

**PATIENT**

Tinkerbelle Bohager

**SPECIES**

Canine

**BREED**

Chihuahua

**SEX**

Female Spayed

**AGE**

2.15.11

**WEIGHT**

7.09lbs

**INTERPRETED BY**Maggie Machen Lamy,  
DVM, DACVIM  
(Cardiology)**HOSPITAL NAME**White Marsh Animal  
Hospital**REFERRING VET**

Dr. Danna

**INVOICE**

23829

**DATE**

4.22.22

**PRESENTING CLINICAL SIGNS**

History: Recheck echo.

-Current medications: Atenolol 25mg/mL 0.2mL SID, Hydrocodone 5mg ¼ BID for coughing.

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

-Pertinent previous ultrasound results (10/2021 CS DAVIM): CVD B1, LVOTO (severe): dramatically improved on Atenolol. Recheck values: LA/AO: 1.45, moderate LAVH (0.6cm globally), mild TR, mild RVH, mild to moderate LVOTO, AV max: 2.2.

-STAT: Not requested

-Imaging performed by: Stephanie Pearce RDCS, RVT.

**ECHOCARDIOGRAM FINDINGS**

2D, m-mode, color flow and doppler imaging is available. Significant thickening of mitral valve with no prolapse into the left atrial lumen. Systolic anterior motion is appreciated causing a significant LVOTO. The mitral regurgitation is suspected to be secondary to this phenomenon. Flow through the region is moderately elevated. Moderate LV hypertrophy is identified (0.85cm globally). The left atrium is normal. The tricuspid valve appears thickened and prolapsing with trivial tricuspid regurgitation. A significant dynamic RVOT obstruction is noted and confirmed on color flow and 2D imaging. 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)
<b>NORMAL PARAMETER</b>	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
<b>PATIENT</b>	NM	NM	NM	1.3	44	79	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)
<b>NORMAL PARAMETER</b>	50-100	0.7-1.7	0.7-1.6	BELOW	BELOW	BELOW	BELOW
<b>PATIENT</b>	NM	3.5	4.2	3.2	1.4	1.8	1.0
*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)
*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)
				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

Unusual case. While some degree of chronic degenerative valve disease is suspected with both mitral and tricuspid regurgitation, the most significant abnormality seen here is an LVOT and RVOT obstruction. There is both LVH and RVH and this is likely developing secondary to this phenomenon. This was noted on the initial study and improved on Atenolol therapy. Compared to what is available, this does show some progression compared to the recheck values, with increasing LV wall thickness and LVOTO. The dynamic RVOT obstruction is typically benign; however, follow up is advised given mild RVH. The LA remains normal, indicating low risk for complication. These are unusual findings to see in a dog and **baseline lab work and blood pressure are recommended if not recently assessed.**

Given these findings, continue Atenolol therapy going forward ensuring the heart rate remains <140bpm stressed. No obvious need for additional medications at this time, pending BP and lab work assessment.

Assessment of progression in the future will help predict long term prognosis, which is highly variable at this stage (B1). Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit. Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes.

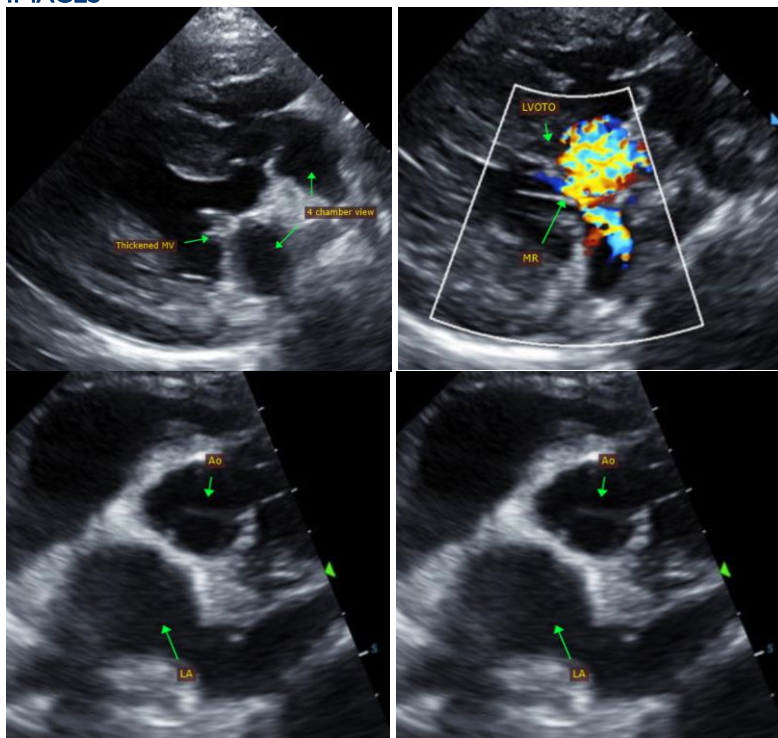
Anesthetic risk is considered mild if needed. Cardiac protective drug choices (opioid/benzodiazepine premedication, propofol or alfaxalone induction, isoflurane gas) are recommended. Pre-oxygenate for 5-10 minutes prior to induction. Monitor for arrhythmias, hypotension, and hypoxia both intra and post-operatively and intervene as necessary. Mild IV fluid restriction is recommended to avoid fluid overload. **Avoid heart rate stimulating drugs such as atropine unless clinically indicated.**

## PLAN

Continue Atenolol lifelong, ensuring the stressed heart rate does not exceed 140bpm. Baseline lab work and BP are recommended with monitoring every 6 months.

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.

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