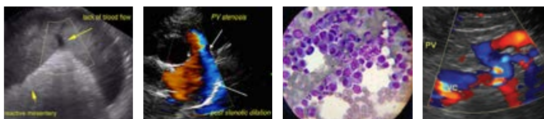


PATIENT

Charlie Jones

SPECIES

Canine

BREED

Cavalier King Charles Spaniel

SEX

Intact Male

AGE

1 Year

WEIGHT

19.1 Pounds

INTERPRETED BY

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY

Sara Hansen

HOSPITAL NAME

Cascade Animal Clinic

REFERRING VET

Dr. Rosen

INVOICE

39094

DATE

6/28/22

PRESENTING CLINICAL SIGNS

CARDIAC MURMUR loudest on left side caudally, found at OFA clinic
Abnormal PE/Chem/CBC/UA Results: CRT < 2 SECONDS MM moist and pink. Blood Pressure Measurments 179 099 (135) 131 171 088 (113) 125 156 082 (106) 129 cuff 4.5 on front arm

ULTRASONOGRAPHIC EXAMINATION OF THE HEART

CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swedish)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT	4.01	Trivial (0.33)		1.4	32	NM	0.23
CANINE CARDIAC PARAMETERS	**HR (BPM)**	**AV VMAX (m/s)**	**PV MAX (m/s)**	**BODY WEIGHT kg**	**LA 2D long axis Base view (cm)**	**LVIDd Avg; 2D and m-mode long axis (cm)**	**LVIDs Avg; 2D and m-mode long axis (cm)**
NORMAL PARAMETER	50-100	0.7-1.7	0.7-1.6				
PATIENT		1.00	0.64	8.68	2.28	2.75 (LAx)	1.86 (LAx)
Adapted from June Boon, Veterinary Echocardiography, 1998 Sisson D et al. JVIM 1991; 5: 232, and Jacobs et al. Am J Vet Res 1985; 46:1705							

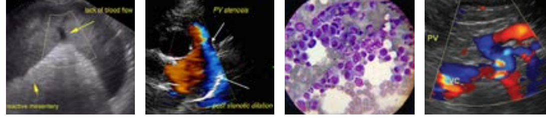
Echocardiographic findings

Mitral valve

- Mild (posterior) to moderate (septal) thickening and irregularity; consistent with myxomatous degeneration
- Mild prolapsing of the septal leaflet (mid leaflet).
- Moderate mitral regurgitation.
- No left auricular enlargement.
- LA: Ao ratio = within normal limits (WNL)
- LA normalized for BW (LAN = 1.1); very mild enlargement
- LVIDd normalized for BW (LVIDND = 1.4); WNL
- LVIDs normalized for BW (LVIDNs = 0.94); WNL

Aortic valve

- No abnormalities
- No aortic insufficiency



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Tricuspid valve

- Very mild to mild thickening and irregularity of both leaflets; consistent with myxomatous degeneration
- No prolapse.
- Very mild tricuspid regurgitation.
- No right ventricular or atrial enlargement.

Pulmonic valve

- No abnormalities
- No pulmonary insufficiency.
- Main pulmonary artery within normal limits.
- Pulmonary artery - bifurcation, no abnormalities.
- Pulmonary artery: aortic ratio within normal limits.

Other

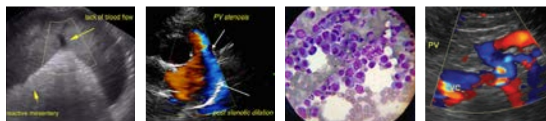
- No signs of pericardial or pleural effusion
- No evidence of pulmonary edema.
- Pulmonary veins, no abnormalities.
- No obvious signs of a mass.

ULTRASONOGRAPHIC FINDINGS

- Myxomatous degeneration of the mitral (moderate) and tricuspid (mild) valves, ACVIM stage B2, with very mild left atrial enlargement. The left ventricle is within the normal reference range.
- The results of the echocardiogram do not meet the criteria of the EPIC study, therefore, the administration of pimobendan (Vetmedin) is not indicated. However, due to Charlie's very young age, the valvular changes already present, as well as the mild left atrial enlargement, a re-evaluation of Charlie's echocardiogram is strongly recommended in 3 months.
- The breeder should also be informed of the changes noted on his echocardiogram.
- An anesthesia protocol will be suggested (see below), in case a procedure is required between now and the re-evaluation of the echocardiogram.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Suggestions/recommendations include:



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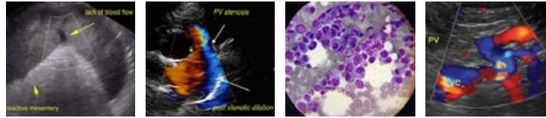
- Evaluation of the arterial blood pressure
- Monitoring of the resting (sleeping) respiratory rate (RRR) is highly recommended once a day. The RRR should NOT EXCEED 30 breaths per minute (bpm). If the respiratory rate is greater than 30 bpm, *or* if there is a gradual increase (over a day or two) toward 30 bpm, the patient should be evaluated immediately for congestive heart failure and the appropriate treatment initiated.
- Other clinical signs clients should monitor for include coughing (particularly at night), fatigue, lethargy, decreased exercise tolerance (i.e., not being able to walk for as long before becoming tired, or "running out of breath" while playing, or going up and down stairs, as well as syncope (collapsing or fainting spells). Restlessness, or agitation during the night, or being unable to find a comfortable position to sleep are also very common clinical signs.
- Mild salt restriction is suggested (less than 0.9 grams/1000 kcal of food). Monitor salt content in treats.
- Omega-3 fatty acids may be helpful (EPA = 40 mg/kg/day and DHA = 25 mg/kg/day); *gradual* uptitration of the dose is suggested over a few days to weeks to decrease risk of gastrointestinal effects.
- Monitoring for progression of heart disease with a re-evaluation of an echocardiogram in 3 months.
- A baseline NT-pro BNP is also suggested.

Example of general anesthesia protocol

- Premedication with an opioid, such as hydromorphone, butorphanol, or methadone, +/- *low dose* of midazolam. Avoid dexmedetomidine (label indications).
- Avoid acepromazine, atropine and glycopyrrolate. The latter two drugs should only be considered if a patient becomes bradycardic during the procedure.
- Preoxygenation for 10-15 minutes (minimum 5 minutes).
- Induction with alfaxalone, or propofol, if alfaxalone is not available. Avoid ketamine, if possible.
- Monitor arterial blood pressure during the procedure. The mean blood pressure should be between 90 - 100 mm Hg. Fluid rate may be adjusted, judiciously, according to blood pressure, however, fluid boluses should *not* be administered to avoid volume overload and congestive heart failure. That is, if the patient's blood pressure is decreased, dobutamine is suggested
- The intravenous fluid rate should be approximately ¼ of the DAILY maintenance requirements, or 1.75-2 ml/kg/hour to avoid fluid overload.
- Local anesthetic blocks are *strongly* recommended to decrease MAC and the amount of isofluorane necessary, as the latter tends to cause hypotension, particularly in cardiac patients.
- *Two shorter procedures are preferable to performing one long procedure (when possible).
- One could consider sending the patient home with *furosemide in case of an emergency*.
- Monitoring the patient's resting respiratory (breathing) rate twice a day for 4-6 weeks following general anesthesia is suggested to monitor for signs of decompensation of heart disease.



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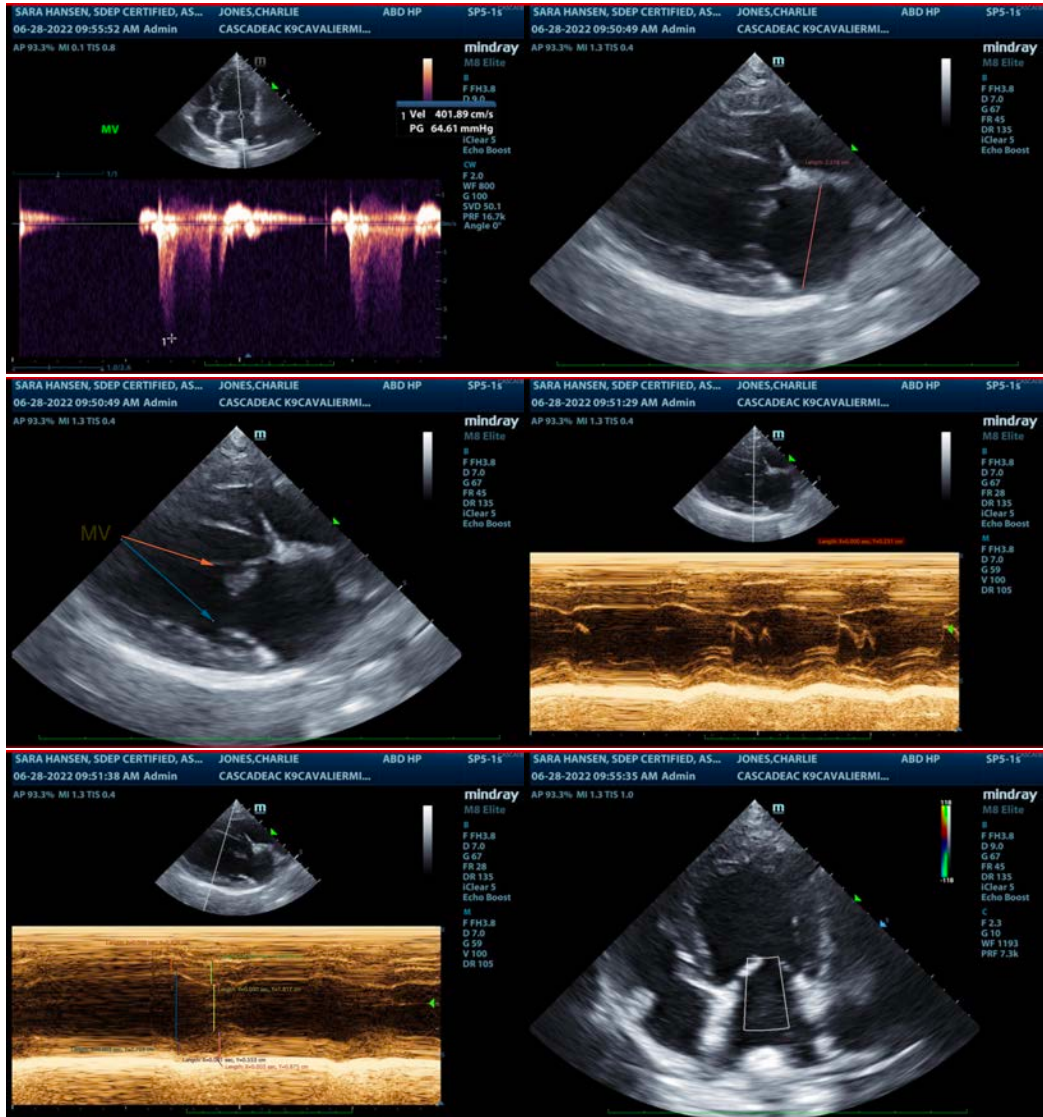

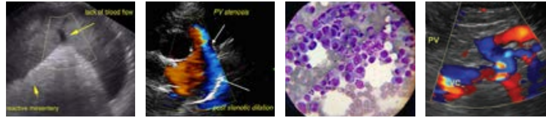

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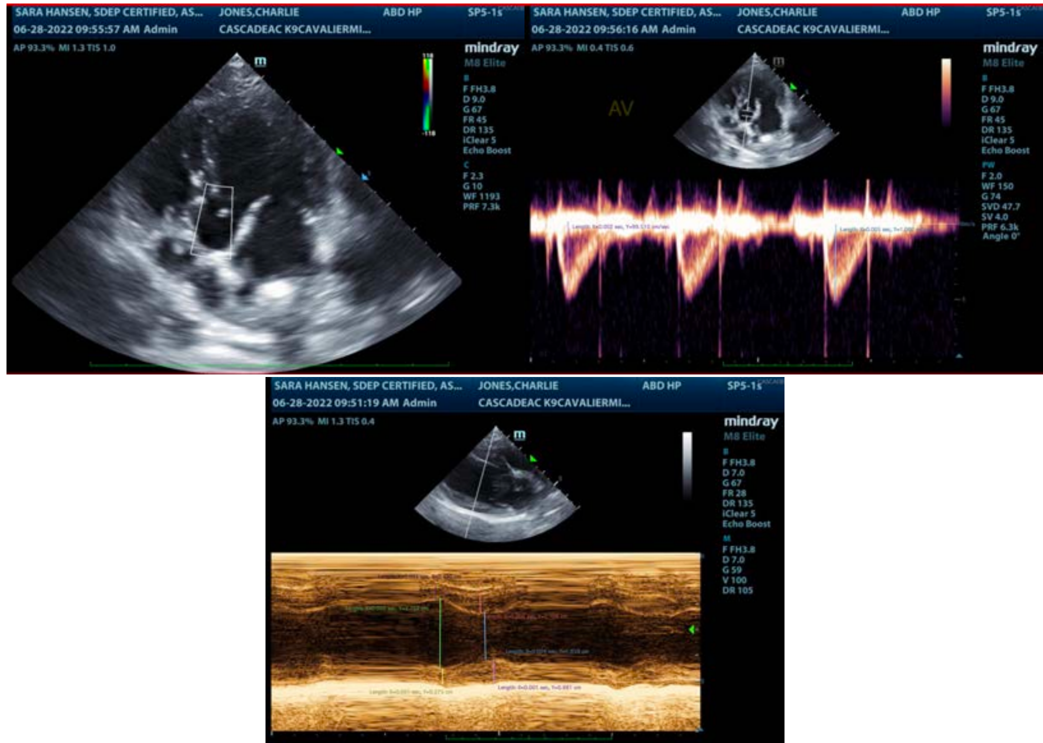

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

Lisa.Carioto@sonopath.com