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PATIENT

Henry Senior Dog Sanctuary

SPECIES

Canine

BREED

Terrier Mix

SEX

Male Neutered

AGE

12.9.10

WEIGHT

19.5lbs

INTERPRETED BY

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

HOSPITAL NAME

North Laurel Animal Hospital

REFERRING VET

Dr. Steere

INVOICE

27765

DATE

12.1.22

PRESENTING CLINICAL SIGNS

History: 12/1/20 - AllyVet echo diagnosed stage B2 heart disease, severe MR. 12/3/21 - AllyVet Echo - Mitral and tricuspid valve degeneration with regurgitation - progressive. Mitral chordal rupture. 7/26/22 - Seen at VCA Calvert for cough, echocardiogram Diagnosed with mitral and tricuspid valve regurgitation. Recommend recheck in 8 months or sooner if coughing is worsening. 8/24/22 - VCA Calvert - Diffuse bronchointerstitial markings which may represent age related change, but nonspecific airway disease cannot be ruled out. Left atrial enlargement without overt cardiomegaly or signs of cardiac decompensation. Started on Cerenia, Doxycycline and Hydrocodone. Per foster mom, Doxycycline caused V, hydrocodone caused sedation and cough did not improve. They were given to completion. 9/2022 - Theophylline was started by Dr. Imperato after reviewing rads and echo (late September). Owner feels cough improved with theophylline until over the last week. Henry was very sensitive to gabapentin 100mg and trazodone 50mg, barely responsive according to the foster about 6 hours after dose was given. After that he had pronounced bronchospasms and collapsed. He will occasionally cough up a pill, so owner gave an extra dose of Lasix. 6 days ago, chronic cough worsened. Grade 3/6 murmur, normal lung sounds, eupneic, no cough noted on exam. -Chest radiographs (11/17/22: Enlarged LA, VHS 9.75, right sided enlargement normal pulmonary vasculature, moderate bronchointerstitial pattern noted, redundant tracheal membrane over trachea, mild liver enlargement. -Current medications: Pimobendan, Lasix, Theophylline, Benazepril (unsure of doses) -Sedation used: Torbugesic. -Pertinent previous ultrasound results: See above. -STAT: Not requested. -Imaging performed by: Stephanie Warga RDCS, RVT.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental information only. Mild cardiomegaly. No obvious evidence of CHF.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets with minimal prolapse into the left atrial lumen. Mild mitral regurgitation with mild left atrial dilation. Normal LV diameter with adequate myocardial function. The tricuspid valve appears normal with mild tricuspid regurgitation. Prominent right heart. TR velocity indicative of early pulmonary arterial hypertension. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. No obvious aortic or pulmonic insufficiency. No pericardial or pleural effusion noted. No obvious cardiac masses.

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	3.2	NM	1.4	33	64	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	90	1.2	0.9	8.8	1.9	2.8	1.9
*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)

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	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)

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Chronic degenerative valve disease causing mild mitral and tricuspid regurgitation. Lack of significant left atrial enlargement indicates the current risk for complication is low. Mild pulmonary hypertension is noted, which is likely developing secondary to the cough/airway disease. No concurrent issues such as systolic dysfunction are noted in this study.

These findings are directly discordant with what is reported previously with severe MR and significant cardiac enlargement. That being said, the recent VHS was reportedly normal. This variable history is difficult to explain without having prior images available.

Given these findings, the cough is **certainly non-cardiogenic in origin** and Lasix can be safely discontinued. Respiratory disease is considered most likely. If the cough is poorly controlled/progresses long term, this can certainly lead to worsening of PAH. Clinical signs of significant PAH include exertional dyspnea/collapse. Continued monitoring is advised. Cough control is recommended lifelong (hydrocodone, intermittent AI prednisone, fluoroquinolone for acute flare up, etc.). **Given that the symptom is refractory and chronic in nature, advanced evaluation such as a TTW/BAL sampling is strongly recommended. Referral to an IM Specialist may be beneficial.**

In a dog without significant left atrial enlargement, no cardiac medications are clearly indicated. That being said, given the unusual history reasonable to continue Pimobendan for the short-term. Assessment of progression in the future will help predict long term prognosis, which is highly variable at this stage (B1). Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit. Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes.

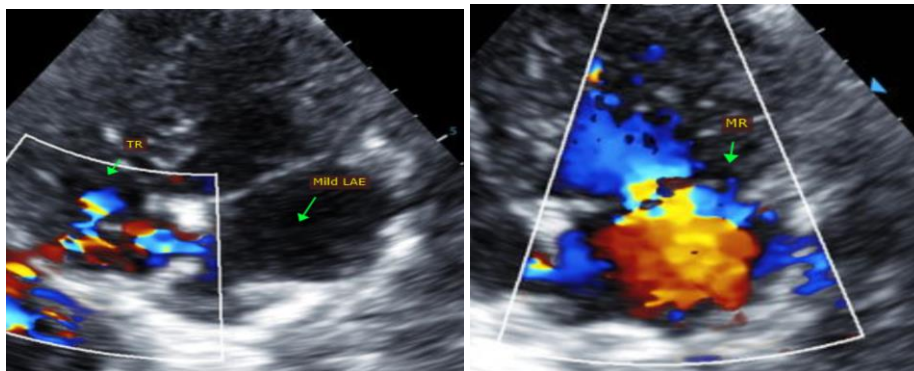
Anesthetic risk is considered mild if needed. Cardiac protective drug choices (opioid/benzodiazepine premedication, propofol or alfaxalone induction, isoflurane gas) are recommended. **Pre-oxygenate for 5-10 minutes prior to induction.** Monitor for arrhythmias, hypotension, and hypoxia both intra and post-operatively and intervene as necessary. Mild IV fluid restriction is recommended to avoid fluid overload. Avoid heart rate stimulating drugs such as atropine unless clinically indicated.

PLAN

Discontinue Lasix. Continue Pimobendan 0.3mg/kg PO q12h. Further cough/respiratory evaluation as discussed. Consider referral to an IM Specialist. Baseline BP recommended.

Recommend conservative monitoring with a recheck echocardiogram in 6 months, sooner if any development of clinical signs.

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