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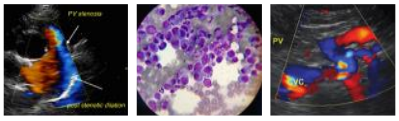

SonoPath
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PATIENT
Ryder Langsner

SPECIES
Canine

BREED
Labrador Retriever

SEX
Male Neutered

AGE
9.9.21

WEIGHT
72.5lbs

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

HOSPITAL NAME
Animal Emergency Hospital

REFERRING VET
Dr. Nacke-Homey

INVOICE
26381

DATE
9.15.22

PRESENTING CLINICAL SIGNS

History: Fever, lethargy and diarrhea- treating for hepatopathy, rule out lepto vs toxin. Incidentally found cardiomegaly and decreased cardiac function- has been on grain free diet. Clinically tolerating low-rate IVF. Initial presentation: 106.4 F fever, QAR, mild dehydration, painful cranial abdomen, admitted to hospital 9/9-early 9/10.
-Pertinent abnormal PE/Chem/CBC/UA Results: X-ray: Cardiomegaly. Bili and ALKp rising. Renal values going up as well. 9/10 12 AM WNL (Tbili 0.4). 9/10 10PM Tbili 4.8. 9/11 8:25AM ALT 66, ALKP 126. 9/12 ALT 105, ALKP 469, Tbili 6. 9/13 ALT WNL 116, ALKP 475, Tbili 7.4. 9/13 Crea 2.9, BUN 88.
-Blood pressure: 170- started on Benazepril- only had 1 day.
-Sedation used: Not required to complete full diagnostic ultrasound.
-Pertinent previous ultrasound results:
-STAT: Not requested
-Imaging performed by:

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Elongated, thickened TV leaflets with tethered septal leaflet. Stenosis is ruled out. Moderate to severe tricuspid regurgitation with moderate to severe right atrial and ventricular dilation. Normal TR velocity. LV diameter is normal with mildly depressed myocardial function. LA is normal. Mitral valve is normal with trace mitral regurgitation. Normal velocity. Normal aortic and pulmonic outflow velocities. The pulmonic valve is unremarkable with no obvious stenosis is identified. Trace pulmonic insufficiency. 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	4.5	2.5	NM	1.2	25	48	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	1.3	0.5	32.9	2.5	4.0	3.0
*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)

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

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the murmur is tricuspid valve dysplasia. This is causing tricuspid regurgitation and significant secondary RA and RV dilation. Stenosis of the valve is not ruled out, which can further exacerbate RA dilation. No additional shunts or congenital issues are identified; however, it is important to note that small defects are easily missed (such as an ASD, significant TV stenosis, etc.). Consider referral to a local Cardiologist for advanced diagnostics in this case to confirm the diagnosis and provide lifelong monitoring and follow-up care. There is also mild LV dysfunction, which may be a normal variant or may be secondary to the reported diet. A diet change is recommended with follow-up imaging. No evidence of endocarditis at this time; however, blood cultures should be considered if suspicion persists.

TVD is a relatively uncommon form of inherited heart disease, although common in the Labrador Retrievers. In a 1yo dog, the finding of significant right heart dilation is concerning, and this condition will likely limit life span. The long-term prognosis is guarded; however, outcome varies widely among TVD patients. 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.

Little is known about the long-term effects of medical therapy in patients with TVD prior to the onset of congestive failure signs. Medical therapy can be considered as below for theoretic benefit, with close monitoring is advised for need for diuretic therapy. If declined, an alternative approach would be to monitor for progressive right heart dilation over the next 6-12 months prior to initiating. Discussion with the owner is advised.

Lifelong activity restriction is advised. Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.

Elective anesthesia is not advised. This patient certainly has risk for fluid intolerance, and continued monitoring of RR/RE in hospital is advised.

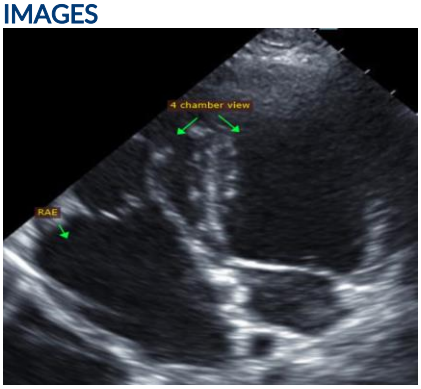
Monitor closely at home for development of any associated clinical signs, including abdominal distention, labored breathing, lethargy and/or collapse episodes.

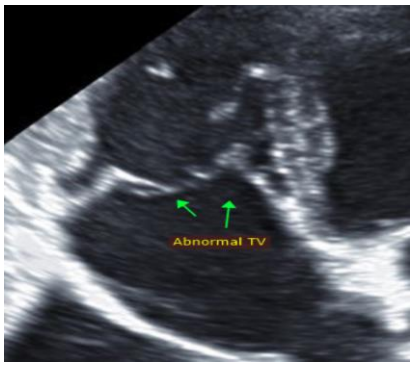
PLAN

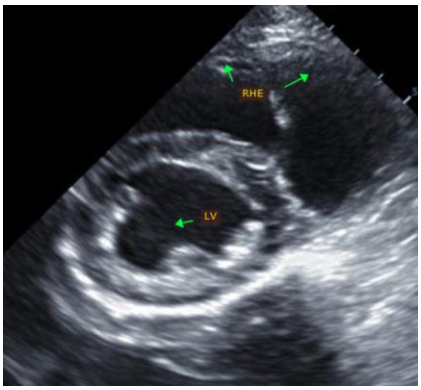
Consider referral as discussed. Consider baseline chest radiographs, ECG. If medications are elected, recommend as follows: Administer heart muscle support Pimobendan (Vetmedin) 0.25-0.3mg/kg PO q12h. Administer vasodilator/anti-fibrotic Benazepril or Enalapril 0.5mg/kg PO q12h. Diet change recommended to a traditional option.

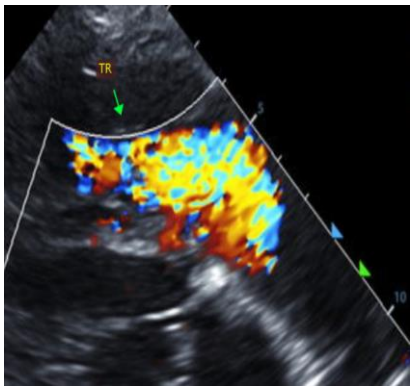
A recheck echocardiogram is recommended in 6 months to screen for progression, sooner if any clinical signs arise.

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