



**PATIENT**

Canela Tapia

**SPECIES**

Canine

**BREED**

Chihuahua

**SEX**

Female Spayed

**AGE**

12 years

**WEIGHT**

8.8lbs

**INTERPRETED BY**

Maggie Machen Lamy,  
DVM, DACVIM  
(Cardiology)

**IMAGING PERFORMED BY**

Loetitia St-Jacques,  
LVT/RVT

**HOSPITAL NAME**

North Hills Veterinary  
Clinic

**REFERRING VET**

Dr. Gonzales

**INVOICE**

23589

**DATE**

4/11/22

**PRESENTING CLINICAL SIGNS**

History: Hacking cough over last few weeks. Otherwise, asymptomatic. Grade 5/6 heart murmur. Increased abdominal effort. Started Tussigon and Clavamox.  
-Abnormal PE/Chem/CBC/UA Results: HWT negative. BP 107 systolic,90 diastolic, 115 BPM and 93 MAP. Radiographs: No pleural effusion. BCS: 3.50 / 5.00

**ELECTROCARDIOGRAPHIC FINDINGS**

A six lead ECG is available at 50mm/s; 10mm/mV. The average heart rate is 140bpm (range 86-200bpm). 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.

**ECHOCARDIOGRAM FINDINGS**

2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets with significant prolapse into the left atrial lumen. Moderate mitral regurgitation with mild left atrial dilation. Normal LV diameter with adequate myocardial function. The tricuspid valve appears thickened with septal prolapse and trace tricuspid regurgitation. Prominent right heart. TR velocity is elevated indicative of moderate pulmonary hypertension. Mild MPA and branch dilation. 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	NM	3.6	NM	1.4	68	95	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	0.9	0.9	4.0	1.8	1.9	0.6
*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)
<i>*Note: All measurements based upon multi-modal images and methods. An average value is reported.</i>				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 moderate mitral and trace tricuspid regurgitation. Lack of significant left atrial enlargement indicates the current risk for complication is low. The right heart is prominent with a dilated MPA and elevated TR velocity suggestive of moderate pulmonary hypertension. Clinical signs of weakness, heavy breathing, cyanosis, and syncope are attributed to severe PAH. The ECG is unremarkable with a respiratory sinus arrhythmia.

The underlying genesis of PAH is poorly understood in cases other than heartworm infestation, though it occurs with increased frequency in a variety of forms of chronic lung disease and in patients with idiopathic pulmonary fibrosis. In a dog without a chronic cough, the origin remains unknown. The history notes a relatively acute onset of symptom, and an infectious or inflammatory cause should be considered most likely. It is important to note that PAH does NOT cause a cough; rather the opposite is true. Treatment for PAH is typically recommended with severe PG (>80mmHg) or associated clinical signs including syncope or exertional dyspnea/cyanosis. Given reported abdominal breathing in hospital, it is reasonable to trial a month of sildenafil and assess response. If no clinical improvement at home, safe to discontinue at that time. Additionally, the most important thing is adequate cough management. This may include empiric Baytril or Azithromycin, taper course of prednisone, aggressive hydrocodone (once controlled wean to the lowest effective dose), etc. If therapy is still unsuccessful, highly recommend TTW/BAL for further information. The left heart disease is mild and well compensated for and should not be contributing to any clinical issues at this time.

No additional cardiac medications are clearly indicated. Assessment of progression in the future will help predict long term prognosis, which is highly variable at this stage. Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit. Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes.

Anesthetic risk is considered mild if needed. Cardiac protective drug choices (opioid/benzodiazepine premedication, propofol or alfaxalone induction, isoflurane gas) are recommended. Pre-oxygenate for 5-10 minutes prior to induction. Monitor for arrhythmias, hypotension, and hypoxia both intra and post-operatively and intervene as necessary. Mild IV fluid restriction is recommended to avoid fluid overload. Avoid heart rate stimulating drugs such as atropine unless clinically indicated.

**PLAN**

Consider trial sildenafil for 30 d; administer 1-2mg/kg by mouth every 12 hours and assess response/improvement in symptoms. Address cough/respiratory disease as discussed.

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



Portable Animal Western Sonography, Inc.

IMAGING PERFORMED BY

pawsonography@gmail.com 530-786-8340

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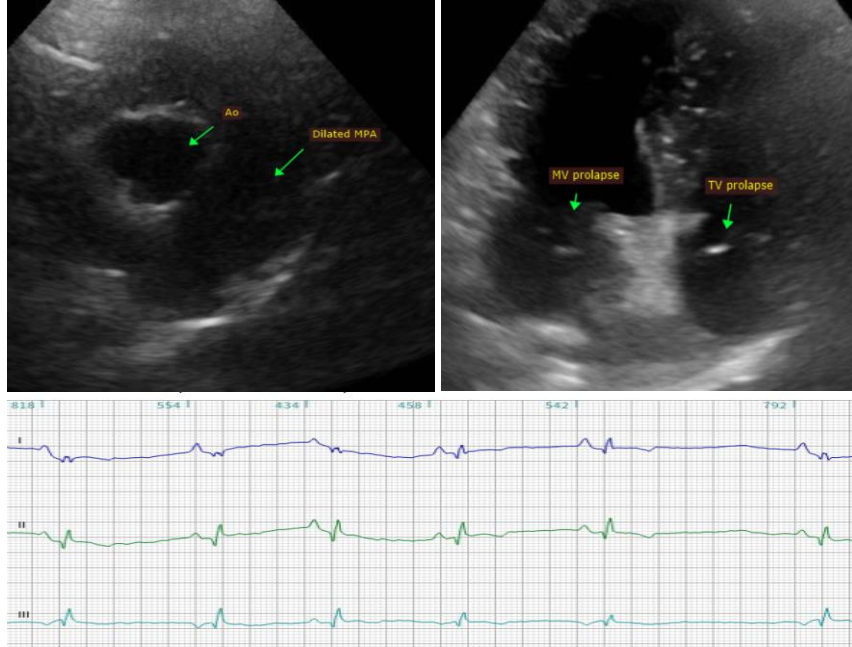
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**IMAGES**



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. 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