


**PATIENT**

 A173843 Brampton  
 Animal Services

**SPECIES**

Feline

**BREED**

DSH

**SEX**

Male Neutered

**AGE**

~2 years

**WEIGHT**

7.1lbs

**INTERPRETED BY**

 Maggie Machen Lamy,  
 DVM DACVIM  
 (Cardiology)

**IMAGING  
 PERFORMED BY**

Kelly Reschny, RVT

**HOSPITAL NAME**

 Snelgrove Veterinary  
 Service

**REFERRING VET**

Dr. Gunsinger

**INVOICE**

26847

**DATE**

10/12/22

**PRESENTING CLINICAL SIGNS**

History: Grade 4/6 heart murmur.

**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; 50mm/s, 20mm/mV. The average heart rate is 200bpm with a largely regular rhythm. The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P morphology is positive. The QRS is isoelectric. No ectopic beats, pauses or other dysrhythmias observed.

ECG diagnosis: Normal sinus tachycardia.

**ECHOCARDIOGRAM FINDINGS**

2D, m-mode, color flow and doppler imaging is available. The left ventricular wall is normal to decreased in dimension. The LV chamber is mildly increased in diastole. A moderate diameter perimembranous VSD is seen just below the aortic valve. The shunt is left to right; max velocity recorded is 5.2m/s. No right to left flow identified. The left atrium is mildly increased in size for this body size. The right atrium is normal in size. The right ventricle appears normal. The MPA is significantly dilated. The mitral valve is normal in structure and mobility with mild MR. No TR. Blood flow through the LVOT is normal in velocity. Mild AI. Blood flow through the PV is mildly increased in velocity. Trace PI. There is no pleural or pericardial effusion seen. Occasional premature beats are seen throughout.

**CARDIAC CHART**

FELINE CARDIAC PARAMETERS	BODY WEIGHT (kg)	HR (BPM)	IVSd (cm) <small>(Moise, Pipers)</small>	LVIDd (cm) <small>(Moise, Pipers)</small>	LVWd (cm) <small>(Moise, Pipers)</small>	FS (%)	EF (%)
NORMAL PARAMETER	-----	150-240	0.35-0.55	<2 (mean 1.5)	3.5-0.55	35-67	80-100
PATIENT	3.2	180	0.38	1.94	0.40	38	70
FELINE CARDIAC PARAMETERS	LA/AO <small>(Boon)</small>	LA/AO HEART BASE (Swe) <small>(Abbott)</small>	LA 2D short axis Base view (cm) <small>(Abbott)</small>		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	NM	1.44	1.44		1.7	2.5	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.

**INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS**

The cause of the murmur is a perimembranous ventricular septal defect (VSD). The defect is moderate to severe in dimension, with left to right flow. There is evidence of mild left heart volume overload, which while mild is concerning for progression going forward. Additionally, the MPA is significantly dilated which is of unknown origin. While mild MPA enlargement can be seen with increased flow through the vessel (i.e., relative pulmonic stenosis), this is considered a mismatch for this size shunt. Other possibilities include primary pulmonary hypertension, pulmonic stenosis not appreciated here, etc. Given this



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mismatch referral to a local Cardiologist for advanced imaging is recommended in this case, to ensure no ancillary issues are present and follow up is advised. No additional congenital defects are visualized.

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The ECG is unremarkable with a normal sinus tachycardia; however, premature beats are noted throughout the study. Reassessment is advised if these are a prominent finding on exam going forward. No treatment is indicated at this time.

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VSDs in cats have variable outcomes, and lifelong monitoring is advised. The defect in this case appears hemodynamically significant, leading to increased concern for volume overload over time and potentially progression to clinical signs and development of CHF earlier in life. The prognosis is guarded however, as the rate of progression with subclinical cardiomyopathy is highly variable. Patient will always remain at risk for development of congestive signs, arrhythmias and/or sudden death in the future.

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With mild heart enlargement, no medications are clearly indicated at this time. That being said, if the patient is easily medicated an ACE-I can be considered for potential long-term benefit. Pimobendan may be recommended in the future if progressive left heart enlargement is appreciated.

**WEIGHT**

7.1lbs

Monitor at home for any associated clinical signs, including respiratory changes or signs of a thrombus.

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(Cardiology)

Anesthetic risk is considered mild, however judicious IV fluid rates are advised to avoid fluid overload. Additionally, drugs that stimulate heart rate should be avoided unless clinically necessary (glycopyrrolate, atropine). Avoid vasodilators as this may worsen the obstruction. A reasonable protocol includes opioid/benzodiazepine premedication, propofol induction, isoflurane maintenance. Additionally, steroids should be used with caution lifelong, as with LA dilation there is risk for acute intolerance and fluid retention.

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**PLAN**

Consider referral if desired. If declined, consider ACEI (if easily medicated) 0.5mg/kg PO q12h.

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Recheck echocardiogram is recommended in 6 months.

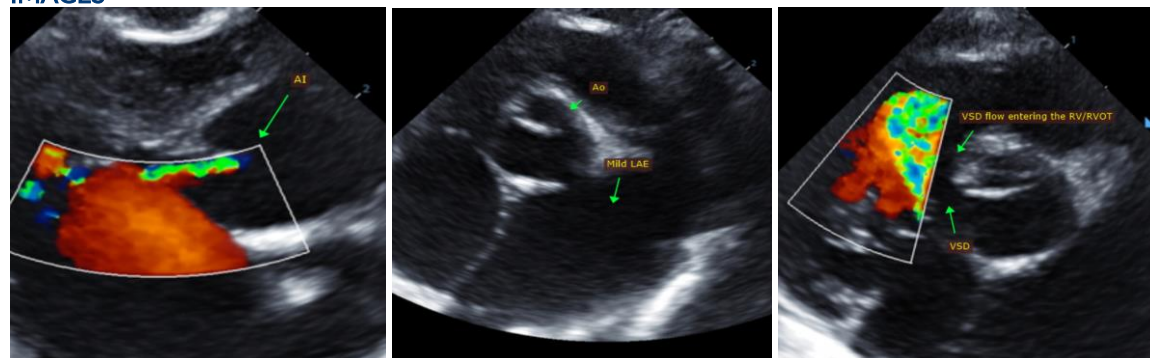
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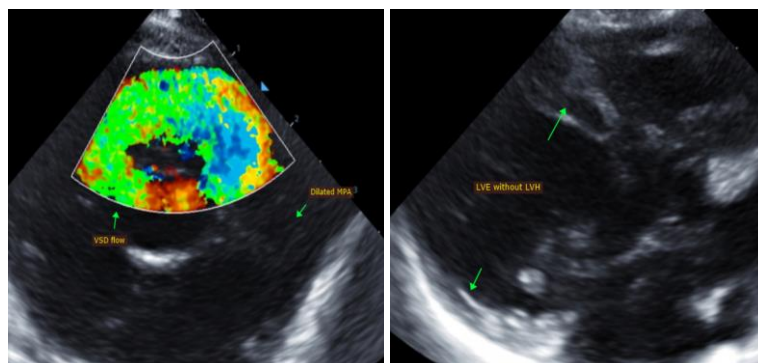
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. This report was generated using transcription software, and minor dictation errors may be present. 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**  
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