



**PATIENT**

Starr Reed

**SPECIES**

Canine

**BREED**

Chihuahua

**SEX**

Female Spayed

**AGE**

12.5 years

**WEIGHT**

8lbs

**INTERPRETED BY**

Maggie Machen Lamy,  
DVM, DACVIM  
(Cardiology)

**IMAGING PERFORMED BY**

Emily Kalenius, DVM

**HOSPITAL NAME**

Willamette Veterinary  
Hospital

**REFERRING VET**

Dr. Kalenius

**INVOICE**

22812

**DATE**

2/24/22

**PRESENTING CLINICAL SIGNS**

History: Presented for coughing episodes and syncopal episodes with excitement. Known history of heart murmur for "years". Normal RR/RE. Significant dental disease. 5/6 left and right apical systolic heart murmur. normal pulses. Lungs clear. BP WNL.

-Abnormal PE/Chem/CBC/UA Results: EPOC = pH 7.353, BUN 43 mg/dl, CREA 2.44 mg/dl, GLU 166 mg/dl, LAC 3.94 mmol/L UA = USG 1.019.

-Thoracic radiographs; Severe cardiomegaly no evidence of pulmonary edema.

-Current medications: Prescribed pimobendan 1.25mg 3/4 tab PO BID and hydrocodone cough syrup for PRN use.

**ECHOCARDIOGRAM FINDINGS**

2D, m-mode, color flow and doppler imaging is available. Diffuse nodular thickening of mitral valve. Prolapse into the left atrial lumen with lack of coaptation in systole. Severe eccentric mitral regurgitation with severe left atrial enlargement. MR velocity is normal. Mild LV dilation with hyperdynamic function. The tricuspid valve appears mildly thickened with septal prolapse and moderate tricuspid regurgitation. TR velocity is moderately elevated. The right heart is mildly dilated. The pulmonic and aortic valves appear normal in appearance and mobility. Normal pulmonic and aortic outflow velocities. Mild MPA and branch dilation. No aortic insufficiency noted. Trace pulmonic insufficiency noted. No pericardial or pleural effusion seen. No obvious cardiac tumors.

**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	5.4	4.0	NM	2.5	62	92	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	130	1.0	0.6	3.6	2.5	2.3	0.9
*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>				5	1.40 (4.5)	2.74 (5.2)	1.60 (4.7)
*Note: All measurements based upon multi-modal images and methods. An average value is reported.				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)

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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**INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS**

Chronic degenerative valve disease causing severe mitral and moderate tricuspid regurgitation. Significant 4 chamber dilation indicates there is an elevated risk for spontaneous congestive heart failure. Moderate pulmonary hypertension is suspected, which is likely secondary to chronic LA pressure elevation; however, primary respiratory disease is also suspected in a predisposed breed. No additional issues are identified.

Syncope and coughing in this patient are suspected to be cardiogenic in origin. Possible causes of syncope include poor forward blood flow leading to hypoxia, early CHF, pulmonary hypertension (moderate in this case), an arrhythmia and/or blood pressure swings, etc. A combination of pulmonary hypertension and severe MR/poor cardiac output is suspected, even without obvious CHF on CXR. Recommend full cardiac support including low-dose Lasix and Sildenafil. If the episodes persist despite the medications, further evaluation may be indicated. Additionally, Hydrocodone is strongly recommended given the description of the cough with tracheal palpation. Long term prognosis is guarded to poor; however, most dogs are able to maintain a good QOL on medications for an average of 8-12 months. Patient will always be at risk for recurrent CHF, development of arrhythmias/LA tear, syncope, and/or sudden death in the future.

Monitoring of sleeping respiratory rates will be paramount to screen for congestive heart failure at home. Omega fatty acid supplementation and mild salt restriction may also be of some long-term benefit. Monitor for development of a cough, labored breathing, exercise intolerance or worsening collapse episodes in the future.

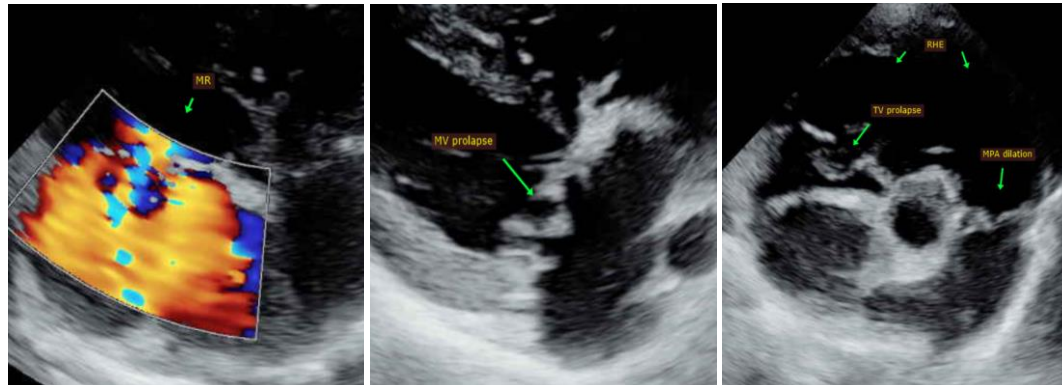
**PLAN**

Institute low-dose Lasix 1mg/kg PO q12h. Institute Spironolactone 1-2mg/kg PO q12h. Institute Pimobendan to 0.3mg/kg PO q12h. Institute Sildenafil 1-2mg/kg PO q12h. Recommend Hydrocodone with homatropine, 0.2 - 0.4 mg/kg PO up to q4-6 hours PRN for cough (available in 5/1.5mg tablets or 5mg/5ml solution).

Recheck renal panel and BP in 1-2weeks then every 3-4 months lifelong. If BP is >130mmHg, institute ACE-I 0.5mg/kg PO q12h. If episodes persists despite above therapy, consider further evaluation as discussed including an ECG.

Recommend conservative monitoring with a recheck echocardiogram in 6 months, sooner if any development of associated clinical signs occurs in the interim.

**IMAGES**





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Starr Reed

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.

**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**

Chihuahua

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

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