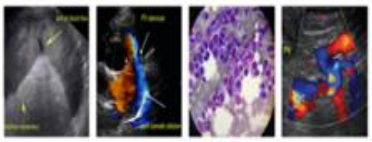
Mass Veterinary Services



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PATIENT
Lila Friedrich

SPECIES
Canine

BREED
Retriever Mix

SEX
Female Spayed

AGE
13 years

WEIGHT
51lbs

INTERPRETED BY
Maggie Machen Lamy, DVM DACVIM (Cardiology)

IMAGING PERFORMED BY
Pamela Harrigan, RDCS

HOSPITAL NAME
Mass Veterinary Services

REFERRING VET
Dr. Masloski

INVOICE
25181

DATE
7/6/22

PRESENTING CLINICAL SIGNS

History: Lila presents with an increasingly pronounced heart murmur. She needs to have a mass removed. She has become somewhat hyporexic. Her activity level has also declined a bit. Lila was coughing but that has improved since she started pimobendan and Lasix in May (chest films at that time read out as consistent with congestive heart failure with improvement noted on repeat films---sent to radiologist). On exam: arrhythmia, grade IV/VI murmur with PMI left apical area, PSS, lung fields clear. BP: 90mmHg x 3. Current medications: 1) Proin 74mg extended release 1 tablet daily 2) Pimobendan/vetmedin 5mg 1.5 tabs twice a day 3) Lasix/furosemide 50mg 1/2 tab twice a day 4) DES 1mg 1 capsule every 4 days *No sedation for study.

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 120bpm (range 75-188bpm). Irregularly irregular rhythm without a consistent PR interval. Most consistent atrial fibrillation. Isolated VPCs throughout; monomorphic and primarily singles with a tight couplet.
ECG diagnosis: Suspect atrial fibrillation with frequent VPCs and a single couplet.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and Doppler imaging is available.
Left ventricle: Severe LV dilation with adequate myocardial function.
Left atrium: The left atrium is severely dilated.
Mitral valve: Diffuse thickening of mitral valve leaflets with mild prolapse into the left atrial lumen. Suspect ruptured chord (see below). Severe eccentric mitral regurgitation with a normal velocity.
Aortic valve/Aorta: The aortic valve is normal in morphology and mobility. Normal aortic outflow velocity; laminar flow. No aortic insufficiency.
Right ventricle: Mild RV dilation.
Right atrium: No right atrial dilation.
Tricuspid valve: The tricuspid valve appears mildly thickened with mild tricuspid regurgitation. Normal velocity.
Pulmonic valve/Pulmonary artery: The pulmonic valve is normal in morphology and mobility. Normal pulmonic outflow velocities with laminar flow. No PI.
Pericardium/other: No pericardial or pleural effusion noted. No obvious cardiac masses.

2-Dimensional Measurements

Ao diam (cm)	2.0
LA diam (cm)	5.5
LA:Ao (Swe)	2.8
IVS thickness (cm)	0.9
LVID diastole (cm)	5.8
PW thickness (cm)	0.9
LVID systole (cm)	3.6
FS (%)	38

Doppler Measurements

PV Vmax (m/s)	0.54
AoV Vmax (m/s)	1.6
MR Vmax (m/s)	5.0
TR Vmax (m/s)	2.5
TR PG (mmHg)	25

INTERPRETATION OF THE FINDINGS

The cause of the murmur is chronic degenerative valve disease causing severe mitral and mild tricuspid regurgitation. Severe left atrial enlargement indicates the risk for

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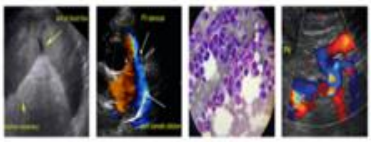

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spontaneous congestive heart failure is elevated. A ruptured chord dramatically raises this risk and may explain prior episode of decompensation. No additional issues are identified.

These findings would support the prior diagnosis of congestive heart failure and continued medications are warranted lifelong as below. This includes addition of Spironolactone for long-term benefit. Do not utilize an ACE-I due to hypotension. Hydrocodone can be utilized if needed for quality of life.

As a complicating factor, the patient has also developed a significant arrythmia with both atrial fibrillation (AF) and VPCs. Development of multiform arrhythmias puts the patient at high risk for acute decompensation going forward. Tachycardia of any origin (when sustained) leads to right sided congestion (tachycardia-induced cardiomyopathy). AF is characterized by disorganized contractions of the atria leading to an irregular heart rhythm. The heart rate is unusually low for a patient with atrial fibrillation, and certainly does not warrant rate control. Periodic screening is advised going forward as if tachycardia develops, this may certainly change in the future. Additionally, VPCs are concerning, particularly with the presence of a couplet. This raises risk for sudden death and careful monitoring is advised.

Given the complexity of this case, I would not necessarily institute Sotalol at this time given a low resting heart rate and primarily isolated VPCs. The patient is doing reasonably well at home given what is seen here, without reported collapse/syncope. A holter monitor would be ideal to ensure no additional issues are going on outside of the hospital. Close monitoring going forward is advised.

Monitoring of sleeping respiratory rates will be paramount to screen for recurrent congestive heart failure at home in the future. Cough suppression to improve QOL can also be considered once diuretics are on board for any residual mechanical cough in the face of normal sleeping respiratory rates.

Prognosis is poor at this stage, with risk for recurrent congestive heart failure, malignant arrhythmias (AF, VT), collapse and/or sudden death in the future.

RECOMMENDATIONS

- Continue Lasix and Pimobendan as prescribed.
- Institute Spironolactone 1-2mg/kg PO q12h.
- Consider a holter monitor as discussed.
- Cough suppression to improve QOL can also be considered (hydrocodone, 0.2-0.4mg/kg up to q4-6h PRN) for any residual mechanical cough in the face of normal sleeping respiratory rates.
- Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes.
- Monitoring of sleeping respiratory rates will be paramount to screen for congestive heart failure at home.
- Elective anesthesia is not advised as there is exceedingly high risk for complication, given the complexity of issues seen here. If required, referral to a facility with an Anesthesiologist is strongly recommended. Risk:benefit ratio should be considered. Should you elect to proceed, cardiac protective drug choices (opioid/benzodiazepine premedication, propofol or alfaxalone induction, iso or sevoflurane gas) are

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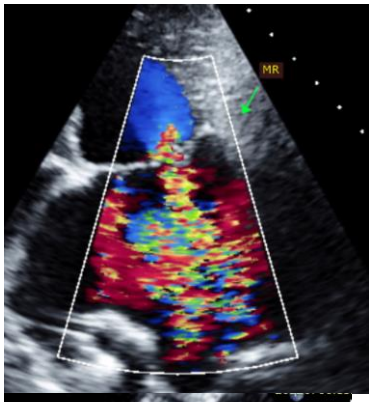
recommended. Pre-oxygenate for 5-10 minutes prior to induction and recover in O2 cage. Monitor for arrhythmias, hypotension, and hypoxia both intra and post-operatively and intervene as necessary. Avoid ketamine, telazol, dexdomitor (or other alpha-2 agonists) and acepromazine. Recommend having lidocaine CRI available for use in the event of worsening ventricular arrhythmias under anesthesia (CRI 50—75mcg/kg/min).Moderate IV fluid restriction is recommended to avoid fluid overload, while considering comorbidities, hydration status, BP, etc. Avoid heart rate stimulating drugs such as atropine unless clinically indicated.

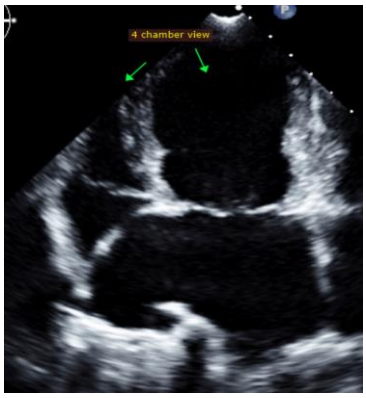
- Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.

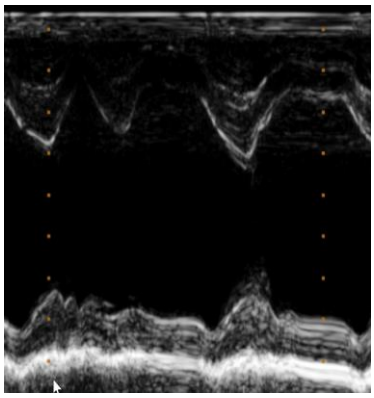
PLAN

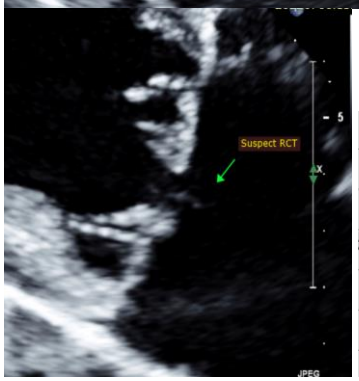
- Monitor renal values and BP in 1-2 weeks, then every 3-4 months lifelong.
- Recommend conservative monitoring with a recheck echocardiogram in 6 months, sooner if any development of clinical signs.

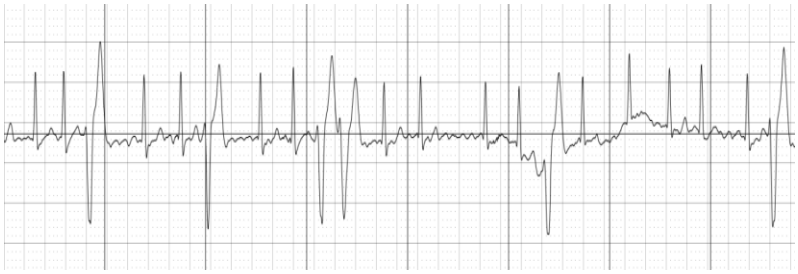
IMAGES











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. 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
Diplomate of the American College of Veterinary Internal Medicine (Cardiology)

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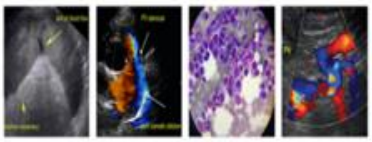

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Echocardiogram performed by: Pamela Harrigan, RDCS
Pet Animal Ultrasound Service (4paus.com)