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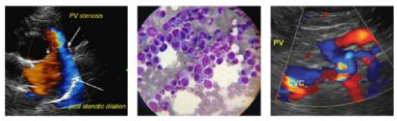

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
1-800-838-4268 info@sonopath.com SonoPath.com

PATIENT

Flynn Saso

SPECIES

Canine

BREED

German Shepherd

SEX

Male Intact

AGE

10 weeks

WEIGHT

12.8lbs

INTERPRETED BY

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY

Kim Liedberg

HOSPITAL NAME

SVS Imaging WI

REFERRING VET

Dr. Kamps

INVOICE

26175

DATE

9/2/22

PRESENTING CLINICAL SIGNS

History: Presented with lethargy and decreased appetite and vomiting with occasional diarrhea. At 6-week-old puppy exam this puppy did not have a heart murmur. Now at 10 weeks a grade 5/6 both sides systolic heart murmur was noted. Chest radiographs unremarkable. Abdominal radiographs show mild gas in SI. Pup was sedated with .3mg/kg butorphanol=0.17ml IV
-Abnormal PE/Chem/CBC/UA Results: Mild anemia, increased WBC, low creatinine and TP Increased phos and Ck.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. The left ventricular wall is minimally hypertrophied (0.8cm globally). There is a mildly hyperechoic endocardium. Papillary muscles are mildly hypertrophied. 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 thickened and elongated consistent with dysplasia. An LVOTO due to the abnormal mitral valve is seen on 2D and color flow imaging, with a severe obstruction noted on doppler. There is mild to moderate mitral regurgitation associated with this abnormal motion. Trivial tricuspid regurgitation. Normal TR velocity. Blood flow through the RVOT is normal in velocity. No aortic and mild pulmonic insufficiency noted. 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	6.3	2.0	1.2	1.3	54	88	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	152	4.8	1.0	5.8	2.0	1.9	0.9
*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 cause of the murmur is mitral valve dysplasia causing an LVOT obstruction and mitral regurgitation. This is similar to SAM in a cat, with hypertrophy of the LV secondary to pressure overload. The obstruction through the LVOT is severe with a pressure gradient of 90mmHg.The

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good news is there is minimal LVH and no LA enlargement, indicating the risk for complication is currently low. No additional defects are seen; however, small abnormalities are easily missed in juvenile animals. Consider referral in this severe case for life-long management by an Attending Cardiologist.

If referral is declined, life-long heart rate control with Atenolol is recommended once the puppy reaches 6 months of age. The dynamic nature of the obstruction will be reduced at lower heart rates. No other medications are indicated at this juncture. Life-long activity restriction is advised. Monitor at home for any respiratory signs or clinical lethargy/collapse. Prognosis is poor long term given the severity of disease at such a young age. That being said, some cases of MVD will improve on atenolol and serial monitoring is advised. Patient will always be at risk for collapse, left-sided CHF and/or sudden death going forward.

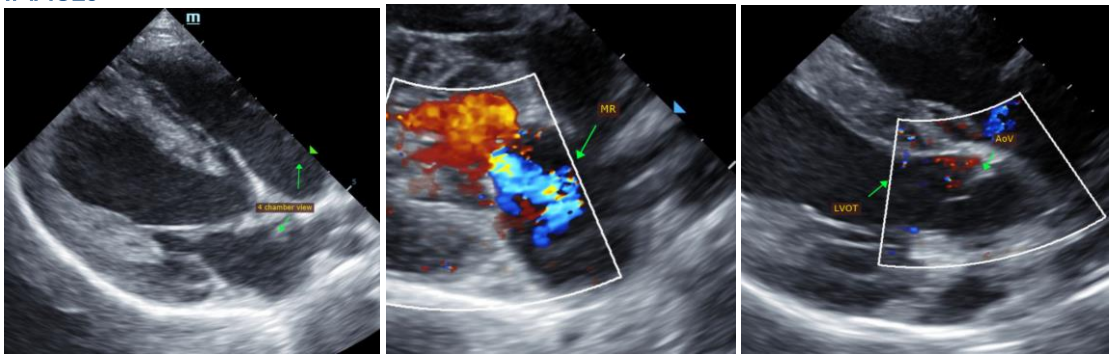
Anesthetic risk is considered mild if needed. Cardiac protective drug choices (opioid/benzodiazepine premedication, propofol or alfaxalone induction, isoflurane gas) are recommended. Pre-oxygenate for 5-10 minutes prior to induction. Monitor for arrhythmias, hypotension, and hypoxia both intra and post-operatively 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

Recommend referral in this case. If declined, initiate Atenolol (at 6 months of age), 25mg tablets; Give ¼ tab once daily. Recheck heart rate in 1-2 weeks with target stressed rate of <130bpm, increase as needed until target reached.

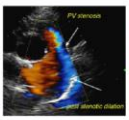
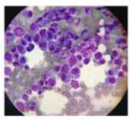
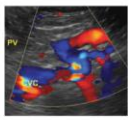
If referral is declined, recommend recheck echocardiogram at 1 year of age to screen for progression and/or improvement with Atenolol.

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

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can be of any further assistance, please contact me.

Maggie Machen Lamy, DVM
Diplomate of the American College of Veterinary Internal Medicine (Cardiology)
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