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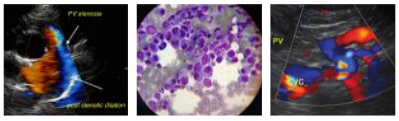

SonoPath
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PATIENT
Benny Muller-Hinger

SPECIES
Canine

BREED
English Setter

SEX
Male Neutered

AGE
9 years

WEIGHT
44.6lbs

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

IMAGING PERFORMED BY
Stephanie Pearce, RDCS, RVT

HOSPITAL NAME
Chadwell Animal Hospital

REFERRING VET
Dr. Haskin

INVOICE
22324

DATE
12/7/21

PRESENTING CLINICAL SIGNS

History: Presented initially Sept 24, 2021, for check ears. During appt, owner noted that pet had been coughing, mildly, off and on for "a little while." Owner felt like it was due to allergies and PE was unremarkable. Benny was started on Benadryl. One week later, Benny had not improved, and tracheal sensitivity was noted on PE. A trial of Doxycycline was done. During Doxy therapy, the cough worsened. The lungs remained clear on auscultation and no murmur was noted. Chest rads were taken and the cardiac silhouette was very, very enlarged. The owner was then asked about diet, and it was found that the pet ate N&D pumpkin grain free food. The owner declined an echocardiogram at the time. Vetmedin, Spironolactone, Lasix, Taurine and a diet change were immediately initiated. Benny immediately improved. The cough has almost completely resolved.
-Current medications: Vetmedin 5mg BID, Spironolactone 25mg BID, Lasix 20mg BID, Taurine.
-Blood pressure: 130mmHg.
-Sedation used: Not required for a full diagnostic ultrasound.
-STAT: Not requested. ECG declined.

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

Significant cardiomegaly. No obvious evidence of CHF.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Severe left ventricular dilation with decreased systolic function. Decreased LV wall thickness with increased sphericity. Moderate left atrial enlargement. The mitral valve appears normal in form and function, with no obvious prolapse into the left atrial lumen. Mild anterior directed mitral regurgitation. Decreased velocity. Mild right atrial and ventricular dilation. Trace TR. Normal velocity. The aortic valve is normal in morphology and mobility. No subvalvular ridge present; normal LVOT velocity. Trace aortic insufficiency. Normal pulmonic valve with trace pulmonic insufficiency seen. 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	4.5	2.4	NM	1.7	10	22	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	100	1.9	1.0	20.2	3.1	6.0	5.4
*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

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Unfortunately, this patient has severe left ventricular myocardial failure. This is causing dilation and overload of the left heart resulting in insufficiency of the mitral valve. The degree of dilation and pump failure is resulting in presumably prior congestive heart failure as mentioned in the history. The right heart appears mildly affected as well, however this is of less clinical concern. A small aortic leak is noted; however, baseline blood pressure is normal. No additional issues are identified.

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 senior large breed dog, a primary genetic DCM is certainly possible, although the history of a grain-free diet is concerning for a diet-related issue. Highly recommend change to a more standard well formulated diet. Additionally, a taurine level can be submitted, however regardless of results recommend a taurine supplement in this case as below. Finally, a thorough medical history to assess for prior issues such as parvo virus, Chagas disease, etc. is recommended. A cardiac troponin level can be submitted to assess for ongoing damage to the myocardium as well.

Regardless of cause, prognosis is poor at this stage in the disease process, with an average survival time of 8-9mo for canine patients with active pulmonary edema on medications, however they generally are able to maintain a good quality of life for that period. Even with diet-related dysfunction, improvement will likely be minimal at this end-stage phase of disease.

Continued cardiac supportive medications are recommended as below. Cases of systolic failure are at high risk for malignant tachyarrhythmias (such as AF or VT), and activity restriction is advised. Patient will always be at risk for recurrent CHF, development of arrhythmias/LA tear, syncope and/or sudden death in the future.

Monitor for development of a cough, worsening labored breathing, exercise intolerance or collapse episodes in the future. Monitoring of sleeping breathing rates at home is recommended to assess response to medications and recurrence of CHF in the future.

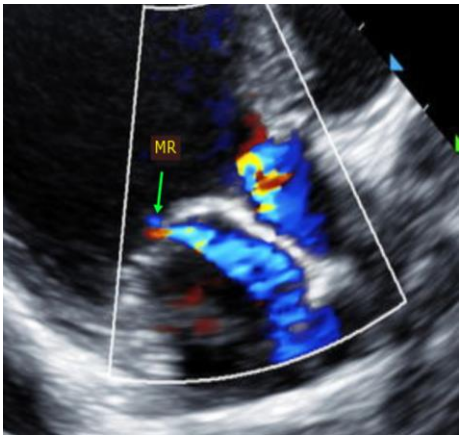
PLAN:

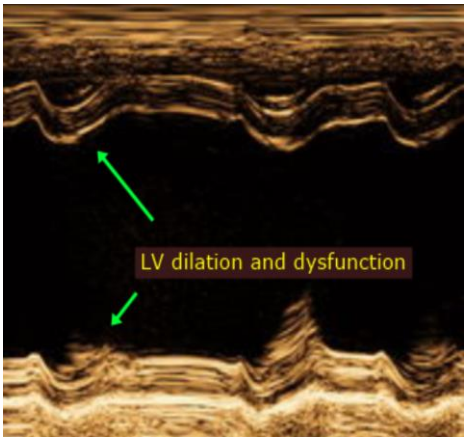
Administer diuretic furosemide 1-2mg/kg PO q12h. Administer Pimobendan 0.3mg/kg PO q12h. Administer aldosterone antagonist Spironolactone 1-2mg/kg PO q12h. Continue Taurine supplementation 1000mg PO q12h.

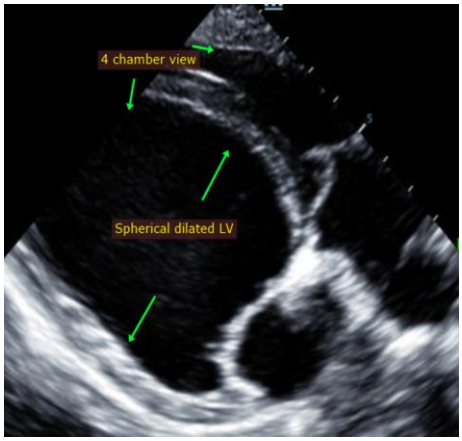
Recheck renal panel, heart rate, BP every 3-4 months lifelong. Diet change immediately recommended.

Recheck echocardiogram in 6 months to reassess cardiac function.

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.

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