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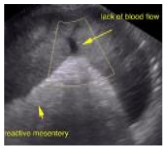
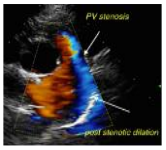
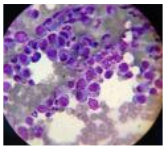
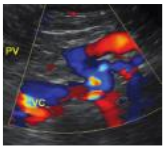
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™

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

PATIENT
Nellie Swaney

SPECIES
Canine

BREED
Chihuahua

SEX
Female Spayed

AGE
3 years

WEIGHT
9.6lbs

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

IMAGING PERFORMED BY
Dana Alterman, RDCS, LVT

HOSPITAL NAME
Eubank Animal Clinic

REFERRING VET
Dr. Gardner

INVOICE
26009

DATE
8/24/22

PRESENTING CLINICAL SIGNS

History: (7/2022): Not eating well and lethargic. ACTH stim- pre cortisol 1.4 (1-5), post cortisol 1.1 (8-17) 8/15: diagnosed with pyelonephritis - responding well to enrofloxacin. (8/2022): Became weak and pale with syncope during short walk with ausculted arrhythmia. BP was ok.
-Abnormal PE/Chem/CBC/UA Results: (8/23): Na - 147, K - 5.7, Cl – 105.

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; 50mm/s, 20mm/mV. The underlying rhythm is sinus in origin with an average heart rate of 120bpm (range 75-150bpm). P waves cannot be identified throughout; however, a sinus origin is suspected. Two periods of sinus arrest are noted; 2 seconds in length without an escape foci. Occasional ACPs; primarily isolated with 1 couplet.
ECG diagnosis: Sinus arrest with APCs; rule out sick sinus syndrome versus secondary to Addisonian crisis.

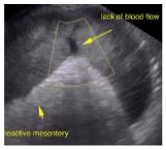
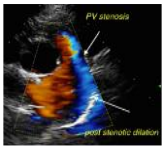
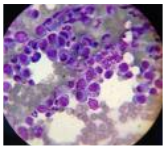
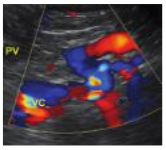
ECHOCARDIOGRAM FINDINGS

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 trace tricuspid regurgitation. Normal velocity. 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. Dramatic heart rate seen throughout the study with periods of tachycardia.

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	2.7	NM	1.3	35	66	0.3
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	1.2	0.72	4.4	1.3	2.7	1.7
*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 *Note: All measurements based upon multi-modal images and methods. An average value is reported.*				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)
				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)

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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	50	2.88 (7.1)	6.07 (8.3)	4.46 (7.4)

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.

The ECG is abnormal, with both sinus arrest and supraventricular arrhythmias. While these can be seen with Sick Sinus Syndrome (SSS; a form of sinus node dysfunction), the patient's lab work is abnormal with reduced adrenal function. Correction of the metabolic derangement will likely resolve the abnormal ECG/syncope as this is the most likely cause. If this is not the case and the abnormalities persist there is concern for true SSS.

SSS is idiopathic in origin, with progressive deterioration of the electrical system resulting in inappropriate tachycardia, bradycardia, intermittent lethargy and collapse. Typically, SSS heart rates range from asystole to tachycardia as is seen here, making medical therapy nearly impossible to utilize safely. Unfortunately, the patient did experience syncope which is a common presentation and can develop due to asystole or SVT; the former is more commonly the issue. Treatment of bradycardia (heart rate stimulants) can exacerbate inappropriate tachycardia and is often an ineffective treatment.

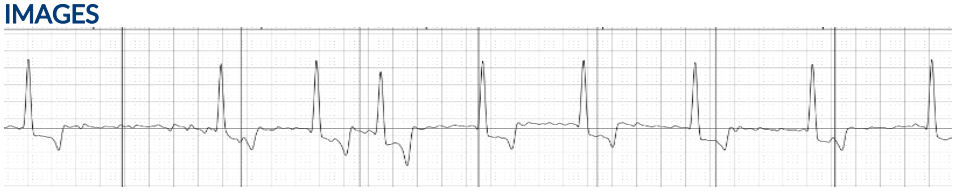
In the acute phase, no treatment is warranted at this time. Once the patient's metabolic disease is corrected, recommend reassess an ECG. If the abnormal ECG and/or syncope recurs, a holter monitor and/or **referral to a local Cardiologist is recommended for consultation.** From there, possible medical and/or surgical options (pacemaker implantation) can be discussed. Any patient with electrical disturbances can experience progressive debilitating syncope and potentially sudden death.

PLAN

No treatment is warranted in the acute phase; however, metabolic abnormalities should be corrected ASAP with in hospital monitoring of the ECG. If any progressive brady or tachycardia is noted, immediate resubmission of the ECG is recommended.
If ECG abnormalities/syncope persists despite resolution of systemic disease, a holter monitor (can be ordered through Sonopath if necessary) and/or referral to a local Cardiologist is recommended.

A recheck echocardiogram is recommended should a murmur be ausculted in the future.

IMAGES



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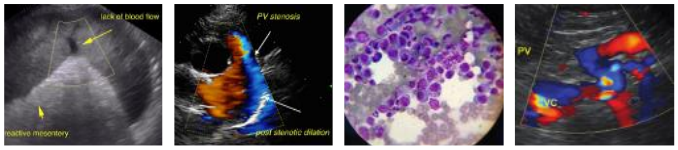

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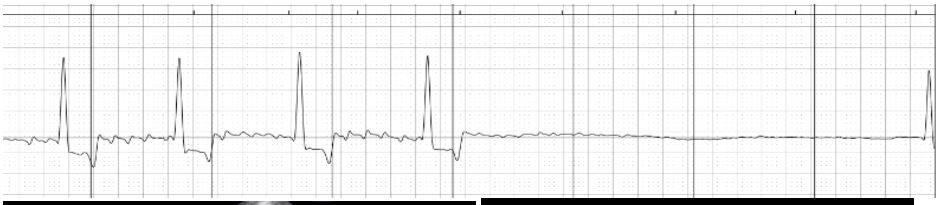

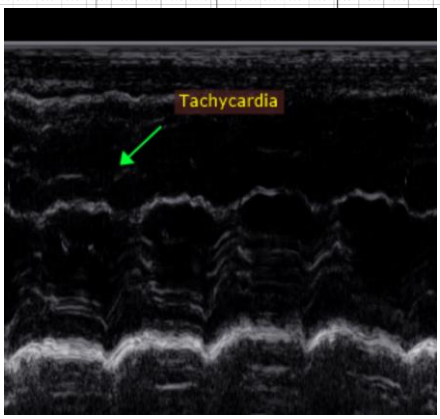

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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