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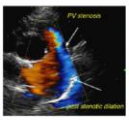
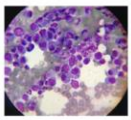
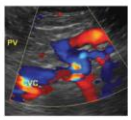

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
1-800-838-4268 info@sonopath.com SonoPath.com

PATIENT
Oliver Green

SPECIES
Canine

BREED
English Mastiff

SEX
Male Intact

AGE
4 years

WEIGHT
183lbs

INTERPRETED BY
Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY
Sarah Pender, CVT

HOSPITAL NAME
SVS Imaging QC

REFERRING VET
Dr. Glispie

INVOICE
29687

DATE
3/17/23

PRESENTING CLINICAL SIGNS
History: Arrhythmia on routine exam. No symptoms. Addison's disease – well managed. Electrolytes' WNL.

RADIOGRAPHIC FINDINGS *NOTE: Images submitted for supplemental cardiac information only.
Normal cardiac silhouette. No obvious evidence of CHF.

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 145bpm (range 107-188bpm). P waves cannot be identified throughout. No premature beats, pauses or other dysrhythmias observed.
ECG diagnosis: Atrial fibrillation.

ECHOCARDIOGRAM FINDINGS
2D, m-mode, color flow and doppler imaging is available. Normal mitral valve leaflets with no prolapse into the left atrial lumen. Trace/mild central mitral regurgitation with mild left atrial dilation. Normal LV diameter with adequate myocardial function. The tricuspid valve appears normal with trace tricuspid regurgitation. Normal velocity. Normal right atrial and ventricular diameter and morphology indicating no overt evidence of pulmonary arterial hypertension. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. Trace aortic and no pulmonic insufficiency. No pericardial or pleural effusion noted. No obvious cardiac masses.

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	2.3	NM	1.4	31	58	0.7
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	170	1.2	1.5	3.08	4.0	6.0	4.2
*Normal chamber parameters expressed as a mean value (SD)				3	1.27 (5.3)	2.46 (2.46)	1.36 (5.5)
BODY WEIGHT DEPENDENT PARAMETERS				5	1.40 (4.5)	2.74 (5.2)	1.60 (4.7)
**Note: All measurements based upon multi-modal images and methods. An average value is reported.*				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)
Adapted from June Boon, Veterinary Echocardiography, 1998				25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435				30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)
Hansson et al, Vet Rad and Ultrasound 2002				35	2.48 (4.3)	5.17 (5.0)	3.69 (4.5)
Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995				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)

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Overtly normal cardiac dimensions and function, with no obvious dysfunction or dilation of the left heart. Small leaks are noted in 3 of 4 valves, which may suggest early valve disease. Mild LA dilation suggests risk for complication is low (suspected to be secondary to the arrhythmia). Monitoring for progression is recommended. Additionally, a baseline BP is suggested. No additional issues are identified, and systolic function is intact.

The ECG shows Atrial Fibrillation (AF) with significant heart rate variation. AF typically develops secondary to severe atrial dilation; however, lone or primary atrial fibrillation can be seen in giant breed dogs and horses, which is suspected here. In these animals the arrhythmia develops simply due to a relatively large myocardial size. The difference between lone AF and a malignant AF that develops secondary to structural disease is heart rate and atrial dimension; lone AF is typically a normal rate with normal variation based upon sympathetic drive, while structural AF is rapid and >200bpm even at rest, often accompanying acute congestive signs. Given a lack of structural changes in a giant breed dog, lone AF is the presumed diagnosis.

Dogs with lone AF typically exhibit minimal clinical signs if the rate is normal and can often remain asymptomatic for some time with this abnormal rhythm. That being said, many lone AF dogs can develop DCM down the road and long-term prognosis is guarded. Lifelong monitoring is advised. Electrical conversion can be considered in some cases depending on activity level of the patient but is typically not necessary. Mild activity restriction is advised.

Going forward, no obvious indication for rate control medications at this time. The majority of the tracing is less than 180bpm and briefly elevated rates are suspected to be secondary to sympathetic drive. That being said, given the risk for development of DCM in this case, close follow up is recommended. A holter monitor could be considered to fully understand resting heart rate at home and need for medication. If declined, reassessment is recommended in 6 months. Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit. Ensure that grain free/boutique/exotic ingredient diets are avoided in this case lifelong.

No cardiac contraindication for general anesthesia.

PLAN

Consider holter monitor as discussed. Avoid nontraditional diet lifelong.

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

IMAGES

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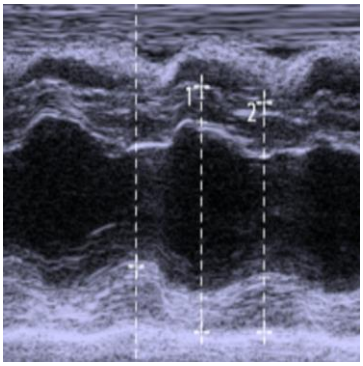

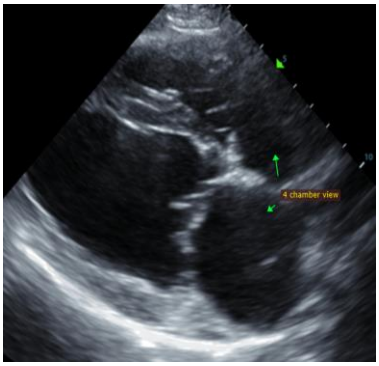

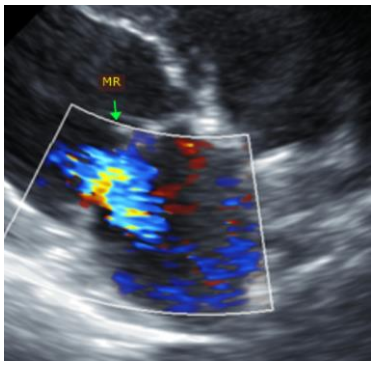

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. 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