



PATIENT

Twyla Kamps

PRESENTING CLINICAL SIGNS

History: Born with cleft palate and a wry bite. Has been tube fed since birth. Now can eat on her own. Smaller than littermates. 3/6 systolic heart murmur more prominent on left side. No thrill or washing machine heart sounds noted.

SPECIES

Canine

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. The mitral valve leaflets appear largely normal. Trace mitral regurgitation. No left atrial dilation. Normal LV diameter with adequate myocardial function. The left ventricular walls are mildly thickened. Mild papillary muscle hypertrophy. Sub-aortic narrowing is suspected, although the region is poorly visualized. The aortic valve appears largely normal, although mild valvular stenosis is not ruled out. Mild stenosis is documented through the region with a mildly elevated aortic outflow velocity, although this is thought to be a mild underestimation. Mild aortic insufficiency. The tricuspid valve appears mildly thickened with mild to moderate tricuspid regurgitation. Normal velocity. Normal right atrial and ventricular diameter and morphology. The pulmonic valve is normal in morphology and mobility. No pulmonic insufficiency. Normal PA outflow velocity. No pericardial or pleural effusion noted. No cardiac tumors identified.

BREED

Golden Retriever

SEX

Female

AGE

7 weeks

CARDIAC CHART

WEIGHT

8lbs

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	1.9	1.6	1.3	43	80	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	167	2.8	0.96	3.6	1.4	2.1	1.2
*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)
<i>*Note: All measurements based upon multi-modal images and methods. An average value is reported.</i>				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)

INTERPRETED BY

Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY

Kim Liedberg

HOSPITAL NAME

SVS Imaging WI

REFERRING VET

Dr. Kamps

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the murmur is two-fold. Most significantly there is at least mild aortic/sub-aortic stenosis causing elevated blood flow velocity through the LVOT and aortic valve. The velocity is indicative of a mild pressure gradient; however, mild LV thickening would suggest this is an underestimation. A small aortic leak is also noted, which should be monitored going forward. **A great concern in this case is the young age of the patient with high risk for progression to severe**

INVOICE

28015

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as the puppy grows. Additionally, the tricuspid valve appears mildly abnormal with mild TR. This likely reflects mild dysplasia which is further adding to murmur intensity. No additional congenital issues are identified in this study (shunts, etc.); however, it should be noted that small defects are easily missed in puppies this young. Referral for advanced imaging should always be considered in congenital cases (bubble study, angiogram, etc.), particular given the multifocal nature of the findings.

Surgery for SAS has not been proven to alter long term outcome; however, select Universities will attempt a cutting balloon valvuloplasty. Medical management through heart rate control is recommended once the puppy is old enough, in hopes of decreasing the obstruction long term. Omega fatty acid supplementation may be of some long-term benefit.

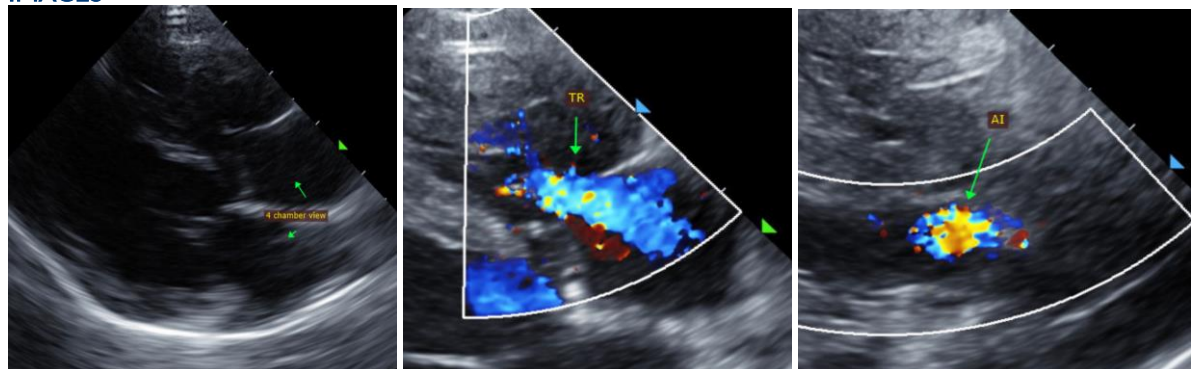
Prognosis is guarded pending monitoring for progression to severe, with many dogs in the severe category succumb to malignant arrhythmias by mid-life and others maintaining asymptomatic status for some time. Serial echocardiography is recommended lifelong to assess for progression and risk for complication as the patient matures. Monitor for development of labored breathing, exercise intolerance or collapse episodes, as SAS patients are more predisposed to development of arrhythmias than to CHF. Mild exercise restriction is advised lifelong.

Anesthetic risk is mild. Avoid heart rate stimulating drugs such as atropine or glycopyrrolate unless clinically indicated. Avoid ketamine and acepromazine due to systemic vascular effects. Mild IV fluid restriction is advised. Recommend prophylactic antibiotics for any orthopedic or dental procedure in the future given predisposition to endocarditis.

PLAN

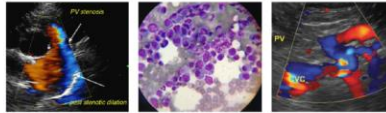
Consider referral in this case given the complexity of the issues. If declined, once the puppy is 6 months old institute atenolol to effect: 0.5-1.5mg/kg SID-BID (up-titrate to desired effect). Goal is to suppress heart rate <130bpm even with stress/activity.

Recommend recheck echocardiogram in 6-8 months to screen for progression, sooner if clinical signs arise.

IMAGES

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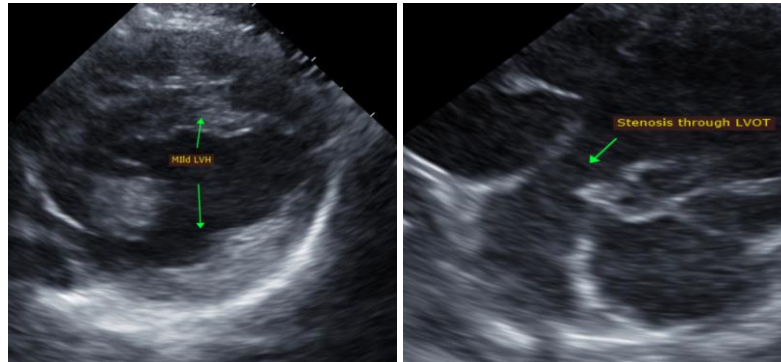
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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