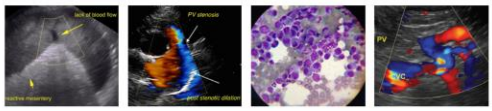
PAUS
Pet Animal Ultrasound Service
4paus.com 781-635-5677



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

PATIENT
Mac Miller

SPECIES
Canine

BREED
Golden Retriever

SEX
Male Neutered

AGE
9 years

WEIGHT
71lbs

INTERPRETED BY
Maggie Machen Lamy, DVM DACVIM (Cardiology)

IMAGING PERFORMED BY
Pamela Harrigan, RDCS

HOSPITAL NAME
Falmouth Animal Hospital

REFERRING VET
Dr. Hauser

INVOICE
26682

DATE
10/3/22

PRESENTING CLINICAL SIGNS

History: Recheck echocardiogram and AUS. VPCs, historical. Splenomegaly, subjective, mild, on prior AUS 1/31/22 (R. McKenzie, Daniel, DVM, DABBVP) Currently, doing well. Needs anesthesia for mass removal and dental procedure. BP: 140, 142mmHg
-Pertinent previous echo findings (1-31-22 Scott Forney, DVM, DACVIM - Cardiology): LA 2.7 cm, LA: Ao 1.22, LV 3.93 cm, normal LA size, trace MR. Normal cardiac structure and function.
* Sedated with Alfaxalone/Butorphanol.

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 100bpm (range 78-125bpm). The rhythm is sinus in origin, with a p for every QRS complex. P and QRS morphologies are positive. Isolated VPCs are seen throughout; primarily singles with interpolated beats. A third QRS morphology is present (see below) with a narrow complex and without an obvious P wave or significant prematurity (instantaneous HR 125bpm). No supraventricular premature beats, pauses or other dysrhythmias observed.
ECG diagnosis: Normal sinus rhythm with isolated VPCs.

ECHOCARDIOGRAM FINDINGS

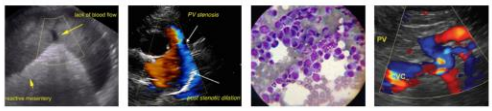
2D, m-mode, color flow and Doppler imaging is available.
Left ventricle: The LV diameter is normal with adequate myocardial function. LV wall thicknesses are normal.
Left atrium: The left atrium is normal.
Mitral valve: The mitral valve is normal with no MR.
Aortic valve/Aorta: The aortic valve is normal with normal mobility. Normal aortic outflow velocity; laminar flow. 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 trivial tricuspid regurgitation.
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)	2.2
LA diam (cm)	2.6
LA:Ao (Swe)	1.2
IVS thickness (cm)	1.0
LVID diastole (cm)	4.3
PW thickness (cm)	1.0
LVID systole (cm)	2.6
FS (%)	40

Doppler Measurements

PV Vmax (m/s)	0.94
AoV Vmax (m/s)	1.7
MR Vmax (m/s)	NA
TR Vmax (m/s)	NA
TR PG (mmHg)	NA



PATIENT
Mac Miller

SPECIES
Canine

BREED
Golden Retriever

SEX
Male Neutered

AGE
9 years

WEIGHT
71lbs

INTERPRETED BY
Maggie Machen Lamy, DVM DACVIM (Cardiology)

IMAGING PERFORMED BY
Pamela Harrigan, RDCS

HOSPITAL NAME
Falmouth Animal Hospital

REFERRING VET
Dr. Hauser

INVOICE
26682

DATE
10/3/22

INTERPRETATION OF THE FINDINGS

Overtly normal cardiac structure and function. Previously noted trace MR is not appreciated; however, a small tricuspid leak is noted. No structural issues or cardiac tumors are identified.

Isolated VPCs are confirmed on the ECG, as were previously documented. The abnormal beats are single only and monomorphic in appearance. A third QRS morphology is seen which is of unknown origin (see description above). The atypical beat does not have an apparent P wave, nor are the beats premature making them likely hemodynamically insignificant. Further comment cannot be made without a 6 lead tracing.

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.

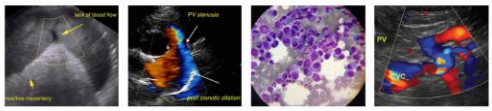
VPCs are a very non-specific finding. They can be primary in origin (arrhythmic disease; a rule out diagnosis), develop secondary to significant cardiac disease (not present in this study), or be extra-cardiac in origin, i.e., due to pain, stress, inflammation, cancer, GI disease, DIC/sepsis, etc. In this senior dog without structural cardiac disease, ruling out all differentials can be considered. 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 low markers of malignancy, consider application of a holter monitor prior to determining If therapy is warranted. In an asymptomatic dog however, suspicion is low. 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.

RECOMMENDATIONS

- No cardiac medications are clearly indicated at this time.
- Consider a 6 lead tracing.
- Consider holter monitor as discussed.
- Consider full systemic evaluation if not already performed.
- 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.

PAUS
Pet Animal Ultrasound Service
4paus.com 781-635-5677



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

PATIENT
Mac Miller

SPECIES
Canine

BREED
Golden Retriever

SEX
Male Neutered

AGE
9 years

WEIGHT
71lbs

INTERPRETED BY
Maggie Machen Lamy, DVM DACVIM (Cardiology)

IMAGING PERFORMED BY
Pamela Harrigan, RDCS

HOSPITAL NAME
Falmouth Animal Hospital

REFERRING VET
Dr. Hauser

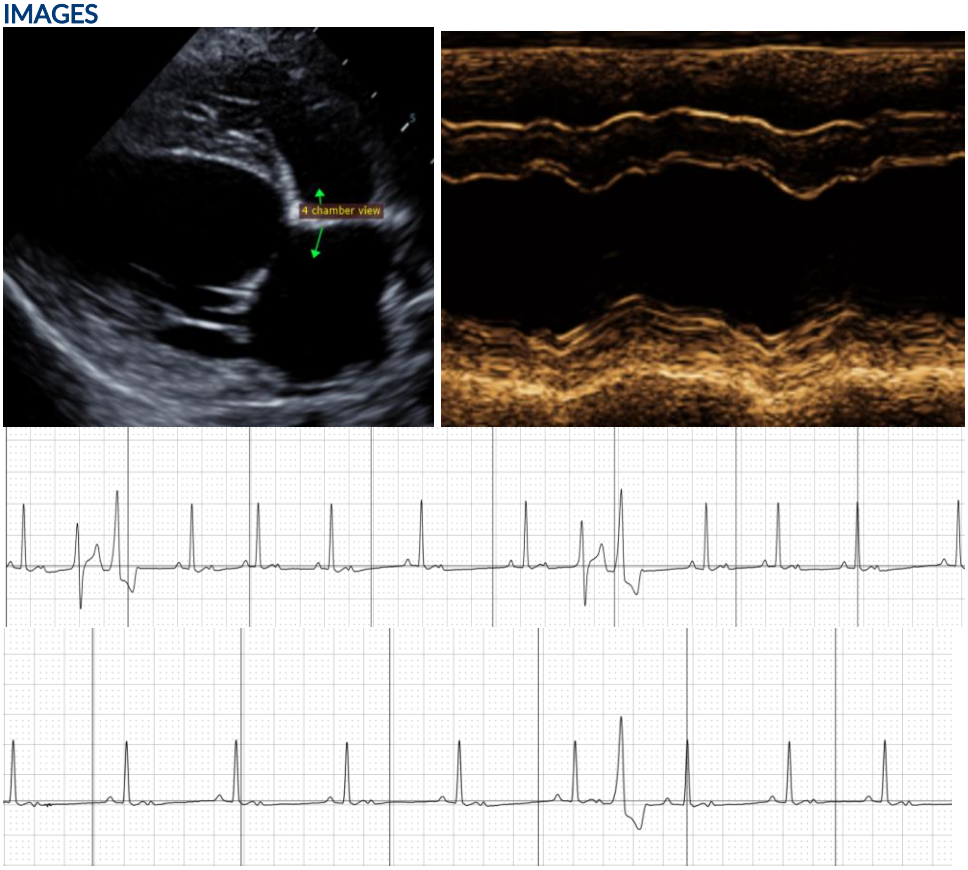
INVOICE
26682

DATE
10/3/22

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.
- A recheck echocardiogram is recommended in 1 year, sooner if a murmur or any clinical signs arise.

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