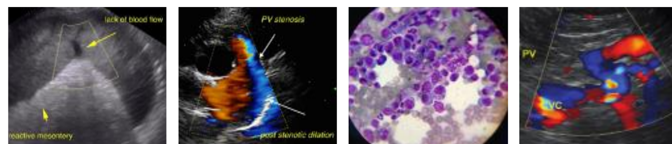

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1-800-838-4268 info@sonopath.com

PATIENT
Cleopatra Rodriguez

SPECIES
Canine

BREED
Mix

SEX
Female Spayed

AGE
13 years

WEIGHT
24lbs

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

IMAGING PERFORMED BY
G. Ferrer, DVM

HOSPITAL NAME
Paseos Veterinary Center

REFERRING VET
Dr. Davila

INVOICE
23710

DATE
4/18/22

PRESENTING CLINICAL SIGNS

History: Chronic cough as well as respiratory distress – worsened the last 2 days. History of heartworm disease (6-7 years ago).
-Current medications: Prednisone 5mg BID, Furosemide 20mg 1 tab BID, heartworm preventions.
-Radiographs: Cardiomegaly.

ECHOCARDIOGRAM FINDINGS

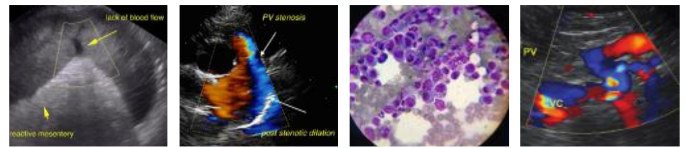
2D, m-mode, color flow and doppler imaging is available. Mild thickening of mitral valve leaflets with no obvious prolapse into the left atrial lumen. No mitral regurgitation with a normal left atrial dimension. Normal LV diameter with adequate myocardial function. LV wall dimension is normal. The tricuspid valve appears mildly thickened, and there is mild tricuspid regurgitation. Mild to moderate right atrial enlargement; moderate right ventricular hypertrophy with mild dilation consistent with pulmonary arterial hypertension. TR velocity is normal however this is suspected to be an underestimation. The pulmonic and aortic valves are normal in morphology and mobility. Severe main PA and branch dilation. Mild pulmonic insufficiency. Normal pulmonic and aortic outflow velocities. No pericardial or pleural effusion noted. No cardiac tumors observed.

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	NA	2.5	NM	1.2	62	92	0.4
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	50	1.3	1.6	10.9	2.1	2.3	0.9
*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				20	2.02 (1.9)	4.14 (2.2)	2.80 (2.0)
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435				25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
Hansson et al, Vet Rad and Ultrasound 2002				30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)
Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995				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

Pulmonary hypertension (PAH) is present, as evidenced by an enlarged right heart, severely dilated MPA and TR/PI. The estimated systolic pulmonary arterial pressure is >60mmHg based upon these findings, with normal being <25mmHg. This is causing pressure overload of the right ventricle. The left heart is essentially normal, indicating low risk for complication such as left-sided CHF. No additional issues are identified. A bradycardia is noted throughout the study and a screening ECG is strongly recommended.



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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. Given the history of heartworm disease, this likely is the root issue. Patients with severe PAH and pulmonary disease can eventually develop right-sided congestive heart failure (ascites), debilitating cyanosis, labored breathing, and exertional syncope if poorly controlled.

Given a chronic cough with an acute recent increase, the most common cause is an infectious or inflammatory insult causing a decline in already poor oxygenation status. A PTE cannot be ruled out. Coverage with broad spectrum pulmonary antibiotic (fluoroquinolone) is recommended, in addition to vasodilation using sildenafil. I am hopeful single agent therapy will be sufficient as the PAH is only moderate and is likely acutely increased due to active inflammation. If response is insufficient (i.e., syncope/dyspnea develops), can also add Pimobendan. Anti-inflammatory taper course of steroids may also be useful depending on severity of signs. No indication for Lasix in this case as there is no evidence of CHF (i.e., body cavity effusion), and should be discontinued.

Once stable, use of theophylline and PRN use of cough suppressants may also be beneficial to help decrease the inflammatory component as much as possible. The prognosis overall is guarded, and I am hopeful we can provide some medical relief going forward.

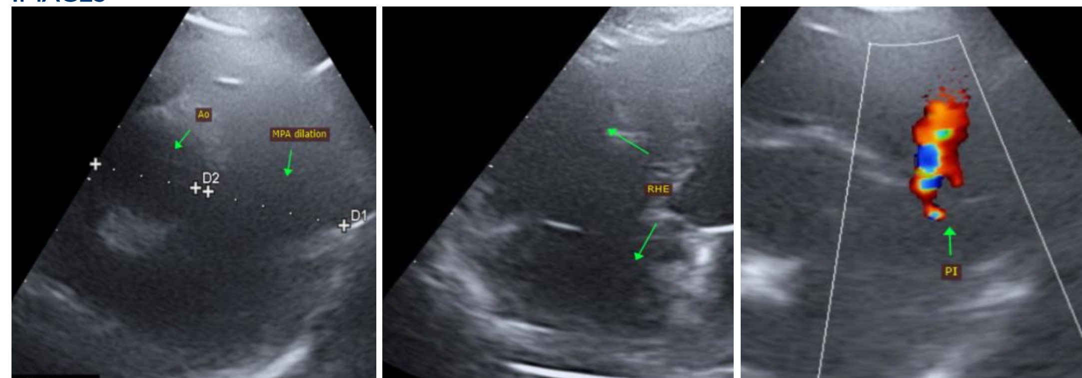
Omega fatty acid supplementation (anti-inflammatory) may be of some long-term benefit. Monitor for worsening of labored breathing, exercise intolerance or collapse episodes.

PLAN

Discontinue Lasix. Institute course of pulmonary antibiotics (Enrofloxacin or similar) IV or PO depending on patient stability. Institute sildenafil (Viagra) 1-2mg/kg PO q8h. Can also use hydrocodone, taper course of steroids, and/or theophylline depending on chronic clinical signs of cough/exertional dyspnea.

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

IMAGES



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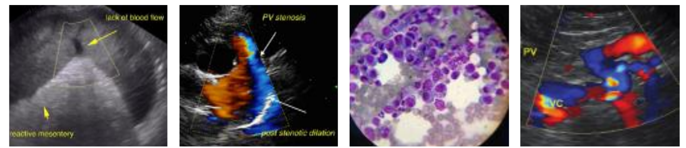

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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. 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