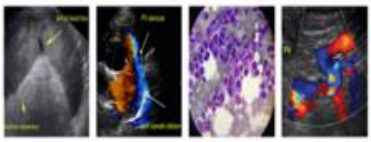
Mass Veterinary Services



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

PATIENT
Freddie Sanetti

SPECIES
Canine

BREED
Labrador Retriever Mix

SEX
Male Neutered

AGE
6 years

WEIGHT
55.5lbs

INTERPRETED BY
Maggie Machen Lamy, DVM DACVIM (Cardiology)

IMAGING PERFORMED BY
Pamela Harrigan, RDCS

HOSPITAL NAME
Mass Veterinary Services

REFERRING VET
Dr. Masloski

INVOICE
28421

DATE
1/18/23

PRESENTING CLINICAL SIGNS

History: Freddie was diagnosed with a VSD as a young dog with previous owner. Current owner unsure of where or when (adopted at ~ 2 years of age). He is a very mellow dog. Good appetite. On exam: NSR, grade IV/VI murmur with PMI basilar area, PSS, lung fields clear, mm pink, moist, CRT<2. BP: 180mmHg x 5. No medications. *No sedation for study.

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 150bpm with a largely regular rhythm. The rhythm is sinus in origin, with a p for every QRS complex and vice versa. P and QRS morphologies are positive. Isolated VPCs throughout; singles only, monomorphic. No supraventricular ectopic beats, pauses or 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. A small perimembranous ventricular septal defect (VSD) is visualized.The flow is left to right; max velocity >5.8m/s.
Left atrium: The left atrium is normal.
Mitral valve: The mitral valve is normal with no mitral regurgitation.
Aortic valve/aorta: The aortic valve is normal in morphology and mobility. Normal aortic outflow velocity; laminar flow. No aortic insufficiency.
Right ventricle: The RV appears normal with no evidence of hypertrophy.
Right atrium: Normal RA dimension.
Tricuspid valve: The tricuspid valve appears normal with no tricuspid regurgitation.
Pulmonic valve/pulmonary artery: The pulmonic valve is normal in morphology and mobility. Trivial 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)	2.4
LA diam (cm)	2.8
LA:Ao (Swe)	1.2
IVS thickness (cm)	0.9
LVID diastole (cm)	3.9
PW thickness (cm)	0.9
LVID systole (cm)	2.3
FS (%)	

Doppler Measurements

PV Vmax (m/s)	1.4
AoV Vmax (m/s)	1.7
MR Vmax (m/s)	NA
TR Vmax (m/s)	NA
TR PG (mmHg)	NA

INTERPRETATION OF THE FINDINGS

The cause of the murmur is a perimembranous ventricular septal defect (VSD). The defect is small in dimension, with high velocity left to right flow. There is no evidence of left heart volume overload or relative pulmonic stenosis at this time. Assessment of progression in the future will help predict long term prognosis, which is generally good with this size defect. Most small congenital shunts are able to live a normal life free of medications; however, periodic monitoring is advised.

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Isolated VPCs are confirmed on the ECG. 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 (minimal present in this study), or be extra-cardiac in origin, i.e., due to pain, stress, inflammation, cancer, GI disease, DIC/sepsis, etc. Even with a small VSD, this is not sufficient to fully explain these abnormal beats. If elected, recommend ruling out all differentials can be considered through an abdominal ultrasound, full lab work, etc. 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.

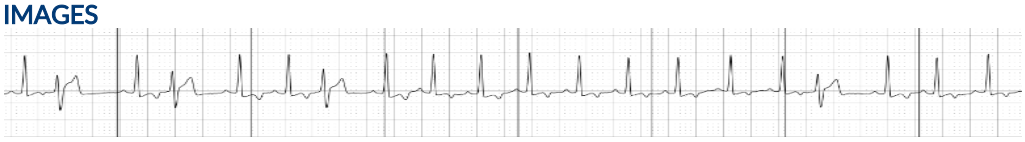
RECOMMENDATIONS

- No medications are indicated.
- Consider further evaluation of the arrhythmia through a holter and systemic screening.
- Reassess BP to determine persistence/need for medication.
- Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.
- Anesthetic risk is considered mildly elevated if needed. Cardiac protective drug choices (opioid/benzodiazepine premedication, propofol or alfaxalone induction, isoflurane gas) are recommended. Pre-oxygenate for 5-10 minutes prior to induction. Monitor for arrhythmias, hypotension, and hypoxia both intra and post-operatively and intervene as necessary. Mild IV fluid restriction is recommended to avoid fluid overload. Avoid heart rate stimulating drugs such as atropine unless clinically indicated.
- Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes.

PLAN

- Recommend conservative monitoring with a recheck echocardiogram in 12 months, sooner if any development of clinical signs.

IMAGES



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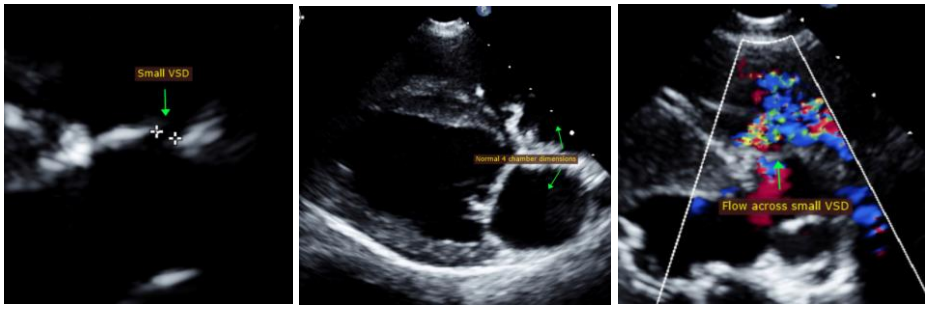

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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
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)