

# Case 14

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# Signalment and History

- 4 months old, intact female, DSH cat
- Presented for acute onset of respiratory distress
- History of intermittent episodes of increased respiratory effort and lethargy

# Additional medical history

- Diagnosed with pectus excavatum and was corrected with external splint placement
- Continued to experience intermittent respiratory episodes during serial rechecks
- After removal of splint, showed increased respiratory effort increasing in frequency and exercise intolerance
- Presented for respiratory distress

# Physical Exam Findings

- T: 96.6, P: 180, R: 24
- Dull mentation, tachypneic, cyanotic mucus membrane
- Increased respiratory effort with intermittent open-mouth breathing
- No murmurs or arrhythmias auscultated, synchronous but weak pulses

Thoracic radiographs are available

- 1) Describe your radiological findings
- 2) List your diagnosis/differential diagnosis

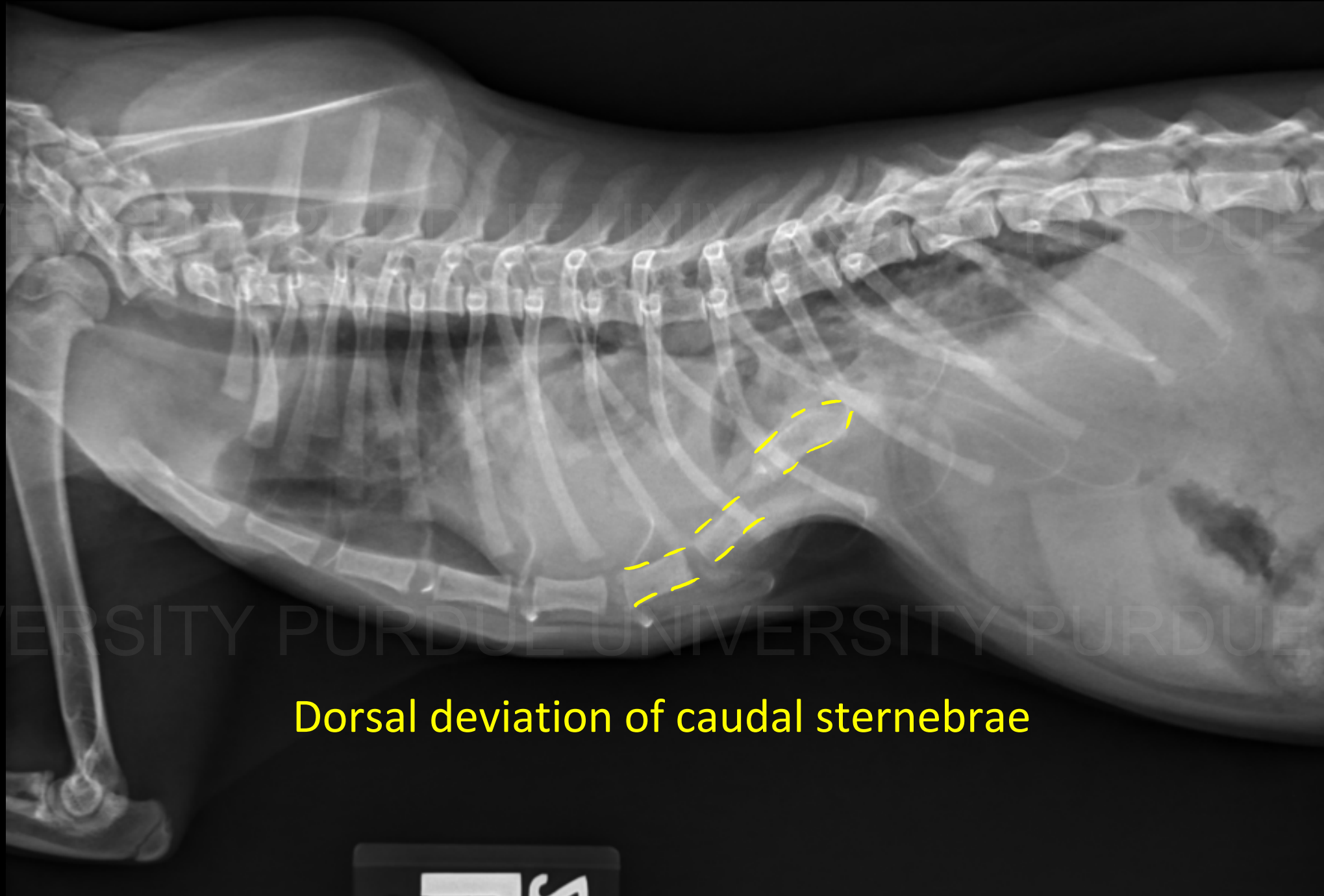




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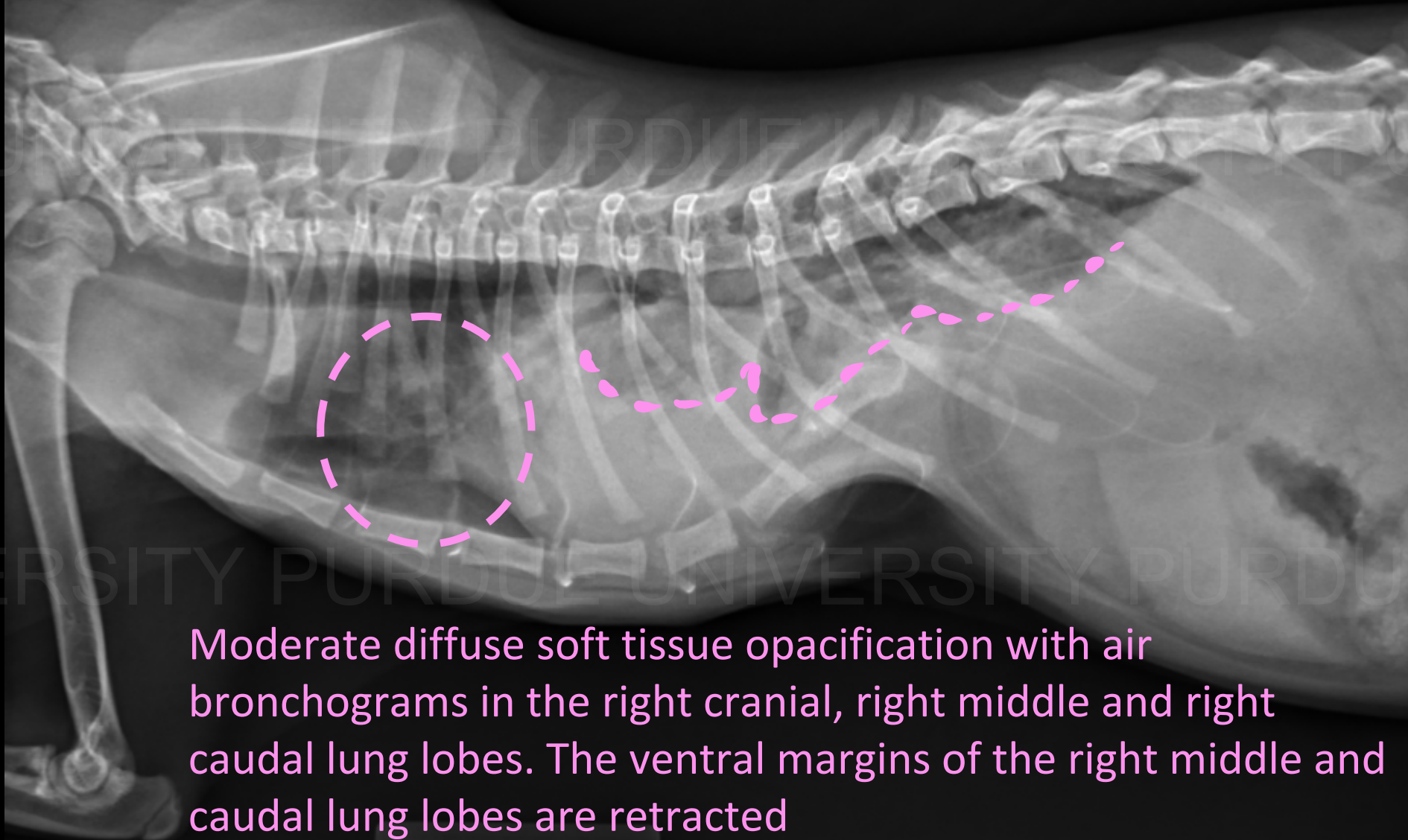


# Radiological Findings



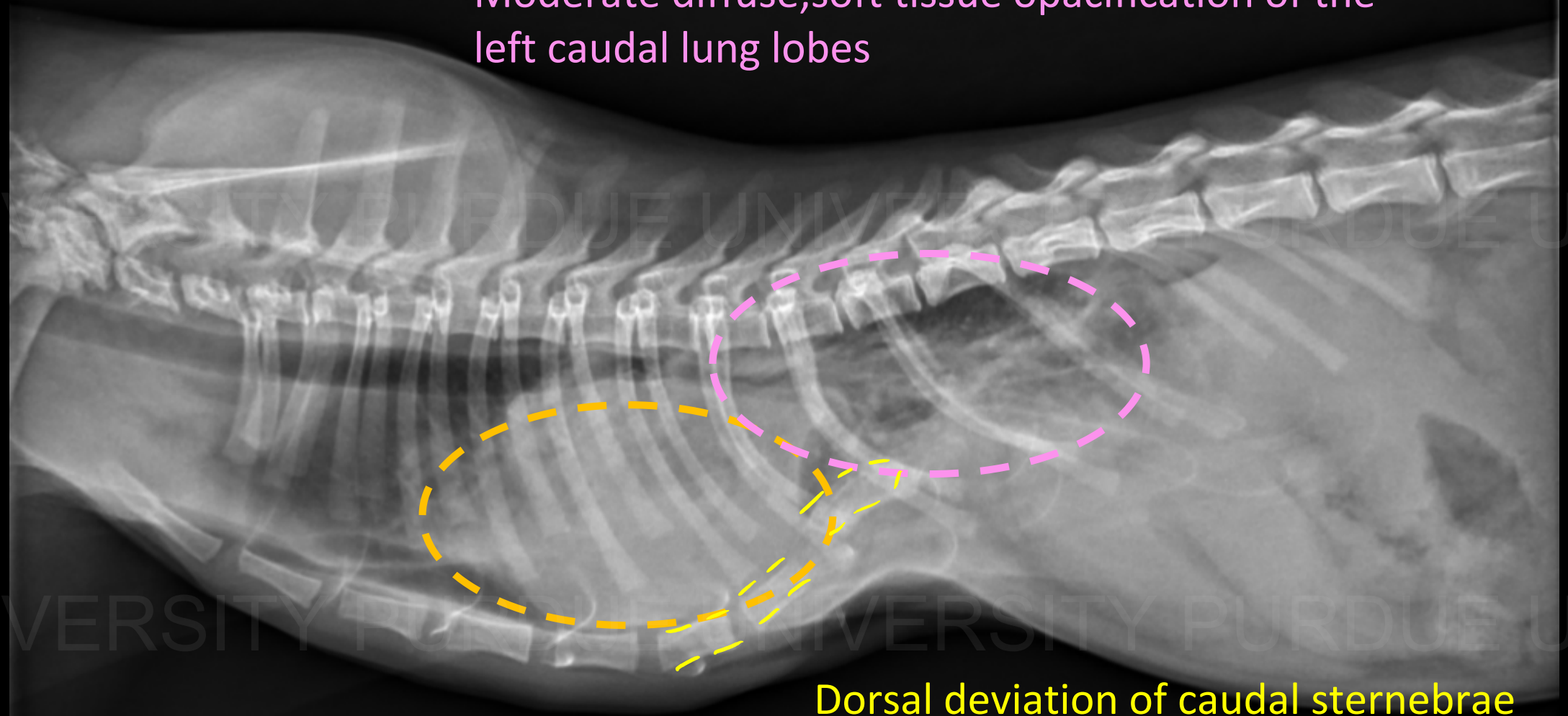
Dorsal deviation of caudal sternebrae

Cardiac silhouette is partially effaced and subjectively mildly enlarged  
The diaphragm is also partially effaced



Moderate diffuse soft tissue opacification with air bronchograms in the right cranial, right middle and right caudal lung lobes. The ventral margins of the right middle and caudal lung lobes are retracted

Moderate diffuse, soft tissue opacification of the left caudal lung lobes



Marked soft tissue opacification with air bronchograms in pars caudalis of left cranial lung lobe

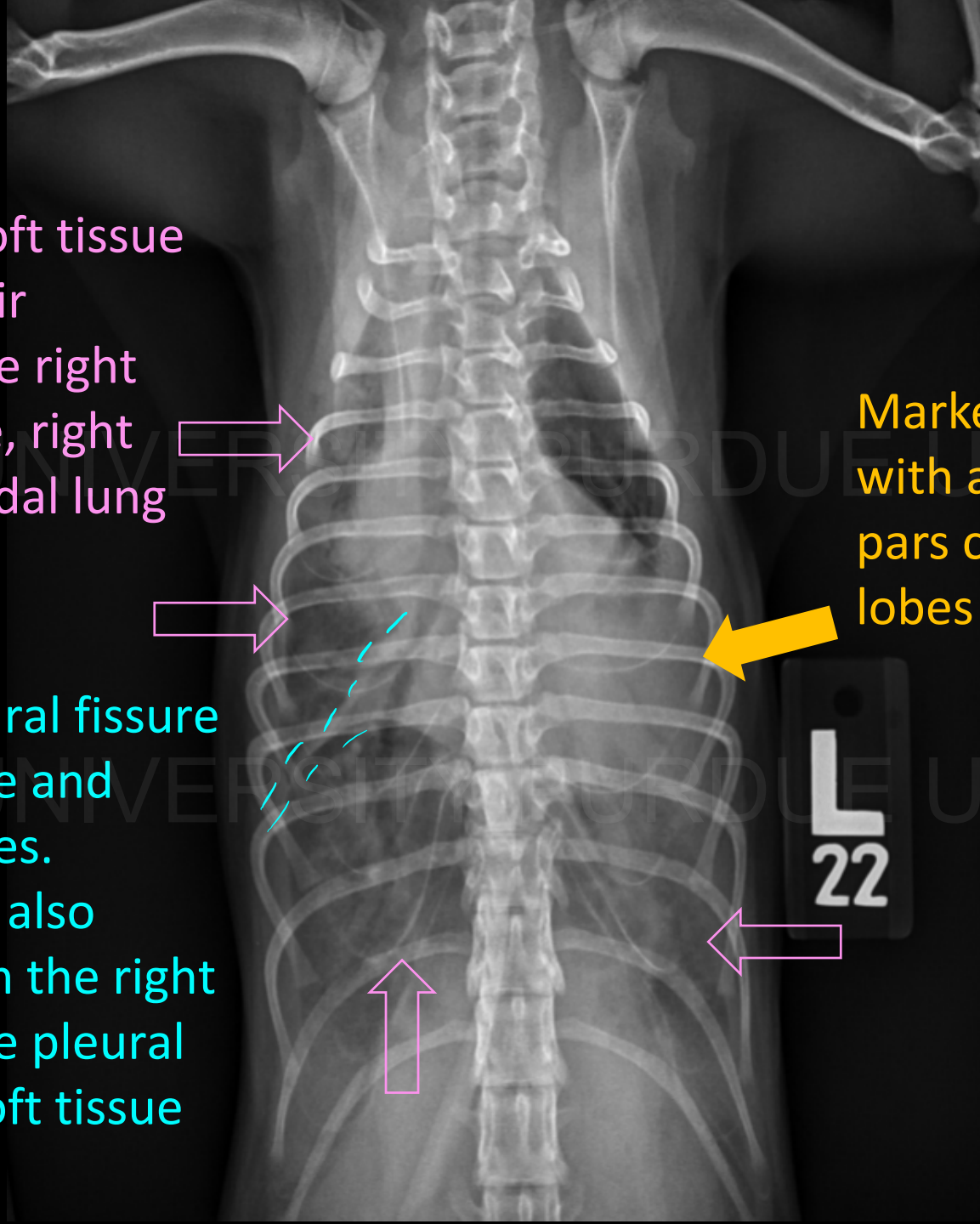
Dorsal deviation of caudal sternebrae

R<sub>2</sub>

Moderate diffuse soft tissue opacification with air bronchograms in the right cranial, right middle, right caudal, and left caudal lung lobes

Thick soft tissue pleural fissure between right middle and right caudal lung lobes. These lung lobes are also mildly retracted from the right thoracic wall with the pleural space occupied by soft tissue opacity

Marked soft tissue opacification with air bronchograms in the pars caudalis of left cranial lung lobes



# Radiological diagnoses

- Congenital pectus excavatum
- Congestive heart failure with pulmonary edema and pleural effusion

# Additional echocardiographic findings

- Severely enlarged right atrium with right ventricular outflow obstruction
- No other cardiac abnormalities
- Heart failure most likely due to persistent excavatum than underlying heart condition

# Outcome

- Due to guarded prognosis and worsening of clinical signs the owner elected humane euthanasia

# Remarks

## Pectus excavatum

- Congenital
  - Uncommon disorder caused by malformation of costal cartilages and secondary deviation of caudal sternum
  - Possible etiologies – shortening of central tendon, changes in intrauterine pressure, congenital deficiency of diaphragm musculature
  - Possible familial cause suggested in Bengal kittens
  - Many are asymptomatic

# Remarks

- Clinical signs
  - respiratory distress, exercise intolerance, coughing, cardiac murmurs, cyanosis
  - restriction of thoracic volume -> impaired ventilation
  - compression of intrathoracic structures -> abnormal heart position, kinking of blood vessels, dynamic right ventricular outflow tract obstruction
- Treatment
  - Surgical or conservative

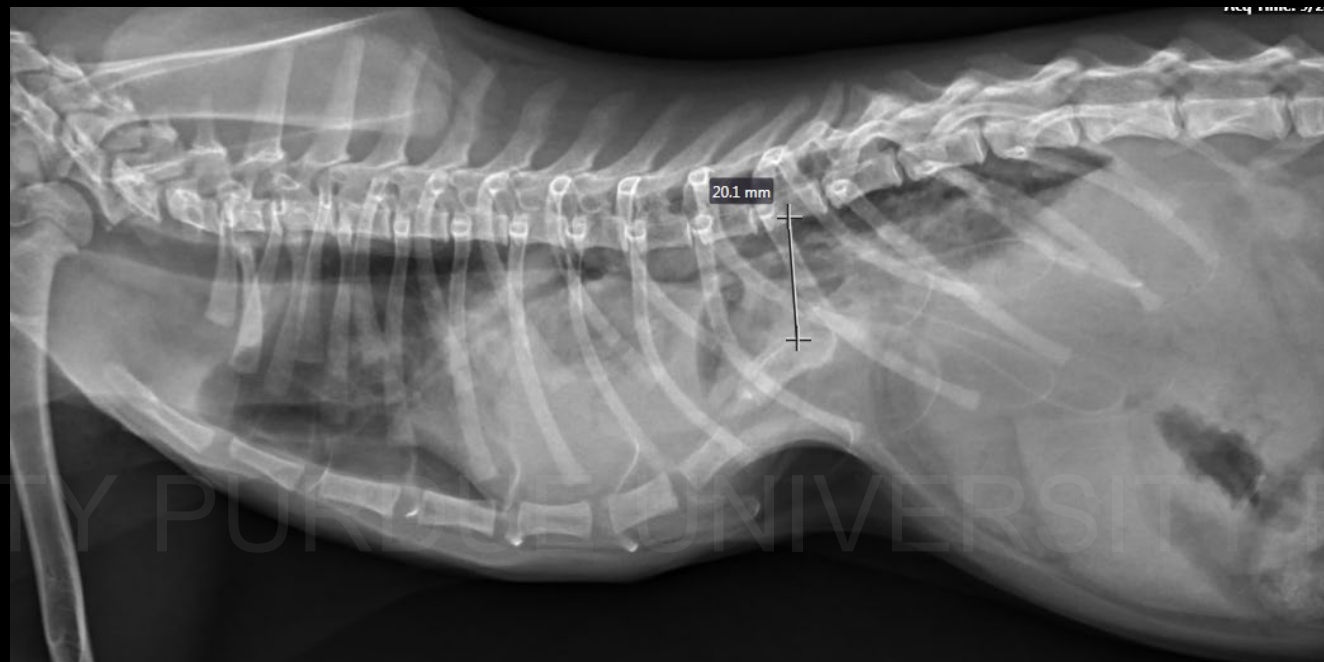
# Remarks

## Pectus excavatum

- Acquired
  - Less common
  - Documented in dogs, secondary to chronic upper airway obstruction (e.g. laryngeal paralysis)
  - Surgical correction of upper airway obstruction -> correction of pectus excavatum

# Objective Assessment of Severity of PE

- Fronto-sagittal index (FSI)
  - Ratio between width of thorax at level of 10<sup>th</sup> thoracic vertebrae and distance between center of ventral surface of 10<sup>th</sup> thoracic vertebral body and nearest point on sternum
  - $\leq 2.0$  – mild PE
  - 2.0-3.0 – moderate PE
  - $> 3.0$  – severe PE
- Vertebral index (VI)
  - Ratio distance from center of dorsal surface of 10<sup>th</sup> thoracic vertebral body to nearest point on sternum and dorsoventral diameter of vertebral body at same level
  - $> 9.0$  – mild PE
  - 6.0-8.99 – moderate PE
  - $< 6.0$  – severe PE



FSI:  $84.8/20.1 = 4.22$  (severe PE)  
VI:  $25.5/5.2 = 4.9$  (severe PE)

# References

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