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Clinical Sonography & Telecytology
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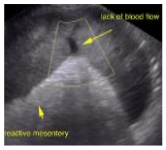
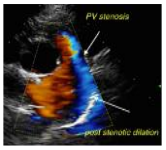
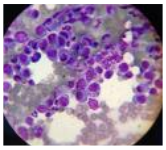
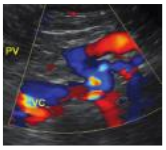

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1-800-838-4268 info@sonopath.com

PATIENT
Lily Gilbert

SPECIES
Canine

BREED
Boxer

SEX
Female

AGE
12years

WEIGHT
130lbs

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

IMAGING PERFORMED BY
Shari Reffi, CVT

HOSPITAL NAME
North Warren Animal Hospital

REFERRING VET
Dr. Corrado

INVOICE
30472

DATE
4/27/23

PRESENTING CLINICAL SIGNS
History: Elevated ProBNP: 1683. BP: 181, 182, 177mmHg. Assess prior to anesthesia.

ELECTROCARDIOGRAPHIC FINDINGS *Note: Single lead ECGs are evaluated as a rhythm strip. Morphology/MEA cannot be definitively commented on.
A video of an anesthesia monitor is included for interpretation. The recorded heart rate is 220bpm, which appears accurate. The rhythm is irregularly irregular without identifiable P waves. ECG diagnosis: Suspect rapid atrial fibrillation; sinus rhythm with frequent supraventricular tachycardia cannot be ruled out.

ECHOCARDIOGRAM FINDINGS
2D, m-mode, color flow and doppler imaging is available. Severe left ventricular dilation with increased sphericity and markedly decreased systolic function, EPSS increased. Moderate left atrial enlargement. The mitral valve appears mildly thickened, with no obvious prolapse into the left atrial lumen. Mild central mitral regurgitation secondary to annular stretch. Decreased LV wall thickness. The tricuspid valve appears normal in form and function. Mild right atrial and ventricular dilation. Trace tricuspid regurgitation secondary to annular stretch. The aortic valve is normal in morphology and mobility. No subvalvular ridge present; normal LVOT velocity. Mild aortic insufficiency. No pericardial or pleural effusion noted. No obvious cardiac tumors. Rapid irregular HR/rhythm throughout.

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	NM	NM	1.8	6	13	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	1.4	NM	59.0	4.9	6.4	6.0
*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

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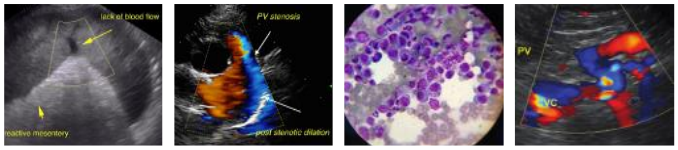

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Unfortunately, this patient has end-stage cardiomyopathy and severe systolic dysfunction. This is causing dilation and overload of all 4 chambers resulting in insufficiency of the mitral and tricuspid valves. The degree of dilation and pump failure has resulted in development of a rapid arrhythmia, most consistent with atrial fibrillation (AF). While AF is suspected, a sinus rhythm with intermittent supraventricular tachycardia (SVT) cannot be ruled out without a more sensitive tracing. Fortunately, treatment is the same although differentiating the two would be ideal. AF is characterized by disorganized contractions of the atria leading to an irregular heart rhythm. The irregular heart rhythm rarely causes clinical signs in dogs; however, atrial fibrillation also usually causes an increase in the heart rate as is seen here and this can lead to clinical signs and biventricular CHF (tachycardia-induced cardiomyopathy results in right-sided congestion). **While it is unusual for the patient to be asymptomatic with this arrythmia, no clinical signs are mentioned.**

Systolic failure can be primary in nature (DCM) or secondary to taurine deficiency, myocarditis, tachycardia-induced cardiomyopathy, or infiltrative disease such as lymphoma. In a senior giant breed dog primary disease is suspected. Consider ancillary issues, such as an atypical diet or hypothyroidism that may be contributing.

Regardless of cause, prognosis is guarded to poor at this stage in the disease process, with an average survival time of <6 months. Dogs with DCM and AF are at high risk for complications such as recurrent congestive heart failure, malignant arrhythmias and sudden death. The only treatable cause of systolic failure is taurine deficiency. If a taurine level is declined, it is also reasonable to simply supplement with taurine on the off chance of a malabsorption issue.

Given that the patient is asymptomatic, hospitalization is likely unnecessary. That being said, it would be ideal to obtain a more sensitive ECG tracing prior to treatment and referral should be offered to the client. If declined, treatment is recommended as below.

Goals of therapy include correcting/preventing water retention, improving myocardial contractility, afterload reduction, and heart rate control. It is important to note that dogs in AF typically do not convert back to sinus rhythm; however, they can do quite well in AF if the heart rate is controlled.

Once stabilized, monitor at home for cough, lethargy, inappetance, collapse/fainting episodes or increase in respiratory rate or effort. Monitoring of sleeping breathing rates is recommended to screen for recurrent CHF at home. Moderate activity restriction is advised. Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.

Elective anesthesia, fluid or steroid therapy is not advised in this patient.

PLAN

Consider referral for a more sensitive ECG tracing. If declined, institute Diltiazem 1-2mg/kg PO q8h. Institute low dose furosemide 1mg/kg PO q12h. Institute Spironolactone 1-2mg/kg PO q12 hours. Institute Pimobendan 0.3mg/kg PO q12h. Consider taurine supplement 1000mg PO q8-12h. Consider diet history and thyroid status as discussed.

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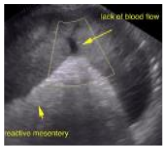
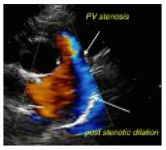
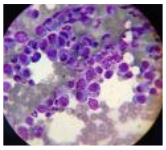
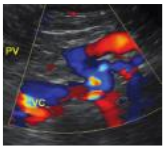

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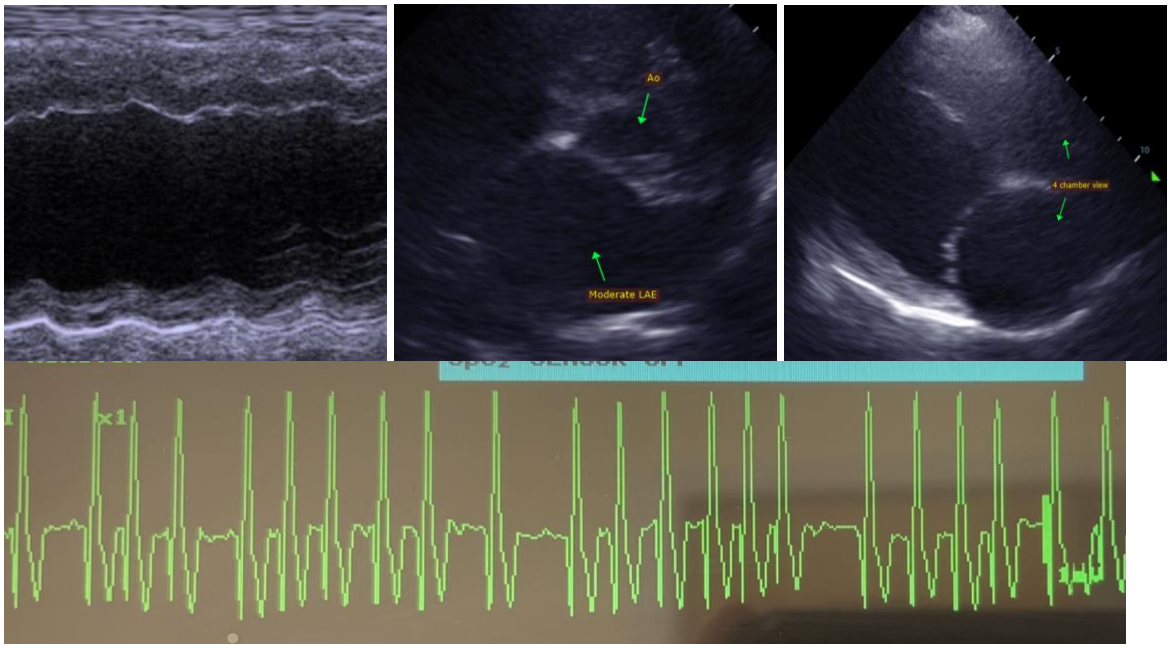
Recheck renal panel/BP/HR in 5-7 days to assess response to medications. Target stressed heart rate with AF is 140-160bpm. Up-titrate diltiazem and/or add digoxin if poorly controlled. Reassess HR/BP and renal panel every 3-4 months lifelong.

A recheck echocardiogram is recommended in 6 months, sooner if clinical signs arise in the interim.

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