SonoPath
Clinical Sonography & Telecytology
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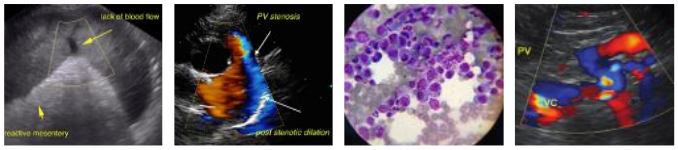

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1-800-838-4268 info@sonopath.com

PATIENT
Ruger Charlesworth

SPECIES
Canine

BREED
German Shepherd

SEX
Male Neutered

AGE
6 years

WEIGHT
99.2lbs

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

IMAGING PERFORMED BY
A. Westcott, DVM

HOSPITAL NAME
Alastair Westcott, DVM

REFERRING VET
Dr. Westcott

INVOICE
28841

DATE
2/7/23

PRESENTING CLINICAL SIGNS

History: Recheck echo; prior report not included. Complex cardiac case previously diagnosed with rapid AF, LAE, poor contractility, SAS, MR/TR. Diagnosed 6 weeks ago.
PE: Tachycardia with grade III/VI systolic murmur PMI Left side, significant arrhythmia with pulse deficits.
-Current medications: Pimobendan 5mg 3 caps Q12 or 15mg Q12 Furosemide 40 mg Q12 Diltiazem 60mg Q8 Digoxin 0.125 mg Q12.
-ECG report: Atrial fibrillation is present.
-Radiographs: Marked cardiomegaly. VHS 13.8 with LAE, tracheal horizontalization and perihilar alveolar to interstitial edema noted. No obvious pulmonary vessel distension.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Moderate left ventricular dilation with depressed myocardial function and increased sphericity. Decreased LV wall thickness. Marked left atrial enlargement. The mitral valve appears thickened with no obvious prolapse into the left atrial lumen. Severe eccentric mitral regurgitation. Normal MR velocity. Tricuspid valve appears mildly thickened with mild TR. Velocity consistent with mild pulmonary hypertension. Mild right atrial and ventricular dilation. The aortic valve appears thickened. A clear subvalvular ridge is present. Flow through the region is consistent with a moderate stenosis. Moderate aortic and trace pulmonic insufficiency. Normal RVOT velocity. Abnormal flow is seen in the region of a ductus arteriosus on both color flow and spectral doppler, consistent with a PDA. The flow appears left to right. No pericardial or pleural effusion noted. No obvious cardiac tumors. Irregular rhythm throughout.

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	5.1	3.1	NM	2.5	15	31	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	3.7	1.0	45.0	7.4	6.4	5.4
*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)
Adapted from June Boon, Veterinary Echocardiography, 1998				25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435				30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)
Hansson et al, Vet Rad and Ultrasound 2002				35	2.48 (4.3)	5.17 (5.0)	3.69 (4.5)
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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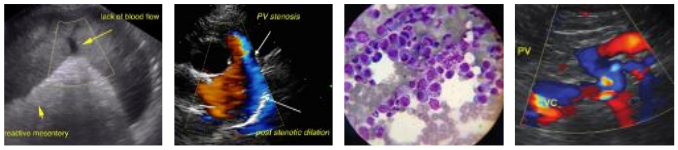

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Complex structural disease is present. First is previously diagnosed sub-aortic stenosis is identified with a moderately elevated velocity through the region. A concurrent significant aortic insufficiency is also appreciated. Additionally, severe MR and mild TR are noted, which may suggest concurrent valve disease and/or primary AV valve dysplasia depending on chronicity. Additionally, the LV is severely dilated with evidence of significant dysfunction, suggestive of myocardial failure. Finally, a PDA is appreciated, which was not noted on the prior exam and is likely leading to further volume overload of the left heart. No additional structural issues are identified.

Atrial fibrillation is apparent throughout the study; however, no further comment can be made without an ECG tracing. Target heart rate should be 140-160bpm with monitoring of blood digoxin levels lifelong.

While any patient with complex congenital heart disease should consider referral, this is particularly warranted in this case as these findings are extremely unusual. While surgical intervention is likely of little benefit at this time, the finding of a PDA certainly complicates things. It is unusual to see a case of congenital SAS develop myocardial failure and LV wall thinning, and screening for concurrent contributing issues should be considered (such as an atypical diet or hypothyroidism). Regardless, what is seen here is considered marked structural disease with development of arrythmias and congestive heart failure. Prognosis is poor to grave, and if QOL suffers euthanasia should be elected.

Going forward, no persistent symptoms are noted in the history and if that is the case continuing the current therapy is recommended, pending ECG/HR assessment. Additionally, an ACE-I and Spironolactone are recommended pending a BP >130mmHg.

Cases of systolic failure are at high risk for malignant tachyarrhythmias (such as VT) and sudden death, and this should be expressed to the owner. Activity restriction is advised.

Elective anesthesia is not advised due to high risk for complications.

Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit. Monitor for development of a cough, worsening labored breathing, abdominal distention, exercise intolerance or collapse episodes in the future. Monitoring of sleeping breathing rates at home is recommended to assess response to medications and recurrence of CHF in the future.

PLAN:

Highly recommend referral for lifelong management in this complicated case. If declined and patient is doing well at home, continue Lasix and Pimobendan as prescribed. Institute Spironolactone 1-2mg/kg PO q12h. Baseline BP is recommended, institute ACE-I (0.5mg/kg PO q12h if BP is >130mmHg. Institute taurine 1000mg PO q12h. Consider diet history/thyroid status. Treatment/follow up for the arrhythmia as dictated by the ECG report.

Monitor a renal panel and blood pressure every 3-4 months lifelong.

A recheck echocardiogram is recommended in 6 months to screen for progression, sooner if clinical issues arise in the interim.

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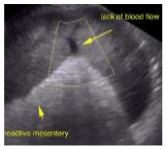
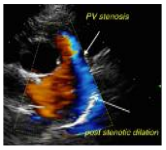
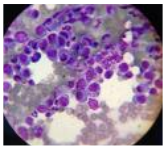
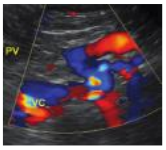

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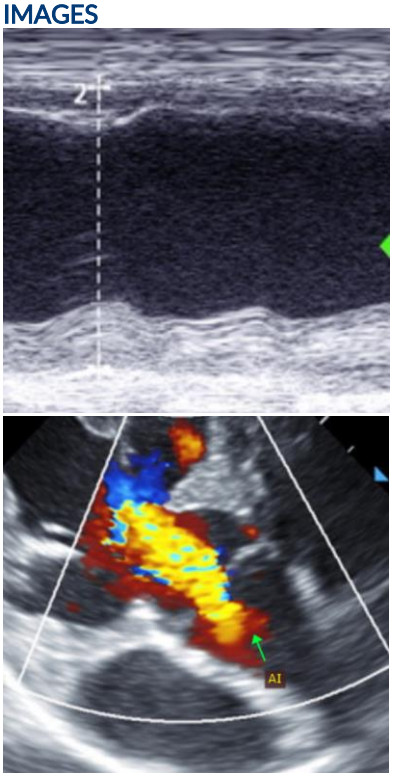
IMAGES



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.

Maggie Machen Lamy, DVM
Diplomate of the American College of Veterinary Internal Medicine (Cardiology)
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