

The mediastinum and the diaphragm






Diagnostic Mindset

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Objectives

- The mediastinum is a problematic area to check but is a fundamental part of the thorax
- Diaphragm evaluation can be challenging, but a systematic approach helps!

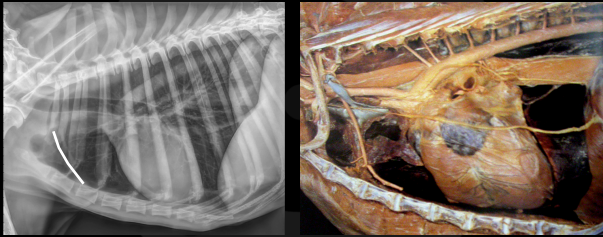


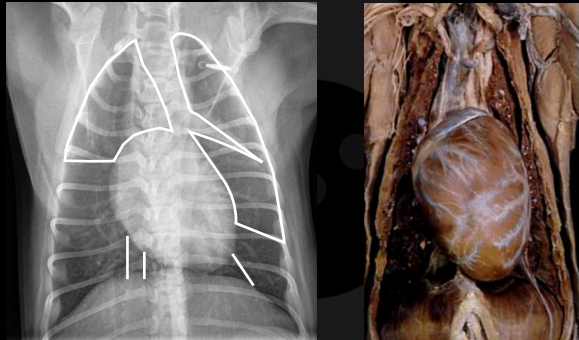
Normal thoracic anatomy

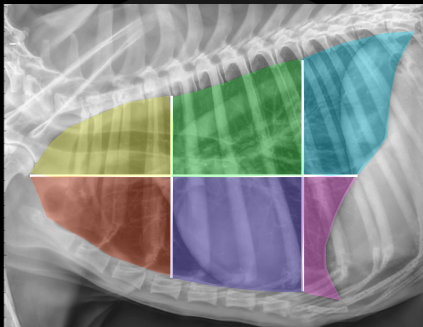
- Skin - soft tissues
- Rib cage
- Pleural space
- Lungs
- Mediastinum
- Airways
- Heart

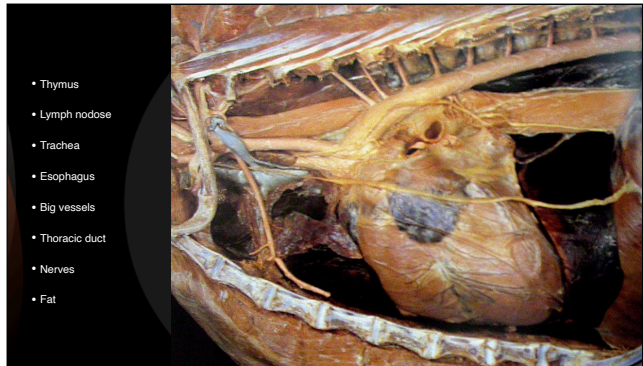


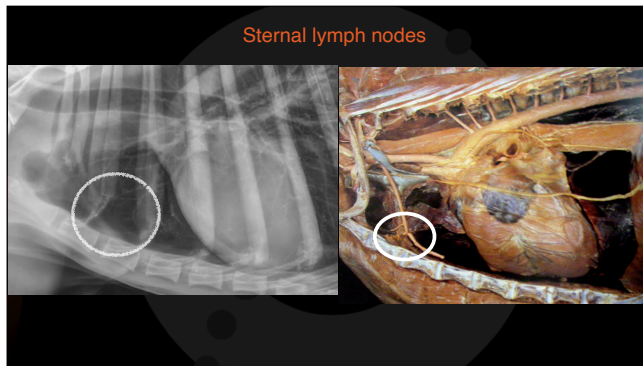
Mediastinum

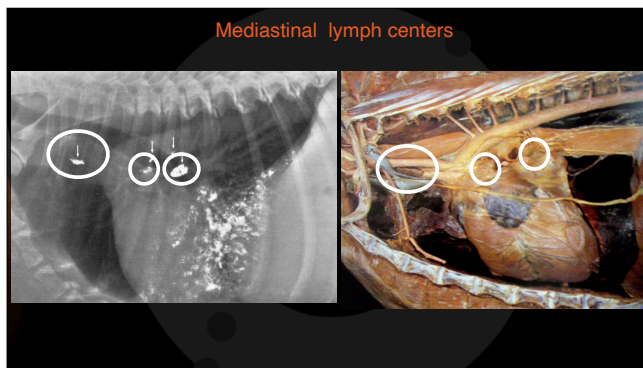




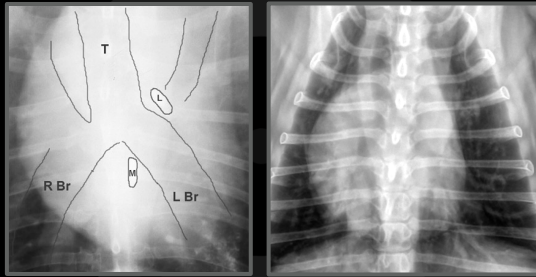




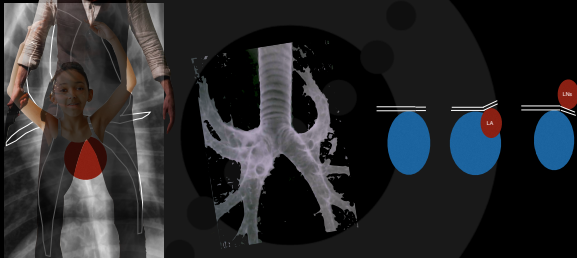




Mediastinal lymph nodes



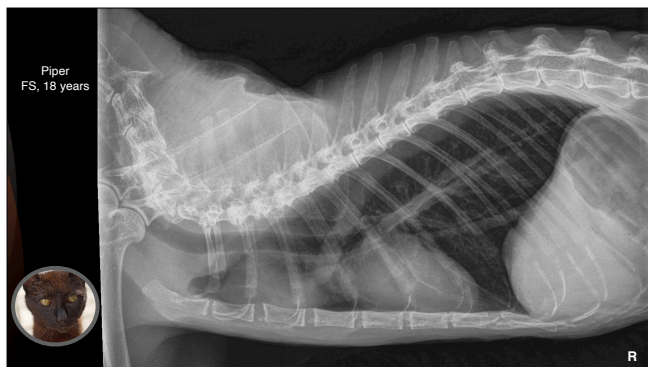
Left atrium or tracheo-hilar LNs?

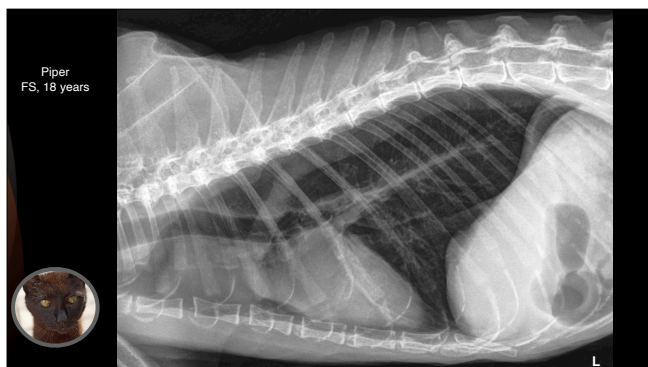


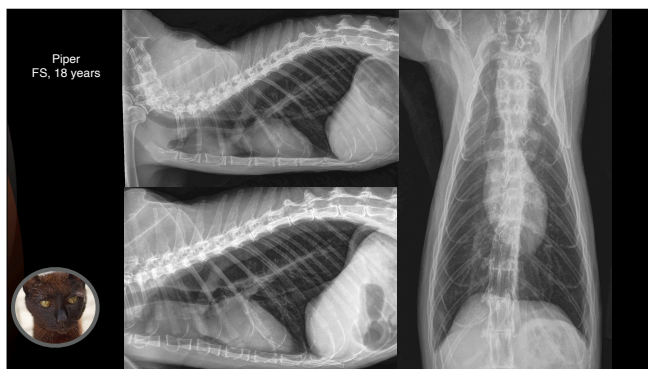
Piper, DSH, FS, 18 years

- Senior wellness
- History of chronic renal disease





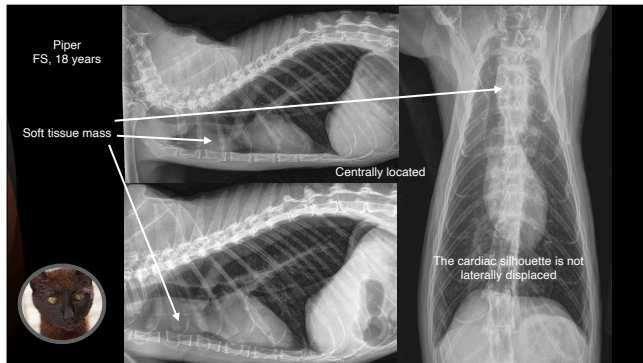




Your evaluation

- Is there a pulmonary mass?
- Is there a mediastinal mass?
- How do you differentiate a mediastinal from a pulmonary mass?





Piper, DSH, FS, 18 years

Radiographic diagnoses:

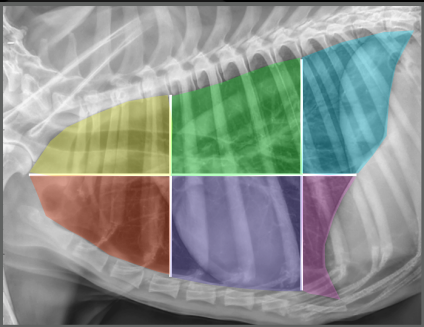
- Cranio-ventral mediastinal mass
- Otherwise unremarkable thorax

How to arrive to conclusions?



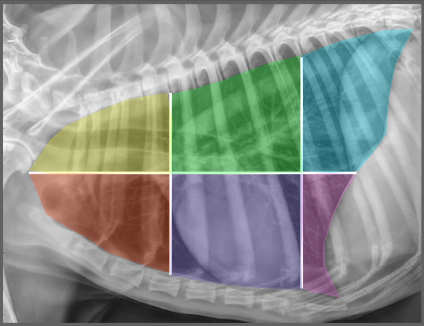
Centro-dorsal mediastinal mass

- 1) Left atrial enlargement (dog ++)
- 2) Tracheo-hilar LNs enlargement
- 3) Less likely:
 - Enlarged pulmonary artery
 - Oesophageal NAG
 - Heart base neoplasia (hemangio +)



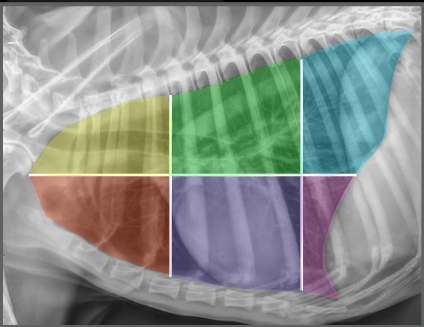
Centro-ventral mediastinal mass

- 1) Ruptured diaphragm or PPDH
- 2) Lipoma
- 3) Pericardial mass or effusion
- 4) Severe cardiomegaly



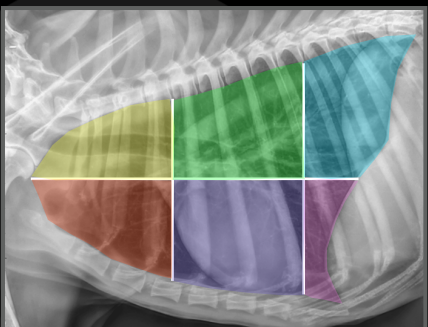
Caudo-dorsal mediastinal mass

- 1) Hiatal hernia
- 2) Oesophageal NAG
- 3) Gastro-esophageal intussusception



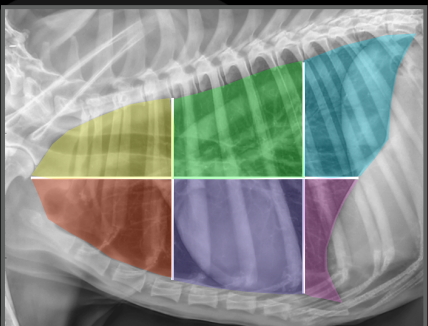
Caudo-ventral mediastinal mass

- 1) Ruptured diaphragm or PPDH
- 2) GB +++
- 3) Much less likely NAG



Cranio-ventral mediastinal mass

- 1) Neoplasia
 - Thymoma
 - Lymphoma
 - Ectopic thyroid carcinoma
- 2) Especially in aged cat
 - Branchial cyst
 - Much less likely NAG



Case Series

Long-term survival in six cats with mediastinal cysts

Corrine M Camero¹, Zachary L Neumann² and Laura D Garrett¹

Abstract

Case series summary Mediastinal cysts were diagnosed as incidental findings in six cats evaluated for non-thoracic disease, including staging for histiocytic sarcoma, flea dermatitis and hairballs, and hyperthyroidism. Radiographically, the cysts appeared as soft tissue opacities cranial to the heart. Ultrasound revealed the masses to be thin-walled, single lumen, anechoic, fluid-filled structures. One cat also had thoracic and abdominal CT performed for cancer staging; the CT revealed a well-defined, fluid-attenuating mass without peripheral contrast enhancement in the cranial mediastinum. Fine-needle aspiration confirmed acellular fluid consistent with a cyst in five cases; in one case the cyst ruptured during aspiration and no fluid was obtained. Post-aspiration, all masses were no longer visible with ultrasound or radiographs. No treatment was recommended for the cysts. Long-term follow-up (2–9 years post-diagnosis) was available in all six cats. The cysts recurred in five cats but were never associated with clinical signs.

Relevance and novel information Mediastinal cysts are an important benign differential for cranial mediastinal masses in cats. Treatment for the cysts does not appear to be indicated. This series also includes the first CT description of this clinical entity.

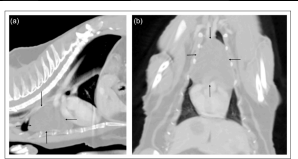
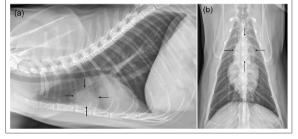
Journal of Feline Medicine and Surgery
2019, Vol. 23(10) 896–1002
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DOI: 10.1177/1098612319860070
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SAGE



In this series of six cats with mediastinal cysts, the cysts were incidental findings, they radiographically appeared as soft tissue opacities cranial to the heart, they were unilocular on ultrasonographic examination, and they contained clear, acellular fluid with a low specific gravity and protein. The CT of the cyst in one cat revealed a well-defined, fluid-attenuating mass in the cranial mediastinum, without evidence of ring-enhancement after contrast administration. This is the first description of the CT findings of a mediastinal cyst. All six of the cats in this report had long-term follow-up, ranging from 2-9 years. Five of the cats showed radiographic evidence of cyst recurrence, ranging from 9 months to 3 years post-diagnosis, and none of these patients demonstrated clinical signs related to the cysts.

Conclusions

Despite recurrence in the majority of cases, all of the cats in this series had long-term follow-up and remained asymptomatic. Some authors have recommended surgical resection of cysts in the cranial mediastinum if they recur following drainage.³ Based on extended follow-up in this series of cases, drainage or excision of mediastinal cysts does not appear to be indicated. Mediastinal cysts need to be considered as a benign differential in cats with a cranial mediastinal mass; on CT the cyst will appear as a well-defined, fluid-attenuating mass without evidence of contrast ring-enhancement. These cysts carry an excellent prognosis.



Piper, DSH, FS, 18 years

Radiographic diagnoses:

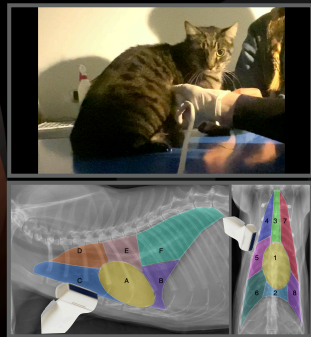
- Cranio-ventral mediastinal mass
- Otherwise unremarkable thorax

Conclusions

- Rule out a bronchial cyst
- Rule out a mediastinal neoplasia

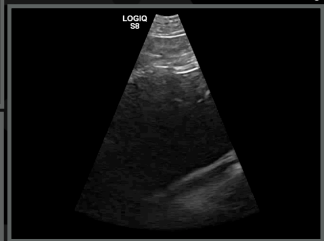


Probe position in another patient



Piper, FS, 18 years

C-4 long



Piper, DSH, FS, 18 years

Ultrasonographic diagnoses:

- A cystic lesion was detected and aspirated
- Water-like content

Conclusions

- Confirmed branchial cyst, an incidental finding

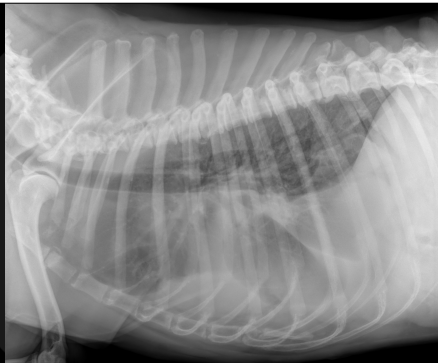


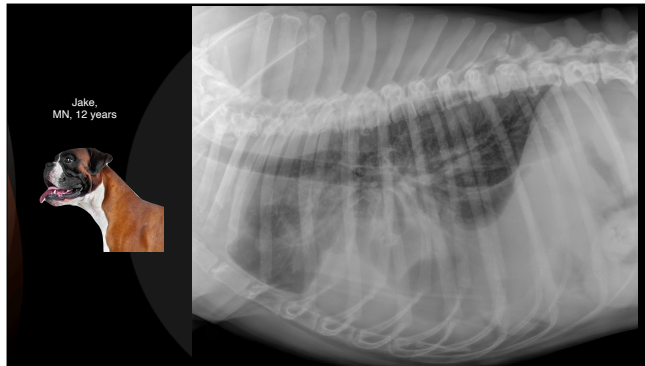
Jake, Boxer, MN, 12 years

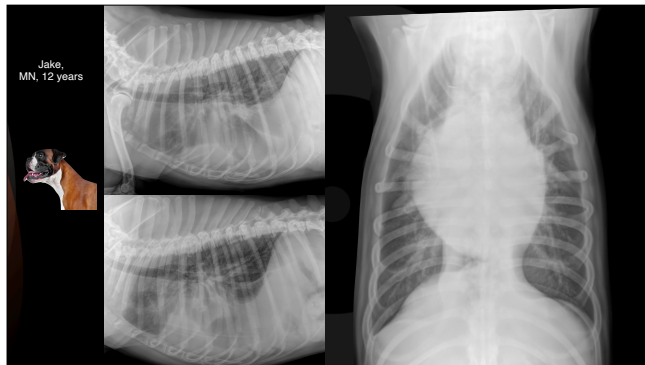
- Anorexic 48 hours
- Lethargic
- Diarrhoea
- Dyspneic



Jake,
MN, 12 years

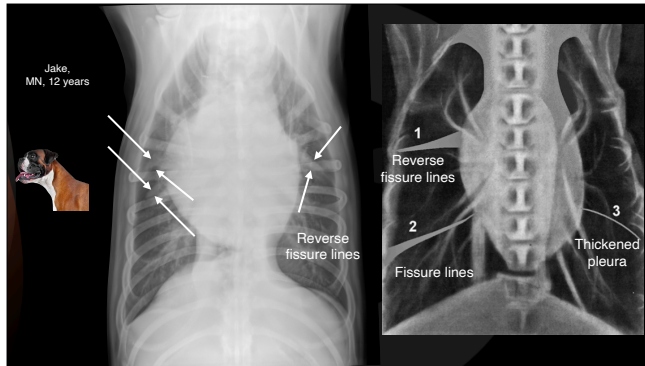


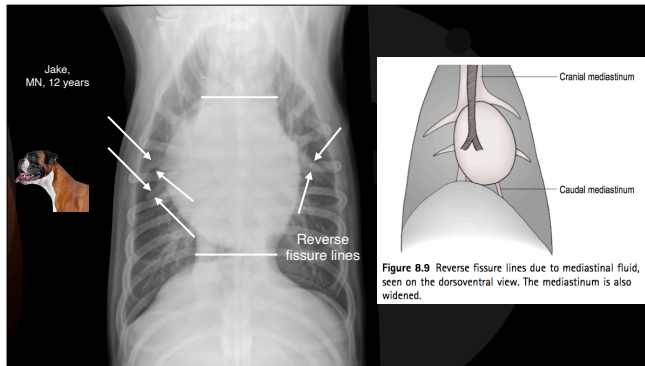


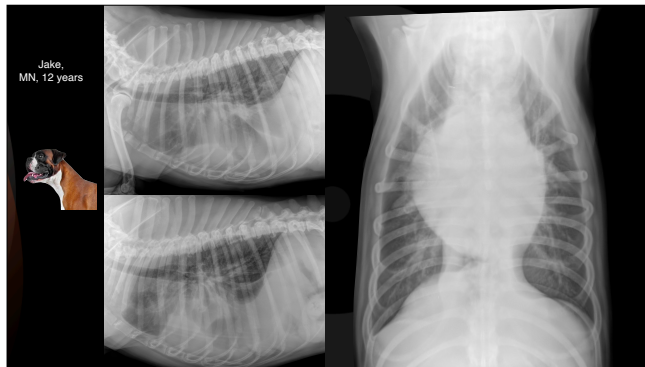


Your evaluation

- Is there a diaphragmatic hernia?
- Is there a mediastinal mass?
- Is there pleural effusion?

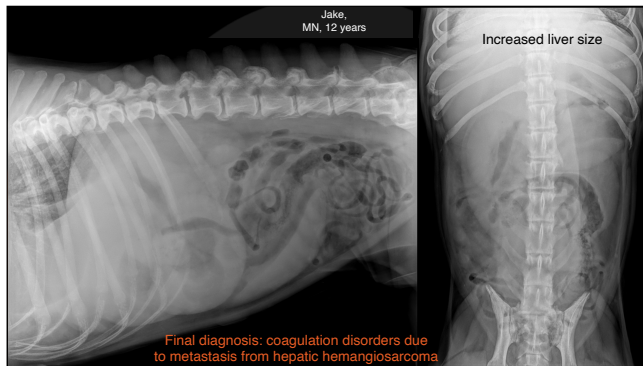
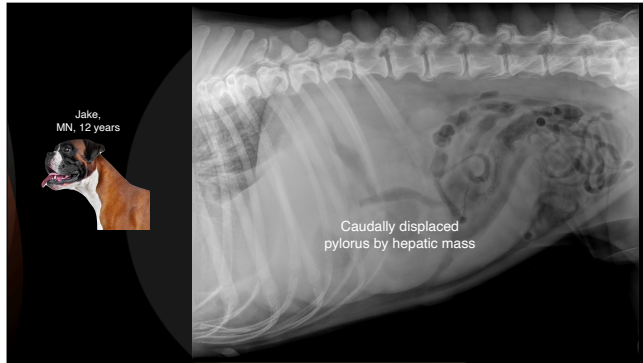






Differential diagnoses of mediastinal effusion

- Haemorrhage
 - Coagulative disorder
 - Trauma
 - Ruptured mass
- Rat poisoning
- Paraneoplastic syndrome
- Collar related



Key points

- Reverse fissure lines
- Widened mediastinum
- Mediastinal structures poorly visible in the lateral views



Diaphragmatic dislocation

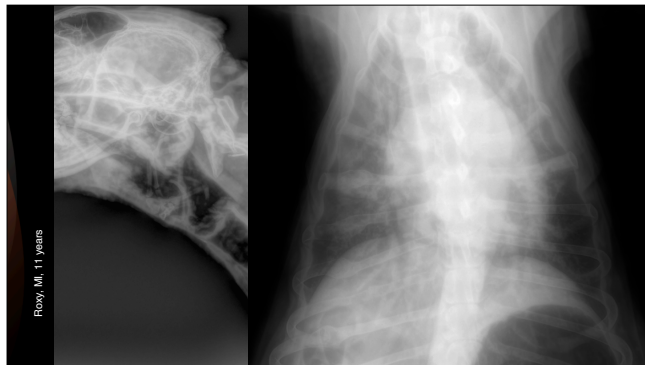
Bilateral cranial dislocation of the diaphragmatic crurae	Obesity, pain, reduced lung or chest volume, abdominal distension, upper airway obstruction
Bilateral caudal dislocation of the diaphragmatic crurae	Increased chest volume due to lower airway disease, severe pleural effusion, pneumothorax
Monolateral cranial dislocation of a diaphragmatic crura	Diaphragmatic rupture, unilateral paralysis, pleural adhesion
Monolateral caudal dislocation of a diaphragmatic crura	Obstruction of a main bronchus, emphysema, often associated with mediastinal diversion

Roxy, Giant Schnauzer, MI, 11 years

Exercise intolerance for the last two months
Progressive dyspnea worsening in the last four hours




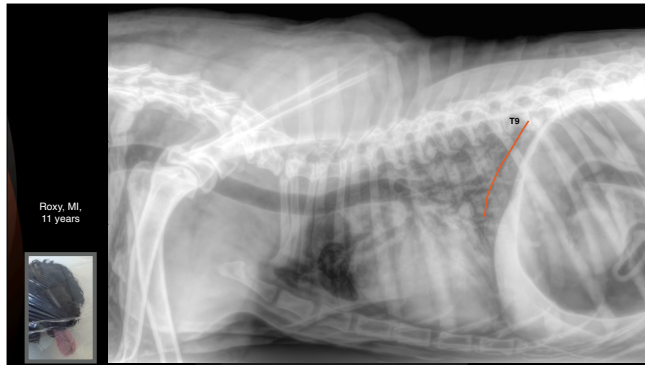




Your evaluation

- Is there a pulmonary nodule?
- Is there pneumonia?
- Is there a congestive heart tumour?



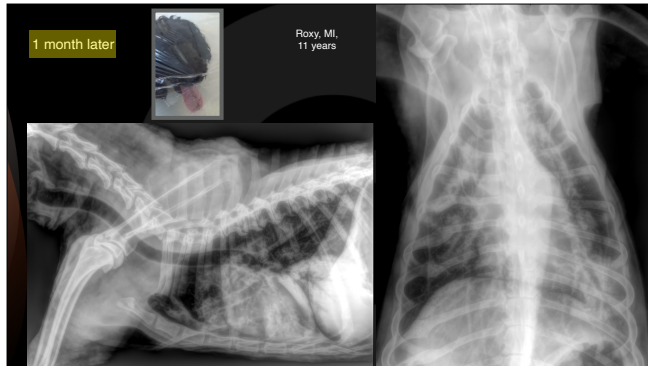


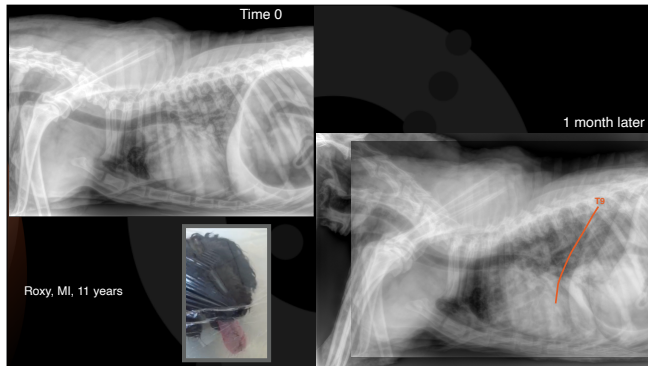
Roxy, Giant Schnauzer, MI, 11 years

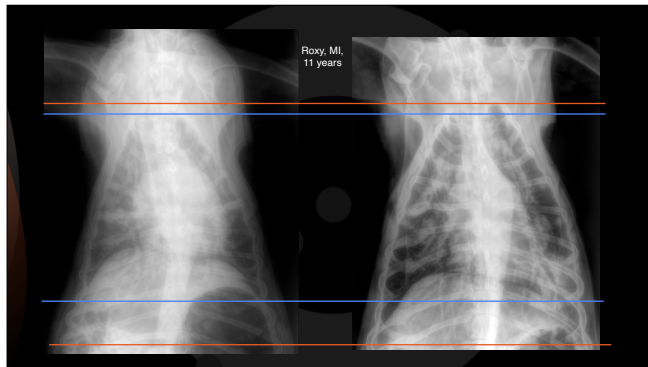
- Severely reduced thoracic volume
- Confirmed and treated laryngeal paralysis
- Fine for one month
- Sudden severe cough









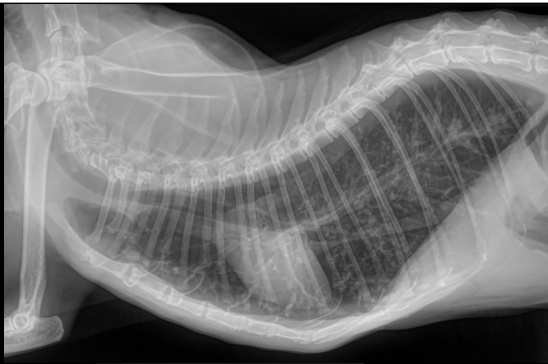


Fiona, Siamese, FS, 13 years

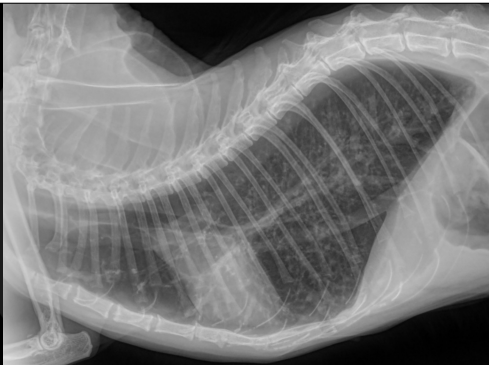
- Recurrent cough, worsening
- Acute onset of dyspnea

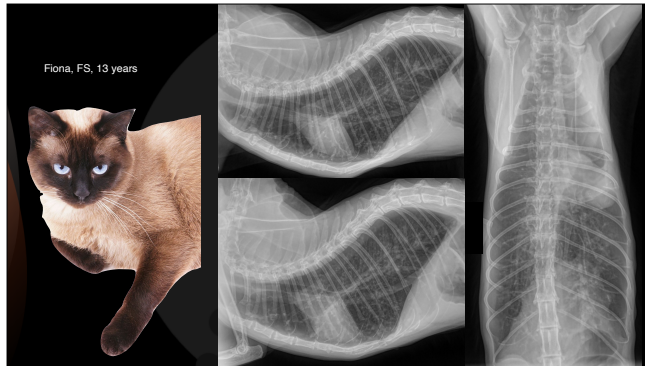


Fiona, FS,
13 years



Fiona, FS, 13 years

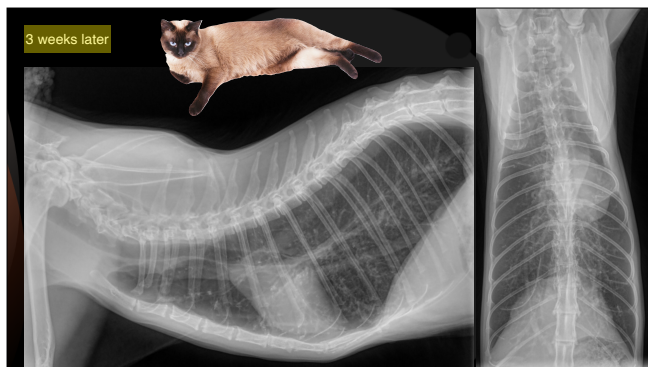


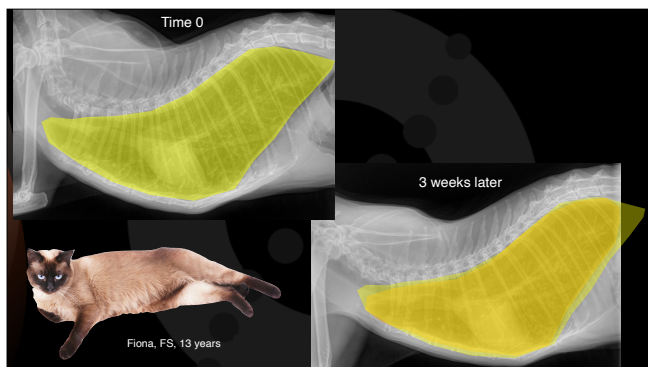


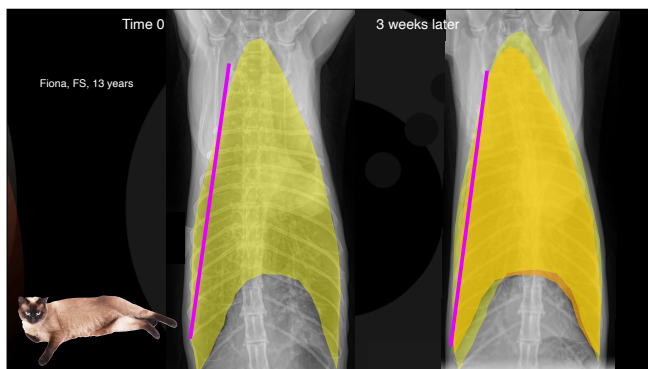
Your evaluation

- Severely increased thoracic volume
- Severe bronchial pattern
- Focal lung lesion?
- Diaphragmatic tenting









Mila, DSH, FS, 3 years

- The owner wants a prescription for prednisolone
- She knows the cat has asthma because she reads the internet
- She shows this video

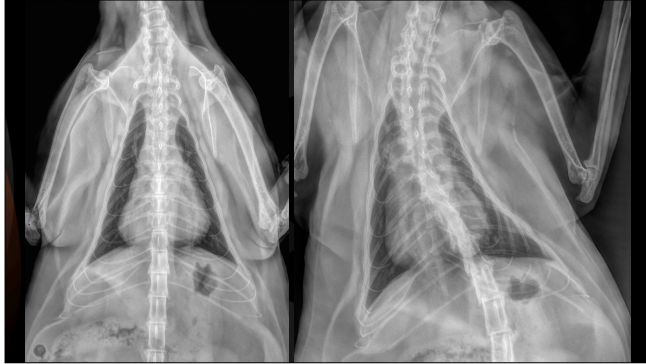


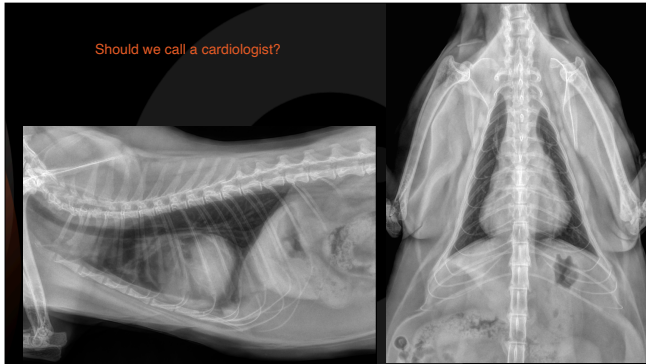
Mila, FS, 3 years

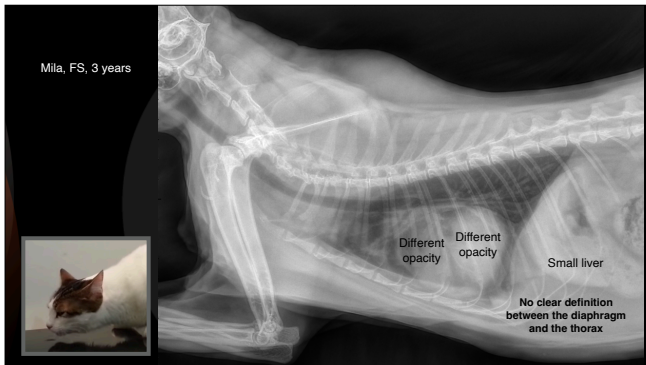


Mila, FS, 3 years



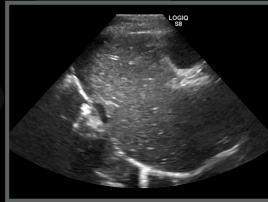






Mila, DSH, FS, 3 years

- Confirmed by ultrasound a PPDH
- Suspected feline asthma
- Bronchoscopy refused
- Responded to treatment

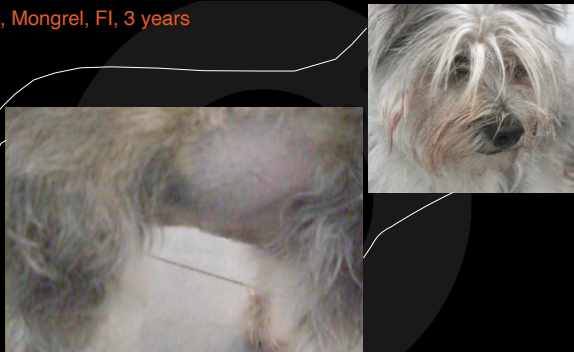


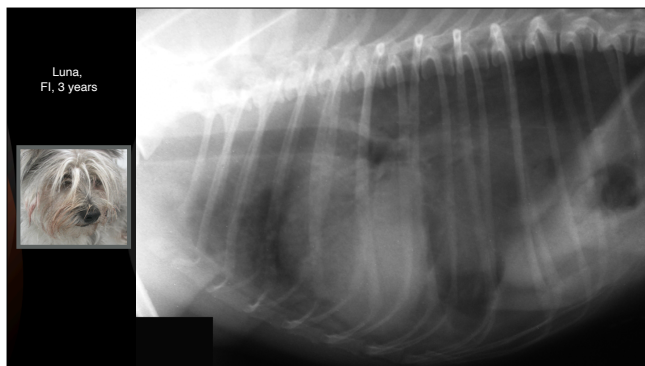
Luna, Mongrel, FI, 3 years

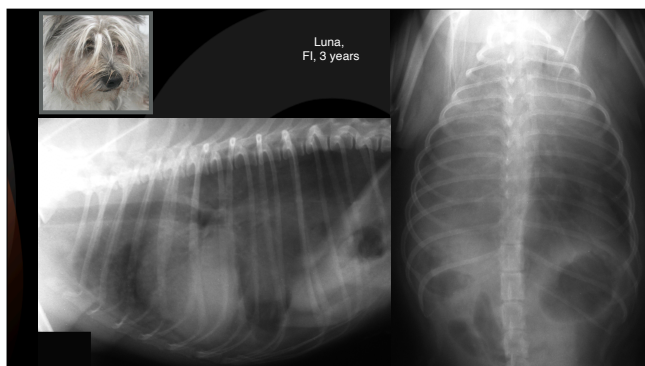
- In aestro, escaped from home
- The owner finds her after a couple of hours
- The vet discharged her
- The owner asks for a second consultation



Luna, Mongrel, FI, 3 years







Your evaluation

- Is there pleural effusion?
- Is there a lung contusion
- Is there diaphragmatic rupture

