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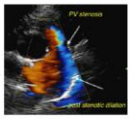
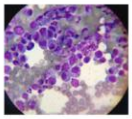
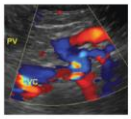
SVS IMAGING

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

PATIENT
Oliver Gerl

SPECIES
Feline

BREED
DSH

SEX
Male Neutered

AGE
13 years

WEIGHT
11.52lbs

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

IMAGING PERFORMED BY
KIm Liedberg

HOSPITAL NAME
SVS Imaging WI

REFERRING VET
Dr. Dolan

INVOICE
24581

DATE
6/6/22

PRESENTING CLINICAL SIGNS
History: Over the past year, increased appetite with weight loss. Murmur on exam. Previously diagnosed with PAH at Cardiologist. Thyroid panel pending. Normal RR/RE in hospital.
Current medications: Probiotic, MiraLAX, Viagra ¼ tab TID, Zeniquin for a UTI. Given Gabapentin and Lasix this am in hospital.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.
Severe cardiomegaly with CHF.

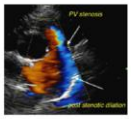
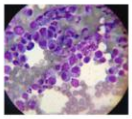
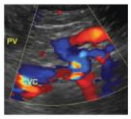
ELECTROCARDIOGRAPHIC FINDINGS *Note: Single lead ECGs are evaluated as a rhythm strip. Morphology/MEA cannot be definitively commented on.
A single lead ECG is available; 25mm/s, 10mm/mV. The average heart rate is 250bpm (range 176-300bpm). P waves cannot be identified throughout with an irregularly irregular rhythm.
ECG diagnosis: Suspect rapid atrial fibrillation; however, a sinus origin with frequent atrial ectopy is not ruled out.

ECHOCARDIOGRAM FINDINGS
2D, m-mode, color flow and doppler imaging is available. The left ventricular wall is normal in dimension yet remodeled with regions of asymmetry. There is a diffusely hyperechoic endocardium consistent with fibrosis. The papillary muscles are remodeled. The LV systolic function is significantly decreased. Borderline LV dilation. The left atrium is severely dilated and bulbous in appearance. No obvious smoke visualized. The right atrium is severely dilated. The mitral valve appears normal, mild central MR. Mild to moderate TR. Pulmonary hypertension is not ruled out. The MPA does appear dilated. Blood flow is mildly decreased through both the LVOT and RVOT. Scant pericardial effusion seen. Pockets of pleural effusion. No obvious cardiac tumors.

CARDIAC CHART

FELINE CARDIAC PARAMETERS	BODY WEIGHT (kg)	HR (BPM)	IVSd (cm) (Moise, Pipers)	LVIDd (cm) (Moise, Pipers)	LVWd (cm) (Moise, Pipers)	FS (%)	EF (%)
NORMAL PARAMETER	------	150-240	0.35-0.55	<2 (mean 1.5)	3.5-0.55	35-67	80-100
PATIENT	5.2	234	0.41	1.8	0.47	28	50
FELINE CARDIAC PARAMETERS	**LA/AO** (Boon)	**LA/AO HEART BASE (Swe)** (Abbott)	**LA** 2D short axis Base view (cm) (Abbott)		**LVOT VEL** (m/s)	**RVOT VEL** (m/s)	**E max** (m/s)
NORMAL	<1.5	<1.3	<1.2		<1.6	<1.3	<0.9
PATIENT	2.9	2.5	2.3		3.0	1.1	NM

**Note: All measurements based upon multi-modal images and methods. An average value is reported.*
Adapted from June Boon, Veterinary Echocardiography,1998
Abbott J & MacLean H JVIM 2006;20: 111-119, Moise et al. Am J Vet Res 47:1476, 1986. Pipers et al. Am J Vet Res 40:882, 1979.

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The finding of severe biatrial enlargement in the face of normal LV wall thickness and systolic dysfunction is most consistent with Unclassified Cardiomyopathy (UCM); however, burn-out or end-stage HCM can also have this appearance. There is also mild LV remodeling and fibrosis which indicates diastolic dysfunction as well. The degree of biatrial dilation is severe and puts the patient at risk for decompensation. The systolic function is significant decreased as well, which is likely due to a combination of structural disease and the arrythmia. Finally, some degree of pulmonary hypertension is suspected, based upon prior report and appearance of the MPA. No additional issues are identified.

The ECG is highly suspicious for atrial fibrillation (AF) which puts the patient at risk for more malignant arrhythmias and sudden death in the future. A sinus rhythm with frequent APCs cannot be ruled out without a six-lead tracing in order to definitively identify P waves. Most cats are asymptomatic with AF and do not require medications. That being said, the patient's heart rate is frequently >300bpm and rate control is recommended as below.

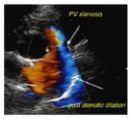
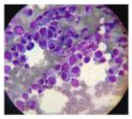
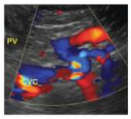
The history is classic for hyperthyroidism, which appears suspected based upon pending lab work. It is highly important that this case be managed from all aspects, as chronic uncontrolled hyperthyroidism can lead to development of arrythmias and atrial fibrillation, independent of underlying structural issues. These results likely warrant additional therapy. Additionally this patient has a priori Cardiology evaluation that is not included in the history, and comparisons cannot be made. Reevaluation by the initial clinician once the patient is stabilized may be beneficial, for a valuable comparison of progression and prior findings. In total, given the complexity of this case, consider referral to a Multispecialty Center if needed for stabilization.

Regardless of categorical classification, this degree of atrial dilation and arrhythmic disease suggests that bicavitary effusion is cardiogenic in origin. Immediate full cardiac support is recommended including low dose of rate control. This is a delicate balance, as we certainly don't want to drop the HR too far; however, maximizing cardiac output is the goal until the thyroid is controlled. A thoracocentesis should be considered if the patient appears unstable. No chronic clinical signs consistent with CHF are noted, which is somewhat atypical. Regardless, the long-term prognosis is guarded to poor, however most cats are able to maintain a good quality of life for some time on medications if tolerated.

Going forward there will always remain risk for episodes of CHF and development of blood clots and/or sudden death in the future. Monitoring of sleeping breathing rates at home is recommended as the best way to screen for progression to CHF at home. Tolerance of medications in geriatric cats is always of concern, and blood values must be watched carefully. Elective anesthesia should be avoided.

PLAN

Highly recommend referral to a Multispecialty Center for hospitalization, full systemic evaluation, reevaluation by the initial Cardiologist, etc. If declined, a thoracocentesis with injectable Lasix in hospital can be considered with oral medications as follows: Institute Lasix/furosemide 1mg/kg PO q12h. Institute blood thinner Clopidogrel (Plavix) 75mg tablets; give ¼ tab orally once daily (NOTE: this medication is very bitter on the cut edges). Institute Pimobendan (off label use) 1.25mg PO q12h. Institute low dose Diltiazem 7.5mg PO q12h (available in 30mg tablets).

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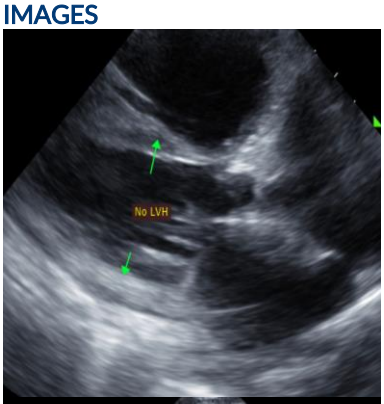
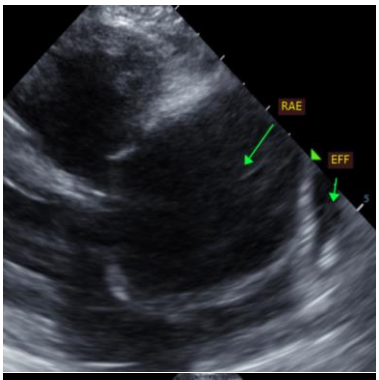
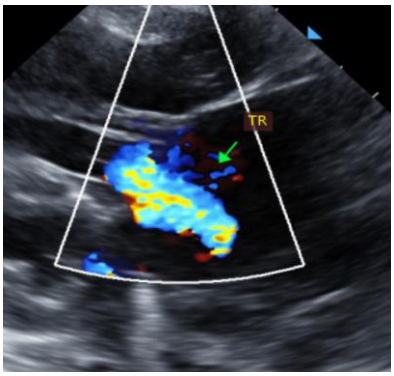
Recheck renal, BP, heart rate in 1-2 weeks, **sooner if any decline in the interim**. The target heart rate is 140-160bpm in hospital and up titrate the medication to effect. If the BP is >130mmHG and patient is doing well at home, institute ACEI 0.5mg/kg PO q12h.
*If hyperthyroidism is confirmed and treated, rate control can likely be weaned pending normalization of thyroid and tachycardia. Close monitoring of HR is advised through this process.

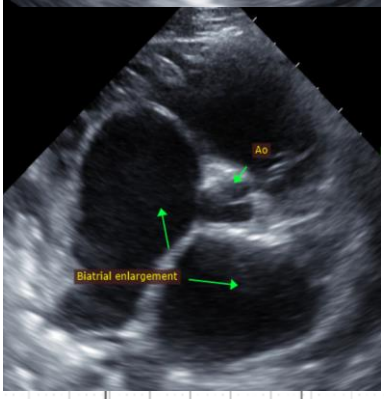
A recheck echocardiogram is recommended in 6 months to assess progression.

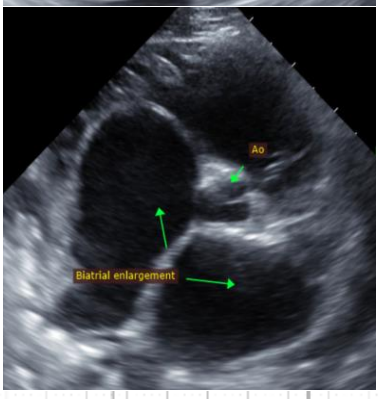
IMAGES

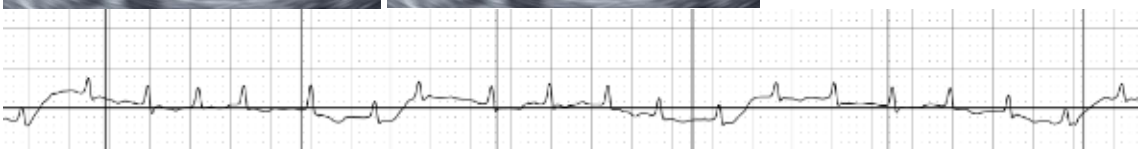












The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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