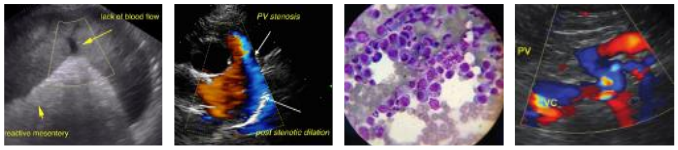
SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



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

PATIENT
Penelope Taylor

SPECIES
Canine

BREED
Lab Mix

SEX
FS

AGE
5y

WEIGHT
68lbs

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

IMAGING PERFORMED BY
Amanda Lacey-Crook

HOSPITAL NAME
River's Edge PMC

REFERRING VET
Dr. Gray

INVOICE
24843

DATE
6/17/22

PRESENTING CLINICAL SIGNS
History: Presented for acute respiratory distress, hacking up light pink foam. Diagnosed 11/2020 with diet-related DCM (at OSU) - Summer of 2021 another echo was done, heart improved per O. P has been on pimobendan, enalapril , +/- furosemide for at least a year 1-2 years

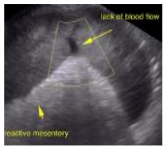
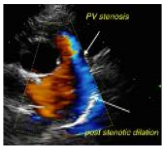
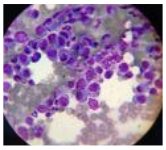
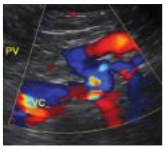
RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.
Cardiomegaly. Evidence of left-sided congestive heart failure.

ELECTROCARDIOGRAPHIC FINDINGS
A six lead ECG is available at 25mm/s; 5mm/mV. The average heart rate is 150bpm with a largely regular rhythm. The rhythm is sinus in origin, with a p for every QRS complex. The P wave morphology is positive with a normal dimension. Normal PR. The QRS morphology is positive; prolonged morphology with a notched R wave. Isolated VPCs throughout; primarily singles with a brief triplet noted. Polymorphism noted. No supraventricular ectopic beats, pauses or dysrhythmias observed. ECG diagnosis: Normal sinus tachycardia with a left bundle branch block and isolated multiform VPCs. Single triplet observed.

ECHOCARDIOGRAM FINDINGS *Brief echo due to instability.
2D, m-mode, color flow and doppler imaging is available. Severe left ventricular dilation with diminished systolic function. Decreased LV wall thickness with increased sphericity. Severe left atrial enlargement. The mitral valve appears normal in form and function, with no obvious prolapse into the left atrial lumen. Mild central mitral regurgitation secondary to annular stretch. Moderate tricuspid regurgitation. Moderate right atrial and ventricular dilation. TR velocity consistent with mild pulmonary hypertension. The aortic valve is normal in morphology and mobility. No pericardial or pleural effusion noted. No obvious cardiac tumors.

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	3.2	NM	2.5	10	15	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	NM	NM	30.9	5.0	7.7	6.9
*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 **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				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)

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Hansson et al, Vet Rad and Ultrasound 2002 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

Unfortunately, this patient has end-stage cardiomyopathy and systolic dysfunction. This is causing dilation and volume overload of both the left and right heart resulting in insufficiency of the mitral and tricuspid valves. The severity of dysfunction and pump failure is severe and puts the patient at exceedingly high risk for decompensation. Going forward, the patient will always be at risk for right and/or left-sided CHF, development of arrhythmias/syncope and/or sudden death going forward. As was previously discussed, this is likely a case of diet-related cardiomyopathy given the history.

The ECG does confirm sinus tachycardia with a bundle branch block. More importantly, frequent single ventricular premature contractions (VPCs) are identified with a brief triplet. VPCs are ectopic beats generated from abnormal conductive or fibrotic tissue in the ventricles of the heart muscle, and even frequent single VPCs will often cause no clinical signs in dogs. When sustained however, ventricular tachycardia can lead to symptoms such as lethargy and collapse. Given the severity of structural disease, this is no doubt the cause of the arrhythmia. While a triplet is concerning for development of VT, my hope is this is simply due to a patient in crisis and will improve once stabilized. Monitoring the ECG in hospital is certainly recommended, as any development of progressive VT would certainly warrant therapy as below. Follow up is advised, particularly should any syncope be noted.

Continued hospitalization for supportive care is necessary until stable. Full cardiac supportive medications are recommended as below upon dicharge. Prognosis is poor to grave as this patient is considered end stage. If further decompensation develops and the patient is refractory to therapy, euthanasia should be elected. Our goal is to stabilize the situation for a matter of months at this juncture.

Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit. Monitor for development of a cough, worsening labored breathing, abdominal distention, exercise intolerance or collapse episodes in the future. Monitoring of sleeping breathing rates at home is recommended to assess response to medications and recurrence of CHF in the future.

PLAN

Continued hospitalization for O2, injectable diuretics and monitoring. Continue Pimboendan in hospital; 10mg PO q12h. If any further triplets/VT are noted, institute mexilitene 5-7mg /kg PO q12h (available in 150 and 250mg capsules). Discharge on the following: Institute Spironolactone 1-2mg/kg PO q12h. Administer furosemide 1-2mg/kg PO q8h. Administer Pimobendan 10mg PO q12h. Administer taurine 1000mg PO q12h. Discontinue ACEI. If patient continues to decompensate, euthanasia should be considered.

Monitor a renal panel, ECG and blood pressure in 1-2 weeks to ensure tolerance. If any question on the arrhythmia, submit ECG and/or consider a holter.

A recheck echocardiogram and ECG are recommended in 6 months to screen for progression, sooner if clinical issues arise in the interim.

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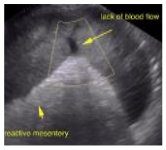
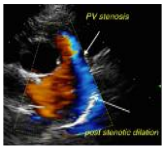
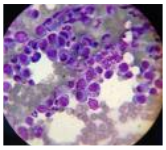
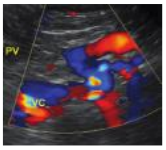

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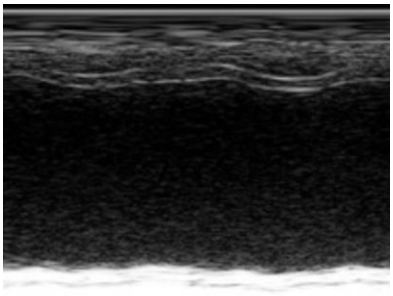
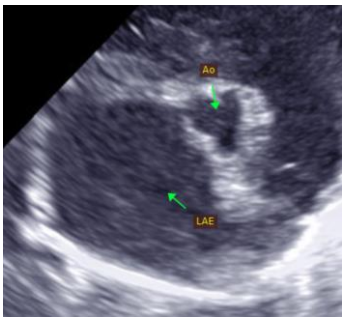
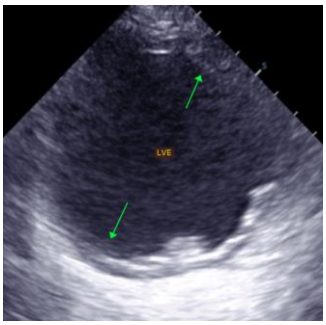
IMAGES



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. 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