



**PATIENT**

Calypto Rosenleaf

**PRESENTING CLINICAL SIGNS**

History: Grade III/VI left sided holosystolic murmur. Arrhythmia auscultated and visible during echo. ALT 468. Average BP 137/107, mean 115

**SPECIES**

Canine

**ELECTROCARDIOGRAPHIC FINDINGS**

A brief six lead ECG is available at 50mm/s; 5mm/mV. The average heart rate is 120bpm (range 90-166bpm). 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. No ectopic beats, pauses or dysrhythmias observed. ECG diagnosis: Normal sinus rhythm with respiratory variation.

**BREED**

Boston Terrier

**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. No mitral regurgitation with mild left atrial dilation. Normal MR velocity. 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. Occasional VPCs are seen throughout the study (single lead ECG attached).

**SEX**

FS

**AGE**

4y

**WEIGHT**

18 lbs

**CARDIAC CHART**

**INTERPRETED BY**

Maggie Machen  
Lamy, DVM, DACVIM  
(Cardiology)

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	1.3	46	90	0.16
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	1.3		1.4	2.5	1.3
*Normal chamber parameters expressed as a mean value (SD)				3	1.27 (5.3)	2.46 (2.46)	1.36 (5.5)
<b>BODY WEIGHT DEPENDENT PARAMETERS</b> <i>*Note: All measurements based upon multi-modal images and methods. An average value is reported.</i>  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				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)
				50	2.88 (7.1)	6.07 (8.3)	4.46 (7.4)

**IMAGING PERFORMED BY**

Kelly Romero,  
DVM

**HOSPITAL NAME**

Midtown AMC

**REFERRING VET**

Dr. Hunter

**INVOICE**

28765

**DATE**

2/2/23



<b>PATIENT</b>	<b><u>INTERPRETATION OF THE FINDINGS &amp; FURTHER RECOMMENDATIONS</u></b>
Calypto Rosenleaf	Overtly normal cardiac structure and function with no cause of a murmur identified. No significant valvular insufficiencies were noted and no structural issues identified. In the absence of significant volume changes (dehydration) or anemia, other possibilities include a physiologic flow murmur only present with elevated heart rates, or a small flow abnormality not seen here. It is reasonable to monitor periodically via recheck echocardiography in the future, particularly should the murmur persist/progress.
<b>SPECIES</b>	
Canine	
<b>BREED</b>	
Boston Terrier	While the brief screening ECG was normal, isolated ventricular premature contractions were identified on the ECG attached. 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.
<b>SEX</b>	
FS	
<b>AGE</b>	
4y	VPCs are a very non-specific finding. They can be primary in origin, 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 relatively young small breed dog, primary arrhythmias are possible (yet uncommon); however, all differentials should be ruled out. Consider full systemic evaluation, including AUS and labs. 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. VPCs carry 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.
<b>WEIGHT</b>	
18 lbs	
<b>INTERPRETED BY</b>	
Maggie Machen Lamy, DVM, DACVIM (Cardiology)	Based strictly upon the amount of arrhythmia present on the available ECG in this asymptomatic dog, anti-arrhythmic therapy is not clearly indicated. A holter monitor can be considered as the next step to allow monitoring of the rhythm throughout 24 hours of a normal day and help determine if treatment is indicated. An alternative approach would be to simply monitor for clinical signs and recheck ECG in 6 months. Discussion with the owner is advised.
<b>IMAGING PERFORMED BY</b>	
Kelly Romero, DVM	Fish oil supplementation is recommended for dogs with arrhythmias (1000mg of omega 3 and 6 once to twice daily). Mild activity/stress restriction is advised.
<b>HOSPITAL NAME</b>	Monitor at home for collapse, exercise intolerance, and/or lethargy.
Midtown AMC	If a holter monitor is elected, this will dictate whether therapy is needed and follow up protocol. I would not recommend anesthesia until the results are available if elected. If declined, an ECG should be monitored during general anesthesia and lidocaine administered in the event of sustained VT or malignant arrhythmias. Avoid stimulants such as atropine or glycopyrrolate unless indicated.
<b>REFERRING VET</b>	
Dr. Hunter	No cardiac medications are indicated at this time. Monitor for any development of cough, labored breathing or exercise intolerance.
<b>INVOICE</b>	<b><u>PLAN</u></b>
28765	Consider Holter monitor as discussed. Consider systemic evaluation as discussed. If a holter is declined, recommend a recheck ECG is recommended in 6 months (sooner if any collapse episodes occur). A recheck echocardiogram is suggested in 1 year to reassess murmur origin, sooner if clinical signs arise.
<b>DATE</b>	
2/2/23	



**PATIENT**

Calypso Rosenleaf

**SPECIES**

Canine

**BREED**

Boston Terrier

**SEX**

FS

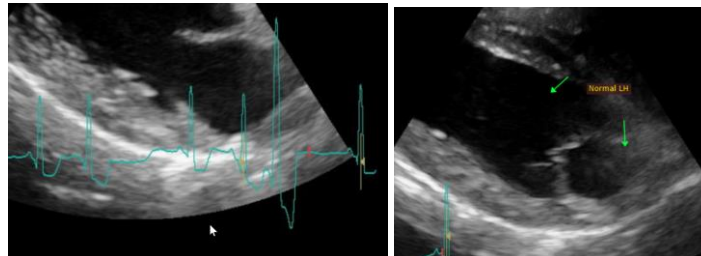
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4y

**WEIGHT**

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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. 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

**INTERPRETED BY**

Maggie Machen  
Lamy, DVM, DACVIM  
(Cardiology)

**IMAGING PERFORMED BY**

Kelly Romero,  
DVM

**HOSPITAL NAME**

Midtown AMC

**REFERRING VET**

Dr. Hunter

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