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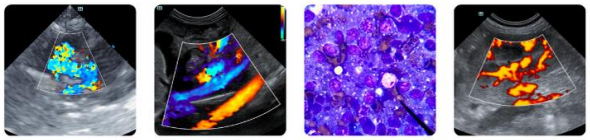


Clinical Sonography & Telecytology
Educational Teleconsultation Services™

PATIENT
Lola Quinones

SPECIES
Canine

BREED
Boxer

SEX
Female Spayed

AGE
9 years

WEIGHT
88lbs

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

IMAGING PERFORMED BY
G. Ferrer, DVM

HOSPITAL NAME
Pulse: Pet Ultrasound Services

REFERRING VET
Dr. Catinchi

INVOICE
45719

DATE
11/12/25

PRESENTING CLINICAL SIGNS

History: Presented 9/15 with ascites, labored breathing and edema on both hindlimbs. Diagnosed with heartworm disease and Microfilaria; treated with Furosemide 40mg BID, Doxycycline 100mg BID, Proviable. Did not improve as medications were not given correctly and dose of furosemide was increased to 80mg BID. Provisional diagnosis HW disease with right sided CHF. Treated with furosemide, Pimobendan 5mg BID, Enalapril 10mg BID, Spironolactone 50mg BID. 10/1 respiratory distress continues, but abdominal distention improved and recommended echocardiogram. Oct 15th still have abdominal distention and is on Furosemide 40mg BID, Pimobendan 5 mg BID, Enalapril 10mg BID, Spironolactone 50mg BID. Removed 5 liters of abdominal fluid modified transudate-like fluid by abdominocentesis.

ECHOCARDIOGRAM FINDINGS

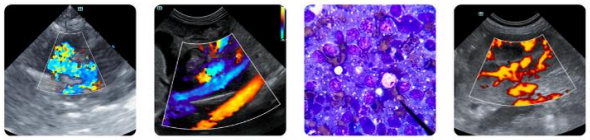
2D, m-mode, color flow and doppler imaging is available. Mild diffuse thickening of mitral valve with no prolapse into the left atrial lumen. No mitral regurgitation, normal left atrial dimension. Normal LV diameter with adequate function. The TV appears mildly thickened with mild to moderate tricuspid regurgitation. Suspect worm embolus associated with the tricuspid valve leaflets which can be seen moving between the atria and ventricle. Velocity consistent with mild pulmonary hypertension (suspected to be an underestimation). Marked right atrial and ventricular dilation with evidence of hypertrophy. The MPA and branches are mildly dilated. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. No AI or PI. No pericardial or 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		3.3	NM	1.3	42	76	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	166	1.4	0.8	39.9	2.4	3.0	1.7
*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)
Adapted from June Boon, Veterinary Echocardiography, 1998				25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435				30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)
Hansson et al, Vet Rad and Ultrasound 2002				35	2.48 (4.3)	5.17 (5.0)	3.69 (4.5)
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

Unfortunately, this patient has marked right heart enlargement, suspected to be secondary to a heartworm infestation. The location of the worm embolus is somewhat atypical with a lesion



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seen associated with the tricuspid valve. No worms are seen in the distal pulmonary artery, which is unusual. Regardless, the right heart is massively dilated, and ascites is certainly due to right-sided CHF. A concurrent component of RV cardiomyopathy would be possible as well. Even if we are able to clear the infestation, these changes may be irreversible, and the prognosis is guarded to poor long-term.

Heartworms can cause significant damage to the lung tissue leading to pulmonary damage, pulmonary hypertension and clinical signs such as coughing, decreased ability to exercise, or difficulty breathing. Disease severity can range from an asymptomatic dog with few worms to dogs with severe respiratory signs. In the most severe cases, 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. Screening for this phenomenon is indicated through lab work assessment.

Unfortunately, the degree of right-sided damage has led to congestive heart failure as evidenced by reported ascites. A therapeutic abdominocentesis was performed to improve comfort and should be repeated if and when the patient is inappetent or uncomfortable. Additionally, immediate medical stabilization is recommended including diuretics, Sildenafil, Pimobendan and treatment for the cough (hydrocodone, Doxycycline). If extraction would be a possibility from a financial standpoint, I would **consider immediate referral to a local cardiologist** for advanced echocardiography and evaluation. If that is not a possibility, utilizing the standard approach to heartworm treatment as dictated by the American Heartworm Society is recommended, including 30 days of doxycycline and heart guard prior to continuing the split Immiticide protocol. Please see website and protocol for specific information.

There is high risk for thromboembolism in any patient, however those with adult worms in the PA are no question at elevated risk. At this time, exercise restriction is paramount, including cage rest with leash walks only, as a worm embolus can be a life-threatening complication of the disease. This should be continued for an additional 6-8 weeks following therapy.

Modifications to this protocol are sometimes elected depending on individual circumstances which may involve fewer injections or a “slow kill” method. These are not; however, our standard recommendation as alternate treatment may not result in effective treatment of the infestation.

Following treatment, retest for heartworm disease 6 months after completing the full course of therapy. Anesthesia is NOT advised prior to completing the protocol, as vasodilation can lead to increased risk for an embolus. Prognosis is guarded, as the right heart/MPA changes are often permanent and may cause clinical signs (exertional syncope/dyspnea, right-sided CHF) in the future. It must be reiterated that this patient is considered end-stage, and our goals are to improve QOL for the short term. If QOL suffers, humane euthanasia should be considered.

During therapy, there is high risk for a worm embolus and breathing rate, and effort should be monitored closely. Anti-inflammatory prednisone can be used if becomes symptomatic. Patient will be at high risk for developing clinical signs due to pulmonary hypertension with age given the inherent secondary inflammation and damage to the pulmonary vasculature and lungs, and periodic rechecks may be helpful. Monitor for exertional dyspnea or fainting episodes going forward.

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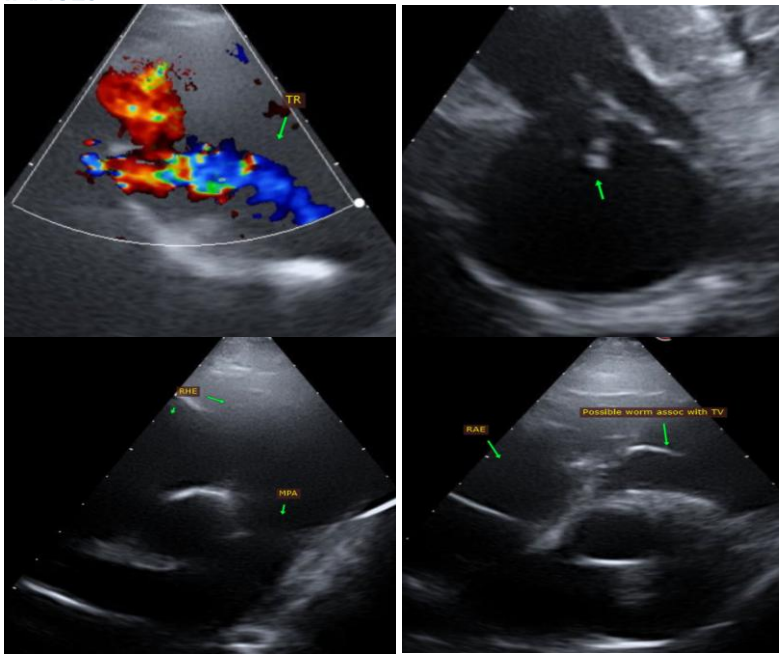
PLAN

Abdominocentesis as needed. Immediate referral as discussed. Continue Lasix 1-2mg/kg PO q12h. Continue Spironolactone 1-2mg/kg PO q12h. Continue Pimobendan 0.3mg/kg PO q12h. Institute Sildenafil 1-2mg/kg PO q8h. Discontinue ACEI unless BP is documented normnal,. Continue treatment for heartworm disease as dictated by the American HW society. If patient's ascites persists/worsens, a course of anti-inflammatory prednisone is recommended. Screen for caval syndrome through routine lab work and urinalysis. If QOL suffers, euthanasia should be considered.

Monitor renal values/BP in 1-2 weeks, then every 3-4 months lifelong.

Once heartworm negative, a recheck echocardiogram and chest radiographs are recommended in 6 months to reassess right heart changes.

IMAGES



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