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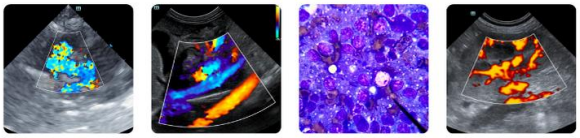

Clinical Sonography & Telecytology
Educational Teleconsultation Services™

**PATIENT**

Rex Maher

**SPECIES**

Canine

**BREED**

Spaniel Mix

**SEX**

Male Intact

**AGE**

12.3 years

**WEIGHT**

83lbs

**INTERPRETED BY**

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

**IMAGING PERFORMED BY**

Kathleen Byrnes

**HOSPITAL NAME**

Chatham VS

**REFERRING VET**

Dr. Weiser

**INVOICE**

47224

**DATE**

3/12/26

## PRESENTING CLINICAL SIGNS

History: Heartworm Positive. CXR showed cardiomegaly. Possible cough. Currently on Lasix, Vetmedin. Sedated with Torb. VPC's seen on ECG. Mild ALT elevation.

## ELECTROCARDIOGRAPHIC FINDINGS

A six lead ECG is available at 25mm/s; 20mm/mV. The underlying rhythm is sinus in origin with an average heart rate of 60bpm. P for every QRS complex and vice versa. The P wave morphology is positive with a normal dimension. Normal PR. The QRS morphology is positive with normal dimension. MEA is normal. Frequent VPCs are noted during the initial portion of the tracing; primarily singles; however, couplets are observed. No APCs, or other dysrhythmias observed. ECG diagnosis: Sinus bradycardia with respiratory variation. Single and couplet VPCs.

## ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Mitral valve is normal with no obvious prolapse into the left atrial lumen. Trace mitral regurgitation with slight left atrial dilation. Normal LV diameter with adequate myocardial function. Normal LV wall thickness. The tricuspid valve appears mildly thickened with moderate TR. Moderate right heart enlargement. The TR velocity is mildly elevated. The pulmonic and aortic valves are normal in morphology and mobility. Normal LVOT and RVOT velocity. No aortic and trace pulmonic insufficiency. MPA and PA branches; no obvious adult worms seen in the right heart or distal vasculature. No pericardial or pleural effusion noted. No obvious cardiac tumors seen.

## 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** | NM | 3.1 | NM | 1.4 | 43 | 80 | 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** | NM | 1.8 | 1.5 | 37.6 | 2.5 | 4.0 | 2.3 |
| *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) |
| | | | | 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) |

***Note: All measurements based upon multi-modal images and methods. An average value is reported.***

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

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## INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The only abnormality identified is the right heart and MPA are dilated with evidence of mild pulmonary hypertension, which is secondary to the reported heartworm infestation. No obvious adult worms seen in the MPA or branches. That being said, it is important to note that ultrasound is not 100% sensitive for finding adult worms however, although suspicion is low in a dog without associated clinical signs (cough, exertional syncope). The left heart is largely normal with an insignificant mitral regurgitation.

The ECG shows a sinus bradycardia with a brief period of VPCs. While single and couplet beats are observed, the remainder of the tracing is normal. These may be secondary to heartworm disease as well, and use of treatment could be argued in this case. Given that the patient is not experiencing any clinical signs (such as syncope), recommend simple monitoring at this time. A holter monitor should be considered for further evaluation.

Given these findings, there is no obvious contraindication for Immiticide therapy with a presumably low adult worm burden. Confirming the diagnosis followed by the split immiticide protocol is recommended as dictated by the American Heartworm Society (www.heartwormsociety.org), including 30 days of doxycycline and monthly Ivermectin. Strict cage rest required at least until 4-6 weeks following the final treatment. If the patient is having any symptoms of pulmonary hypertension, such as exertional dyspnea or collapse, Sildenafil can be instituted. If the patient is asymptomatic, Pimobendan and Lasix are certainly unnecessary.

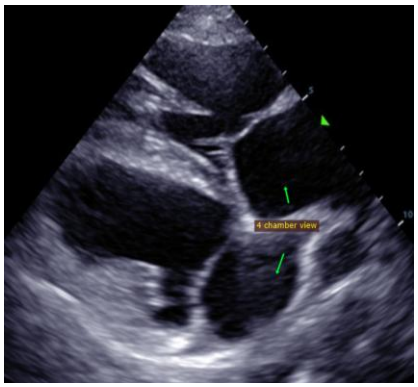
If treatment is successful, this patient may be left with residual pulmonary damage. Follow up is recommended once the infestation is cleared.

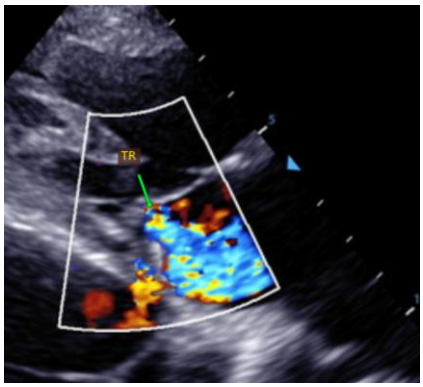
## PLAN

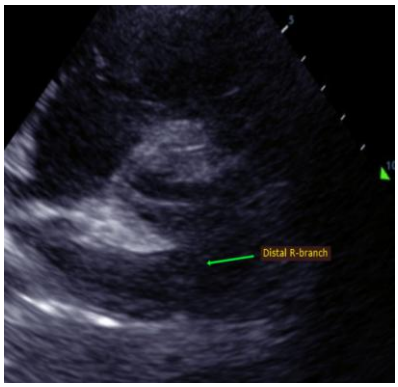
No indication for Lasix or Pimobendan in this case. If any signs of pulmonary hypertension arise (exertional syncope or dyspnea), Sildenafil can be utilized; 1-2mg/kg PO q8-12h. The cough/respiratory signs should be addressed separately, through medications such as Theophylline, Hydrocodone, prednisone, etc. Consider a holter monitor as discussed.

Follow up echocardiography is recommended in 6 months.

## IMAGES



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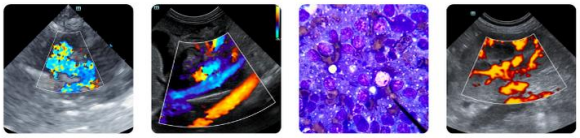

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**The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.**

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