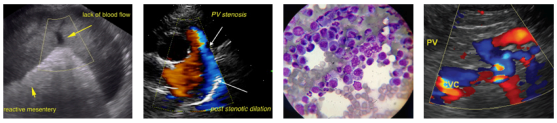



**PATIENT**

Marley Skoner

**SPECIES**

Feline

**BREED**

DLH

**SEX**

Neutered Male

**AGE**

14 Yrs

**WEIGHT**

3.2 kg

**INTERPRETED BY**

Eric Lindquist, DMV

DABVP, Cert. IVUSS

**IMAGING PERFORMED BY**

Andrea Nicastro, DVM, Diplomate ACVIM (*Small Animal Internal Medicine*)

**HOSPITAL NAME**

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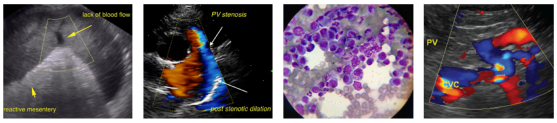
4/7/22

## PRESENTING CLINICAL SIGNS

presenting for open mouth breathing. Owner says patient was healthy until about 1 month ago, patient began to have shortness of breath. Owner took patient to pDVM where CXR showed pleural effusion. Thoracentesis was performed and 200 mL of pleural effusion was removed. Fluid was sent out for cytology - uncertain of results. Two weeks ago, patient presented to VSC for difficulty breathing, and thoracocentesis was performed again with 160 ml of fluid removed. Owner declined hospitalization and followed up with her pDVM who performed an echocardiogram which confirmed suspected CHF. Patient has not been to see a cardiologist, but owner thinks there was a phone consult performed with a cardiologist. Patient was prescribed Enalapril, Lasix, and Pimobendan. Owner declined use of Plavix. Owner says that patient seemed to be improving with the medications, and was eating and drinking as normal. Today, patient developed an increased respiratory effort, so owner presented patient to pDVM again. Another thorcocentesis was performed, and 400mL of pleural fluid was removed. pDVM was concerned for pericardial effusion as well. Owner took patient home following this, and said he started to appear worse with open mouth breathing and crackles/wet respirations, so she presented to VSC for further care. Current Lasix dose is 6.25 mg PO q12h. Owner is unsure of current Enalapril or Pimobendan dose. - PE: 5% dehydrated, heart sounds slightly muffled, no obvious murmurs ausculted, regular rhythm, femoral pulses fair and synchronous, moderately tachypnic and dyspnic, harsh crackles bilaterally - POINT OF CARE ULTRASOUND: THORACIC: Scant pericardial effusion - thin rim of fluid, not enough to tap Mild bilateral pleural effusion remains Severe B-lines (wet lung) bilaterally LV volume (subjective) - decreased vs. thick LV function (subjective) - adequate LA (subjective) - severely enlarged ABDOMINAL DH 0 SR 0 CC 0 HR 0 Total Score: 0/4 Gall Bladder Wall: Typical Gall Bladder Contents: Typical Urinary Bladder Wall: Typical Urinary Bladder Contents: Typical Clinical Impressions: LA enlargement, pulmonary B-lines, pleural effusion, and scant pericardial effusion is most consistent with reported historical CHF. - CBC: RDW 27.1 (H), Lymph 0.84k (L), Eos 0.11k (L), rest WNL - Chem17: BG 265 (H), BUN 51 (H), Cr 2.1 (H-normal), TP 5.5 (L), ALT 186 (H), K 3.4 (L), rest WNL - CXR (3-view) with Keystone review: Findings: Three radiographs are available for review. There is pleural effusion demonstrated by the presence of fissure lines, scalloping of the lung margins, widening of the lumbophrenic and costophrenic angles by an ill-defined soft tissue opacity, increased opacity of the lungs and border effacement of the cardiac silhouette. There is also evidence of air bronchograms along the ventral aspect of the lungs. The caudal lung vessels are visualized and appear normal in size. A more homogeneous soft tissue opacity is noted within the left cranioventral pleural space. There is no evidence of significant mass effect on the trachea/mediastinum. Normal skeletal structures and visible portion of the cranial abdomen. Assessment: Moderate pleural effusion with ventral lung lobe consolidation Ddx: atelectasia, pneumonia. Soft tissue opacity in the left cranioventral pleural space Ddx: pleural effusion vs mediastinal/pleural mass. Consider thoracocentesis, TFAST and repeated views or CT of the thorax for further evaluation, if clinically indicated. - Performed thoracocentesis and removed 35 ml of serosanguinous pleural effusion from left side, not enough effusion remaining to remove from right side - PCV/TP (effusion): 2%, 2.0 - Cytology (effusion, in-house): Majority RBCs. Moderate degenerate neutrophils and macrophages, few lymphocytes. No obvious neoplastic cells. No bacteria noted. - Repeat CXR (3-view) with Keystone STAT (post-tap): Findings: 3-view thorax radiographs, compared to images dated 4/6/2022 Improved amount of soft tissue opaque material in the pleural space. Persistent, ventrally distributed, lobar alveolar pattern, with border effacement of the pulmonary vasculature and cardiac silhouette, and air bronchograms. Identified on the lateral images, worse on the right lateral image, is a progressive amount of small, round, coalescing gas opacities associated with the cranioventral aspect of the caudal lung lobes. Bronchi are normal in position. Cardiac silhouette is normal in size. Pulmonary vasculature is diffusely thin. Interpretation Improved pleural effusion and persistent lung lobe consolidation. DDX neoplastic effusion such as lymphoma versus infectious such as from FIP with pulmonary atelectasis versus pleuropneumonia. Progressive pneumothorax (e.g. iatrogenic from repeated thoracocentesis) versus progression of caudal lung lobe consolidation (e.g. abscessation). Hypovolemia. Consider secondary to furosemide administration. BP not obtained - cat too fractious No murmur Meds: At home: Lasix 6.25 mg PO q12h. Enalapril and Pimobendan (owner unsure of dose). In hospital: total of 8 mg/kg lasix, butorphenol and midazolam PRN for sedation for handling, unasyn, O2 therapy.
Abnormal PE/Chem/CBC/UA Results: Findings are inconsistent with left sided congestive heart





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failure. - Chem10: BG 187 (H), BUN 60 (H), Cr 2.1 (H-normal), ALT 171 (H), K 2.9 (L), rest WNL - proBNP SNAP: Abnormal - FIV/FeLV/HWT: Negative x 3

## ULTRASONOGRAPHIC EXAMINATION OF THE HEART

| FELINE CARDIAC PARAMETERS | BODY WEIGHT (kg) | HR (BPM) | IVSd (cm) | LVIDd (cm) | LVWd (cm) | FS (%) | EF (%) |
|---|---|---|---|---|---|---|---|
| NORMAL PARAMETER | ------ | 150-240 | 0.3-0.6 | 1.0-2.1 | 0.25-0.6 | 35-67 | 80-100 |
| PATIENT | | NM | 0.63 | 1.8 | 0.66 | 50 | |

| FELINE CARDIAC PARAMETERS | LA/AO (Boon) | LA/AO HEART BASE (Sisson) | LA 2D 4-chamber long axis AS to FW (Sisson) (cm) | LVOT VEL. (m/s) | RVOT VEL. (m/s) | IVRT (m/) |
|---|---|---|---|---|---|---|
| NORMAL PARAMETER | <1.5 | 0.88-1.79 | 0.7-1.7 | <1.6 | <1.3 | 40-60 |
| PATIENT | 1.9 | 1.9 | 2.16 | 1.6 | 1.2 | NM |

Adapted from June Boon,Veterinary Echocardiography,1998
Sisson D et al. JVIM 1991; 5: 232, Jacobs et al. Am J Vet Res 1985; 46:1705

### *Cardiac Presentation*

The echocardiogram was performed rapidly owing to the respiratory distress of the patient. Volume overload noted in the left atrium and left ventricle. Left atrial enlargement was present with smoke. Contractility appeared to be adequate. Mitral and tricuspid insufficiency noted. Mild excessive septal and free wall thicknesses noted. Tachycardia noted. Mild pleural and slight pericardial effusion noted in this patient. B-lines/comet tail lung pattern noted in the extracardiac space.

## ULTRASONOGRAPHIC FINDINGS

- Decompensation of cardiomyopathy and left-sided heart failure
- Concurrent pulmonary disease such as thromboembolic event should be considered

## INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Pimobendan, ACE inhibitor, Plavix therapy recommended. I suggest increasing Lasix to 12.5 mg BID x2-3 doses based on BUN parameters and hydration status as well as respiratory rate, then eventually diminishing to 12.5 mg SID and 6.25 SID. Consider inciting causes sending this patient into heart failure such as underlying infectious disease, myocarditis, or thromboembolic events that may be affecting the myocardium as well as lung. Opioids should be utilized to sedate the patient, such as Torbutrol. Broad-spectrum antibiotics such as Zithromax recommended to treat for concurrent pneumonitis. Oxygen therapy and cage rest as necessary. This patient is at risk for sudden death. Target respiratory rate <20/min. Very guarded prognosis.

***Radiographs:*** *Pleural effusion, dorsally displaced lungs. Post-Lasix therapy – Multifocal lung consolidations noted with airbronchograms and mild cardiomegaly.*

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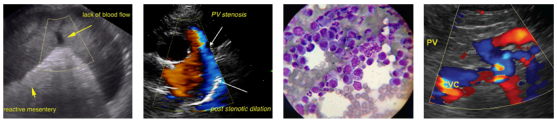

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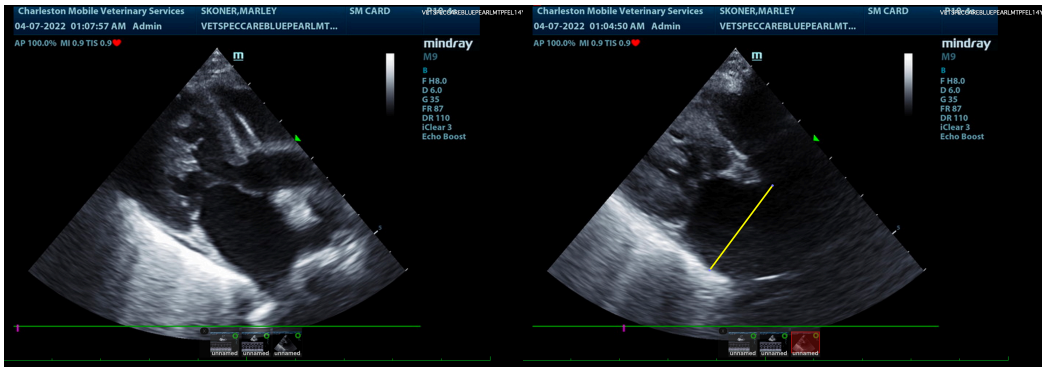


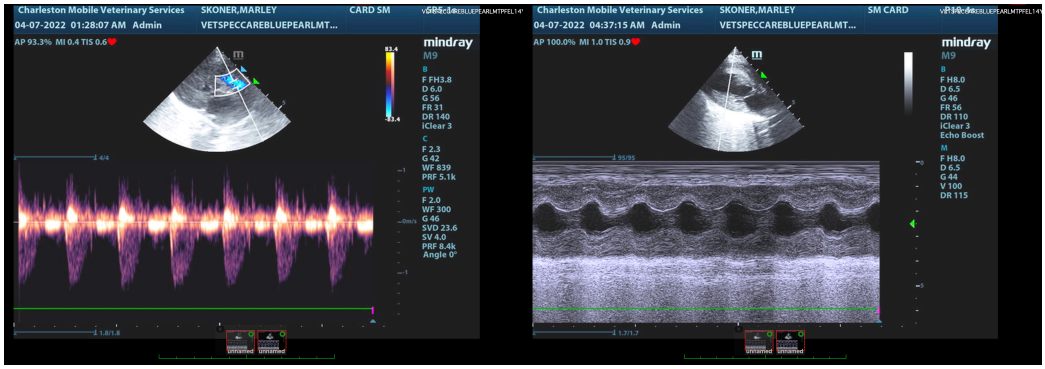


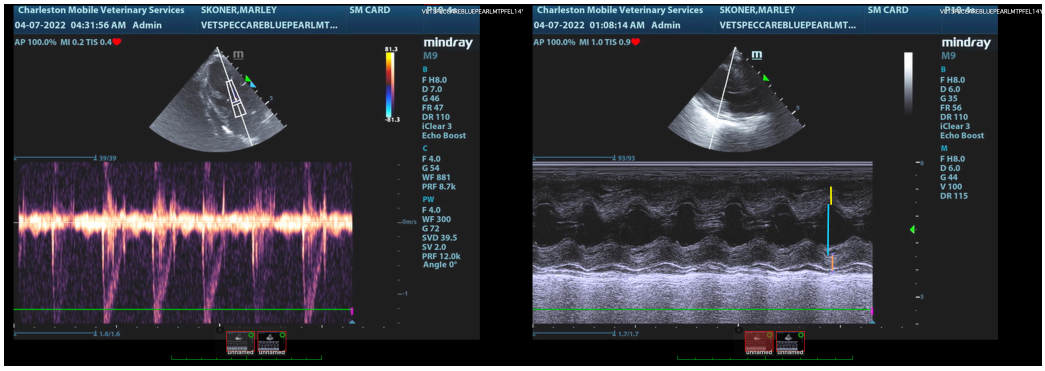


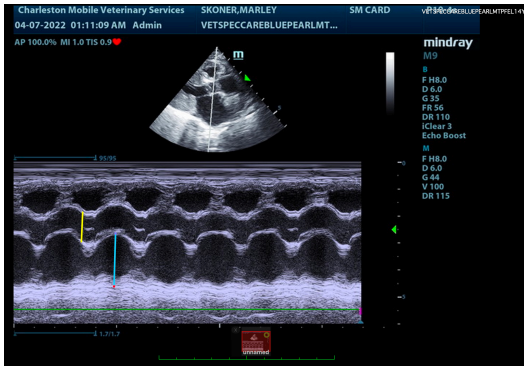

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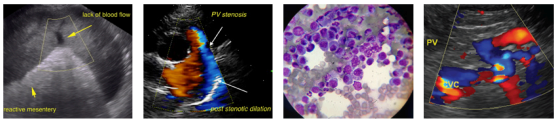


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**The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.**

Thank you for this referral. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance please contact me.

**Eric Lindquist**, DMV, DABVP, Cert. IVUSS, CEO of SonoPath.com

info@SonoPath.com