



PATIENT

Alanis Abee

SPECIES

Canine

BREED

Miniature Schnauzer

SEX

Female Intact

AGE

4 years

WEIGHT

10.6lbs

INTERPRETED BY

Maggie Machen Lamy,
DVM, DACVIM
(Cardiology)

IMAGING PERFORMED BY

G. Ferrer, DVM

HOSPITAL NAME

Pulse: Pet Ultrasound
Services

REFERRING VET

Dr. Rivera

INVOICE

46939

DATE

2/23/26

PRESENTING CLINICAL SIGNS

History: Grade 3/6 heart murmur. Heartworm positive – on 2nd month of treatment. CXR showed CHF and bronchitis. BP: 114mmHg.

-CXR report: MPA enlargement, bronchial changes. No CHF.

-Current medications: Pimobendan (1.25mg, 1 tab, PO, BID), Sildenafil citrate (20mg, 1/4-tab, PO, TID), and Furosemide (12.5mg, 1/2-tab, PO, BID).

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Mild diffuse thickening of mitral valve leaflets with no obvious prolapse into the left atrial lumen. No obvious MR with normal LA dimension. Normal LV diameter with adequate myocardial function. The tricuspid valve appears mildly thickened with no tricuspid regurgitation. Elevated velocity consistent with PAH. Mild right heart enlargement. Mild RV hypertrophy. The pulmonic and aortic valves are normal in morphology and mobility. Significant MPA/branch dilation. Hyperechoic linear opacities seen in deep PA extending into the right branch consistent with adult heartworms. Normal pulmonic and aortic outflow velocities with laminar flow. No obvious aortic and mild pulmonic insufficiency. No pericardial or pleural effusion noted. No obvious cardiac masses.

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	45	80	0.1
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	110	1.2	1.2	4.8	1.7	2.0	1.1
*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)

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Adult heartworm infestation is present in the main pulmonary artery extending into the right branch. There is evidence of likely pulmonary hypertension, which is not surprising in light of



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active heartworm disease. There is only mild right heart enlargement; however, the MPA is severely dilated. The left heart is normal, and no additional issues are identified.

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.

Given that this patient has no reported clinical signs and only mild right heart enlargement, we do have some flexibility when approaching therapy. Lasix and Pimobendan are unnecessary; however, continuing Sildenafil is reasonable. If extraction would be a possibility from a financial standpoint, recommend 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 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.

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.

Anesthesia is NOT advised prior to completion of heartworm treatment due to high risk for complication.

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.

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.

PLAN

Follow up as dictated by the American Heartworm Society Website. Consider referral for worm



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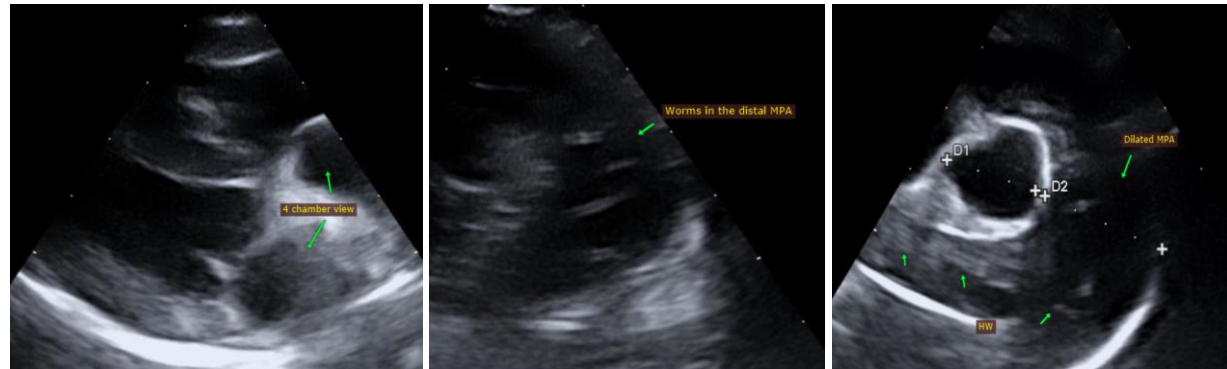
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extraction. Continue Sildenafil 1-2mg/kg PO q8h. Discontinue Pimobendan and Lasix. Further cough treatment if necessary.

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)

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