



PATIENT

Shop Dog
Weinheimer

SPECIES

Canine

BREED

Labrador Retriever

SEX

Male Intact

AGE

12 years

WEIGHT

96lbs

INTERPRETED BY

Maggie Machen
Lamy, DVM, DACVIM
(Cardiology)

IMAGING PERFORMED BY

Sara Hansen

HOSPITAL NAME

Sutherland Veterinary
Hospital

REFERRING VET

Dr. Herrera

INVOICE

25185

DATE

7/6/22

PRESENTING CLINICAL SIGNS

History: Multiple episodes of collapse with minimal exertion. Normal thoracic radiographs. No audible murmur. ECG: Reveals large number of VPC complexes. BP: 168, 181, 185mmHG.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.
 Normal cardiac silhouette. No obvious evidence of CHF.

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

A brief single lead ECG is available; 25mm/s, 10mm/mV. The average heart rate is 110bpm (range 100-125bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. Isolated VPCs throughout; 4 in total, monomorphic, singles only. No supraventricular premature beats, pauses or dysrhythmias observed.
 ECG diagnosis: Normal sinus rhythm with isolated VPCs.

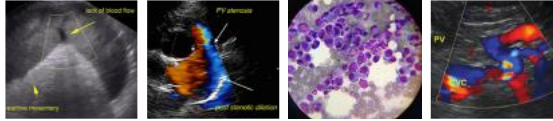
ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. The mitral valve appears normal in form and function, with no obvious prolapse into the left atrial lumen. There is trace central MR present. Normal velocity. Normal left atrial dimension. Normal LV diameter with adequate myocardial function. Normal LV wall thickness. The tricuspid valve appears normal in form and function. Normal right atrial and ventricular diameter and morphology indicating no overt evidence of pulmonary arterial hypertension or right heart compensation. Trivial tricuspid regurgitation. The aortic valve is normal in morphology and mobility. No subvalvular ridge present, normal velocity. No aortic insufficiency. Normal pulmonic valve with trivial pulmonic insufficiency seen. No pericardial or pleural effusion noted. No obvious cardiac tumors.

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	4.6	NA	NM	1.2	29	55	0.16
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	98	1.6	1.4	43.5	3.2	4.7	3.3
*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)
				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)

Adapted from June Boon, Veterinary Echocardiography, 1998
 Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435



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Hansson et al, Vet Rad and Ultrasound 2002	25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995	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)
	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

Overtly normal geriatric cardiac structure and function. Equivocal leaks are noted, which appear physiologic (i.e., unlikely to progress) at this time. Monitoring for progression is advised going forward. Regardless, the amount of abnormality seen on this exam does not definitively explain the collapse episodes.

The ECG confirms isolated VPCs. Ventricular premature contractions (VPCs) are 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 due to significant cardiac disease (not identified in this study) or be extra-cardiac in origin; i.e., due to pain, stress, inflammation, cancer, GI disease, DIC/sepsis, etc. Regardless of cause, there is always an elevated risk for collapse and sudden death in any arrhythmic patient, and even on medications this risk still persists. When VPCs are found, two things should be assessed: why they are occurring (extra-cardiac or primary arrhythmic causes suspected) and if they require therapy. Today's echo findings are not enough to explain the VPCs or collapse episodes described, and other contributing causes should also be ruled out. What is difficult is the VPCs may be secondary to some neurologic pathology, or may indicate a more malignant arrhythmic issue such as VT. Further systemic and neurologic workup including AUS is advised to be thorough. That being said, even with only single VPCs appreciated, it is still possible this patient had arrhythmogenic syncope (ventricular tachycardia) and a holter monitor is highly recommended as the next step to allow monitoring of the rhythm throughout 24 hours of a normal day and help determine if treatment is indicated. If this is declined or not possible and no alternative explanation is found, consider use of Sotalol although this is not ideal. Discussion with the owner is advised.

Fish oil supplementation is recommended for dogs with arrhythmias (1000mg of omega 3 and 6 once to twice daily as tolerated).

Monitor at home for collapse, exercise intolerance, and/or lethargy. If a holter monitor is elected, this will dictate whether therapy is needed for the arrhythmia and follow up protocol. Mild activity restriction is advised.

PLAN

Holter monitor and further systemic evaluation recommended as discussed. A neurologic consultation is reasonable as well. If declined and no alternative explanation is found, consider institute Sotalol 1-2mg/kg PO q12h. If syncope persists despite therapy, further evaluation must be performed.

If this alternative is elected, a recheck ECG/holter in 1-2 weeks to assess response. A recheck echocardiogram is recommended in 6-12 months to screen for any development of progressive issues.



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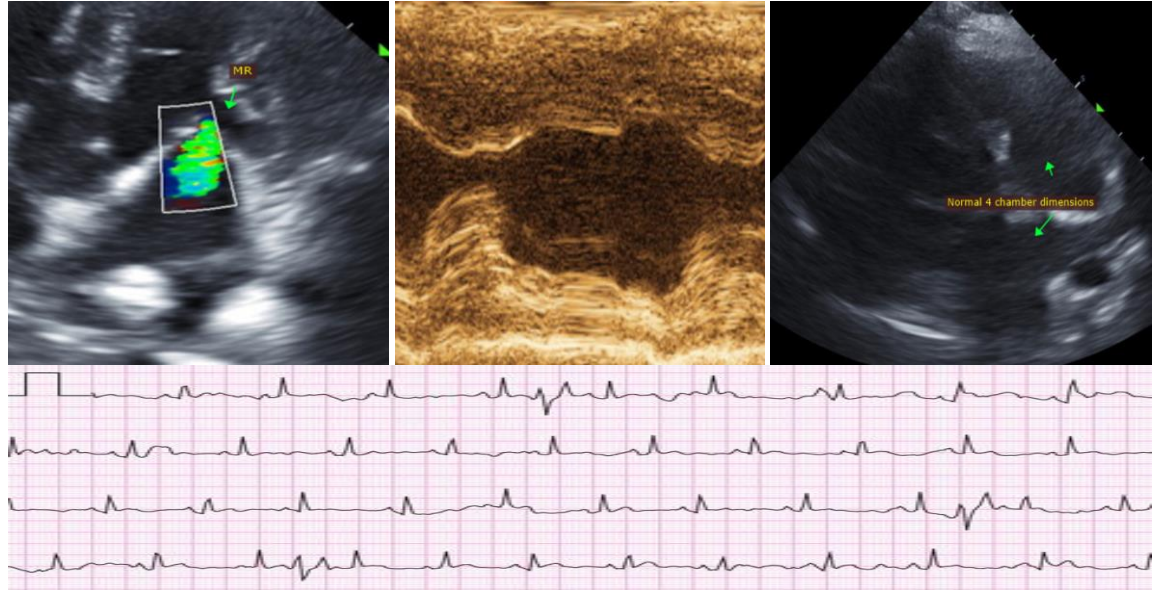
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IMAGES



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
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