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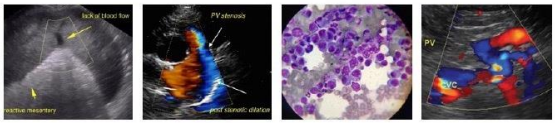


THE FOCAL ZONE
IMAGING PERFORMED BY
289-808-2608 info@thefocalzone.com

**PATIENT**
Blue Duif-Davis

**SPECIES**
Canine

**BREED**
Cairn Terrier

**SEX**
Male Intact

**AGE**
6 months

**WEIGHT**
12lbs

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

**IMAGING PERFORMED BY**
Kelly Reschny, RVT

**HOSPITAL NAME**
Graham Animal Hospital

**REFERRING VET**
Dr. Lukacs

**INVOICE**
22364

**DATE**
2/4/22

## PRESENTING CLINICAL SIGNS

History: Intermittent heart murmur noted during puppy vaccine series (not heard at 8 and 16 weeks, heard at 12 weeks and 5 months). At last visit 1/13/21: grade 2/6 heart murmur, PMI left systolic, soft, focal, possible irregular arrhythmia (vs. sinus arrhythmia). Murmur gets quieter as heart rate increases. No clinical signs associated with murmur. Client plans to compete in agility with patient. BP: 93/36 MAP 54 91/39 MAP 58mmHg.

## ECHOCARDIOGRAM FINDINGS

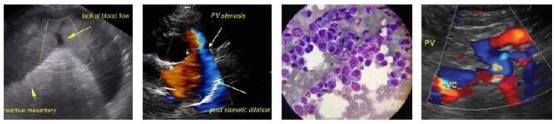
2D, m-mode, color flow and doppler imaging is available. The left ventricular wall is mild to moderately hypertrophied (0.9cm globally). There is a diffusely hyperechoic endocardium consistent with fibrosis. Mild papillary muscle hypertrophy with fibrosis is identified. The left atrium is normal. The right atrium is normal in size. The right ventricle appears normal. The anterior leaflet of the mitral valve appears elongated and thickened with prolapse into the LVOT during systole. There is mild mitral regurgitation associated with this abnormal motion. Trace tricuspid regurgitation seen. Blood flow through the LVOT is mildly elevated in velocity (underestimated on Doppler). Mild thickening of the aortic valve. No significant aortic insufficiency noted. Mild pulmonic insufficiency noted. No evidence of additional congenital issues in this scan. No pleural or pericardial effusion seen.

## 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 | NM | 1.1 | 1.3 | 46 | 90 | 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 | 2.7 | 1.5 | 5.43 | 1.7 | 2.8 | 1.5 |
| *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) |

## INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The diagnosis is mitral valve dysplasia with a secondary LVOT obstruction and mitral regurgitation. This is a similar pathophysiology to SAM in a cat. Moderate LV hypertrophy has developed with fibrosis of the endocardium. The degree of LV changes





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are more significant than the recorded LVOT velocity, which likely reflects an underestimation. If the patient was sedated this can further mask true degree of the obstruction. There is certainly concern for progression as this animal ages and monitoring is advised. No additional issues are identified.

Given LV hypertrophy, lifelong heart rate control with atenolol is recommended, as the dynamic nature of the obstruction will be reduced at lower heart rates. In select cases of MV dysplasia, the cardiac dimensions can improve dramatically with therapy and improve prognosis significantly. No other medications are indicated at this juncture. Mild activity restriction is advised lifelong. Monitor at home for any respiratory signs or clinical lethargy/collapse (the most common symptom of obstructive disease). Prognosis is guarded long-term although highly variable.

Breeding is not advised.

Omega fatty acid supplementation (1000mg 1-2x daily) is of some long-term benefit for dogs predisposed to arrhythmias.

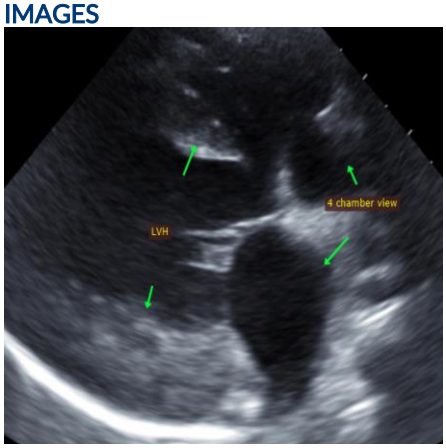
Anesthetic risk is mildly elevated. Avoid heart rate stimulating drugs such as atropine or glycopyrrolate unless clinically indicated. Avoid ketamine and acepromazine due to peripheral vascular effects. Mild IV fluid restriction is advised. Monitor closely for ventricular arrhythmias and intervene as needed.

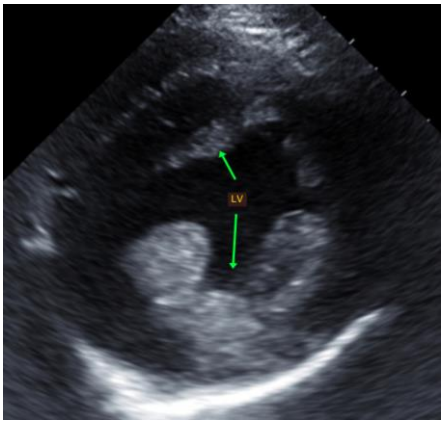
## PLAN

Administer titrating dose of atenolol: 25mg tablets; Give ¼ tab once daily. Recheck heart rate in 1-2 weeks with target stressed rate of <120bpm, Increase as needed until target reached.

Recommend recheck echocardiogram in 6 months to assess for progression, sooner if clinical issues arise.

## IMAGES



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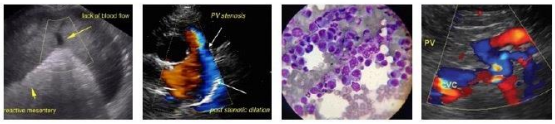

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**The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.**

Thank you for this referral. 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