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Clinical Sonography & Telecytology
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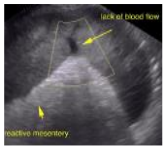
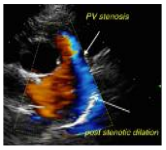
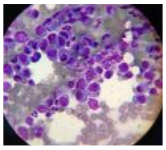
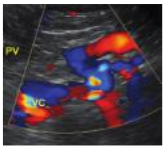

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1-800-838-4268 info@sonopath.com

**PATIENT**
Rousseau Therrien

**SPECIES**
Canine

**BREED**
Labrador Retriever

**SEX**
Male Neutered

**AGE**
11 months

**WEIGHT**
74lbs

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

**IMAGING PERFORMED BY**
Dr. Karen Ebersole

**HOSPITAL NAME**
Scanvet

**REFERRING VET**
Dr. Bennett

**INVOICE**
20604

**DATE**
8/18/21

## PRESENTING CLINICAL SIGNS
History: Grade 2/6 systolic heart murmur auscultated. No symptoms but is a laid-back puppy. Sedated with Butorphanol IV.

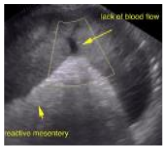
## RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.
Mild cardiomegaly with right sided enlargement. No obvious evidence of CHF.

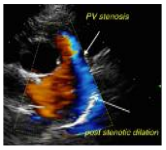
## ELECTROCARDIOGRAPHIC FINDINGS *Note: Single lead ECGs are evaluated as a rhythm strip. Morphology/MEA cannot be definitively commented on.
A single lead ECG is available; 50mm/s, 20mm/mV. The average heart rate is 85bpm (range 50-100bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P and QRS morphologies are positive. No ectopic beats, pauses or other dysrhythmias observed.
ECG diagnosis: Profound respiratory sinus arrythmia.

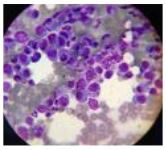
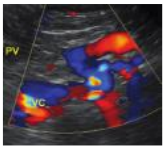
## ECHOCARDIOGRAM FINDINGS
2D, m-mode, color flow and doppler imaging is available. Elongated, thickened TV leaflets with tethered septal leaflet. No obvious stenosis; however, inflows is not assessed. Distorted RV papillary musculature with apical displacement of the annulus. Severe tricuspid regurgitation with severe right atrial and ventricular dilation. Bowing of the interatrial septum. Normal TR velocity. LV diameter is normal with adequate myocardial function. LA is normal. Mitral valve is normal with no mitral regurgitation. Normal aortic and pulmonic outflow velocities. The pulmonic valve is normal. Trace PI. The aortic valve is normal with no aortic insufficiency. No obvious congenital shunts. No pleural or pericardial effusion.

## 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 | 2.2 | 1.2 | 1.0 | 27 | 55 | 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** | 69 | 1.1 | 1.2 | 33.6 | 2.2 | 3.0 | 2.2 |
| *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) |
| | | | | 35 | 2.48 (4.3) | 5.17 (5.0) | 3.69 (4.5) |



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| | | | | |
|---|---|---|---|---|
| Hansson et al, Vet Rad and Ultrasound 2002 | 40 | 2.62 (5.2) | 5.48 (6.1) | 3.96 (5.4) |
| Bonagura et al. Echocardiography: principles of interpretation, Vet | 50 | 2.88 (7.1) | 6.07 (8.3) | 4.46 (7.4) |

## INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the murmur is severe tricuspid valve dysplasia. This is causing tricuspid regurgitation and significant secondary RA and RV dilation. No additional shunts or congenital issues are identified; however, it is important to note that particularly with this degree of anatomic distortion small defects are easily missed (such as an ASD, mild valve stenosis, etc.). Highly recommend referral to a local Cardiologist for advanced diagnostics in this case to confirm the diagnosis and provide lifelong monitoring and follow-up care. The ECG shows a respiratory sinus arrhythmia, which is a normal finding.

TVD is a relatively uncommon form of inherited heart disease, although common in the Labrador Retrievers. Little is known about the long-term effects of medical therapy in patients with severe TVD prior to the onset of congestive failure signs. Patient will always be at high risk for right-sided CHF and/or development of arrhythmias such as atrial fibrillation, collapse and sudden death going forward.

Surgical reconstruction/repair is available as an option, though it requires use of cardiopulmonary bypass, and such procedures are only offered at select universities. Referral is recommended if interested in pursuing surgical options.

In a nearly 1 year old dog, the finding of severe right heart dilation is highly concerning, and this condition will likely limit life span. Medical therapy is indicated as below including an aldosterone-antagonist (spironolactone), and close monitoring is advised for need for diuretic therapy. The long-term prognosis is guarded; however, outcome varies widely among TVD patients. Activity restriction is advised. Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.

Elective anesthesia is not advised.

Monitor closely at home for development of any associated clinical signs, including abdominal distention, labored breathing, and/or collapse episodes or lethargy.

## PLAN

Consider referral as discussed. Administer heart muscle support Pimobendan (Vetmedin) 0.3mg/kg PO q12h. Administer vasodilator/anti-fibrotic Benazepril or Enalapril 0.5mg/kg PO q12h. Administer spironolactone 1-2mg/kg PO q12h.

Monitor renal values in 1-2 weeks, then every 4-6 mo lifelong.

A recheck echocardiogram is recommended in 6 months to screen for progression, sooner if any clinical signs arise.

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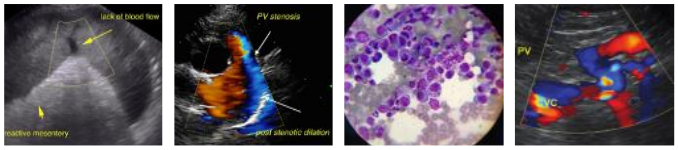

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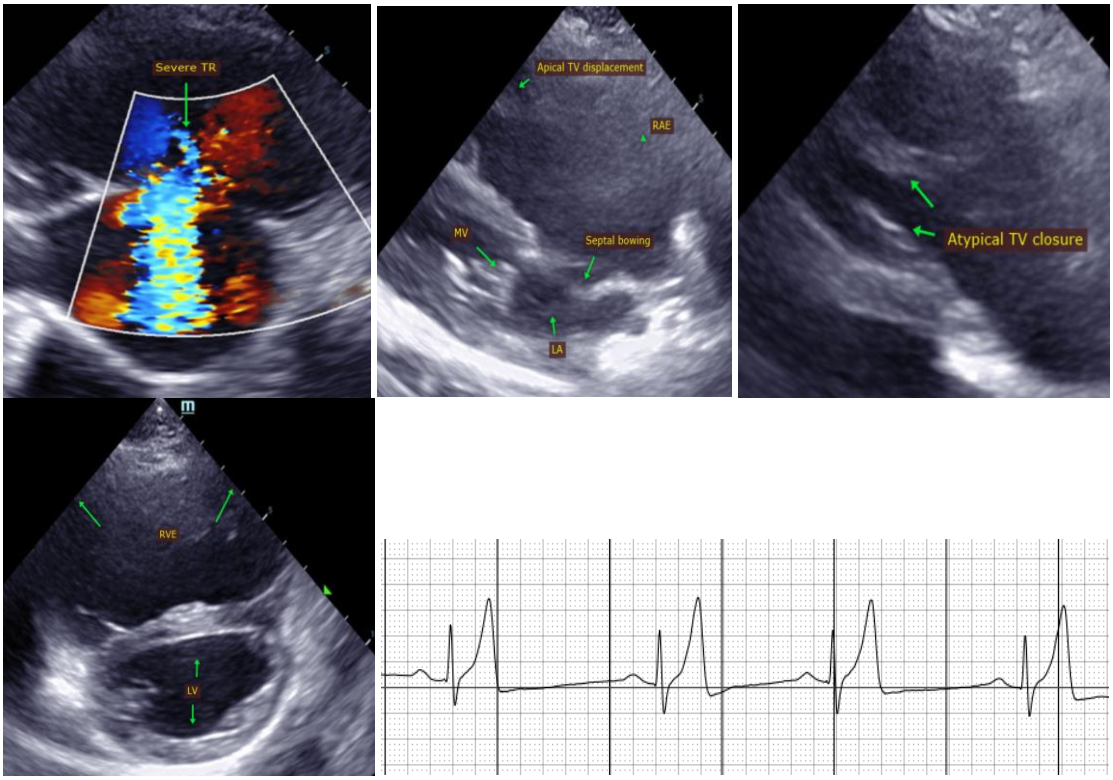


**The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.**

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