



PATIENT

Mactavish Cash

PRESENTING CLINICAL SIGNS

History: Heart murmur and syncope. Previous heart block diagnosis. Hypertension. BP (12/2022): 180/126, 181/109, 153/126, 202/174, 183/161mmHg. Renal disease.

SPECIES

Canine

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 at 50mm/s; 20mm/mV. The ventricular rate is 45bpm with some heart rate variability. P waves are unable to be visualized; however, high grade (2nd v 3rd degree) AV block is suspected. The QRS morphology is wide suggesting ventricular origin.

BREED

Collie Mix

ECG diagnosis: Suspect high grade AV block; rule out 2nd versus 3rd degree as p waves are low voltage and difficult to visualize consistently throughout.

SEX

Male Neutered

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Mild thickening of both mitral valve leaflets with no prolapse into the left atrial lumen. There is trace mitral regurgitation present with diastolic regurgitation seen. There is minimal left atrial enlargement. There is mild left ventricular dilation. Left ventricular systolic function is adequate during ventricular contraction. The aortic valve appears normal. The main pulmonary artery is normal in diameter. The pulmonic valve is normal in appearance. Mild right atrial and ventricular dilation (subjective). Normal thickening of the tricuspid valve with no TR. No pericardial/pleural effusion or cardiac masses are seen. Bradycardia with high grade heart block suspected throughout.

AGE

9 years

WEIGHT

40.3lbs

CARDIAC CHART

INTERPRETED BY

Maggie Machen Lamy,
DVM, DACVIM
(Cardiology)

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	NM	NA	1.0	1.3	29	50	0.83
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	1.5	1.1	18.3	3.0	4.2	3.0
*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)
*Note: All measurements based upon multi-modal images and methods. An average value is reported.				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

IMAGING PERFORMED BY

Dana Alterman,
RDCS, LVT

HOSPITAL NAME

Eubank Animal Clinic

REFERRING VET

Dr. Pauly

INVOICE

28794

DATE

2/6/23



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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Today's evaluation confirms a slow ventricular rate, most consistent with high grade second- or third-degree AV block as the cause of the clinical signs/syncope. There are various types of AV block with a range of clinical symptoms, from dogs who are asymptomatic to those that are collapsing at home. Most often AV block occurs due to age-related electrical system degeneration, although it can also be encountered with cardiac tumors, in younger dogs associated with idiopathic dysfunction, or with inflammatory diseases such as myocarditis or endocarditis. Systemic issues are also possible albeit rare, such as Addison's disease. Screening lab work may be useful if not recently performed.

Unfortunately, with high grade 2nd degree or 3rd degree block, medications are ineffective, and Atropine typically has little to no response. In this case with low voltage p waves, the diagnosis is suspect rather than definitive. It cannot be determined if any P waves are conducting (2nd degree block) or no (3rd degree block); however, **the treatment and prognosis is the same**. Following an atropine challenge and repeat ECG confirming little to no HR stimulation, the ideal treatment is placing a permanent cardiac pacemaker. Pacemaker implantation is fairly routine, minimally invasive, and in cases of uncomplicated heart block is very well tolerated and eliminates any clinical signs due to slow heart rate. No obvious contraindication to surgery is seen here with only mild structural changes and the procedure should be performed as soon as possible. Given that the patient is syncopal, if referral is declined euthanasia may have to be elected if quality of life suffers.

The prognosis with pacemaker implantation is generally good; however, patient will always be at risk for complications.

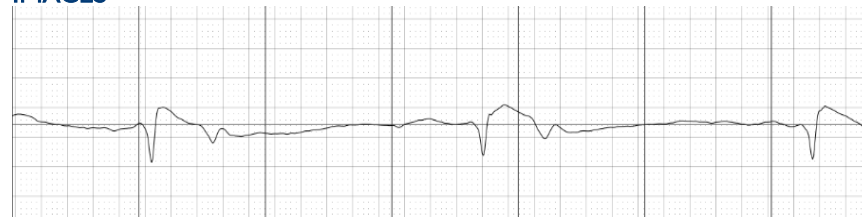
Until the HR is corrected, anesthesia carries high risk and should be avoided.

PLAN

Institute Pimobendan 0.3mg/kg PO q12h. Consider full lab work and systemic evaluation to screen for underlying issues. Repeat 6 lead ECG with increased sensitivity for further assessment of AV block would be ideal. An atropine challenge is recommended; administer 0.04mg/kg IV or IM and repeat ECG in 10 minutes. A negative/lack of response supports AV block, and immediate referral to a local Cardiologist for pacemaker consultation is recommended. If referral is declined and patient has deteriorating QOL despite medications, euthanasia should be considered.

If patient improves, a recheck echocardiogram in 6 months, sooner if issues arise.

IMAGES





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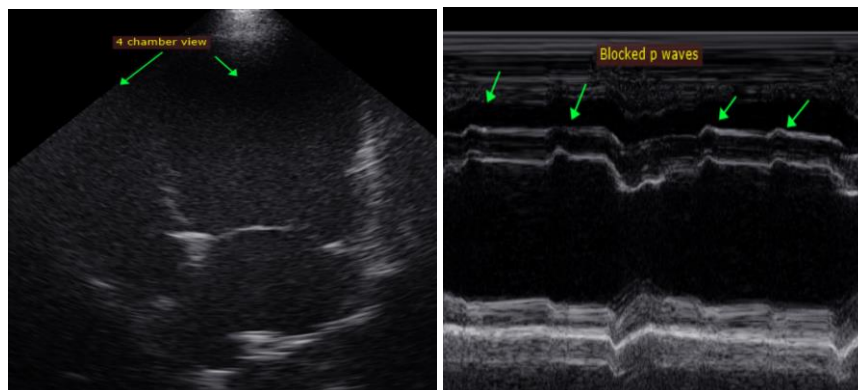
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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