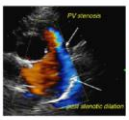
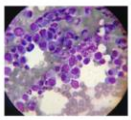
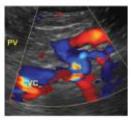
IMAGING PERFORMED BY
svsmobileimaging.com 309 - 737 - 3070

SVS IMAGING

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
1-800-838-4268 info@sonopath.com SonoPath.com

**PATIENT**

Princess Bastin

**SPECIES**

Canine

**BREED**

Yorkshire Terrier

**SEX**

Female Spayed

**AGE**

12.11 years

**WEIGHT**

13.4lbs

**INTERPRETED BY**

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

**IMAGING PERFORMED BY**

Kim Liedberg

**HOSPITAL NAME**

SVS Imaging WI

**REFERRING VET**

Dr. Hayes

**INVOICE**

25345

**DATE**

7/15/22

## PRESENTING CLINICAL SIGNS

History: Patient presented in ER for acute respiratory distress last night with an abdominal component. One month history of a progressive cough and exercise intolerance. Grade 2/6 right sided heart murmur.
CXR results: scalloped lung edges with prominent pleural fissure lines.

## ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Mild diffuse thickening of mitral valve leaflets with no prolapse into the left atrial lumen. Mild mitral regurgitation with normal left atrial dimension. Normal LV diameter with adequate myocardial function. The tricuspid valve appears thickened with septal prolapse and mild to moderate tricuspid regurgitation. Velocity consistent with moderate to severe pulmonary hypertension. Mild right heart enlargement. Moderate MPA dilation. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. No obvious aortic and mild 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) |
|---|---|---|---|---|---|---|---|
| NORMAL PARAMETER | 4.5-5.5 | <2.7 | 1.3 | <1.6 | 28-40 | 40-100 | <0.6 |
| PATIENT | NM | 4.5 | 1.3 | 1.2 | 49 | 84 | 0.3 |
| **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 | 140 | 1.0 | 0.7 | 6.1 | 1.6 | 1.8 | 0.8 |
| *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) |
| | | | | 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

The primary finding is moderate to severe pulmonary hypertension with mild to moderate tricuspid regurgitation. The estimated systolic pulmonary arterial pressure is 70-80mmHg, with normal being <25mmHg. This is causing mild right heart enlargement and MPA dilation. Additionally mild MR is noted without left heart enlargement, which appears hemodynamically insignificant at this time. No additional issues are identified.

Clinical signs of weakness, heavy breathing, cyanosis, and syncope are attributed to severe PAH.

**PATIENT**

Princess Bastin

**SPECIES**

Canine

**BREED**

Yorkshire Terrier

**SEX**

Female Spayed

**AGE**

12.11 years

**WEIGHT**

13.4lbs

**INTERPRETED BY**

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

**IMAGING PERFORMED BY**

Kim Liedberg

**HOSPITAL NAME**

SVS Imaging WI

**REFERRING VET**

Dr. Hayes

**INVOICE**

25345

**DATE**

7/15/22

The underlying genesis of PAH is poorly understood in cases other than heartworm infestation, though it occurs with increased frequency in a variety of forms of chronic lung disease and in patients with idiopathic pulmonary fibrosis. If not performed, a heartworm antigen test is always recommended.

Given the signalment, history and echocardiogram findings, it is likely this patient has underlying lower airway disease (COPD/chronic bronchitis) causing the cough that has begun to affect the heart (PAH). An acute worsening of respiratory signs is most typically due to an infectious or inflammatory exacerbant; a PTE cannot be ruled out. **It is important to note that the respiratory signs is not typically CAUSED BY PAH, rather they LEADS TO PAH.** Patients with severe PAH can eventually develop right-sided congestive heart failure (ascites), debilitating cyanosis and labored breathing and exertional syncope if poorly controlled.

Given reported clinical compromise, use of Sildenafil is reasonable as below. Additional treatment of the respiratory disease must also be utilized, including coverage with a broad spectrum antibiotic such as Baytril and O2 support. Going forward, use of ancillary therapy can be considered based upon persistent clinical signs such as bronchodilators, cough suppressants, etc.

Prognosis is guarded, with risk for recurrent respiratory issues lifelong.

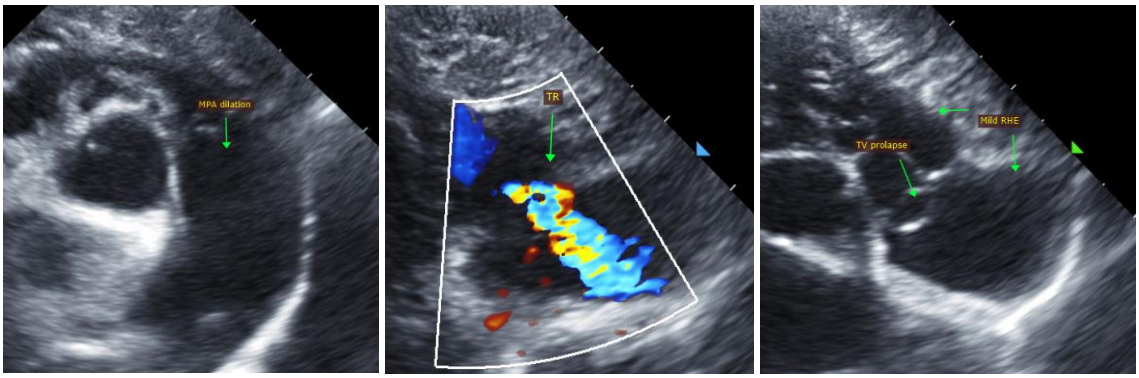
Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit. Monitor for development of a labored breathing, exercise intolerance or collapse episodes.

## PLAN

Institute sildenafil 1-2mg/kg PO q12h. Consider ancillary respiratory therapy such as a course of fluoroquinolone, Hydrocodone, etc. Consider heartworm test and advanced airway diagnostics as mentioned should the cough/dyspnea persist/worsen.

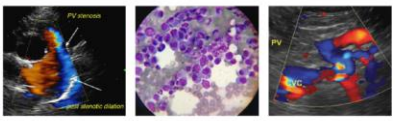
A recheck echocardiogram is recommended in 6 months to screen for progression, sooner if clinical signs arise.

## 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. If the clinical or image interpretation does not parallel your findings or if I





**PATIENT**

Princess Bastin

**SPECIES**

Canine

**BREED**

Yorkshire Terrier

**SEX**

Female Spayed

**AGE**

12.11 years

**WEIGHT**

13.4lbs

**INTERPRETED BY**

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

**IMAGING PERFORMED BY**

Kim Liedberg

**HOSPITAL NAME**

SVS Imaging WI

**REFERRING VET**

Dr. Hayes

**INVOICE**

25345

**DATE**

7/15/22

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