



PATIENT PRESENTING CLINICAL SIGNS

Max Brush

History: O requested dental, reports dog isn't eating well. Tachyarrhythmia noted on exam, recommended Echo and ECG. Butorphanol IV for sedation.

SPECIES ELECTROCARDIOGRAPHIC FINDINGS

Canine

A six lead ECG is available at 50mm/s; 10mm/mV. The average heart rate is 210bpm (range 150-230bpm). No identifiable p waves with an irregularly irregular rhythm consistent with atrial fibrillation. Occasional isolated VPCs. No sustained ventricular arrhythmias, pauses or other dysrhythmias observed.

BREED

ECG diagnosis: Rapid atrial fibrillation. Rare isolated VPCs.

Boxer

SEX

Male Neutered

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Mild left ventricular dilation with diminished systolic function. Decreased LV wall thickness and increased sphericity. The mitral valve appears mildly thickened with no obvious prolapse into the left atrial lumen. Moderate central mitral regurgitation. The tricuspid valve appears mildly thickened. Moderate right atrial and ventricular dilation. Mild tricuspid regurgitation. Normal velocity. The aortic valve is normal in morphology and mobility. No aortic insufficiency. Normal pulmonic valve. No pulmonic insufficiency seen. Normal LVOT and RVOT velocities. No pericardial or pleural effusion noted. Ascites and hepatic congestion noted on sub-costal views. No obvious cardiac tumors.

AGE

10 years

WEIGHT

105lbs

CARDIAC CHART

INTERPRETED BY

Maggie Machen Lamy,
DVM, DACVIM
(Cardiology)

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	4.7	2.4	NM	2.8	13	20	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	1.2	0.4		5.7	5.6	4.9
*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				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)

IMAGING PERFORMED BY

Dr. Karen Ebersole

HOSPITAL NAME

Scanvet

REFERRING VET

Dr. Ebersole

INVOICE

28175

DATE

1/10/23



PATIENT **INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS**

Max Brush

Unfortunately, this patient has significant cardiomyopathy and systolic dysfunction. This is causing dilation and overload of all 4 chambers resulting in insufficiency of the mitral and tricuspid valves. There is severe LA and LV dilation indicating high risk for complication going forward. No additional issues are identified.

SPECIES

Canine

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 Boxer, primary disease is suspected; however, consider testing for primary causes that may be treatable. A thyroid and troponin level can be submitted to further investigate infiltrative/inflammatory contribution (myocarditis). Additionally, a taurine level may be helpful (screen for malabsorption issue) with avoidance of grain free, exotic ingredient or boutique brand options going forward.

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Boxer

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Male Neutered

As a complicating factor, the patient has also developed rapid atrial fibrillation (AF) secondary to atrial dilation. Development of the arrhythmia puts the patient at high risk for acute decompensation and development of right-sided congestion (ascites in this case). 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, and this can lead to clinical signs and CHF as we see in this patient. Once a patient is in AF, this will likely never convert back to sinus rhythm, however they typically do well with simply rate control. The structural disease and development of AF requires lifelong diuretics (due to high risk for decompensation) and management of the structural disease in addition to the arrhythmia as below. Close monitoring going forward is advised. Isolated VPCs are also seen, which may put the patient at risk for malignant VT and collapse in the future as well.

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(Cardiology)

Regardless of cause, prognosis is guarded to poor at this stage in the disease process, with an average survival time of <6 months. Patient will always be at risk for recurrent CHF, development of malignant arrhythmias and/or sudden death in the future. The only treatable cause of systolic failure is taurine deficiency, which is uncommon on commercially formulated dog foods (albeit renewed with the recent correlation to grain free diets). If a taurine level is declined, it is also reasonable to simply supplement with taurine on the off chance of a malabsorption issue.

IMAGING PERFORMED BY

Dr. Karen Ebersole

Monitoring of sleeping respiratory rates will be paramount to screen for recurrent congestive heart failure at home in the future. Cough suppression to improve QOL can also be considered once diuretics are on board for any residual mechanical cough in the face of normal sleeping respiratory rates.

HOSPITAL NAME

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Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes in the future. Monitoring of sleeping breathing rates at home is recommended to screen for progression to CHF. Omega fatty acid supplementation (1000mg once to twice daily) and mild salt restriction may be of some long-term benefit.

REFERRING VET

Dr. Ebersole

PLAN:

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If the patient appears unstable, recommend offer referral for 24-hour monitoring/supportive care and IV rate control/diuretics. If stable, discharge on the following oral medications: Pimobendan 0.3mg/kg PO q12h, Lasix 1-2mg/kg PO q12h; Spironolactone 1-2mg/kg PO q12h; Diltiazem 1-2mg/kg PO q8h. Institute taurine supplement 1000-2000mg PO q12h. Consider diet history, taurine level, cTnl, etc. as discussed.

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Recheck BP, heart rate/ECG and renal values in 5-7 days. If BP >130mmHg and patient is feeling well, institute Benazepril at that time (0.5mg/kg PO q12h). Target HR is 140-160bpm in hospital/stressed. Up-titrate diltiazem to effect. If difficult to control, can also consider digoxin (0.005mg/kg PO q12h with close monitoring of blood dig levels) due to synergistic effect with diltiazem.

SPECIES

Canine

BREED

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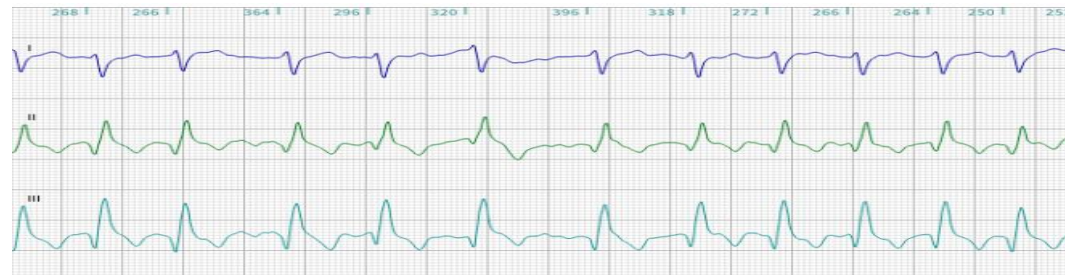
Monitor renal values/BP/HR every 3-4 months lifelong.

A recheck echocardiogram is recommended in 4-6 months to screen for progression.

SEX

Male Neutered

IMAGES



AGE

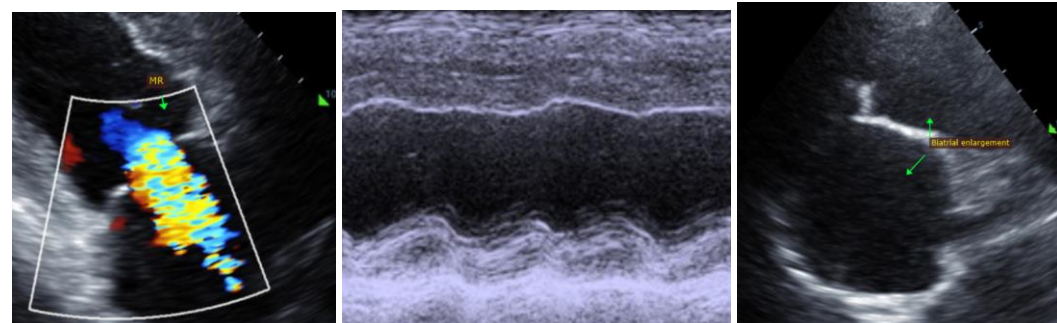
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

HOSPITAL NAME

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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)
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