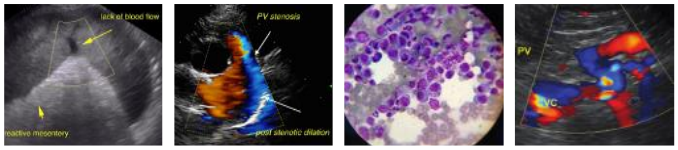
SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT
Hunter Neal

SPECIES
Canine

BREED
Basset Hound

SEX
Male

AGE
6 months

WEIGHT
33lbs

INTERPRETED BY
Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY
S. Doverspike, DVM

HOSPITAL NAME
Franklin Animal Clinic Inc

REFERRING VET
Dr. Doverspike

INVOICE
32387

DATE
8/16/23

PRESENTING CLINICAL SIGNS

History: Presented for routine castration with no known issues. *Was premedicated with Acepromazine 2.5mg/Atropine 0.14mg/Torb 2.5mg all given SQ. *Hunter seemed normal ~5minutes after sedation but ~10 minutes after sedation seemed much more sedate than would normally expect for our protocols. *~20 minutes after sedation, during blood draw for labs it was noted he was very pale compared to earlier and minimally/non responsive *IV Catheter placed and shock volume of 150ml saline bolused *Epinephrine 0.2ml given IV *Pulses were strong BUT bradycardia and irregular *Overall was slow to recover back to Pink MM and alert attitude The EKG's are after the epi was administered...Initially bradycardia w/ heart block... ~25 minutes after epi is when we noted the tachycardia runs of 175-230 bpm. but then returned to more normal rate Ultrasound done ~ 3 hours after this event...can still see irregular rhythm... Final U/S done ~6 hours after event. RELEVANT Hx: The owners note that at times Hunter acts sluggish and off at home...Not to the level of collapse but definitely not active like a puppy.
-Abnormal PE/Chem/CBC/UA Results: Labs were WNL.

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

Multiple single lead ECGs are submitted, all 50mm/s, 10mm/mV: during the event, 20 min after Epinephrine, and 6 hours post. The 6-hour post tracing is considered the baseline and will be evaluated first.

1) 6 hours post: The average heart rate is 150bpm (range 86-188bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. No ectopic beats, pauses or other dysrhythmias observed.
ECG diagnosis: Normal sinus rhythm with respiratory variation.

2) During the episode: The average heart rate is 100bpm (range 47-150bpm). While there is a p for every QRS complex, intermittent frequent 2nd degree AV block is noted (2:1). The PR interval does appear to slightly prolong prior to the blocked P waves, most consistent with type I. No ectopic beats or other dysrhythmias observed.
ECG diagnosis: Sinus bradycardia with low-grade 2nd degree AV block; suspect Wenkebach.

3) Post Epinephrine (20 minutes): The ECG shows a sinus tachycardia with a HR of 250bpm.

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 obvious mitral regurgitation with a normal left atrial dimension. Normal LV diameter with adequate myocardial function. The tricuspid valve appears normal with no 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 obvious aortic or pulmonic insufficiency. No pericardial or pleural effusion noted. No obvious cardiac masses.

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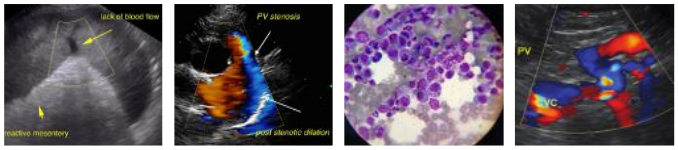

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CARDIAC CHART

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	1.0	1.2	42	80	0.25
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	1.3	1.1	15.0	2.3	3.6	2.1
*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				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

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Overtly normal cardiac dimensions and function, with no obvious dysfunction or dilation of the left heart. No significant valvular leaks are visualized, and no evidence of pulmonary hypertension. No congenital shunts or significant defects are appreciated.

Multiple ECGs are submitted showing bradycardia with AV block during sedation. While the heart rate did slow significantly, a positive response to Epinephrin is also documented. This suggests that an underlying conduction disorder is unlikely. True sinus node dysfunction would typically have a lackluster response to heart rate stimulants and is not documented here. Additionally, the ECG taken 6 hours post-event is unremarkable, although there is evidence of persistent high vagal tone. No further AV block or significant bradycardia is identified. These findings in total would suggest that the most likely explanation is the patient had an exuberant and unexpected reaction to sedatives. Consider screening for underlying issues, such as a liver shunt that may lead to this development. In an asymptomatic dog however, a simple sensitivity is most likely. If the patient has further bradycardia in the future (independent of sedation) and/or the patient continues to exhibit lethargy, a Holter monitor +/- an atropine challenge should be considered to further evaluate the health of the conduction system. Suspicion is low in this case.

Monitor for development of a heart murmur, cough, labored breathing, exercise intolerance or collapse episodes.

A recheck echocardiogram is recommended should a significant murmur develop, or signs of cardiac compromise be noted in the future.

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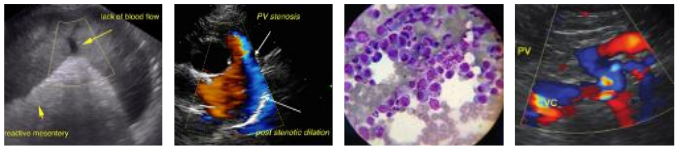

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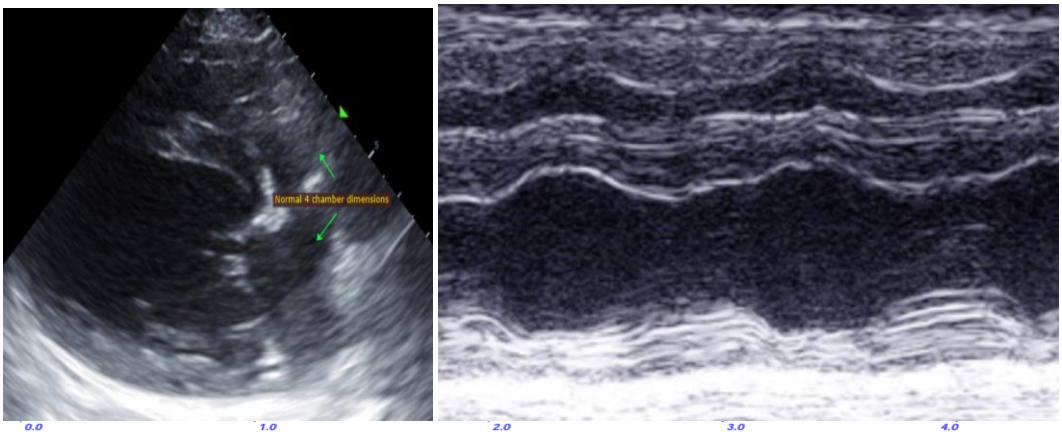
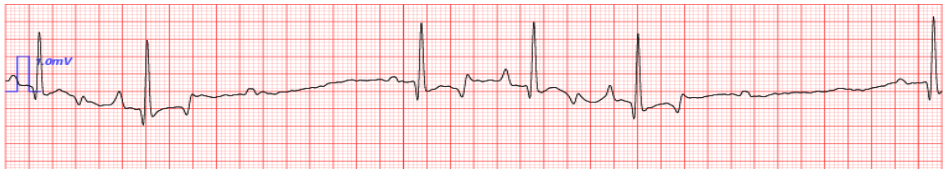
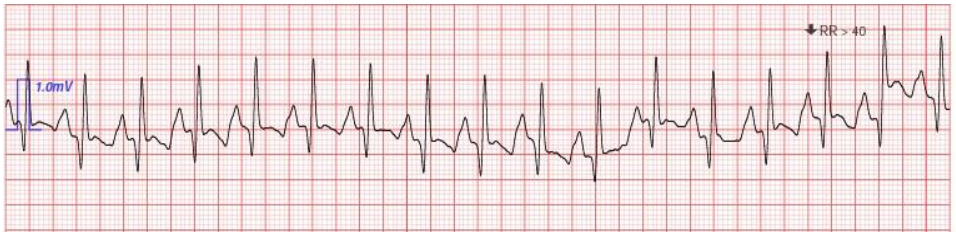
IMAGES

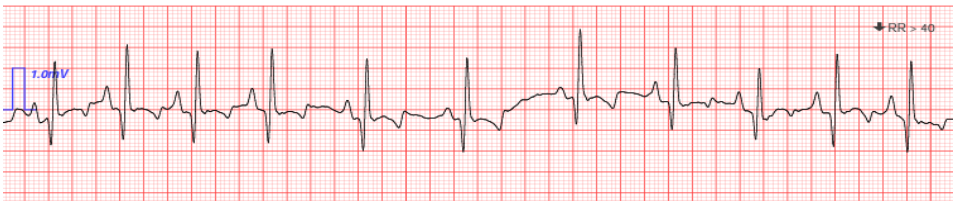




During



Epi



6h post

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