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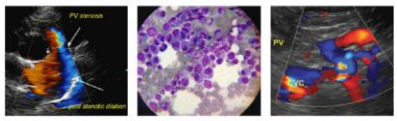

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
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PATIENT

Molly Sheldon

SPECIES

Canine

BREED

Lab

SEX

Female Intact

AGE

19 weeks

WEIGHT

14.4lbs

INTERPRETED BY

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY

Sarah Pender, CVT

HOSPITAL NAME

SVS Imaging QC

REFERRING VET

Dr. Hahn

INVOICE

24365

DATE

5/24/22

PRESENTING CLINICAL SIGNS

History: Cardiac murmur auscultated in the early puppy visits, becoming more intense. The puppy also has juvenile type 1 diabetes that we have started treating. She is underweight and rate of growth is slow with multiple congenital abnormalities.
-Sedation: Torb.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. The mitral valve is abnormal with abnormal closure and elongated leaflets. Mild to moderate eccentric mitral regurgitation. Suspect some degree of stenosis, although not assessed in this study. Mild left atrial dilation. Mild LV dilation with thinning of the wall. The tricuspid valve appears thickened with mild dysplasia. Mild to moderate tricuspid regurgitation. Mild RA enlargement. Mild right ventricular enlargement. No obvious hypertrophy. The pulmonic valve is normal in morphology and mobility. No obvious narrowing seen. Normal pulmonic outflow velocity. Mildly increase in aortic outflow velocity suspected, although not captured on Spectral. The aortic valve appears mildly thickened. Mild to moderate aortic and no pulmonic insufficiency. No pericardial or pleural effusion noted. No obvious cardiac tumors seen. No obvious congenital shunts.

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	2.3	NM	1.4	36	70	0.2
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	120	1.0	1.1	6.5	1.8	3.0	2.0
*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

Several mild abnormalities are identified in this study. Both the mitral and tricuspid valves appear dysplastic, with mild to moderate mitral and tricuspid regurgitation and mild biatrial enlargement. Mitral stenosis is suspected, although not assessed in this image set. The LV is dilated with a significant aortic insufficiency, which is the only identified cause. This can also develop with intra or extra-cardiac shunts and may still be present. No LV hypertrophy is noted; however, the LVOT flow appears turbulent, and some degree of stenosis may be present. Overall, all four cardiac

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chambers appear mildly dilated, which is concerning for progressive issues going forward. It is important note that this is not considered an extensive congenital study and small defects are easily missed in the absence of advanced imaging. Referral to a local Cardiologist should be considered in this case to confirm the diagnosis particularly given multiple affected valves.

If referral is declined, I would not institute medications at this time given mild four chamber enlargement. Serial echocardiography is recommended lifelong to continue assessment for progression and risk for complication going forward.

Monitor for development of labored breathing, exercise intolerance or collapse episodes lifelong.

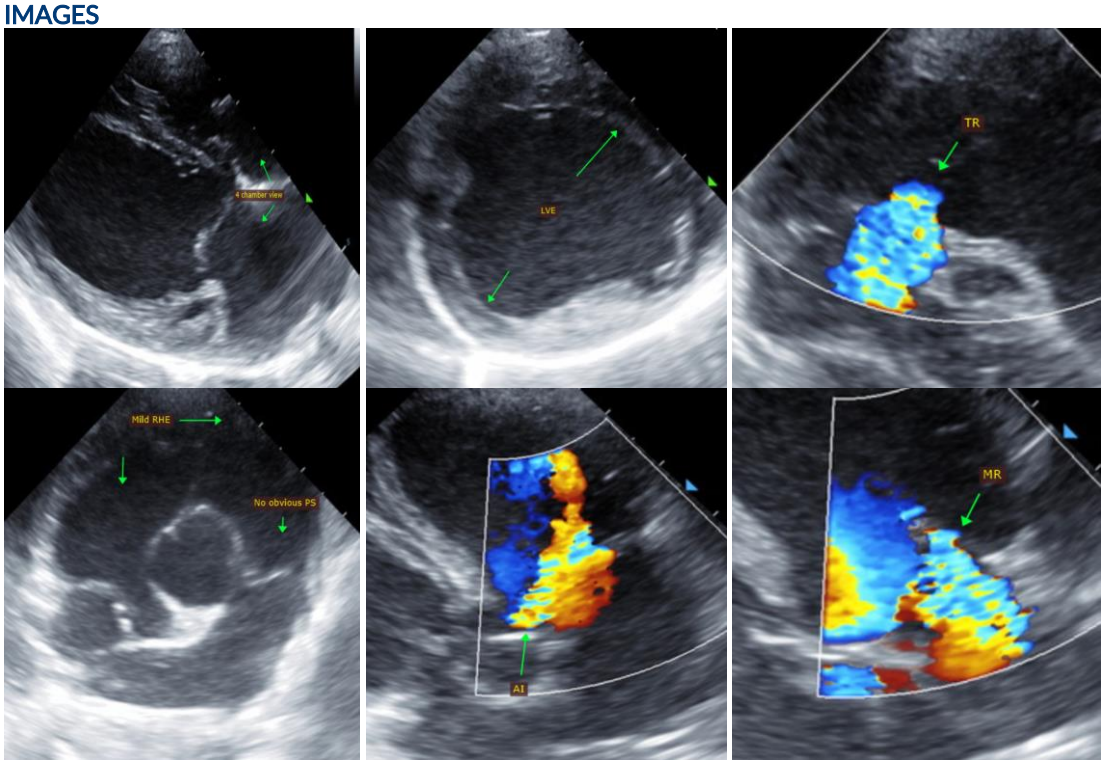
Ideally referral is recommended prior to proceeding with anesthesia. If declined or not possible, anesthetic risk is likely mildly elevated. Avoid heart rate stimulating drugs such as atropine or glycopyrrolate unless clinically indicated. Avoid ketamine and acepromazine due to peripheral vascular effects. Mild IV fluid restriction is advised. A reasonable protocol includes cardiac protective drug choices (opioid/benzodiazepine premedication, propofol or alfaxalone induction, isoflurane gas). Monitor for arrhythmias, hypotension, and hypoxia both intra and post-operatively and intervene as necessary.

PLAN

No medications are clearly indicated at this time. Referral is recommended in this case.

If referral is declined, recommend recheck echocardiogram in 4-6 months to screen for progression, sooner if clinical signs arise.

IMAGES



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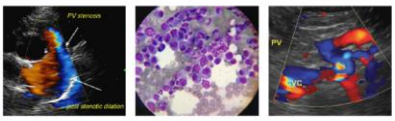

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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. 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