



## PATIENT

Zelda Albritton

## SPECIES

Canine

## BREED

Hovawart

## SEX

Female Spayed

## AGE

10 years

## WEIGHT

78.9lbs

## INTERPRETED BY

Maggie Machen Lamy,  
DVM, DACVIM  
(Cardiology)

## IMAGING PERFORMED BY

Eileen Jenkins, DVM

## HOSPITAL NAME

Huntsville Veterinary  
Specialists &  
Emergency

## REFERRING VET

Dr. Jenkins

## INVOICE

27989

## DATE

12/14/22

## PRESENTING CLINICAL SIGNS

History: Presented for chronic cough and exercise intolerance. rDVM previously took thoracic rads which revealed cardiomegaly (no murmur) and started Zelda on pimobendan (10mg in the morning, 5mg in the evening). On presentation to Internal Med, the patient was in a-fib with HR >240bpm, constant panting and restless but normotensive. Started atenolol for rate reduction at 0.7mg/kg (25mg) PO BID and clopidogrel loading dose on day 1 and then 75mg PO SID. Recheck 48 hours later, the HR was reduced to ~160 but the patient is still panting and restless, so increased the atenolol dose to 1.4mg/kg (50mg) PO BID and rechecked 72 hours later (today). BP today is normotensive. No significant medical history for this dog - owner denies any history of GI or respiratory disease. Only health-related breed predispositions in literature are immune-mediated thyroiditis (comprehensive thyroid testing in this patient was normal) and degenerative myelopathy.

**RADIOGRAPHIC FINDINGS** \*NOTE: Images submitted for supplemental cardiac information only. Significant cardiomegaly with concern for impending CHF.

## ELECTROCARDIOGRAPHIC FINDINGS

A brief six lead ECG is available at 25mm/s; 10mm/mV. The average heart rate is 160bpm (range 120-188bpm). Tall R waves. No identifiable P waves with an irregularly irregular rhythm, most consistent with atrial fibrillation.  
ECG diagnosis: Atrial fibrillation (on Atenolol).

## ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets with mild prolapse into the left atrial lumen. Moderate to severe eccentric mitral regurgitation with marked left atrial dilation. LV dilation with mildly decreased myocardial function. The tricuspid valve is not assessed. Moderate right atrial Scant pericardial and 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  | 4.2           | NM            | NM                  | >2.5                    | 24                              | 40                                       | 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            | NM            | NM                  | 35.8                    | 6.0                             | 5.9                                      | 4.5                                      |
| *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)                               |
| *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)                               |
|  |               |               |                     | 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)                               |

Adapted from June Boon, Veterinary Echocardiography, 1998  
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435


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|   |    |            |            |            |
|---|----|------------|------------|------------|
| 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**

Findings are most consistent with chronic degenerative valve disease causing severe mitral regurgitation and secondary systolic dysfunction. Significant biatrial and ventricular enlargement indicates the risk for spontaneous congestive heart failure is high and scant pericardial and pleural effusion are most consistent with early CHF (biventricular failure). The tricuspid valve is not assessed, and concurrent pulmonary hypertension is not ruled out.

As a complicating factor rapid atrial fibrillation (AF) has developed. 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 leads to clinical signs and CHF as we see here. Development of AF and CHF requires lifelong diuretics and management of the structural disease in addition to the arrhythmia. It is important to note that right-sided failure is due to the arrhythmia while left-sided failure is due to the structural disease.

Unfortunately, dogs with CHF and AF are at high risk for complications such as recurrent congestive heart failure, malignant arrhythmias, left atrial tear and sudden death. Medications and close monitoring will help give the best prognosis possible, however the average survival time with this condition is <6 months.

Goals of therapy include correcting water retention, improving myocardial contractility, afterload reduction, and heart rate control. Full cardiac support including diuresis is indicated, due to the high risk for decompensation with rapid arrhythmias and severe disease. Medical management is recommended as below with a guarded to poor prognosis. Consider hospitalization if the patient appears unstable. The target heart rate is 140-160bpm in hospital.

Diltiazem is a safer choice than Atenolol for a dog with LV dysfunction and end-stage structural disease. Use of Atenolol in the face of CHF can actually lead to worsen clinical compromise, due a drop in LV function. Recommend carefully wean Atenolol while instituting Diltiazem in hopes of controlling the heart rate while maximizing cardiac output. See recommendations below.

Please monitor at home for cough, lethargy, inappetance, collapse/fainting episodes or increase in respiratory rate or effort. Monitoring of sleeping breathing rates is recommended to screen for recurrent CHF at home. Moderate activity restriction is advised. Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.

**PLAN**

No indication for Plavix and this can be safely discontinued. Continue Pimobendan 0.3mg/kg PO q12 hours. Wean Atenolol by 50% for 2 days. At that time, institute Diltiazem 1-2mg/kg PO q8 hours. 2 days later, discontinue Atenolol. Institute Spironolactone 1-2mg/kg PO q12 hours.

Recheck ECG and HR 3 days following sole Diltiazem therapy; goal is a HR of 140-160bpm stressed. Monitor renal vales and BP at this visit as well. If doing well and BP is >130mmHg, institute ACEI- 0.5mg/kg PO Q12 hours. Otherwise, do not utilize.



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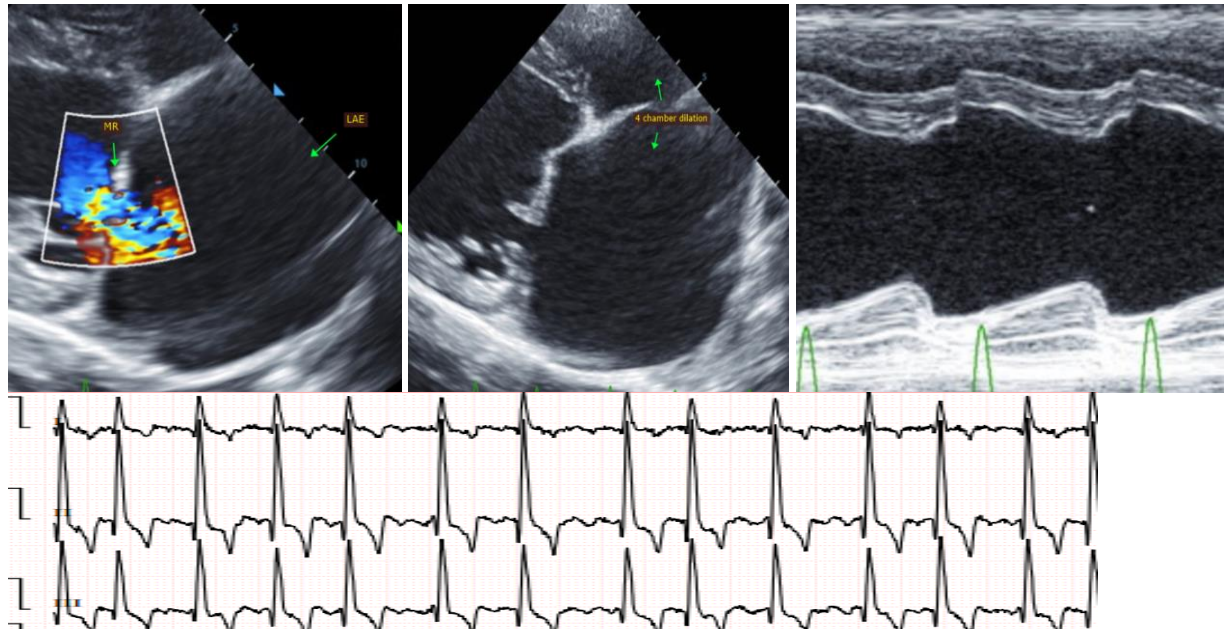
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A recheck echocardiogram is recommended in 6 months to screen for progression.

**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**  
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