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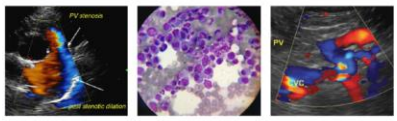

SonoPath
Clinical Sonography & Telecytology
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PATIENT

Duck Webb

SPECIES

Canine

BREED

German Shepherd

SEX

Male Intact

AGE

6 months

WEIGHT

46lbs

INTERPRETED BY

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY

Kim Liedberg

HOSPITAL NAME

SVS Imaging WI

REFERRING VET

Dr. Kamps

INVOICE

28141

DATE

1/6/23

PRESENTING CLINICAL SIGNS

History: Recheck echo. Asymptomatic.
-Current medications: Atenolol (dose not provided).
-Pertinent previous echo findings (9/2022 MML): Severe LVH: 1.1cm, mild LAE, no RAE, RVH present, moderate MR with MVD, trace TR: 2m/s, mild AI, valvular AS. LV: 2.1, LA: 2.2, FS: 23%.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. The left ventricular wall is severely hypertrophied (1.5cm globally). There is a markedly hyperechoic endocardium consistent with marked fibrosis. Moderate papillary muscle hypertrophy and fibrosis. The left atrium is mildly enlarged. The right atrium is normal in size. The right ventricle appears abnormal as well with evidence of hypertrophy. An RVOT obstruction is suspected with exuberant fibrosis tissue. Flow through the region is not extensively assessed. The mitral valve appears dysplastic, although difficult to visualize extensively. There is moderate mitral regurgitation likely associated with this abnormal anterior motion. Trace tricuspid regurgitation seen. Normal velocity. Blood flow through the LVOT is severely elevated. No obvious subaortic ridge is seen although the LVOT is not extensively visualized. The aortic valve is abnormal and appears stenotic. Mild to moderate aortic insufficiency. The RVOT velocity is normal. No obvious shunts. No evidence of cardiac tumors or metastatic lesions on 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	5.5	2.4	1.4	1.5	47	90	0.66
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	130	4.8	1.3	20.9	3.4	4.4	2.3
*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

Compared to the prior study, findings appear similar. A numeric comparison is difficult to make given the increase in patient body size; however, the severity remains significant. Previously not documented, there does appear to be an RVOT obstruction due to exuberant tissue in the region (rule out subvalvular/infundibular stenosis). This likely explains RV hypertrophy, as was noted

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previously. **Regardless, what is seen here does not show significant progression or improvement on Atenolol therapy.** Referral should always be considered in these cases, particularly with multi-focal disease.

Lifelong heart rate control with Atenolol remains the recommended. The heart rate appears relatively well controlled at this time. No other medications are clearly warranted.

Monitor for development of labored breathing, exercise intolerance or collapse episodes, as SAS/AS patients are more predisposed to development of arrhythmias than to CHF. Mild exercise restriction is advised lifelong.

Prognosis in this case is poor, given the severity biventricular changes at such a young age. If quality of life suffers and referral is declined, euthanasia should be considered. This patient is at extremely high risk for sudden death, due to the appearance of the left ventricle and this will persist lifelong.

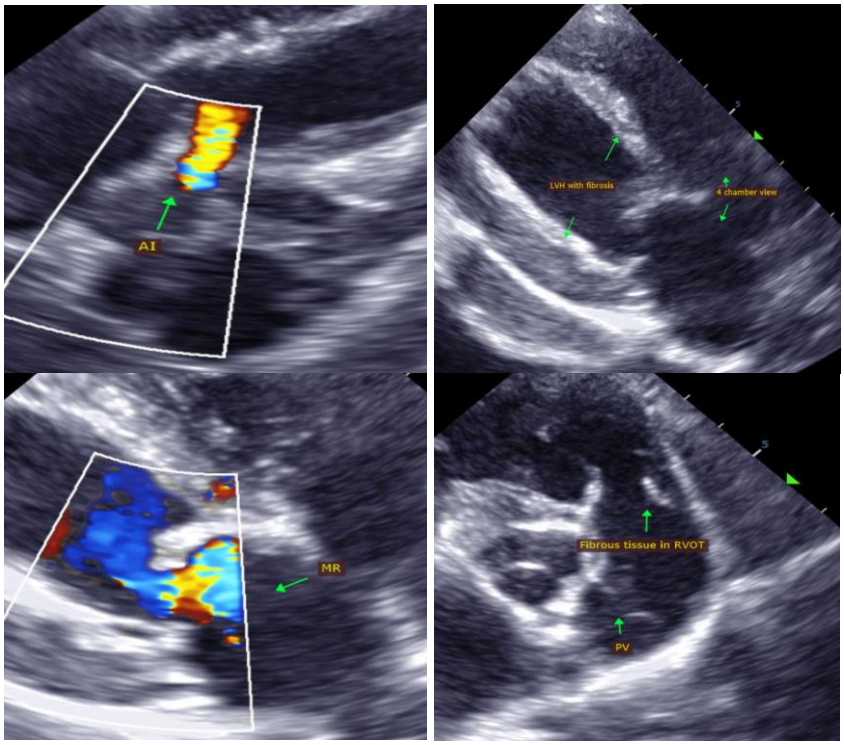
Anesthesia is not advised in this case.

PLAN

Highly recommend referral as previously discussed. Continue Atenolol as prescribed. If quality of life suffers, humane euthanasia should be considered.

Recommend recheck echocardiogram in 6-12 months to screen for progressive changes.

IMAGES



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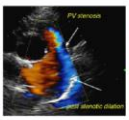
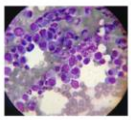
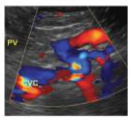

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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. 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