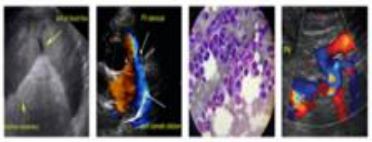
Mass Veterinary Services



SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
1-800-838-4268 info@sonopath.com SonoPath.com

PATIENT
Minnie Goodyear

SPECIES
Canine

BREED
Chihuahua

SEX
Female Spayed

AGE
14 years

WEIGHT
7.13lbs

INTERPRETED BY
Maggie Machen Lamy, DVM DACVIM (Cardiology)

IMAGING PERFORMED BY
Pamela Harrigan, RDCS

HOSPITAL NAME
Mass Veterinary Services

REFERRING VET
Dr. Masloski

INVOICE
22857

DATE
3/1/22

PRESENTING CLINICAL SIGNS

History: Minnie has been coughing x 6-8 months. No labored breathing. Chest films revealed cardiomegaly. Her appetite and activity level are normal. Minnie is flying in March. On auscultation: NSR, grade IV/VI murmur with PMI left apical area radiating to right with grade II/VI murmur noted on right, PSS, lung fields clear, no cough with tracheal pressure . BP: 140mmHg.
-Current medications: 1) Vet pro hip and joint 2) Hydrocodone with homatropine 5/1.5mg 1/2 tab twice a day

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, 20mm/mV. The average heart rate is 150bpm (range 71-188bpm). The underlying rhythm is sinus in origin, with a p for every QRS complex. Blocked P waves are noted throughout; singles only (low grade). Consistent with 2nd degree AV block. No premature beats, pauses or other dysrhythmias observed.
ECG diagnosis: Normal sinus rhythm with low-grade 2nd degree AV block; suspect early sinus node dysfunction.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and Doppler imaging is available.
Left ventricle: The LV diameter is normal with adequate myocardial function. LV wall thicknesses are normal.
Left atrium: The left atrium is mildly dilated.
Mitral valve: The mitral valve is diffusely thickened with minimal prolapse into the left atrial lumen. Moderate eccentric mitral regurgitation with a normal velocity.
Aortic valve/aorta: The aortic valve is normal in morphology and mobility. Normal aortic outflow velocity; laminar flow. No aortic insufficiency.
Right ventricle: Mild right ventricular enlargement.
Right atrium: Mild RA enlargment.
Tricuspid valve: The tricuspid valve appears thickened with septal prolapse and moderate tricuspid regurgitation. Velocity consistent with mild pulmonary hypertension.
Pulmonic valve/pulmonary artery: The pulmonic valve is normal in morphology and mobility. No pulmonic insufficiency. Normal RVOT velocity; laminar flow.
Pericardium/other: No pericardial or pleural effusion noted. No obvious cardiac masses.

2-Dimensional Measurements

Ao diam (cm)	1.3
LA diam (cm)	1.9
LA:Ao (Swe)	1.5
IVS thickness (cm)	0.6
LVID diastole (cm)	2.1
PW thickness (cm)	0.7
LVID systole (cm)	0.8
FS (%)	62

Doppler Measurements

PV Vmax (m/s)	0.93
AoV Vmax (m/s)	1.1
MR Vmax (m/s)	6.3
TR Vmax (m/s)	3.3
TR PG (mmHg)	43

INTERPRETATION OF THE FINDINGS

The cause of the murmur is chronic degenerative valve disease causing moderate mitral and tricuspid regurgitation. Lack of significant left atrial enlargement indicates the current risk for complication is low. Mild pulmonary hypertension is noted which should be

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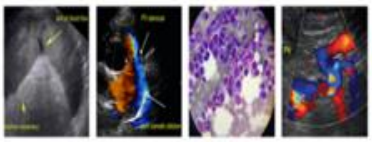

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monitored going forward in this coughing dog. The right atrium is enlarged indicating this may be a progressive issue. No additional issues are identified. Assessment of progression in the future will help predict long term prognosis, which is highly variable at this stage (B1).

Given these findings, it is reasonable to institute Pimobendan, given its benefit for both pulmonary hypertension and chronic valve disease. The cough is suspected to be **non-cardiac in origin** and other possibilities should be considered. This breed is predisposed to primary airway disease and Hydrocodone may be of some benefit.

The rhythm diagnosis is low-grade second-degree AV block. This indicates the majority of sinus p waves are conducting to the ventricle and resulting in ventricular contraction; however, frequent P waves are blocked at the level of the AV node. The diagnosis of type I (elongating PR interval, generally benign and caused by high vagal tone) versus type II (consistent PR interval, due to conduction disease) is important, as type I is typically benign. Type I block will resolve with activity or atropine while type II block is unlikely to respond normally to an atropine challenge, and often can lead to life threatening anesthetic complications such as hypotension, bradycardia and sinus arrest (without a normal response to interventional drugs). What is seen in this tracing is most consistent with type II, which is concerning in this senior dog, although an Atropine Challenge is typically considered. In this particular case, the resting heart rate is elevated which poses some risk for administration of the drug (and leads to suspicion of type II block). As an alternative, a holter monitor is strongly recommended to ensure no prolonged pauses are identified.

Regardless of academic diagnosis, the rate and rhythm seen here is unlikely to cause clinical signs and no treatment is indicated. That being said, anesthesia is not advised without further evaluation. Prognosis is open, as the clinical impact of this finding long term is unknown (i.e., progression to causing clinical signs or a subclinical issue).

Given that this patient is being screened prior to air travel, there are some concerns. Risk for an adverse event during a stressful trip is elevated in this case and should be avoided if possible. If elect to travel, ideally institute Pimobendan and further evaluate the arrythmia prior to proceeding.

RECOMMENDATIONS

- Recommend a holter monitor as discussed.
- Institute Pimobendan 0.3mg/kg PO q12h.
- Anesthesia is not advised.
- Monitor for any development of cough, labored breathing or exercise intolerance.

PLAN

- Recheck ECG pending results of the holter monitor, if elected.
- If declined, recommend recheck echocardiogram and ECG in 6 months, sooner if any syncope is noted at home.

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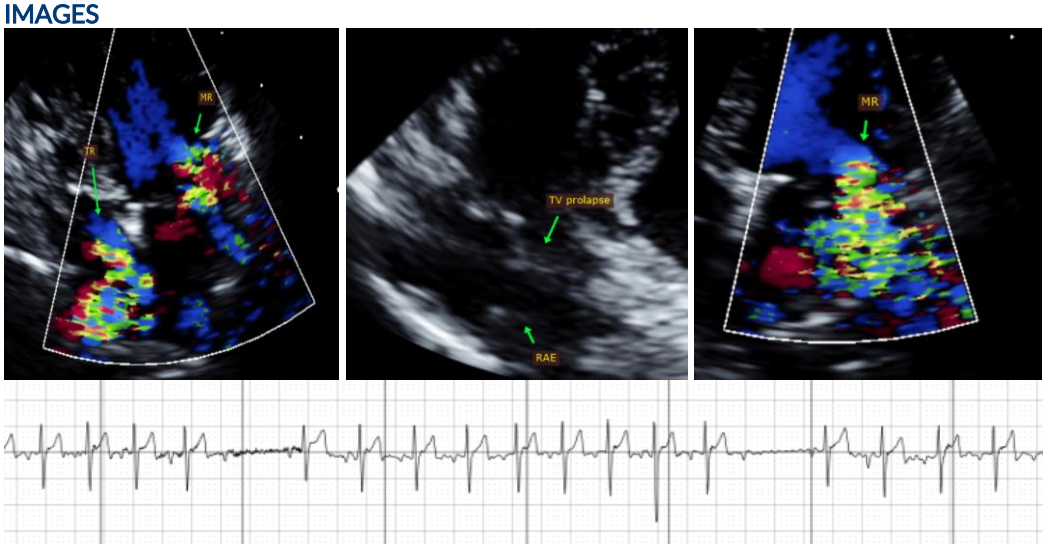
IMAGES



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. 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

Echocardiogram performed by: Pamela Harrigan, RDCS
Pet Animal Ultrasound Service (4paus.com)