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Clinical Sonography & Telecytology
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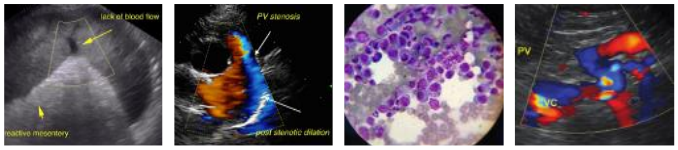


SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT
Dug Raley

SPECIES
Canine

BREED
Goldent Retriever

SEX
Male

AGE
6 months

WEIGHT
39lbs

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

IMAGING PERFORMED BY
Kara Wallisch, DVM

HOSPITAL NAME
Sondeal Family Veterinary Clinic

REFERRING VET
Dr. Wallisch

INVOICE
21584

DATE
10/19/21

PRESENTING CLINICAL SIGNS

History: Dug was adopted as a pup with a 3/6 systolic heart murmur. He has no symptoms and is otherwise a normal playful puppy. Rest of PE is WNL.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. The left ventricular wall is mildly hypertrophied (0.84cm globally). There is a diffusely hyperechoic endocardium consistent with fibrosis. Mild papillary muscle hypertrophy. The left atrium is normal. The right atrium is mildly enlarged. The right ventricle appears normal. The mitral valve is dysplastic, with an elongated and thickened anterior leaflet that is suspected to prolapse into the LVOT in systole (unable to visualize). There is moderate eccentric mitral regurgitation secondary to the abnormal motion. The tricuspid valve appears abnormal as well, although difficult to extensively visualize. Moderate tricuspid regurgitation present with a normal velocity. Blood flow through the LVOT is severely elevated and turbulent with a sub aortic ridge visualized (see below). The aortic valve appears largely normal with a small aortic insufficiency. No obvious shunts. No evidence of cardiac tumors or metastatic lesions on this scan. No pleural or pericardial effusion seen.

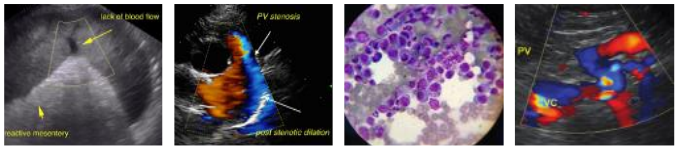
CARDIAC CHART

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	NA	2.6	NM	1.1	42	80	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	4.6	0.82	17.7	2.2	3.1	1.8
*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

Complex congenital heart disease is present. The most significant finding appears to be severe subaortic stenosis causing an increased flow velocity through the LVOT and aortic valve. There is also mitral valve dysplasia that is likely contributing to the obstruction and causing a mitral leak. Additionally, significant tricuspid regurgitation is identified with an abnormal tricuspid valve consistent with dysplasia. It is possible there are additional abnormalities such as intra or extra-



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cardiac shunts that are not visualized here. **Highly recommend referral in this complicated case for advanced echocardiography.**

Despite these findings, there is only mild LV hypertrophy present, and the LA is normal indicating the risk for complication is currently low. Lifelong heart rate control with atenolol is recommended, as the dynamic nature of the obstruction will be reduced at lower heart rates. No other medications are indicated at this juncture. Monitor for development of labored breathing, exercise intolerance or collapse episodes, as SAS/AS patients are more predisposed to development of arrhythmias than to CHF. Mild exercise restriction is advised lifelong.

Prognosis is guarded yet highly variable, with many severe AS/SAS patients succumbing by mid-life. **My main concern in this case is the young age of the patient as these findings can certainly progress up to 1 year of age**. Follow up is highly recommended.

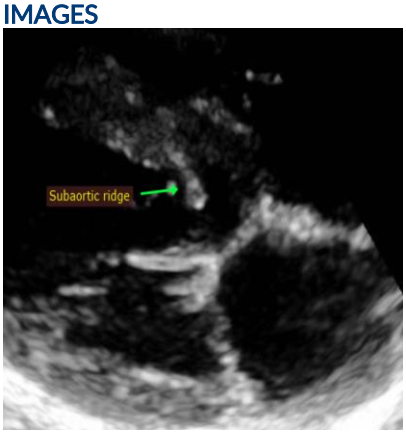
Once Atenolol is initiated, anesthetic risk is mild although referral should be considered prior to proceeding. If declined, avoid heart rate stimulating drugs such as atropine or glycopyrrolate unless clinically indicated. Avoid ketamine and acepromazine due to systemic vascular effects. Mild IV fluid restriction is advised. Recommend prophylactic antibiotics for any orthopedic or dental procedure in the future given predisposition to endocarditis.

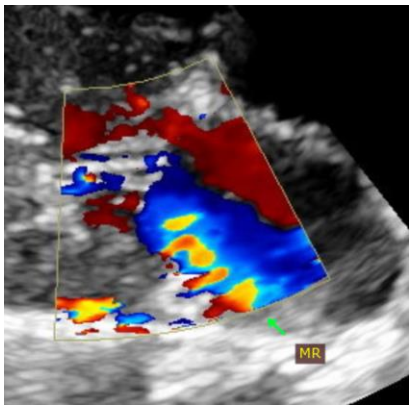
PLAN

Institute titrating dose of atenolol: 25mg tablets; Give 1/2 tab once daily. Recheck heart rate in 1-2 weeks with target stressed rate of <140bpm, Increase as needed until target reached. Will need to up-titrate to desired effect as puppy grows. **Highly recommend referral for lifelong monitoring and advanced echocardiography.**

If referral is declined, a recheck echocardiogram in 6 months to assess response to atenolol and screen for additional issues, sooner if clinical issues arise.

IMAGES





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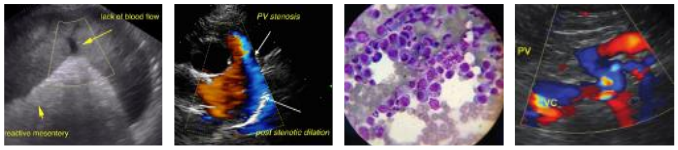

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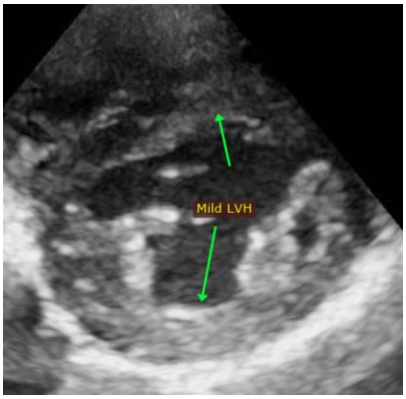

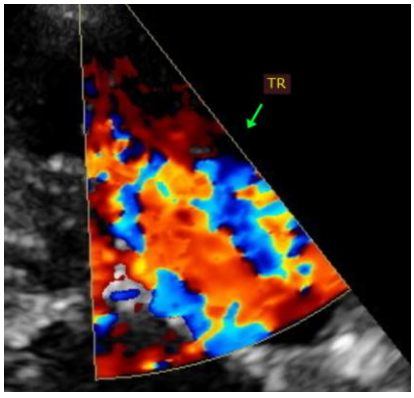

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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