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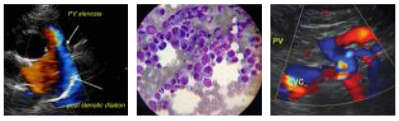

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PATIENT

Merlin Cocoros

SPECIES

Canine

BREED

Golden Retriever

SEX

Male Neutered

AGE

10 years

WEIGHT

80lbs.

INTERPRETED BY

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

HOSPITAL NAME

Banfield Pet Hospital of Towson

REFERRING VET

Dr. Culbertson

INVOICE

21312

DATE

10/1/21

PRESENTING CLINICAL SIGNS

History: Patient was noted to have arrhythmia 1 week ago. ECG shows VPC's, ~45 / min w/ some consecutive runs. Recheck today and arrhythmia is markedly worse.
-Pertinent abnormal PE/Chem/CBC/UA Results: NSF.
-Blood pressure: 181, 187, 190mmHg.
-Sedation used: Sedation not required for scan.
-STAT: Requested by the veterinarian.

ELECTROCARDIOGRAPHIC FINDINGS

A six lead ECG is available at both 25 and 50mm/s; 2mm/mV. The underlying rhythm is sinus in origin with an average heart rate of 120bpm. P for every QRS complex and vice versa. The P wave morphology is positive with a normal dimension. Normal PR. The QRS morphology is positive with normal dimension. MEA is normal. Frequent VPCs throughout; singles only. The majority of the tracing is varying between bigeminy and trigeminy. The VPCs are monomorphic. No supraventricular premature beats, pauses or other dysrhythmias observed.
ECG diagnosis: Ventricular bigeminy and trigeminy.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Mild mitral valve leaflet thickening with no obvious prolapse into the left atrial lumen. Trace mitral regurgitation is identified. Normal left atrial dimension. Normal LV diameter with normal myocardial function. The tricuspid valve appears subjectively normal. No TR. The right heart is normal. No overt evidence of pulmonary arterial hypertension. The pulmonic and aortic valves are normal in morphology and mobility. No aortic abnormalities identified, with normal outflow velocity. Normal pulmonic outflow velocities. No aortic insufficiency. No pulmonic insufficiency. No pericardial or pleural effusion noted. No cardiac tumors observed.

CARDIAC CHART

CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swe)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT	NM	NA	NM	1.3	31	59	NM

CANINE CARDIAC PARAMETERS	HR (BPM)	AV VMAX (m/s)	PV MAX (m/s)	BODY WEIGHT (kg)	LA 2D short axis Base view (cm)	LVIDd Avg; 2D and m-mode short axis (cm)	LVIDs Avg; 2D and m-mode short axis (cm)
NORMAL PARAMETER	50-100	0.7-1.7	0.7-1.6	BELOW	BELOW	BELOW	BELOW
PATIENT	59	1.1	0.86	36.3	3.0	4.2	2.9

*Normal chamber parameters expressed as a mean value (SD)				
BODY WEIGHT DEPENDENT PARAMETERS	3	1.27 (5.3)	2.46 (2.46)	1.36 (5.5)
***Note: All measurements based upon multi-modal images and methods. An average value is reported.**	5	1.40 (4.5)	2.74 (5.2)	1.60 (4.7)
	10	1.50 (3.8)	3.27 (3.5)	2.06 (3.1)
	15	1.83 (2.0)	3.71 (2.4)	2.43 (2.1)
	20	2.02 (1.9)	4.14 (2.2)	2.80 (2.0)
	25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
	30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)
	35	2.48 (4.3)	5.17 (5.0)	3.69 (4.5)
	40	2.62 (5.2)	5.48 (6.1)	3.96 (5.4)
	50	2.88 (7.1)	6.07 (8.3)	4.46 (7.4)

Adapted from June Boon, Veterinary Echocardiography, 1998
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435
Hansson et al, Vet Rad and Ultrasound 2002
Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Overtly normal cardiac structure and function are identified. No significant valve leaks are noted, and the systolic function is intact. No obvious intra or extra-cardiac tumors are visualized; however, it is important to note that small masses are easily missed in absence of effusion. Suspicion is low; however, advanced imaging such as a thoracic CT scan can be considered.

The ECG does confirm the arrhythmia is due to single ventricular premature contractions (VPCs). VPCs are ectopic beats generated from abnormal conductive or fibrotic tissue in the ventricles of the heart muscle, and even frequent single VPCs will often cause no clinical signs in dogs. When sustained however, ventricular tachycardia can lead to symptoms such as lethargy and collapse.

VPCs are a very non-specific finding. They can be primary in origin such as ARVC, be secondary to significant cardiac disease (not present in this study), or be extra-cardiac in origin, i.e., due to pain, stress, inflammation, cancer, GI disease, DIC/sepsis, etc. In this dog without structural disease, all additional causes should be considered. An abdominal ultrasound to monitor for any underlying abnormalities, in addition to full lab work, tick titers, cardiac troponin level, etc. can be considered. Unfortunately, there is always an elevated risk for collapse and sudden death in any arrhythmic patient, and even on medications this risk unfortunately still persists.

Based upon the amount of arrhythmia seen on this recording (a bigeminal and trigeminal rhythm). Sotalol is recommended as below. The goal is to significantly decrease the frequency of VPC's going forward. Ideally, a holter monitor would be applied once the medication is initiated to fully understand control.

The recorded blood pressure is elevated and must be interpreted in light of the patient's stress level. Consider reassess at follow up exam.

Fish oil supplementation is recommended for dogs with arrhythmias (1000-2000mg of omega 3 and 6 once to twice daily). Fish oil supplementation is recommended for dogs with arrhythmias (1000-2000mg of omega 3 and 6 once to twice daily).

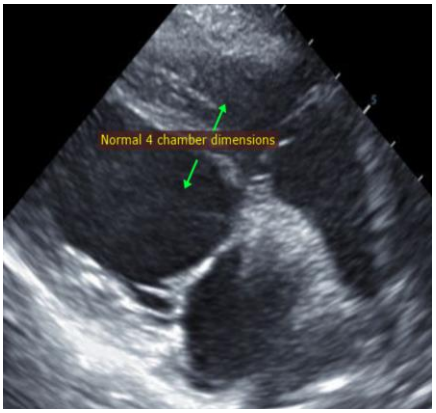
Elective anesthesia is not advised prior to further work up/sotalol therapy and arrhythmic control.

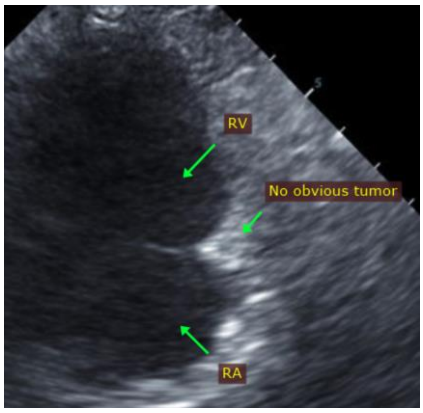
PLAN

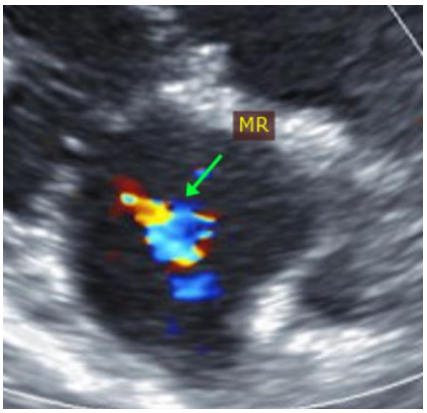
Institute Sotalol 1-2mg/kg PO q12h. Recheck BP, ECG or ideally a holter monitor in 2 weeks to assess response and need for additional therapy. Full systemic evaluation is advised.

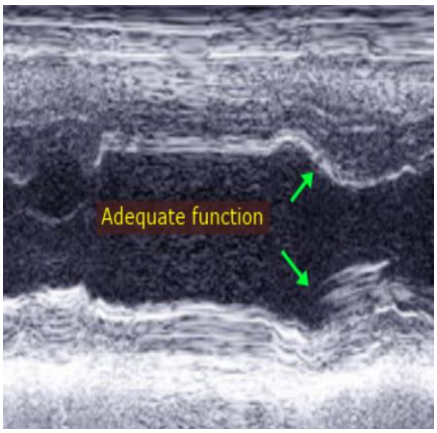
Recommend a recheck ECG and echocardiogram in 6 months, sooner if any development of clinical signs.

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.

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