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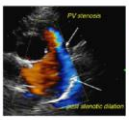
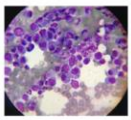
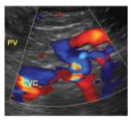

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PATIENT
Oliver Szewczyk

SPECIES
Canine

BREED
Lab

SEX
Male Neutered

AGE
8 years

WEIGHT
90.4lbs

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

IMAGING PERFORMED BY
Kim Liedberg

HOSPITAL NAME
SVS Imaging WI

REFERRING VET
Dr. Lux

INVOICE
25029

DATE
6/28/22

PRESENTING CLINICAL SIGNS
History: Increased respiratory rate, arrhythmia and tachycardia with skipped beats noted on exam.

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 underlying rhythm is irregularly irregular with a rapid heart rate, ranging from 200-300bpm. No obvious identifiable P waves, most consistent with atrial fibrillation. Ventricular premature beats are suspected, although difficult to confirm without a six-lead tracing.
ECG diagnosis: Rapid atrial fibrillation with suspicion for concurrent ventricular arrythmias.

ECHOCARDIOGRAM FINDINGS
2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets with no prolapse into the left atrial lumen. Moderate to severe eccentric mitral regurgitation with marked left atrial dilation. Normal MR velocity. LV dilation with mildly decreased myocardial function. The tricuspid valve appears normal with moderate tricuspid regurgitation. Velocity consistent with mild pulmonary hypertension. Moderate right atrial and ventricular dilation. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. No aortic or pulmonic insufficiency; normal velocities. Scant pericardial and pleural effusion noted. 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	5.2	2.9	2.4	2.4	20	36	1.0
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	230	1.3	1.1	41.0	5.1	6.5	5.2
*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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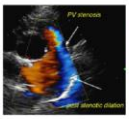
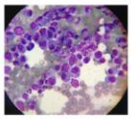
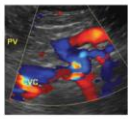

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Findings are most consistent with chronic degenerative valve disease causing severe mitral and moderate tricuspid regurgitation and secondary systolic dysfunction. Significant biatrial and ventricular enlargement indicates the risk for spontaneous congestive heart failure is high and scant pericardial and pleural effusion is most consistent with early CHF (biventricular failure). While not a primary issue, ensure thyroid status and diet are normal as possible contributing issues to LV dysfunction.

As a complicating factor rapid atrial fibrillation and VPCs have developed. 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. It is important to note that right-sided failure is due to the arrythmia while left-sided failure is due to the structural disease.

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. Consider hospitalization if the patient appears unstable. The target heart rate is 140-160bpm in hospital.

Please 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.

PLAN

Consider hospitalization for IV diuretic/rate control therapy if needed. 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. Institute Diltiazem 1-2mg/kg PO q8 hours. Once eating well at home and BP is documented > 130mmHg, institute Benazepril 0.5mg/kg PO Q12h. Consider diet/thyroid status.

Recheck heart rate/ECG 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.

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

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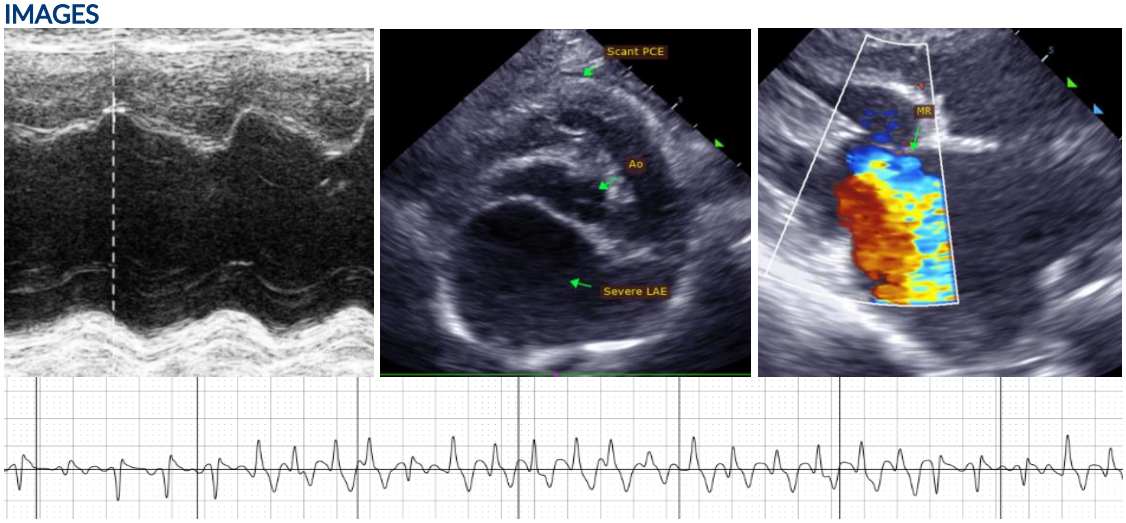

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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