



**DATE PRESENTING CLINICAL SIGNS**

3.12.26

**PATIENT**

Marmaduke Hulbert

**SPECIES**

Canine

**BREED**

Great Dane

**SEX**

MI

**AGE**

8.16.20

**WEIGHT**

111lbs

**INTERPRETED BY**

Maggie Machen Lamy,  
DVM, DACVIM  
(Cardiology)

**HOSPITAL NAME**

Celebrie VH

**REFERRING VET**

Dr. Hepner

**INVOICE**

47228

History: Syncopal episode 3/7, nonproductive cough developed 3/8, decreased appetite since 3/8. Went to grooming 3/6. No history of heart disease prior. Grade 3/6 R sided systolic murmur, gallop arrhythmia L side, cannot eval pulses. Harsh bronchovesicular sounds all lung fields. No cough on exam. On home cooked diet.

-Pertinent abnormal PE/Chem/CBC/UA Results: Labs pending.

-CXR show cardiomegaly.

-Current medications: Gaba and traz for PVPs. NG plus inconsistently.

-Sedation used: Not required to complete full diagnostic ultrasound.

-Pertinent previous ultrasound results: No previous.

-STAT: Declined at this time.

-Imaging performed by: Stephanie Warga RDCS, RVT.

**RADIOGRAPHIC FINDINGS** \*NOTE: Images submitted for supplemental information only.

Cardiomegaly with PV dilation. Concern for imminent CHF.

**ELECTROCARDIOGRAPHIC FINDINGS**

A six lead ECG is available at both 25 and 50mm/s; 2mm/mV. The average heart rate is 160bpm. The rhythm is sinus in origin, with a 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. No ectopic beats, pauses or dysrhythmias observed. ECG diagnosis: Normal sinus rhythm with respiratory variation.

**ECHOCARDIOGRAM FINDINGS**

2D, m-mode, color flow and doppler imaging is available. Severe left ventricular dilation with diminished systolic function. Decreased LV wall thickness with increased sphericity. Severe left atrial enlargement. The mitral valve appears normal in form and function, with no obvious prolapse into the left atrial lumen. Mild to moderate central mitral regurgitation secondary to annular stretch. Decreased velocity. Moderate right atrial and ventricular dilation. Mild to moderate tricuspid regurgitation. TR velocity consistent with mild to moderate pulmonary hypertension. The aortic valve is normal in morphology and mobility. Normal LVOT velocity. No aortic insufficiency. Normal RVOT velocity. Normal pulmonic valve with trace pulmonic insufficiency seen. No pericardial or pleural effusion noted. No obvious cardiac tumors.

**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)
<b>NORMAL PARAMETER</b>	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
<b>PATIENT</b>	4.6	3.5	NM	2.2	14	30	NM

<b>CANINE CARDIAC PARAMETERS</b>	<b>HR</b>  (BPM)	<b>AV VMAX</b>  (m/s)	<b>PV MAX</b>  (m/s)	<b>BODY WEIGHT</b>  (kg)	<b>LA</b> 2D short axis Base view  (cm)	<b>LVIDd</b> Avg; 2D and m- mode short axis  (cm)	<b>LVIDs</b> Avg; 2D and m-mode short axis (cm)
<b>NORMAL PARAMETER</b>	50-100	0.7-1.7	0.7-1.6	BELOW	BELOW	BELOW	BELOW
<b>PATIENT</b>	170	1.4	1.3	50.3	5.3	8.3	7.0
*Normal chamber parameters expressed as a mean value (SD)				3	1.27 (5.3)	2.46 (2.46)	1.36 (5.5)
<b>BODY WEIGHT DEPENDENT PARAMETERS</b>				5	1.40 (4.5)	2.74 (5.2)	1.60 (4.7)
<i>*Note: All measurements based upon multi-modal images and methods. An average value is reported.</i>				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**

Unfortunately, this patient has significant cardiomyopathy and systolic dysfunction. This is causing dilation and volume overload of both the left and right heart resulting in insufficiency of the mitral and tricuspid valves. The severity of dysfunction and pump failure is great, and the patient is at high risk for decompensating into congestive failure. Patient will always be at risk for right and/or left-sided CHF, development of arrhythmias/syncope and/or sudden death going forward. Mild to moderate pulmonary hypertension is noted, which is likely secondary. No additional issues are seen. The ECG is normal with a normal sinus rhythm.

Development of the DCM-phenotype can be primary in nature (i.e. genetic DCM as is seen in Dobermans) or develop secondary to a variety of issues such as a non-traditional diet, myocarditis, hypothyroidism, chronic tachycardia, or infiltrative disease such as lymphoma. While primary disease is suspected in this signalment, the diet history is of great concern. Taurine should be supplemented as below, and a well balanced senior diet recommended.

Regardless of cause, prognosis is guarded to poor at this stage in the disease process, with an average survival time of <6 months. Some cases with diet-related disease can improve to some degree with diet correction; however, cases with advanced disease are often irreversible.

Immediate institution of full cardiac supportive medications is recommended as below. Cases of systolic failure are at high risk for tachyarrhythmias (such as VT or rapid AF) and sudden death, and this should be expressed to the owner. Activity restriction is advised, and a baseline ECG recommended.

Elective anesthesia is not advised due to high risk for complications.

Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit. Monitor for development of a cough, worsening labored breathing, abdominal distention, exercise

intolerance or collapse episodes in the future. Monitoring of sleeping breathing rates at home is recommended to assess response to medications and recurrence of CHF in the future.

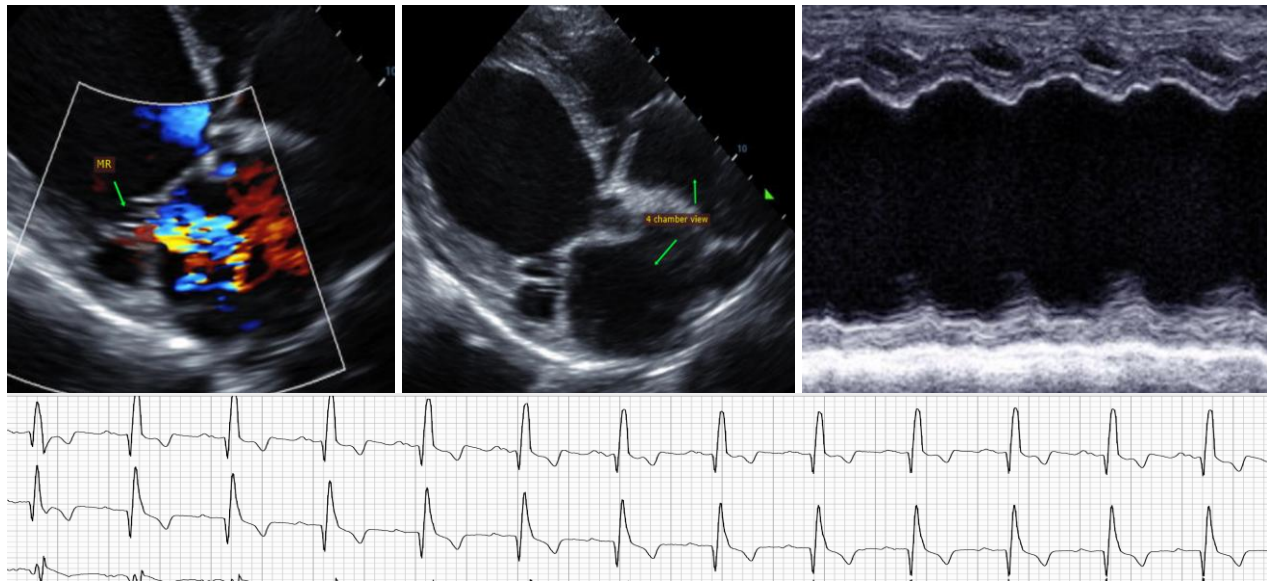
**PLAN:**

Baseline BP/ECG recommended. Initiate aldosterone antagonist Spironolactone 1-2mg/kg PO q12h. Institute furosemide 1-2mg/kg PO q12h. Institute Pimobendan 0.3mg/kg PO q12h. Institute taurine supplement 1000mg PO q12h. Consider diet change as discussed.

Monitor a renal panel and blood pressure in 1-2 weeks to ensure tolerance of medications, then every 3-4 months lifelong. If BP >130mmHg and the patient is doing well at home, institute an ACEI 0.5mg/kg PO q12h.

A recheck echocardiogram is recommended in 6 months to screen for progression, sooner if clinical issues arise in the interim.

**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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