



PATIENT

McGhee Kefauver

PRESENTING CLINICAL SIGNS

History: Coughing with labored breathing noted in mid-January. Cardiomegaly and possible PAH seen on CXR.

SPECIES

Canine

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.

Right-sided cardiomegaly with MPA enlargement. Suspect primary pulmonary pathology.

BREED

Lab/Bernese Mountain Mix

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; 50mm/s, 20mm/mV. The average heart rate is 80bpm (range 63-100bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. No ectopic beats, pauses or other dysrhythmias observed. ECG diagnosis: Sinus bradycardia with respiratory variation.

SEX

Male Neutered

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Mild thickening of mitral valve leaflets with no obvious prolapse into the left atrial lumen. No mitral regurgitation with a normal left atrial dimension. Normal LV diameter with adequate myocardial function. Subtle septal flattening in systole. The tricuspid valve appears mildly thickened with no obvious tricuspid regurgitation. Moderate right atrial enlargement; significant right ventricular dilation and hypertrophy consistent with severe pulmonary arterial hypertension. Pulmonic and aortic valves are normal in morphology and mobility. Severe main PA and branch dilation. No obvious pulmonic insufficiency. Normal pulmonic and aortic outflow velocities. No pericardial or pleural effusion. No cardiac tumors observed.

AGE

13 years

WEIGHT

79.9lbs

CARDIAC CHART

INTERPRETED BY

Maggie Machen Lamy,
DVM, DACVIM
(Cardiology)

CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swe)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT	NA	NA	NM	NM	46	90	NM
CANINE CARDIAC PARAMETERS	HR (BPM)	AV VMAX (m/s)	PV MAX (m/s)	BODY WEIGHT (kg)	LA 2D short axis Base view (cm)	LVIDd Avg; 2D and m-mode short axis (cm)	LVIDs Avg; 2D and m-mode short axis (cm)
NORMAL PARAMETER	50-100	0.7-1.7	0.7-1.6	BELOW	BELOW	BELOW	BELOW
PATIENT	NM	0.72	0.86	36.2	NM	3.7	2.0
*Normal chamber parameters expressed as a mean value (SD)				3	1.27 (5.3)	2.46 (2.46)	1.36 (5.5)
BODY WEIGHT DEPENDENT PARAMETERS				5	1.40 (4.5)	2.74 (5.2)	1.60 (4.7)
<i>*Note: All measurements based upon multi-modal images and methods. An average value is reported.</i>				10	1.50 (3.8)	3.27 (3.5)	2.06 (3.1)
				15	1.83 (2.0)	3.71 (2.4)	2.43 (2.1)
				20	2.02 (1.9)	4.14 (2.2)	2.80 (2.0)
				25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
				30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)
				35	2.48 (4.3)	5.17 (5.0)	3.69 (4.5)
				40	2.62 (5.2)	5.48 (6.1)	3.96 (5.4)
				50	2.88 (7.1)	6.07 (8.3)	4.46 (7.4)

IMAGING PERFORMED BY

Dana Alterman,
RDCS, LVT

HOSPITAL NAME

Eubank Animal Clinic

REFERRING VET

Dr. Smith

INVOICE

22541

DATE

2/14/22

Adapted from June Boon, Veterinary Echocardiography, 1998
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435
Hansson et al, Vet Rad and Ultrasound 2002
Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995



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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Significant pulmonary hypertension (PAH) is present, as evidenced by right heart/MPA enlargement. The estimated systolic pulmonary arterial pressure is >100mmHg, with normal being <25mmHg. This is causing hypertrophy and dilation of the right ventricle (indicating right-heart pressure overload) and significant MPA enlargement. No additional issues are identified.

Clinical signs of weakness, heavy breathing, cyanosis, and syncope are attributed to severe PAH. The underlying genesis of PAH is poorly understood in cases other than heartworm infestation, though it occurs with increased frequency in a variety of forms of chronic lung disease and in patients with idiopathic pulmonary fibrosis. If not performed, a heartworm antigen test is recommended. Given the chronicity of the disease seen here, in addition to the included radiographic report, underlying airways issues are suspected as an underlying cause with a prior acute secondary exacerbating insult (infectious or inflammatory). Patients with this degree of PAH and pulmonary disease can develop right-sided congestive heart failure (ascites), debilitating cyanosis, labored breathing and exertional syncope if poorly controlled.

Given that the episode of respiratory distress was a month ago and no residual clinical signs are reported in the history, treatment may be limited to simply lowering pulmonary pressures with Pimobendan and Sildenafil. If there are any residual respiratory signs, coverage with broad spectrum pulmonary antibiotic (fluoroquinolone) may be useful. Use of theophylline and/or taper course of anti-inflammatory steroids can also be beneficial in these cases, if clinical signs persist or to treat exertional dyspnea or acute flare ups. The goal is to decrease the inflammatory component as much as possible. PRN use of cough suppressants may also be beneficial. Unfortunately, the prognosis overall is poor, however I am hopeful we can provide some medical relief going forward.

The ECG shows a bradycardia with respiratory variation. Primary respiratory disease is a common cause of profound sinus arrhythmia, which is suspected here. If the heart rate does not stimulate with activity or stress, consider an Atropine Challenge to ensure a normal response. Underlying sinus node disease is also a possibility; however, this is considered less likely. No treatment is indicated based upon what is seen here in a dog without associated clinical signs, such as collapse.

Omega fatty acid supplementation (anti-inflammatory) may be of some long-term benefit. Monitor for worsening of labored breathing, exercise intolerance or collapse episodes.

PLAN

Institute Pimobendan 0.25-0.3mg/kg PO q12h. Institute Sildenafil 1-2mg/kg PO q8h. If any residual respiratory signs are noted, a course of Baytril, anti-inflammatory steroids, theophylline, etc. can be utilized. Can also use Hydrocodone for quality of life. Monitor for syncopal episodes in the future.

Recommend recheck echocardiogram in 6 months to reassess pulmonary pressures, sooner if any development of clinical signs.



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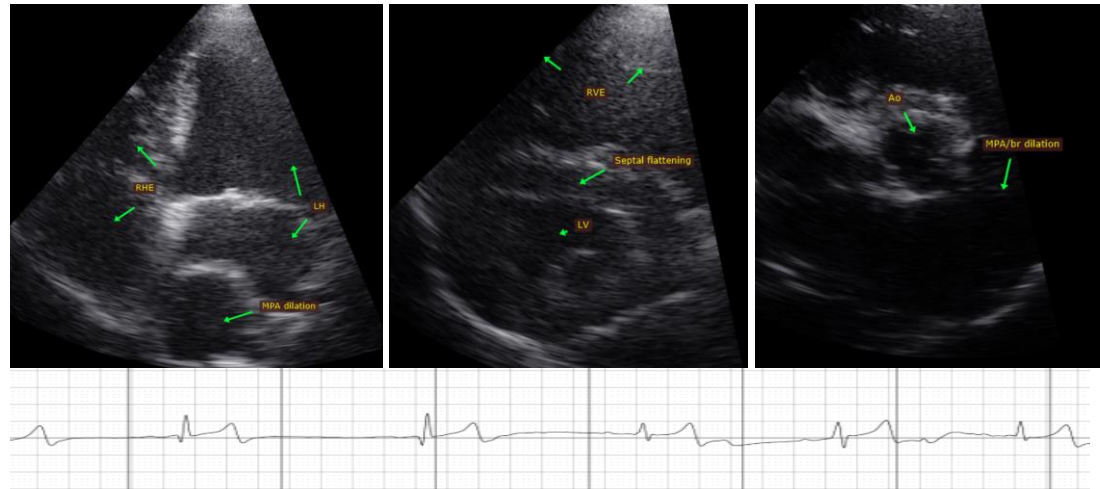
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IMAGES



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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