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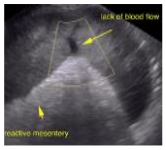
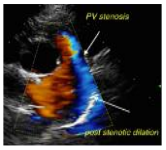
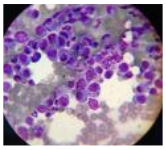
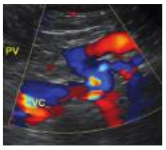
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™

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

PATIENT
Hatch Reynolds

SPECIES
Canine

BREED
Pitbull Mix

SEX
Male Neutered

AGE
4 years

WEIGHT
58.4lbs

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

IMAGING PERFORMED BY
Dana Alterman, RDCS, LVT

HOSPITAL NAME
Eubank Animal Clinic

REFERRING VET
Dr. Harrell

INVOICE
21696

DATE
10/25/21

PRESENTING CLINICAL SIGNS
History: Just adopted. Grade 4/6 murmur, was on grain-free diet (now transitioning off), coughs. Heartworm negative.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.
Normal cardiac silhouette. Bulge in the region of the great vessels. No obvious evidence of CHF.

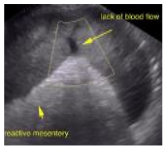
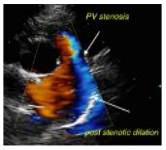
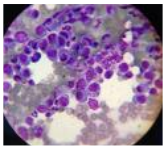
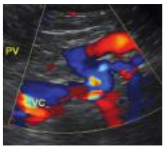
ELECTROCARDIOGRAPHIC FINDINGS *Note: Single lead ECGs are evaluated as a rhythm strip. Morphology/MEA cannot be definitively commented on.
A single lead ECG is available; 25mm/s, 5mm/mV. The average heart rate is 90bpm (range 75-100bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. No ectopic beats, pauses or other dysrhythmias observed.
ECG diagnosis: Normal sinus rhythm with respiratory variation.

ECHOCARDIOGRAM FINDINGS
2D, m-mode, color flow and doppler imaging is available. The mitral valve leaflets appear normal in form and function with no thickening or prolapse into the left atrial lumen. No mitral regurgitation noted with mild LA dilation. Normal LV internal diameter with normal myocardial function. The left ventricular walls are mildly increased in dimension. Prominent papillary muscles. Sub-aortic narrowing is visualized (see below). The aortic valve appears mildly thickened as well. Moderate sub-aortic stenosis is present, with an LVOT velocity of approximately 4.2m/s. Trace aortic insufficiency. The tricuspid valve appears subjectively normal, no tricuspid regurgitation. Normal right atrial and ventricular diameter and morphology. The pulmonic valve is normal in morphology and mobility. No pulmonic insufficiency. No pericardial or pleural effusion noted. No cardiac tumors identified.

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	2.2	NM	1.5	50	82	0.3
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	4.2	1.3	26.5	2.8	4.0	2..0y
*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 *Note: All measurements based upon multi-modal images and methods. An average value is reported.*				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)

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

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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)

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the murmur is moderate subaortic stenosis (SAS) causing elevated blood flow velocity through the LVOT and aortic valve. The LV walls are mildly hypertrophied secondary to the stenosis, however the remainder of the cardiac structure and function appears adequate. Most importantly, the LA is only mildly enlarged indicating the risk for complication is low at this time. No evidence of diet-related cardiomyopathy; however, a diet change remains a conservative recommendation.

Prognosis is guarded yet highly variable, with many dogs in the moderate category never experiencing associated clinical signs and others ultimately succumbing to malignant arrhythmias. Serial echocardiography is recommended lifelong to continue assessment for progression and risk for complication. Monitor for development of labored breathing, exercise intolerance or collapse episodes, as **SAS patients are more predisposed to development of arrhythmias than to CHF which is actually very uncommon**. Mild exercise restriction is advised. **Omega fatty acid supplementation (1000mg 1-2x daily) is of some long term benefit for dogs predisposed to arrhythmias.**

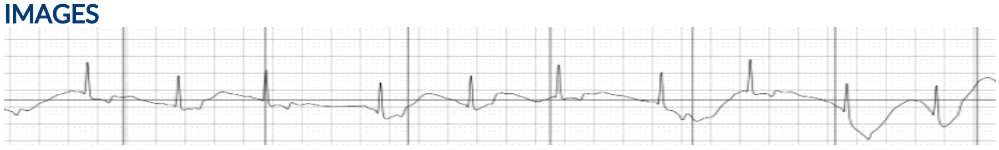
Atenolol is often utilized in these cases, to decrease the degree of obstruction through heart rate management. I do recommend it's use in this case, however the HR on the patient's ECG is already quite low. If this is the normal resting HR in this patient, atenolol is likely unnecessary. Recommend reassess baseline heart rate, institute atenolol as below if indicated, and up-titrate to effect. Goal is a stressed heart rate <120-130bpm without causing any change in activity levels at home.

Even with structural disease identified here, the cough is unlikely to be cardiac in origin and primary respiratory causes should be considered. Consider further respiratory work up/treatment (hydrocodone, taper course of steroids, Enrofloxacin, TTW/BAL, etc). Consider a Radiologist review of the films for a more extensive pulmonary evaluation.

Anesthetic risk is mildly elevated. Avoid heart rate stimulating drugs such as atropine or glycopyrrolate unless clinically indicated. Avoid ketamine and acepromazine due to peripheral vascular effects. Mild IV fluid restriction is advised. Monitor closely for ventricular arrhythmias and intervene as needed. **Recommend prophylactic antibiotics prior to and during any orthopedic or dental procedure in the future given predisposition to endocarditis.**

Plan: Reassess heart rate at home and stressed. If greater than 130 bpm, institute atenolol 25mg tabs, Give ½ tab PO q12h. Reassess HR in 1-2 weeks and up-titrate to effect. Goal is a stressed HR <130bpm.
Recommend recheck echocardiogram yearly to screen for progression, sooner if clinical signs arise.

IMAGES



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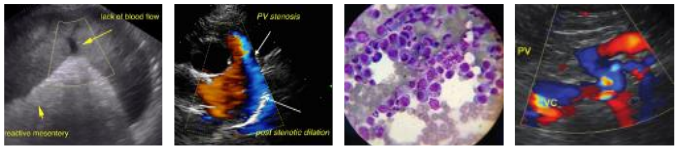

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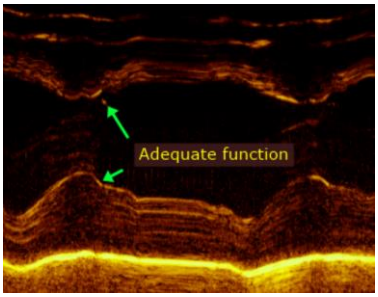

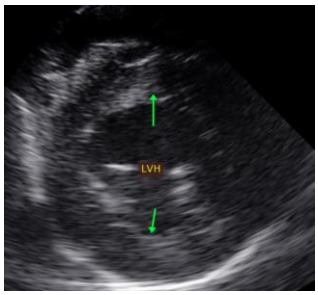

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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