

“What’s Your Diagnosis?”

Signalment:

Species: Ferret, *Mustela putorius furo*

Sex: Female Spayed

Date of Birth: 03/01/02

History of Adrenal Disease

Presenting Complaint:

Diarrhea; Acute Dyspnea.

For a couple of weeks prior to presentation, the animal had increased respiratory rate and squeaks, also became dyspneic when stressed. The night previous to presentation, the owner noticed cyanosis of the tongue and feet.

Physical Examination:

HR- 240, RR- 200

Mucous membranes- pink (after nasal insufflation of oxygen)

CRT < 2 sec

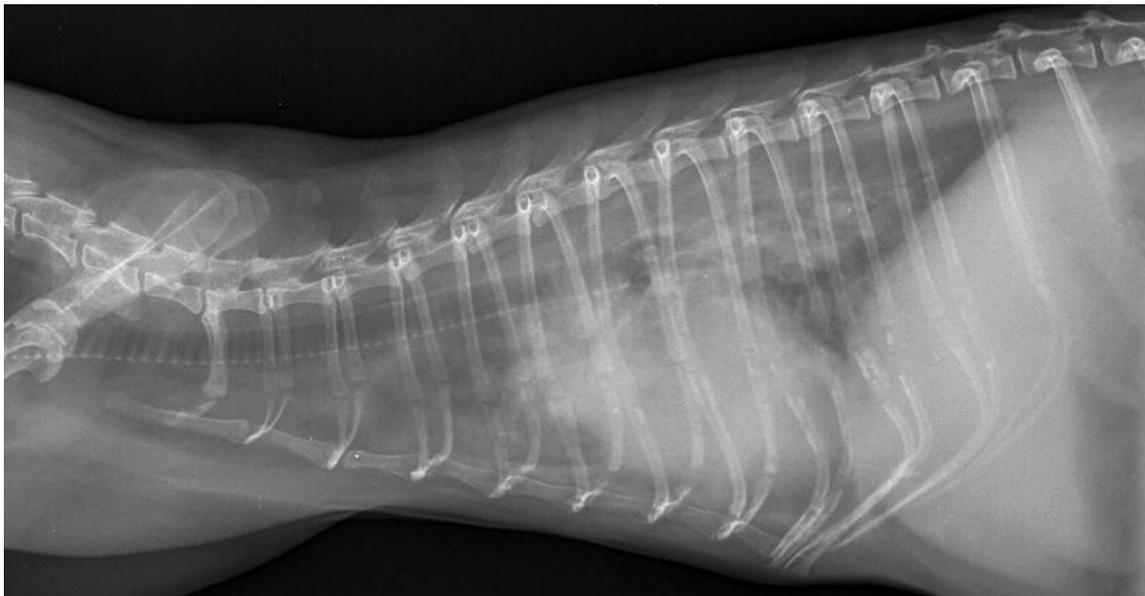
Blood pressure- 141/120 mmHg (140-160/110-125 mmHg)

Weight- 1.156 kg

Truncal Alopecia

Lungs- wheezes and increased respiratory sounds on auscultation; increased respiratory rate.

Diagnostic Plan: Thoracic radiographs plus echocardiography if necessary.



Right Lateral



What are your radiographic impressions?

There is severe enlargement of the heart, which has progressed compared to the previous study. It causes dorsal displacement of the carina. Cardiac margins are ill-defined due to juxtaposed pulmonary changes. An estimate of the vertebral heart score is 6.75 vertebrae (reference range: 3.75 – 4.07 vertebrae)¹. It is the width of 3 intercostal spaces on the lateral view, which is increased from normal (2.3 rib spaces). There is increased soft tissue opacity throughout the lungs. Multiple, ill-defined areas of complete soft tissue opacification and air bronchograms are present throughout the lung. There is border effacement of peripheral pulmonary disease and the pleural space. There is retraction of lung margins from the thoracic wall by homogeneously fluid opaque material. Thick pleural fissure lines are present, which further widen toward the periphery. On limited evaluation, incongruity and degenerative changes are present on the included elbow joint.

Radiographic Findings:

- Severe cardiomegaly
- Pulmonary edema
- Pleural effusion

Differential diagnoses: Heart failure most likely due to dilated cardiomyopathy with hypertrophic cardiomyopathy being less common in ferrets. DCM and HCM are

usually idiopathic although genetic and nutritional factors may contribute. There is a report of HCM being associated with cryptococcal infection. Pulmonary edema and pleural effusion are most likely due to biventricular congestive heart failure. DCM has a fair prognosis for survival of up to a year with appropriate treatment, but ferrets with HCM have a poorer prognosis with sudden death and poor-response to treatment being more likely.

Echocardiographic Findings: Aortic insufficiency, generous hepatic veins indicating biventricular heart failure likely due to hypertrophic cardiomyopathy.

Therapeutic plan: Treat cardiac failure with Angiotensin-converting enzyme inhibitors and diuretics. Enalapril: 0.23 mL by mouth twice daily (0.5 mg/kg), Furosemide: Give 0.23 mL by mouth every 8 hours. Offer a low-stress environment, and plan to recheck in one week.

Recheck 3 days later—

Presenting Complaint: Continued lethargy, serous nasal discharge; increased respiratory rate and effort; muddy mucous membranes

Physical Examination:

HR- 220

RR- 120

Mucous membranes- muddy

CRT <2 sec

Weight- 1.162 kg

Diagnostic Plan: Recheck thoracic radiographs



Right lateral



Right

Left

What are your radiographic impressions?

Radiographic Findings: Thorax: Radiographs were acquired with the patient restrained vertically and are compared to a study dated 2/20/09. There is decreased pleural fluid

compared to the previous study, which displaces the caudal lung lobe margins medially. There is decreased soft tissue opacity throughout the lungs. An unstructured interstitial pulmonary pattern persists in all lung lobes. Generalized cardiomegaly is unchanged. On limited evaluation, a 2 cm nodule is present in the right cranial abdomen which contains small ill-defined mineral structures. The stomach is increased in size and contains predominantly fluid and gas. Degenerative changes of the elbows are similar in appearance.

Radiographic Findings:

Cardiomegaly is most likely due to cardiomyopathy. Partial resolution of pulmonary edema and pleural effusion. Fluid gastric contents may be due to ileus or recent ingestion of water. Right cranial abdominal nodule is consistent with history of adrenal origin.

Problems to Consider:

Improved pleural effusion, but chronic cardiac failure. The patient is still not improved much clinically.

Therapeutic plan:

Since there continues to be pleural effusion, add Spironolactone (10 mg/ml). Give 0.1 mL every 12 hours to the furosemide and enalapril as previously directed. Monitor and recheck in one week.

Reference:

1. Wagner, Robert A. (2009) *Ferret Cardiology*. Veterinary Clinics of North America: Exotic Animal Practice: 12: 1, 115-134.

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