



**ESDA**

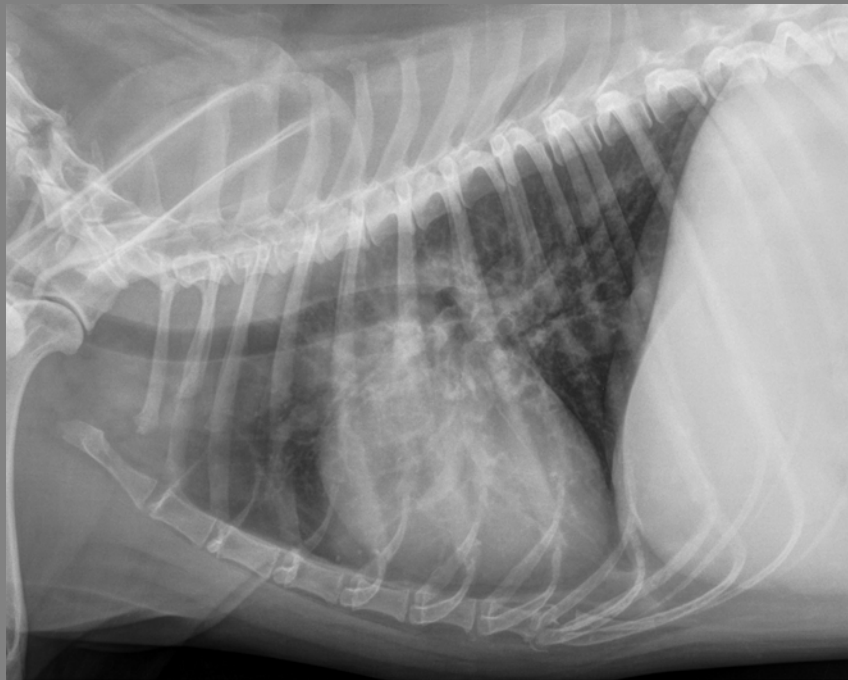
European Society of Dirofilariosis and Angiostrongylosis

# Evaluation of Thoracic Radiographs in Canine HW Disease

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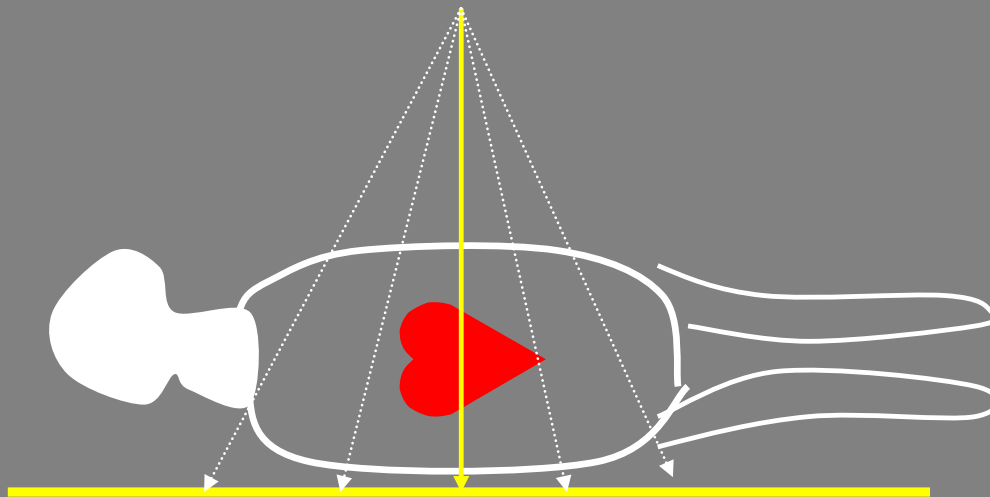
# Two views

- ☐ Latero-lateral (right recumbency)
- ☐ Sagittal (dorso-ventral strongly advised)



# Dog positioning

- Sagittal plane of the thorax parallel to the film and perpendicular to the X ray beam
- Center of the X-ray beam centered on the heart  
*to avoid distortion of cardiac silhouette*

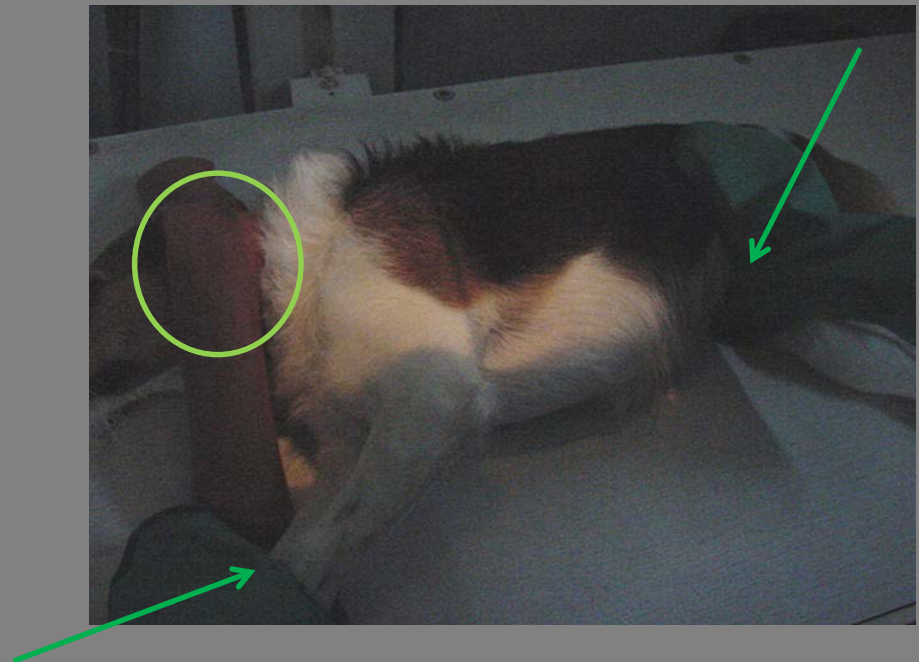


# Dog positioning

**Wrong**



**Correct**



# HW disease in DOGS Pathogenesis

- Chronic disease
- Damages first at the pulmonary parenchyma and arterial vessels
- Right cardiac chambers dilatation only in the late stage of the disease and when parenchymal and arterial diseases are present only



*Radiographic right cardiac chambers enlargement not associated to pulmonary arteries enlargement is not consistent with HW disease*

# HW disease in DOGS Pathogenesis

Months/Years

No lesions

Inflammatory  
pulmonary disease

Arterial pulmonary  
disease (*pulmonary  
hypertension, "cor pulmonale"*)

right heart congestive  
failure

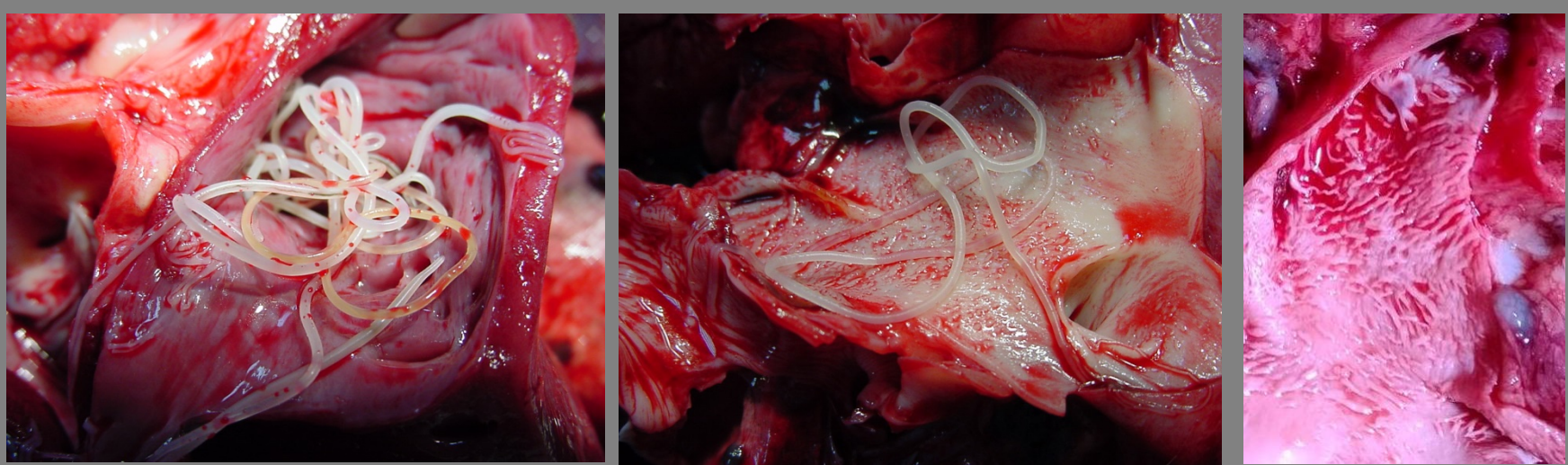




# Thoracic radiographs

Tool for obtaining information about

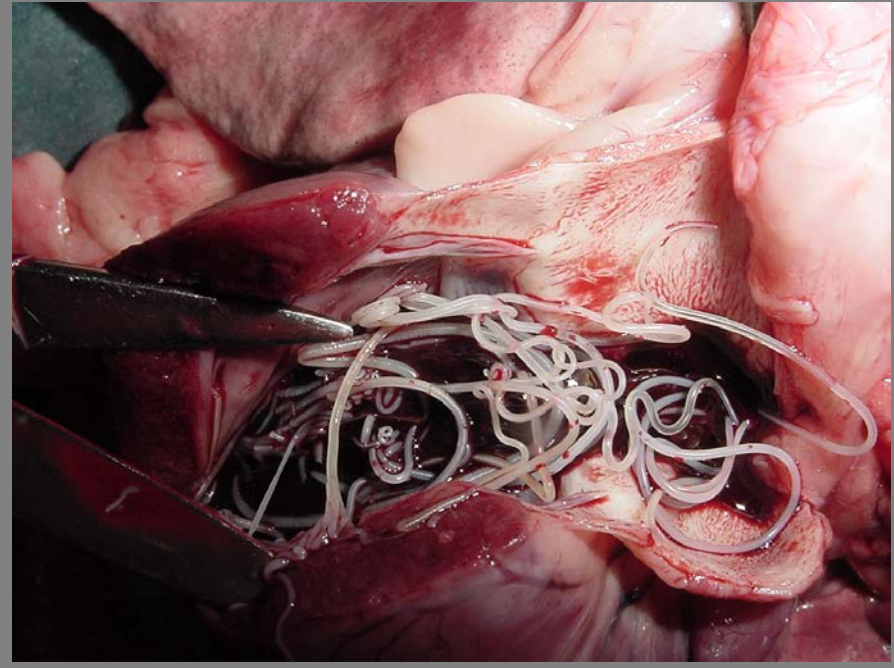
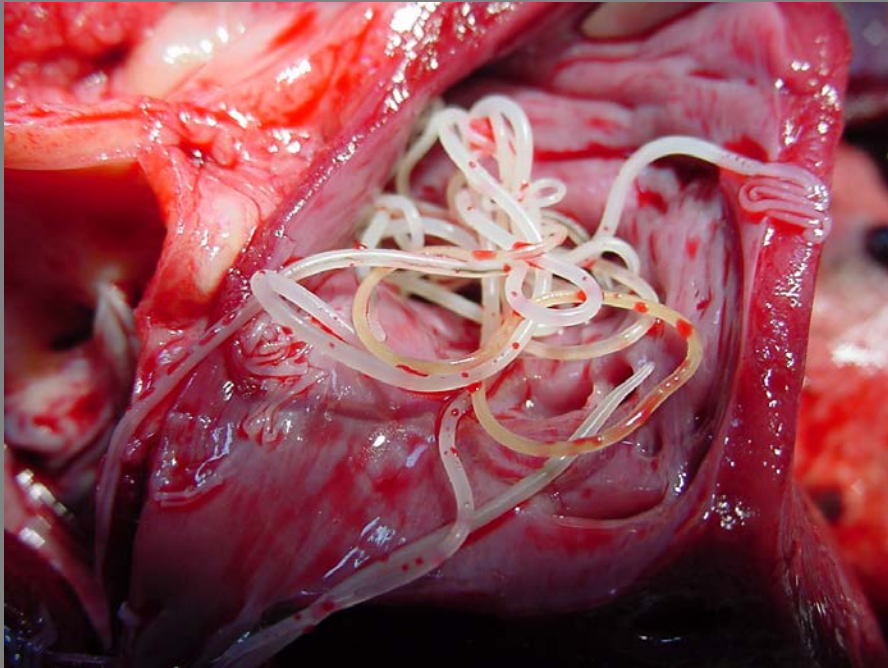
- Pulmonary parenchymal disease
- Pulmonary arterial disease



Less important

- *Right cardiac chambers (cardiac silhouette)*
- *Pulmonary venous circulation (in case of left cardiac side concurrent diseases i.e. Mitral insufficiency or DCM)*

# No indications about worm burden

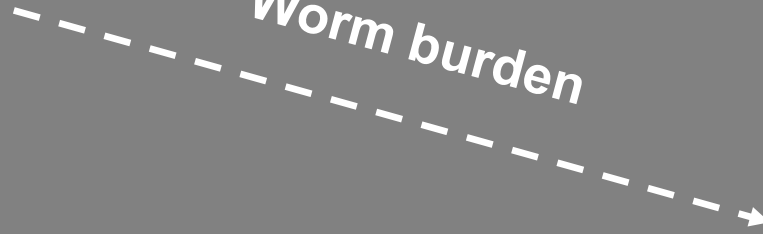


Normal thoracic radiographs may be associated to recent infections with high worm burden and severe radiographic changes may be associated to long lasting infections with exhausted worm burden





Worm burden

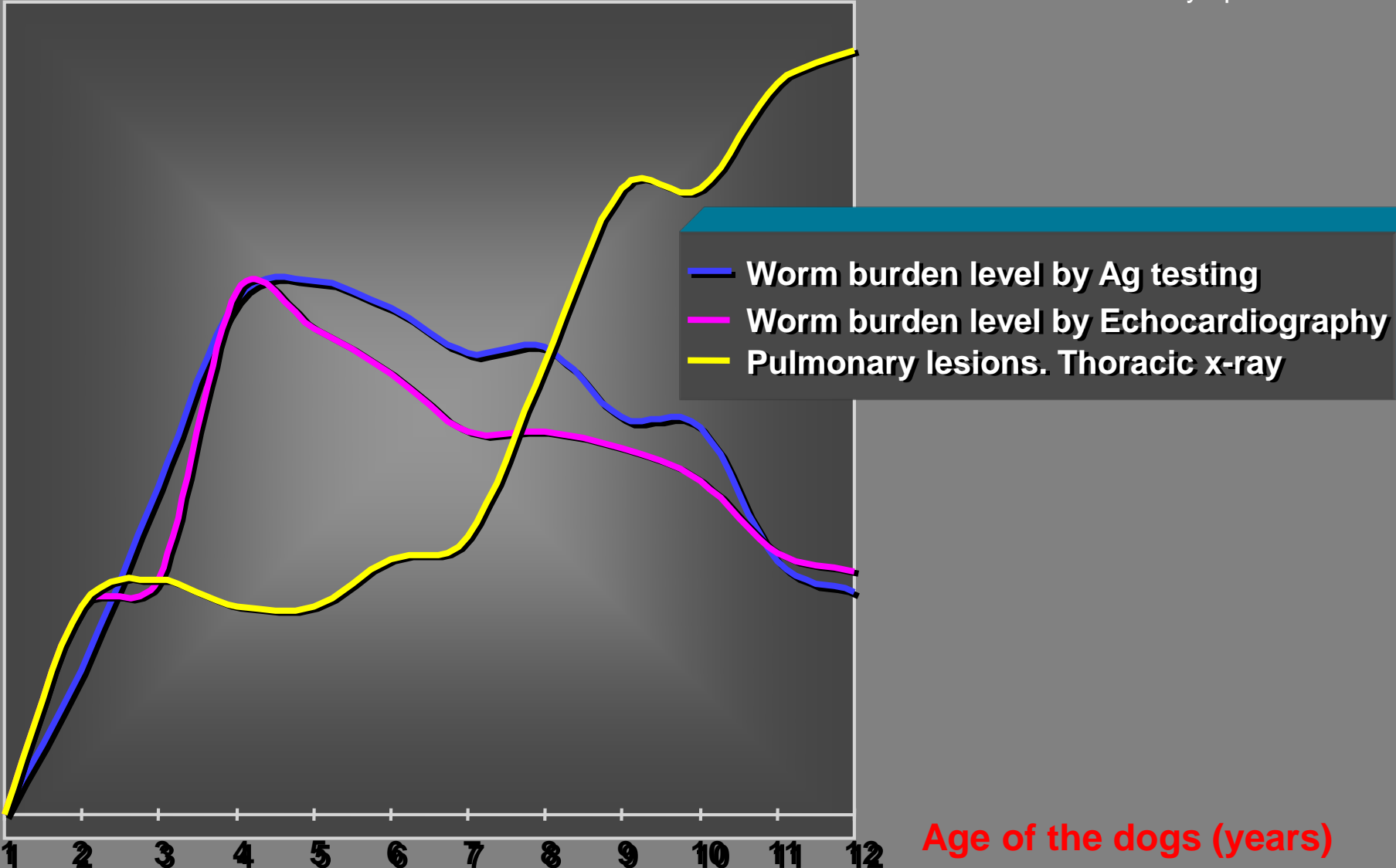


Over the time, during the infection, the worm burden is reducing due to the spontaneous death of the parasites that, causing thromboembolism, worsen the radiographic picture



Venco L et al. *Relative utility of Echocardiography, Radiography, Serologic testing and Microfilariae counts to Predict Adult Worm Burden in Dogs Naturally Infected with Heartworms.*

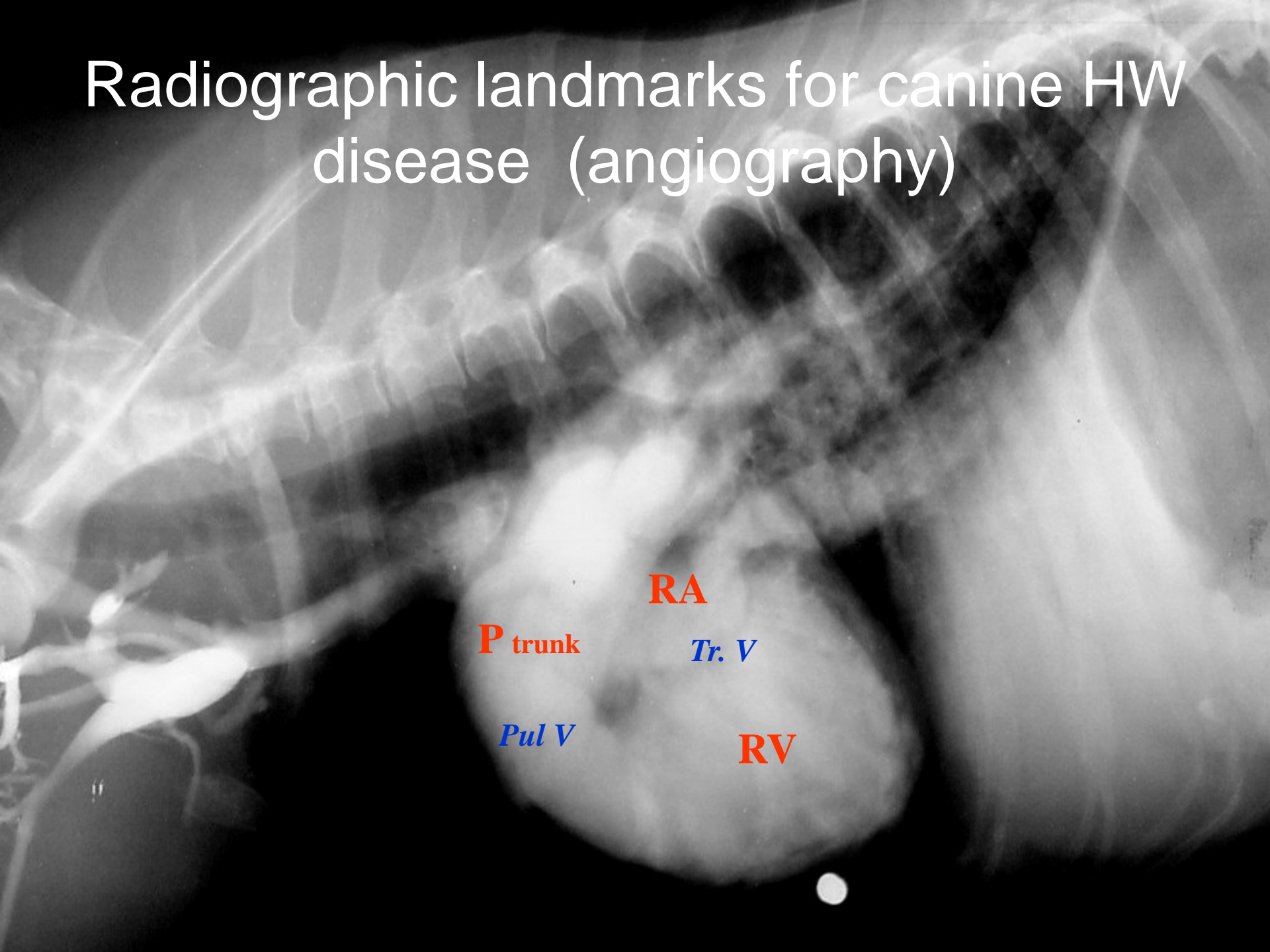
Recent Advances in Heartworm Disease. Symposium '01.



**Age of the dogs (years)**

Middle-aged dogs usually have high worm burden without severe radiographic changes. Older dogs rather severe radiographic abnormalities with reduced worm burden

# Radiographic landmarks for canine HW disease (angiography)



**RA**

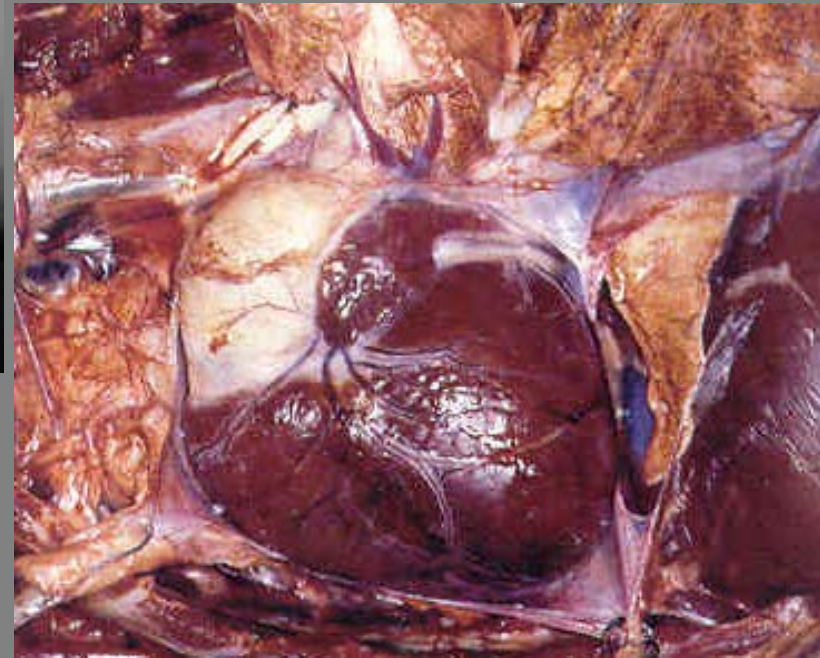
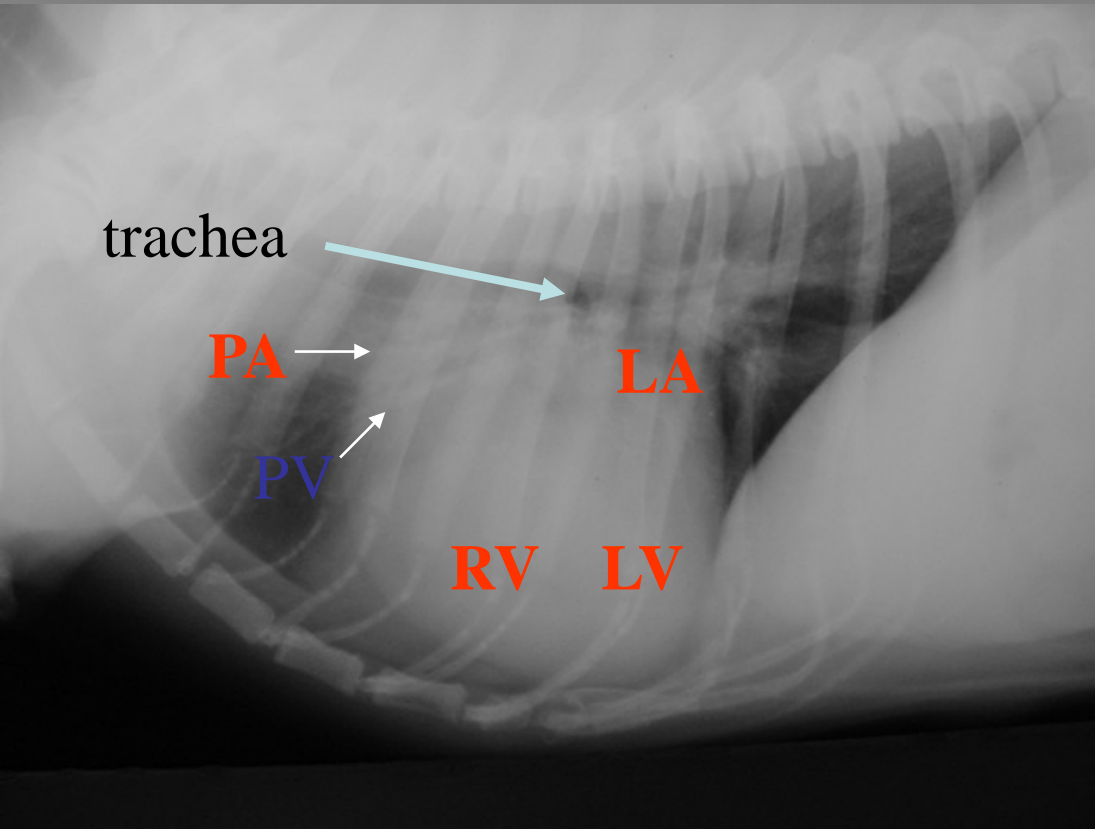
**P trunk**

*Tr. V*

*Pul V*

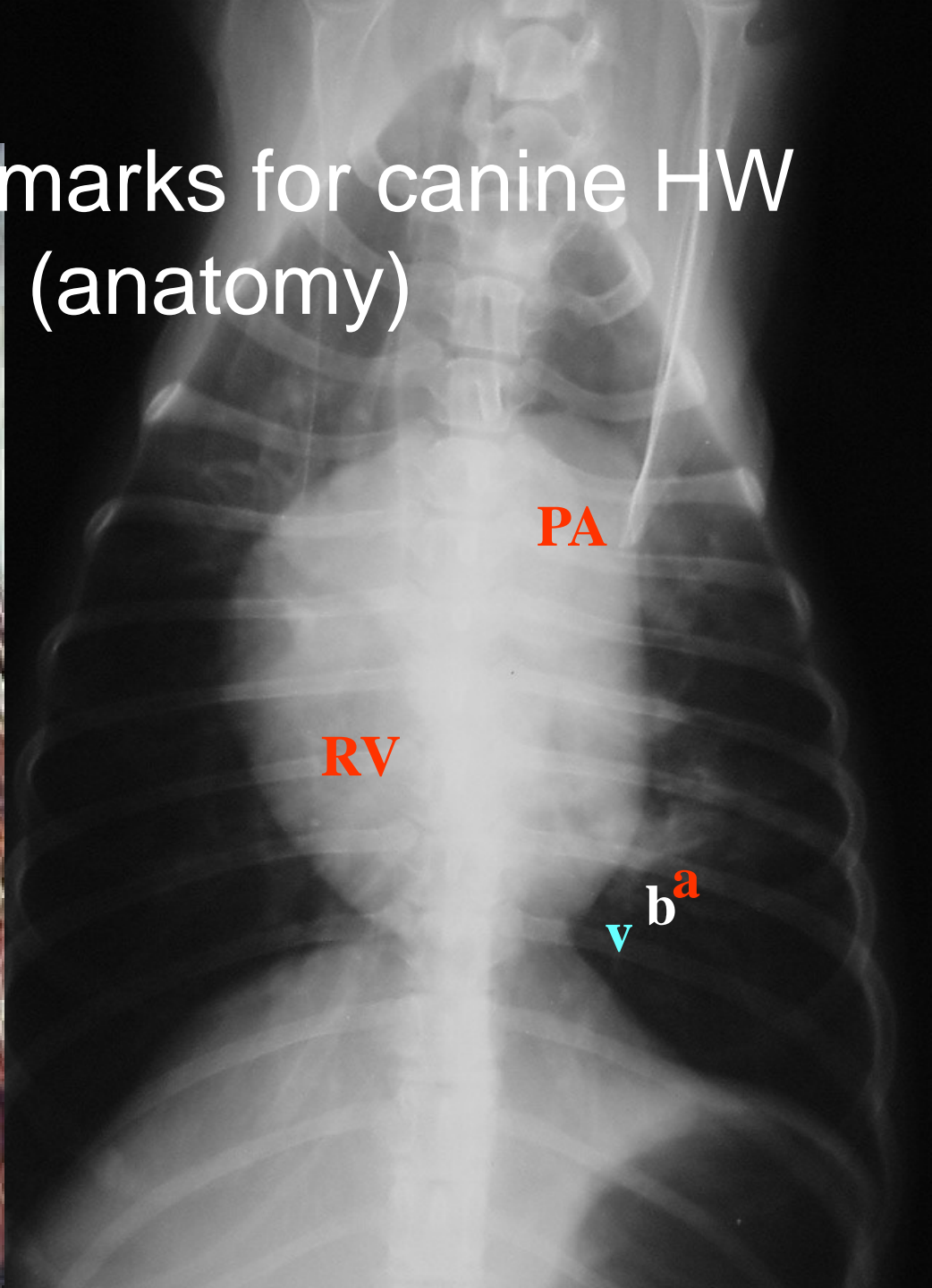
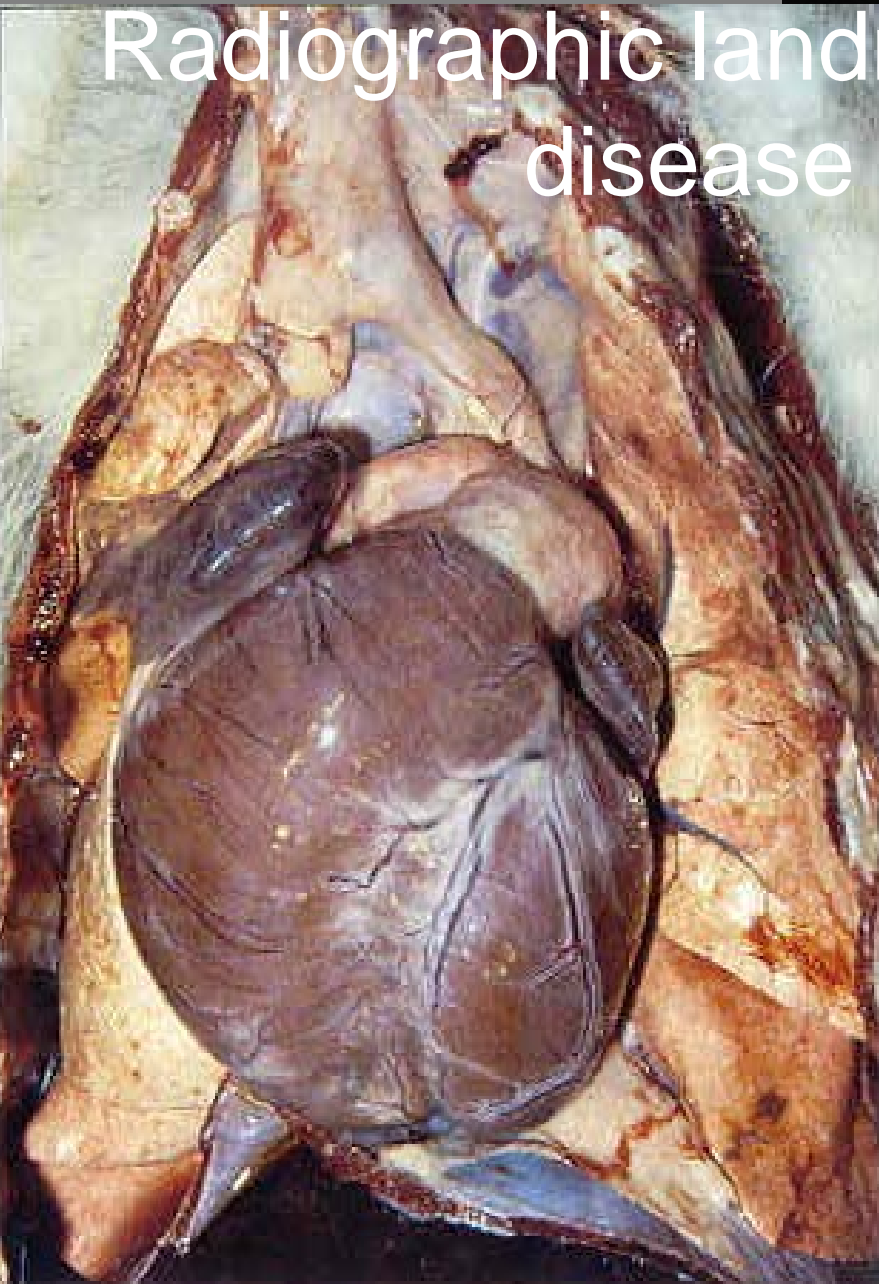
**RV**

# Radiographic landmarks for canine HW disease (anatomy)





# Radiographic landmarks for canine HW disease (anatomy)



PA

RV

v b a

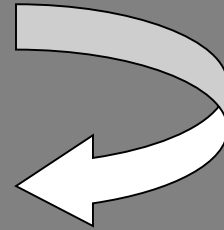


# QUESTIONS to be answered when evaluating Thoracic radiographies in a HW infected dog

- Is pulmonary parenchyma damaged ?



- Are pulmonary arteries enlarged?



- Is cardiac silhouette modified?



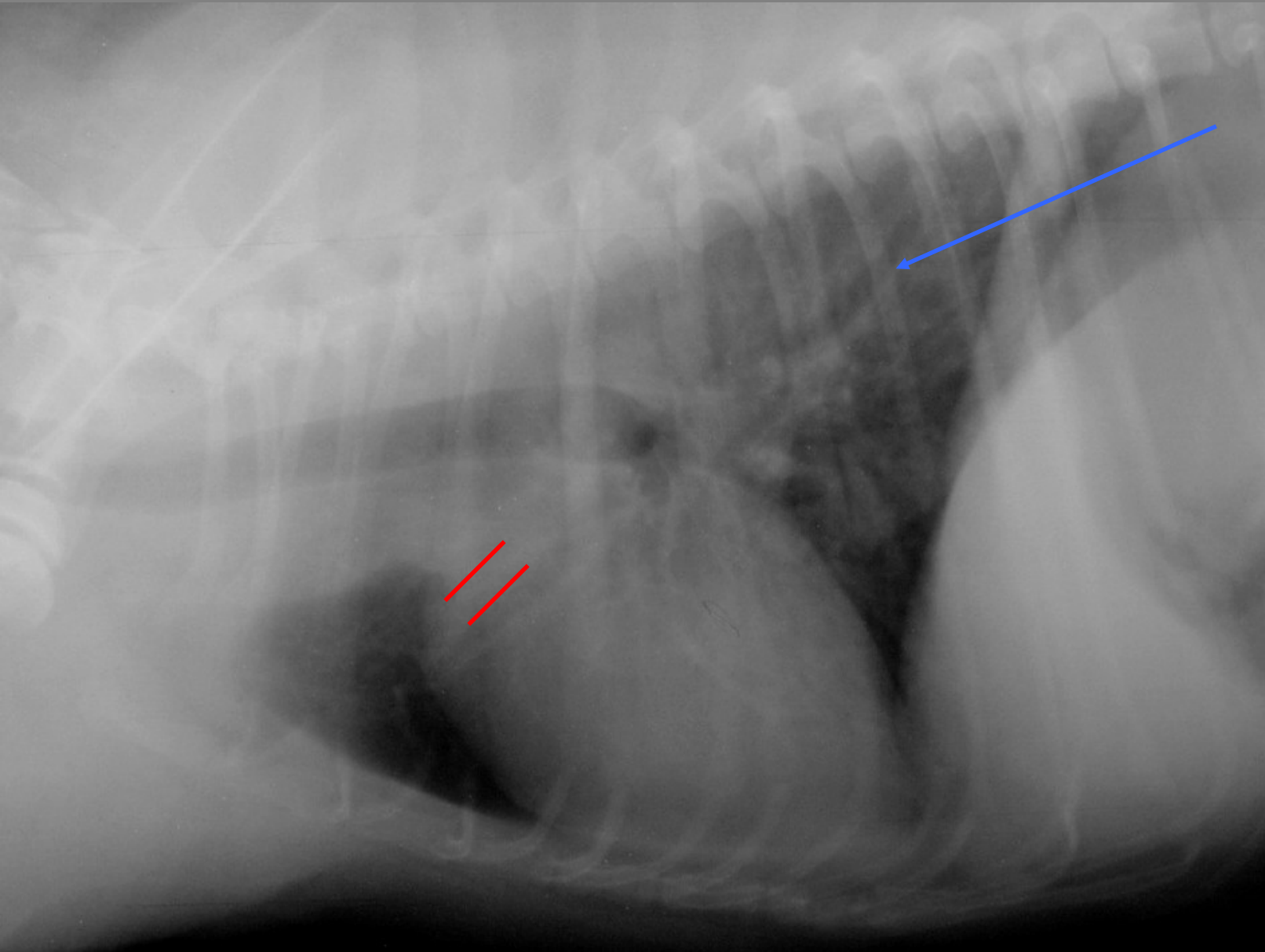
- If yes what about right cardiac chambers?



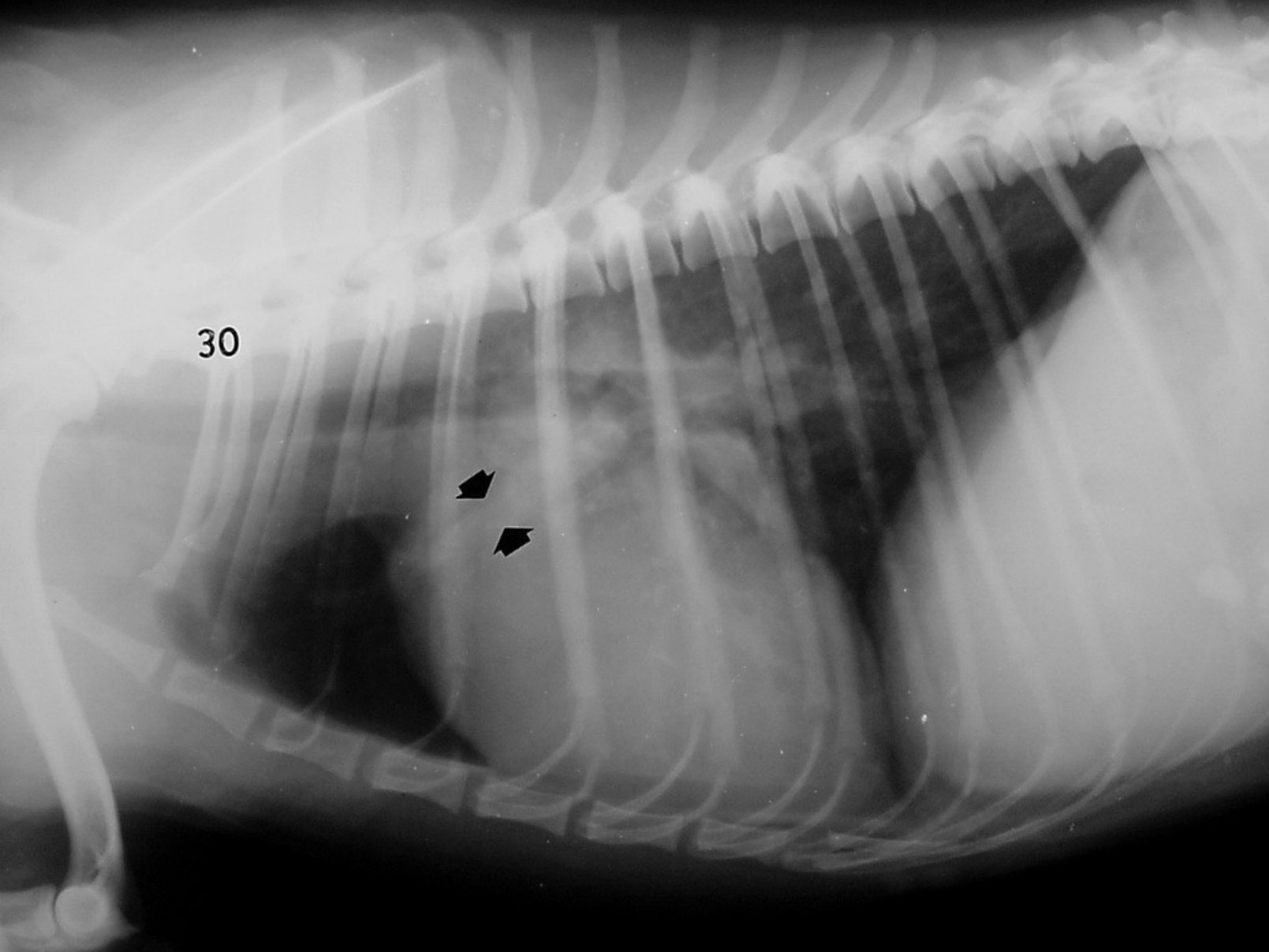
- Are signs of right cardiac congestive failure present ?



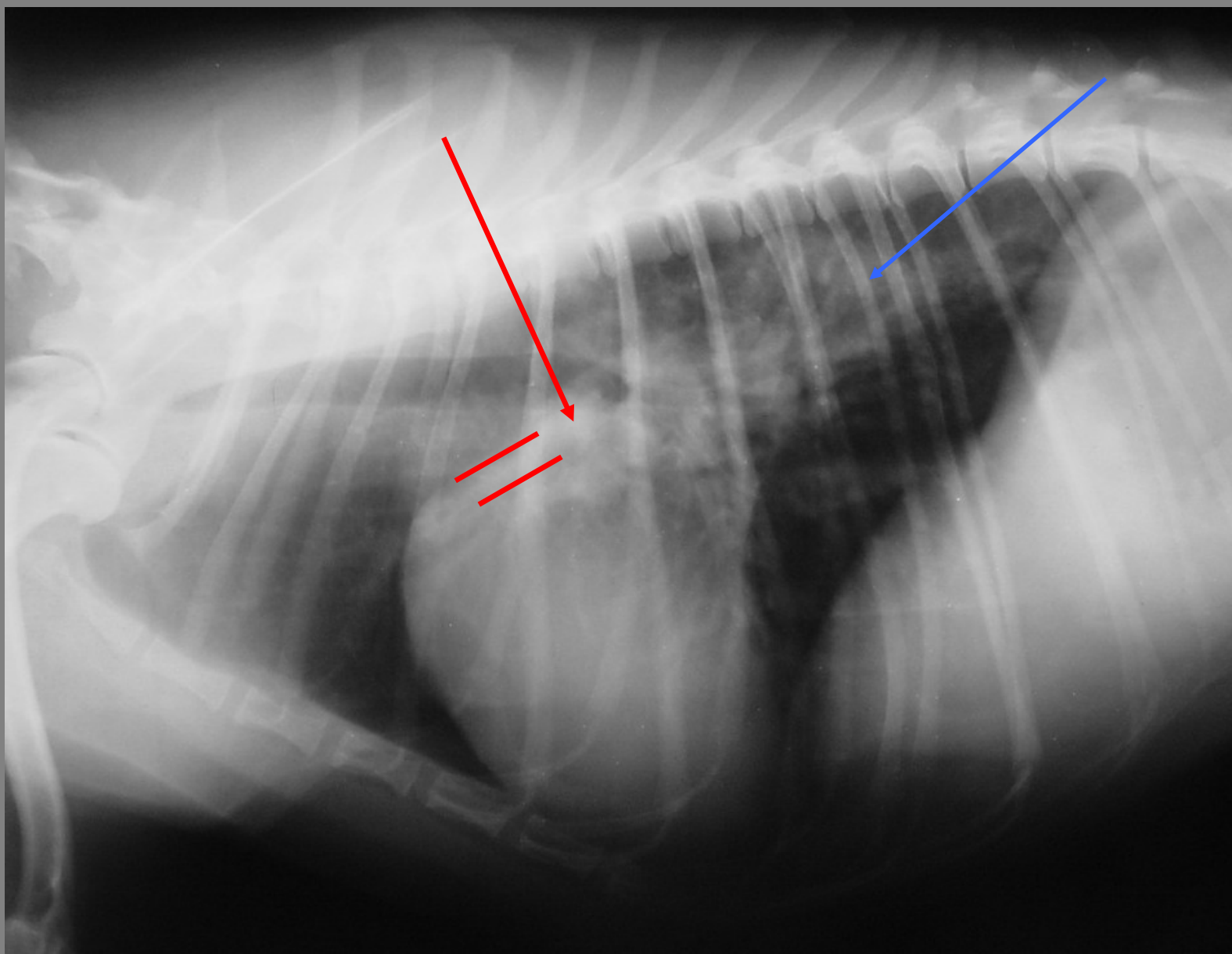
No obvious lesions (recent infection)



Pulmonary interstitial pattern and mild enlargement of cranial pulmonary arteries

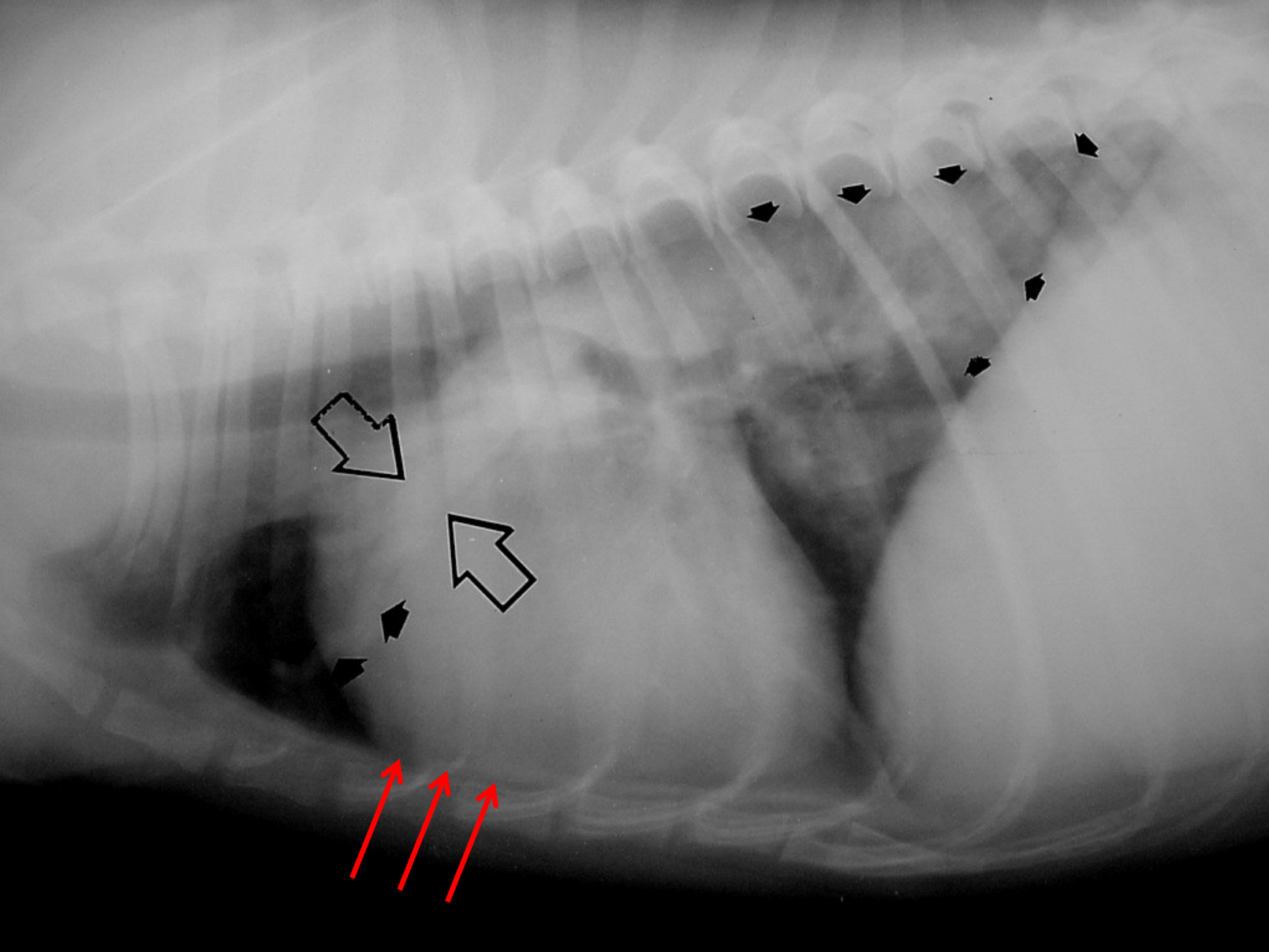


Clear enlargement of cranial pulmonary arteries

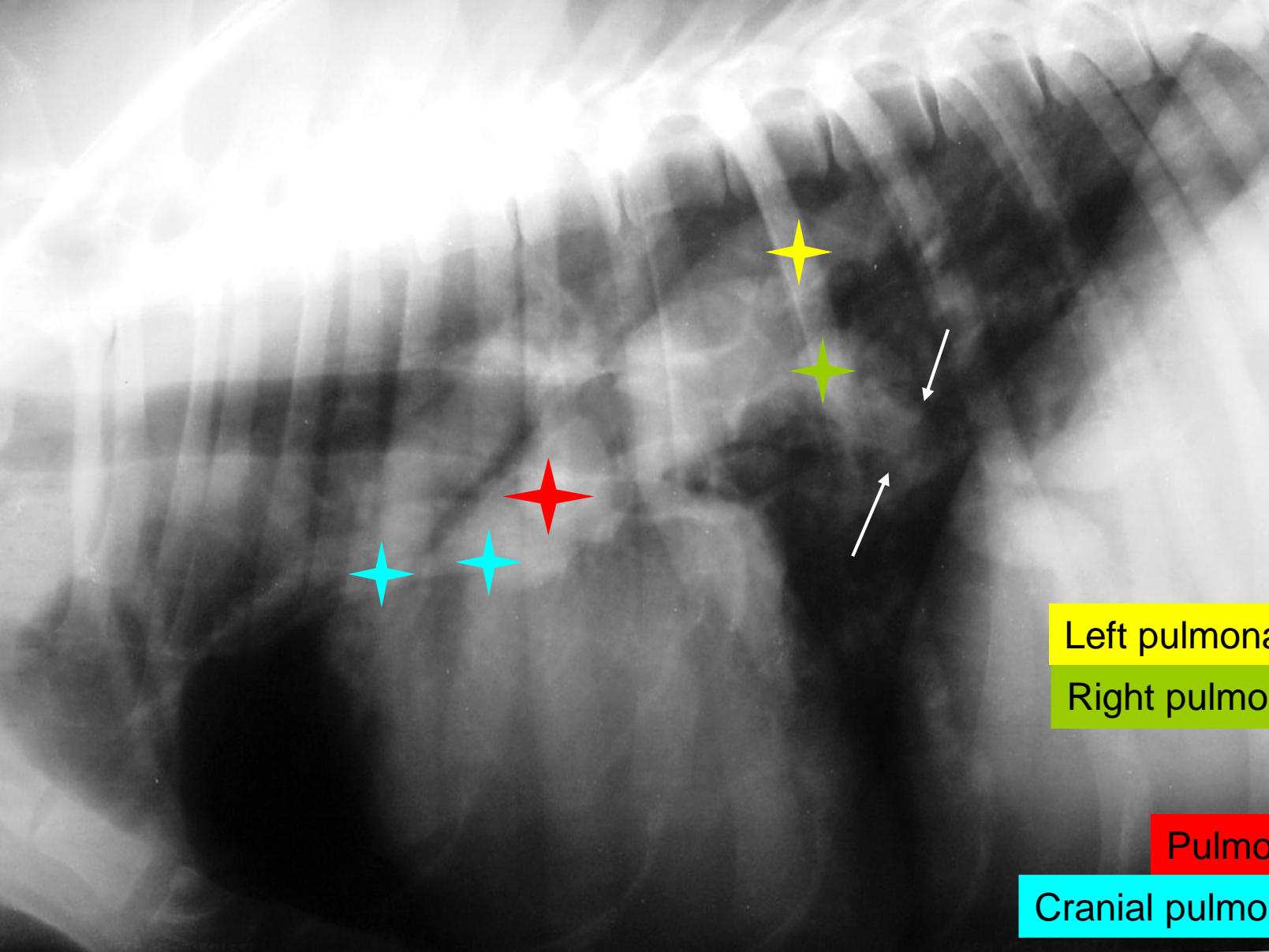


Mixed interstitial-alveolar pattern of the caudal lung lobes  
Severe enlargement of the main and cranial pulmonary arteries





Interstitial pattern of the caudal lung lobes  
Severe enlargement of cranial pulmonary arteries and pulmonary trunk  
Right ventricle enlargement



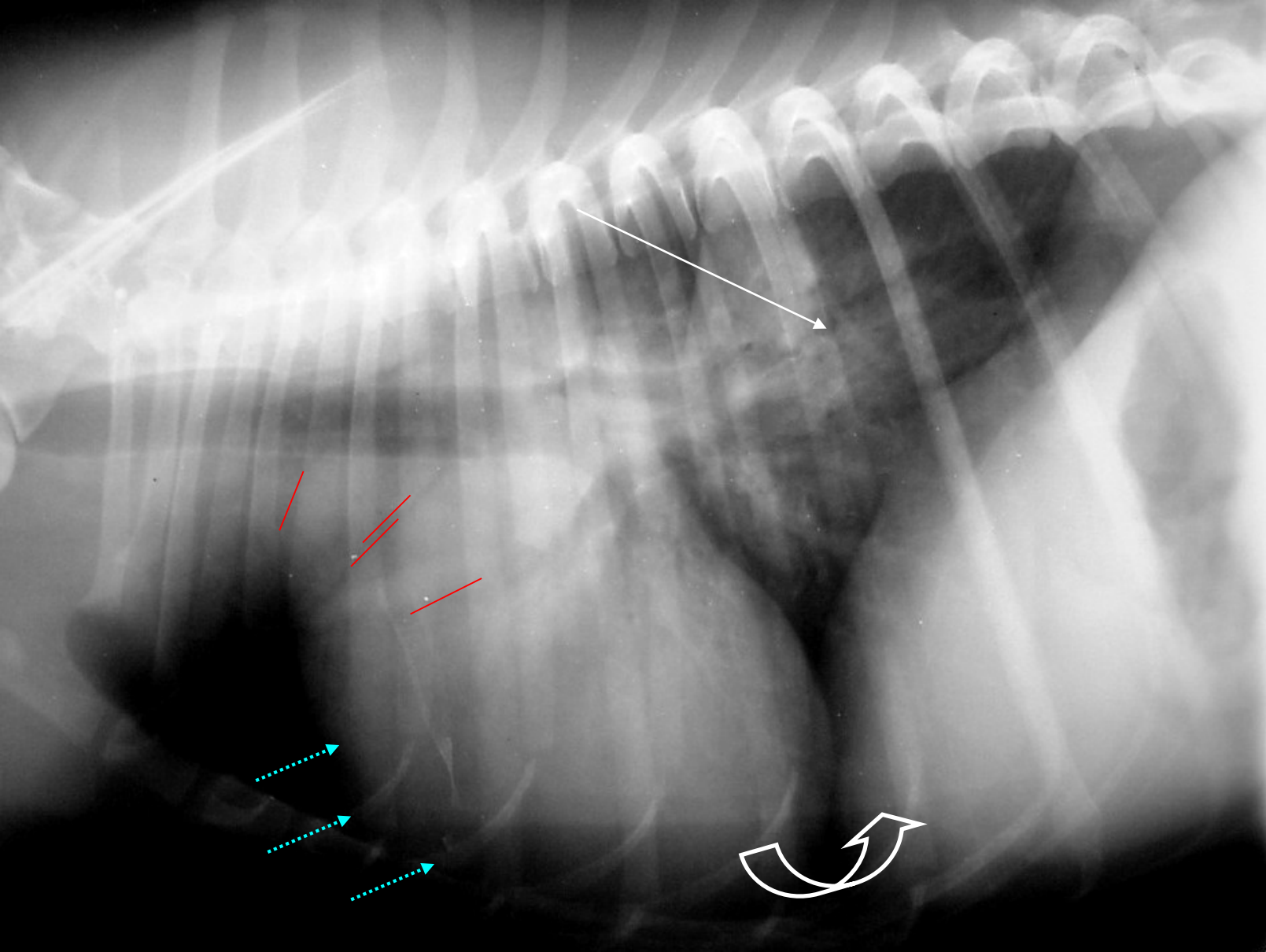
Left pulmonary artery

Right pulmonary artery

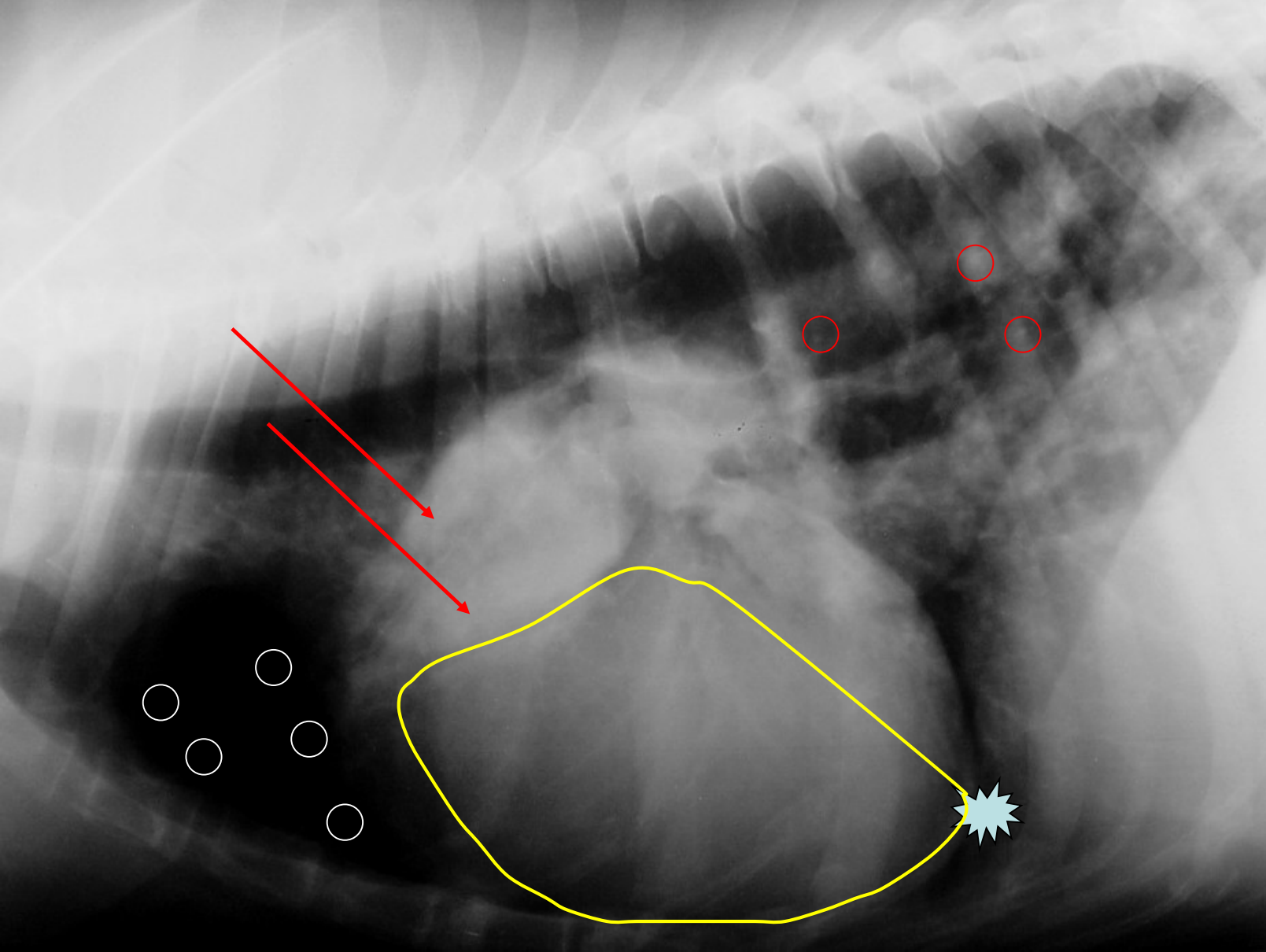
Pulmonary trunk

Cranial pulmonary arteries

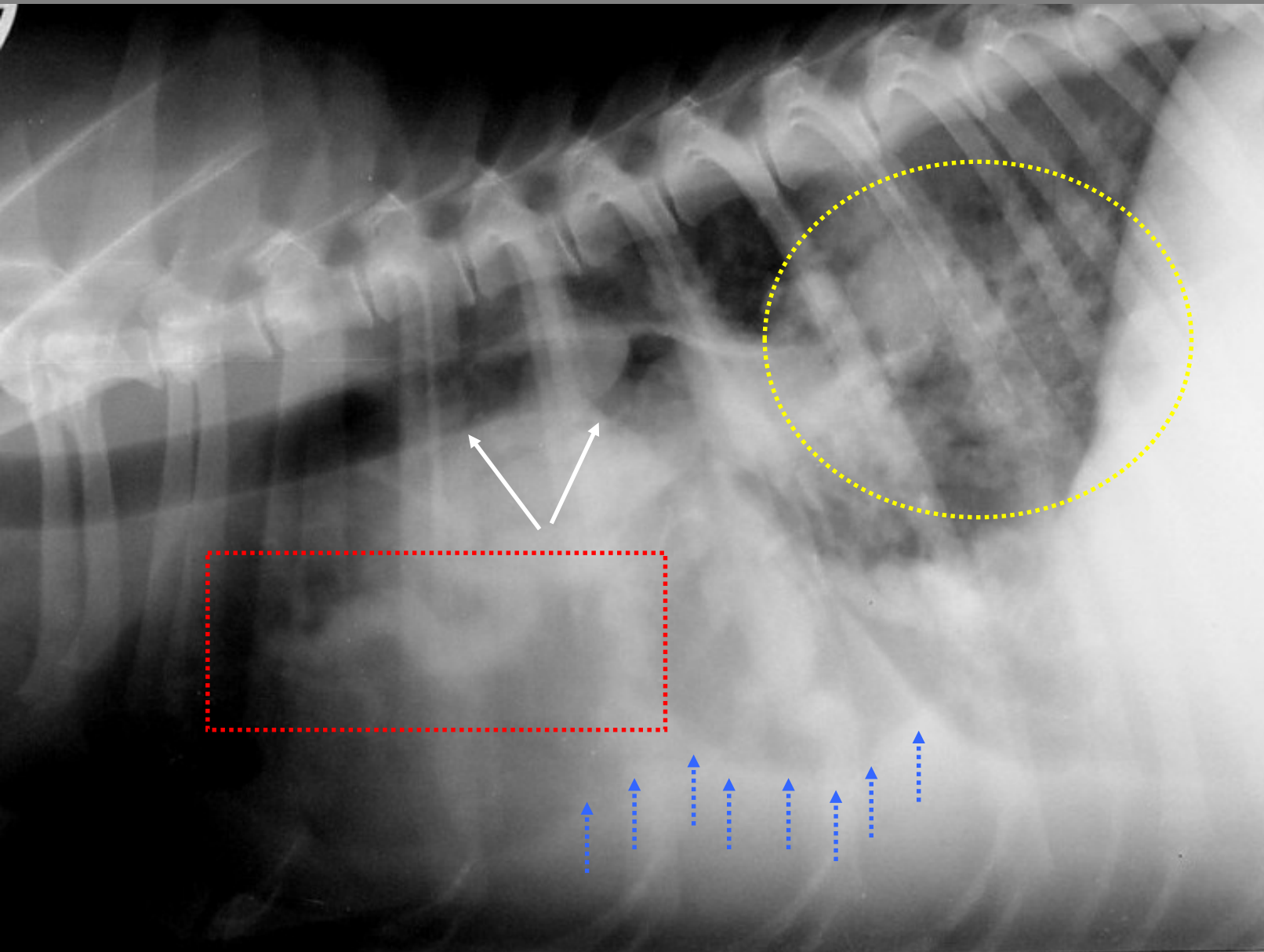
Severe enlargement of the arterial pulmonary vessels and «pruning» of the right pulmonary artery (arrows)



Mixed interstitial-alveolar pattern of the caudal lung lobes  
Severe enlargement of cranial pulmonary arteries  
Right ventricle enlargement with the heart apex displaced dorsally

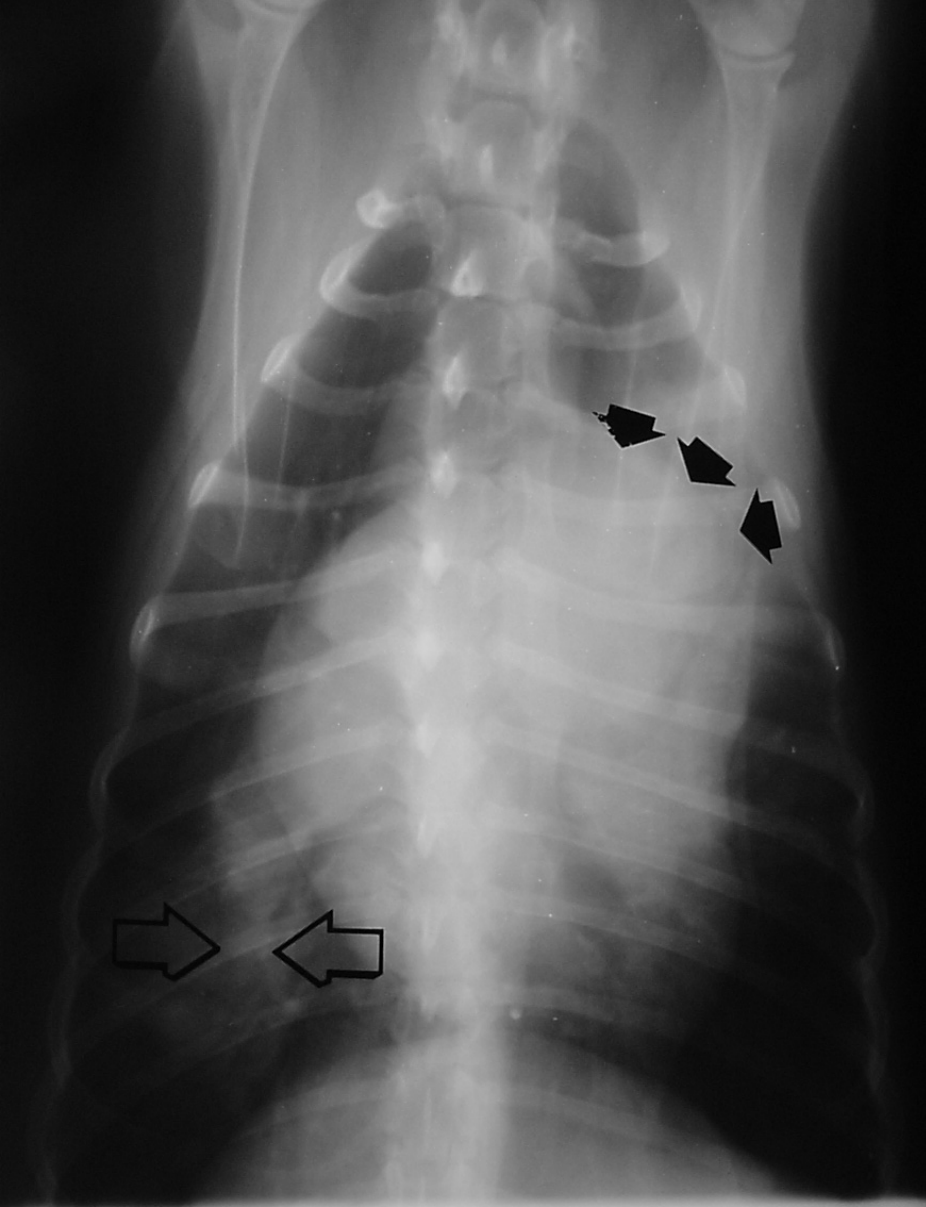


Mixed interstitial-alveolar pattern of caudal lung lobes, and reduced flow to cranial lobes  
Severe enlargement of cranial pulmonary arteries  
Right ventricle enlargement with the heart apex displaced dorsally



Mixed interstitial-alveolar pattern of caudal lung lobes.  
Severe enlargement of cranial pulmonary arteries.  
Trachea displaced dorsally by right atrium enlargement. Pleural effusion



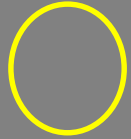


Bulging of the main pulmonary artery  
Severe enlargement of caudal pulmonary arteries.

Cross breed F  
8 year old 14 kg



Main pulmonary artery



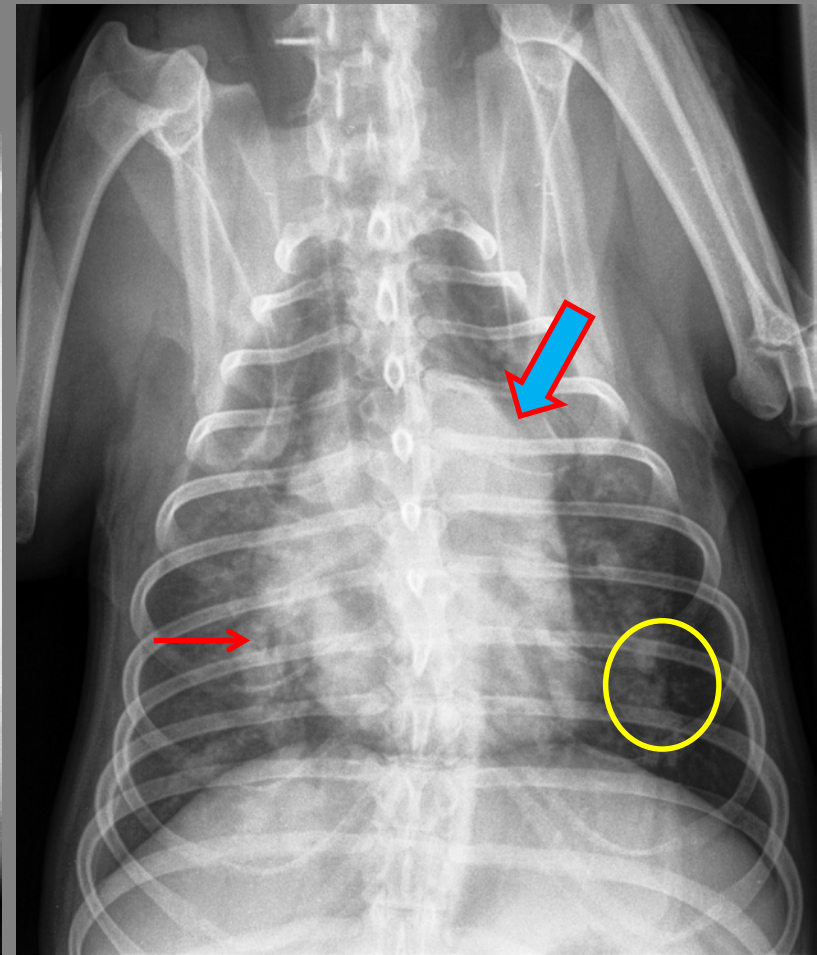
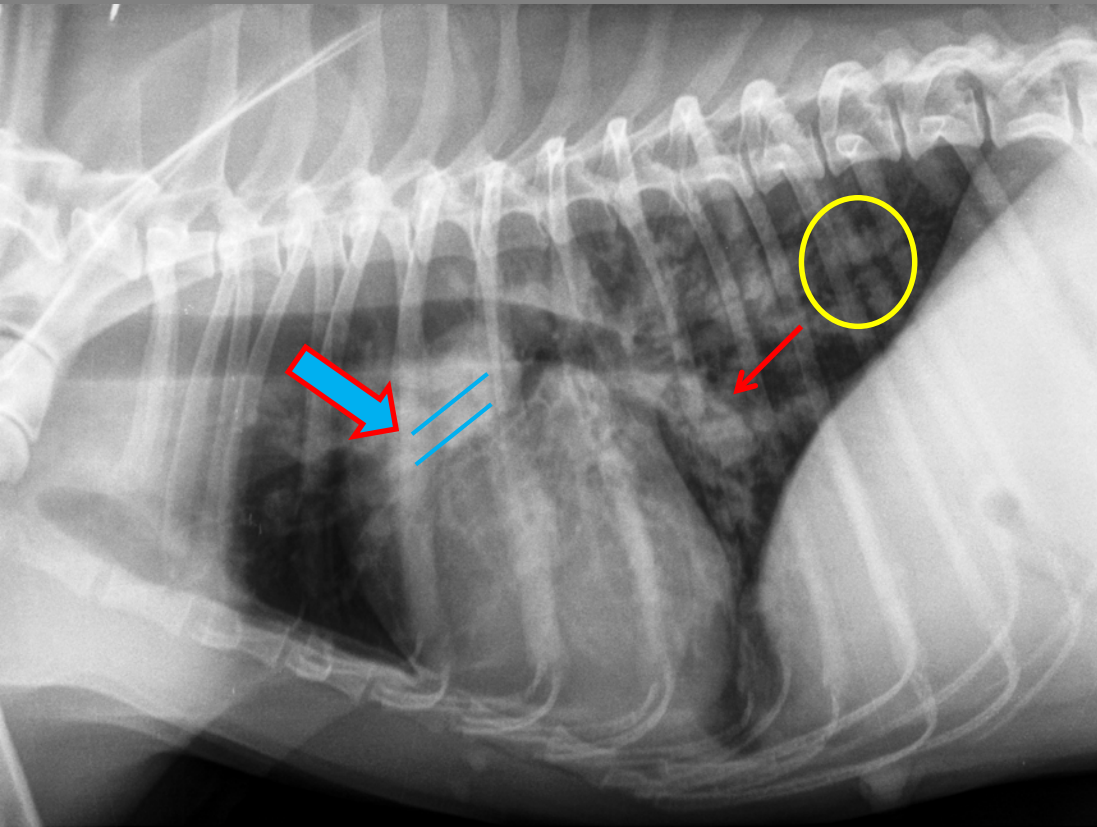
Interstitial pattern caudal lung lobes



Right pulmonary artery



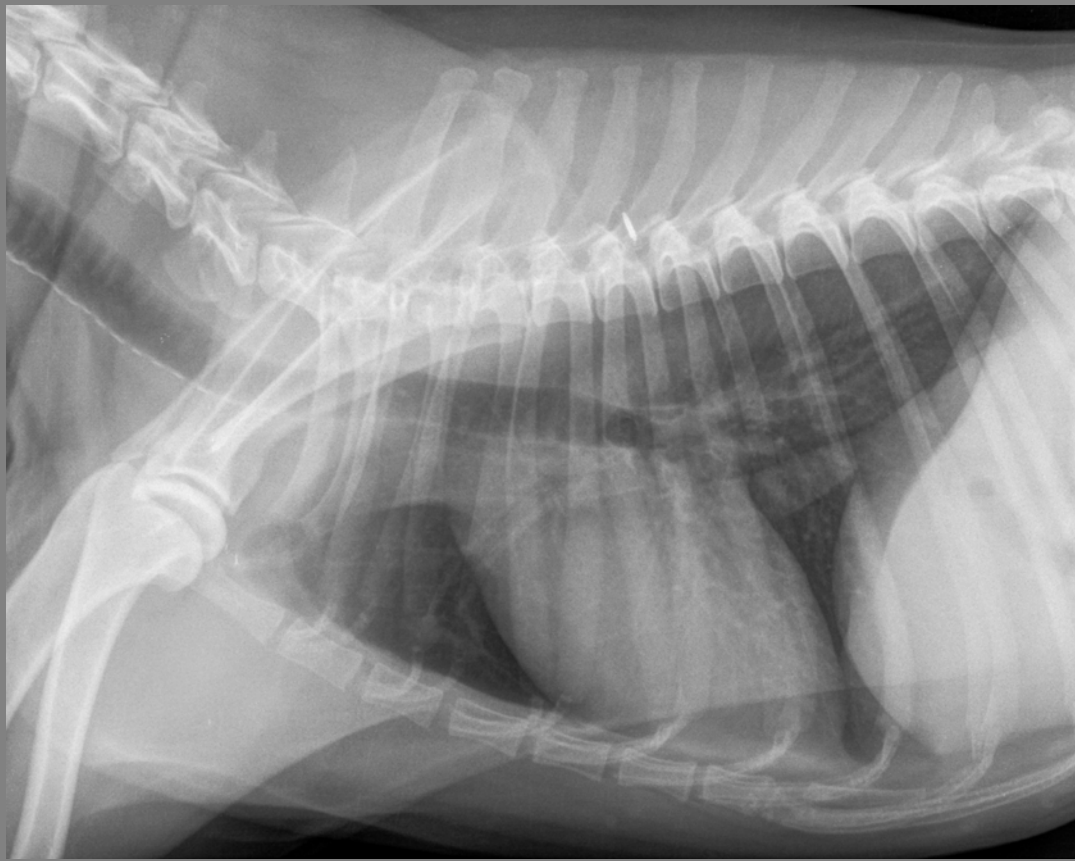
Cranial pulmonary artery



# Self assessment

Cross breed Male 4 year old 12 kg

Estimate radiographic changes and worm burden



# Results

## Thoracic radiograph evaluation

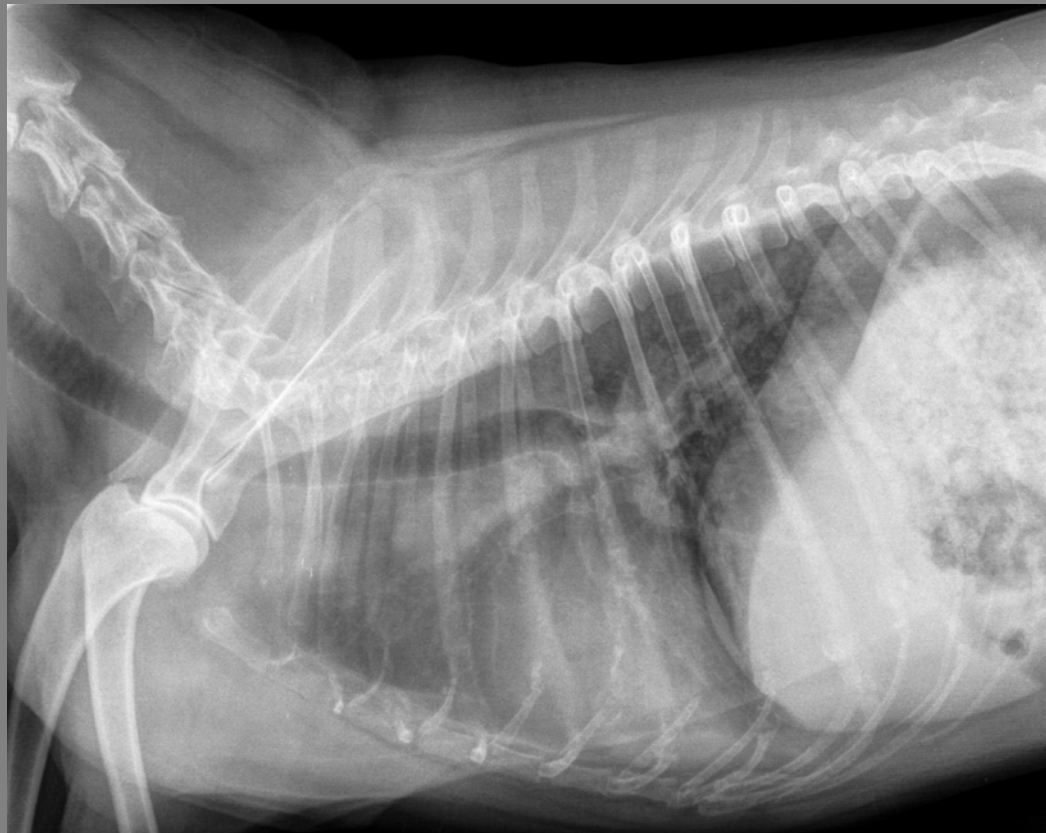
- No radiographic changes

## HW surgically removed



# Self assessment

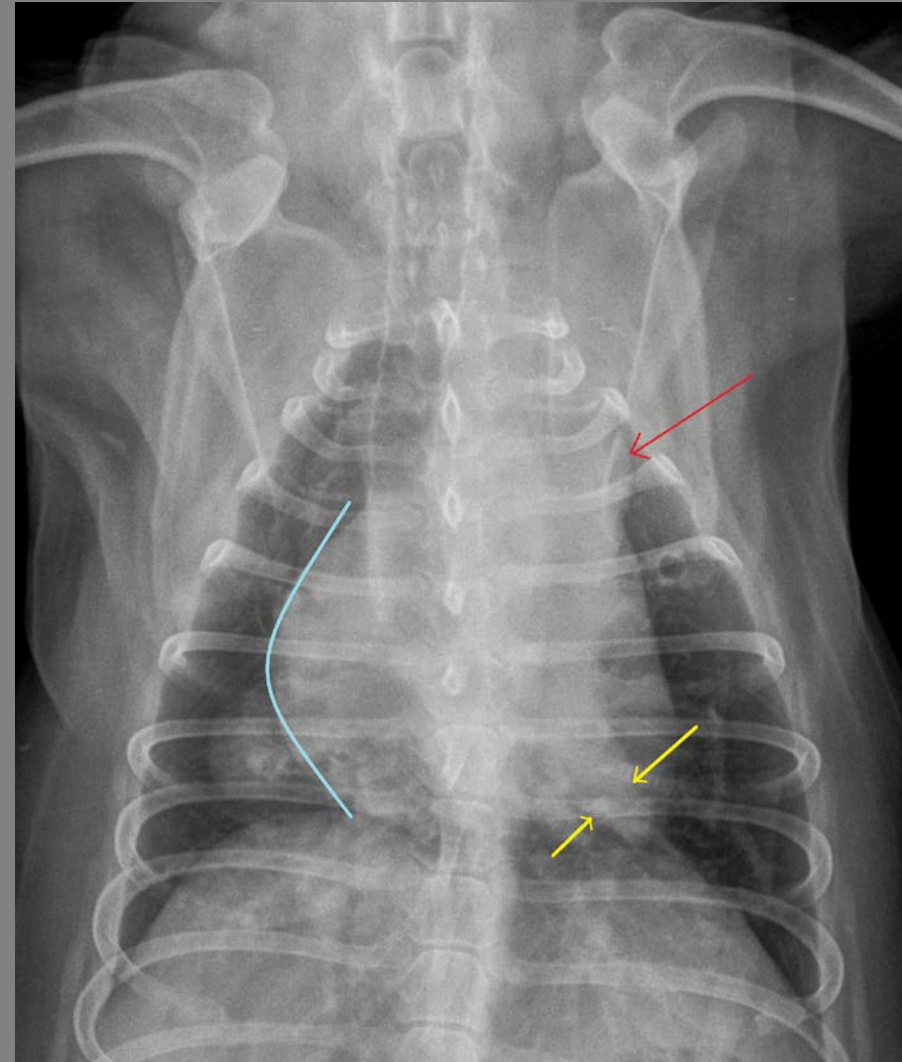
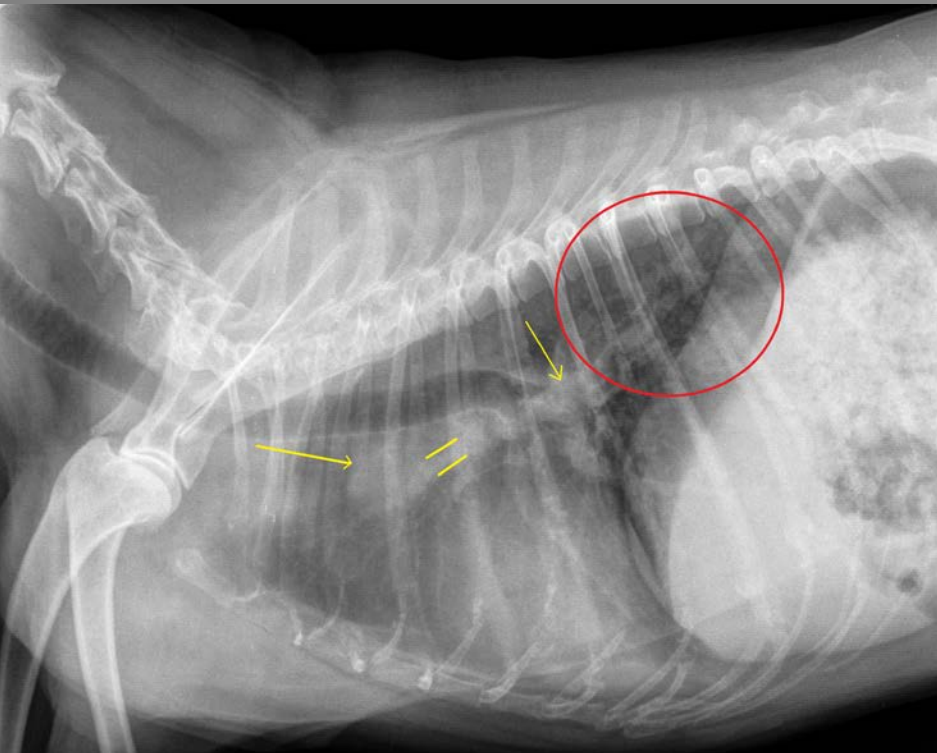
Estimate radiographic changes related to HW disease





**Dilated main pulmonary artery**  
**Dilated caudal pulmonary arteries**  
**Pruning right caudal pulmonary artery**  
**Dilated right ventricle (reversed D shape)**

**Caudal lung lobes interstitial pattern**  
**Dilated main pulmonary artery**  
**Dilated cranial pulmonary arteries**





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