



PATIENT

Rosie Grenier

SPECIES

Canine

BREED

Staffordshire Bull
Terrier

SEX

Female Spayed

AGE

3 years

WEIGHT

65.6lbs

INTERPRETED BY

Maggie Machen
Lamy, DVM
DACVIM (Cardiology)

**IMAGING
PERFORMED BY**

Pamela Harrigan,
RDCS

HOSPITAL NAME

Mass Veterinary
Specialty Services

REFERRING VET

Dr. Masloski

INVOICE

21003

DATE

9/14/21

PRESENTING CLINICAL SIGNS

History: Rosie was adopted over a year ago. She was noted to have a positive heartworm test last month on pre-op blood for a stifle issue. On HW prevention for the past month. She has been coughing the past 2 days. Good appetite. CV/RESP: NSR, no murmurs noted, PSS, lung fields clear. BP: 140mmHg.

-Current medications: 1) Doxycycline 100mg 2 tabs twice a day 2) Gabapentin 100mg 1 capsule twice a day 3) Meloxicam daily. *No sedation.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and Doppler imaging is available.

Left ventricle: The LV diameter is normal with adequate myocardial function. LV wall thicknesses are normal.

Left atrium: The left atrium is normal.

Mitral valve: The mitral valve is normal with trace mitral regurgitation.

Aortic valve/aorta: The aortic valve is normal in morphology and mobility. Normal aortic outflow velocity; laminar flow. No aortic insufficiency.

Right ventricle: Normal right ventricular diameter and morphology indicating no overt evidence of pulmonary arterial hypertension.

Right atrium: Normal RA dimension.

Tricuspid valve: The tricuspid valve appears normal with no tricuspid regurgitation.

Pulmonic valve/pulmonary artery: The main pulmonary artery and branches are normal in dimension. Suspicion for a single adult worm near the bifurcation (see below). The pulmonic valve is normal in morphology and mobility. No pulmonic insufficiency. Normal RVOT velocity; laminar flow.

Pericardium/other: No pericardial or pleural effusion noted. No obvious cardiac masses.

Heart rhythm: ECG reveals a sinus rhythm with an average HR of 140bpm.

2-Dimensional Measurements

Ao diam (cm)	2.1
LA diam (cm)	2.4
LA:Ao (Swe)	1.1
IVS thickness (cm)	1.0
LVID diastole (cm)	4.2
PW thickness (cm)	1.1
LVID systole (cm)	2.8
FS (%)	33

Doppler Measurements

PV Vmax (m/s)	0.9
AoV Vmax (m/s)	1.4
MR Vmax (m/s)	NA
TR Vmax (m/s)	NA
TR PG (mmHg)	NA

INTERPRETATION OF THE FINDINGS

Overtly normal cardiac structure and function with no obvious significant PAH. The right heart appears largely normal and MPA branches are normal in dimension.

There is however suspicion for a single adult worm near the bifurcation of the pulmonary vasculature. This is certainly not definitive as ultrasound is largely insensitive (i.e., adult worms may be missed peripheral or elsewhere, and artifact over-interpreted). Despite this finding, given a lack of right heart enlargement the infestation is still considered relatively mild without evidence of significant pulmonary hypertension. No additional issues are identified.



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Heartworms if left untreated 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.

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Given that this patient has only recently developed a mild cough and there is no right heart enlargement, we do have some flexibility when approaching therapy. Medical management with drugs like Sildenafil is typically utilized if the patient is showing respiratory signs such as dyspnea and/or syncope (none noted). The cough is likely related, and if the symptom does not improve with Doxycycline alone a course of anti-inflammatory prednisone may be useful (+/- Hydrocodone). Baseline CXr are recommended.

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Given an apparently low worm burden, no obvious indication for extraction in this case; however, if the owner is interested in the gold standard approach referral should be considered for advanced evaluation. Otherwise, utilizing the standard approach to heartworm treatment as dictated by the American Heartworm Society is recommended, including 30 days of doxycycline and heartguard prior to 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 seen 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.

INTERPRETED BY
Maggie Machen Lamy, DVM DACVIM (Cardiology)

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.

IMAGING PERFORMED BY
Pamela Harrigan, RDCS

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.

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During therapy, there is high risk for a worm embolus and breathing rate and effort should be monitored closely. 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.

REFERRING VET
Dr. Masloski

RECOMMENDATIONS

- Continue Doxycycline and Ivermectin as prescribed.
- Consider baseline CXR, a course of anti-inflammatory Prednisone, Hydrocodone, etc. to stabilize clinical signs.
- If interested, consider referral for advanced imaging/options as discussed.

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- Otherwise, recommend split protocol as dictated by the American Heartworm Society.
 - Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes.
 - Strict activity restriction is indicated.
 - Monitor for exertional dyspnea or fainting episodes going forward.

PLAN

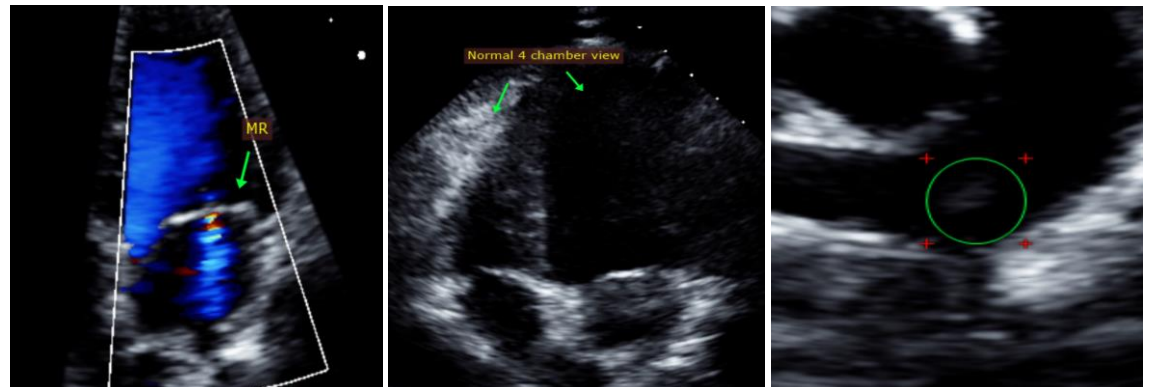
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- Once heartworm negative, a recheck echocardiogram and chest radiographs are recommended in 6 months to reassess pulmonary/right heart changes.

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.

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.

**IMAGING
PERFORMED BY**

Pamela Harrigan,
RDCS

Maggie Machen Lamy, DVM
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Echocardiogram performed by: Pamela Harrigan, RDCS
Pet Animal Ultrasound Service (4paus.com)

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