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Clinical Sonography & Telecytology
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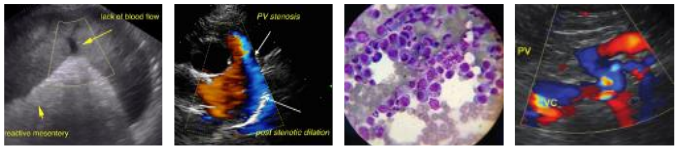


SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT
Lucy Rowe

SPECIES
Canine

BREED
Chihuahua

SEX
Female Spayed

AGE
14 years

WEIGHT
3.3lbs

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

IMAGING PERFORMED BY
Alastair Westcott, DVM

HOSPITAL NAME
Dr. Alastair Westcott

REFERRING VET
Dr. Westcott

INVOICE
26709

DATE
10/4/22

PRESENTING CLINICAL SIGNS

History: Was diagnosed with a heart murmur 7 months ago and based on radiographic findings of mild cardiomegaly and extremely elevated ProBNP with a slight cough, was placed on furosemide and Pimobendan. Grade 4/6 systolic murmur PMI left apex with synchronous abnormal pulses.
-Abnormal PE/Chem/CBC/UA Results: Mild renal azotemia with a borderline USG.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Both leaflets of the mitral valve are thickened with a club-like appearance. No obvious prolapse into the left atrial lumen. Abnormal closure noted. The anterior leaflet can be seen occluding outflow through the LVOT consistent with systolic anterior motion. Moderate secondary MR; elevated velocity. The left atrium is normal. The velocity through the LVOT is severely elevated with a dynamic component. The left ventricle chamber is diminished with marked global hypertrophy (IVSd/LVPWd: 0.8-1.0cm globally). Systolic function appears adequate. The aortic valve appears normal. The pulmonic valve appears normal; however, RVOT velocities are normal. Trace AI and no PI. Right atrial and right ventricular dimensions are subjectively normal. The tricuspid valve is normal with no tricuspid regurgitation. No pericardial/pleural effusion or cardiac masses are seen.

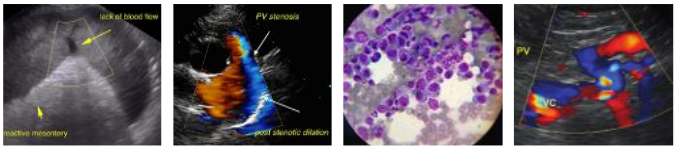
CARDIAC CHART

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	6.4	NA	NM	1.2	39	70	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	5.9	1.4	1.5	1.4	1.4	0.85
*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)
				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

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Mitral valve dysplasia is suspected as the primary cause of the murmur, with a significant obstruction to LVOT flow and secondary MR. Murmur history may be useful as this is typically a congenital abnormality. An alternative explanation would be HOCM similar to we see in cats, which is exceedingly rare in dogs. The former is suspected based upon the morphology of the mitral valve. Regardless, the obstruction is severe and there is secondary mitral regurgitation



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present. The most striking finding in this study is the degree of LV hypertrophy is marked with a diminished LV chamber. While LVH is certainly an expected development with an aortic outflow obstruction, lab work also shows mild azotemia and a baseline blood pressure is highly recommended as a possible contributing issue. Despite this, the LA is normal indicating low risk for complication at this time. No additional issues are identified.

Given a normal LA dimension, CHF is unlikely and particularly in light of azotemia, recommend discontinue both Lasix and Pimobendan. No symptoms are mentioned in the history and if this is accurate this would be a safe change to make. As an alternative, with an LVOT obstruction Atenolol is recommended to help decrease any dynamic component. No additional medications are clearly indicated.

Elective anesthesia is not advised until the patient's medications are altered and BP assessed.

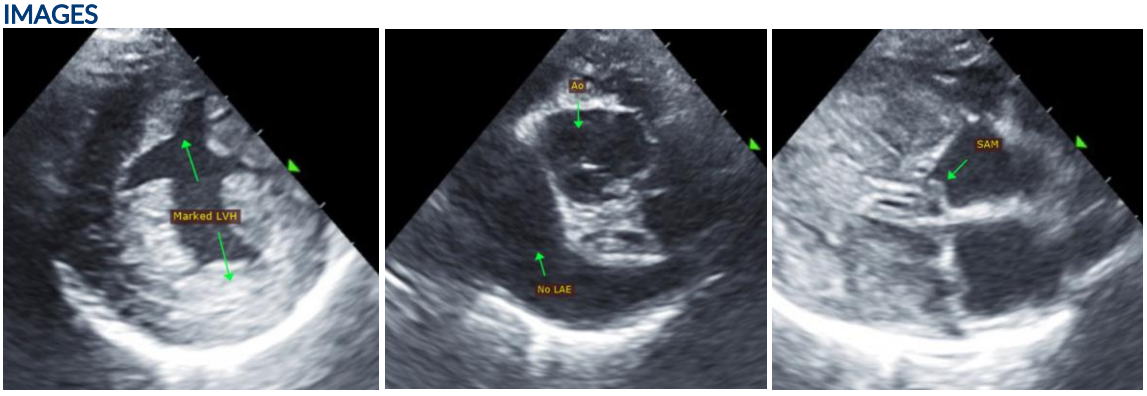
Omega fatty acid supplementation and mild salt restriction may also be of some long-term benefit. Monitor for development of a progressive cough, labored breathing, exercise intolerance or collapse episodes. Prognosis is guarded long term, with risk for arrhythmias, syncope, and sudden death in the future.

PLAN

Recommend discontinue Lasix and Pimobendan. Institute Atenolol 25mg tablets, give ¼ tab PO q12h. Reassess heart rate in 1-2weeks with target <130bpm in hospital. Recheck BP 1-2 weeks later, if persistently >160-180mmHg, institute Amlodipine to effect and screen for underlying issues. Once Lasix is discontinued reassess renal values and USG in the future to reestablish a baseline.

Recommend monitor for progression with a recheck echocardiogram in 6 months, sooner if any development of clinical signs.

IMAGES



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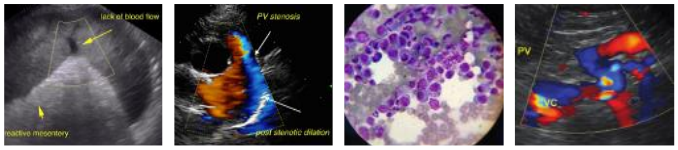

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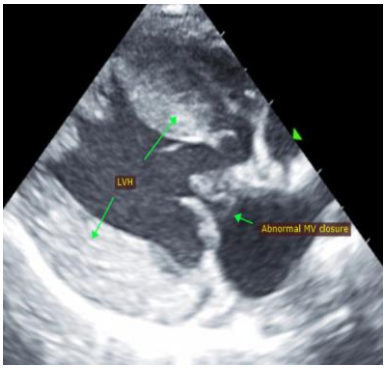

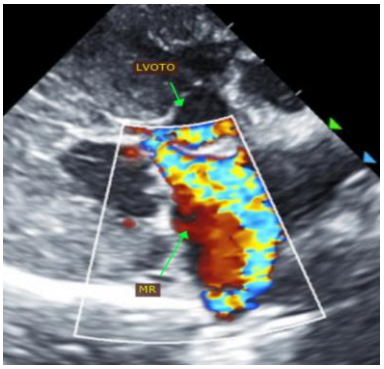

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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