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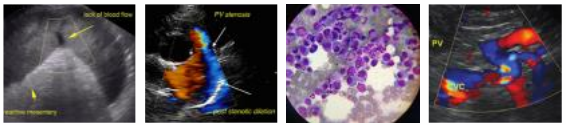

ANIMAL SOUNDS NW
MOBILE VETERINARY ULTRASOUND
IMAGING PERFORMED BY
AnimalSoundsNW.com 541-357-9423

PATIENT
Tavi Crandall

SPECIES
Canine

BREED
Pomeranian

SEX
Female Intact

AGE
6 months

WEIGHT
6.4lbs

INTERPRETED BY
Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY
Jenna Walsh, CVT

HOSPITAL NAME
Q Street Animal Hospital

REFERRING VET
Dr. Bretschneider

INVOICE
31821

DATE
7/12/23

PRESENTING CLINICAL SIGNS
History: Grade 3/6 heart murmur. Sedated with Torb.

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; 50mm/s, 20mm/mV. The average heart rate is 120bpm (range 120-150bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. 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. Continuous flow detected with color Doppler in the pulmonary artery in the region of the ductus arteriosus. High velocity shunt primarily L-R. Mild volume overload of the left heart with adequate systolic function. Increased LV sphericity. No LA dilation. Trivial MR. No obvious TR. Normal pulmonic outflow velocities; no pulmonic insufficiency. Mild MPA and branch dilation. The PV appears normal. Normal aortic outflow velocities with no AI. 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			1.3	1.2	52	90	0.1
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	107	1.5	1.0	2.9	1.4	2.5	1.2
*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)

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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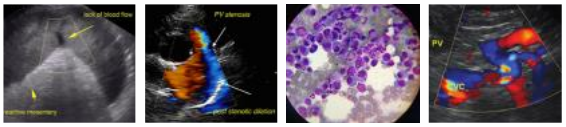

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the murmur is a patent ductus arteriosus (PDA). This is a congenital condition where a blood vessel present in the fetus remains open after birth. When patent, this allows blood to recirculate through the lungs inappropriately and volume overloads the left heart chambers as is seen here. It is important to note that other small congenital defects can be easily missed in these cases, and advanced imaging with a Cardiologist is recommended. The ECG is unremarkable with a normal sinus rhythm.

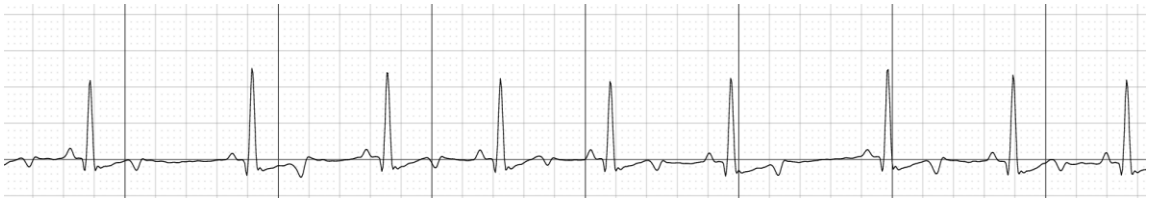
Given a lack of significant LA or LV dilation, this patient is at low current risk for complication at this time. If left open however, there will be risk lifelong for progression to CHF, arrhythmias, PDA reversal due to development of pulmonary hypertension, exertional syncope, and/or sudden death at home in the future. Monitor sleeping respiratory rates at home to screen for progression to CHF.

Gold standard therapy is surgical closure of the vessel. This can be done interventionally or through a thoracotomy, and consultation with a local Cardiologist is recommended if sought **(highly recommended).** Success rates for the procedure are generally high, particularly given the asymptomatic status and a good chance for a normal life if closed appropriately. Medical therapy is not indicated at this time. If surgery is not an option, prognosis is guarded to poor long term and close monitoring is advised.

Omega fatty acid supplementation and mild salt restriction may be of some long term benefit. Monitoring of sleeping breathing rates is recommended as the best way to screen for progression to CHF at home. Mild activity restriction is advised. Monitor at home for breathing changes, worsening cough, fainting episodes, exertional dyspnea.

Plan: Recommend referral to a local Cardiologist for surgical consultation. If not an option, reassess structure and function every 6 months lifelong to assess need for medications, sooner if clinical signs arise (progressive cough, labored breathing, syncope).

IMAGES



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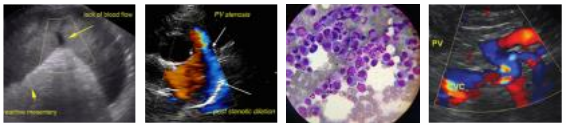

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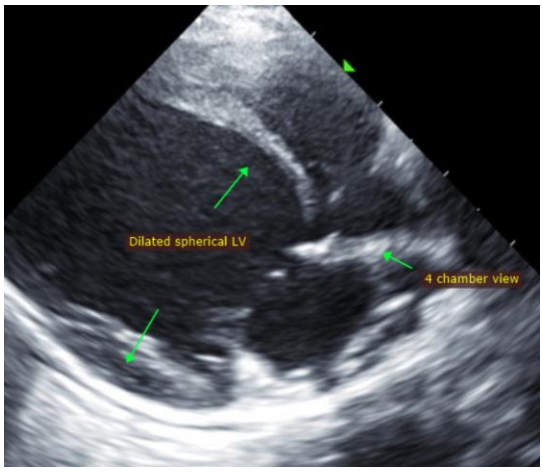

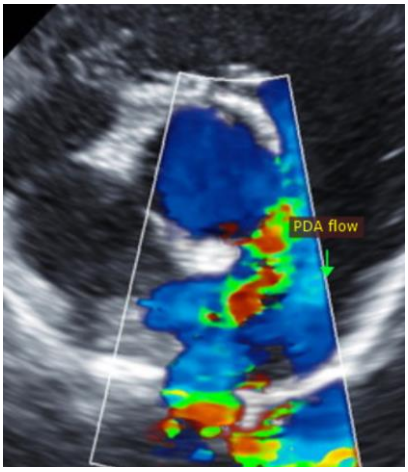

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. 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