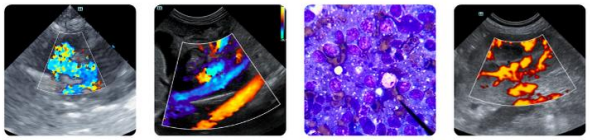

PATIENT

Blacky Torres

SPECIES

Canine

BREED

Chihuahua

SEX

Male Intact

AGE

11 years

WEIGHT

5lbs

INTERPRETED BY

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY

G. Ferrer, DVM

HOSPITAL NAME

Pulse: Pet Ultrasound Services

REFERRING VET

Dr. Morales

INVOICE

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PRESENTING CLINICAL SIGNS

History: Presented with history of coughing for 2 months; worsening and more water intake. Prescribed Prednisolone tapering q5days and Doxycycline for 14 days to reassess after. At recheck, cough had improved so Doxycycline was continued for 14 additional days. Labs: showed monocytosis, increased globulins, and he was positive for heartworm antigen. CXR showed slight increased cardiac silhouette on lateral view, spondylosis between L3-L4 with narrowing of intervertebral space. Assess prior to anesthesia.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.

Possible slight cardiomegaly. No obvious evidence of CHF.

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. No mitral regurgitation with normal left atrial dimension. Normal LV diameter with adequate myocardial function. No significant TR. Mild right atrial and ventricular enlargement. Adult worms seen within the RA traversing the tricuspid valve. The MPA and branches are mildly dilated. Adult worms noted in the distal pulmonary trunk. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. No pulmonic or aortic insufficiency. No pericardial effusion. No obvious pleural effusion noted.

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	NA	NM	1.3	60	90	0.12
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	100	0.6	0.7	2.3	1.3	1.7	0.7
*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

Adult heartworm infestation is present within the right heart and pulmonary artery. Secondary right heart enlargement is mild, which may support impending pulmonary hypertension. The MV

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is mildly thickened which many reflect early valve disease, and follow up is advised should a murmur develop. The left heart is normal, and 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. Even without obvious red bleed cell destruction on routine blood work, a urinalysis is recommended.

The patient's cough has reportedly improved, which is good news and further supportive care is likely unnecessary. Reinstituting anti-inflammatory Prednisone, Hydrocodone, etc. can be utilized as indicated.

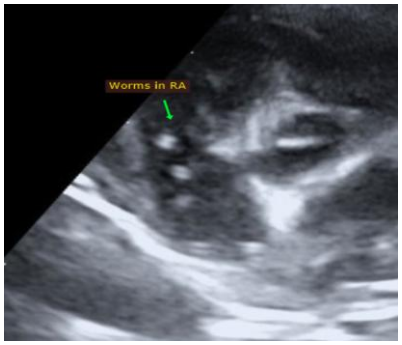
Any patient with visible worms in the cardiac structures should consider extraction (if available) to quickly decrease load and give the greatest chance for long term recovery. The procedure does carry risk, and if available should be discussed with a local Cardiologist ASAP.

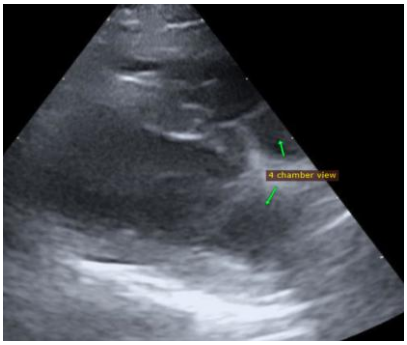
Once the majority of the worm burden is removed if possible and the patient stabilized, I would recommend utilizing the split protocol using Immiticide. This protocol is also recommended if extraction is declined; however, risk for embolus is significantly greater. Strict exercise restriction and administration 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.

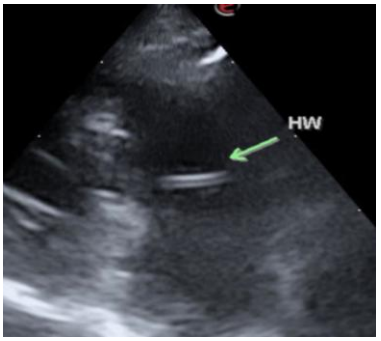
Once heartworm negative, a recheck echocardiogram and chest radiographs are recommended in 6 months to assess for any chronic damage to the heart muscle, lungs or tricuspid valve.

PLAN
Continue supportive care as needed for clinical signs. Consider referral for worm extraction (highly recommended). If declined, recommend immiticide therapy using the split protocol as dictated by the American Heartworm Society website.

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

IMAGES






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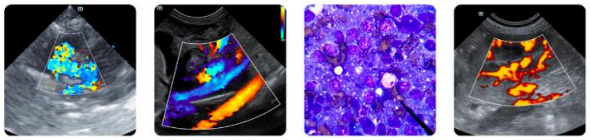

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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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