



PATIENT

Avo Briggs

SPECIES

Canine

BREED

German Shepherd

SEX

Male Intact

AGE

5 years

WEIGHT

70lbs

INTERPRETED BY

Maggie Machen
Lamy, DVM
DACVIM (Cardiology)

PRESENTING CLINICAL SIGNS

History: Thin BCS, tachycardia, arrhythmia and grade III/IV murmur ausculted on exam. Elevated ProBNP on lab work (2789) CBC/chem/T4 otherwise unremarkable.

ELECTROCARDIOGRAPHIC FINDINGS *Note: Single lead ECGs are evaluated as a rhythm strip. Morphology/MEA cannot be definitively commented on.

A single lead ECG is available; 25mm/s, 10mm/mV. The average heart rate is 240bpm (range 188-300bpm). P waves cannot be identified with an irregularly irregular rhythm. ECG diagnosis: Rapid atrial fibrillation.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and Doppler imaging is available.

Left ventricle: The LV diameter is markedly increased with severe systolic dysfunction. LV wall thicknesses are decreased with increased sphericity.

Left atrium: The left atrium is markedly dilated.

Mitral valve: The mitral valve is minimally thickened with no prolapse into the left atrial lumen. Mild to moderate eccentric mitral regurgitation with a decreased velocity.

Aortic valve/Aorta: The aortic valve is normal in morphology and mobility. Normal aortic outflow velocity; laminar flow. No aortic insufficiency.

Right ventricle: Moderately dilated right ventricle.

Right atrium: Moderately RA dilation.

Tricuspid valve: The tricuspid valve appears normal with mild tricuspid regurgitation. Normal velocity.

Pulmonary valve/Pulmonary artery: The pulmonic valve is normal in morphology and mobility. No pulmonic insufficiency. Normal RVOT velocity; laminar flow.

Pericardium/other: No pericardial or pleural effusion noted. Ascites seen on subcostal views. No obvious cardiac masses.

2-Dimensional Measurements

Ao diam (cm)	2.3
LA diam (cm)	6.8
LA:Ao (Swe)	2.9
IVS thickness (cm)	1.0
LVID diastole (cm)	6.0
PW thickness (cm)	1.0
LVID systole (cm)	4.9
FS (%)	18

Doppler Measurements

PV Vmax (m/s)	0.5
AoV Vmax (m/s)	1.3
MR Vmax (m/s)	4.4
TR Vmax (m/s)	2.3
TR PG (mmHg)	22

IMAGING PERFORMED BY

Pamela Harrigan,
RDCS

HOSPITAL NAME

Chase Veterinary
Clinic

REFERRING VET

Dr. Caffarella

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INTERPRETATION OF THE FINDINGS

Marked 4 chamber dilation and systolic dysfunction is identified with secondary MR and TR. The LA is markedly dilated, indicating high risk for complication. Ascites is noted which is consistent with right-sided congestive heart failure.

Systolic failure can be primary in nature (DCM) or secondary to taurine deficiency, myocarditis, tachycardia-induced cardiomyopathy, or infiltrative disease such as lymphoma. In a relatively young large breed dog, primary DCM is certainly possible; however, consider possible contributing issues. A troponin (cTnI) level can be submitted to further investigate infiltrative/inflammatory contribution (myocarditis). Additionally, a taurine level may be helpful (screen for malabsorption issue), with a thorough diet history in such of grain-free/boutique option. Finally, further systemic evaluation for underlying



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infiltrative contribution such as neoplasia is also reasonable although often low yield and low suspicion in this signalment.

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Regardless of cause, prognosis is poor at this stage in the disease process, with an average survival time of <6 months. Patient will always be at risk for recurrent CHF, development of malignant arrhythmias and/or sudden death in the future. The only treatable cause of systolic failure is taurine deficiency, which is uncommon on commercially formulated dog foods (albeit renewed with the recent correlation to grain free diets). If a taurine level is declined, it is also reasonable to simply supplement with taurine on the off chance of a malabsorption issue.

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As a complicating factor, the patient has also developed rapid atrial fibrillation (AF) secondary to atrial dilation. Development of the arrhythmia puts the patient at high risk for acute decompensation and is the reason for effusion in this case. Tachycardia of any origin (when sustained) leads to right sided congestion (tachycardia-induced cardiomyopathy). AF is characterized by disorganized contractions of the atria leading to an irregular heart rhythm. The irregular heart rhythm rarely causes clinical signs in dogs. However, atrial fibrillation also usually causes an increase in the heart rate, and this can lead to clinical signs and CHF as we see in this patient. Once a patient is in AF, this will likely never convert back to sinus rhythm, however they typically do well with simply rate control. The structural disease and development of AF/CHF requires lifelong diuretics and management of the structural disease in addition to management of the heart rate as below. Close monitoring going forward is advised.

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Consider 24-hour hospitalization in this case, due to the severity of disease, need for rate control and active effusions. If declined or not possible, an injection (2mg/kg) of Lasix should be administered.

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Pamela Harrigan,
RDCS

Monitoring of sleeping respiratory rates will be paramount to screen for recurrent congestive heart failure at home in the future. Cough suppression to improve QOL can also be considered once diuretics are on board for any residual mechanical cough in the face of normal sleeping respiratory rates.

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Prognosis is poor at this stage, with risk for recurrent congestive heart failure, malignant arrhythmias (AF, VT), collapse and/or sudden death in the future.

RECOMMENDATIONS

- Consider hospitalization if unstable. As an alternative, administer 2mg/kg Lasix IM or IV prior to discharge.
- Administer Pimobendan 0.3mg/kg PO q12h.
- Administer furosemide/Lasix 1-2mg/kg PO q8h for 3-5 days. If doing well decrease to q12h going forward.
- Consider a Taurine supplement, diet history, etc.
- Institute Spironolactone 1-2mg/kg PO q12h.
- Institute Diltiazem 1-2mg/kg PO q8h.
- Consider hydrocodone with homatropine, 0.2 – 0.4 mg/kg PO up to q4-6 hours PRN for cough (available in 5/1.5mg tablets or 5mg/5ml solution).
- Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.
- Elective anesthesia is not advised.

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- Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes. Monitoring of sleeping breathing rates is recommended as the best way to screen for CHF going forward.

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- Lifelong activity restriction is advised.

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PLAN

- Monitor renal values/ECG in 1-2 weeks, then every 3-4 months lifelong. If average heart rate is persistently >160bpm, up-titrate Diltiazem and/or add Digoxin if needed.
- Recommend conservative monitoring with a recheck echocardiogram in 6 months, sooner if any development of clinical signs.

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IMAGES

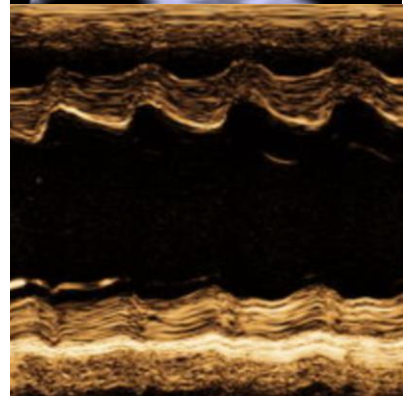
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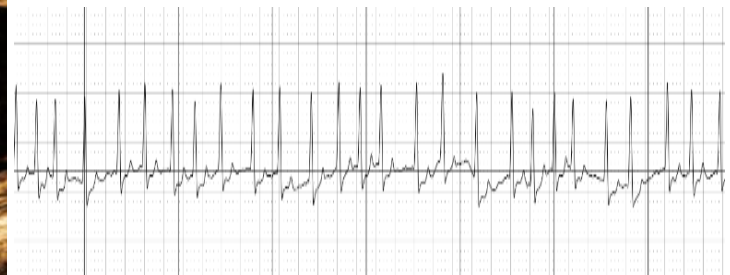
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. This report was generated using transcription software, and minor dictation errors may be present. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance, please contact me.

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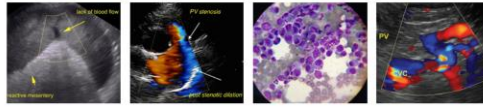
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Echocardiogram performed by: Pamela Harrigan, RDCS
 Pet Animal Ultrasound Service (4paus.com)



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