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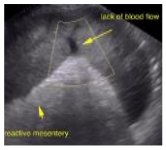
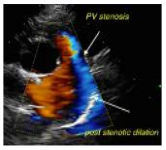
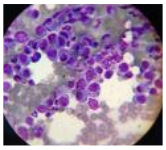
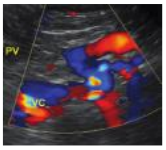
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™

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

PATIENT
Louis Jaborek

SPECIES
Canine

BREED
Boxer

SEX
Male Neutered

AGE
9 years

WEIGHT
84.4lbs

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

IMAGING PERFORMED BY
Tracy LaSarge RDMS, RVT, RTR

HOSPITAL NAME
SVS Imaging NW

REFERRING VET
Dr. Dreher

INVOICE
27827

DATE
12/5/22

PRESENTING CLINICAL SIGNS

History: Presented for episodes of coughing and hypersalivation with occasional shaking/possible fly biting. Anxious, panting Irregular heart rhythm - suspect dropped beats subjectively enlarged on VD, enlarged VHS (12.5), significant bridging bone formation in thorax and lumbar spine. Thyroid tumor removal August 2021. NT-proBNP 3306pmol/L
-Current medications: Levothyroxine 0.5mg q12h, Tramadol 50mg 1-2 tabs q8-12h PRN, Enalapril (for chronic history of proteinuria) 20mg BID.
-Sedation: Ketamine .76ml, Midazolam .76ml.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.

Normal cardiac silhouette without significant chamber enlargement. VHS is falsely elevated due to vertebral abnormalities. No obvious evidence of CHF.

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

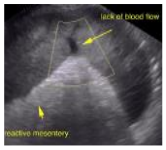
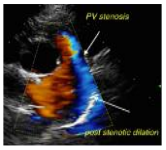
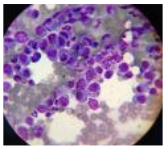
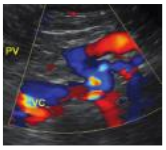
A video of a single lead ECG is available from an anesthesia monitor. The average heart rate cannot be seen nor calculated; however, appears normal. The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. Isolated VPCs are appreciated; no couplets, triplets or VT. No supraventricular ectopic beats, pauses or other dysrhythmias observed.
ECG diagnosis: Normal sinus rhythm with isolated VPCs.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Mild diffuse thickening of mitral valve leaflets with no prolapse into the left atrial lumen. Trace/mild mitral regurgitation with no left atrial dilation. Normal LV diameter with mildly depressed 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. No pericardial or pleural effusion noted. No obvious cardiac masses. Intermittent tachycardia throughout; HR up to 290bpm.

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	1.4	1.2	25y	48	0.6
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	186-294	NM	NM	38.3	2.7	4.0	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 **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)

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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	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)

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Overtly normal cardiac dimensions and function, with no obvious dilation of the left heart. The LV function is mildly depressed, which may be a normal variant or may be secondary to the apparent arrhythmia. No significant valvular leaks are visualized, and no evidence of pulmonary hypertension.

The ECG does confirm ventricular premature contractions (VPCs) in this patient, with concern for intermittent VT on the echo (not captured). 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 primary in origin (such as ARVC), be secondary to significant cardiac disease (not present in this study) or be extra-cardiac in origin, i.e., due to pain, stress, inflammation, cancer, GI disease, DIC/sepsis, etc. In a senior Boxer, there is high suspicion for ARVC (albeit the most common age of onset is 6-8yo, often asymptomatic). ARVC can occur with or without systolic dysfunction and structural issues, however this should be monitored going forward for any progressive dysfunction. It is always reasonable to rule out other differentials for VPCs (AUS, tick titers, troponin, etc.) if elected especially in a senior patient. Unfortunately, there is always an elevated risk for collapse and sudden death in any arrhythmic patient, and even on medications this risk unfortunately still persists. ARVC carries a HIGHLY variable prognosis, with some dogs able to remain asymptomatic for extended periods of time, and others developing exercise intolerance, syncopal episode, and refractory arrhythmias/sudden death imminently.

Based strictly upon the amount of arrhythmia present on the available ECG, anti-arrhythmic therapy is not clearly indicated. This is based upon only single beats on a very brief ECG. That being said there is concern for brief VT during the echocardoimgram, with recorded HR as high as 294bpm. An extended time 6 lead ECG and/or holter monitor is highly recommended as the next step to fully understand the amount of arrythmia present within 24 hours. If this is declined, Sotalol can be initiated as an alternative approach. 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).

Anesthetic risk is considered moderate. Avoid ketamine, telazol, Dexdomitor (or other alpha-2 agonists) and acepromazine. Recommend having lidocaine CRI available for use in the event of worsening ventricular arrhythmias under anesthesia (CRI 50—75mcg/kg/min).
Monitor at home for collapse, exercise intolerance, and/or lethargy. Anesthesia is not recommended until good arrhythmic control is achieved. Lifelong mild to moderate activity restriction is advised.

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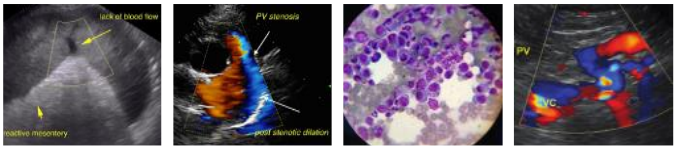

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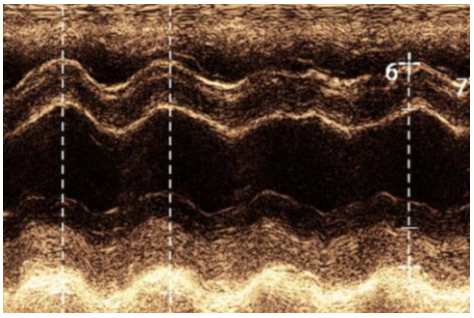
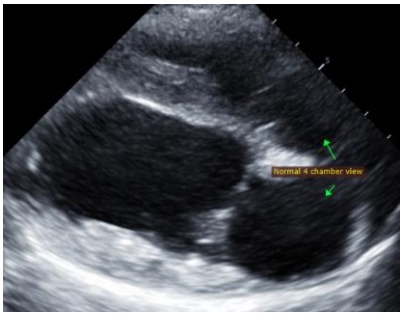
PLAN

Consider a holter monitor. If declined or not possible, institute sotalol 80mg tablets, give ½ tab PO q12h. Recheck ECG in 1-2 weeks to assess response (goal is significant reduction in ectopy without a significant change in underlying sinus rate). If cough/clinical signs persist, repeat CXR recommended.

Recheck ECG and echocardiogram is recommended in 6 months to determine progression/ control, sooner if any development of associated clinical signs such as syncope.

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