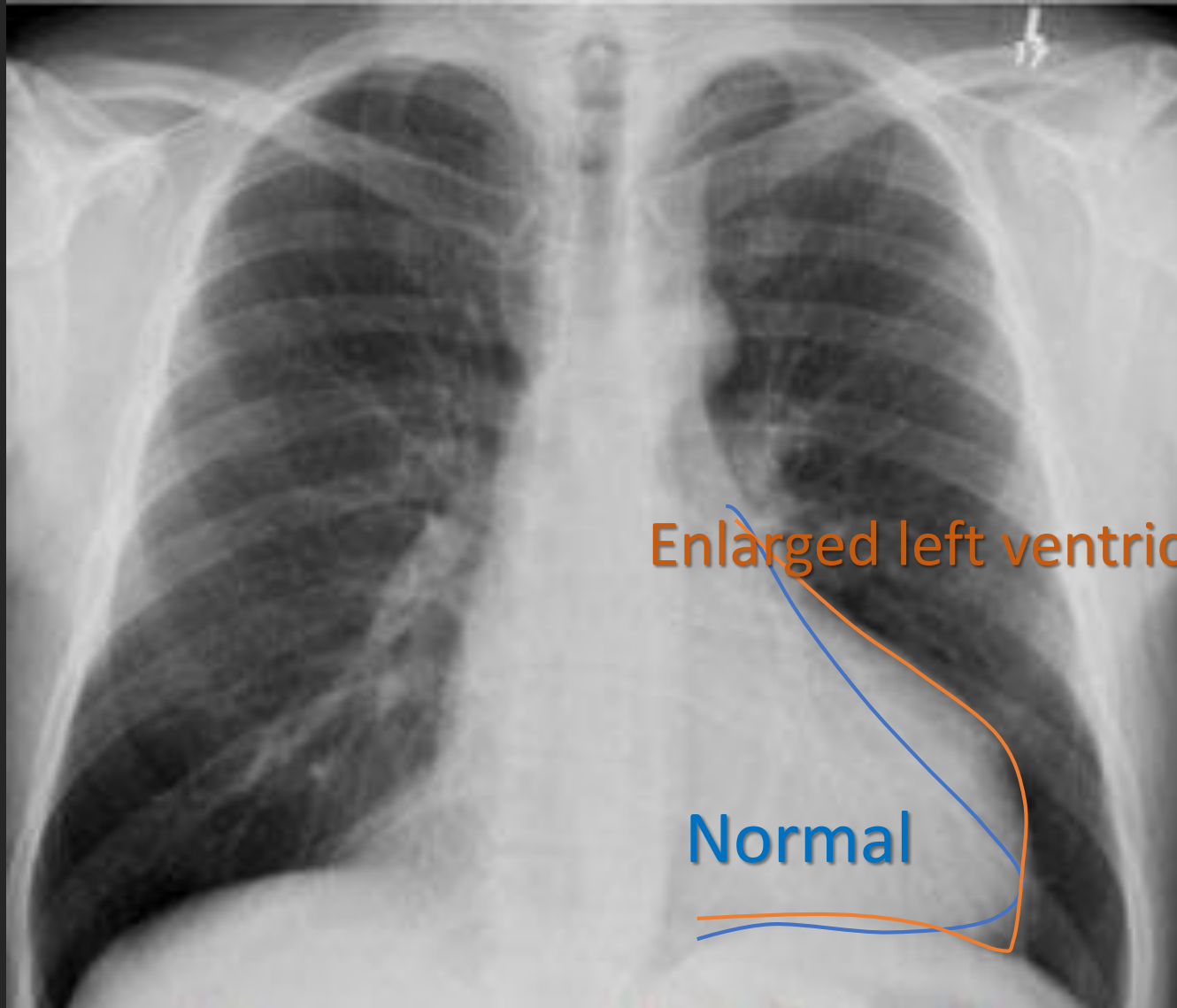
Which heart chamber is enlarged ? **Right ventricle**



Which heart chamber is enlarged ?



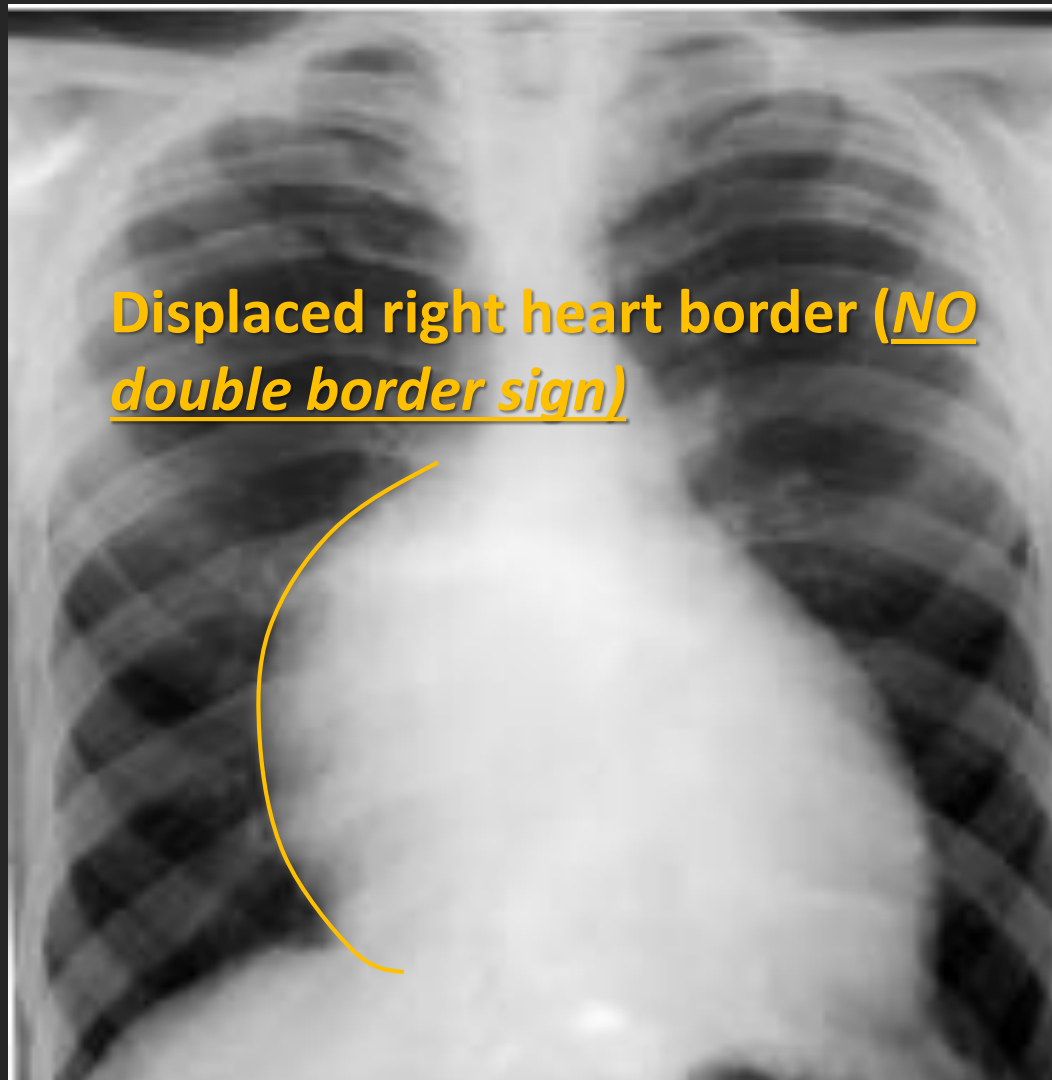
Which heart chamber is enlarged ? **left ventricle**



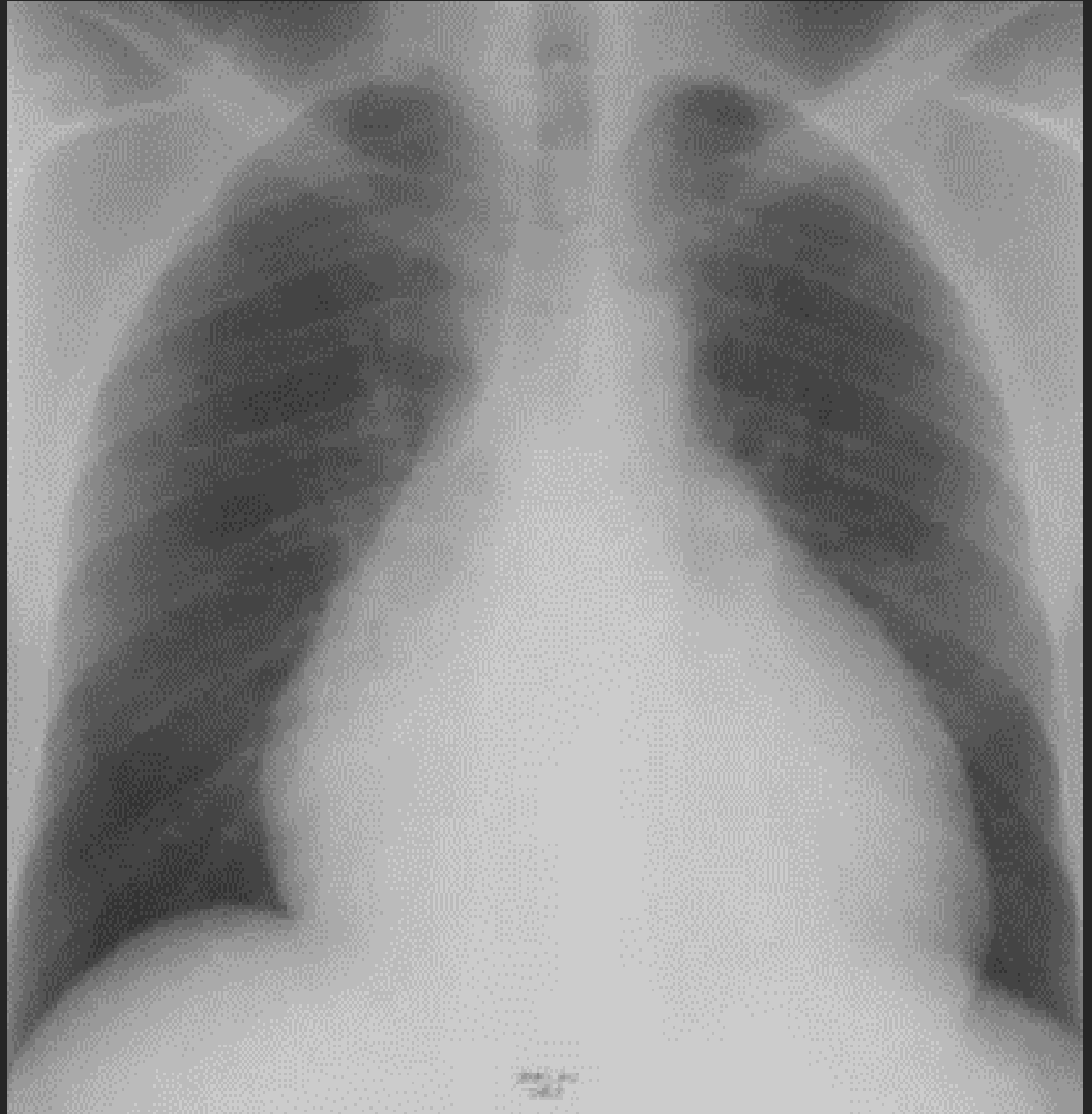
Which heart chamber is enlarged ?



Which heart chamber is enlarged ? **Right atrium**

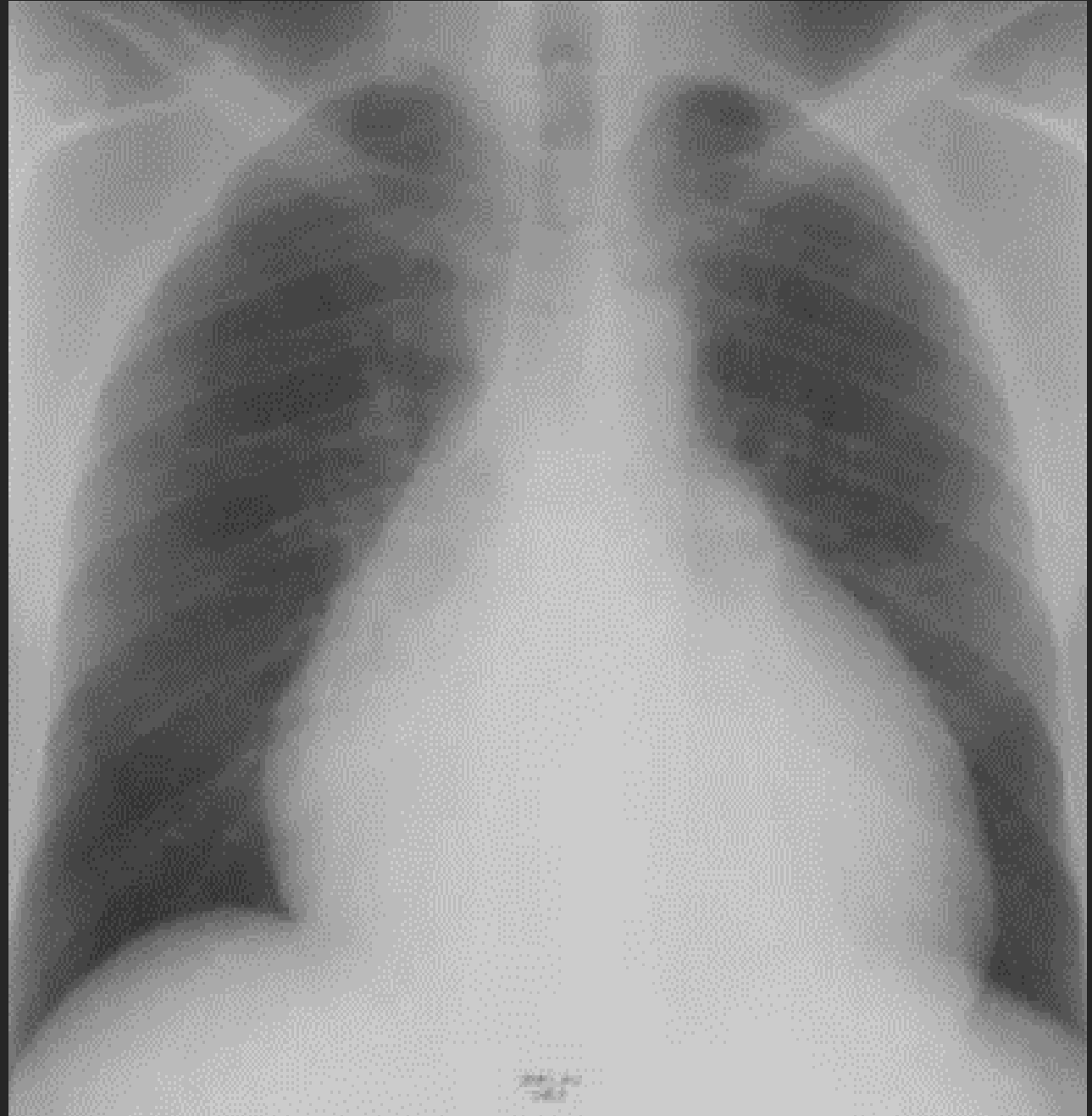


What is abnormal ?

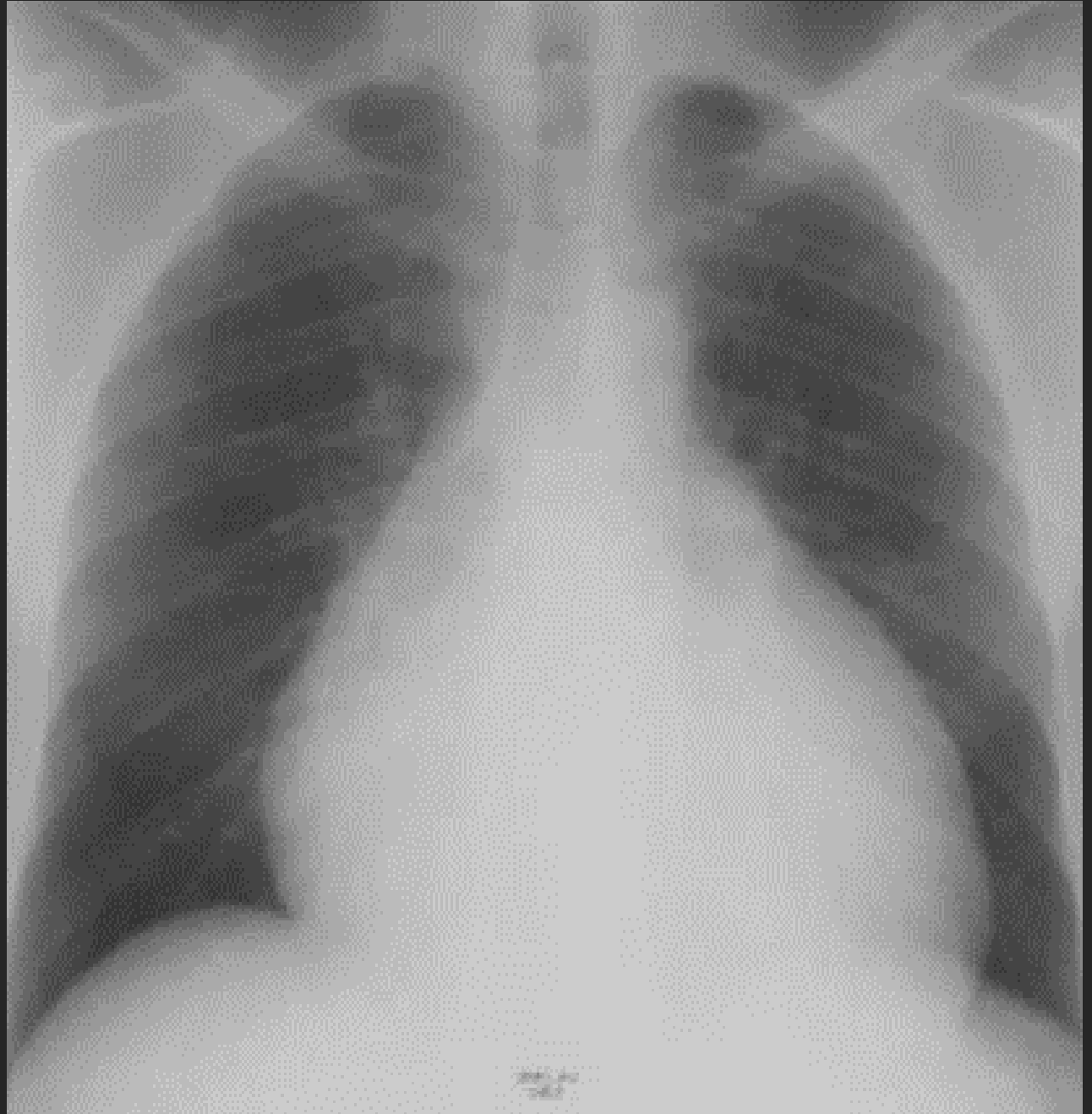


What is abnormal ?

Heart shadow is enlarged.

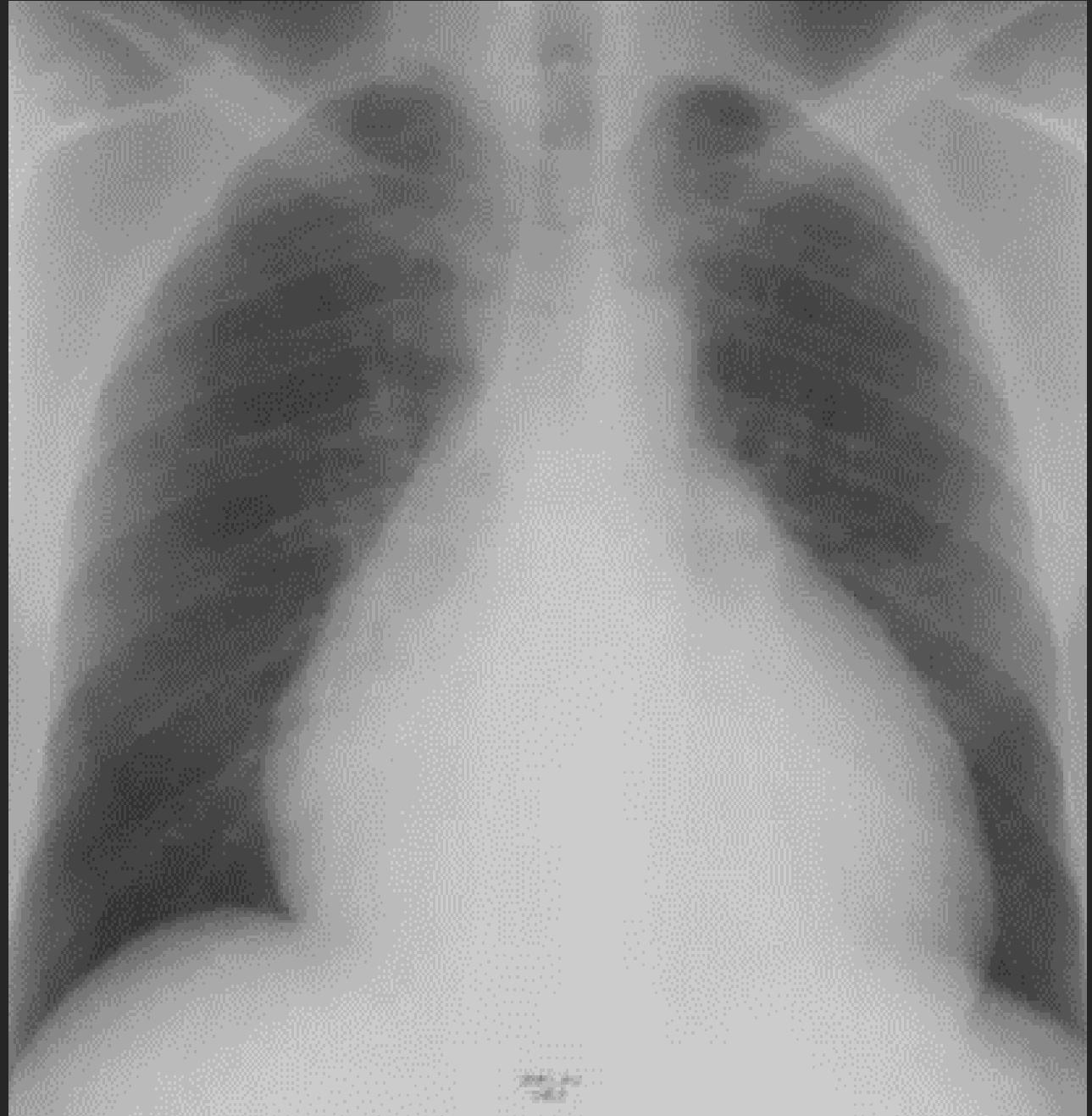


What could be the cause ? And why?

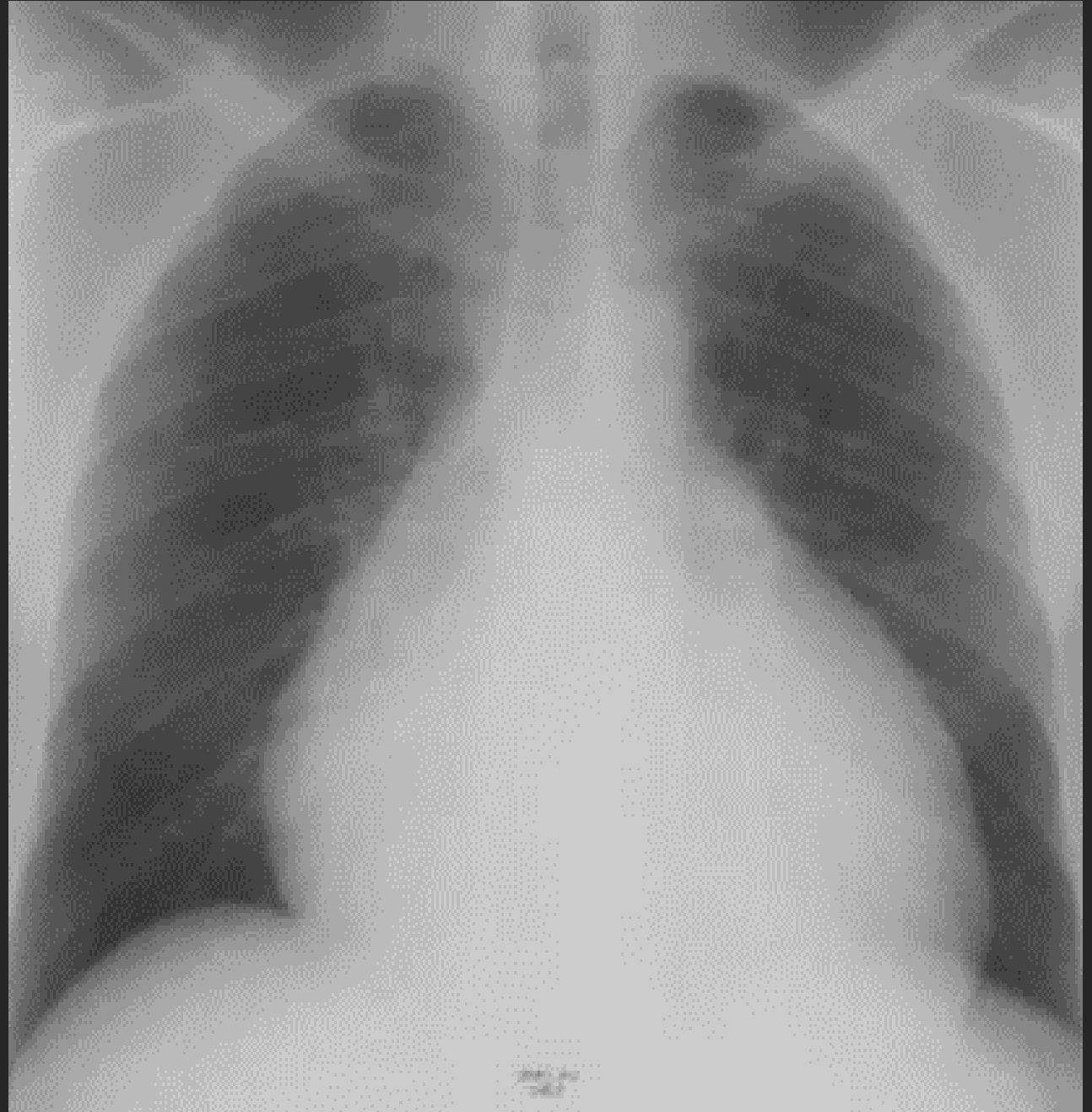


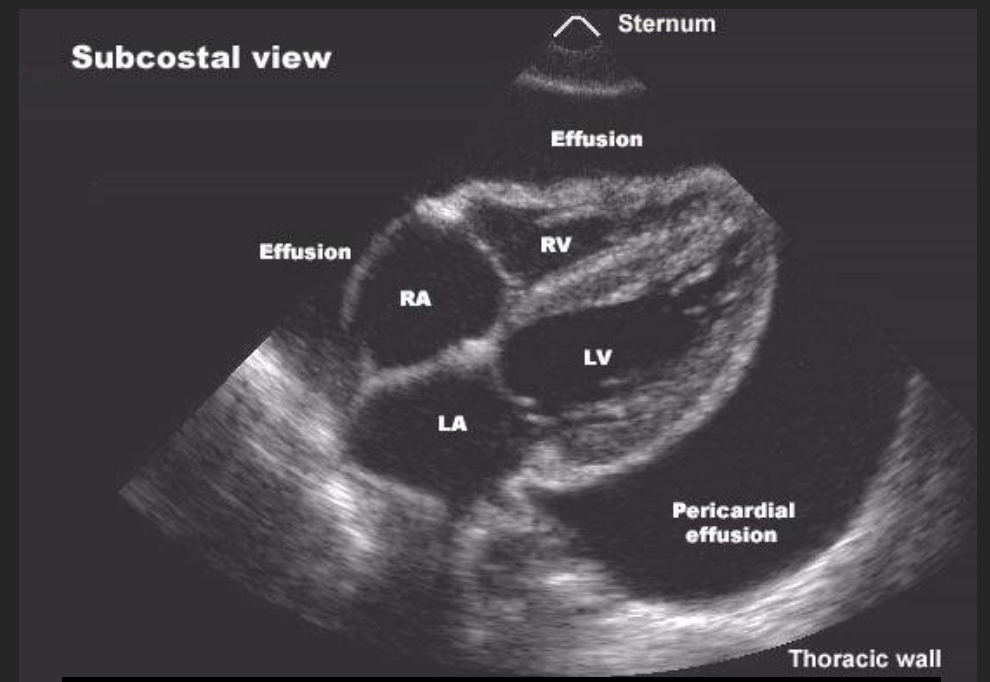
What could be the cause ? And why?

Pericardial effusion. No lung changes (edema).



Who to confirmed the diagnosis ?





Who to confirmed the diagnosis ?

Echocardiograph or CT scan.

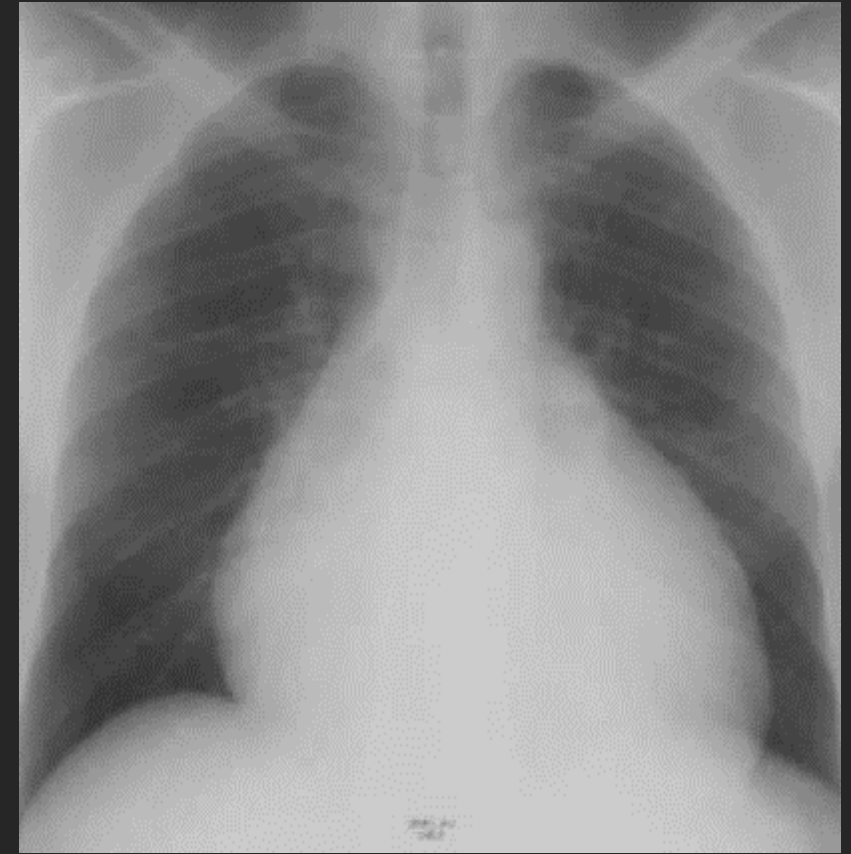


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Heart shadow is enlarged.

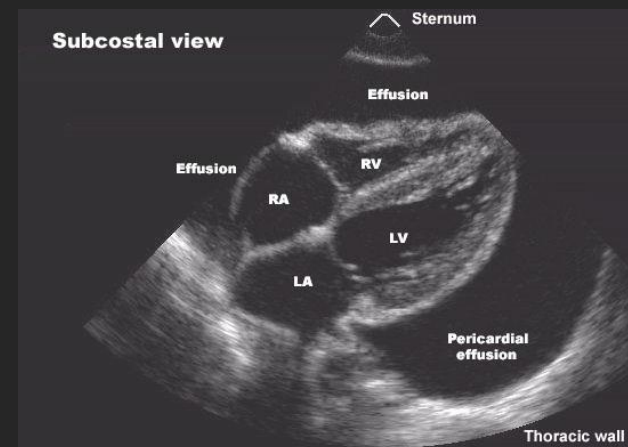
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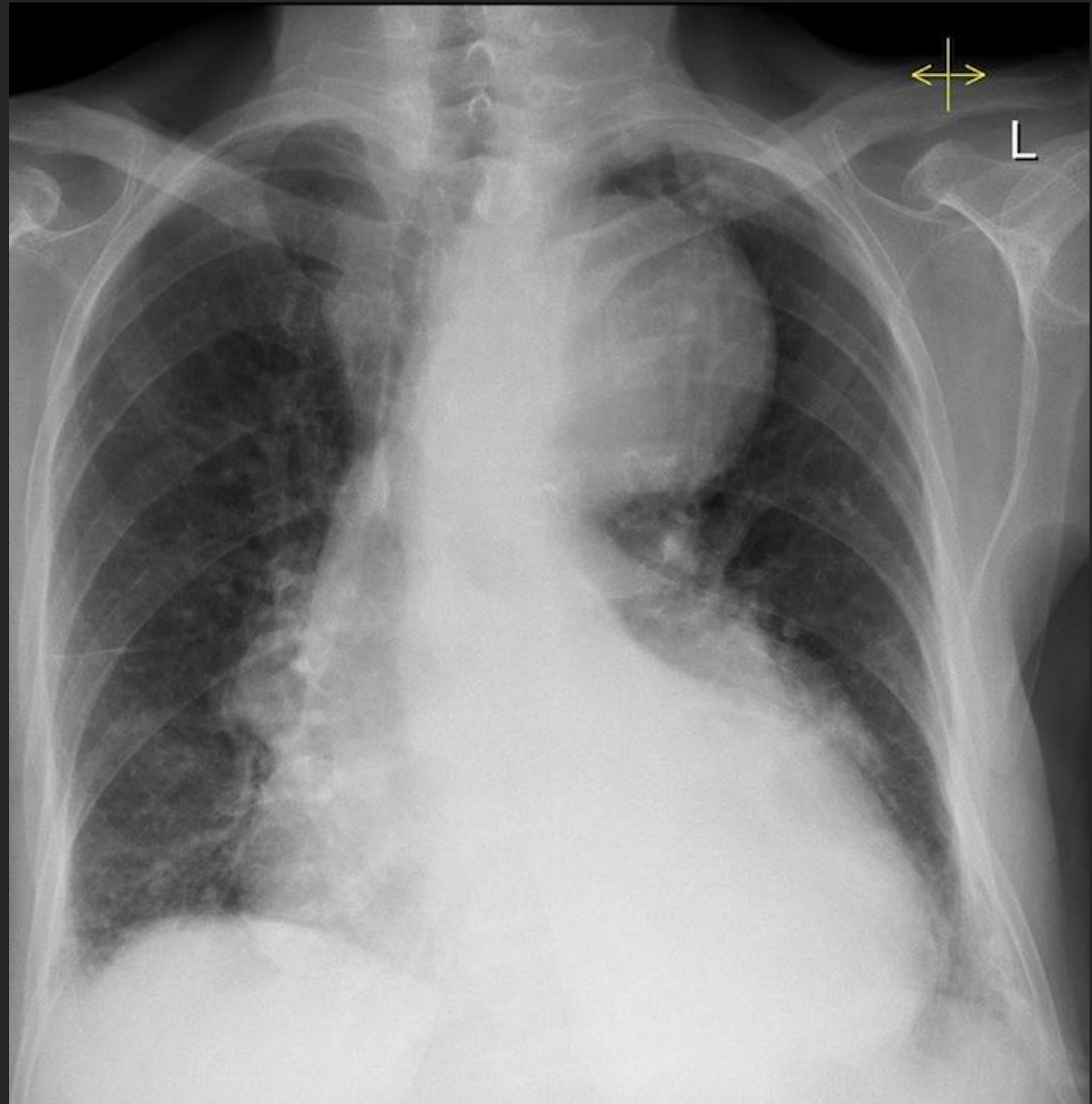


Who to confirmed the diagnosis ?

Echocardiograph or CT scan.

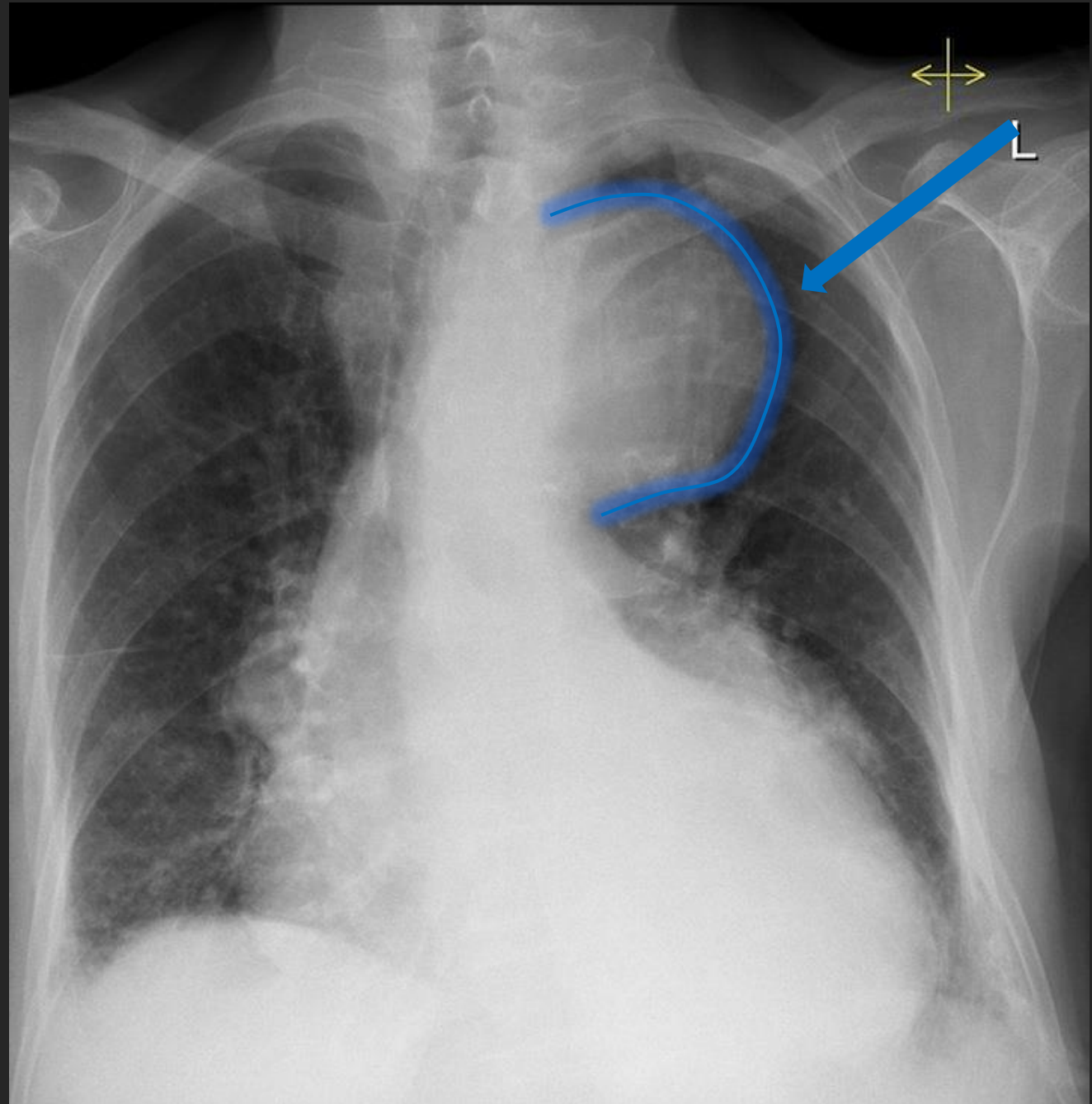


Known case of hypertension presenting with chest pain.



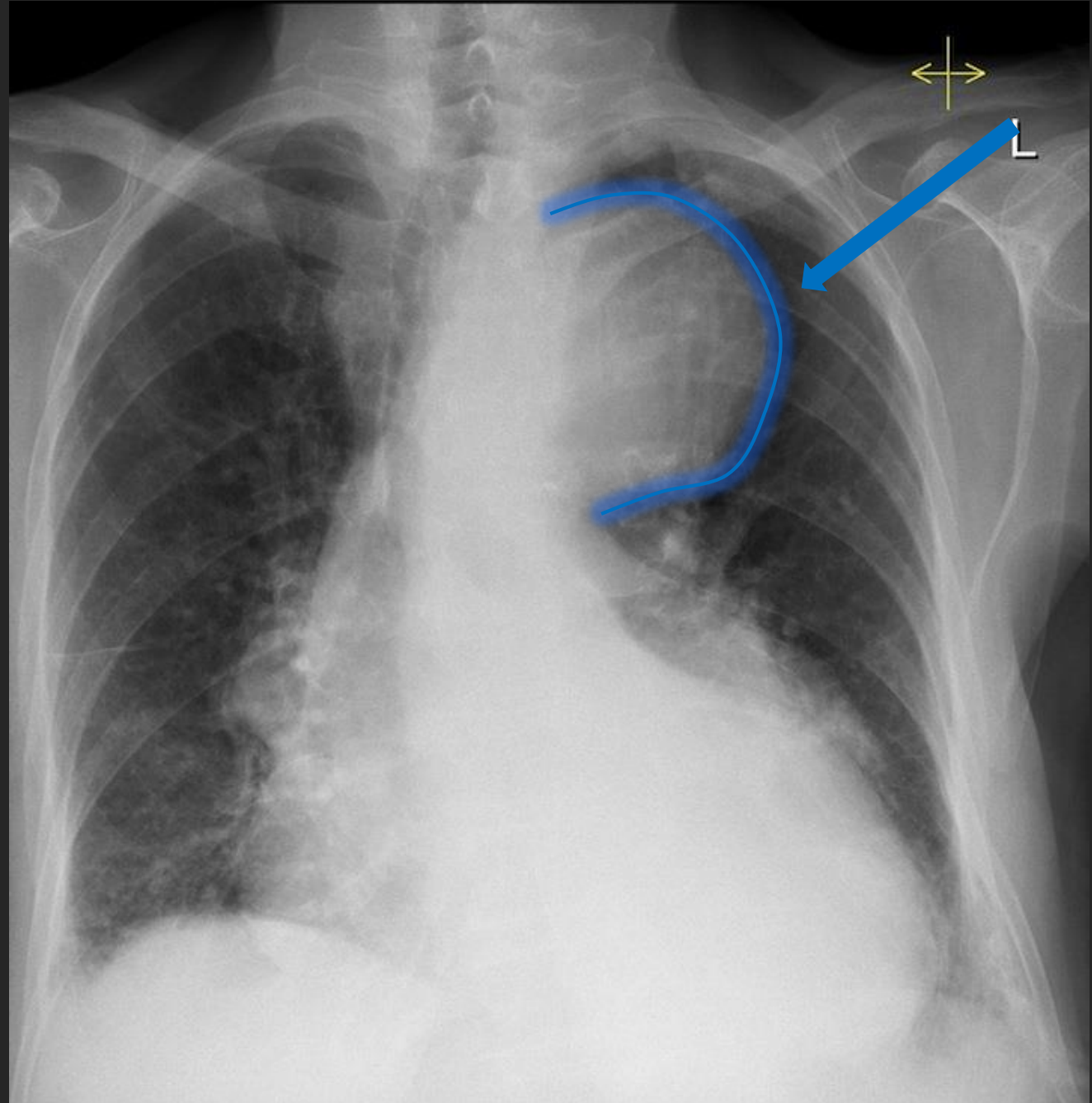
Known case of hypertension presenting with chest pain.

➤ What is the arrow pointing at ?



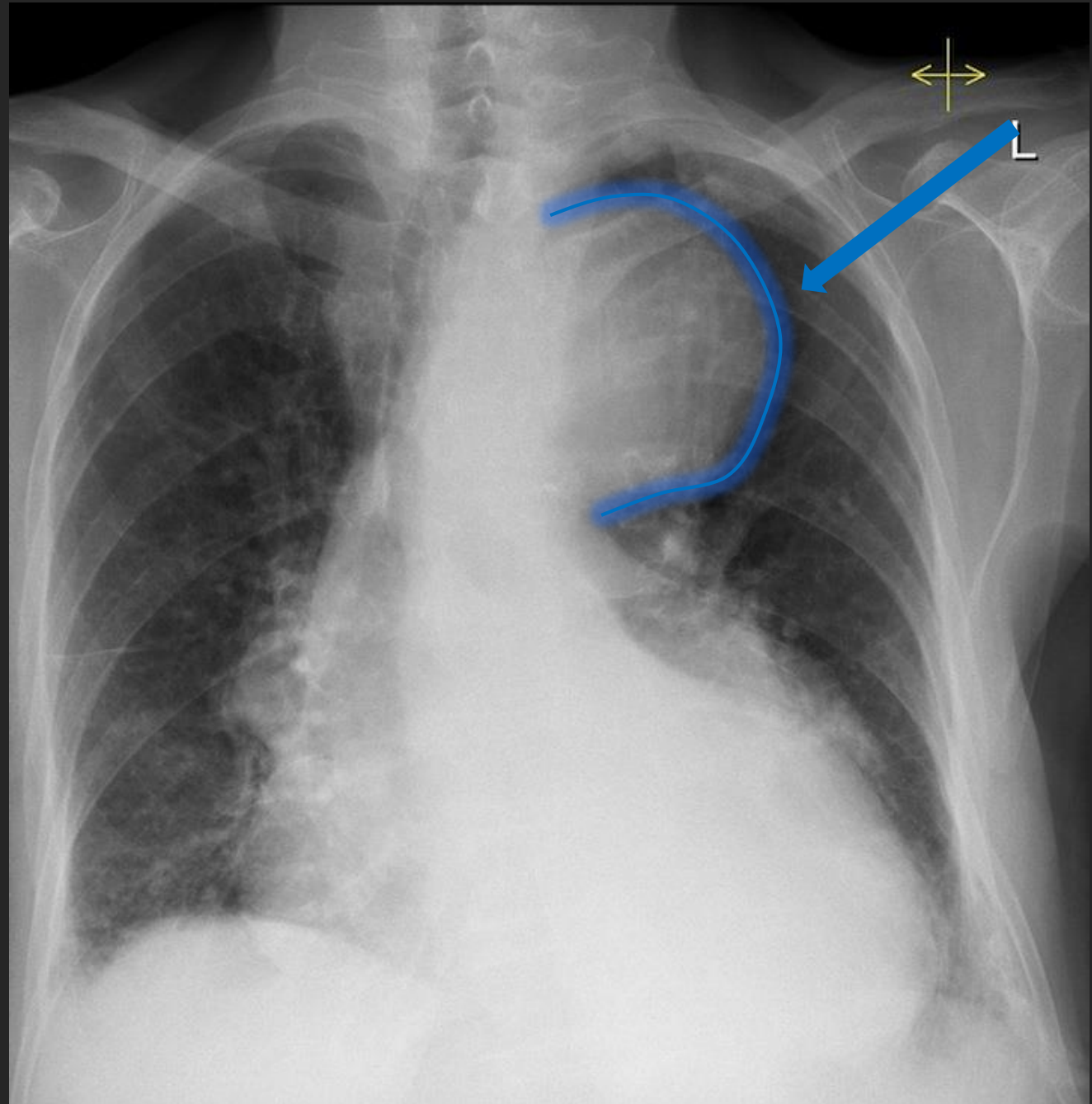
Known case of hypertension presenting with chest pain.

- What is the arrow pointing at ?
Aortic arch (aortic knob)



Known case of hypertension presenting with chest pain.

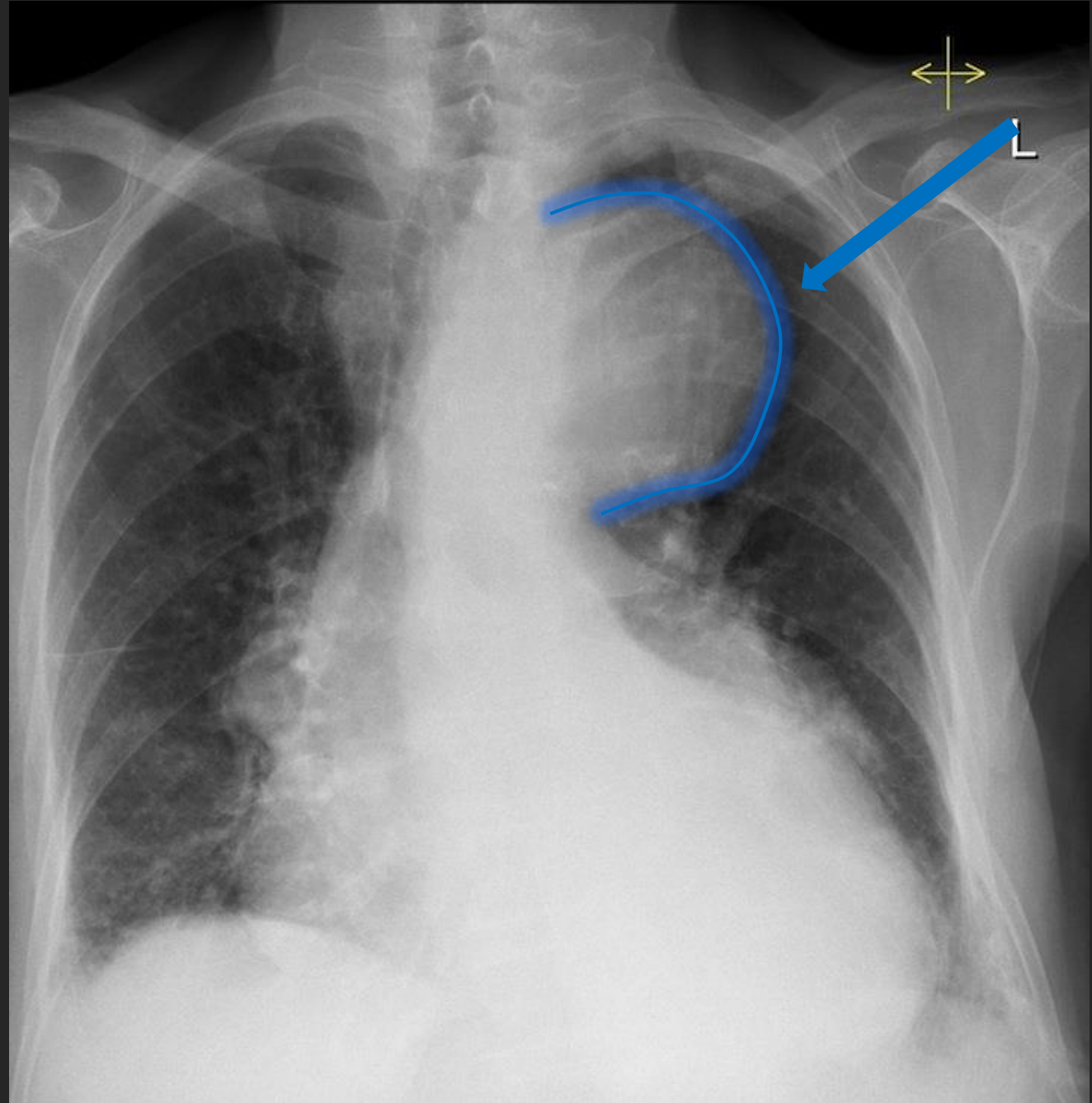
➤ Is it normal ?



Known case of hypertension presenting with chest pain.

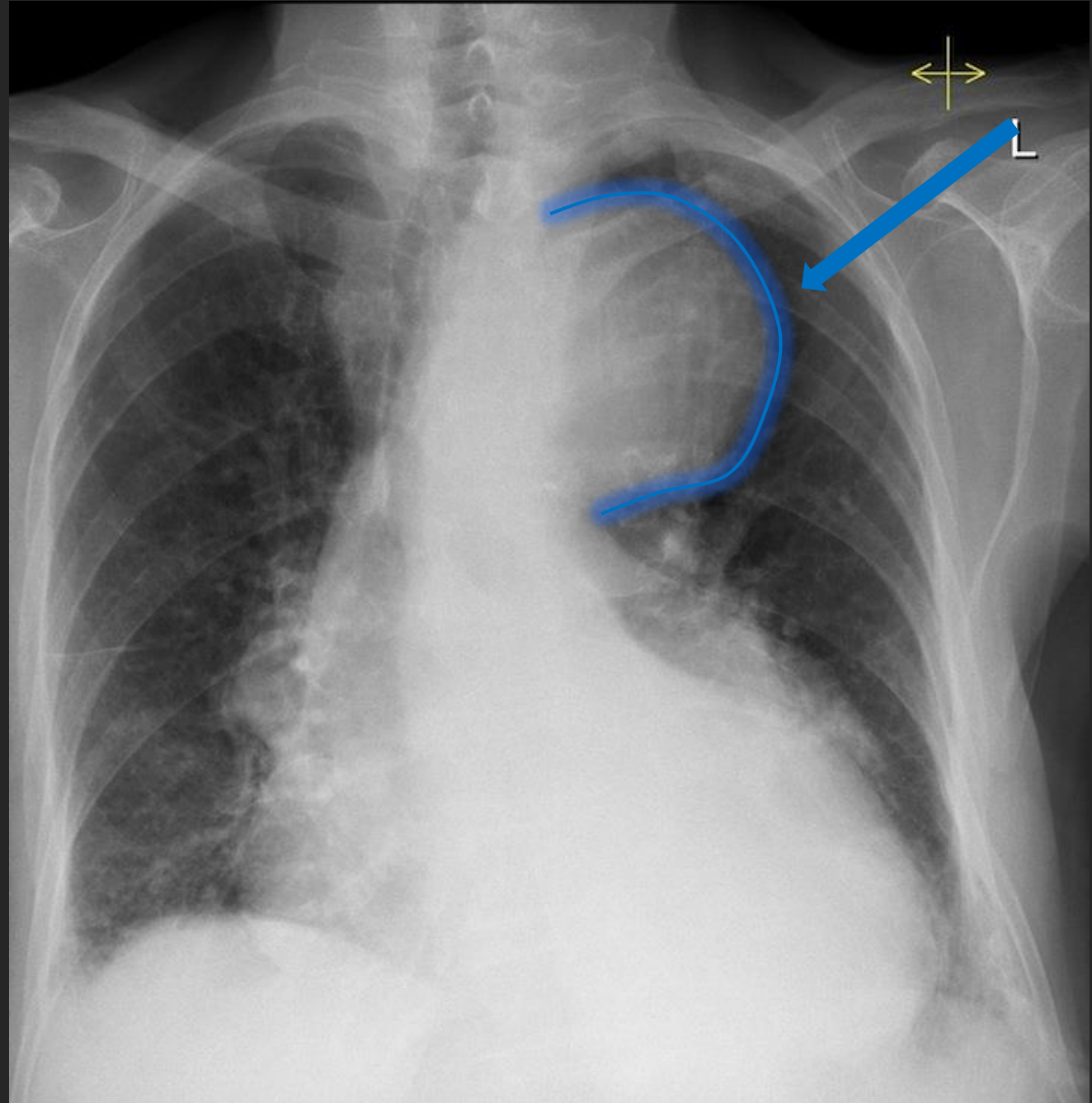
➤ Is it normal ?

No, dilated/enlarged.



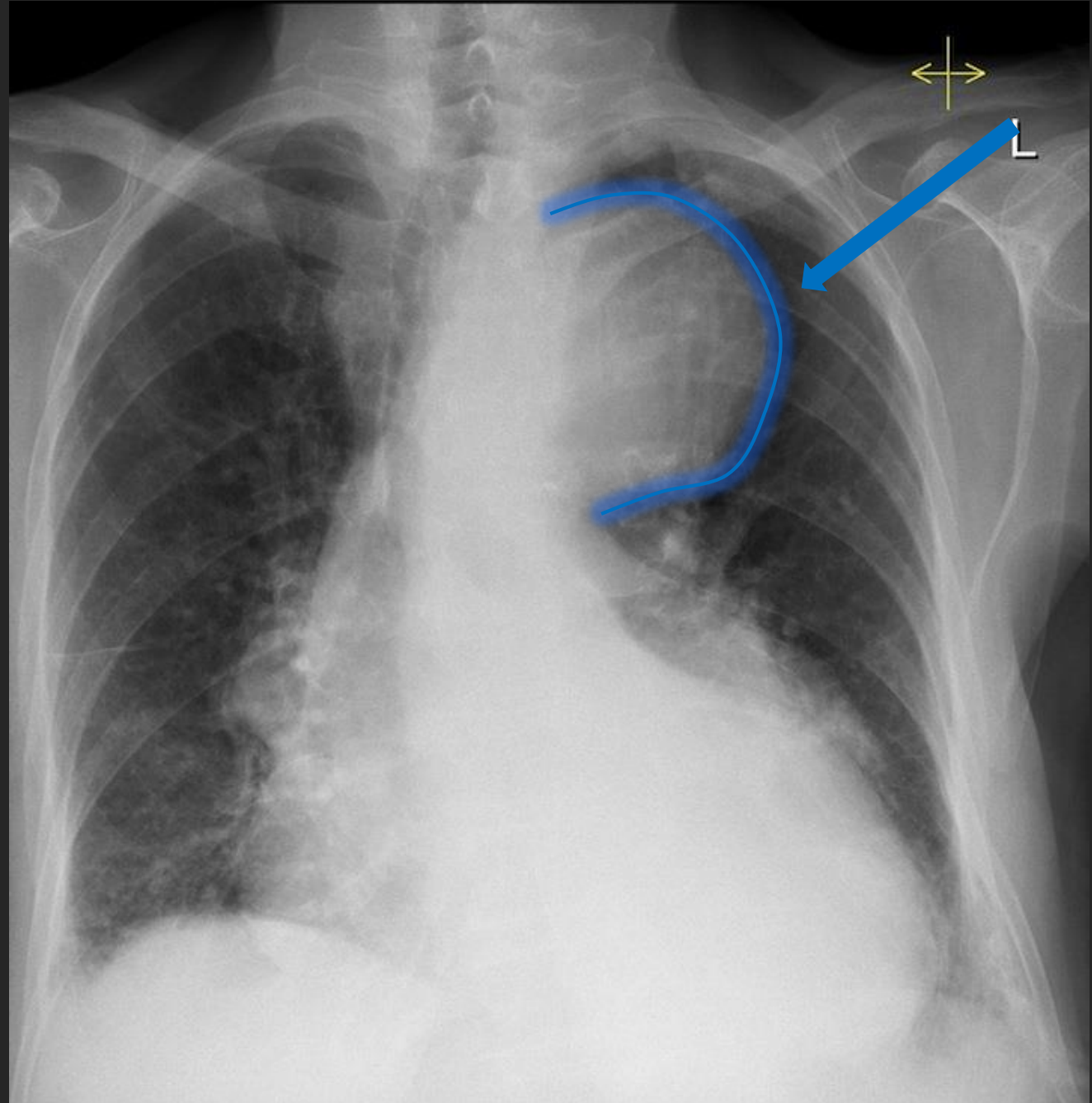
Known case of hypertension presenting with chest pain.

➤ What will you do next?



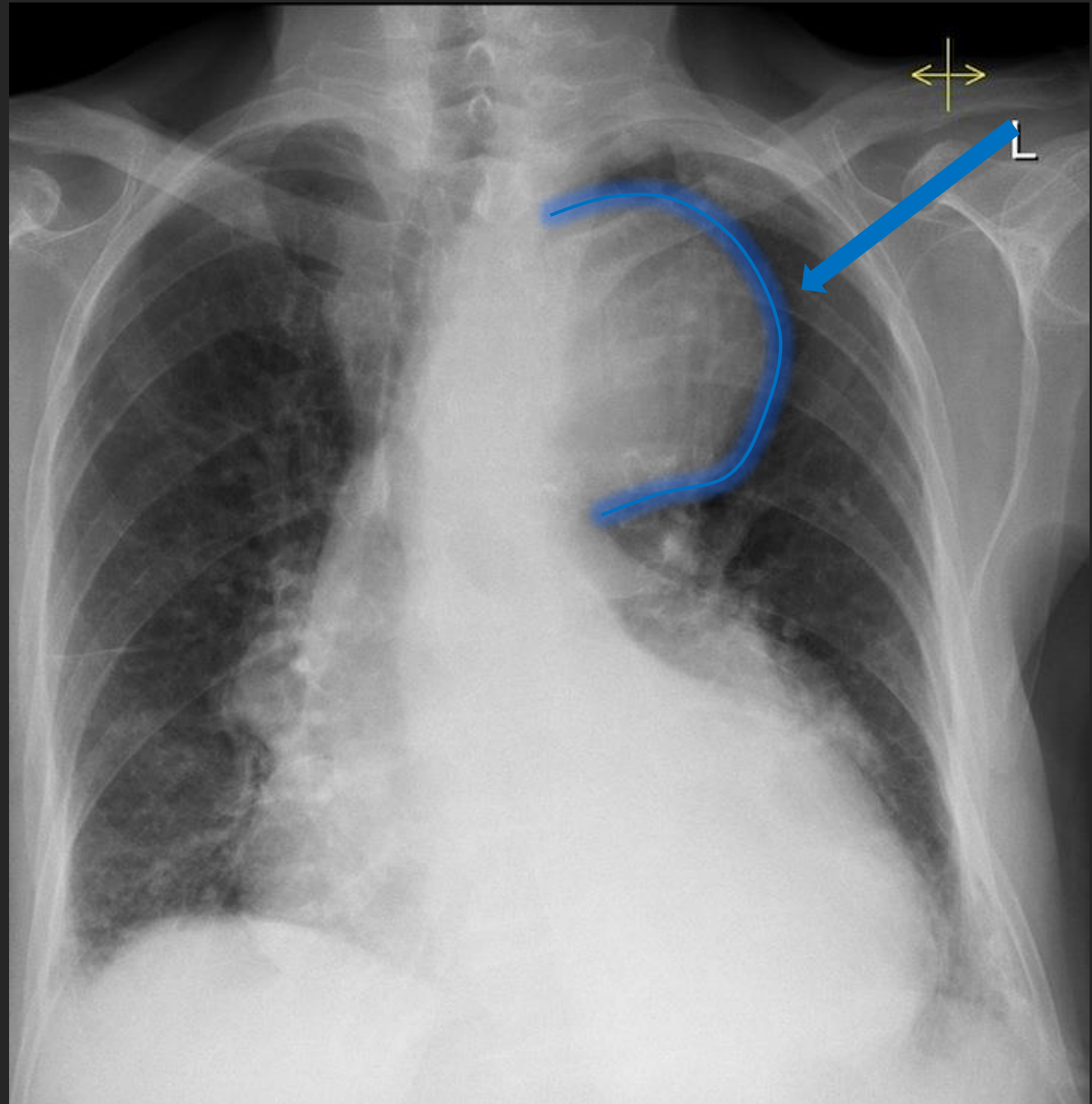
Known case of hypertension
presenting with chest pain.

- What will you do next?
CT Aortogram

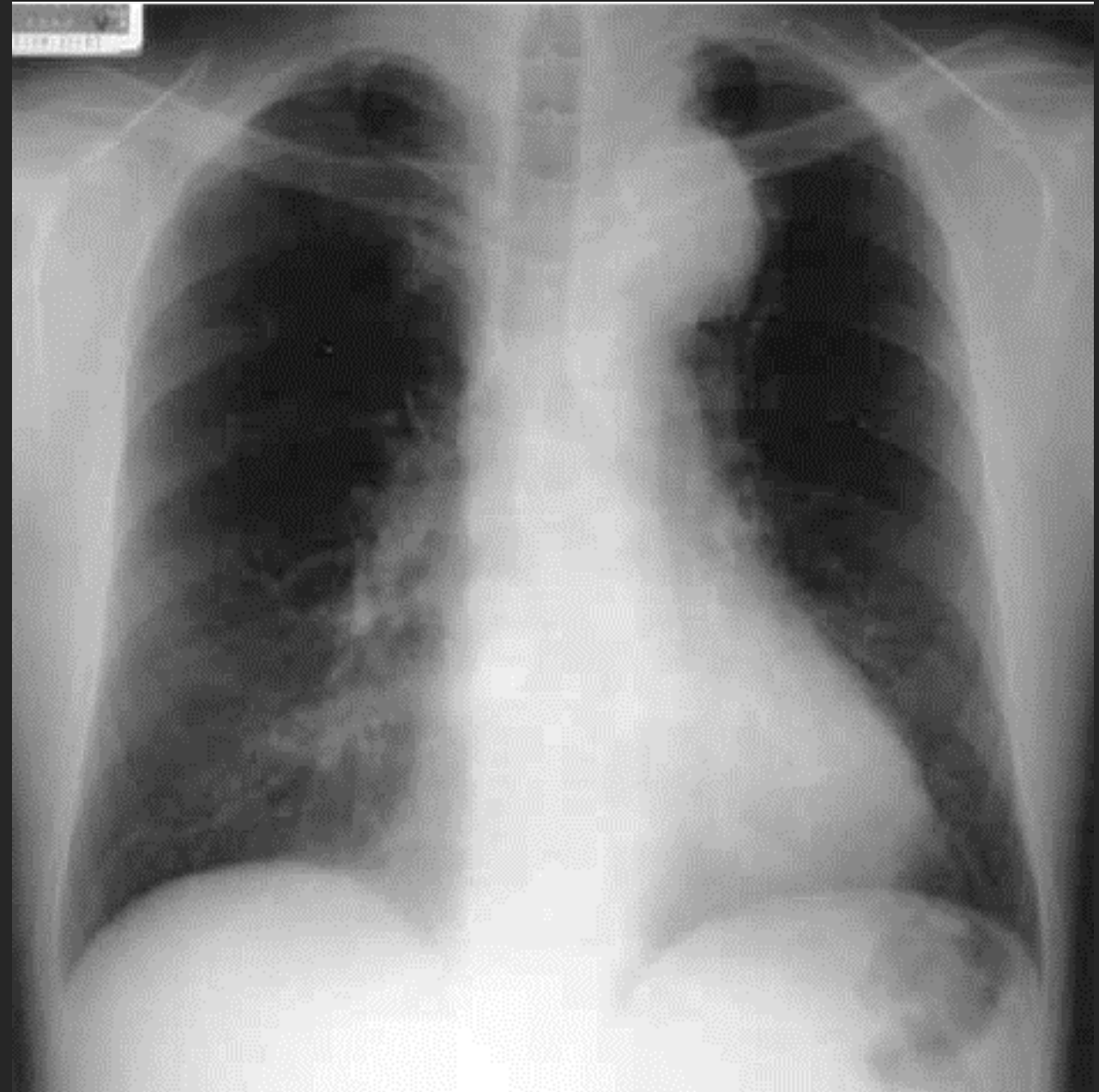
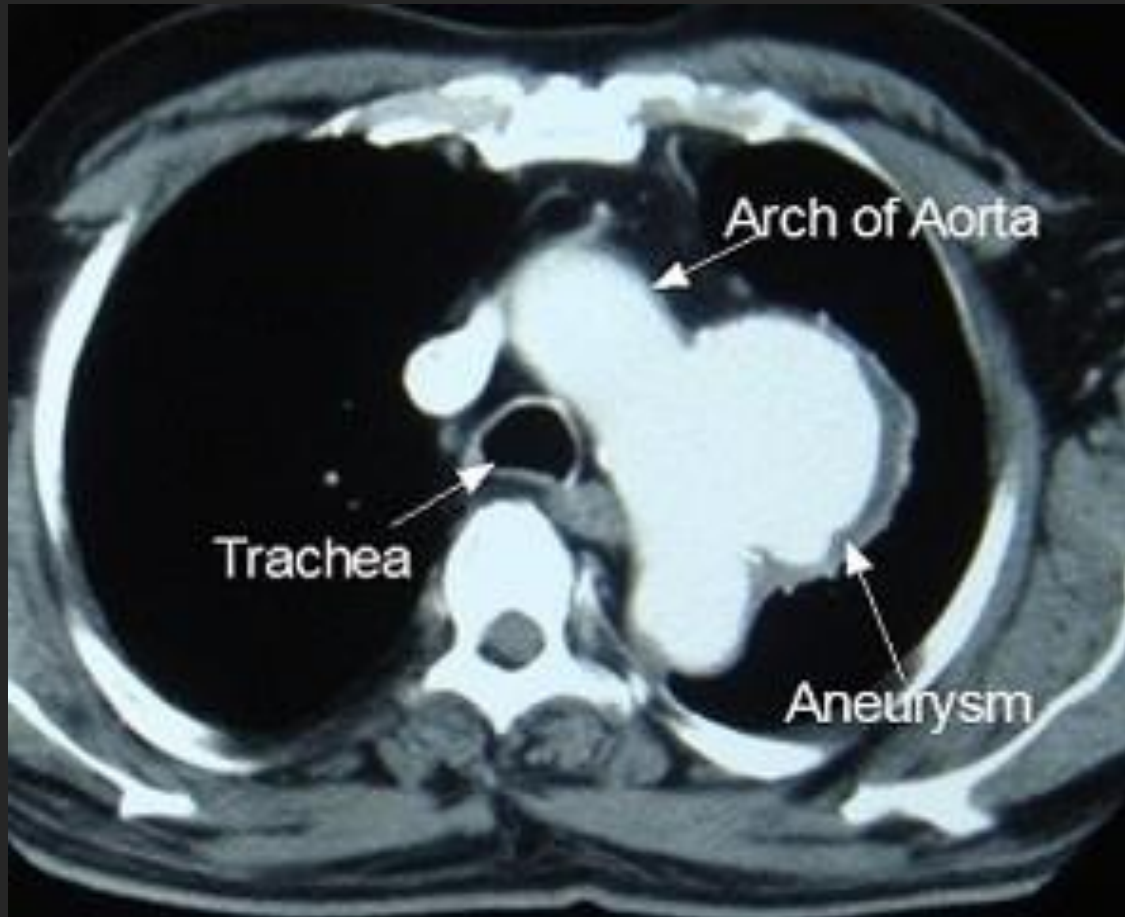


Known case of hypertension presenting with chest pain.

- What is the arrow pointing at ?
Aortic arch (aortic knob)
- Is it normal ?
No, dilated/enlarged.
- What will you do next?
CT Aortogram



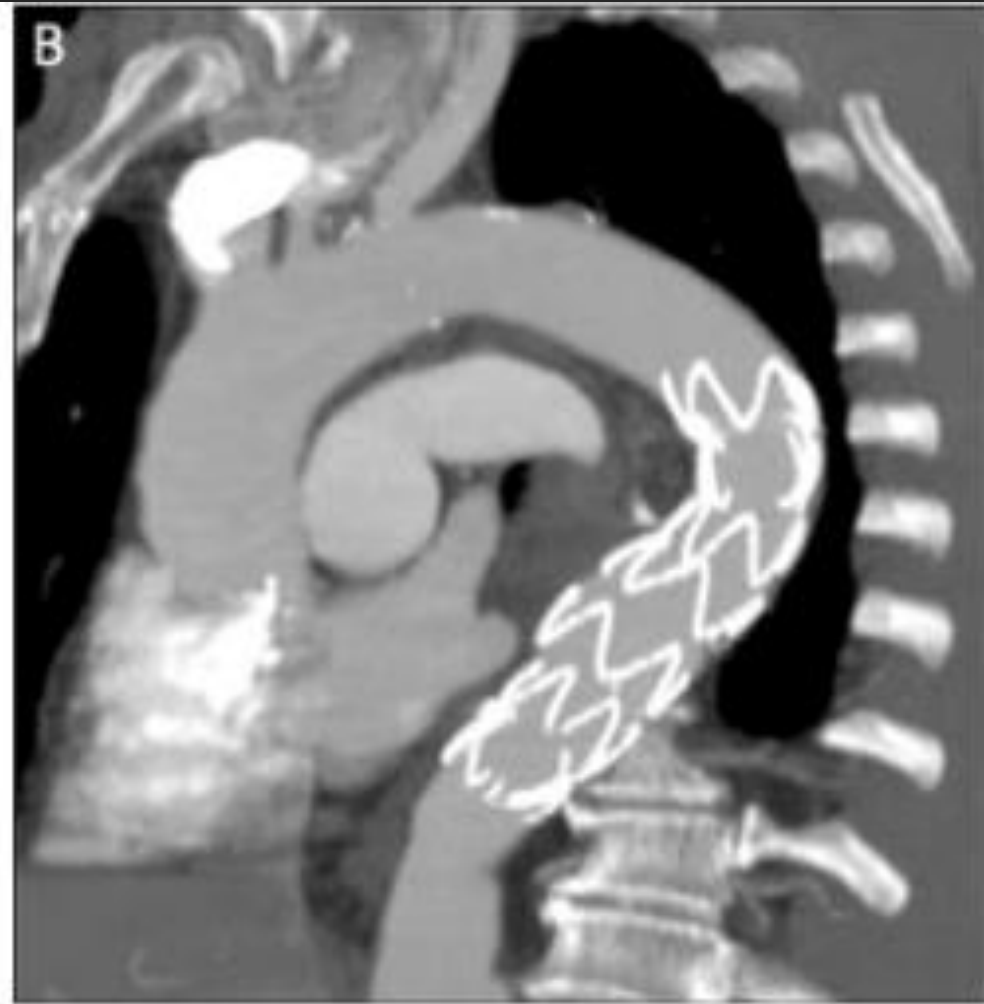
Aortic arch aneurysm



Aortic arch aneurysm (treated with stent)

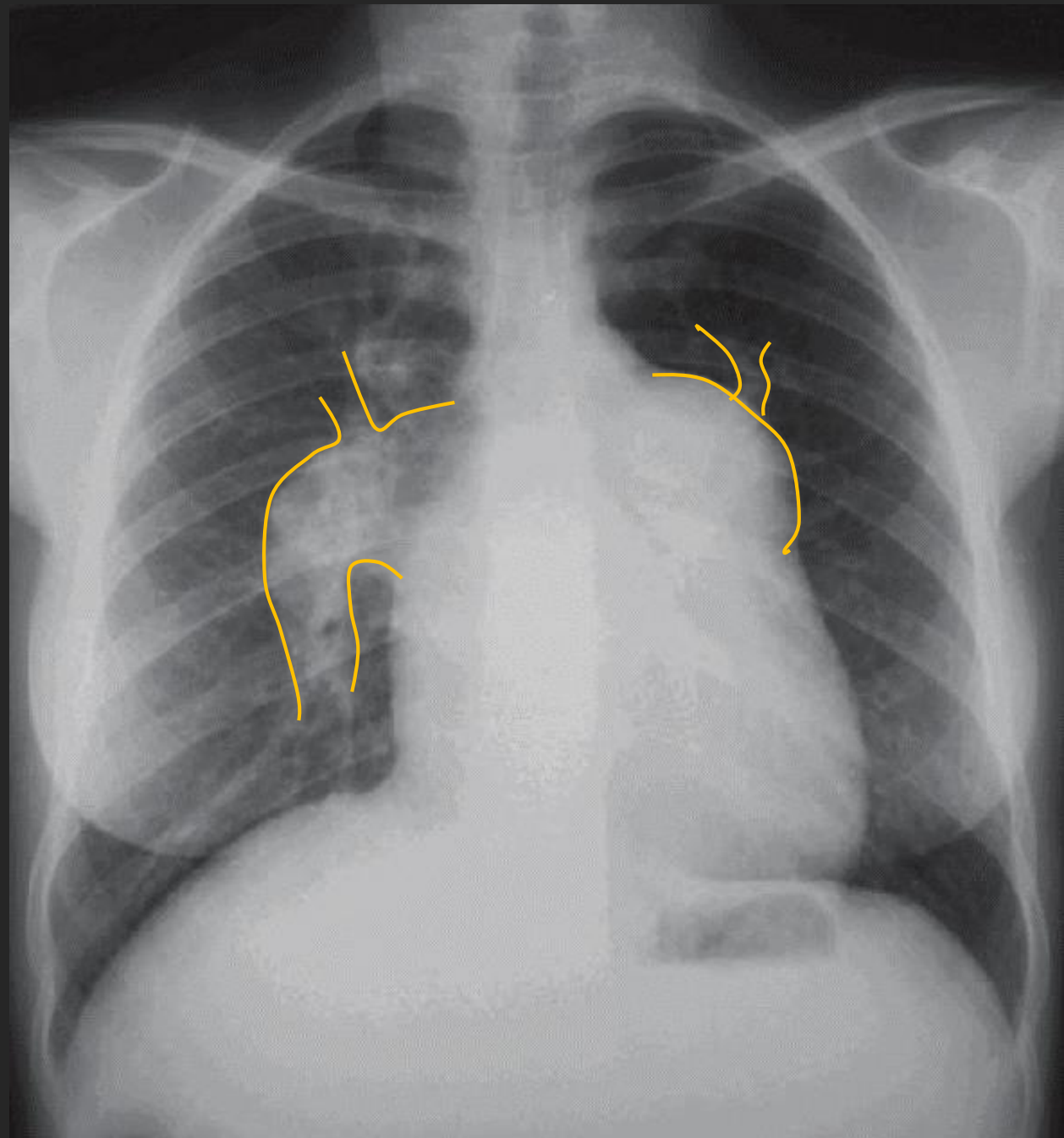


Before stenting



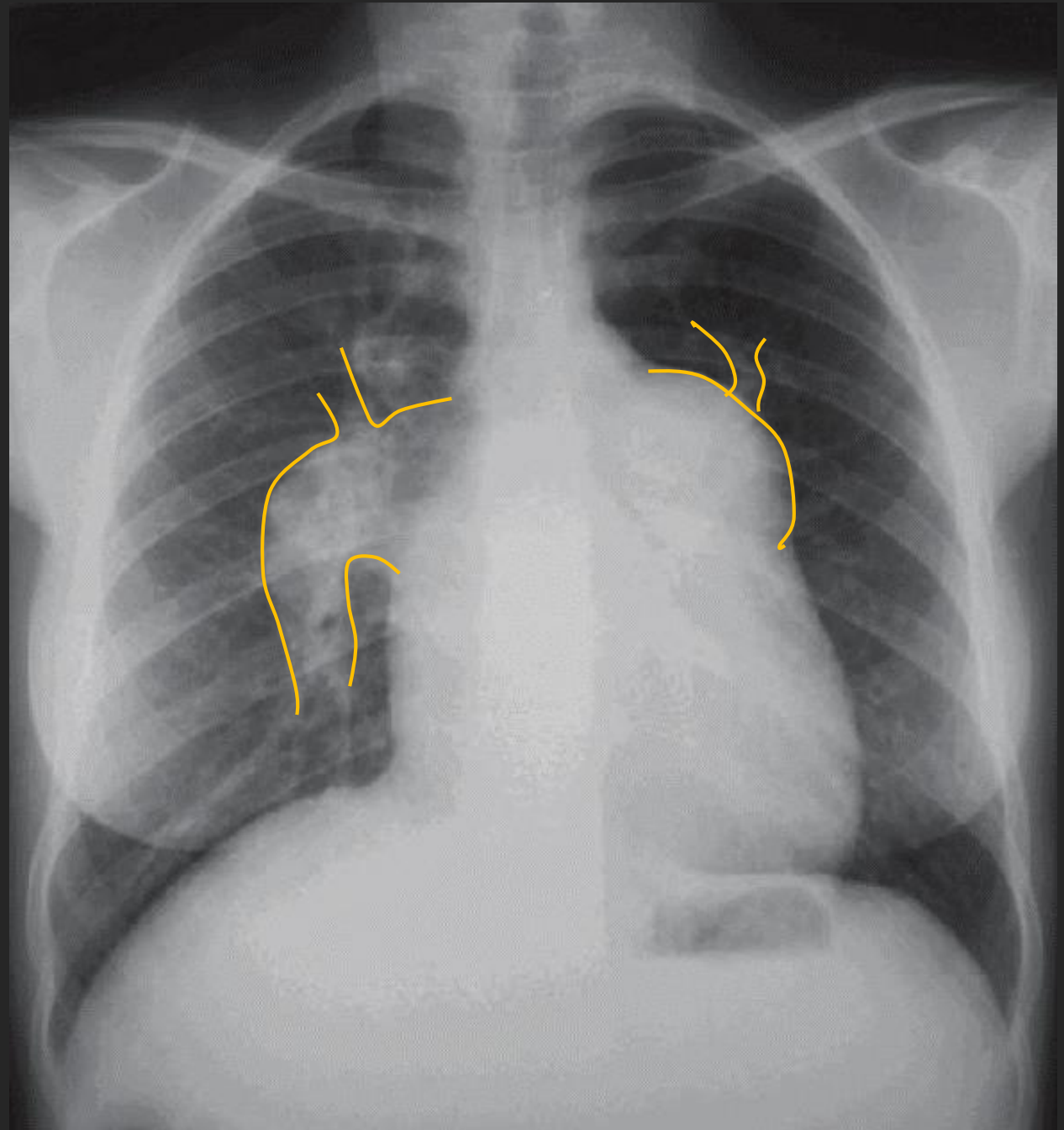
After stenting

What is abnormal in this chest x-ray?

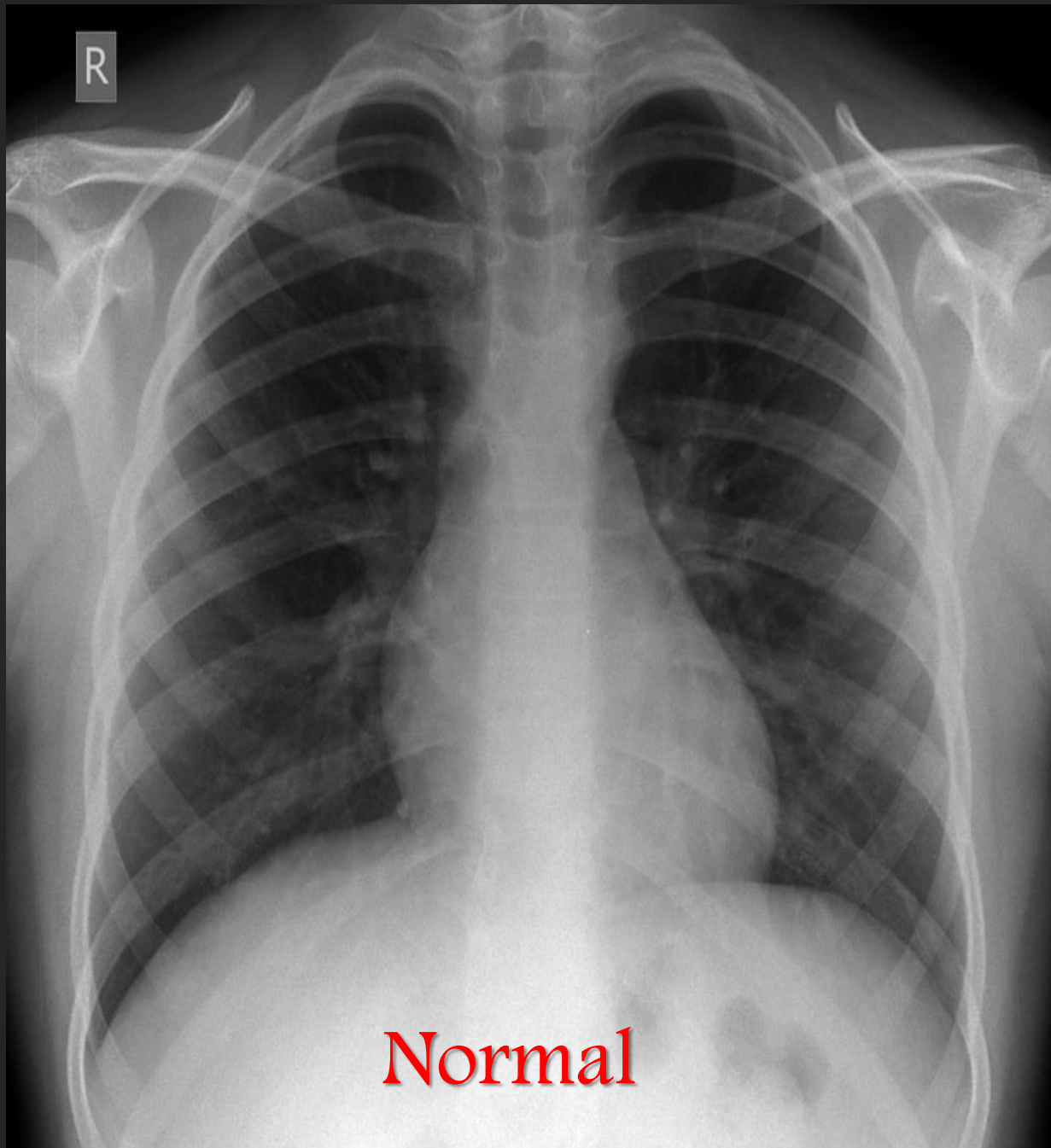


What is abnormal in this chest x-ray?

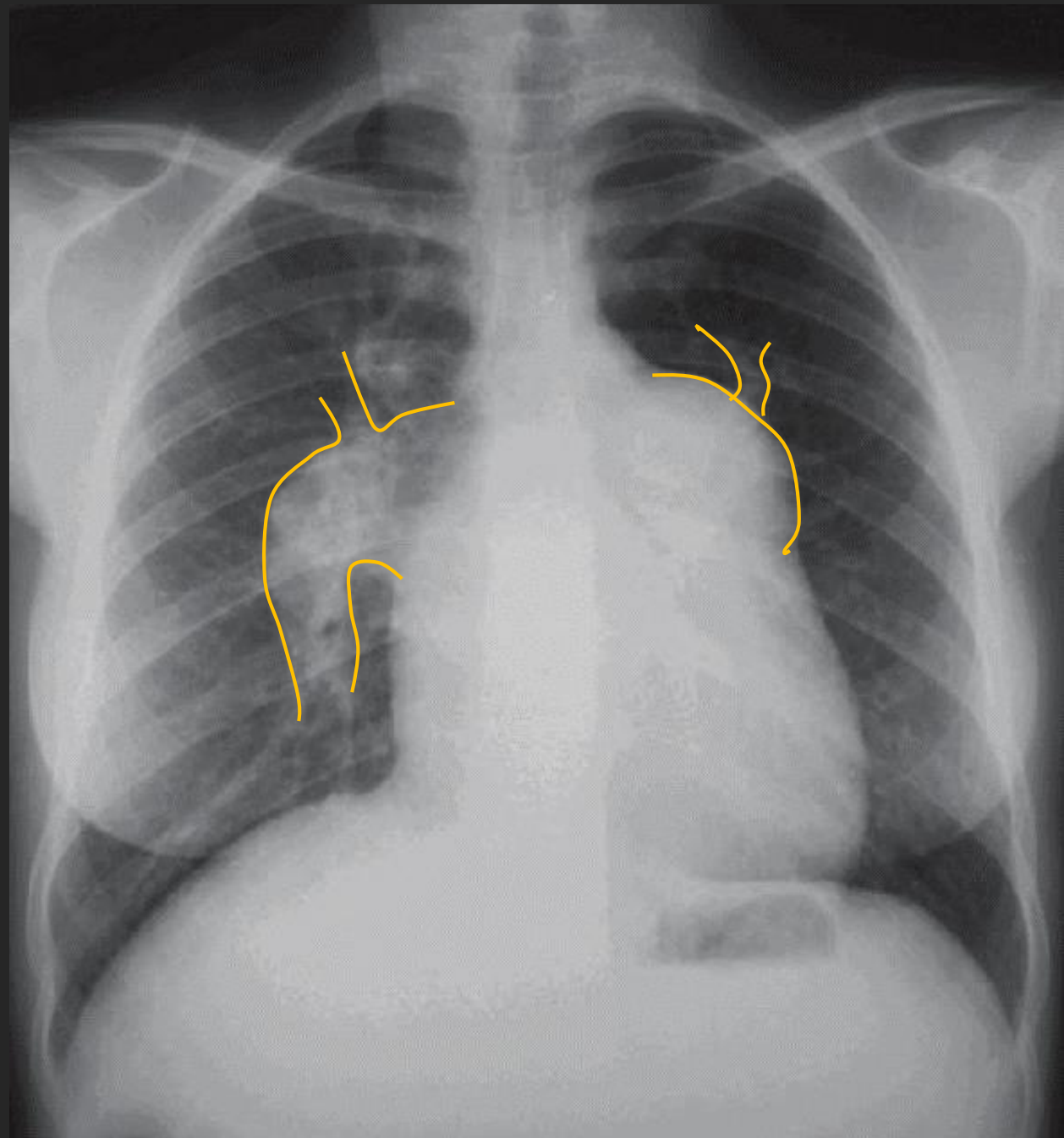
Enlarged pulmonary arteries



R



Normal



70 year-old female
with orthopnea.

*What is abnormal in
this x-ray?*



70 year-old female
with orthopnea.

*What is abnormal in
this x-ray?*

➤ *Pulmonary edema
(cardiogenic)*



Signs of pulmonary edema on chest x-ray:

- *Upper lobe pulmonary venous diversion.*
- *Increased cardio-thoracic ratio (cardiogenic).*
- *Features of pulmonary interstitial edema:*
 - *Peri-bronchial cuffing.*
 - *Septal lines/ thickening (Kerley lines).*
- *Features of pulmonary alveolar edema:*
 - *Air space opacification (batwing distribution).*
- *Pleural effusions.*

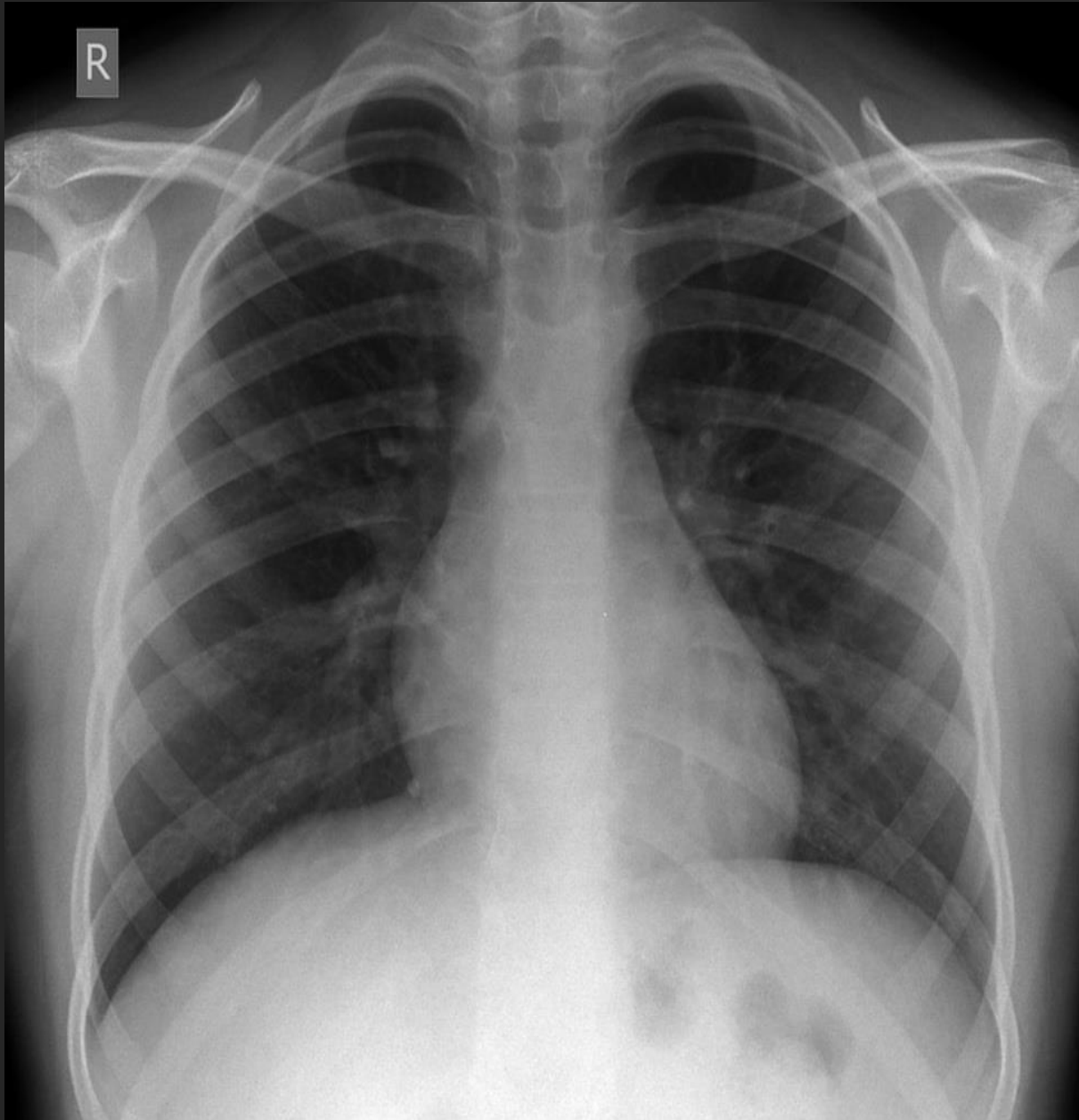


Signs of pulmonary edema on chest x-ray:

- *Upper lobe pulmonary venous diversion.*

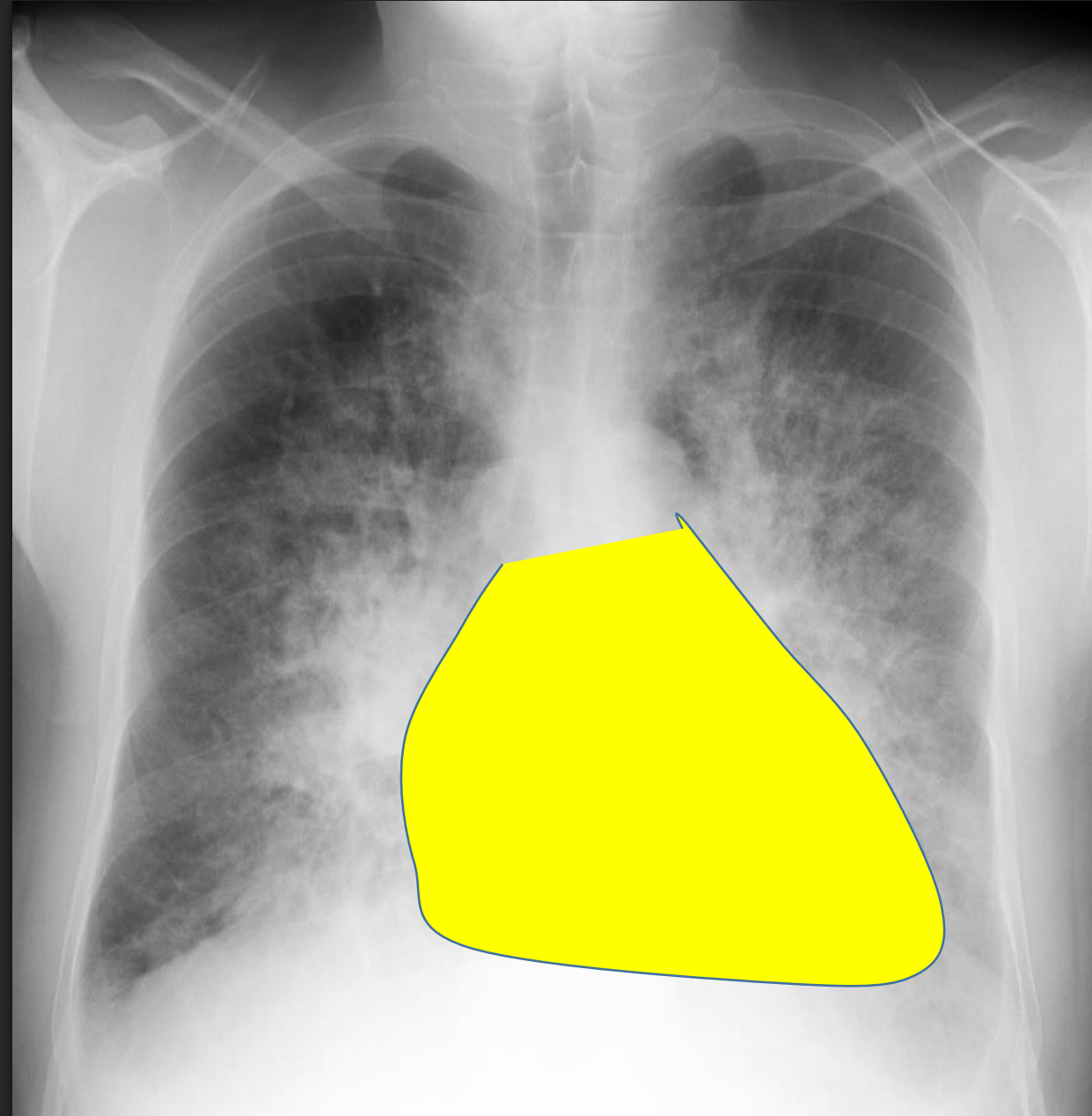


Signs of pulmonary edema on chest x-ray:



Signs of pulmonary edema on chest x-ray:

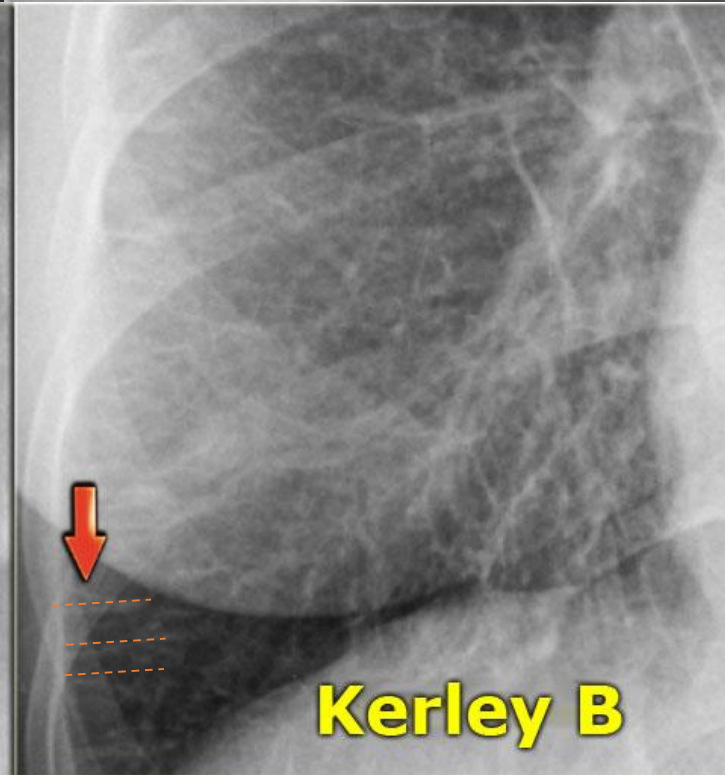
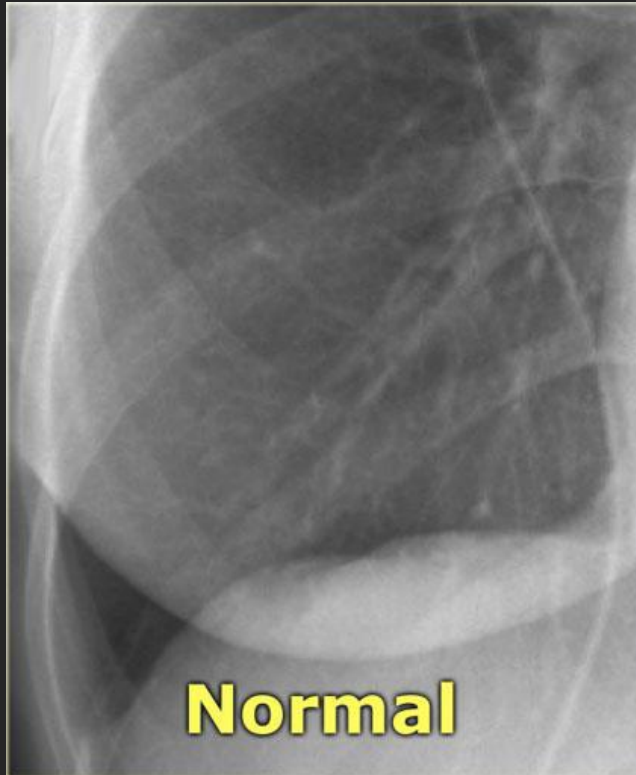
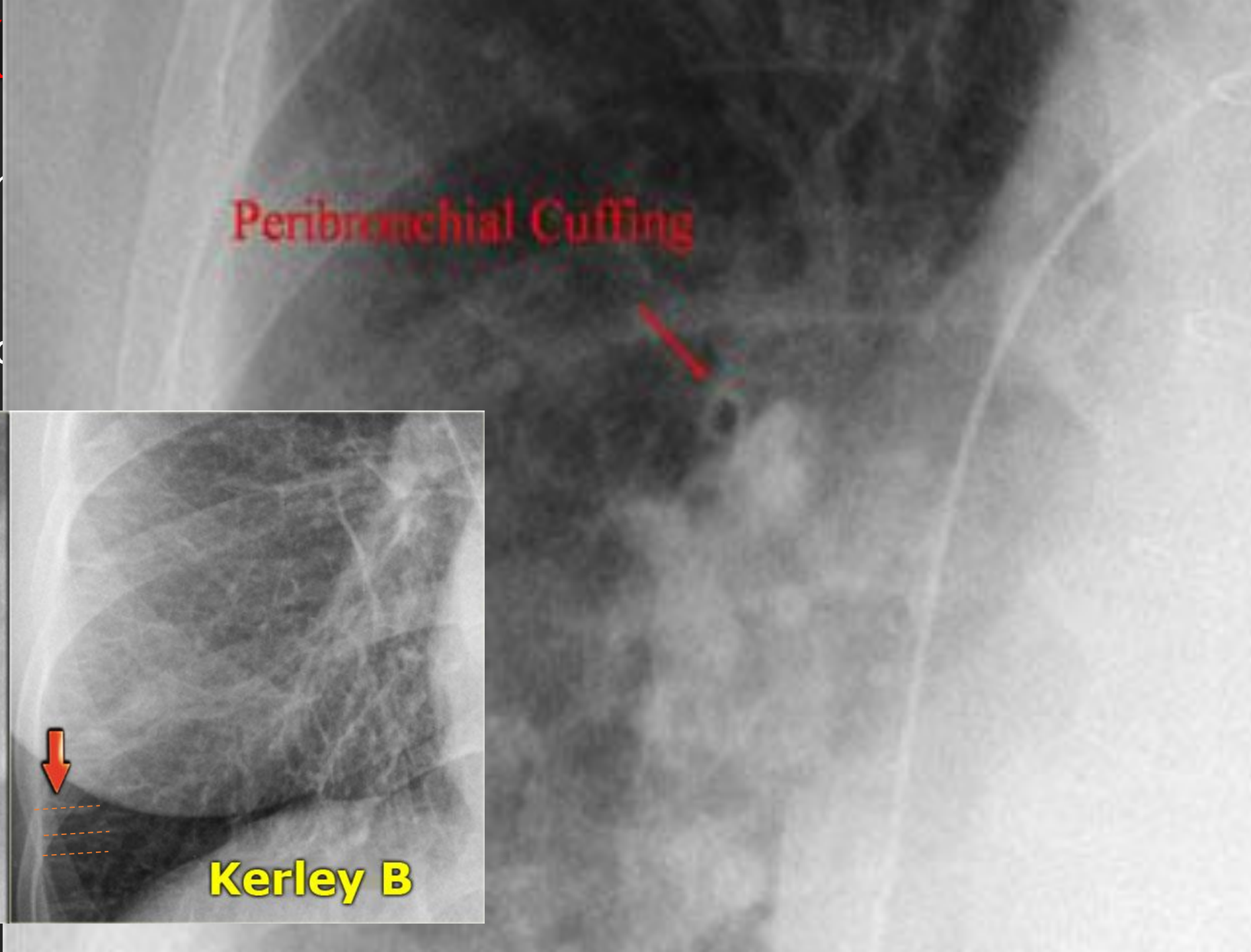
- *Increased cardio-thoracic ratio (cardiogenic).*



Signs of pulmonary edema

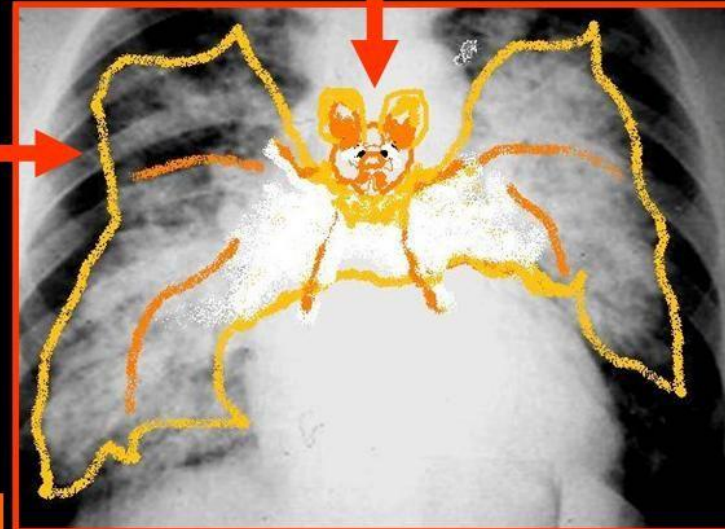
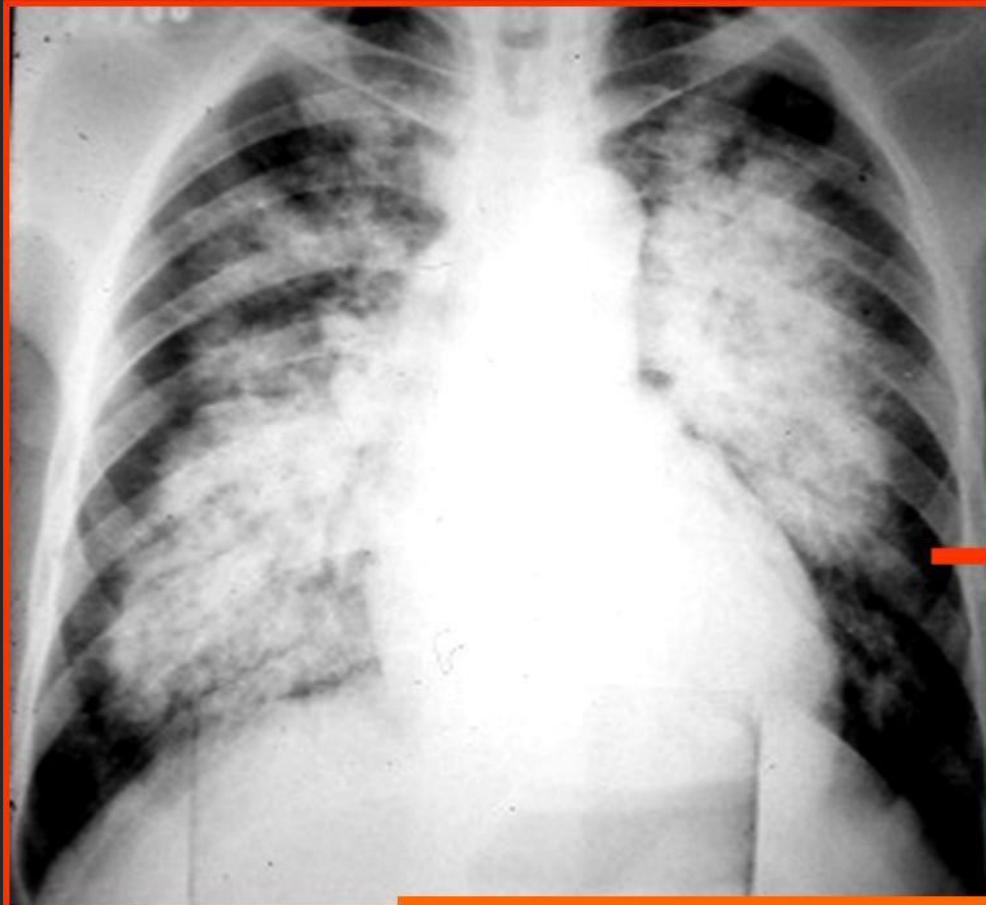
➤ Features of pulmonary edema:

- Peri-bronchial cuffing
- Septal lines/ thickening



Signs of pulmonary edema on chest x-ray:

- *Features of pulmonary alveolar edema:*
 - Air space opacification (**batwing distribution**).



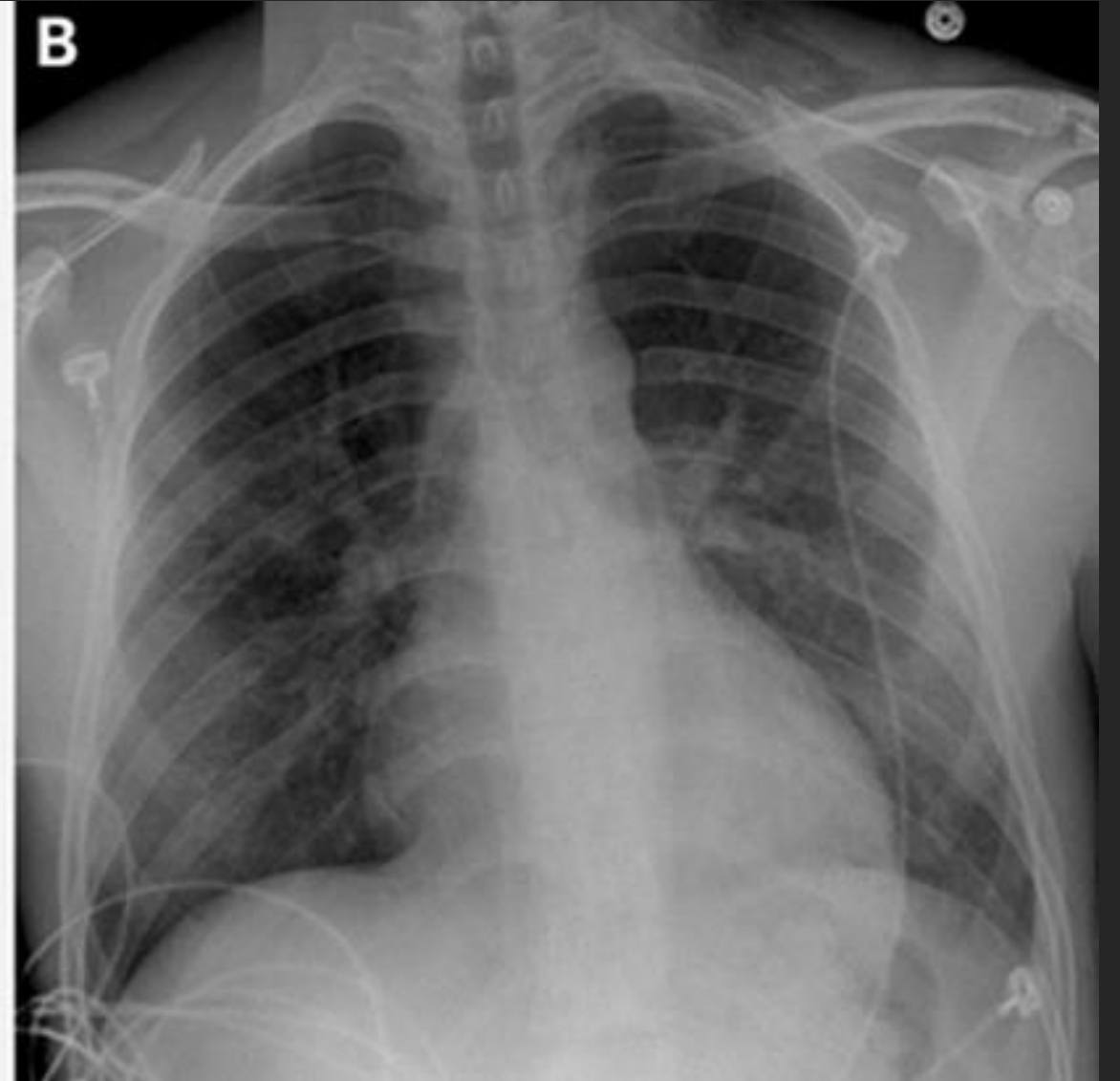
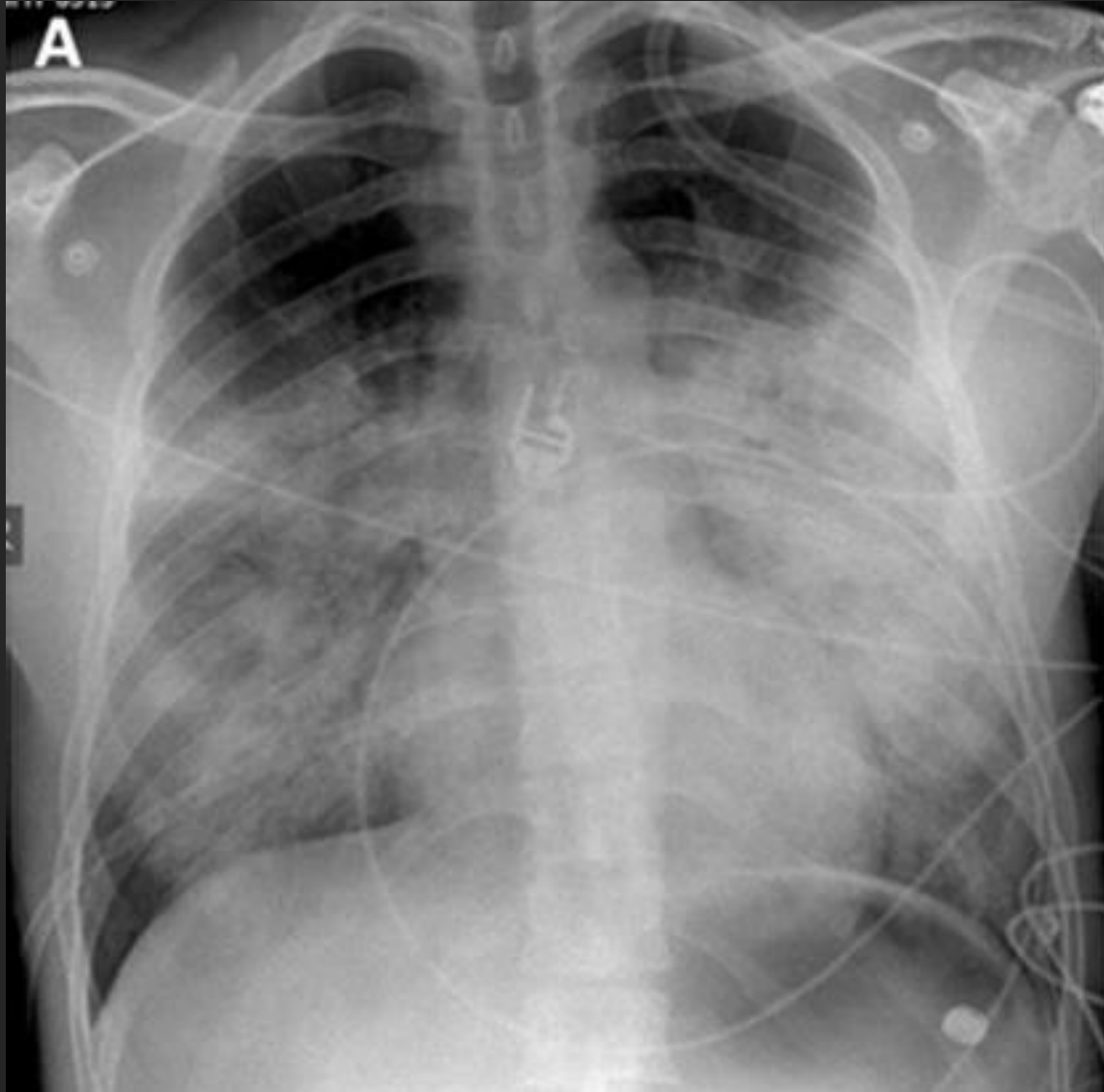
BAT WING APPEARANCE

Signs of pulmonary edema on chest x-ray:

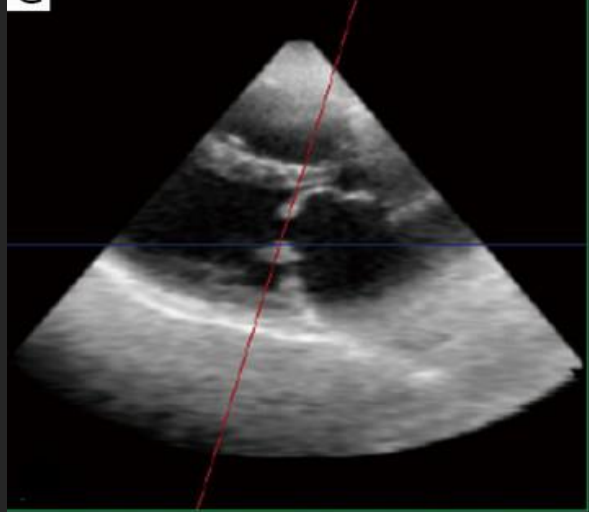
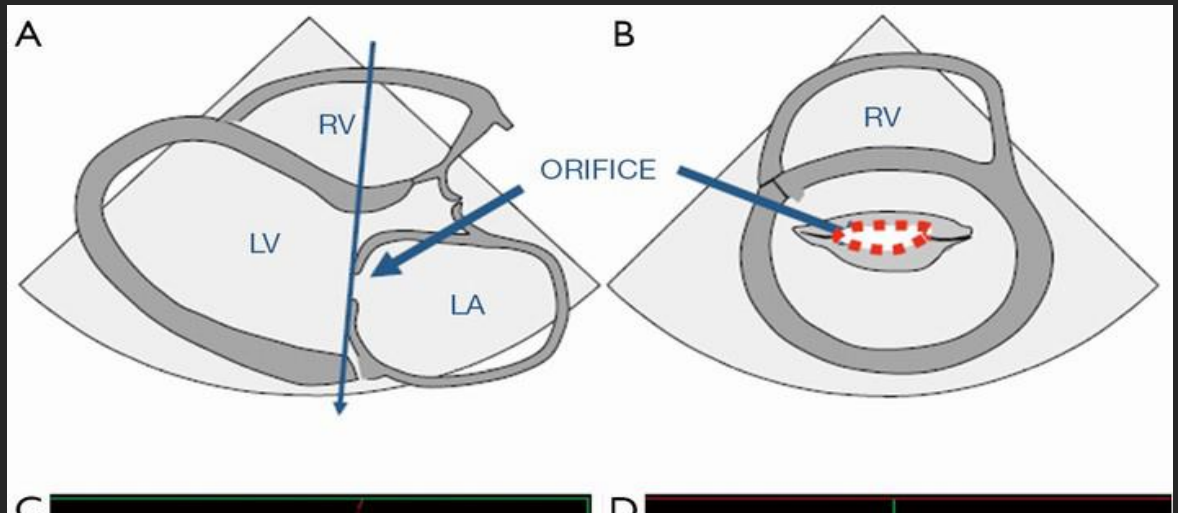
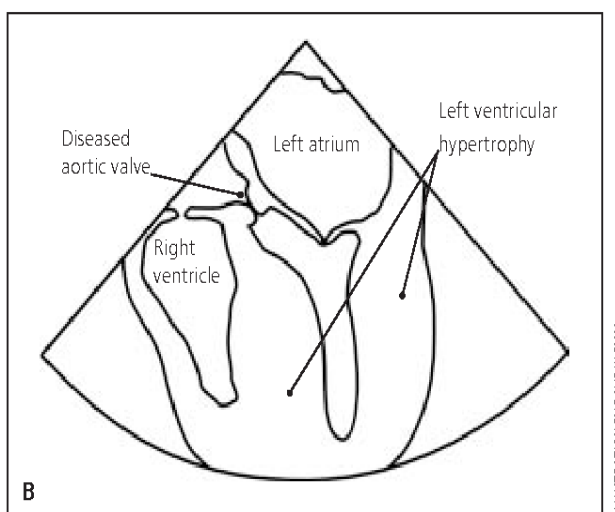
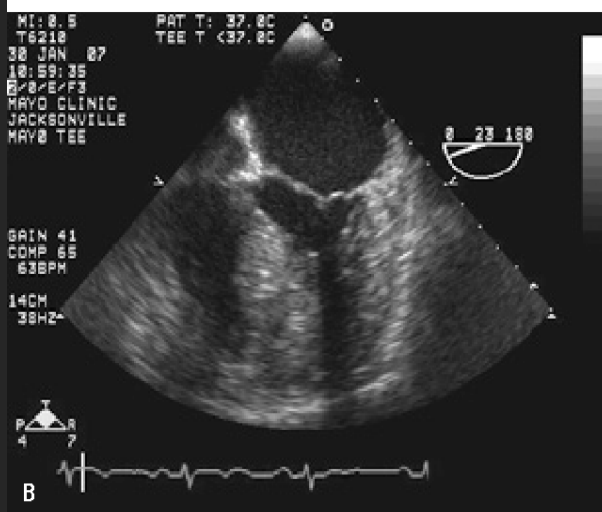
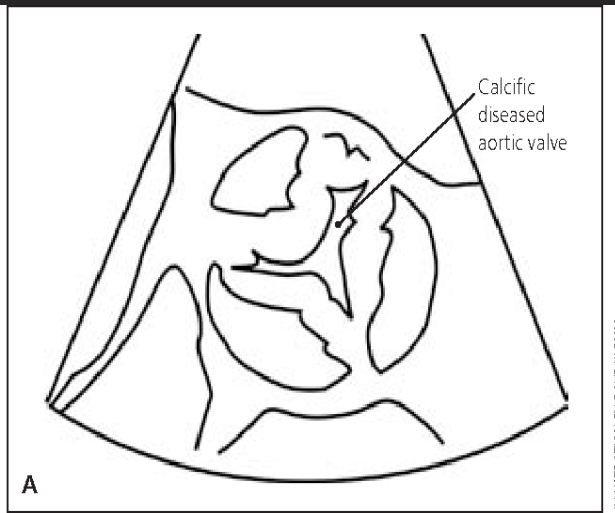
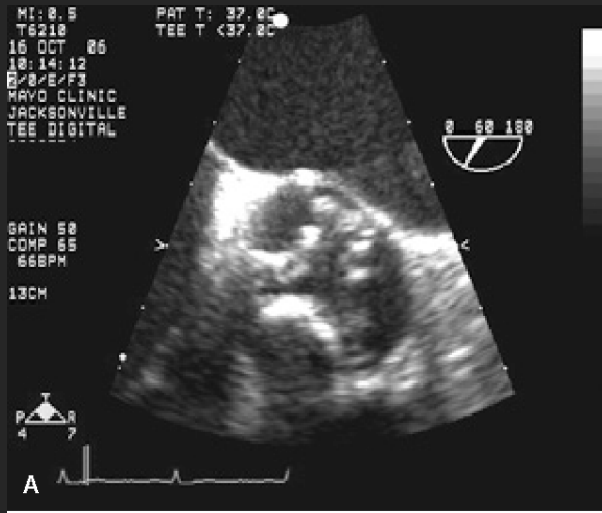
➤ *Pleural effusions.*



Pulmonary edema before and after treatment (diuretics)



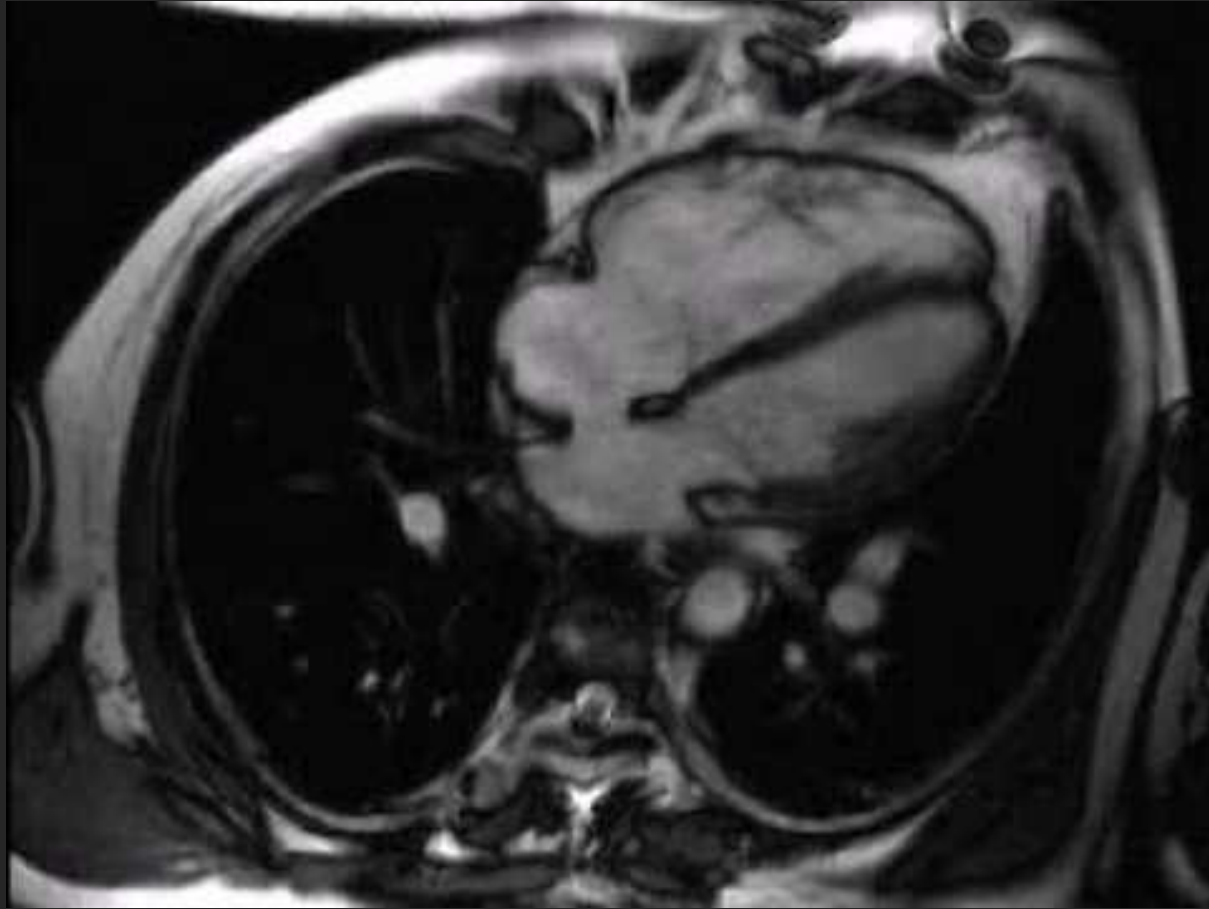
Heart valve assessment on echocardiography



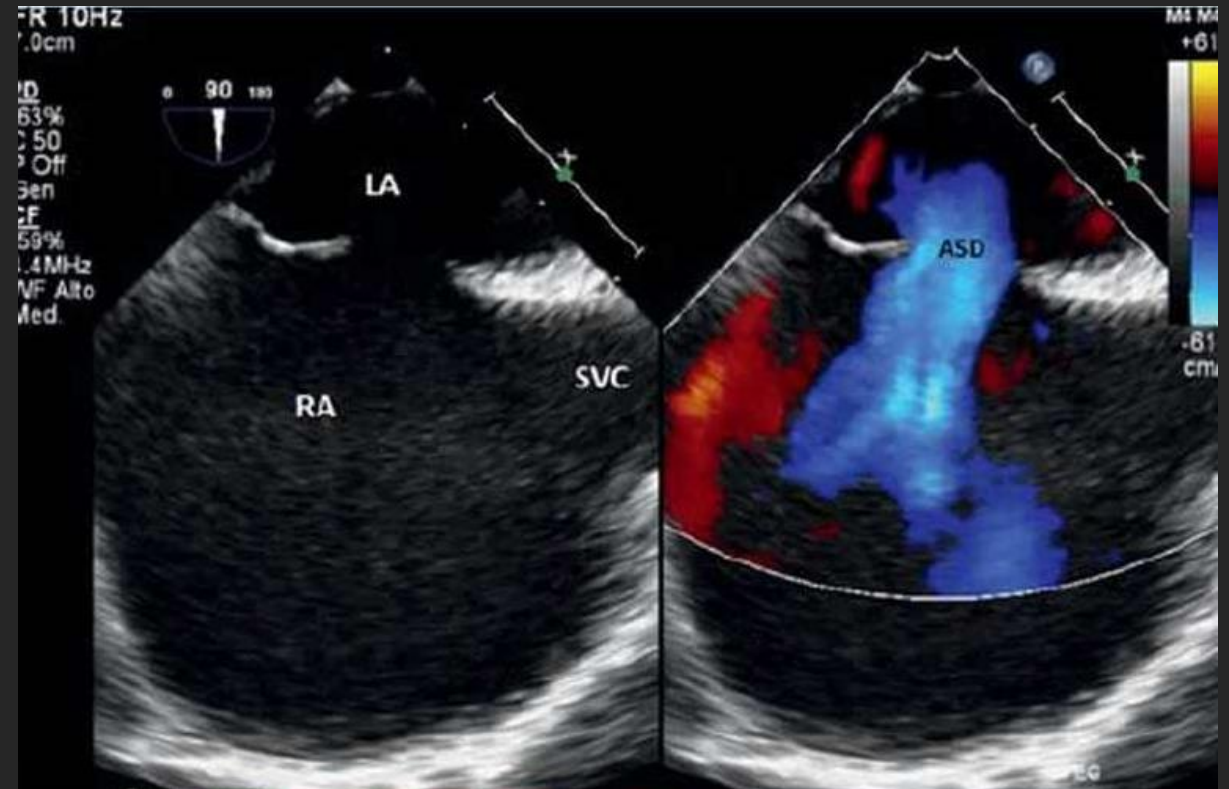
Aortic valve stenosis

Mitral valve stenosis

interatrial Septal defect

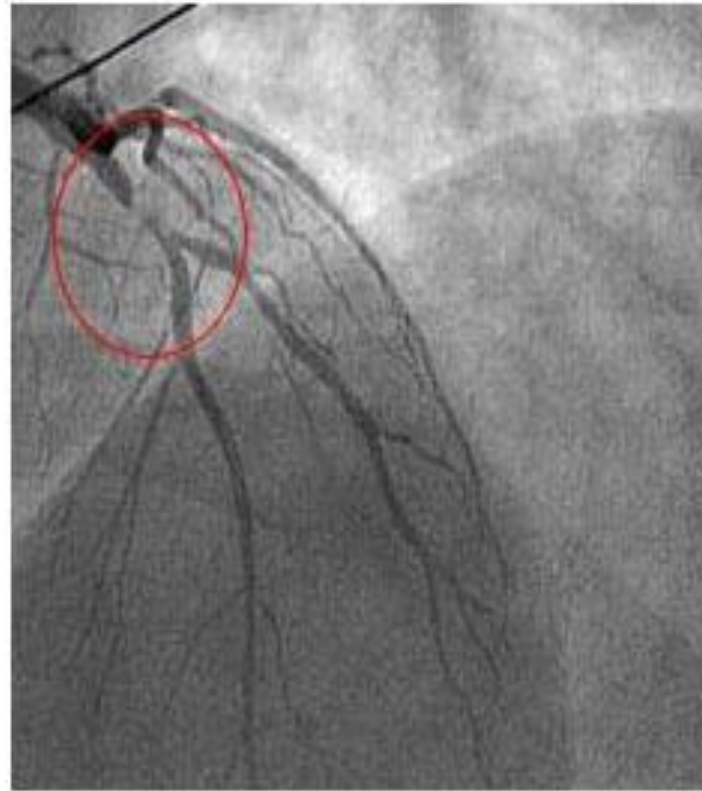
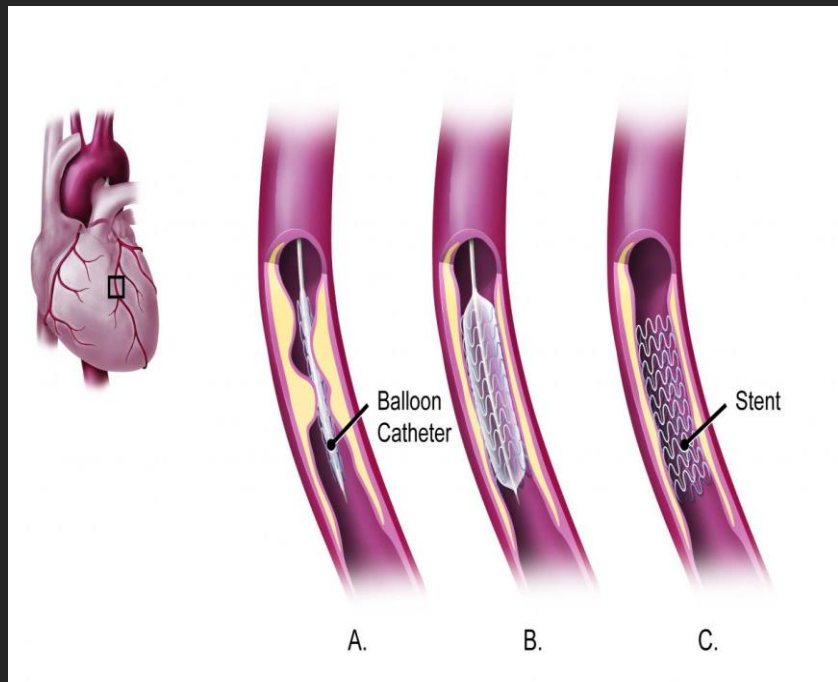


MRI

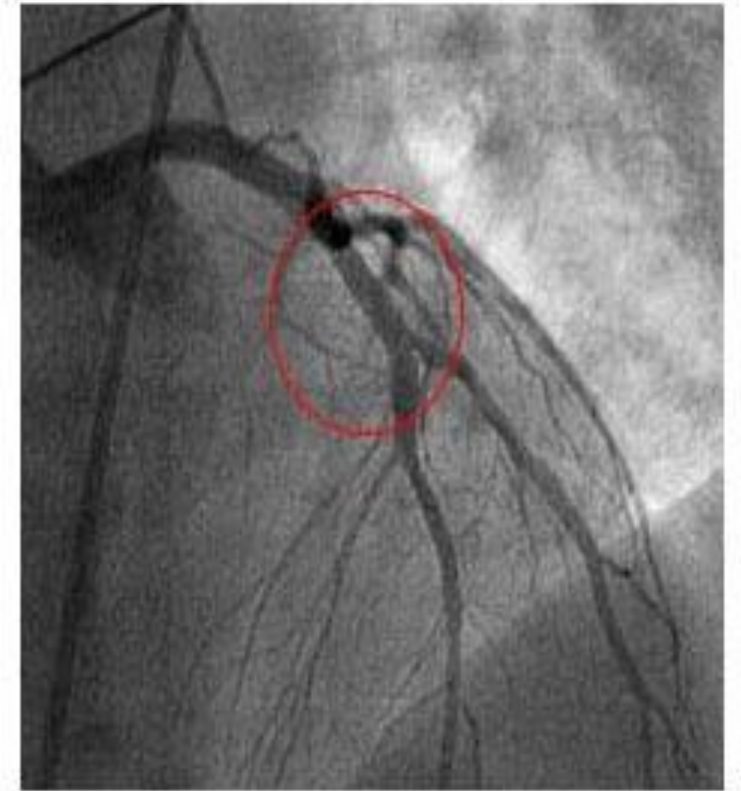


Echo.

Cardiac cath. (before and after stenting)

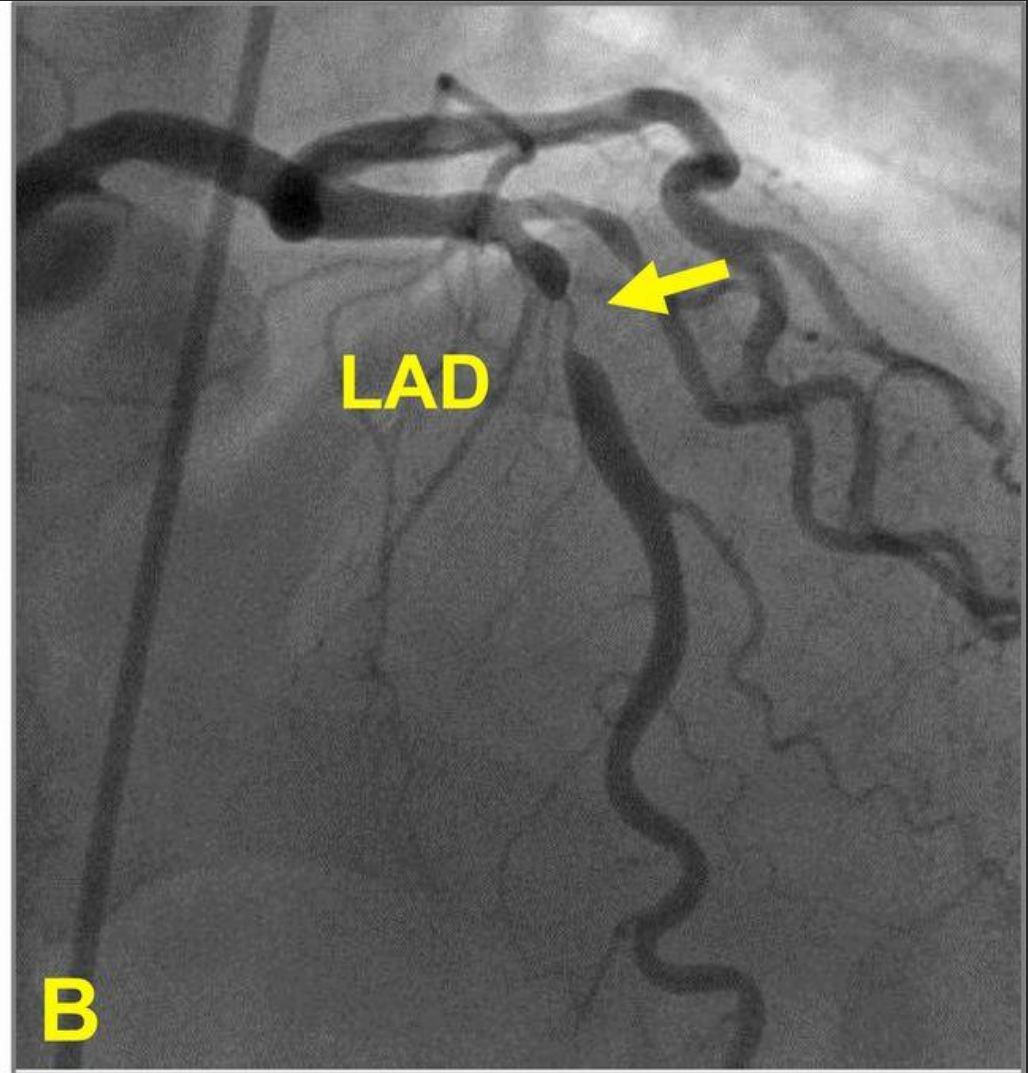
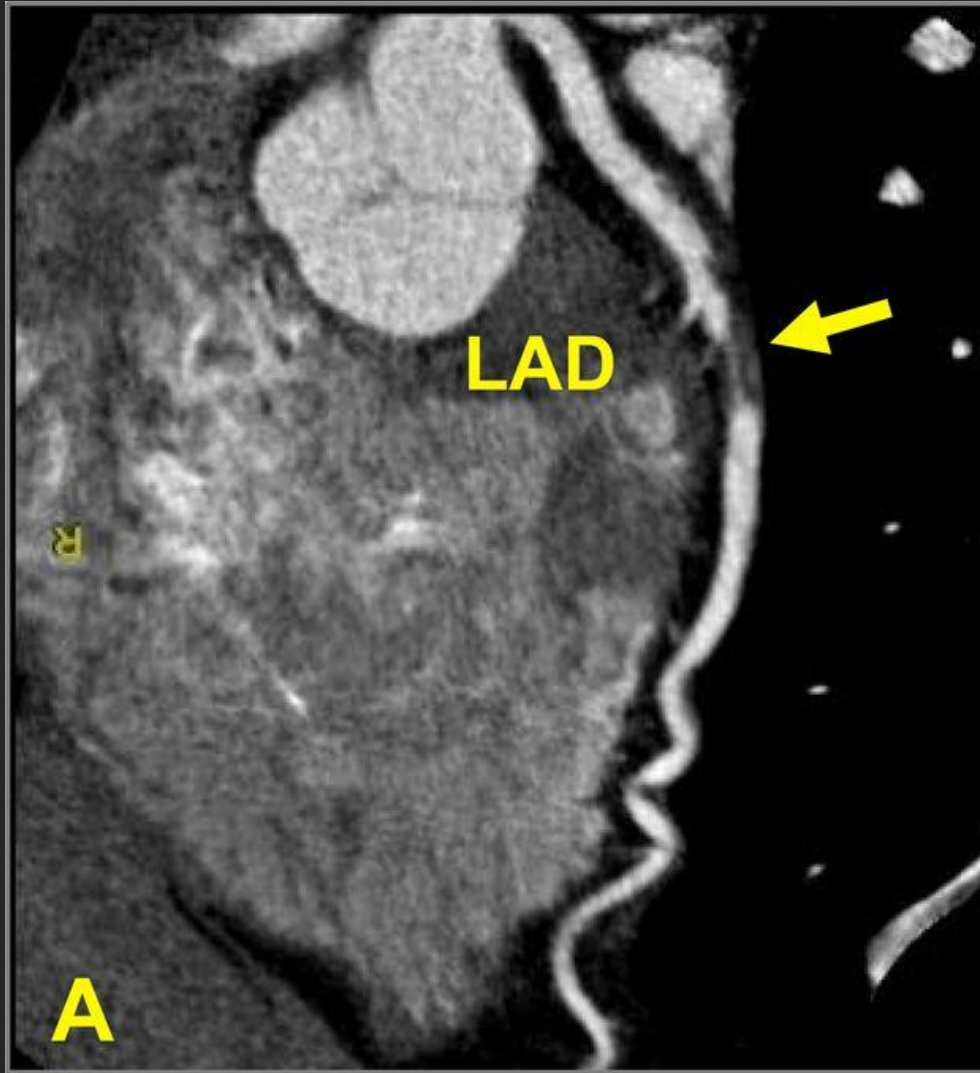


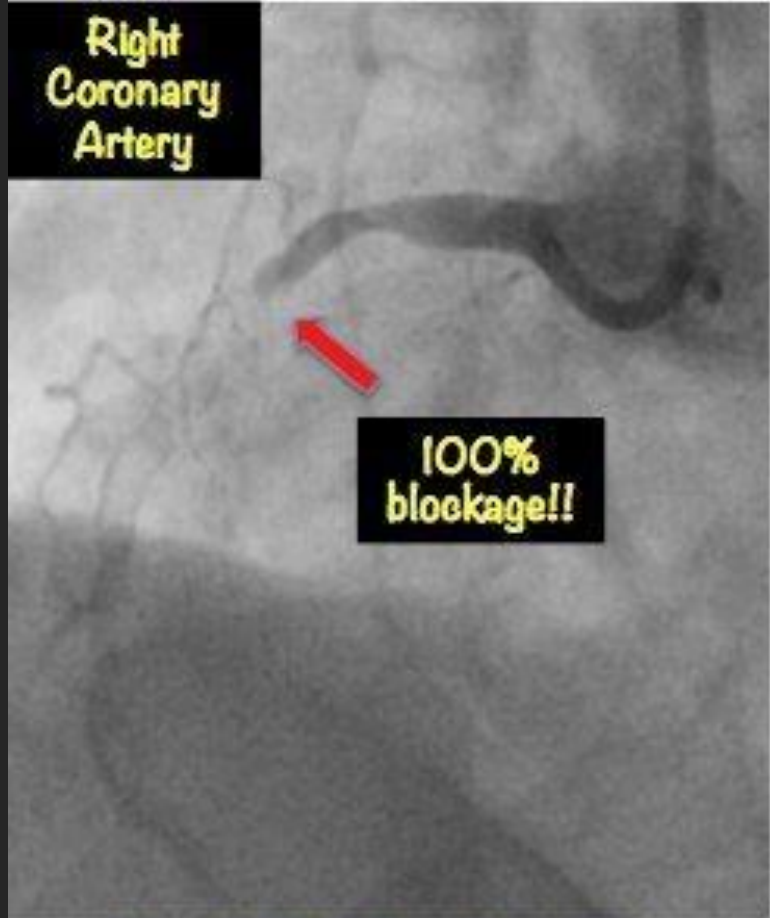
Before
99% proximal left anterior descending artery (LAD)
stenosis



After
Status post stent of proximal left anterior
descending artery (LAD)







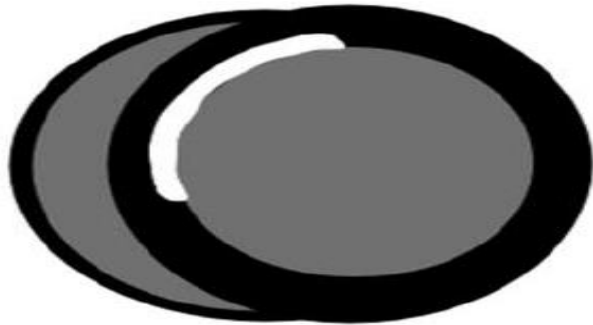
Totally blocked artery leading to a major heart attack

MRI myocardial enhancement

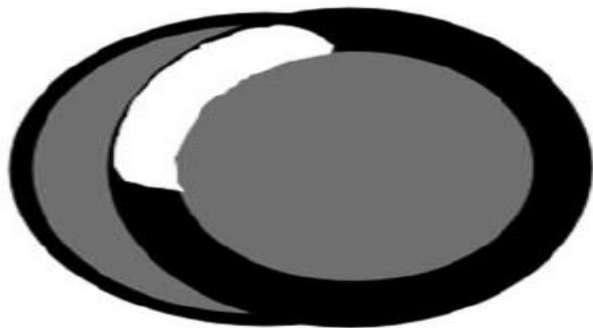
HYPERENHANCEMENT PATTERNS

Ischemic

A. Subendocardial Infarct



B. Transmural Infarct



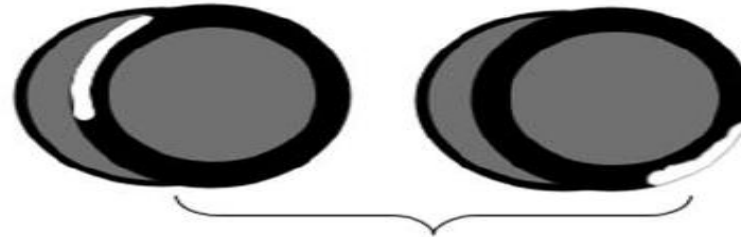
Nonischemic

A. Mid-wall HE



- Idiopathic Dilated Cardiomyopathy
- Myocarditis
- Hypertrophic Cardiomyopathy
- Right ventricular pressure overload (e.g. congenital heart disease, pulmonary HTN)
- Sarcoidosis
- Myocarditis
- Anderson-Fabry
- Chagas Disease

B. Epicardial HE

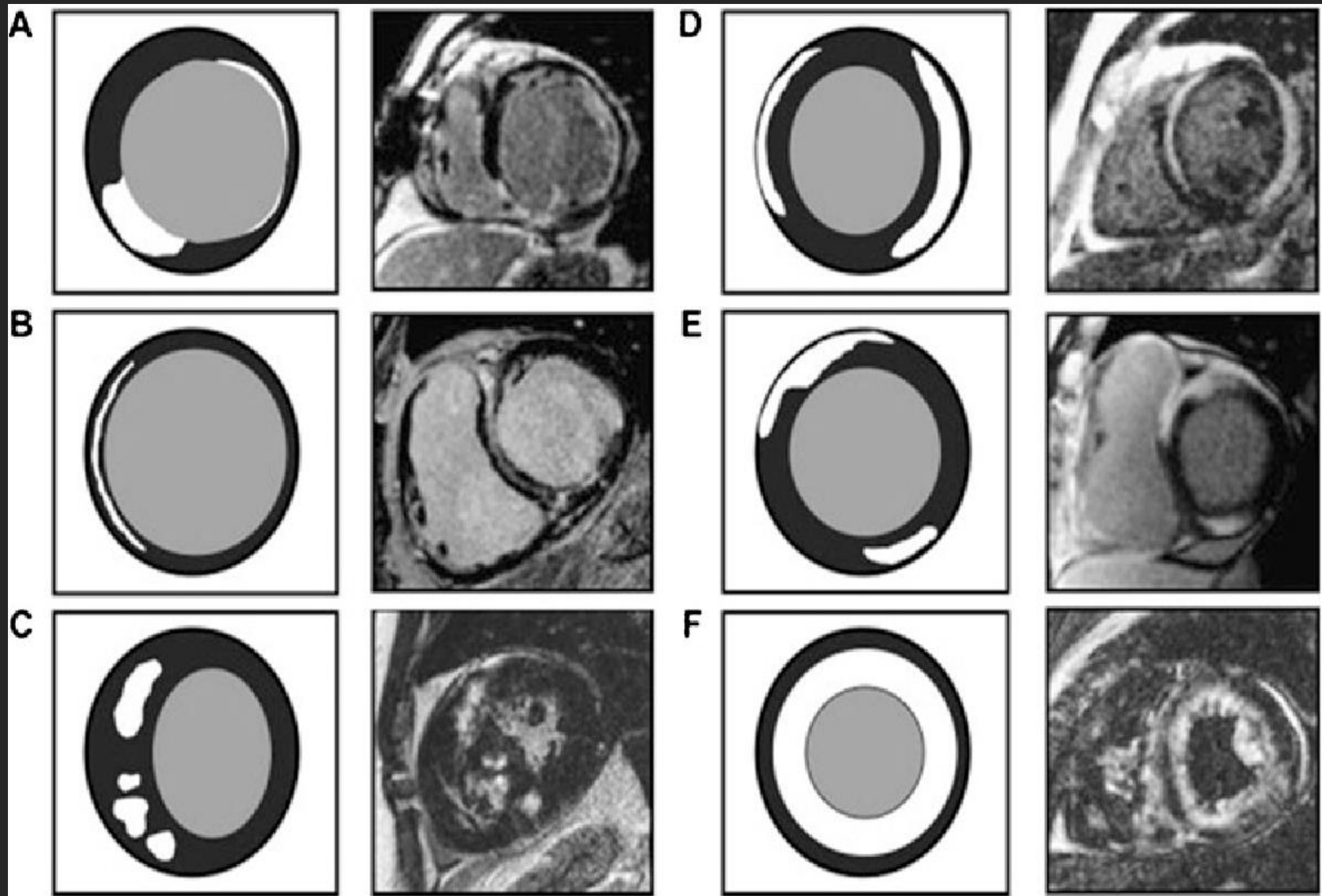


- Sarcoidosis, Myocarditis, Anderson-Fabry, Chagas Disease

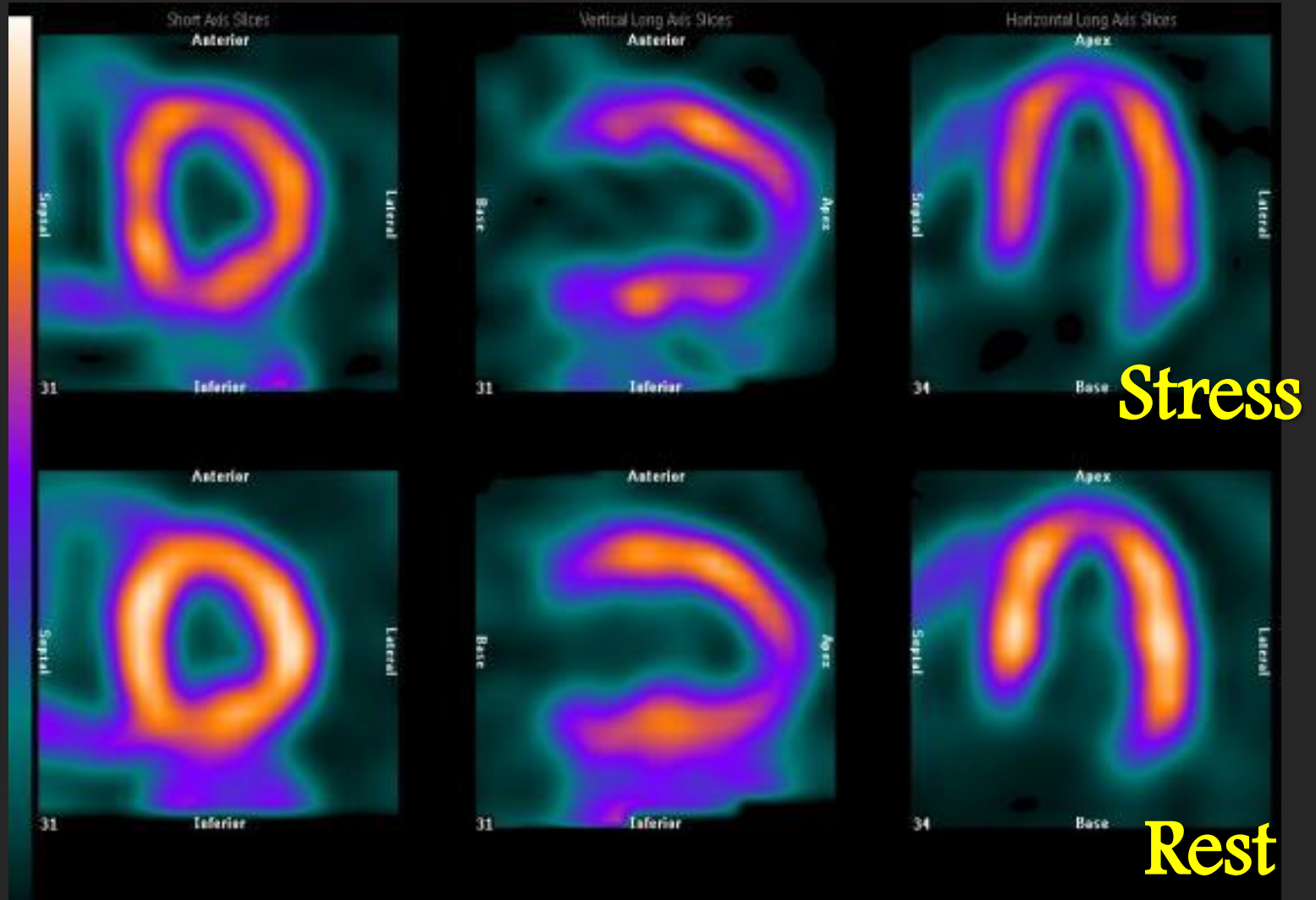
C. Global Endocardial HE



- Amyloidosis, Systemic Sclerosis, Post cardiac transplantation

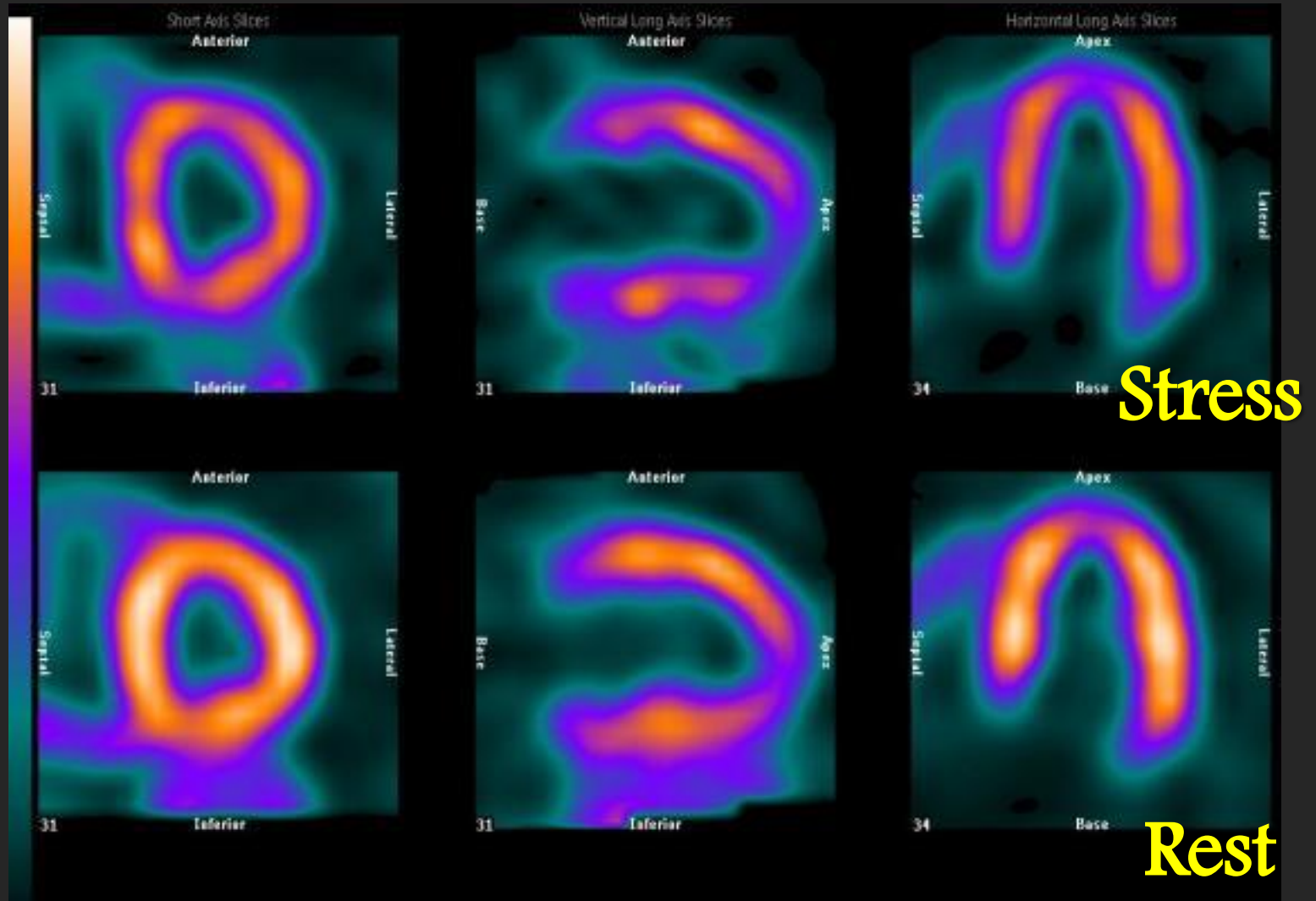


What is the diagnosis ?



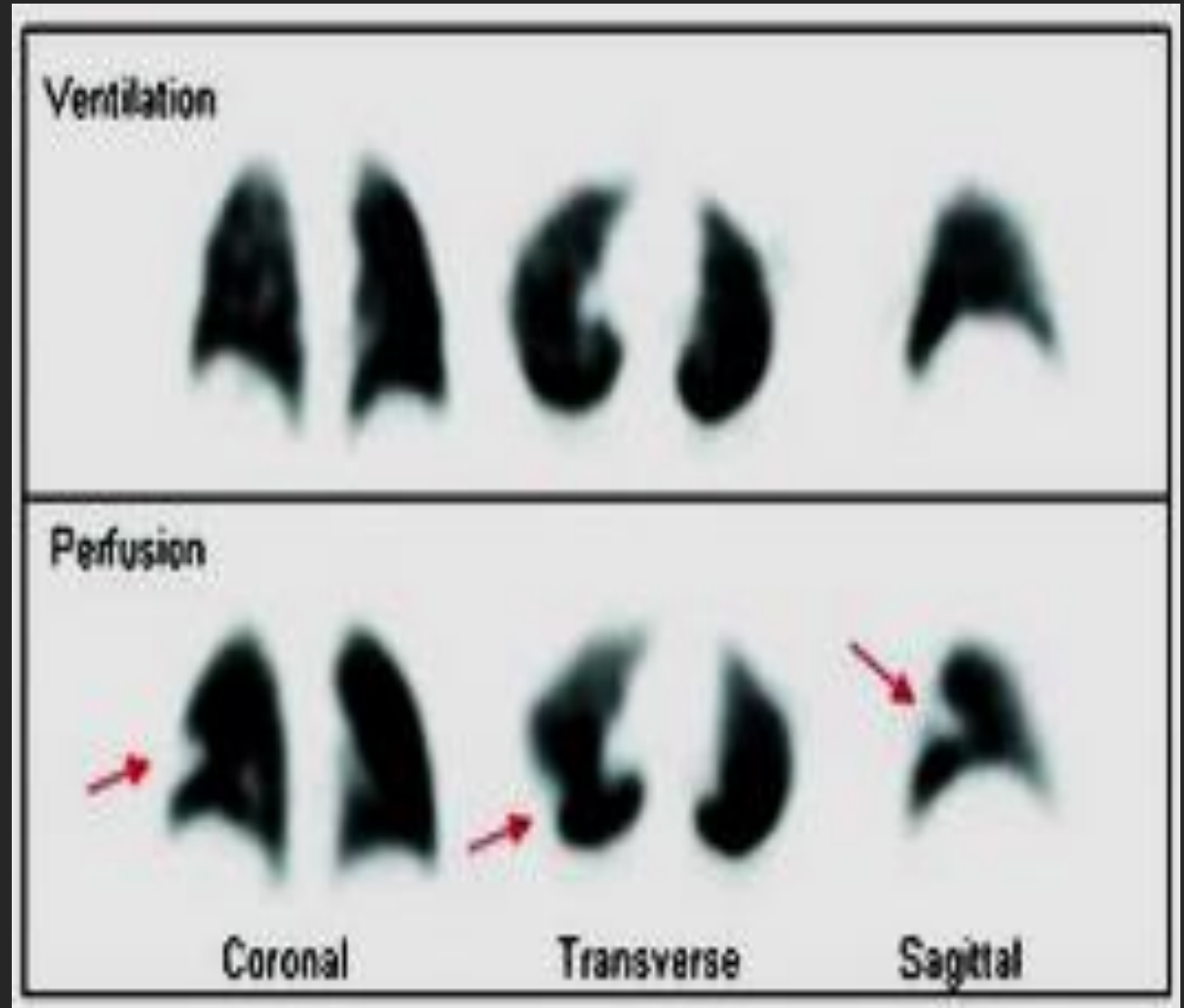
What is the diagnosis ?

Myocardial ischemia



V/Q scan

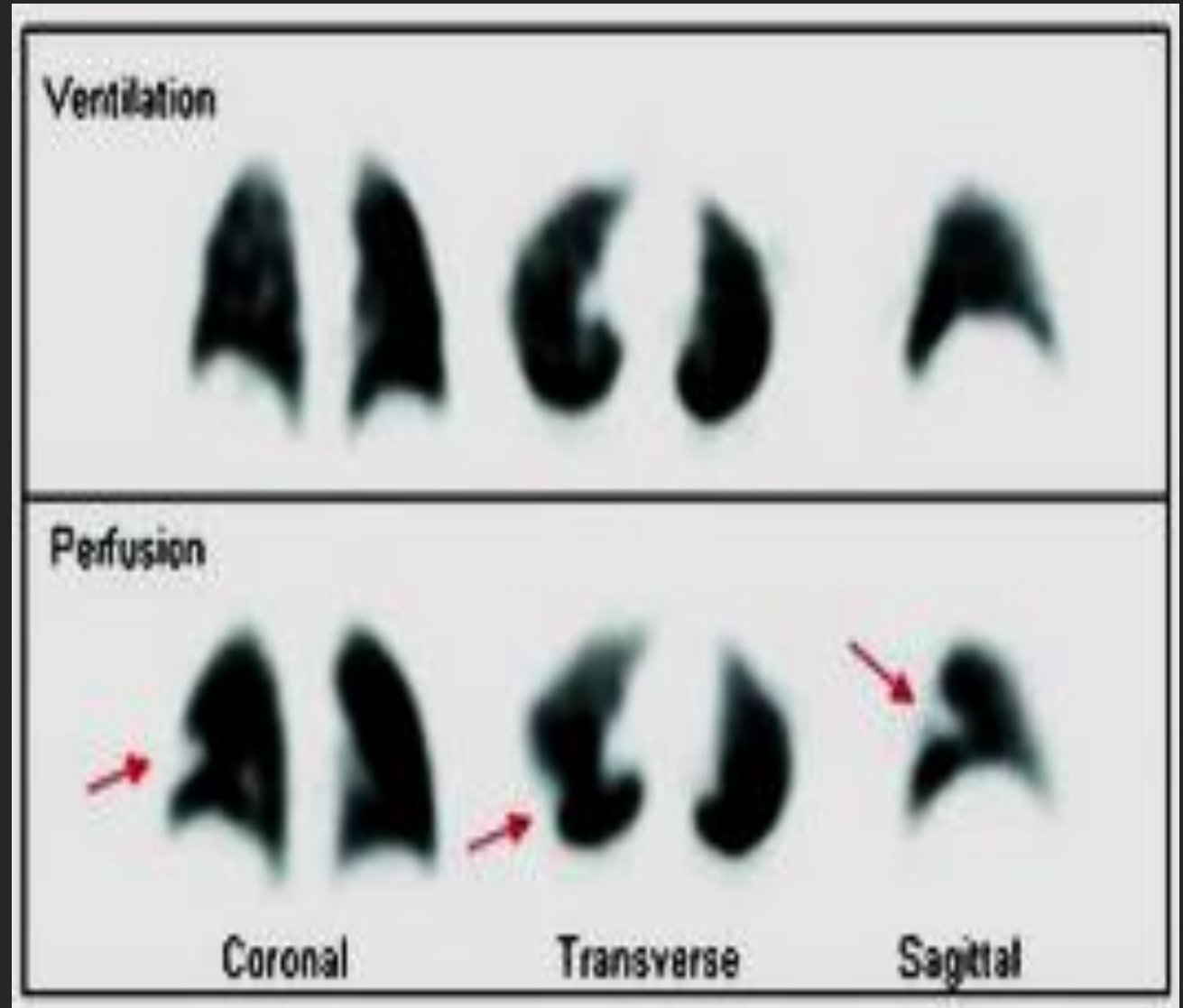
What is the diagnosis?



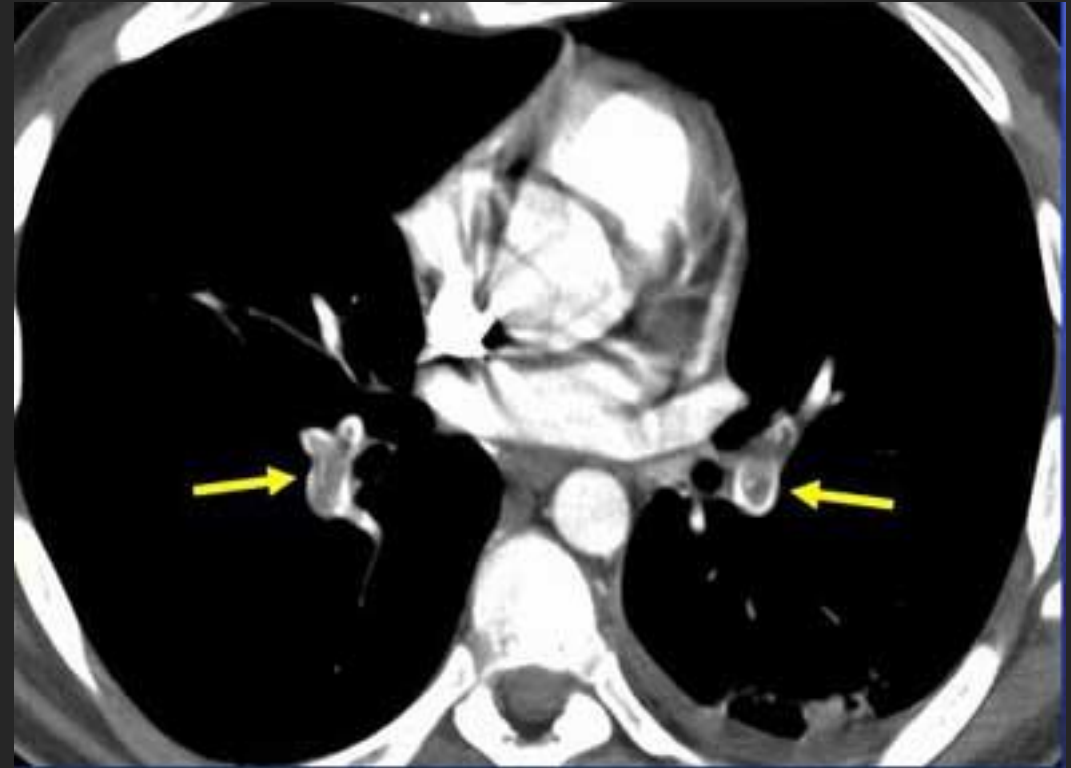
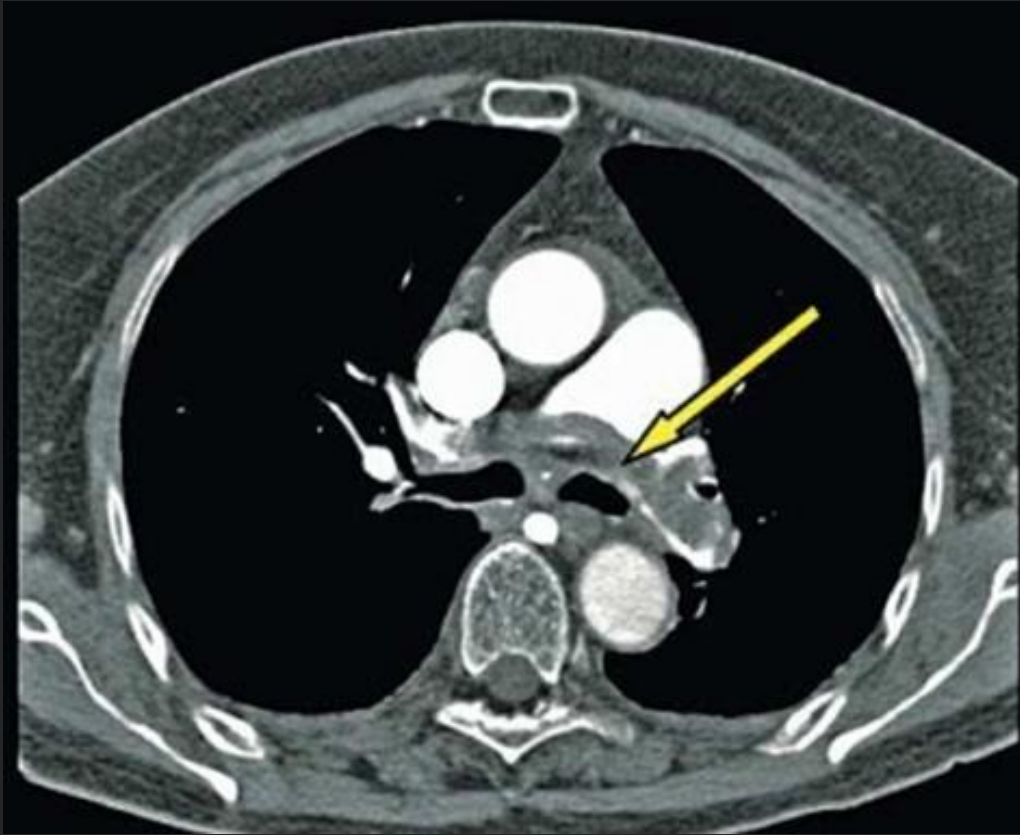
V/Q scan

What is the diagnosis?

Pulmonary embolism
(mis-match between
ventilation and perfusion
scans)



CT pulmonary angiogram



Pulmonary embolism

Thank you