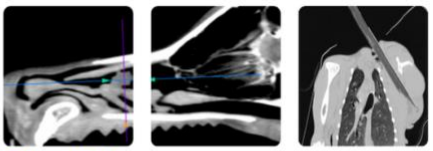

PATIENT

Puffin MacMillan

SPECIES

Feline

BREED

DSH

SEX

Spayed Female

AGE

12 Years

WEIGHT

8.5 kg

INTERPRETED BY

James Wood, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY

Crystal Hill

HOSPITAL NAME

Novel Vet

REFERRING VET

Dr. Machell

INVOICE

37335

DATE

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PRESENTING CLINICAL SIGNS

History: Gallop rhythm, cardiac disease suspected, recommend Echo/ECG. Dental Disease, Obesity with noted weight gain, Diabetes, Age related iris changes. Has been on Lantus insulin, Gabapentin. Assess for safety of anesthesia.

Abnormal PE/Chem/CBC/UA Results: Please read attached ECG. Anion Gap 26, Chloride 112 ALP 63.

ULTRASONOGRAPHIC EXAMINATION OF THE HEART

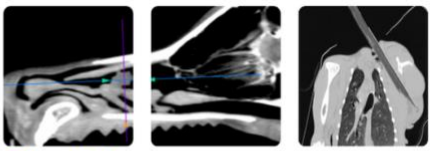
FELINE CARDIAC PARAMETERS	**BODY WEIGHT** (kg)	**HR** (BPM)	**IVSd** (cm)	**LVIDd** (cm)	**LVWd** (cm)	**FS** (%)	**EF** (%)
NORMAL PARAMETER	------	150-240	0.3-0.6	1.0-2.1	0.25-0.6	35-67	80-100
PATIENT	8.54	240	0.71	1.41	0.45	58.8	91.1
FELINE CARDIAC PARAMETERS	**LA/AO** (M-mode)	**LA/AO HEART BASE** (Sisson)	**LAD** LA MAX 4 Chamber		**LVOT VEL.** (m/s)	**RVOT VEL.** (m/s)	**IVRT** (m/)
NORMAL PARAMETER	<1.5	1.6	0.7-1.7		<1.6	<1.3	40-60
PATIENT	1.5	1.8	1.75		1.0	1.1	NM
Adapted from June Boon,Veterinary Echocardiography,1998 Sisson D et al. JVIM 1991; 5: 232, Jacobs et al. Am J Vet Res 1985; 46:1705							

ECG Interpretation

A six lead ECG is reviewed. There is significant baseline artifact. However, line 1 continues with good contact. The underlying rhythm is a narrow complex tachycardia at a rate of 240bpm. There are sinus appearing P waves in lead 1 and in the other leads when baseline artifact is not present. The rhythm does not break, however, has some rate modulation on some page. This is suspected to be a sinus tachycardia. However, an SVT cannot be fully excluded. No supraventricular or ventricular ectopy was otherwise visualized.

Cardiac Presentation

The left atrium is mildly enlarged. The mitral valve leaflets are normal and there is no mitral regurgitation. There is no evidence of systolic anterior motion of the mitral valve and no evidence of a left ventricular outflow tract obstruction. There is mild concentric hypertrophy of the interventricular septum with a normal LV free wall thickness. The right atrium is normal. The tricuspid valve is normal without evidence of tricuspid regurgitation. Subjectively normal RV systolic function. The aortic and pulmonary valves are normal without evidence of insufficiency. Aortic and pulmonary outflow



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velocities are within normal limits. The aorta and PA are normal along with the associated PA branches. There is no evidence of pleural effusion, pericardial effusion, or intracardiac masses.

ULTRASONOGRAPHIC FINDINGS

- Hypertrophic cardiomyopathy phenotype - ACVIM stage B2
- Narrow complex tachycardia - suspect sinus tachycardia

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The echocardiogram revealed thickening of the left ventricular walls. This is consistent with a hypertrophic cardiomyopathy phenotype, or HCM. In HCM, there is hypertrophy (thickening) of the muscle fibers that make up the walls of the heart. Many cases are a primary heart muscle disease (genetic in origin), however in some cases this can be a secondary process that may improve with treatment of the underlying condition (i.e. high blood pressure or hyperthyroidism among others). A blood pressure and total T4 are recommended in cats >6yr to rule these out as underlying causes (if not already performed). Regardless of the cause, the thickening causes diastolic dysfunction, and progressive left atrial enlargement. Eventually, cats with left atrial enlargement are at risk of developing congestive heart failure (pulmonary edema, pleural effusion, or both), blood clot formation and arrhythmias/sudden death. Some cats with mild HCM may live a normal lifespan with no further progression of disease. However, it is also possible that his HCM will progress over time and further therapy may be required for congestive heart failure, blood clots, or arrhythmias.

The echocardiogram showed HCM with left atrial enlargement. While there is no evidence of CHF, baseline thoracic radiographs within the last 1-2 years are ideal to serve as a baseline. Clopidogrel is recommended (18.75 mg PO once daily) to reduce the risk of clot formation. A recheck echocardiogram +/- thoracic radiographs are recommended in 6 months to determine if there is any progression.

Monitoring

It is very important to catch any clinical signs concerning for emerging CHF as early as possible. The client should be closely monitoring and ideally tracking the sleeping respiratory rate. The sleeping RR should be between 10-30 breaths per minute or less (ideally in the teens or low 20s). **If the resting RR is trending upward**, consistently>35/min while resting/sleeping, the patient should be seen urgent for evaluation to determine if CHF is developing. If your pet is ever unable to use one or more of their limbs, seek emergency veterinary attention. *RECHECK ASAP for thoracic radiographs if there is increase in RR to detect early CHF and avoid ER presentation**

Anesthesia

There is a mildly to moderately increased risk to anesthesia given the underlying cardiac disease. Anesthesia should only be pursued for medically necessary procedures with client understanding of the risks.

On top of the increased intraoperative risks (hypotension, hypoventilation, hypothermia) with cardiac disease, there is an increased risk of precipitating CHF. With this understanding, anesthesia can be pursued pending normal labwork, with appropriate precautions for strictly necessary procedures. Baseline thoracic radiographs are recommended within 1-2 months of anesthesia, not only to rule out

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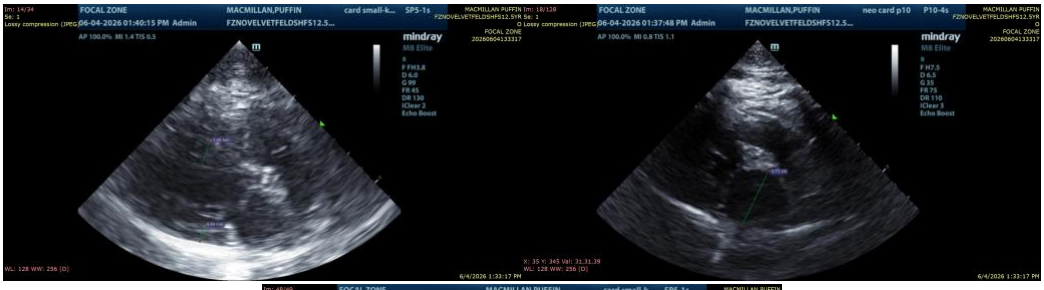
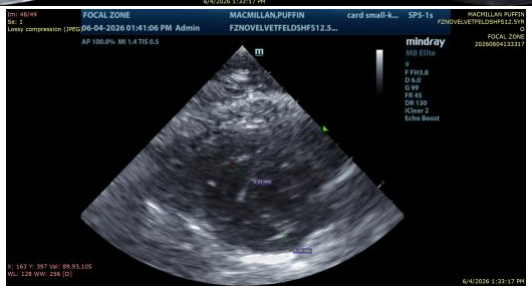
CHF, but to serve as a baseline for comparison if a new cough or other respiratory signs develop after anesthesia.

Recommendations for pre-operative sedation include an opiate (such as butorphanol) combined with a benzodiazepine (such as midazolam or diazepam). It is recommended to avoid alpha 2 agonists, as these agents can cause vasoconstriction and worsen MR, exacerbating left atrial hypertension. These effects persist for hours even after reversal. Etomidate or alfaxalone are preferred induction agents. Propofol can be considered for induction; however, is less preferred to alfaxalone or etomidate. Ketamine should ideally be avoided. Atropine should be used as needed for blood pressure support when bradycardia is present during periods of hypotension.

Full cardiac precautions should be taken with regards to monitoring (ideally CO2, SpO2, ECG, and BP monitoring) and judicious IV fluid administration (avoid volume overload or underload/hypotension – 1-2 mL/kg/hr surgical fluid rate is recommended). All other methods of blood pressure support should be utilized **instead of fluid boluses** (i.e. reduce inhalant/use MAC reducing agents, consider anticholinergics if bradycardia + hypotension), and the use of parenteral inotropes should be considered (i.e. dobutamine or dopamine).





The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. 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.

James Wood, DVM, DACVIM (Cardiology)

info@SonoPath.com