



PATIENT

Booker Waverly Pup
House

SPECIES

Canine

BREED

Mix

SEX

Male

AGE

6 months

WEIGHT

10.6lbs

INTERPRETED BY

Maggie Machen Lamy,
DVM, DACVIM
(Cardiology)

IMAGING PERFORMED BY

Lindsey Daniel,
DVM

HOSPITAL NAME

Moore's Mill Animal
Hospital

REFERRING VET

Dr. Lamb

INVOICE

24393

DATE

5/24/22

PRESENTING CLINICAL SIGNS

History: Grade 5/6 murmur. No clinical signs. Sedated with IV Butorphanol.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Normal MV with no prolapse into the left atrial lumen. No obvious mitral regurgitation with no left atrial dilation. Normal LV diameter with adequate systolic function. The tricuspid valve appears largely normal, however there is mild tricuspid regurgitation. Elevated TR velocity. Moderate right atrial and mild ventricular dilation; mild RV hypertrophy. There is a muscular ridge of tissue located within the mid-RV lumen. This is suspected to be causing a significant obstruction to flow, seen on color imaging (not assessed on doppler). The pulmonic and aortic valves are largely normal in morphology and mobility, although difficult to visualize. No obvious pulmonic stenosis. Mild to moderate PI. Normal pulmonic and normal aortic outflow velocities. Laminar flow. No AI. No continuous flow identified in the distal PA. No pericardial or pleural effusion noted. No cardiac tumors observed.

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		5.0	1.1	1.3	50	92	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	1.8	3.0	4.8	1.4	2.0	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)
<i>*Note: All measurements based upon multi-modal images and methods. An average value is reported.</i>				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

The cause of the murmur is suspected to be due to an obstruction to flow through the mid-RV. There appears to be a muscular ridge of tissue creating the obstruction, likely consistent with a double chamber right ventricle (DCRV). This is causing pressure overload of the right heart, a dilated RA and a mild tricuspid leak due to the elevated pressure gradient. No additional issues are identified, such as an intra or extra-cardiac shunt, however it is important to note that small congenital defects are easily missed. Regardless, this patient does not appear to be at imminent risk for CHF or development of clinical signs as the compensatory dilation of the chambers appears mild.



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This type of stenosis is highly unusual, and referral to a local Cardiologist is strongly recommended to confirm the diagnosis and screen for additional issues through advanced imaging. If confirmed, there is no clear surgical intervention for this type of muscular abnormality, making medical management the only viable option at this time. Similar to pulmonic stenosis, increased heart rate may lead to a worsening obstruction and rate control with activity restriction is recommended lifelong. If referral is declined, err on the side of caution and initiate Atenolol as below. No additional medications are indicated at this time.

Due to the highly uncommon nature of this finding, prognosis is guarded. This patient's condition will likely limit lifespan, with many severe stenosis cases developing CHF by mid-life. That being said, outcome is highly variable. Monitor for development of associated clinical signs (collapse, abdominal distention, cough, labored breathing). Patient will always be at risk for progression to right-sided CHF (ascites, pleural effusion), development of exertional dyspnea/syncope, and/or malignant arrhythmias/sudden death lifelong.

Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.

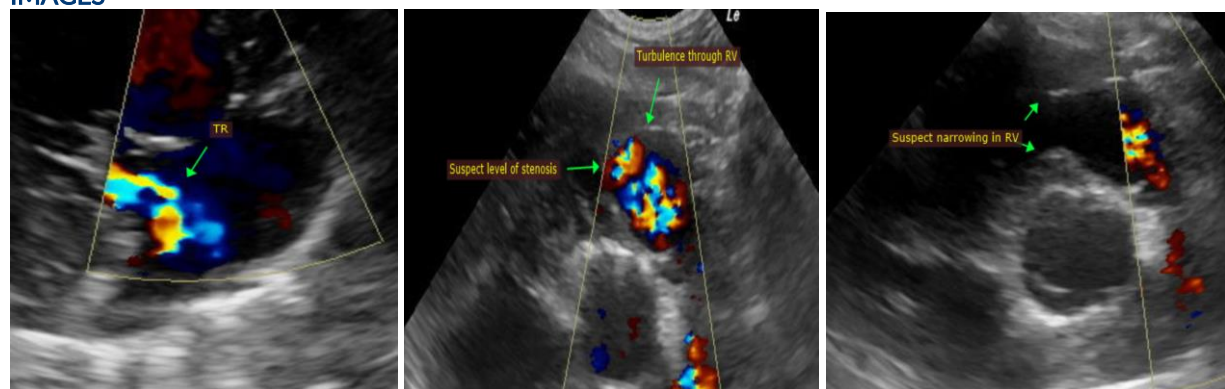
Anesthetic risk is mild to moderate at this time. Avoid heart rate stimulating drugs such as atropine or glycopyrrolate unless absolutely necessary. Avoid vasodilators such as acepromazine. Mild IV fluid restriction is advised.

PLAN

Consider referral for advanced diagnostics as discussed. If declined, institute atenolol to effect: 25mg tabs, ¼ tab PO BID to start (up-titrate to desired effect). Goal is to suppress heart rate <120bpm even with stress/activity.

Recommend a recheck echocardiogram in 6 months to assess for progression, response to medication, sooner if any clinical signs arise.

IMAGES





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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.

SPECIES

Canine

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.

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Maggie Machen Lamy, DVM
Diplomate of the American College of Veterinary Internal Medicine (Cardiology)
info@sonopath.com

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