SonoPath
Clinical Sonography & Telecytology
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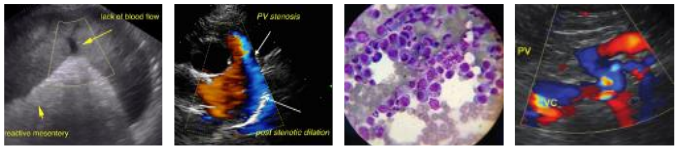

SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT
Bailey Cox

SPECIES
Canine

BREED
Shepherd Mix

SEX
Female Spayed

AGE
10 years

WEIGHT
69.7lbs

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

IMAGING PERFORMED BY
Dana Alterman, RDCS, LVT

HOSPITAL NAME
Eubank Animal Clinic

REFERRING VET
Dr. Nolan

INVOICE
31758

DATE
7/10/23

PRESENTING CLINICAL SIGNS
History: Arrhythmia. Rule out seizure vs syncope.

ELECTROCARDIOGRAPHIC FINDINGS
A six lead ECG is available at 25mm/s; 10mm/mV. The average heart rate is 150bpm (range 115-166bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P wave morphology is positive with a normal dimension. Normal PR. The QRS morphology is positive with normal dimension. MEA is normal. Isolated VPs throughout; singles only with an RBBB morphology. No ectopic beats, pauses or dysrhythmias observed.
ECG diagnosis: Normal sinus rhythm with respiratory variation. Isolated monomorphic VPCs.

ECHOCARDIOGRAM FINDINGS *image quality limited by patient confirmation
2D, m-mode, color flow and doppler imaging is available. The mitral valve appears normal in form and function, with no obvious prolapse into the left atrial lumen. No MR present. Normal left atrial dimension. Normal LV diameter with adequate myocardial function. Normal LV wall thickness. The tricuspid valve appears normal in form and function. Normal right atrial and ventricular diameter and morphology indicating no overt evidence of pulmonary arterial hypertension or right heart compensation. No tricuspid regurgitation. The aortic valve is normal in morphology and mobility. No subvalvular ridge present, normal velocity. No aortic insufficiency. Normal pulmonic valve with trivial pulmonic insufficiency seen. No pericardial or pleural effusion noted. No obvious cardiac tumors.

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	1.3	26	51	0.7
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	1.1	1.4	31.6	2.8	4.1	3.1
*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)
Adapted from June Boon, Veterinary Echocardiography, 1998				25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435				30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)
Hansson et al, Vet Rad and Ultrasound 2002				35	2.48 (4.3)	5.17 (5.0)	3.69 (4.5)
Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995				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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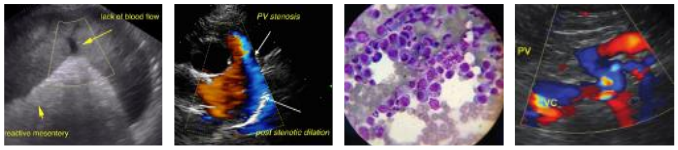

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Overtly normal cardiac structure and function. No chamber enlargement, valve leaks or dysfunction is appreciated. It is worth noting that image quality is limited in this exam. Small abnormalities may have been missed; however, no obvious structural issues were seen.

The ECG confirms isolated VPCs. Ventricular premature contractions (VPCs) are generated from abnormal conductive or fibrotic tissue in the ventricles of the heart muscle, and even frequent single VPCs will often cause no clinical signs in dogs. When sustained however, ventricular tachycardia can lead to symptoms such as lethargy and collapse.

VPCs are a very non-specific finding. They can be due to significant cardiac disease (not identified in this study) or be extra-cardiac in origin; i.e., due to pain, stress, inflammation, cancer, GI disease, DIC/sepsis, etc. Regardless of cause, there is always an elevated risk for collapse and sudden death in any arrhythmic patient, and even on medications this risk still persists. When VPCs are found, two things should be assessed: why they are occurring (extra-cardiac or primary arrhythmic causes suspected) and if they require therapy. Today's echo findings do not explain the VPCs or episodes described, and other contributing causes should also be ruled out. What is difficult is the VPCs may be secondary to some neurologic pathology, or may indicate a more malignant arrhythmic issue such as VT. Further systemic and neurologic workup including AUS is advised to be thorough. That being said, even with only single VPCs appreciated, it is still possible this patient had arrhythmogenic syncope (ventricular tachycardia) and a holter monitor is highly recommended as the next step to allow monitoring of the rhythm throughout 24 hours of a normal day and help determine if treatment is indicated. If this is declined or not possible and no alternative explanation is found, consider use of Sotalol although this is not ideal. Discussion with the owner is advised.

Fish oil supplementation is recommended for dogs with arrhythmias (1000mg of omega 3 and 6 once to twice daily as tolerated).

Monitor at home for collapse, exercise intolerance, and/or lethargy. If a holter monitor is elected, this will dictate whether therapy is needed for the arrhythmia and follow up protocol. Mild activity restriction is advised.

PLAN

Holter monitor and further systemic evaluation recommended as discussed. A neurologic consultation is reasonable as well. If declined and no alternative explanation is found, consider institute Sotalol 1-2mg/kg PO q12h. If syncope persists despite therapy, further evaluation must be performed.

If this alternative is elected, a recheck ECG/holter in 1-2 weeks to assess response. A recheck echocardiogram is recommended in 6-12 months to screen for any development of progressive issues.

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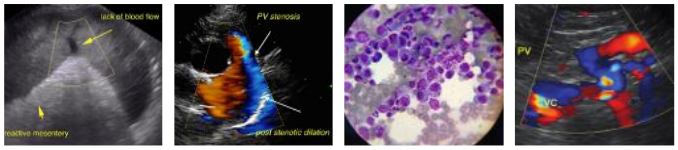

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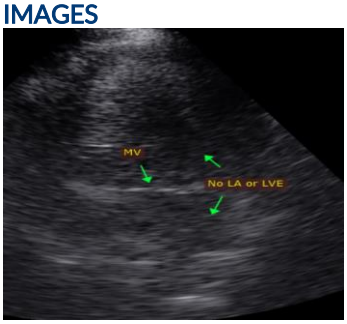
IMAGES



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.

Maggie Machen Lamy, DVM
Diplomate of the American College of Veterinary Internal Medicine (Cardiology)
info@sonopath.com