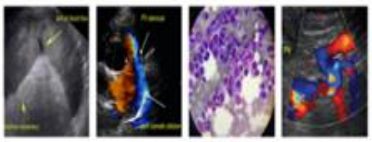
Mass Veterinary Services



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

PATIENT
Happy Ragone

SPECIES
Canine

BREED
Havanese

SEX
Male Neutered

AGE
15 years

WEIGHT
15.5lbs

INTERPRETED BY
Maggie Machen Lamy, DVM DACVIM (Cardiology)

IMAGING PERFORMED BY
Pamela Harrigan, RDCS

HOSPITAL NAME
Mass Veterinary Services

REFERRING VET
Dr. Masloski

INVOICE
24510

DATE
6/1/22

PRESENTING CLINICAL SIGNS

History: Happy was noted to have a heart murmur in February at rDVM. An echocardiogram done in March revealed mitral and tricuspid insufficiency with left atrial dilation as well as right heart enlargement (Elizabeth Shaker, DVM): LA 3.2 cm; LA:Ao 2.4; LV 3.2 cm; MR, LAE, TR (no velocity provided). Happy was started on Enalapril. Happy is presently eating well with normal activity but occasionally pants. On exam today: NSR, grade IV/VI murmur with PMI left apical area radiating to right, PSS, lung fields clear. BP: 270mmHg x 3 (shaking). Current medications: Enalapril 5mg 1/2 tab daily *Sedated with propofol for study.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and Doppler imaging is available.
Left ventricle: LV is dilated with hyperdynamic myocardial function. Subtle septal flattening in systole.
Left atrium: The left atrium is severely dilated.
Mitral valve: Diffuse thickening of mitral valve leaflets with mild prolapse into the left atrial lumen. Severe eccentric mitral regurgitation, 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: Moderate RV dilation.
Right atrium: Moderate RA dilation.
Tricuspid valve: The tricuspid valve appears thickened with mild septal prolapse and moderate tricuspid regurgitation. TR velocity is elevated consistent with moderate pulmonary hypertension.
Pulmonic valve/Pulmonary artery: The pulmonic valve is normal in morphology and mobility. Normal pulmonic outflow velocities. No pulmonic insufficiency.
Pericardium/other: No pericardial or pleural effusion noted. No obvious cardiac masses.
Heart rhythm: ECG reveals a sinus rhythm with an average HR of 160bpm.

2-Dimensional Measurements

Ao diam (cm)	1.4
LA diam (cm)	3.5
LA:Ao (Swe)	2.5
IVS thickness (cm)	0.59
LVID diastole (cm)	3.4
PW thickness (cm)	0.56
LVID systole (cm)	1.5
FS (%)	56

Doppler Measurements

PV Vmax (m/s)	0.56
AoV Vmax (m/s)	1.0
MR Vmax (m/s)	4.0
TR Vmax (m/s)	3.9
TR PG (mmHg)	62

INTERPRETATION OF THE FINDINGS

Chronic degenerative valve disease persists with evidence of progression. Severe mitral and mild to moderate tricuspid regurgitation are noted with significant 4 chamber enlargement. Severe left atrial and ventricular enlargement indicate the risk for spontaneous congestive heart failure is elevated. Moderate pulmonary hypertension is noted, which is likely secondary to chronically elevated LA pressure. No obvious additional issues such as systolic dysfunction are noted.

Even without clinical signs, recommend institute cardiac supportive medications including a weak diuretic (spironolactone) and advise close monitoring at home for need for Lasix therapy. If needed, cough suppression (up to q4-6 hours) can be used for mechanical

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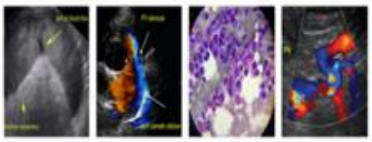

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cough. Monitoring of sleeping breathing rates is recommended as the best way to screen for CHF at home.

Pulmonary hypertension of this degree does not necessarily require medication with sildenafil prior to associated symptoms. Monitoring for symptoms of progressive pulmonary hypertension are recommended, including exertional collapse/dyspnea. Should these develop, I would not hesitate to institute sildenafil, however I am hopefully that the recommended medications will help stabilize this pathology as well. Adequate cough suppression is also of the upmost importance, utilizing hydrocodone.

Long term prognosis is guarded to poor; however, I am hopeful we can stabilize the patient for some time on medications. Once CHF develops, they are generally able to maintain a good quality of life for an average of 8-12 months. Patient will always be at risk for progression to CHF, development of arrhythmias/LA tear, syncope and/or sudden death in the future.

The reported blood pressure is elevated and should be reassessed for accuracy particularly given no reported clinical signs of severe hypertension (retinal changes, etc.) or evidence of LVH on echo. Ideally obtain serial measurements in a controlled, low stress environment and continue until 3 consecutive readings plateau within 5mmHg of variability. If persistently >180mmHg despite a relatively calm demeanor, recommend institution of amlodipine to effect. Additionally, if deemed accurate, screening for predisposing underlying causes of SHT is recommended (Cushings, PLN, adrenal tumor, etc.), as primary disease is relatively uncommon and a rule out diagnosis.

RECOMMENDATIONS

- Administer ACE-I (benazepril or enalapril) 0.5mg/kg PO **q12h.**
- Institute Pimobendan 0.3mg/kg PO q12h.
- Institute Spironolactone 1-2mg/kg PO q12h.
- Reassess BP as discussed.
- Consider hydrocodone if needed for quality of life (0.2-0.4mg/kg PO up to q4-6 hours PRN for cough; available in 5/1.5mg tabs and 5mg/5ml liquid suspension).
- If symptoms of progressive PAH develop institute sildenafil 1-2mg/kg PO q12h.
- Elective anesthesia is not advised.
- Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.
- Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes. Monitoring of sleeping breathing rates is the best way to screen for progression to CHF at home.

PLAN

- A renal panel is recommended in 1-2 weeks, then every 3-4 months lifelong.
- A recheck echocardiogram is recommended in 4-6 months to screen for progression, sooner if clinical signs arise.

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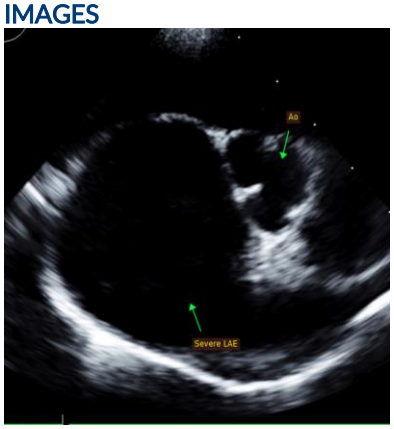
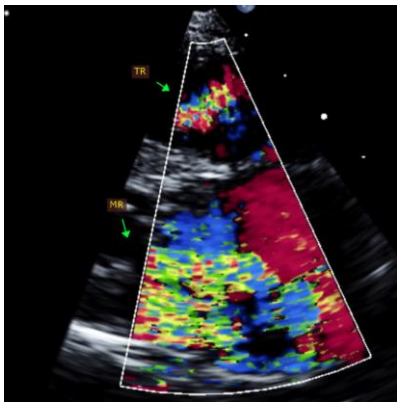
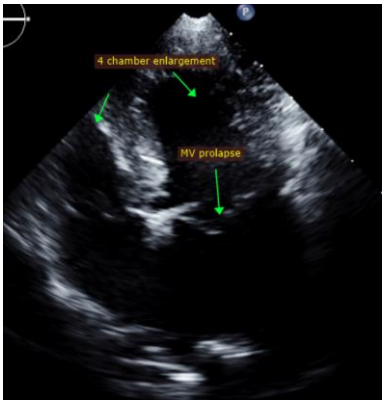
IMAGES







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)
info@sonopath.com

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