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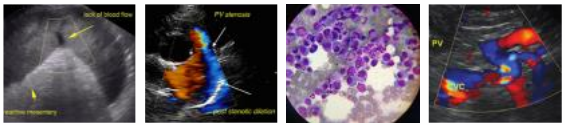

ANIMAL SOUNDS NW
MOBILE VETERINARY ULTRASOUND
IMAGING PERFORMED BY
AnimalSoundsNW.com 541-357-9423

PATIENT
Sugar Cleveland

SPECIES
Canine

BREED
Maltese

SEX
Female

AGE
8 weeks

WEIGHT
1.3lbs

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

IMAGING PERFORMED BY
Jenna Walsh, CVT

HOSPITAL NAME
Santa Clara Animal Hospital

REFERRING VET
Dr. Zulauf

INVOICE
22353

DATE
12/8/21

PRESENTING CLINICAL SIGNS
History: Grade 5/6 continuous heart murmur present on the left and right side.

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 210bpm (range 200-230bpm). 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 tachycardia.

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. The diastole PA is poorly visualized and Spectral doppler not assessed. Moderate volume overload of the left heart with mildly depressed systolic function. Increased LV sphericity. Moderate LA dilation. Mild central MR. No obvious TR. Mildly elevated pulmonic outflow velocities; no pulmonic insufficiency. MPA and branch dilation. The PV appears normal. Mildly elevated aortic outflow velocities with trace 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	NA	NA	1.64	1.6	33	60	0.22
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	180	1.8	0.7	0.6	1.2	1.5	1.0
*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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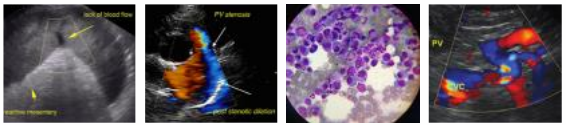

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the murmur is a patent ductus arteriosus (PDA). This is tentative given that the actual ductus is not well visualized. 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. There is also trivial MR and AI, however these are clinically insignificant at this time. 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 shows a sinus tachycardia which is not surprising given the young age of the patient.

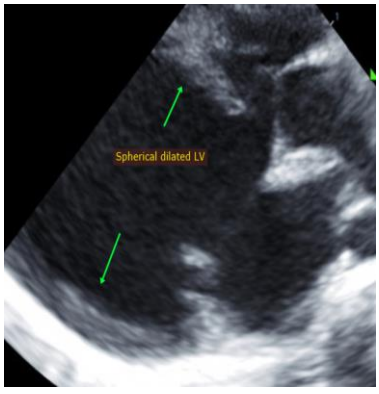
Given moderate LA/LV dilation, this patient is at risk for progression to CHF, arrhythmias, PDA reversal due to development of pulmonary hypertension, exertional syncope, and/or sudden death at home in the future. Monitor sleeping respiratory rates at home to screen for progression to CHF.

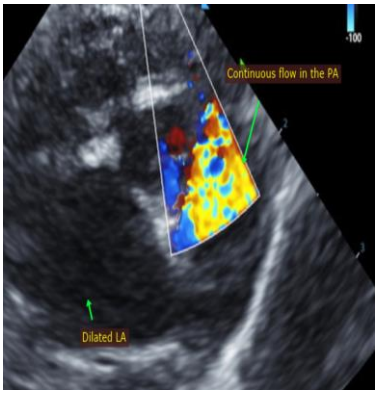
Gold standard therapy is surgical closure of the vessel. This can normally be done interventionally, although this patient is extremely small, and a surgical approach is likely necessary. Consultation with a local Cardiologist is strongly recommended as quickly as possible. Success rates for the procedure are generally high, particularly given the asymptomatic status and a good chance for a normal life if closed appropriately. Regardless of whether or not surgery is elected, cardiac support with Pimobendan is recommended for long term benefit. If surgery is not an option, prognosis is guarded to poor long term and close monitoring is advised.

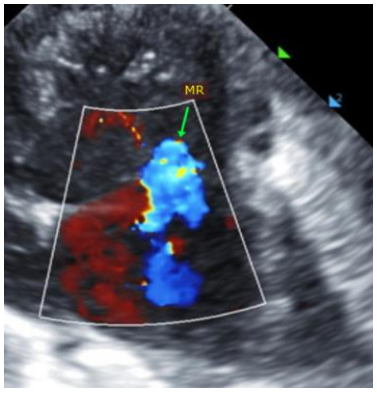
Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit. Monitoring of sleeping breathing rates is recommended as the best way to screen for progression to CHF at home. Mild activity restriction is advised. Monitor at home for breathing changes, worsening cough, fainting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

Plan: Institute Pimobendan 0.3mg/kg PO q12h. 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 additional medications, sooner if clinical signs arise (progressive cough, labored breathing, syncope).

IMAGES







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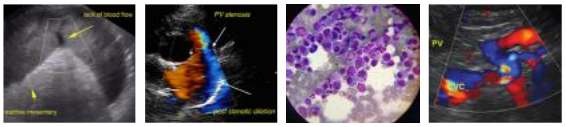

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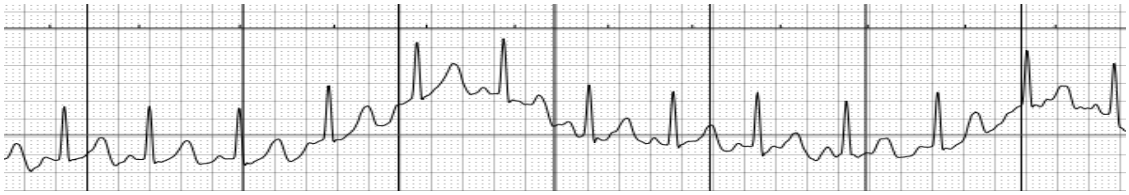

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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