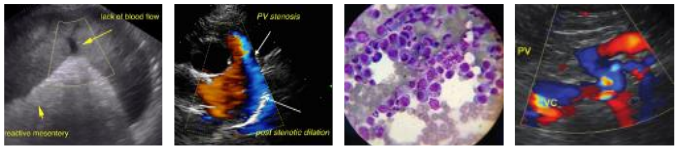
SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



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

PATIENT
Athena Potter

SPECIES
Canine

BREED
Doberman

SEX
FI

AGE
8y

WEIGHT
64.4 lbs

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

IMAGING PERFORMED BY
Amanda Crook
Clinical Sonographer

HOSPITAL NAME
River's Edge Pet Medical Center

REFERRING VET
Dr. Baxter

INVOICE
27186

DATE
10/31/22

PRESENTING CLINICAL SIGNS
History: Presented today for decreased appetite, lethargy and labored breathing. Coughing 1 month, episodes of 'seizures' after strenuous activity for last few months. Muffled heart sounds with abdominal distension, tachypneic.
Diet: Naturals Diamond with and without grain free
Current medications: Proin

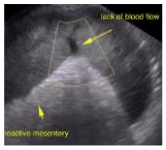
RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.
Cardiomegaly with biventricular CHF.

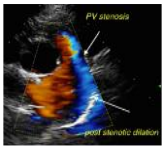
ELECTROCARDIOGRAPHIC FINDINGS
A six lead ECG is available at 25mm/s; 10mm/mV. The average heart rate is 188bpm with a regular rhythm. P waves are difficult to identify throughout. The QRS morphology is inverted. The MEA is shifted right. No ectopic beats, pauses or other dysrhythmias observed.
ECG diagnosis: Supraventricular tachycardia; rule out atrial v sinus origin.

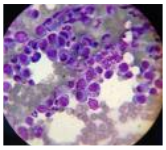
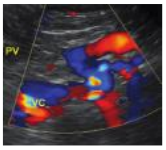
ECHOCARDIOGRAM FINDINGS
2D, m-mode, color flow and doppler imaging is available. Severe left ventricular dilation with diminished systolic function. Decreased LV wall thickness with increased sphericity. Severe left atrial enlargement. The mitral valve appears mildly thickened with no obvious prolapse into the left atrial lumen. Moderate central mitral and mild tricuspid regurgitation secondary to annular stretch. Decreased MR velocity consistent with systolic failure. Moderate right atrial and ventricular dilation. TR velocity normal. The aortic valve is normal in morphology and mobility. No subvalvular ridge present; decreased LVOT velocity. No aortic insufficiency. Normal pulmonic valve with trace pulmonic insufficiency seen. Scant pericardial and large volume 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	4.0	2.7	NM	2.3	10	22	1.2
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	0.7	NM	29.3	4.3	5.8	5.0
*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 **Note: All measurements based upon multi-modal images and methods. An average value is reported.* Adapted from June Boon, Veterinary Echocardiography, 1998				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)





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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, 1985	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

Unfortunately, this patient has severe biventricular myocardial failure resulting in bicavitary effusion and reported syncope. Myocardial failure is causing dilation and overload of all four chambers resulting in insufficiency of the mitral and tricuspid valve. The degree of dilation and pump failure resulting in biventricular congestive heart failure. No additional issues are identified.

Systolic failure can be primary in nature (DCM) or secondary to taurine deficiency, myocarditis, hypothyroidism, tachycardia-induced cardiomyopathy, or infiltrative disease such as lymphoma. Given the signalment, a primary genetic issue is most likely; however, ensuring a traditional diet option is being fed is certainly recommended. A taurine level can be submitted; however, regardless of results a taurine supplement is recommended.

Given the severity of the findings, clinical signs and chest radiographs, the diagnosis is congestive heart failure and **immediate institution of full cardiac support is recommended in this case.** Consider hospitalization for stabilization as the gold standard approach. Additionally a thoracocentesis is strongly recommended due to large volume effusion to stabilize the situation as quickly as possible. Finally, Proin should be discontinued as this can lead to vasocontriction. Consider an alternative such as Incurin if needed.

Prognosis is poor at this stage in the disease process, with an average survival time of 8-9mo for canine patients with active pulmonary edema on medications, however they generally are able to maintain a good quality of life for that period. Even with diet-related dysfunction, improvement will likely be minimal at this end-stage phase of disease.

Cases of systolic failure are at high risk for malignant tachyarrhythmias (such as AF or VT), and activity restriction is advised. Patient will always be at risk for recurrent CHF, development of arrhythmias/LA tear, syncope and/or sudden death in the future.

The ECG shows an elevated heart rate with a supraventricular origin. This is difficult to differentiate between sinus tachycardia and a true SVT without observing response to vagal maneuvers, etc. Recommend institute cardiac support and reassess the ECG in 5-7 days to determine if antiarrhythmic therapy is warranted.

Monitor for development of a cough, worsening labored breathing, 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:

Consider hospitalization for IV diuretic, oxygen support, thoracocenteiss and supportive care until stable. Discharge on the following: administer Lasix 1-2mg/kg PO q12. Administer Pimobendan 0.3mg/kg Po q12. Administer Spironolactone 1-2mg/kg PO q12h. Institute Taurine 1000mg PO q12h. Diet change ASAP. D/C proin and consider alternative as discussed.

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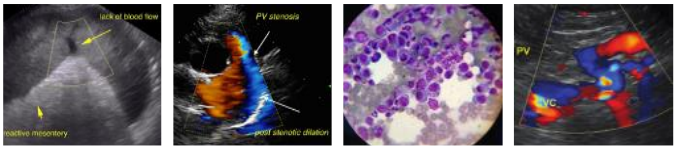

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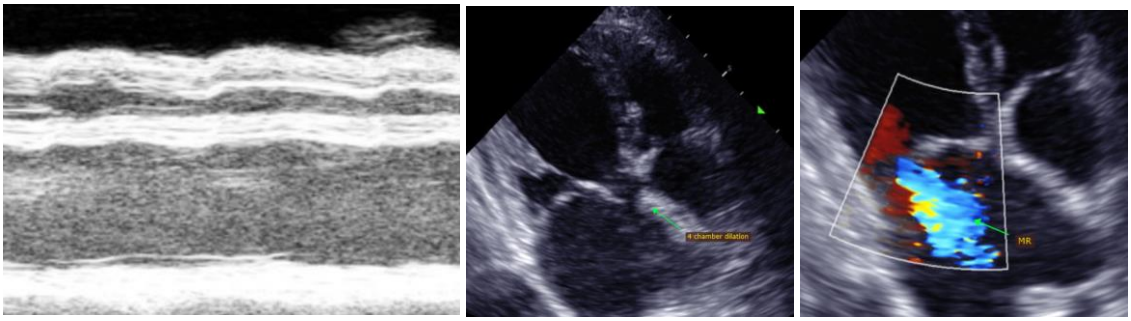
Recheck ECG in 5-7 days and recommend resubmission to determine if heart rate control is recommended, particularly if persistently >180bpm.

Monitor renal panel, heart rate, and BP every 3-4 months lifelong. Once patient is deemed normotensive (blood pressure >130mmHg), institute ACE-I 0.5mg/kg PO q12h.

Recheck echocardiogram and in 6 months to reassess cardiac function sooner if issues 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. 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