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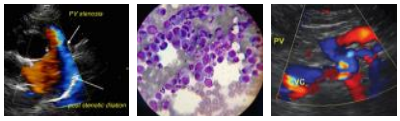

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PATIENT
Betsy Taylor

SPECIES
Canine

BREED
Beagle

SEX
Female Spayed

AGE
9.29.13

WEIGHT
24lbs

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

HOSPITAL NAME
Chadwell Animal Hospital

REFERRING VET
Dr. Malick

INVOICE
32325

DATE
8.11.13

PRESENTING CLINICAL SIGNS

History: Presented for increased respiratory effort, cough. History of proteinuria, seizure episodes (well controlled). Cardiac Murmur Gr III/VI, abdomen somewhat distended-per owner always has been
-Pertinent abnormal PE/Chem/CBC/UA Results: Proteinuria, elevated SDMA.
-Radiographs: Cardiomegaly, pulmonary edema perihilar.
-Current medications: Telmisartan 20 mg 1/2 tablet q 24 hours, levetiracetam 250 mg 1 q 12 hours 8-7-2023 Started on Lasix 12.5 mg q 12 hours, Pimobendan 2.5 mg q 12 hours
-Blood pressure: 175/135, 178/131 and 176/128mmHg.
-Sedation used: Not required to complete full diagnostic ultrasound.
-Pertinent previous ultrasound results: No previous.
-STAT: Not requested
-Imaging performed by: Stephanie Warga RDCS, RVT.

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 anterior-directed mitral regurgitation with mild left atrial dilation. Normal MR velocity. Decrease LV diameter with adequate myocardial function. Increased wall thickness. The tricuspid valve mildly appears thickened with mild tricuspid regurgitation. TR velocity consistent with mild to moderate pulmonary hypertension. No significant right heart enlargement. MPA is prominent. 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	5.8	3.5	NM	1.45	52	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	200	1.2	1.5	10.9	2.1	2.7	1.3
*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 **Note: All measurements based upon multi-modal images and methods. An average value is reported.*				5	1.40 (4.5)	2.74 (5.2)	1.60 (4.7)
				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

Chronic degenerative valve disease causing mild mitral and tricuspid regurgitation. Mild left atrial enlargement indicates the current risk for spontaneous congestive heart failure is low. Mild TR with mild to moderate pulmonary hypertension is also documented, which is likely secondary to a reported cough. It is worth noting the LV has the appearance of pseudohypertrophy. Lasix can cause this; however, the BP is also mildly elevated. Reassessing in the future to determine if further vasodilator therapy is warranted. No additional issues are identified.

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. Primary PAH is also possible in certain breeds as well. If not performed, a heartworm antigen test is highly recommended. Given the breed and a reported cough, underlying upper and/or lower airway disease is the likely primary issue.

Given the combination of MV disease and moderate pulmonary arterial hypertension I would recommend continue Pimobendan in this patient as below. Sildenafil is not yet indicated at this time. **These findings would make CHF an unlikely cause of the current issues**. Highly recommend Radiologist review of the films with discontinuation of Lasix. Primary pulmonary disease is suspected in this predisposed breed**.** It is important to note that the primary clinical sign of pulmonary hypertension is exertional dyspnea/syncope, not coughing, although a cough will certainly lead to worsening PAH. Monitoring for any clinical changes respiratory in origin is recommended. Prognosis is guarded given the combination of issues, and patient will always be at risk for progression to right or left-sided CHF, development of arrhythmias, collapse, etc. going forward.

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

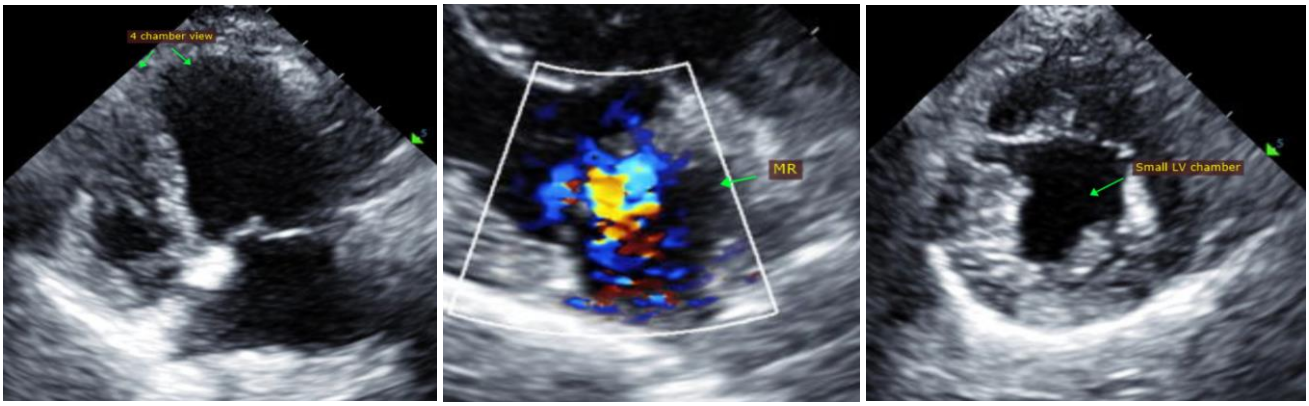
Omega fatty acid supplementation and mild salt restriction may also be of some long-term benefit. Monitor for development of a progressive cough, labored breathing, exercise intolerance or collapse episodes.

PLAN

Continue Pimobendan 0.3mg/kg PO q12h. A Radiologist review is recommended with discontinuation of Lasix therapy as discussed. Further cough evaluation/treatment as dictated by clinical signs. Reassess BP to determine if persistent SHT warrants additional vasodilator therapy. Continue Telmisartan as dictated by IM.

Recommend monitor for progression 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
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