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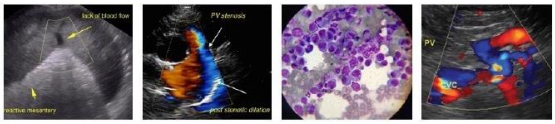


THE FOCAL ZONE
IMAGING PERFORMED BY
289-808-2608 info@thefocalzone.com

PATIENT
Whiskey Gallant

SPECIES
Canine

BREED
Boxer

SEX
Female Spayed

AGE
4 years

WEIGHT
69lbs

INTERPRETED BY
Maggie Machen Lamy, DVM DACVIM (Cardiology)

IMAGING PERFORMED BY
Kelly Reschny, RVT

HOSPITAL NAME
Queensway Veterinary Hospital

REFERRING VET
Dr. Moore

INVOICE
31445

DATE
6/20/23

PRESENTING CLINICAL SIGNS

History: Collapsing episodes (stiff legs, glazed over eyes, no obvious breathing or heartbeat in some cases, lasting 1-5 minutes) cardiovascular (syncopal) in nature or seizures? Ruling out heart issues before running further tests or starting medications for seizures other than thyrotabs. PE WNL. BAR. Normal mentation, ambulation. HR 90bpm, regular strong heartbeat and femoral pulses. No murmur.
-Current medications Thyrotab (levothyroxine) 0.3mg BID.

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

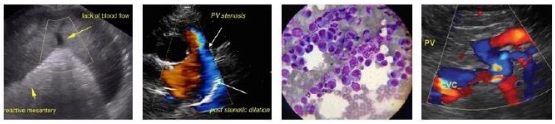
A single lead ECG is available; 50mm/s, 20mm/mV. Motion artifact throughout. The underlying rhythm appears sinus in origin, although P waves are difficult to visualize consistently. The average heart rate is 140bpm (range 120-166bpm). Premature beats are seen throughout of both ventricular and supraventricular origins. Possible brief run of SVT, although this is not definitive. No obvious VT is seen.
ECG diagnosis: Suspect normal sinus rhythm with frequent supraventricular and ventricular premature beats. Possible brief SVT.

ECHOCARDIOGRAM FINDINGS

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. Trace central MR seen. Normal left atrial dimension. Normal LV diameter with adequate myocardial function. Normal LV wall thickness. The tricuspid valve appears normal in form and function. No overt evidence of pulmonary arterial hypertension or right heart compensation, however right heart is prominent. No tricuspid regurgitation. The aortic valve is normal in morphology and mobility. No subvalvular ridge present, mildly increased velocity. Trace aortic insufficiency. Normal pulmonic valve with no pulmonic insufficiency seen. No pericardial or pleural effusion noted. No obvious cardiac tumors. Irregular rhythm noted throughout the examination.

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	NM	NA	1.0	1.4	36	66	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	NM	2.0	1.0	31.3	2.7	4.1	2.6
*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 Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435				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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Hansson et al, Vet Rad and Ultrasound 2002 Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995	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

The cardiac structure and function are essentially normal in this patient. There is mild right heart prominence in some views, however this is angle dependent and may be a normal variant. The left heart dimensions are normal, and the systolic function considered adequate for a large breed dog. No significant valvular insufficiencies were noted, and no structural issues identified.

Frequent premature contractions were however confirmed on the ECG, which appear to be both supraventricular and ventricular in origin. 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 4yo Boxer, there is high suspicion for ARVC (most common age of onset 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 issues. It is always reasonable to rule out other differentials for VPCs (AUS, tick titers, troponin, etc.) however suspicion is low given the signalment of the 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.

Ideally the next step in this case would be a 24-hour holter monitor to determine the true extent of the arrythmia. If this declined or not possible, I would err on the side of caution and institute Sotalol going forward. This is based upon the frequency of premature beats, reported collapse episodes and a high risk for sudden death in this breed. Once sotalol is on board, an extended time 6 lead ECG and/or repeat holter monitor is a reasonable next step to allow monitoring of the rhythm throughout 24 hours of a normal day to ensure good rhythm control.

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

Once the arrythmia is controlled, 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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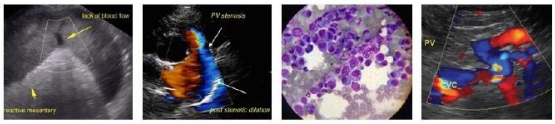

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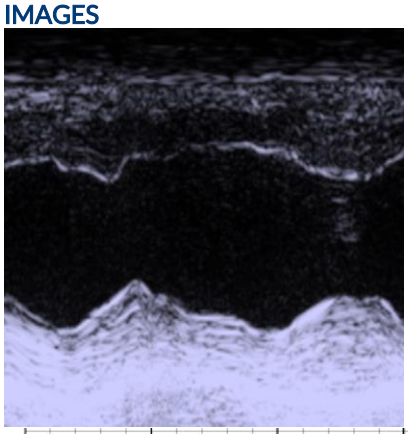
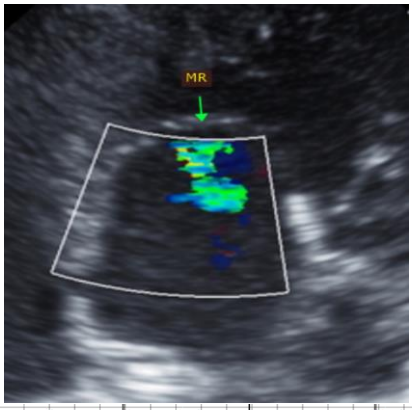
PLAN

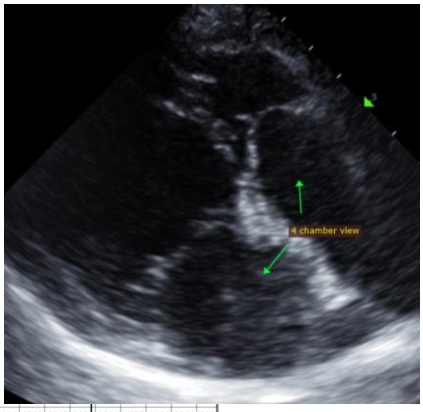
Consider a holter monitor as discussed. If declined or not possible, institute Sotalol 1-2mg/kg PO q12h. Recheck ECG in 1-2 weeks to assess response (goal is significant reduction in ectopy without a significant change in underlying sinus rate). Consider repeat holter at this time.

Recheck ECG is recommended in 6 months to determine progression/control, with a recheck echocardiogram in 1 year.

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)
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