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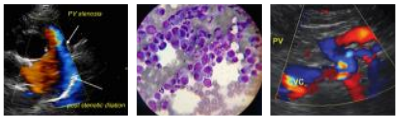

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PATIENT

Lucy Miller

SPECIES

Canine

BREED

Chihuahua

SEX

Female Intact

AGE

5 years

WEIGHT

12.06lbs

INTERPRETED BY

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

HOSPITAL NAME

Everhart Veterinary Center

REFERRING VET

Not provided

INVOICE

21532

DATE

10/14/21

PRESENTING CLINICAL SIGNS

History: Potentially new heart murmur/arrhythmia. Owner rescued last year; previous records may have indicated murmur. Ausculted 2/6 systolic murmur PMI L apex with intermittent arrhythmia at wellness visit 9/23/21. Pet is asymptomatic at home.
-Pertinent abnormal PE/Chem/CBC/UA Results: 9/23/21: proteinuria 2+, ALKP 134, TP 7.9. Attached separately.
-Current medications: Cefpodoxime 50 mg SID for 2 weeks for allergic skin disease.
-Blood pressure: 140mmHg,
-Sedation used: Sedation not required for scan.
-STAT: Not requested.

ELECTROCARDIOGRAPHIC FINDINGS

A six lead ECG is available at both 25 and 50mm/s; 2mm/mV. The average heart rate is 140bpm (range 94-166bpm). 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 shifted left. No ectopic beats, pauses or dysrhythmias observed.
ECG diagnosis: Suspect respiratory sinus arrythmia. Left axis deviation.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Normal mitral valve leaflets with no obvious prolapse into the left atrial lumen. No mitral regurgitation. Normal left atrial dimension. Normal LV diameter with normal myocardial function. The LV wall thickness is normal. The tricuspid valve appears normal in form and function. No right atrial dilation. Mild right ventricular prominence with mild hypertrophy. Mild elevation of pulmonic outflow velocities at the level of the valve. The PV appears mildly thickened, with no post-stenotic dilatation of the branch PA's. Mild pulmonic insufficiency. The aortic valve appears to have normal morphology and mobility. Normal LVOT velocity. 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	NA	NA	NM	1.2	39	72	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	150	1.5	2.2	5.5	1.6	2.5	1.5
*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)
				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)

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

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Elevated flow velocity through the pulmonic valve is noted, consistent with congenital valvular pulmonic stenosis. The degree of obstruction is mild based upon the velocity/pressure gradient across the pulmonic valve and minimal secondary hypertrophy and remodeling of the right ventricle (mild PG is <50mmHg). No tricuspid regurgitation or other issues are noted.

The ECG shows a respiratory sinus arrythmia albeit with significant heart rate variation. No obvious ectopic beats are noted; however, APCs or VPCs remain a possibility. Regardless, what is seen here is mild and no treatment is indicated.

Mild PS cases typically do not impact a patient clinically, and most are able to live a normal life free of complications. That being said, risk for progression to clinical signs will always remain and periodic monitoring is advised.

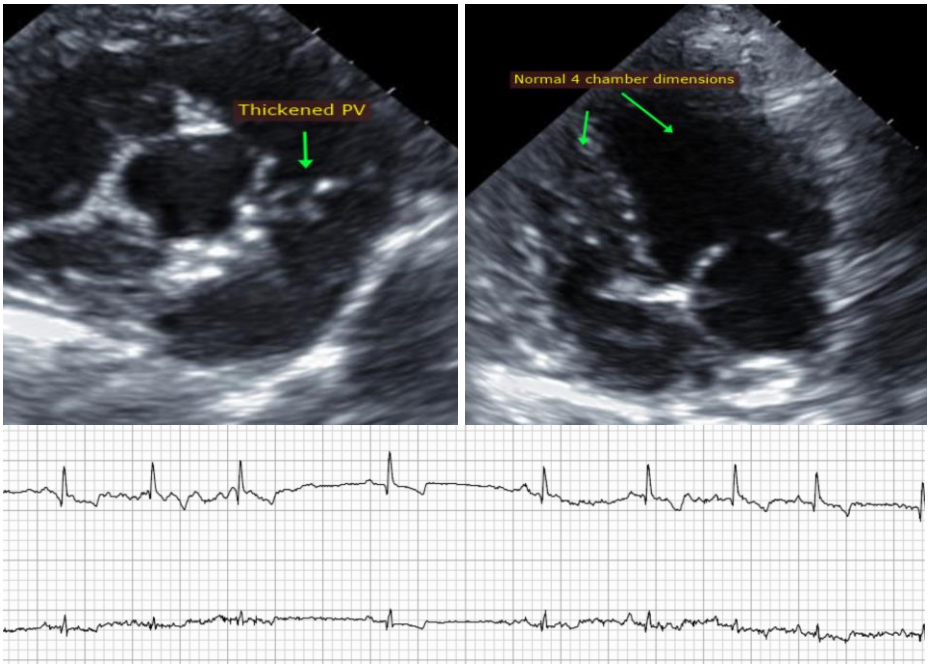
Given mild disease I would not recommend surgical intervention in this case. Medical management with atenolol is often recommended in moderate or severe cases, with mild often not requiring therapy. Given that this case is free of symptoms and mild in severity, it is reasonable to simply monitor going forward rather than instituting lifelong medications. Referral to a local cardiologist should be considered to discuss advanced imaging and potential medical and surgical options if the client is interested.

Anesthetic risk is considered mildly elevated. Avoid heart rate stimulating drugs such as atropine or glycopyrrolate. Avoid excessive vasodilation/hypotension. Pre-oxygenate for 5-10 minutes prior to induction. A reasonable protocol would be as follows: premedicate with opioid/benzodiazepine, propofol or alfaxalone induction, isoflurane maintenance. Monitor ECG, BP as is standard. Monitor for hypoxia in recovery; utilize O2 chamber if needed. Mild IV fluid restriction is advised.

Monitor for development of associated clinical signs (exertional collapse, abdominal distention, cough, labored breathing). Omega fatty acid supplementation may have some long-term benefit, given that these cases are predisposed to development of arrhythmias going forward. Breeding is not advised as this condition is genetically linked.

Recommend recheck ECG and echocardiogram in 12 months to assess for progression, sooner if clinical signs arise in the interim.

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.

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