



## PATIENT

Toby Varner

## SPECIES

Canine

## BREED

Cavachon

## SEX

Male Neutered

## AGE

10.5 years

## WEIGHT

18.8lbs

## INTERPRETED BY

Maggie Machen Lamy,  
DVM, DACVIM  
(Cardiology)

## IMAGING PERFORMED BY

Jennifer Todd, DVM

## HOSPITAL NAME

Lambs Gap Animal  
Hospital

## REFERRING VET

Dr. Todd

## INVOICE

28412

## DATE

1/18/23

## PRESENTING CLINICAL SIGNS

History: Recheck. History of PLE. He has a recent history (2 episodes) of collapse. Toby is limp and unresponsive for 30-60 seconds during these episodes. They have both occurred when he is outside. Exam was normal, no cardiac arrhythmia or murmur. Femoral pulses strong and synchronous.

-Current medications: Gabapentin, dasuquin advanced and prednisone 5mg PO Q24h.

-Abnormal lab results: CBC, Chemistry panel, electrolytes, T4 and cardiac ProBNP showed panhypoproteinemia, increased liver enzymes, neutrophilia, normal cardiac ProBNP.

-Pertinent previous ecg findings (1/2023 MML): NSR with occasional QRS morphology variability; rule out rate dependent BBB v fusion beats. \*Episode of collapse at that time.

**RADIOGRAPHIC FINDINGS** \*NOTE: Images submitted for supplemental cardiac information only.  
Normal cardiac silhouette. 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 single lead ECG is available; 25mm/s, 10mm/mV. The average heart rate is 120bpm (range 75-150bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. Intermittent variability in QRS morphology/width may suggest fusion beats (ie a ventricular beat firing essentially simultaneous to a sinus beat); however, the PR interval is largely consistent and the sinus rhythm is not reset. A rate dependent bundle branch block is also possible. No obvious ectopic beats, pauses or other dysrhythmias observed.

ECG diagnosis: Normal sinus rhythm with respiratory variation. QRS variability; rule out fusion beats (VPCs or AIVR) v rate-dependent BBB v artifact.

## 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. Trivial mitral regurgitation with no left atrial dilation. Normal LV diameter with adequate myocardial function. The tricuspid valve appears normal with trace 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.

## 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			1.0	1.1	41	74	0.15
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		1.3	1.1	8.5	1.4	2.2	1.2
*Normal chamber parameters expressed as a mean value (SD)				3	1.27 (5.3)	2.46 (2.46)	1.36 (5.5)



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## 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  
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)

## INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

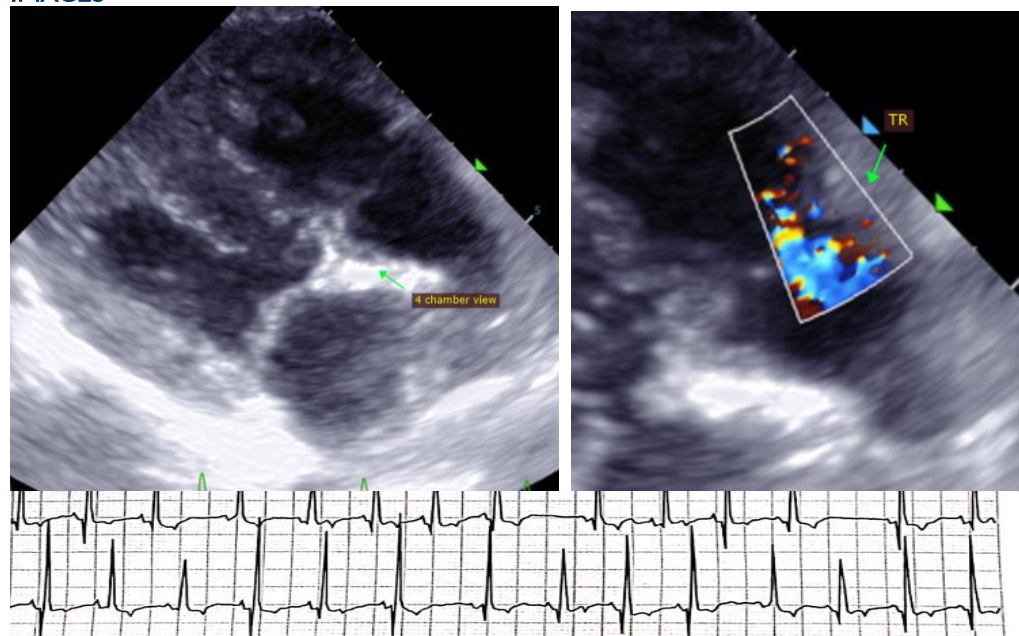
Overtly normal cardiac dimensions and function, with no obvious dysfunction or dilation of the left heart. Trace MR and TR may suggest early valve disease; however, a physiologic origin is suspected. Follow-up is advised should a murmur be auscultated in the future. No significant valvular leaks are visualized, and no evidence of pulmonary hypertension. The ECG is unchanged from the previous tracing. No clear premature beats or tachyarrhythmias are appreciated.

No structural or arrhythmic cause for the episodes is appreciated on these diagnostics. If no systemic or neurologic issues are suspected, strongly recommend referral for a 6 lead tracing with a local Cardiologist. As an alternative a Holter monitor may be reasonable in this case.

Monitor for development of a heart murmur, cough, labored breathing, exercise intolerance or collapse episodes.

A recheck echocardiogram is recommended should a significant murmur develop or signs of cardiac compromise be noted in the future.

## IMAGES



The information and recommendations provided are based on the images presented by the referring



**PATIENT**

Toby Varner

veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

**SPECIES**

Canine

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.

**BREED**

Cavachon

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

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