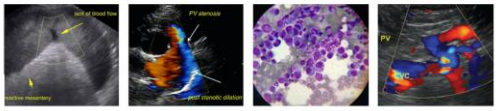
Mass Veterinary Specialty Services
1-413-734-1292



SonoPath
Clinical Sonography & Telecytology
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PATIENT
Vespa Mulvaney

SPECIES
Canine

BREED
Labrador Retriever Mix

SEX
Female Spayed

AGE
10 years

WEIGHT
51lbs

INTERPRETED BY
Maggie Machen Lamy, DVM DACVIM (Cardiology)

IMAGING PERFORMED BY
Pamela Harrigan, RDCS

HOSPITAL NAME
Mass Veterinary Specialty Services

REFERRING VET
Dr. Masloski

INVOICE
20562

DATE
8/17/21

PRESENTING CLINICAL SIGNS

History: Vespa was seen at ER for a rapid heart rate and panting in early July. She was noted to have an arrhythmia at that time along with a low phosphorus and potassium level. She was then seen at Angell on the 10th of July with the same chief complaint. An echocardiogram revealed mild TR with no right sided enlargement; systemic hypertension (190 mmHg). A repeat of her lab work revealed a mild hyperalbuminemia. An EKG reported a narrow complex tachycardia (sinus tach suspected) with frequent VPC's, bigeminy, rare couplets with a LBBB pattern. Vespa was discharged with no medications. Vespa has a good appetite but is finicky. She does have some exercise intolerance noted in the past on long walks. CV/RESP: arrhythmia with periods of tachycardia interspersed with occasional dropped beats, no murmurs noted, pulses strong but not synchronous, lung fields clear BP: 160mmHg x 4. No medications. *No sedation.
-Pertinent previous echo findings (4/9/21): LA 2.54 cm; LA:Ao 1.10; LV 3.28 cm; FS 27%; trace TR (2.64 m/s); no MR.

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, 10mm/mV. The average heart rate is 180bpm (range 170-190bpm). The underlying rhythm is sinus in origin, with a p for every QRS complex and vice versa. Frequent isolated VPCs throughout, firing in a tri and quadrigeminal pattern. Single beats only and monomorphic in appearance. No couplets, triplets or runs of VT are appreciated. No supraventricular premature beats, pauses or other dysrhythmias observed.
ECG diagnosis: Sinus tachycardia with frequent isolated VPCs.

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 normal.
Mitral valve: The mitral valve is normal with no MR.
Aortic valve/Aorta: The aortic valve is normal with normal mobility. Normal aortic outflow velocity; laminar flow. Mildly dilated aortic root. No aortic insufficiency.
Right ventricle: Normal right ventricular diameter and morphology indicating no overt evidence of pulmonary arterial hypertension.
Right atrium: Normal RA dimension.
Tricuspid valve: The tricuspid valve appears normal with trace tricuspid regurgitation. Normal velocity.
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.

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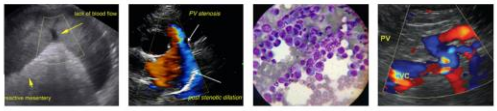

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2-Dimensional Measurements

Ao diam (cm)	2.7
LA diam (cm)	2.7
LA:Ao (Swe)	1.0
IVS thickness (cm)	0.94
LVID diastole (cm)	3.0
PW thickness (cm)	0.90
LVID systole (cm)	2.1
FS (%)	30

Doppler Measurements

PV Vmax (m/s)	0.97
AoV Vmax (m/s)	1.5
MR Vmax (m/s)	NA
TR Vmax (m/s)	2.4
TR PG (mmHg)	22

INTERPRETATION OF THE FINDINGS

Overtly normal cardiac structure and function. No structural issues or cardiac tumors are identified. The aortic root is mildly dilated; however, the reported blood pressure today is reasonable. No additional issues are identified, and these findings are largely similar to what was noted previously.

Isolated VPCs persist on the ECG. No obvious supraventricular arrythmias are noted; however, there is a sinus tachycardia present (previously suspected as well). VPCs are ectopic beats generated from abnormal conductive or fibrotic tissue in the ventricles of the heart muscle, and even frequent single VPCs will often cause no clinical signs in dogs. When sustained however, ventricular tachycardia can lead to symptoms such as lethargy and collapse.

VPCs are a very non-specific finding. They can be primary in origin (arrhythmic disease; a rule out diagnosis), develop secondary to significant cardiac disease (not present in this study), or be extra-cardiac in origin, i.e., due to pain, stress, inflammation, cancer, GI disease, DIC/sepsis, etc. In this senior large breed dog without structural cardiac disease, ruling out all differentials is recommended. The abdominal ultrasound, full lab work, etc. is recommended. Unfortunately, there is always an elevated risk for collapse and sudden death in any arrhythmic patient, and even on medications this risk unfortunately still persists.

In addressing arrhythmias in dogs, we must not only consider why they are happening as above, but also whether or not treatment is warranted. Given what is seen here, which is actually a mild improvement compared to the prior report, I still would not recommend medications at this time. Consider application of a holter monitor prior to determining If therapy is warranted, particularly if the symptoms are suspected to be related (unlikely given the chronicity). A holter will tell us the frequency and complexity of the rhythm over 24 hours of normal activity. An alternative approach would be to simply monitor at home for symptoms and utilize a holter monitor should the patient begin to experience clinical signs such as lethargy or collapse, which is also reasonable. Discussion with the owner is advised.

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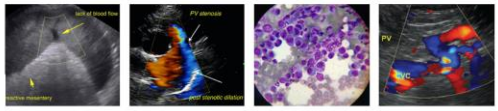

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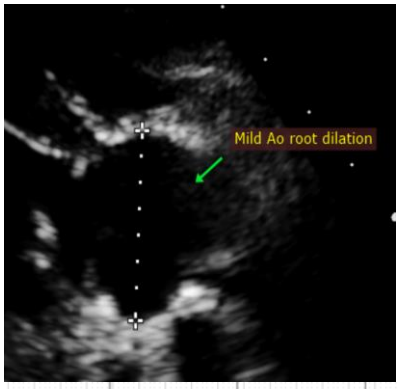
RECOMMENDATIONS

- No cardiac medications are clearly indicated at this time.
- Consider holter monitor as discussed.
- Consider full systemic evaluation.
- Fish oil supplementation is recommended for dogs with arrhythmias (1000-2000mg of omega 3 and 6 once to twice daily).
- If further evaluation is not performed, anesthetic risk is considered moderately elevated. Avoid ketamine, telazol, dexdomitor (or other alpha-2 agonists) and acepromazine. Recommend having lidocaine CRI available for use in the event of worsening ventricular arrhythmias under anesthesia (CRI 50—75mcg/kg/min).
- Monitor at home for collapse, exercise intolerance, and/or lethargy.

PLAN

- If a holter monitor is elected, this will dictate whether additional therapy is needed and follow up protocol. If a holter is declined, recommend recheck ECG in 4-6 months.

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)