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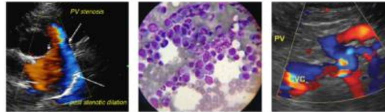


SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
1-800-838-4268 info@sonopath.com SonoPath.com

PATIENT
Finekin Yount

SPECIES
Canine

BREED
Boxer Mix

SEX
Male Neutered

AGE
6 years

WEIGHT
77.8lbs

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

IMAGING PERFORMED BY
Kim Liedberg

HOSPITAL NAME
SVS Imaging WI

REFERRING VET
Dr. Dhillon

INVOICE
22958

3/7DATE
/22

PRESENTING CLINICAL SIGNS

History: Presented at an emergency clinic for evaluation of 3 episodes of collapse this week. Falling over, urinating, hyperextending, and vocalizing. Occasional coughing that started 11/21. Has been treated for the cough but never resolved completely. Based on hx, PE, ECG and PCUS findings, tentative dx consistent with atrial fibrillation and probable dilated cardiomyopathy leading to right and left sided congestive heart failure.
-Current medications: Diltiazem 30mg P q8h Pimobendan 10mg PO q12h Furosemide 75mg PO 112h ADDED Trazodone 150mg PO q8h/PRN for anxiety ADDED Ondansetron 8mg PO q8h.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.

Cardiomegaly with evidence of CHF.

ELECTROCARDIOGRAPHIC FINDINGS *Note: Single lead ECGs are evaluated as a rhythm strip. Morphology/MEA cannot be definitively commented on.

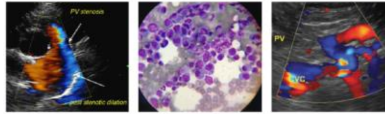
A single lead ECG is available; 25mm/s, 10mm/mV. The average heart rate is 220bpm (range 180-250bpm). No identifiable P waves with an irregularly irregular rhythm. Isolated VPCs.
ECG diagnosis: Rapid atrial fibrillation with isolated VPCs.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets with mild prolapse into the left atrial lumen. Severe mitral regurgitation. Elevated MR velocity. Marked left atrial dilation. Severe LV dilation with adequate myocardial function. The tricuspid valve appears mildly thickened with mild TR. TR velocity consistent with early pulmonary hypertension. Mild to moderate right atrial and ventricular dilation. No obvious RVH. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. No obvious aortic or pulmonic insufficiency. No pericardial or pleural effusion seen. No obvious cardiac masses.

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	6.5	2.9	2.0	2.8	40	72	0.4
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	260	1.4	1.1	35.3	5.4	5.0	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)
Adapted from June Boon, Veterinary Echocardiography, 1998				25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435				30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)



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Hansson et al, Vet Rad and Ultrasound 2002 Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995	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)

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Chronic degenerative valve disease causing severe mitral and mild tricuspid regurgitation is identified. The degree of disease is marked with marked LA enlargement and development of arrythmias. Four chamber dilation suggests the risk for complication is elevated. Mild pulmonary hypertension is noted which is likely due to active congestion. No additional issues are identified.

Rapid atrial fibrillation (AF) is confirmed on the ECG with isolated VPCs. 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 leads to clinical signs and CHF as we see here. Development of AF and CHF requires lifelong diuretics and management of the structural disease in addition to the arrhythmia. The VPCs certainly warrant monitoring going forward; however, no specific therapy is indicated.

Unfortunately, dogs with CHF and AF are at high risk for complications such as recurrent congestive heart failure, malignant arrhythmias, left atrial tear and sudden death. Medications and close monitoring will help give the best prognosis possible, however the average survival time with this condition is <6 months.

Goals of therapy include correcting water retention, improving myocardial contractility, afterload reduction, and heart rate control. Full cardiac support including aggressive diuresis is indicated, due to the high risk for decompensation with rapid arrhythmias and severe disease. Medical management is recommended as below with a guarded to poor prognosis. Continued hospitalization is recommended until the patient is stabilized. The target heart rate is 140-160bpm in hospital.

Please monitor at home for cough, lethargy, inappetence, 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.

PLAN

Continue hospitalization for IV diuretic/rate control therapy as needed until stable. Oral medications are as follows: Institute Spironolactone 1-2mg/kg PO q12 hours. Institute Lasix/Furosemide 1-2mg/kg PO q8h for 3-5 days, if doing well at that time decrease to q12h going forward. Administer Pimobendan 0.3mg/kg PO q12 hours. Dose increase, administer Diltiazem 45mg PO q8 hours. Once eating well at home and BP is documented > 130mmHg, institute Benazepril 0.5mg/kg PO Q12h.

Recheck heart rate in 5-7 days with target being 140-160bpm in hospital (stressed). If persistently >180bpm, institute Digoxin 0.005mg/kg PO q12h.

Screening renal panel and digoxin level in 5-7 days (6-8 hours post-am dose) to ensure tolerance of medications.

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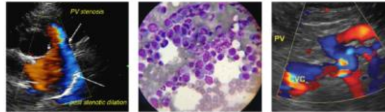

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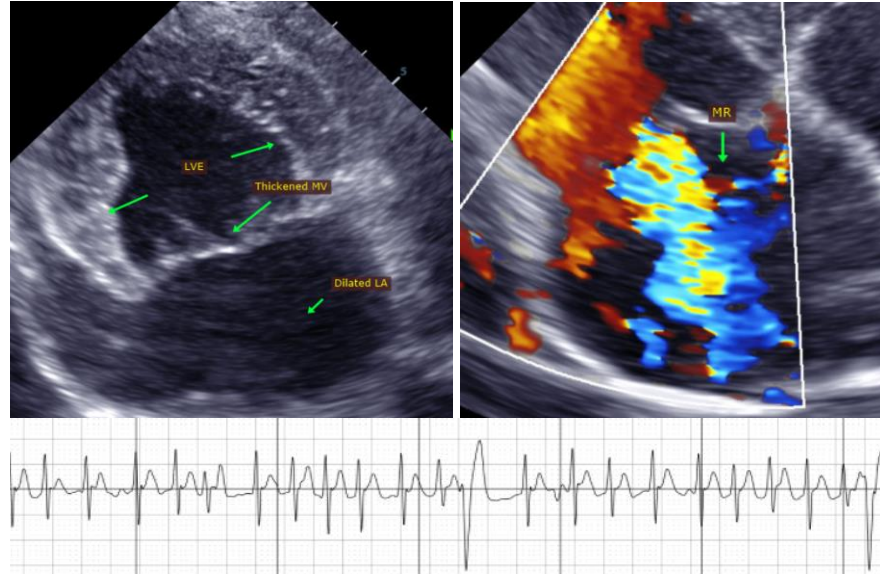
Monitor renal values every 3-4 months lifelong. A recheck echocardiogram is recommended in 6 months to screen for progression.

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