



PATIENT

Doogie Graves

SPECIES

Canine

BREED

Pomeranian Mix

SEX

Male Neutered

AGE

11 years

WEIGHT

25lbs

INTERPRETED BY

Maggie Machen Lamy,
DVM, DACVIM
(Cardiology)

IMAGING PERFORMED BY

Kelly Romero

HOSPITAL NAME

Midtown Veterinary
Midical Center

REFERRING VET

Dr. McCarthy

INVOICE

26771

DATE

10/6/22

PRESENTING CLINICAL SIGNS

History: New heart murmur. History of vestibular episodes. Patient was given butorphanol prior to the echo (for temperament) and he had a vestibular reaction to the medication. Recurrent vestibular episodes.

BP: 157mmHg.

ELECTROCARDIOGRAPHIC FINDINGS

A brief six lead ECG is available at 50mm/s; 5mm/mV. The average HR is variable as 2 sinus beats in a row are not seen. Underlying normal sinus rhythm with atrial bigeminy. A single couplet is observed. The P wave morphology is positive with a normal dimension. Normal PR. The QRS morphology is positive with normal dimension. MEA is shifted left. No ventricular ectopic beats, pauses or other dysrhythmias observed.

ECG diagnosis: Normal sinus rhythm with atrial bigeminy. Single atrial couplet.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets (anterior>posterior) with mild prolapse into the left atrial lumen. Moderate eccentric mitral regurgitation with moderate left atrial dilation. Normal MR velocity. Moderately increased LV diameter with hyperdynamic myocardial function. The tricuspid valve appears mildly thickened with mild to moderate tricuspid regurgitation. Normal velocity. Normal right atrial and ventricular diameter. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities. No aortic or 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	4.7	2.4	1.5	1.78	38	64	0.47
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	0.8		11.3	3.2	4.2	2.7
*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)
<i>*Note: All measurements based upon multi-modal images and methods. An average value is reported.</i>				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)
				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)

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 Clin North Am 15:1177, 1995



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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Chronic degenerative valve disease causing moderate mitral and mild tricuspid regurgitation. Moderate left atrial enlargement indicates there is relatively low risk for imminent complication, however risk for progression to spontaneous congestive heart failure in the future is elevated. No additional issues are identified.

Given the risk for progression and results of the EPIC trial, Pimobendan is indicated in this patient as below. Assessment of progression in the future will help predict long term outcome, however prognosis is guarded at this stage (B2).

The ECG does show an arrhythmia, with frequent atrial premature contractions (APCs) in primarily a bigeminal pattern. APCs are generated from abnormal conductive or fibrotic tissue in the atria of the heart muscle, and even frequent single APCs will often cause no clinical signs in dogs. When sustained however, supraventricular tachycardia can lead to symptoms such as lethargy and collapse. This ECG rules out atrial fibrillation as the cause of prior issues, although intermittent SVT remains possible (not seen here).

APCs are a very non-specific finding. They can be primary in origin, develop secondary to significant cardiac disease, or be extra-cardiac in origin; ie due to pain, stress, inflammation, cancer, GI disease, DIC/sepsis, etc. In this dog with only moderate structural changes, other possibilities should be considered (such as neurologic or systemic disease). My assumption in this case is the APCs are secondary rather than being the cause of vestibular episodes. Sustained SVT if present outside the hospital can lead to episodes; however, there is no evidence of this at this time. Certainly what is seen here would not cause any clinical issues.

While the frequency of APCs is concerning, the tracing is quite brief and the sonographer reports a primarily normal sinus rhythm during the study. No treatment is clearly indicated without sustained or complex arrhythmias (only isolated beats and one couplet seen). A holter monitor is recommended to understand the full extent of the rhythm, particularly should any clinical issues be noted such as lethargy or syncope.

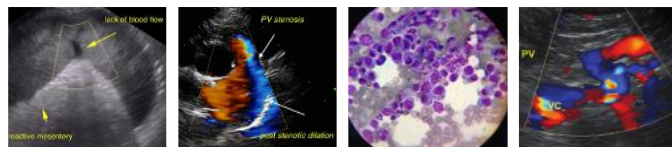
Omega fatty acid supplementation and mild salt restriction may also be of some long-term benefit. Monitor for development of a progressive cough, labored breathing, exercise intolerance or collapse episodes.

Once on the medication for 3-5 days, anesthetic risk is considered mildly elevated. Cardiac protective drug choices (opioid/benzodiazepine premedication, Propofol or alfaxalone induction, iso or sevo gas) are recommended. Monitor for arrhythmias, hypotension, and hypoxia both intra and post-operatively and intervene as necessary. Judicious IV fluid rates are recommended to avoid fluid overload. Avoid heart rate stimulating drugs such as atropine unless clinically indicated.

PLAN

Institute heart muscle support Pimobendan 0.25-0.3mg/kg PO q12h. Consider an extended ECG tracing or holter with systemic evaluation.

Recommend monitor for progression with a recheck echocardiogram in 6 months, sooner if any development of clinical signs.



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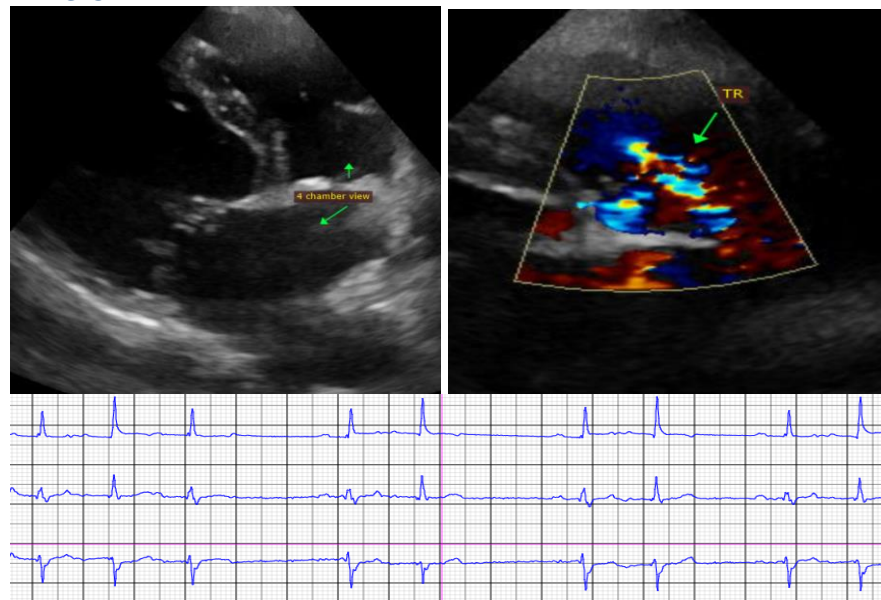
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IMAGES



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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