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Clinical Sonography & Telecytology
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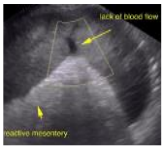
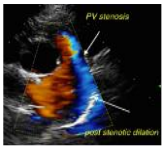
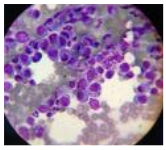
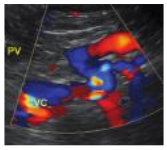

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1-800-838-4268 info@sonopath.com

PATIENT
Winston Witthum

SPECIES
Canine

BREED
Maltese Mix

SEX
Male Neutered

AGE
2 years

WEIGHT
14lbs

INTERPRETED BY
Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY
Kara Wallisch, DVM

HOSPITAL NAME
Sondel Family Veterinary Clinic

REFERRING VET
Dr. Wallisch

INVOICE
28548

DATE
1/25/23

PRESENTING CLINICAL SIGNS

History: Grade 3/6 heart murmur ausculted during a sedated procedure for a laceration repair. No symptoms currently.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Normal mitral valve with no obvious prolapse into the left atrial lumen. No mitral regurgitation with no left atrial dilation. Normal LV with adequate myocardial function. Normal LV wall thickness. A small VSD is suspected on color flow and Spectral doppler imaging with turbulence noted in the right ventricle (see below). The flow is in an atypical direction; however, the velocity is elevated supportive of a VSD. The defect cannot be visualized on 2D imaging, which may suggest an atypical location (or potentially an ancillary pathology). The tricuspid valve appears normal in form and function. Trace TR. Normal right atrial and ventricular diameter and morphology indicating no overt evidence of pulmonary arterial hypertension. The pulmonic valve is normal in morphology and mobility. Normal aortic outflow velocities. The aortic valve appears normal. The aortic root appears normal. Mildly elevated pulmonic outflow velocities. Trace aortic and no pulmonic insufficiency No pericardial or pleural effusion noted. No obvious cardiac tumors.

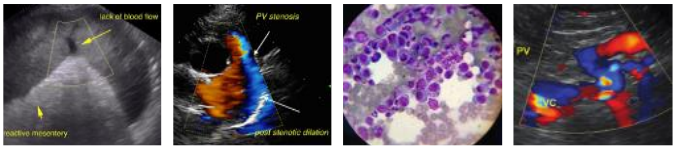
CARDIAC CHART

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	NA	2.0	NM	1.3	40	76	NM
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	NM	1.5	2.5	6.4	1.5	2.8	1.6
*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

Unusual case. The cause of the murmur appears to be a high velocity jet within the RV. The direction and velocity >5m/s are suggestive of a VSD, although the defect cannot be visualized which is unusual. The velocity through the pulmonary artery is mildly elevated, which may further support this theory. This may be indicative of an atypical location; however, other possibilities such as a mid-RV obstruction cannot be ruled out (ie DCRV or similar). Regardless, the right heart



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appears largely normal and no left atrial or ventricular dilation are appreciated. This would suggest a relatively hemodynamically insignificant issue. A small aortic leak is noted and a baseline BP is recommended. The left heart appears largely normal and no additional issues are identified.

Any potential congenital case without a definitive diagnosis should consider referral. If declined, reassessment is advised in the future to screen for progressive chamber enlargement. Based upon what is seen here, prognosis is fair long-term as many small VSD patients will live a normal life free of complications.

No treatment is recommended at this time.

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.

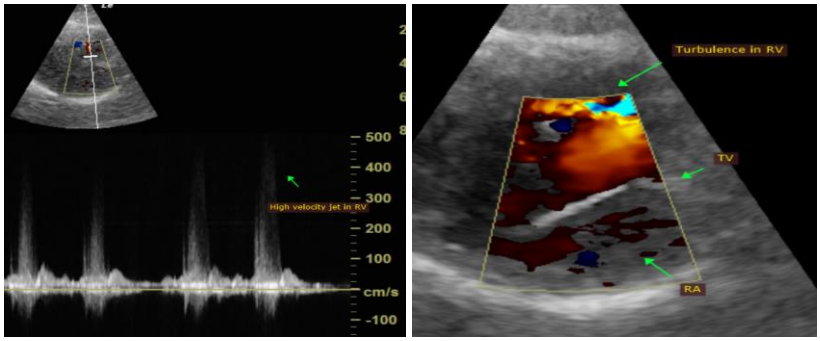
Patient may be at risk lifelong for progression to left-sided congestive heart failure, development of arrhythmias, and/or sudden death. Monitor closely for any development of associated clinical signs, including changes in RR/RE, cough, syncope or significant exercise intolerance.

PLAN

Consider referral as discussed.

If declined, recommend conservative monitoring with a recheck echocardiogram in 1 year.

IMAGES



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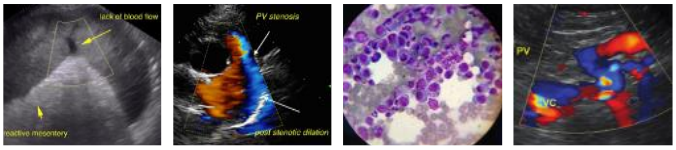

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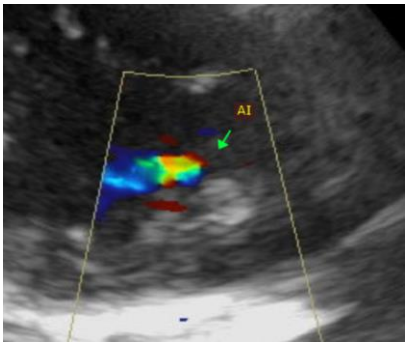

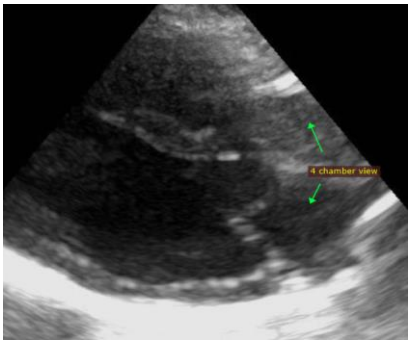

The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. This report was generated using transcription software, and minor dictation errors may be present. 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
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info@sonopath.com