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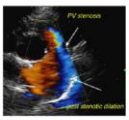
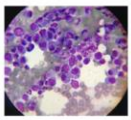
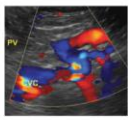

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PATIENT
Lola Berther

SPECIES
Canine

BREED
Labrador Retriever

SEX
Female Spayed

AGE
10.10 years

WEIGHT
63.4lbs

INTERPRETED BY
Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY
Tom McNeill

HOSPITAL NAME
SVS Imaging CT

REFERRING VET
Dr. Peterson

INVOICE
23298

DATE
3/25/22

PRESENTING CLINICAL SIGNS
History: Breathing hard, dry cough, lethargic, not eating.
-Abnormal lab results: NSF.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.
Mild cardiomegaly. Alveolar pattern in the left caudal pulmonary quadrant. The pulmonary veins do not appear significantly distended.

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 100bpm with a largely regular rhythm. A single interpolated VPC is seen. No supraventricular premature beats, pauses or other dysrhythmias observed.
ECG diagnosis: Normal sinus rhythm with a single VPC.

ECHOCARDIOGRAM FINDINGS
2D, m-mode, color flow and doppler imaging is available. Significant left ventricular dilation with decreased systolic function. Decreased LV wall thickness. Increased LV sphericity. Severe left atrial enlargement. The mitral valve appears mildly thickened, with no obvious prolapse into the left atrial lumen. Moderate eccentric mitral regurgitation. Normal velocity. The tricuspid valve appears mildly thickened and trace TR is noted. Mild right atrial and ventricular dilation. The aortic valve is normal in morphology and mobility. No AI, normal LVOT velocity. Normal pulmonic valve with no pulmonic insufficiency seen. Normal RVOT velocity. No pericardial or pleural effusion noted. No obvious cardiac tumors.

CARDIAC CHART

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	5.5	NM	NM	2.4	20	36	0.9
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	93	0.7	1.1	28.8	4.9	6.3	5.0
*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)
**Note: All measurements based upon multi-modal images and methods. An average value is reported.*				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)

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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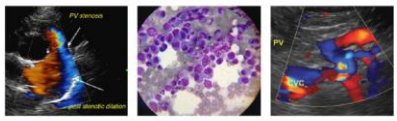

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Unfortunately, this patient has significant 4-chamber dilation and LV dysfunction. The academic diagnosis of chronic degenerative valve disease leading to systolic dysfunction versus true primary cardiomyopathy (DCM) could be argued in this case. The severity of MR would support the latter; however, it is rare for DCM cases to experience clinical signs with a FS of 20%. Regardless, the differentiation is purely academic as severe LA dilation is identified.

Systolic dysfunction can develop as a primary problem or be secondary to diet, hypothyroidism, infiltrative disease, etc. A thorough diet history is recommended, screening for boutique exotic ingredient or grain-free/vegan diets. A taurine level can be submitted; however, regardless of result, recommend a taurine supplement in this case. A thyroid level can also be assessed.

Regardless, there is concern for congestive heart failure based upon clinical signs and CXR findings. The CXR are considered equivocal, and a primary respiratory component is also possible. Institute lifelong cardiac supportive therapy as below and assess response. If the respiratory signs persist, repeat chest films and potentially a course of broad-spectrum antibiotic may be beneficial.

Long term prognosis is poor with this degree of disease; however, most dogs are able to maintain a good QOL on medications for an average of 8-12 months if able to be stabilized. Referral for 24-hour care should be considered if patient appears unstable as oxygen support, IV diuretics and further monitoring may be necessary. Long term prognosis is guarded to poor, as most dogs once in CHF are able to maintain a good QOL on medications for an average of 8-12 months. Patient will always be at high risk for recurrent CHF, development of malignant arrhythmias/LA tear, and/or sudden death in the future.

The ECG does show a single VPC. This is not surprising given underlaying structure disease and a stressed and potentially decompensating patient. No treatment is warranted based upon what is seen here. That being said, certainly monitoring for signs of sustained arrythmias is advised, including syncope or acute lethargy.

Monitoring of sleeping respiratory rates will be paramount to screen for congestive heart failure at home. Omega fatty acid supplementation and mild salt restriction may also be of some long-term benefit. Monitor for development of a cough, labored breathing, exercise intolerance or worsening collapse episodes in the future.

PLAN

Consider referral if the patient appears or becomes unstable. Recommend the following oral medications: Administer Lasix 1-2mg/kg PO q12h. Administer Pimobendan 0.3mg/kg PO q12h. Administer spironolactone 1-2mg/kg PO q12h. Diet history/thyroid level; submit taurine level and/or supplement taurine to the diet; 1000mg PO q12h.

Monitor SRRs at home. Monitor renal values and BP in 10-14 days, then every 3-4 months while on diuretics. If doing well/eating normally at home and BP >130mmHg, reinstitute ACE-inhibitor Enalapril or Benazepril 5mg PO q12h. If the patient's respiratory signs persists despite therapy, repeat CXR and/or course or Baytril may be reasonable.

Recheck: Recommend conservative monitoring with a recheck echocardiogram in 6 months, sooner if any development of associated clinical signs occurs in the interim.

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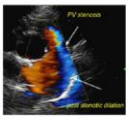
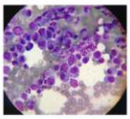
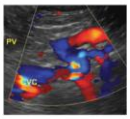

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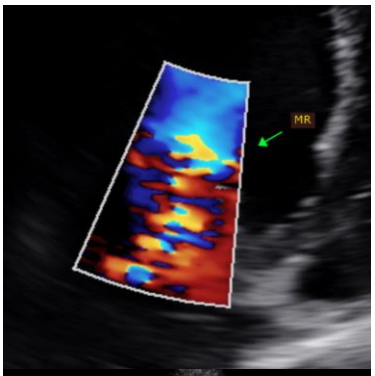

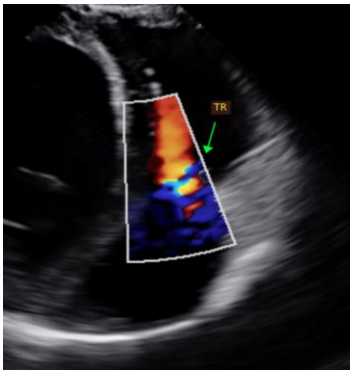

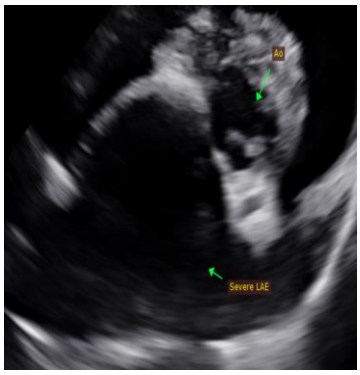

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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

Maggie Machen Lamy, DVM
Diplomate of the American College of Veterinary Internal Medicine (Cardiology)
info@sonopath.com