



**PATIENT**

Winston Noble

**PRESENTING CLINICAL SIGNS**

History: Heartworm positive. Symptomatic-treated with Pred, and Doxycycline. Controlled symptoms with medications. Considering treatment options for Heartworm.

**SPECIES**

Canine

**ECHOCARDIOGRAM FINDINGS**

2D, m-mode, color flow and doppler imaging is available. Mild diffuse thickening of mitral valve with no prolapse into the left atrial lumen. MR mitral regurgitation, normal left atrial dimension. Normal velocity. Normal LV diameter with adequate myocardial function. No significant TR. Mild right atrial and ventricular enlargement. The MPA and branches are moderately dilated. Adult worms near the level of the bifurcation extended into the deep right branch of the pulmonary artery. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. Moderate pulmonic and no aortic insufficiency. No pericardial effusion. No obvious pleural effusion noted.

**BREED**

Boykin

**SEX**

Male Intact

**CARDIAC CHART**

**AGE**

8 years

**WEIGHT**

43lbs

**INTERPRETED BY**

Maggie Machen Lamy,  
DVM, DACVIM  
(Cardiology)

**IMAGING PERFORMED BY**

Sands Hill Mobile  
Veterinary Ultrasound

**HOSPITAL NAME**

Pine Valley Animal  
Hospital

**REFERRING VET**

Dr. Lantzer-Pine

**INVOICE**

32267

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CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swe)	FS (%)	EF (%)	EPSS (cm)
<b>NORMAL PARAMETER</b>	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
<b>PATIENT</b>	5.1	NA	1.5	1.3	53	84	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)
<b>NORMAL PARAMETER</b>	50-100	0.7-1.7	0.7-1.6	BELOW	BELOW	BELOW	BELOW
<b>PATIENT</b>	65	1.4	1.2	19.5	3.1	4.3	2.0
*Normal chamber parameters expressed as a mean value (SD)				3	1.27 (5.3)	2.46 (2.46)	1.36 (5.5)
<b>BODY WEIGHT DEPENDENT PARAMETERS</b>				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)

**INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS**

Adult heartworm infestation is present in the pulmonary artery and branches. Secondary right heart enlargement with suspicion for pulmonary hypertension has developed. The left heart is essentially normal with a small mitral regurgitation. Follow up is recommended. No additional issues are identified.

Heartworm infestation to this degree, caval syndrome may develop due to a very high worm burden sheering blood cells as they pass through the heart. Caval syndrome is a life-threatening emergency that requires immediate surgical removal of the worms. Although no reported lab



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findings are definitive for caval syndrome, I would recommend **ensuring no hemoglobinuria is noted, and no RBC destruction seen by the Pathologist.**

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This patient has respiratory signs, which have improved with supportive care and can be continued. If true caval syndrome is ruled out through lab work, the best we can do is treat the HW disease (extraction, Immiticide) and continue supportive care for respiratory signs. Oxygen support can be used if needed. Sildenafil/Pimobendan are likely unnecessary at this time; however, steroid therapy should be continued at twice daily dosing. Consider broad spectrum antibiotic (Baytril or similar), theophylline, hydrocodone, etc. as indicated.

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**Any patient with visible worms in the cardiac structures should consider extraction (if available) to quickly decrease load and give the greatest chance for long term recovery. The procedure does carry risk, and if available should be discussed with a local Cardiologist ASAP.**

**SEX**

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Once the majority of the worm burden is removed if possible and the patient stabilized, I would recommend utilizing the split protocol using Immiticide. This protocol is also recommended if extraction is declined; however, risk for embolus is significantly greater. Strict exercise restriction and administration of monthly heartworm preventative, such as Heartguard should also be initiated. Starting now through the end of therapy (6-8-week post-last immiticide injection), exercise restriction is paramount, including cage rest with leash walks only as a worm embolus can be a life-threatening complication of the disease. Following treatment, the patient should be re-tested for heartworm disease 6 months after completing the full course of therapy.

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(Cardiology)

Once heartworm negative, a recheck echocardiogram and chest radiographs are recommended in 6 months to assess for any chronic damage to the heart muscle, lungs or tricuspid valve.

**PLAN**

Continue supportive care as prescribed, including Prednisone and Doxycycline. Consider referral for worm extraction (highly recommended). If declined, recommend immiticide therapy using the split protocol as dictated by the American Heartworm Society website.

**IMAGING PERFORMED BY**

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Reassess echocardiogram in 6 months after heartworm negative status is achieved to reassess right heart/MPA dimensions.

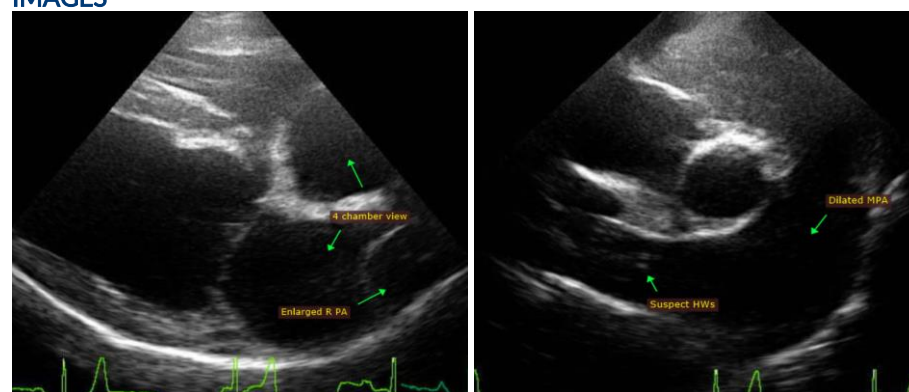
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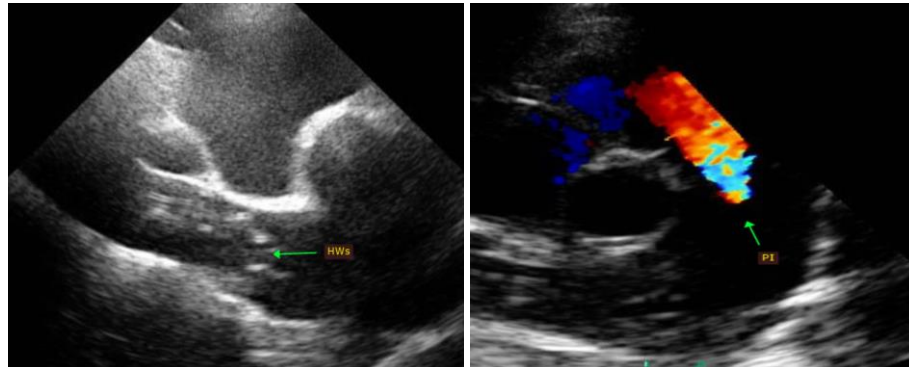
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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