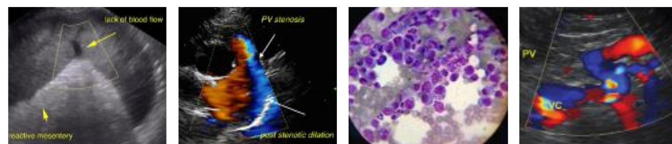

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1-800-838-4268 info@sonopath.com

PATIENT
Dane Chaplin

SPECIES
Canine

BREED
Great Dane

SEX
Male Intact

AGE
6 years

WEIGHT
158lbs

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

IMAGING PERFORMED BY
Andrea Nicastro

HOSPITAL NAME
Flowertown Animal Hospital

REFERRING VET
Dr. Randinelli

INVOICE
26412

DATE
9/16/22

PRESENTING CLINICAL SIGNS

History: 38lb weight loss since January (16lb since July); intermittent large bowel diarrhea; inappetant; coughing noted today.
-Abnormal PE/Chem/CBC/UA Results: USG - 1.037. Irregularly irregular rhythm today on auscultation by Dr Nicastro. BP - 69, 70, 80mmHg systolic. Mild tachypnea today.
-AUS: Showed ascites, CVC dilation and hepatic congestion.

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

Cardiomegaly with concern for biventricular CHF.

ELECTROCARDIOGRAPHIC FINDINGS

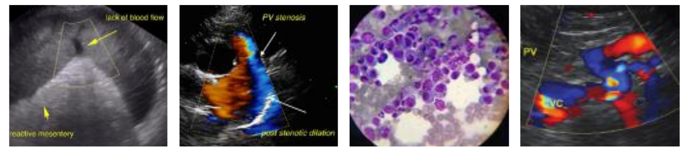
A six lead ECG is available at 50mm/s; 5mm/mV. The average heart rate is 220bpm (range 142-272bpm). No identifiable P waves with an irregularly irregular rhythm, most consistent with rapid atrial fibrillation.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Severe left ventricular dilation with diminished systolic function. Increased EPSS and sphericity. Decreased LV wall thickness. 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. Decreased velocity. The tricuspid valve appears normal in form and function. Moderate right atrial and ventricular dilation. Mild to moderate tricuspid regurgitation due to annular stretch. TR velocity suggests early pulmonary hypertension. The aortic valve is normal in morphology and mobility. No subvalvular ridge present; decreased RVOT/ LVOT velocities. No aortic or pulmonic insufficiency. No obvious cardiac tumors. No pericardial effusion.

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	4.1	3.2	NM	2.5	10	15	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	NM	0.7	0.7	72	5.7	7.1	6.4
*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

Unfortunately, this patient has severe cardiomyopathy and systolic dysfunction. This is causing dilation and overload of all 4 chambers resulting in insufficiency of the mitral and tricuspid valve. Mild pulmonary hypertension is noted, which is suspected to be due to active congestion. No additional issues are identified.

Systolic failure can be primary in nature (DCM) or secondary to taurine deficiency, myocarditis, tachycardia-induced cardiomyopathy, or infiltrative disease such as lymphoma. In senior Great Dane, primary DCM is suspected. Consider exacerbating issues that may be treatable, such as BEG diet, hypothyroidism, etc. Regardless of cause, prognosis is poor at this stage in the disease process, with an average survival time of <6 months if able to be stabilized. Patient will always be at risk for recurrent CHF, development of malignant arrhythmias and/or sudden death in the future.

As a complicating factor, the patient has also developed rapid atrial fibrillation (AF) secondary to atrial dilation. Development of the arrhythmia puts the patient at high risk for acute decompensation and is certainly the reason for ascites in this case. Tachycardia of any origin (when sustained) leads to right sided congestion (tachycardia-induced cardiomyopathy). AF is characterized by disorganized contractions of the atria leading to an irregular heart rhythm. The irregular heart rhythm rarely causes clinical signs in dogs. However, atrial fibrillation also usually causes an increase in the heart rate, and this can lead to clinical signs and CHF as we see in this patient. Once a patient is in AF, this will likely never convert back to sinus rhythm, however they typically do well with simply rate control. The structural disease and development of AF/CHF requires lifelong diuretics and management of the structural disease in addition to management of the heart rate as below. Close monitoring going forward is advised.

Highly recommend 24-hour hospitalization in this case, due to the severity of disease, need for rate control and aggressive management/monitoring. **Sudden death is a possibility at any time, which should be expressed to the owner.**

Monitoring of sleeping respiratory rates will be paramount to screen for recurrent congestive heart failure at home in the future. Cough suppression to improve QOL can also be considered once diuretics are on board for any residual mechanical cough in the face of normal sleeping respiratory rates.

Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes in the future. Monitoring of sleeping breathing rates at home is recommended to screen for progression to CHF. Omega fatty acid supplementation (1000mg once to twice daily) and mild salt restriction may be of some long-term benefit.

PLAN:

Highly recommend immediate 24-hour hospitalization in this case due to severity of disease, need for rate control and monitoring/supportive care and IV rate control with diltiazem/diuretics. Abdominocentesis if needed for patient comfort. Institute Pimobendan ASAP 0.3mg/kg PO q12h.

Once stabilized, recommend discharge on the following oral medications: Pimobendan 0.3mg/kg PO q12h, Lasix/furosemide 1-2mg/kg PO q8h for 3-5 days, if doing well at that time decreased to q12h. Spironolactone 1-2mg/kg PO q12h; Diltiazem 1-2mg/kg PO q8h. Institute taurine supplement 1000mg PO q12h. Consider diet, thyroid panel, etc. as discussed.

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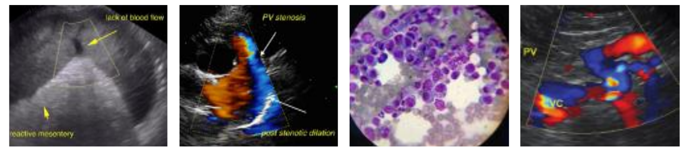

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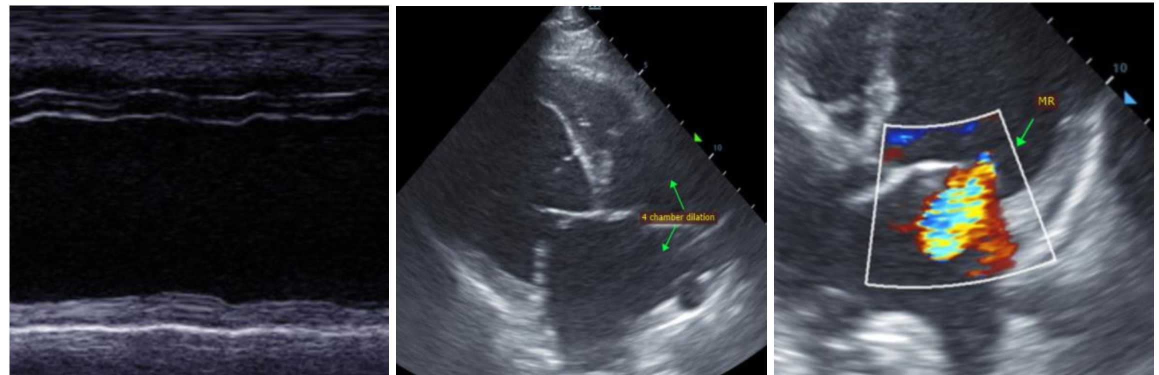
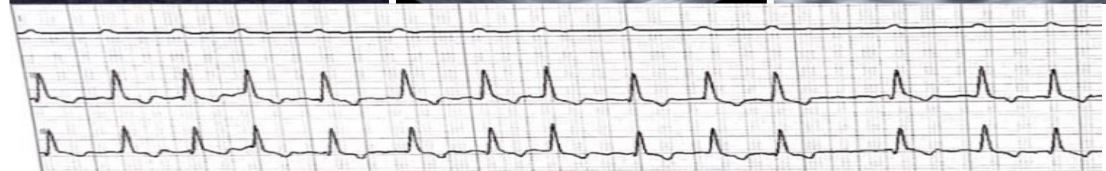
Recheck BP, heart rate/ECG and renal values in 5-7 days. If BP >130mmHg and patient is feeling well, institute ACEI at that time (0.5mg/kg PO q12h). Target HR is 140-160bpm in hospital/stressed. Up-titrate diltiazem to effect. If difficult to control, can also consider digoxin (0.005mg/kg PO q12h) with close monitoring of blood dig levels due to synergistic effect with diltiazem.

Monitor renal values/BP/HR every 3-4 months lifelong.

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)
info@sonopath.com