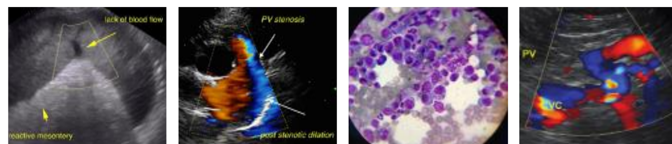
SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



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

PATIENT
Katie Bedford

SPECIES
Canine

BREED
Pomeranian

SEX
Female Spayed

AGE
14 years

WEIGHT
8.4lbs

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

IMAGING PERFORMED BY
Alastair Westcott, DVM

HOSPITAL NAME
Dr. Alastair Westcott

REFERRING VET
Dr. Westcott

INVOICE
25295

DATE
7/13/22

PRESENTING CLINICAL SIGNS

History: Chronic murmur. Started on Pimobendan 1/2022 when CXR showed some cardiomegaly. Coughing. BP: 210 with renal azotemia and proteinuria.

ECHOCARDIOGRAM FINDINGS

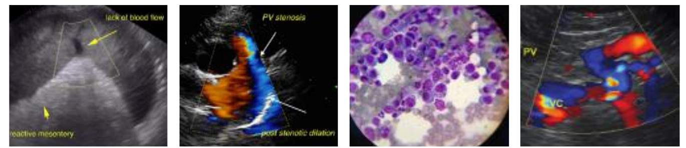
2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets with minimal prolapse into the left atrial lumen. Trace eccentric mitral regurgitation with no left atrial dilation. Decreased LV diameter with adequate myocardial function. Marked LV hypertrophy (1.0/1.3cm). The tricuspid valve appears normal with no tricuspid regurgitation. Normal right atrial and ventricular diameter and morphology indicating no overt evidence of pulmonary arterial hypertension. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic and aortic outflow velocities with laminar flow. No aortic insufficiency. No pulmonic insufficiency. No pericardial or pleural effusion noted. No obvious cardiac masses.

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	4.7	NM	NM	1.2	57	92	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	1.6	0.97	3.8	1.5	12.8	0.55
*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)
Adapted from June Boon, Veterinary Echocardiography, 1998				20	2.02 (1.9)	4.14 (2.2)	2.80 (2.0)
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435				25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
Hansson et al, Vet Rad and Ultrasound 2002				30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)
Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995				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)

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Chronic degenerative valve disease causing trace mitral regurgitation. Lack of left atrial enlargement indicates the current risk for complication is low. Of more clinical significance, there is marked LVH with a small LV chamber dimension. These findings are most consistent with a combination of volume depletion in this azotemic patient and systemic hypertension (i.e., some degree of pseudohypertrophy is suspected). If the BP reading is thought to be accurate (i.e., independent of stress level), recommend institution of Amlodipine in this case given underlying renal disease. Further consultation with an Internist may be useful as an ACE-I or Telmisartan may be warranted depending on findings. Target BP <150mmHg in hospital. Reassessing the LV once the patient is volume resuscitated will be beneficial to establish a baseline (i.e., once the



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pseudohypertrophy factor has been removed). The quantity of MR is subclinical and of little concern at this time; however, monitoring is advised.

Given these findings, the cough is unlikely to be cardiac in origin and primary respiratory causes should be considered. Consider further respiratory work up/treatment (hydrocodone, taper course of steroids, Enrofloxacin, TTW/BAL, etc.).

Given these findings, no cardiac medications are specifically indicated and Pimobendan can be safely discontinued. Once the patient's blood pressure is controlled and volume corrected, serial monitoring will dictate what degree of structural changes are reversible. Assessment of progression in the future will help predict long term prognosis, which is highly variable at this stage (B1). Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit. Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes.

It is assumed that fluid therapy is indicated depending on severity of lab results and clinical picture. These findings do not put the patient at high risk for IV fluid overload. That being said, this is highly dependent on chosen fluid rate and underlying chronic hypertrophy, as even a normal heart at some level can experience intolerance. If RR/RE persistently elevate, repeat films with a Radiologist review may be useful.

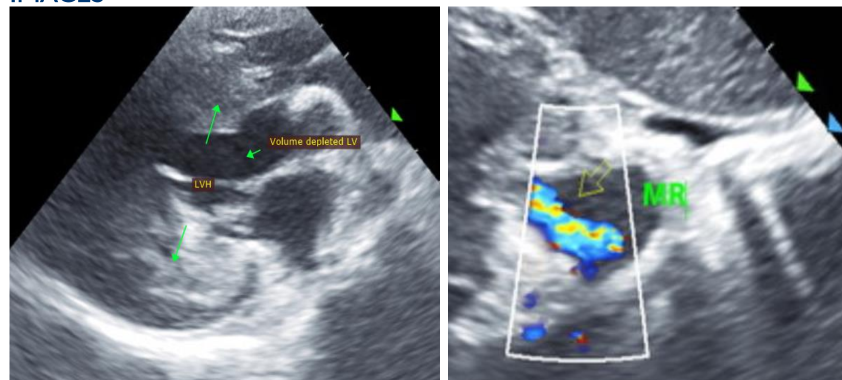
Anesthetic risk is considered mild if needed. Cardiac protective drug choices (opioid/benzodiazepine premedication, propofol or alfaxalone induction, isoflurane gas) are recommended. Pre-oxygenate for 5-10 minutes prior to induction. Monitor for arrhythmias, hypotension, and hypoxia both intra and post-operatively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

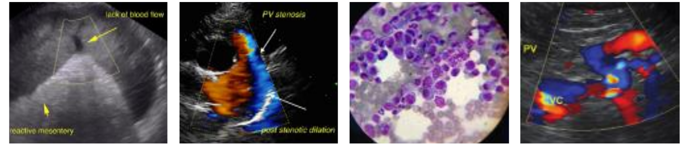
PLAN

If BP is thought to be accurate, institute Amlodipine to effect as discussed. Reassess BP in 1-2 weeks. Consider an ACE-I/ Telmisartan as dictated by your analysis results/UPC. Consider consultation with an IM specialist, particularly if SHT is refractory.

Recommend conservative monitoring with a recheck echocardiogram in 6 months, sooner if any development of clinical signs.

IMAGES





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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
Diplomate of the American College of Veterinary Internal Medicine (Cardiology)
info@sonopath.com