



PATIENT

Lester Lukunich

SPECIES

Canine

BREED

Greyhound

SEX

Male Neutered

AGE

2.5 years

WEIGHT

81lbs

INTERPRETED BY

Maggie Machen Lamy,
DVM, DACVIM
(Cardiology)

IMAGING PERFORMED BY

Jennifer Todd, DVM

HOSPITAL NAME

Lambs Gap Animal
Hospital

REFERRING VET

Dr. Todd

INVOICE

21002

DATE

9/14/21

PRESENTING CLINICAL SIGNS

History: He was adopted from a Greyhound rescue one year ago and his owner reports no cough, no exercise intolerance and no collapse. At his previous vet, they noted a heart problem, and radiographs showed an enlarged heart with possible LA enlargement. On exam here on 9/7/21, I auscultated an irregularly irregular cardiac rhythm with pulse deficits. Bloodwork showed normal CBC, Chemistry, T4 and elevated cardiac ProBNP: 4001. Blood pressure today was 172/106, 177/106, 178/107mmHg.

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

A single lead ECG is available; 25mm/s, 2.5mm/mV. The average heart rate is 1900bpm (range 125-250bpm). No consistent P/R relationship with an irregularly irregular rhythm most consistent with atrial fibrillation. Sinus rhythm with intermittent APCs/SVT cannot be entirely ruled out without a 6 lead tracing. No ventricular ectopic beats or other dysrhythmias observed. ECG diagnosis: Suspect atrial fibrillation; sinus rhythm with frequent premature beats/SVT cannot be ruled out.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets (anterior>posterior) with no prolapse into the left atrial lumen. Moderate central mitral regurgitation with mild to moderate left atrial dilation. Normal MR velocity. No significant LV dilation with adequate myocardial function. The tricuspid valve appears subjectively normal, with mild tricuspid regurgitation. Normal velocity. Normal right atrial and ventricular diameter. A suspect prominent papillary muscle can be seen on left cranial views; small mass is not entirely ruled out. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities. No aortic or pulmonic insufficiency. 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 | 5.0 | nm | NM | 1.5 | 35 | 68 | 1.1 |
| 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 | NM | 0.75 | 0.85 | 36.7 | 3.1 | 4.9 | 3.2 |
| *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) |
| <i>*Note: All measurements based upon multi-modal images and methods. An average value is reported.</i> | | | | 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) |

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



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| | | | | |
|---|----|------------|------------|------------|
| Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995 | 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 moderate mitral and mild tricuspid regurgitation is identified. Mild to moderate left atrial enlargement indicates there is relatively low risk for imminent complication, however risk for progression to spontaneous congestive heart failure in the future is elevated. An abnormally prominent papillary muscle is suspect on RV views, and a small mass or atypical insertion cannot be ruled out. Follow up is advised to screen for any progressive changes. No additional issues are identified.

More importantly, a significant arrhythmia is confirmed with a highly irregular rhythm and dramatic rate variation. In a single lead tracing it is difficult to be definitive that there is no P/QRS correlation (ie some sinus beats are possible). Atrial fibrillation would be the highest likelihood, although this is exceedingly uncommon without severe structural disease in a non-giant breed dog. Frequent APCs would also be a possibility; albeit a constant coupling interval is typically seen and cannot be identified here. No ventricular beats are seen, ruling out VT or similar. Referral for a complete 6 lead tracing is should be considered in this case as the gold standard. Regardless of definitive differentiation, recommend treating the patient given periods of significant rate elevation as below.

Even without a definitive rhythm diagnosis, we can determine from the echocardiogram that significant structural disease is not the obvious cause. Other rule outs include systemic disease/inflammation as an inciting cause, or potentially a primary arrhythmic disease is present. Full systemic evaluation is advised to rule out additional issues (AUS, advanced lab work such as tick titers, etc).

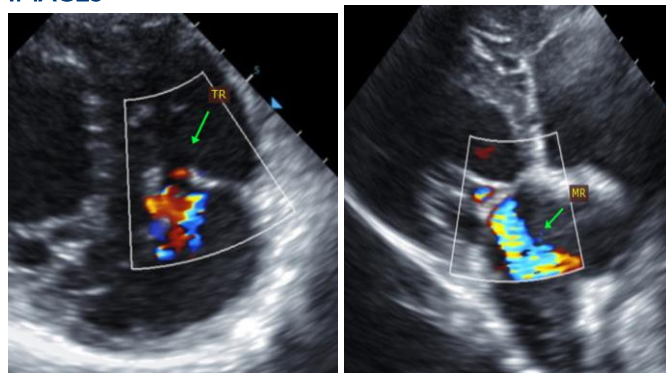
Anesthesia is not advised prior to further evaluation.

Plan: Consider a complete 6 lead tracing. Institute diltiazem 1-2mg/kg PO q8h. Full systemic work up as discussed.

A recheck ECG is recommended in 1-2 weeks. Target HR is 140-160bpm in hospital. Up-titrate to desired effect. If difficult to control, consider ancillary therapy with Digoxin.

A recheck echocardiogram is recommended in 6 months.

IMAGES





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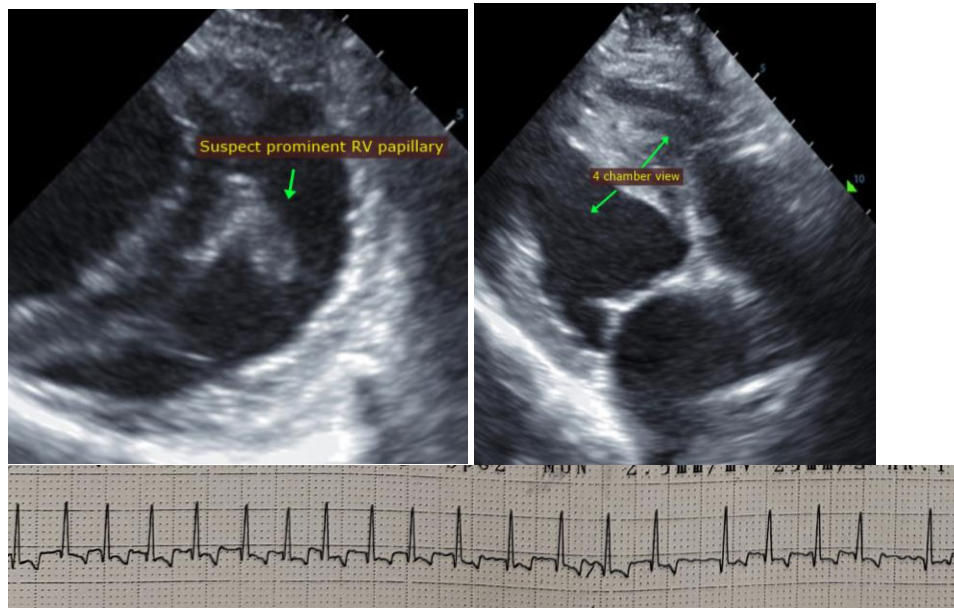
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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
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