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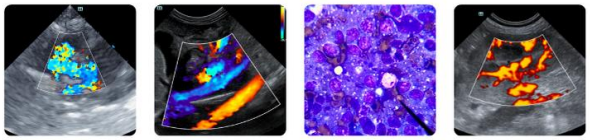


Clinical Sonography & Telecytology
Educational Teleconsultation Services™

PATIENT

Bunji Jawahir

SPECIES

Canine

BREED

Havanese

SEX

Male

AGE

9 months

WEIGHT

10lbs

INTERPRETED BY

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY

Melissa Weisman, DVM

HOSPITAL NAME

Minnesota Veterinary Ultrasound

REFERRING VET

Dr. Weisman

INVOICE

47862

DATE

5/14/26

PRESENTING CLINICAL SIGNS

History: Newly noted arrythmia 2 weeks ago; rechecked a few days later and still present. 1-minute standing ECG showed 2nd degree AV block. HR was 80bpm. At previous visit when arrhythmia was first noted HR was 140bpm. Another doctor briefly thought they potentially heard a grade 1-2 murmur in treatment but was unsure. Murmur wasn't noted on initial examination for either visit. History includes potential syncope-like exercise intolerance described by suddenly stopping during high energy play to rest or pant heavily but no outright syncope/feinting. Sedated with Gabapentin.

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

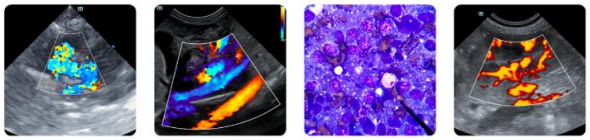
A video of an anesthesia monitor is included. The heart rate is not recorded; however, is estimated to be 80-100bpm. Frequent single blocked P waves with what appears to be 2:1 conduction. No escape beats or premature foci are seen.
ECG diagnosis: Normal sinus rhythm with low grade 2nd degree AV block.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Normal mitral valve leaflets with no prolapse into the left atrial lumen. No mitral regurgitation is seen, with a normal left atrial dimension. Normal LV diameter with adequate myocardial function. The tricuspid valve appears normal with no significant tricuspid regurgitation. Normal right atrial and ventricular diameter and morphology indicating no overt evidence of pulmonary arterial hypertension. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. No aortic and trace pulmonic insufficiency. No obvious congenital shunts or defects are observed. No pericardial or pleural effusion noted. No obvious cardiac masses.

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	NA	NA	NM	1.2	49	83	NM
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	90	1.0	0.8	4.5	1.3	2.1	1.1
*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 *Note: All measurements based upon multi-modal images and methods. An average value is reported. Adapted from June Boon, Veterinary Echocardiography, 1998				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)
				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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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	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)

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Overtly normal cardiac structural and function is identified. No significant valve leaks are appreciated, and flow through the great vessels is normal. No obvious congenital issues are seen and in the absence of a heart murmur structural disease is highly unlikely.

The rhythm diagnosis is low-grade second-degree AV block. This indicates the majority of sinus P waves are conducting to the ventricle and resulting in ventricular contraction; however, frequent P waves are blocked at the level of the AV node. The diagnosis of type I (elongating PR interval, generally benign and caused by high vagal tone) versus type II (consistent PR interval, due to conduction disease) is important, as type I is typically benign. Type I block will resolve with activity or atropine while type II block is unlikely to respond normally to an atropine challenge and often can lead to life threatening anesthetic complications such as hypotension, bradycardia and sinus arrest (without a normal response to interventional drugs). Given the format of a video recording, this is very difficult to decipher at this time.

An Atropine Challenge is recommended regardless as below (with no sedation on board). Pending results of the Atropine Challenge, a holter monitor may be indicated as the next step (i.e., if the response is abnormal). Referral should be considered as an alternative given the highly unusual presentation in this case (rarely seen in young dogs). Discussion is advised in this instance.

Regardless of academic diagnosis, the rate and rhythm seen here is unlikely to cause clinical signs and no treatment is indicated. That being said, anesthesia is not advised without further evaluation. Prognosis is open, as the clinical impact of this finding long term is unknown (i.e., progression to causing clinical signs or a subclinical issue).

No cardiac medications are indicated at this time.

Monitor for any development of cough, labored breathing or exercise intolerance.

Anesthesia is not advised prior to further workup.

PLAN

Recommend an Atropine Challenge. Administer Atropine IV or IM 0.04mg/kg and assess response. A normal response would be a heart rate >180bpm that sustains and maintains for >10 minutes (i.e., AV block resolves). An abnormal response warrants referral and/or a holter monitor application. If the Atropine Challenge is normal, consider evaluating the patient for causes of high vagal tone, such as neurologic, ocular or GI disease. In this instance, there is no cardiac contraindication for general anesthesia. Pre-medicate with Atropine and use as needed to

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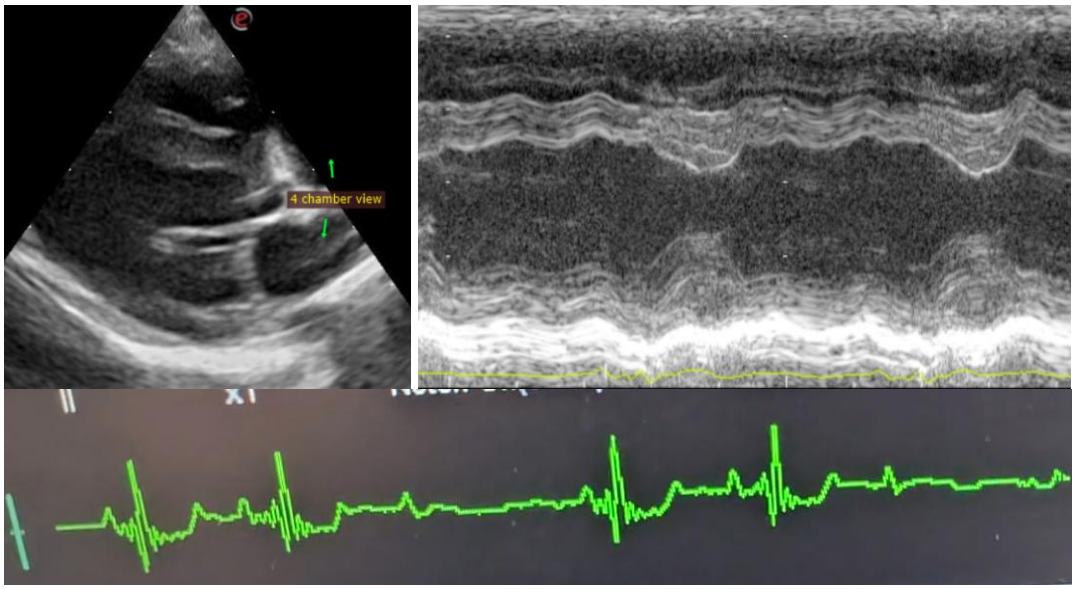
maintain heart rate. Recheck ECG pending results of further evaluation.

Recommend recheck echocardiogram in 12 months to screen for progression or development of concurrent cardiac disease that the preexisting murmur may mask.

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
Diplomate of the American College of Veterinary Internal Medicine (Cardiology)
info@sonopath.com