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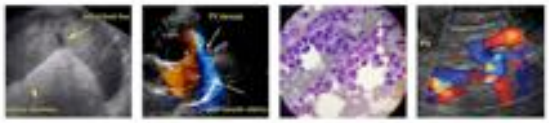


IMAGING PERFORMED BY
pawsonography@gmail.com 530-786-8340

PATIENT

Lily Burt

SPECIES

Canine

BREED

Australian Shepherd

SEX

Spayed Female

AGE

10.5 years

WEIGHT

41.3 Pounds

INTERPRETED BY

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY

Loetitia Saint-Jacques, RVT

HOSPITAL NAME

Critter Care Mobile VC

REFERRING VET

Dr. Hartzell

INVOICE

30713

DATE

5/24/22

PRESENTING CLINICAL SIGNS

"Lily" Burt is a 41.3 lb, 10.5 year old F/S Australian Shepherd, that recently present for progressively worsening non-productive to occasional phlegm cough, especially after being sedentary. Dog was originally diagnosed with mild heart murmur starting 2 years ago but has now progressed to holosystolic III/VI murmur with mild interstitial pulmonary rales. No detectable arrthymias or pulse deficits and dog is still active with no loss of stamina, ATO. Appetite is good, with no recent Hx of V/D, PU/PD. Dog is currently on DES 1.0mg twice weekly for estrogen deficiency urinary incontinence for at least 4 years, plus Iverhart Plus every month since 2016. Physical exam indicates dog in good health with some mild OA symptoms but otherwise NSF. Blood pressures 05/10/2022-[153/120], [155/118], [156/49], Blood Results 05/11/2022 reveal Abnormal PE/Chem/CBC/UA Results: RAD REPORT from 5/11/2022: Findings Five images of the thorax are provided for interpretation. The cardiac silhouette is tall with a large left atrium (VHS 15 V). The pulmonary vasculature is within normal limits. The lungs are unremarkable. The trachea is normal. Cranial abdominal detail is normal and the cranial abdominal organs are within normal limits. The musculoskeletal structures are within normal limits except for several sites of spondylosis deformans. Conclusions Left-sided cardiomegaly consistent with mitral insufficiency. There is no evidence of failure.

ULTRASONOGRAPHIC EXAMINATION OF THE HEART

CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swedish)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT	5.10	3.12	NM	2.81	Avg 33 (4 measurements)	69 (associated with FS of 39%)	0.57
CANINE CARDIAC	HR (BPM)	AV VMAX (m/s)	PV MAX (m/s)	BODY WEIGHT kg	LA 2D long axis Base view	LVIDd Avg; 2D and m-mode short axis	LVIDs Avg; 2D and m-mode short axis
NORMAL PARAMETER	50-100	0.7-1.7	0.7-1.6				
PATIENT	125	1.05	0.85	18.8	6.64	6.68	4.48

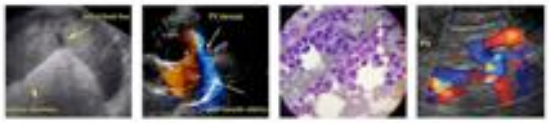
Adapted from June Boon, Veterinary Echocardiography, 1998
Sisson D et al. JVIM 1991; 5: 232, and Jacobs et al. Am J Vet Res 1985; 46:1705

Radiographs

Marked cardiomegaly, with very severe left atrial and left ventricular enlargement and dorsal deviation of the trachea

Compression of the mainstem bronchus by the left atrium

Pulmonary vein enlargement on the left lateral view, possibly due to rotation. The pulmonary veins appear to be within normal limits on the other views, i.e. no evidence of pulmonary congestion.



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Very mild peribronchiolar and interstitial lung pattern, suggestive of underlying chronic bronchitis and age related changes, respectively.

Electrocardiogram (lead II)

Left ventricular enlargement based on the R wave that is too tall

Left atrial enlargement based on the wide P-wave

Wondering atrial pacemaker, which is physiological

ST coving

ST segment depression suggestive of ischemia

An intermittent arrhythmia is observed.

- It consists of a few premature supraventricular contractions, some of which occur in doublets and triplets.
- Left sided premature ventricular contractions are observed on pages 8, 24, 38, 46, 50, 54
- A fusion beat is noted on page 26

Echocardiographic findings

Mitral valve: Mild to moderate myxomatous degeneration of both leaflets. The septal leaflet is more severely affected compared to the posterior leaflet.

Mild to moderate prolapse of both leaflets. The septal leaflet is more severely affected compared to the posterior leaflet.

Mitral regurgitation: severe.

Severe left auricular enlargement.

Rounding of the interventricular septum, i.e. left ventricular enlargement is present

Severe increase of LA: Ao ratio

E and A waves: abnormal

LA normalized for BW (LAN = 2.44); severely enlarged

LVIDd normalized for BW (LVIDND = 2.80); severely enlarged

LVIDs normalized for BW (LVIDNs = 1.90); moderately to markedly increased

LVFWs normalized for BW (LVFWNs = 40); mildly decreased (thinner than normal)

All other results normalized for Lily's weight are within normal limits.

Aortic valve: no abnormalities

Aortic insufficiency: absent

Tricuspid valve: very mild myxomatous degeneration of the tricuspid valve

Mild prolapse of septal leaflet.

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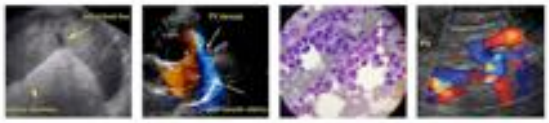

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Tricuspid regurgitation.

Mild pulmonary hypertension

No right ventricular or atrial enlargement.

Pulmonic valve: no abnormalities

Pulmonary insufficiency: absent

Pulmonary artery - bifurcation, no abnormalities.

Pulmonary artery: aortic ratio within normal limits.

Main pulmonary artery within normal limits.

No signs of heart worm.

No signs of pericardial or pleural effusion

Pulmonary veins: subjectively, mildly enlarged.

No evidence of pulmonary edema.

No obvious signs of a mass.

No obvious congenital abnormalities; PDA, VSD, ASD

Subjectively, the hepatic veins appear enlarged

ULTRASONOGRAPHIC FINDINGS

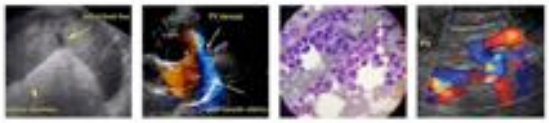
- Myxomatous degeneration of the mitral (mild) and tricuspid (very mild) valves, ACVIM stage B2 (severe), with very severe left atrial and left ventricular enlargement and pulmonary hypertension.
- There are no obvious signs of congestive heart failure based on the ultrasound findings, however, very advanced changes are present. Therefore, treatment with pimobendan (Vetmedin) is recommended to help slow the progression of disease.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Treatment with pimobendan is recommended (see below).

Other suggestions/recommendations include:

- Evaluation of blood pressure
- Treatment with pimobendan at 0.25-0.30 mg/kg PO every 12 hours
- Sildenafil may be required for the treatment of pulmonary hypertension if pimobendan is insufficient
- Spironolactone is strongly recommended to help decrease myocardial fibrosis. It should also help decrease the size of the left atrium. Renal function, including the SDMA and urine specific



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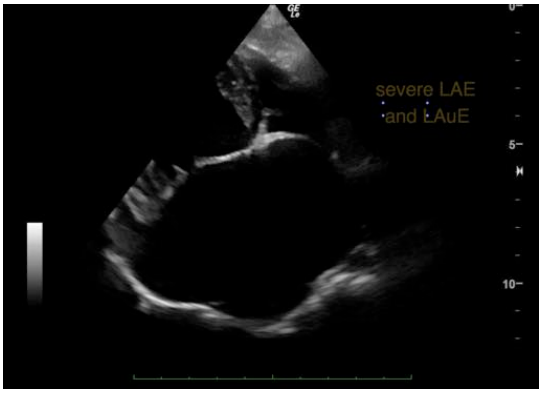
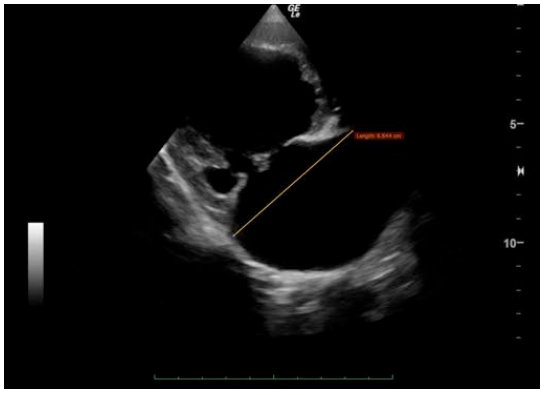
gravity, should be assessed prior to initiation of spironolactone.

- An antiarrhythmic is not necessary.
- *Furosemide should be available at home in case of an emergency*.
- Monitoring of the resting (sleeping) respiratory rate (RRR) is highly recommended once a day. The RRR should NOT EXCEED 30 breaths per minute (bpm). If the respiratory rate is greater than 30 bpm, *or* if there is a gradual increase (over a day or two) toward 30 bpm, the patient should be evaluated immediately for congestive heart failure and the appropriate treatment initiated.
- Other clinical signs clients should monitor for include coughing (particularly at night), fatigue, lethargy, decreased exercise tolerance (i.e., not being able to walk for as long before becoming tired, or "running out of breath" while playing, or going up and down stairs, as well as syncope (collapsing or fainting spells). Restlessness, or agitation during the night, or being unable to find a comfortable position to sleep are also very common clinical signs.
- Mild to moderate salt restriction is suggested (less than 0.9 grams/1000 kcal of food, and ideally, between 0.4-0.5 grams/1000 kcal of food)
- Omega-3 fatty acids may be helpful (EPA = 40 mg/kg/day and DHA = 25 mg/kg/day); gradual uptitration of the dose is suggested to decrease risk of gastrointestinal effects. However, they should not be introduced at the same time as pimobendan.
- Monitoring for progression of heart disease with a re-evaluation of an echocardiogram every 6 to 8 months, or sooner if clinical signs develop, is recommended.
- Non-steroidal anti-inflammatories should be used judiciously for treatment of osteoarthritis, however, comfort of the patient far outweighs potential risks. Multimodal therapy, such as gabapentin, Cartrophen and supplements, as well as laser therapy, etc. may be used in conjunction with NSAIDs to decrease their dose.





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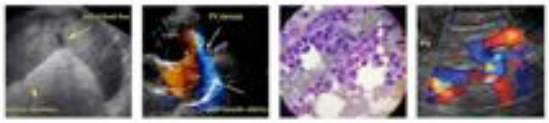

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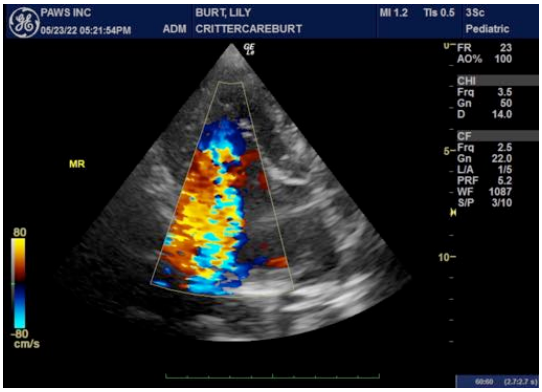

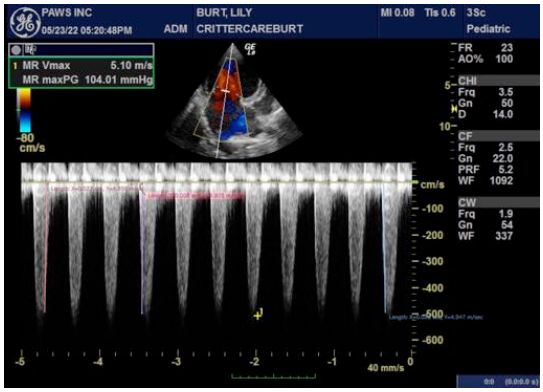

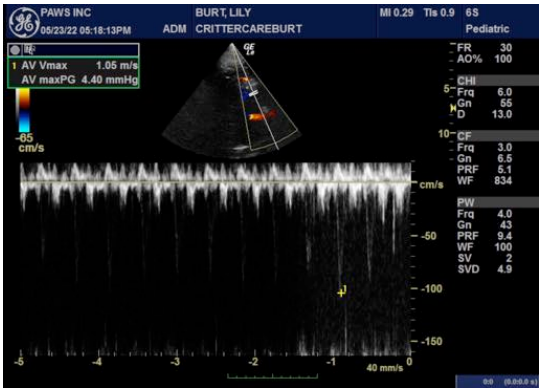

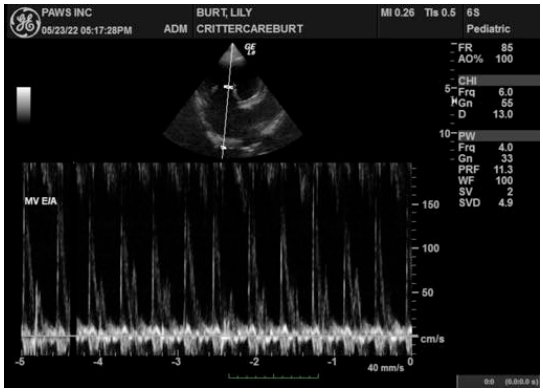

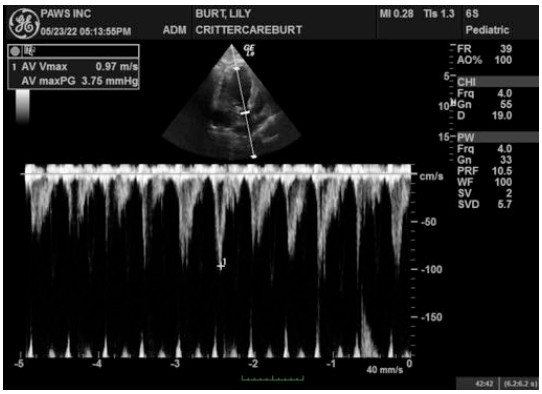

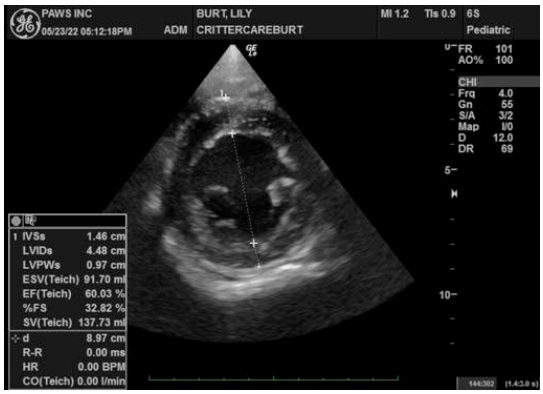

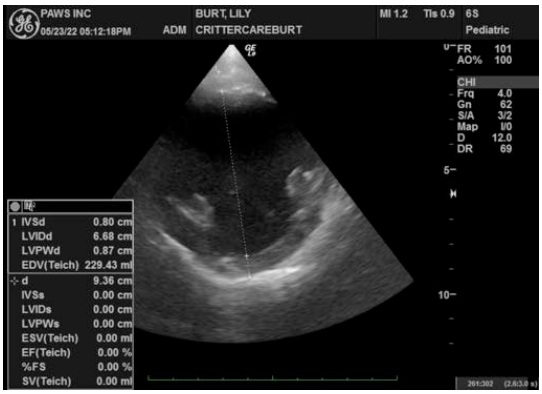

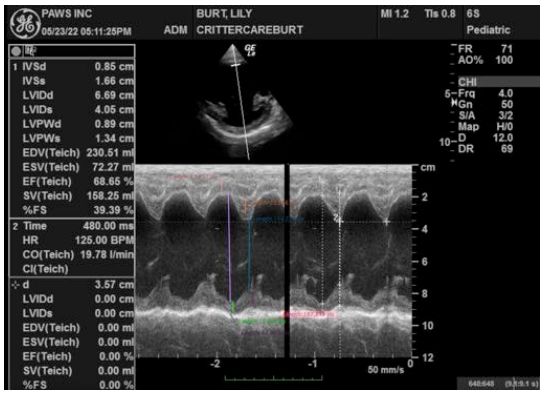

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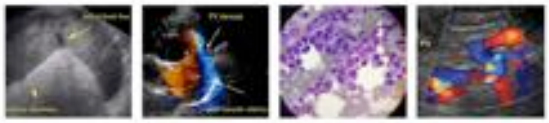

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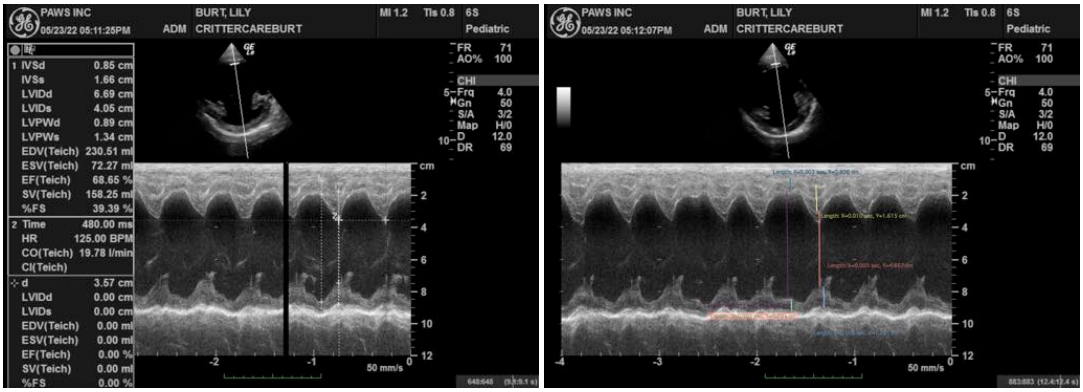

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance please contact me.

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