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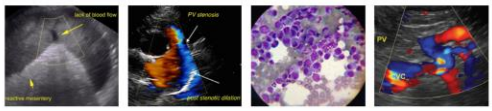


SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
1-800-838-4268 info@sonopath.com SonoPath.com

PATIENT

Millie Ronhock

SPECIES

Canine

BREED

CKCS

SEX

Female Spayed

AGE

8 years

WEIGHT

28lbs

INTERPRETED BY

Maggie Machen Lamy, DVM DACVIM (Cardiology)

IMAGING PERFORMED BY

Pamela Harrigan, RDCS

HOSPITAL NAME

Mashpee Veterinary Hospital

REFERRING VET

Dr. Oldham

INVOICE

20409

DATE

8/6/21

PRESENTING CLINICAL SIGNS

History: Recheck echo. History chronic valvular disease - Stage B1; history 3rd degree AV block; history systemic hypertension. No cardiac medications: on amlodipine 2.5 mg q12h. BP: 129/81mmHg.
-Pertinent previous echo findings (8/2020): LA 2.37 cm; LA:Ao 1.44; LV 3.95 cm; moderate to severe MR; mild TR.

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 from an AliveCor monitor; 25mm/s, 10mm/mV. Complete (3rd degree) AV block is present. The sinus/P wave rate is 170bpm with no P to QRS correlation. The ventricular rate is 45bpm with a junctional escape rhythm.
ECG diagnosis: Complete (3rd degree) AV block.

ECHOCARDIOGRAM FINDINGS

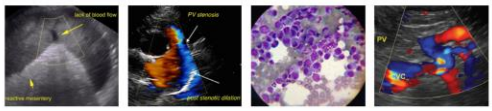
2D, m-mode, color flow and Doppler imaging is available.
Left ventricle: The LV diameter is increased with hyperdynamic myocardial function. LV wall thicknesses are decreased with increased sphericity.
Left atrium: The left atrium is moderate to severely dilated.
Mitral valve: The mitral valve is severely thickened with no prolapse into the left atrial lumen. Moderate to severe eccentric mitral regurgitation with a normal velocity. Diastolic MR.
Aortic valve/Aorta: The aortic valve is normal in morphology and mobility. Mildly elevated aortic outflow velocity; laminar flow. No aortic insufficiency.
Right ventricle: Mild RV dilation. No obvious RVH.
Right atrium: Mild RA dilation.
Tricuspid valve: The tricuspid valve appears mildly thickened with moderate tricuspid regurgitation. Normal velocity. Moderate TR. Velocity consistent with the mild to moderate pulmonary hypertension. Diastolic TR.
Pulmonic valve/Pulmonary artery: The pulmonic valve is normal in morphology and mobility. No pulmonic insufficiency. Mildly elevated RVOT velocity; laminar flow.
Pericardium/other: No pericardial or pleural effusion noted. No obvious cardiac masses.

2-Dimensional Measurements

Ao diam (cm)	1.8
LA diam (cm)	3.4
LA:Ao (Swe)	1.84
IVS thickness (cm)	0.86
LVID diastole (cm)	4.3
PW thickness (cm)	0.77
LVID systole (cm)	2.2
FS (%)	48

Doppler Measurements

PV Vmax (m/s)	1.3
AoV Vmax (m/s)	2.5
MR Vmax (m/s)	6.3
TR Vmax (m/s)	3.8
TR PG (mmHg)	60



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INTERPRETATION OF THE FINDINGS

The diagnosis of 3rd degree (complete) AV block persists with a ventricular rate of 45bpm. No obvious P to QRS relationship is identified. Significant bradycardia and AV block is usually an acutely progressive disorder, with most dogs requiring transvenous pacemaker implantation to relieve clinical signs such as collapse or lethargy. This patient is essentially asymptomatic based upon the provided history which is unusual, particularly a year after diagnosis. Chronic degenerative valve disease persists as was previously noted; however, there is evidence of progression with significant LA and LV dilation. The degree of dilation is likely due to a combination of structural disease and the chronic bradycardia, as even normal hearts with this degree of bradycardia will show secondary dilation. Finally, mild to moderate pulmonary hypertension is noted which is of unknown significance at this time.

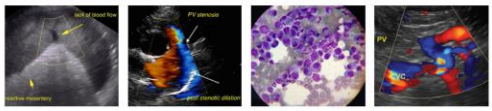
AV block is typically idiopathic in origin, with progressive deterioration of the electrical system resulting in persistent bradycardia, significant lethargy and collapse. An atropine challenge is recommended in any case of bradycardia, although the response is expected to be minimal. If there is any improvement in resting heart rate, stimulation through theophylline or propantheline (see below) can be attempted. Baseline full lab work should be performed, to rule out any electrolyte abnormalities that may be contributing. Additionally, baseline full body radiographs are recommended to rule out any neoplastic issues.

Barring any treatable systemic issues, the recommended treatment in this case is referral for discussion of pacemaker implantation. If declined, heart rate stimulation can be attempted as discussed; however, this is typically of limited benefit. That being said this patient is asymptomatic and potentially may remain that way for some time. If not corrected, this patient will succumb to either the structural disease resulting in CHF (which will be difficult to manage in the absence of a normal heart rate), or to worsening bradycardia/syncope/sudden death. The goal would be to stabilize the situation through heart rate management and use medical support to hopefully support the structural disease.

With this degree of left heart changes, the risk for spontaneous congestive heart failure is elevated and cardiac supportive Pimobendan is recommended as below. Unfortunately, the patient will always be at risk for recurrent CHF, development of arrhythmias/LA tear, syncope and/or sudden death in the future.

RECOMMENDATIONS

- Screening lab work and radiographs.
- Consider Atropine challenge if not already done: Administer 0.04mg/kg atropine IV and reassess ECG for 5-10 minutes post-injection.
- If there is any improvement with atropine, can attempt Theophylline 10mg/kg PO q12h.
- If this is ineffective, can attempt HR stimulation with propantheline bromide (difficult to find typically).



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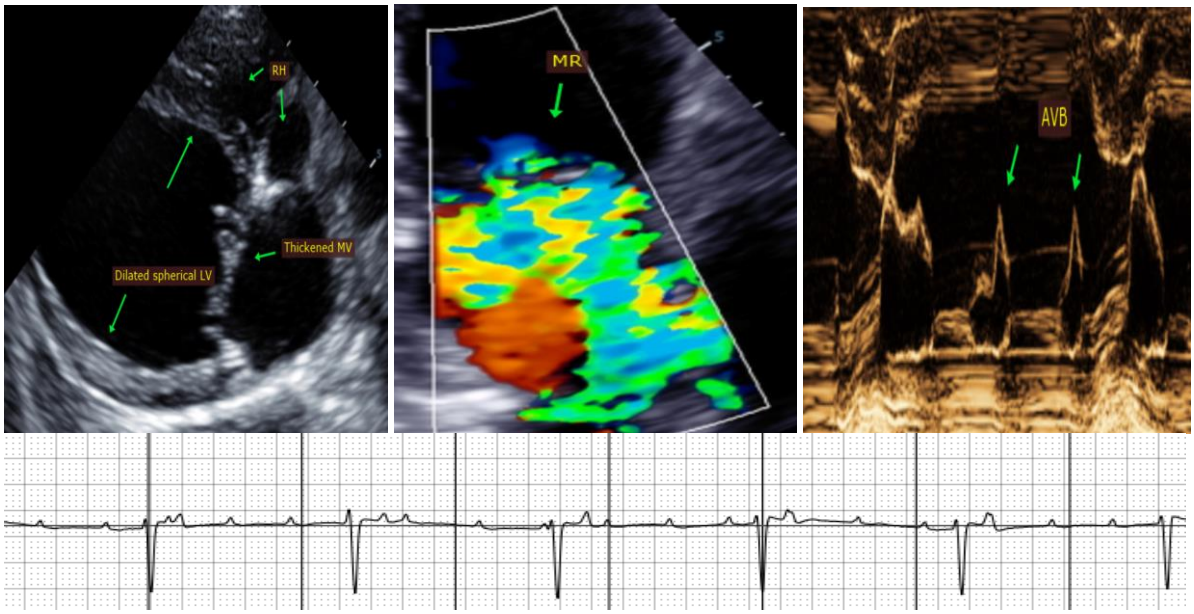
-
- Institute Pimobendan 0.25-0.3mg/kg PO q12h.
- Referral for Cardiologist evaluation and discussion of pacemaker implantation.
- Consider humane euthanasia if lethargy/syncope develops and affects QOL and/or CHF develops.
- Close monitoring for development of associated clinical signs (development of a cough, labored breathing, exercise intolerance or worsening collapse episodes) is recommended. Monitoring of sleeping breathing rates is recommended as the best way to screen for CHF at home.
- Activity restriction is advised.
- Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.

PLAN

- 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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