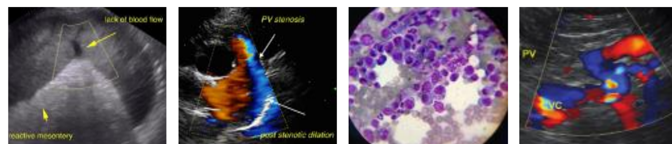
SonoPath

Clinical Sonography & Telecytology

EDUCATIONAL TELECONSULTATION SERVICES™



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

PATIENT
Oliver Gekiere

SPECIES
Canine

BREED
WHWT

SEX
Male Neutered

AGE
15 years

WEIGHT
15lbs

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

IMAGING PERFORMED BY
Kelly Vazquez, CVT

HOSPITAL NAME
Westwood Regional Veterinary Hospital

REFERRING VET
Dr. Giammanco

INVOICE
24167

DATE
5/16/22

PRESENTING CLINICAL SIGNS

History: Patient presented for dyspnea, pulmonary crackles, pulmonary edema, enlarged cardiac silhouette, history of heart murmur. Current meds: Tussigon 2.5 mgs BID/trazodone 12.5 mgs PRN/Temaril-P 1 tab BID, Gabapentin 100mgs BID-TID.

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

Mild right-sided cardiomegaly. No obvious evidence of CHF.

ELECTROCARDIOGRAPHIC FINDINGS *Note: Single lead ECGs are evaluated as a rhythm strip. Morphology/MEA cannot be definitively commented on.

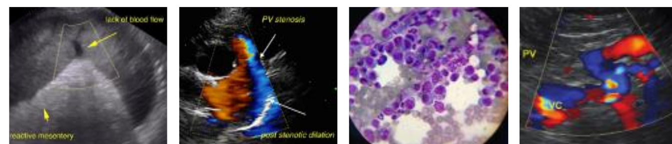
A video of a single lead ECG is available from an anesthesia monitor. The reported HR is 120-130bpm which appears appropriate. Dramatic motion artifact; however, no obvious dysrhythmias observed. ECG diagnosis: Normal sinus rhythm.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Mild diffuse thickening of mitral valve leaflets with no prolapse into the left atrial lumen. Mild eccentric mitral regurgitation with minimal left atrial dilation. Normal MR velocity. Normal LV diameter with adequate myocardial function. The tricuspid valve appears normal with mild tricuspid regurgitation. Normal velocity. Mild RH prominence suspicious for 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	6.2	2.0	1.2	1.3	34	65	0.3
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	137	1.47	0.98		1.8	3.1	2.0
*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)
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)



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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Chronic degenerative valve disease causing mild mitral and tricuspid regurgitation. The left heart disease is well compensated for, with borderline normal LA dimension. The finding of mild RA/RV dilation in the face of mild TR, a chronic cough and crackles supports pulmonary pathology and early pulmonary hypertension (PAH) rather than CHF. The ECG is unremarkable with a normal sinus rhythm.

Clinical signs of weakness, heavy breathing, cyanosis, and syncope are attributed to severe PAH, and may develop in the future. The underlying genesis of PAH is poorly understood in cases other than heartworm infestation or known PTE, though it occurs with increased frequency in a variety of forms of airway disease and in patients with idiopathic pulmonary fibrosis. **In this HIGHLY predisposed breed for pulmonary fibrosis, I am concerned for early changes suggestive of this pathology.** Given the finding of a cough as opposed to exertional dyspnea, chronic bronchitis is also likely +/- an acute exacerbating insult.

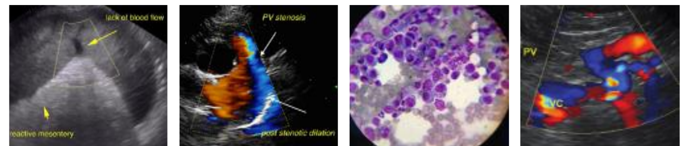
Given the history, signalment, radiographs and echocardiogram findings, it is likely this patient has underlying airway disease that over time has begun to affect the heart (PAH)- in other words **the cough/crackles in this patient is non-cardiac in origin; however, PAH is likely developing secondary to the primary airway cough**. Given that the degree of right heart changes are mild at this time, there is no clear indication for sildenafil at this time. Should the PAH worsen however, patients with right heart changes secondary to PAH can eventually develop right-sided congestive heart failure (ascites), debilitating cyanosis and labored breathing and exertional syncope if poorly controlled.

Assuming the history supports a relatively acute worsening of clinical signs, more aggressive airway treatment and/or workup may be beneficial (ie TTW, BAL and/or broad spectrum pulmonary antibiotics such as Doxy/Baytril, cough suppressants, steroids, etc). CHF is ruled out in this case, and Lasix is contraindicated. Consider theophylline and PRN use of cough suppressants as well for long term support. Omega fatty acid supplementation may be of some long term benefit.

Monitor for development of a labored breathing, worsening cough, exercise intolerance or collapse episodes in the future.

PLAN: No indication for Lasix. Consider course of Enrofloxacin (5-10mg/kg SID-BID for 10 days), more aggressive hydrocodone therapy (hydrocodone with homatropine up to every 4-6 hours PRN for cough), course of anti-inlammatory steroids, +/- TTW/BAL. Consider theophyline trial if any dyspnea/tachypnea. Heartworm antigen test recommended if not current. If patient appears unstable, continued hospitalization for O2 support and injectable therapy recommended.

Recommend recheck echocardiogram in 6 months, sooner if development of PAH symptoms in the interim. Follow up chest radiographs may be useful to establish a baseline.



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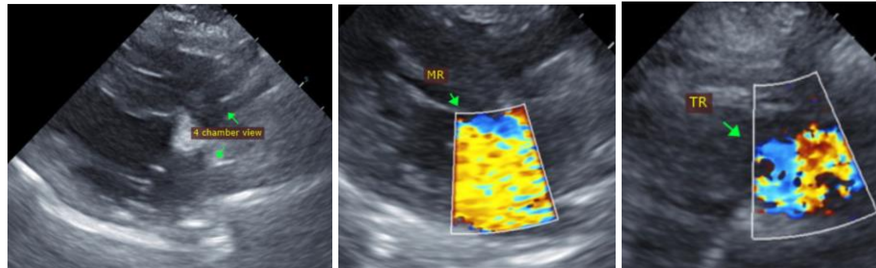
IMAGES



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. 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