



PATIENT

Norman Clark

SPECIES

Canine

BREED

Miniature Schunauzer

SEX

Male Neutered

AGE

15 years

WEIGHT

19lbs

INTERPRETED BY

Maggie Machen
 Lamy, DVM, DACVIM
 (Cardiology)

IMAGING PERFORMED BY

Sara Hansen

HOSPITAL NAME

Q Street Animal
 Hospital

REFERRING VET

Dr. Bretscheider

INVOICE

27134

DATE

10/26/22

PRESENTING CLINICAL SIGNS

History: Coughing for a week. Chronic heart murmur. Collapse episode 2 days ago. Stopped coughing right after starting Vetmedin. On exam also noted an arrhythmia. Normal BP.
 -Current Medications: Vetmedin 2.5mg BID.
 -Pertinent abnormal PE/Chem/CBC/UA Results: Moderate elevations in Alk Phos 957, ALT 293, BUN 54, Creat 1.1

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; 50mm/s, 10mm/mV. The average heart rate is 120bpm (range 107-130bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. Isolated APCs are seen throughout. No ventricular premature contractions, pauses or other dysrhythmias observed.
 ECG diagnosis: Normal sinus rhythm with isolated APCs.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets with no obvious prolapse into the left atrial lumen. Severe eccentric mitral regurgitation with severe left atrial dilation. Mild LV dilation with adequate myocardial function. The tricuspid valve appears mildly thickened with mild tricuspid regurgitation. TR velocity normal. Right heart is prominent. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities. Trace aortic and no pulmonic insufficiency. No pericardial or pleural effusion noted. No cardiac tumors observed.

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	6.5	2.0	1.6	2.4	57	88	0.13
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	NM	1.7	0.9	8.6	3.0	4.0	1.5
*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)
Adapted from June Boon, Veterinary Echocardiography, 1998 Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435 Hansson et al, Vet Rad and Ultrasound 2002 Bonagura et al. Echocardiography: principles of interpretation, Vet				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)
				25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
				30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)



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Clin North Am 15:1177, 1995	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

The cause of the murmur is chronic degenerative valve disease causing severe mitral and mild tricuspid regurgitation. Severe left atrial and ventricular enlargement indicate the risk for spontaneous congestive heart failure is elevated in this patient. A small aortic leak is noted, and a baseline blood pressure is recommended. No additional issues such as pulmonary hypertension or systolic dysfunction are noted.

Given the history, the cough is likely primary respiratory in origin. No mention of CHF is made on the films; however, the risk is elevated. Recommend cardiac supportive medications (Pimobendan, Benazepril, Spironolactone) and continued therapy for respiratory cough. Hydrocodone may be useful for any mechanical component not appreciated on the films (0.22mg/kg up to q4-6 hours PRN). Monitoring of sleeping breathing rates is recommended as the best way to screen for CHF at home.

Finally, the ECG does confirm the arrhythmia ausculted is due to premature beats, which are atrial in origin. APCs are generated from abnormal conductive or fibrotic tissue in the heart muscle, and even frequent single ectopy will rarely cause clinical signs in dogs. When sustained however, tachycardia can lead to symptoms such as lethargy and collapse.

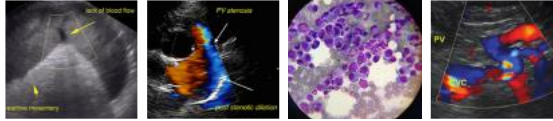
Ectopy is a very non-specific finding. They can be due to significant cardiac disease (as is seen in this study) or be extra-cardiac in origin; i.e., due to pain, stress, inflammation, cancer, GI disease, DIC/sepsis, etc. Given the degree of dilation seen here, the finding is likely due to a combination of structural cardiac disease and stress. Given only single beats and no history of collapse, no treatment is clearly indicated at this time. A holter monitor can be considered to understand the full extent of the arrhythmia outside the hospital. 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.

Omega fatty acid supplementation and mild salt restriction may also be of some long-term benefit. Monitor for development of a worsening cough, labored breathing, exercise intolerance or collapse episodes.

PLAN

Institute ACE-I (benazepril or enalapril) 0.5mg/kg PO q12h. Continue Pimobendan as prescribed. Institute Spironolactone 1-2mg/kg PO q12h. Consider hydrocodone with homatropine for QOL (up to 5-10mg PO up to q4-6 hours PRN).

A recheck echocardiogram and ECG is recommended in 4-6 months to screen for progression, sooner if clinical signs arise.



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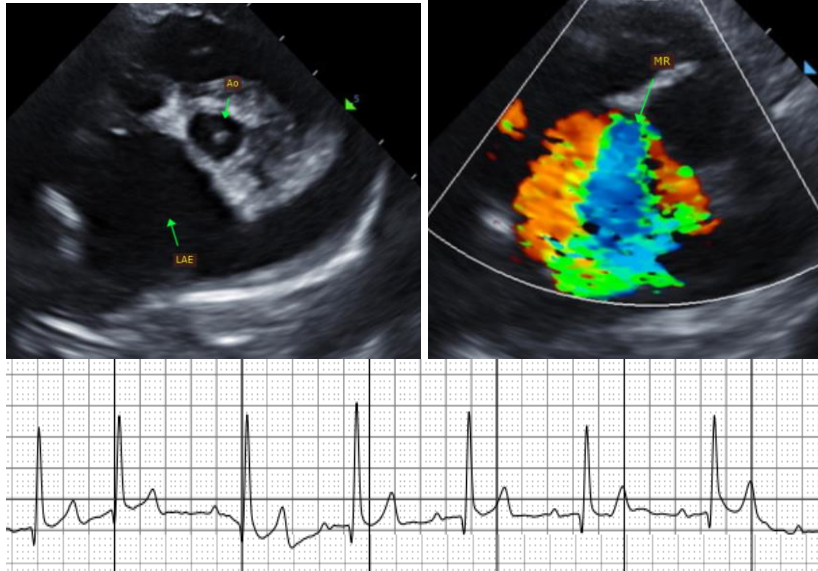
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IMAGES



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.

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