



PATIENT

Luna Sanchez

SPECIES

Canine

BREED

Chihuahua Mix

SEX

F

AGE

7 mo

WEIGHT

4.8lbs

INTERPRETED BY

Maggie Machen Lamy,
DVM, DACVIM
(Cardiology)

IMAGING PERFORMED BY

Dana Alterman,
RDCS, LVT

HOSPITAL NAME

Eubank Animal Clinic

REFERRING VET

Drs. Harris + England

INVOICE

24739

DATE

6/13/22

PRESENTING CLINICAL SIGNS

History: 3/6 holosystolic bilateral murmur Resting respiratory rate at appt = 40bpm thin, tachypneic, coughs, lack of exercise tolerance (owner has been informed to keep her calm) + cyanosis with exercise. Not on medications.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only. Significant right-sided cardiomegaly. 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 150bpm (range 136-166bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The QRS is inverted. No ectopic beats, pauses or other dysrhythmias observed.

ECG diagnosis: Normal sinus rhythm with respiratory variation.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. The TV leaflets appear thickened with abnormal closure consistent with dysplasia. Stenosis is not ruled out. Distorted RV papillary musculature. Moderate tricuspid regurgitation with moderate right atrial and ventricular dilation. Significant RV hypertrophy. Exuberant fibrous tissue associated with the RVOT/RV suspected to be the level of the stenosis (r/o DCRV v subvalvular stenosis). The pulmonic valve is poorly visualized; however, increased flow velocity is noted through the region. LV diameter appears normal with adequate myocardial function. LA is normal. Mitral valve is normal with no mitral regurgitation. Normal aortic outflow velocities. The aortic valve is normal with no aortic insufficiency. No obvious congenital shunts although the region of a PDA is poorly visualized. No pericardial effusion identified. No pleural effusion seen.

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	NA	5.5	NM	1.2	47	90	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	NA	1.2	4.5	2.2	1.3	1.7	0.9
*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				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)

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


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Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995	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)

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the murmur and clinical signs is right-sided congenital heart disease. Tricuspid valve dysplasia is identified with tricuspid regurgitation and a severely elevated velocity. While TV dysplasia can account for RA and RV dilation, this does not explain the elevated TR velocity or RV hypertrophy. There is excessive fibrous tissue in the region of the RVOT/distal RV that is suspected to be the level of the stenosis (such as a double chamber RV or subvalvular abnormality), although visualization is limited. No post-stenotic dilation is seen, and other contributing issues are possible such as a hypoplastic MPA. No additional congenital issues are identified; however, it is important to note that particularly with this degree of anatomic distortion small defects are easily missed (such as an ASD, PDA, etc.). The left heart is normal in dimension, making additional issues unlikely. Finally, the ECG is unremarkable with a normal sinus rhythm and relatively low resting heart rate.

Unfortunately, regardless of a definitive diagnosis the patient has progressed at a very young age to significant right-sided chamber enlargement. Medical support through spironolactone and an ACEI are recommended based upon what is seen here. Without body cavity effusion, no obvious indication for Lasix at this juncture. Additional therapy with a beta blocker may be reasonable; however, this is difficult to recommend without an advanced study. Additionally, surgical intervention may or may not be warranted, and may or may not improve short term outcome/clinical signs (including exertional syncope and right-sided congestive heart failure). Given all of these factors, highly recommend a Cardiologist evaluate this patient in the near future to determine the best course of action. No question this patient's condition will limit lifespan, although outcome is highly variable. If not possible or declined, cautious trial with atenolol can be attempted to assess for clinical improvement if little is seen with initial medications.

Going forward, patient will always be at high risk for recurrent right-sided CHF and/or development of arrhythmias such as atrial fibrillation/VT, collapse and/or sudden death going forward. Monitor for development of associated clinical signs (collapse, abdominal distention, cough, labored breathing). Lifelong exercise restriction is advised.

PLAN

Institute spironolactone 1-2mg/kg PO q12h. Pending BP >130mmHg, institute ACEI 0.5mg/kg PO q12h. Recommend referral to a local Cardiologist ASAP for advanced diagnostics and to determine if Atenolol is indicated.

If referral is not possible or declined and patient does not improve with these medications in 1-2 weeks, consider addition of atenolol 25mg tabs, give ¼ tab PO q24. Recheck HR in 5-7 days; target is stressed in hospital rates not to exceed 130bpm. If patient has worsening signs on the medication, immediate discontinuation is indicated.

If any body cavity effusions develop, institute Lasix 1-2mg/kg PO q12h.

A recheck echocardiogram is recommended in 6 months to screen for progression, sooner if clinical signs arise (or as dictated by referral).



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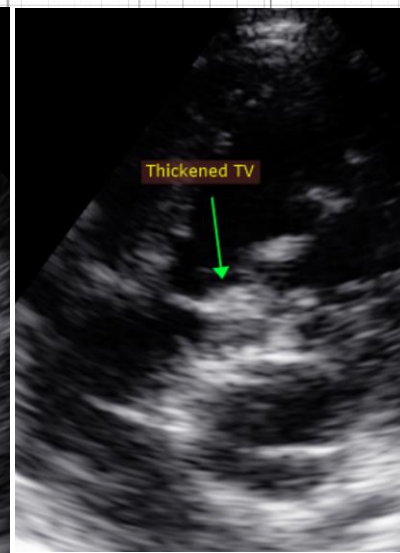
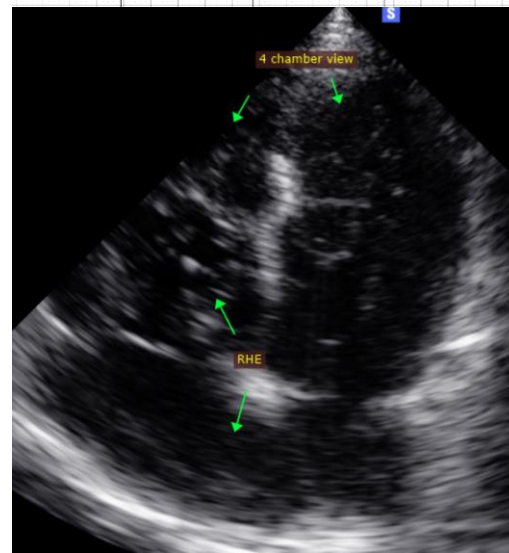
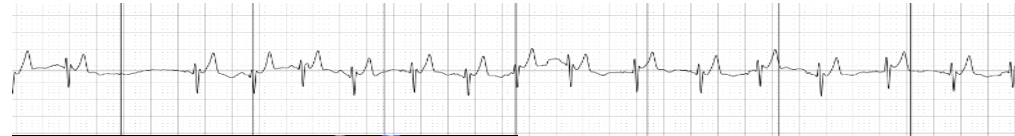
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IMAGES



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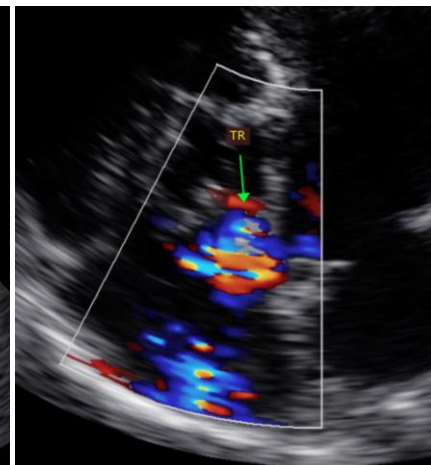
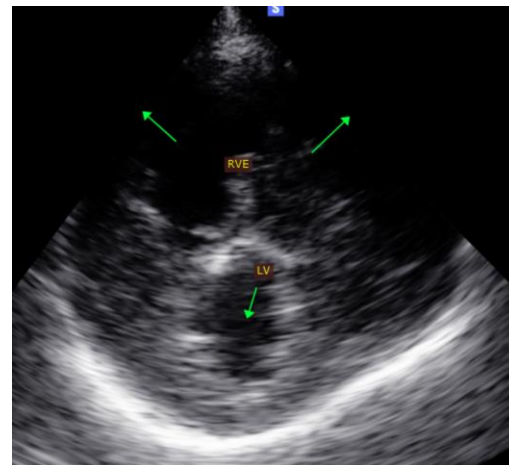
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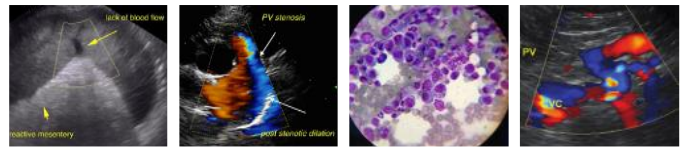
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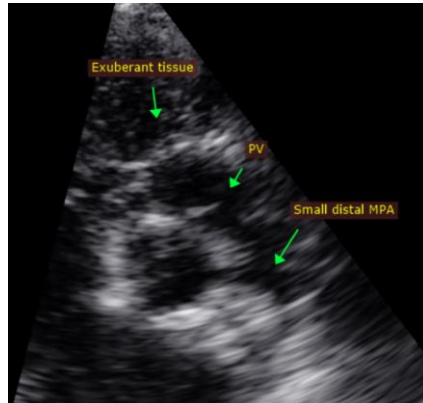
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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

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