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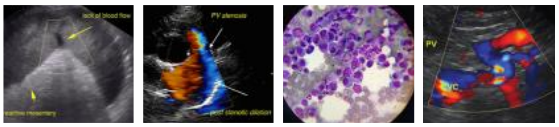


ANIMAL SOUNDS NW
MOBILE VETERINARY ULTRASOUND
IMAGING PERFORMED BY
AnimalSoundsNW.com 541-357-9423

PATIENT

Pez Norton

SPECIES

Feline

BREED

DSH

SEX

M/N

AGE

17 years

WEIGHT

10.4 lbs.

INTERPRETED BY

R. McKenzie Daniel, DVM, DABVP (Canine and Feline)

IMAGING PERFORMED BY

Sara Hansen

HOSPITAL NAME

VCA Vitality

REFERRING VET

Dr. Burgt

INVOICE

14622

DATE

8/16/22

PRESENTING CLINICAL SIGNS

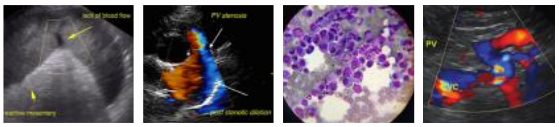
4/6 heart murmur with arrhythmia, abnormal EKG (ventricular arrhythmia/VPCs with 3rd degree AV block) Abnormal PE/Chem/CBC/UA Results: EKG results: HEART RATE AND RHYTHM: Heart Rate: 80 bpm Rhythm: Third degree AV block with a junctional escape rhythm and VPCs ECG AND CLINICAL ASSESSMENT: Third-degree AV block is present. Third-degree AV block usually develops secondary to idiopathic degeneration and/or fibrosis of the atrioventricular node. Other causes are rare but include endocarditis, cardiac neoplasia, and infectious/inflammatory disease (myocarditis). A ventricular arrhythmia is noted. In cats, ventricular arrhythmias are usually secondary to underlying structural heart disease. Causes include cardiomyopathy (e.g., hypertrophic, restrictive, arrhythmogenic, dilated) or secondary myocardial disease (e.g., hyperthyroidism, hypertension). Rarely, ventricular arrhythmias develop secondary to extracardiac conditions (e.g., neurologic disease, metabolic disease, fever, anemia, trauma, GI disease, DIC and sepsis). The reported heart murmur noted in this patient raises concern for underlying structural heart disease.

ULTRASONOGRAPHIC EXAMINATION OF THE HEART

FELINE CARDIAC PARAMETERS	**BODY WEIGHT** (kg)	**HR** (BPM)	**IVSd** (cm)	**LVIDd** (cm)	**LVWd** (cm)	**FS** (%)	**EF** (%)
NORMAL PARAMETER	------	150-240	0.3-0.6	1.0-2.1	0.25-0.6	35-67	80-100
PATIENT		NM	0.44	1.76	0.44	57.4	91.8
FELINE CARDIAC PARAMETERS	**LA/AO** (Boon)	**LA/AO HEART BASE** (Sisson)	**LA** 2D 4-chamber long axis AS to FW (Sisson) (cm)		**LVOT VEL.** (m/s)	**RVOT VEL.** (m/s)	**IVRT** (m/)
NORMAL PARAMETER	<1.5	0.88-1.79	0.7-1.7		<1.6	<1.3	40-60
PATIENT		1.45	1.5		1.0	1.1	NM
Adapted from June Boon,Veterinary Echocardiography,1998 Sisson D et al. JVIM 1991; 5: 232, Jacobs et al. Am J Vet Res 1985; 46:1705							

Cardiac Presentation

The echocardiogram in this patient demonstrated normal **left atrial** size and structure. Chamber volume and blood echogenicity were normal. The cranial and caudal **mitral** valve leaflets presented minor irregular age-related changes that are not clinically significant at this time with adequate extension in systole and union in diastole. No overt MR was noted on doppler. The **left ventricle**



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presented normal free wall and septal thicknesses with areas of subtle alinear contour. The **myocardium** presented minor echogenic remodeling and mild increased endocardium echogenicity consistent with expected age-related myocardial change. **Contractility** of the ventricular walls was adequate and in normal range for this breed and patient size. The **left ventricular outflow** tract demonstrated normal laminar flow with subjectively unremarkable structure. Subjective assessment of the **right atrium** and auricle revealed normal size, structure and content. No evidence of masses was noted. **Tricuspid** valvular assessment demonstrated expected findings for this age patient. Minor TR was present on doppler. The **right ventricle** was of normal size (1/3 diameter of LV), echogenicity and thickness. **Pulmonic** tract assessment revealed normal valve structure, laminar flow, and diameter (approx.1:1 pa/ao ratio). No dilation owing to cuor pulmonale or pulmonic hypertension was noted. No visible **pericardial** or free pleural fluid was noted. The **mediastinum** was free of masses in the visible window. Subjective consistent arrhythmia was present.

ULTRASONOGRAPHIC FINDINGS

- Normal LV thickness with mild LV myocardial remodeling
- Normal left atrium
- Minor TR - no overt clinical pulmonary hypertension
- Arrhythmia

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Overall, no sonographic evidence of significant structural cardiomyopathy was evident. No evidence of HCM criteria, LV Systolic dysfunction, left or right heart chamber enlargement, cardiac tumors, endocarditis, or clinical pulmonary hypertension. The potential for myocarditis is considered unlikely.

A definitive cause of the murmur was not obvious. If no evidence of volume changes such as dehydration or anemia, a physiologic flow murmur with the potential for small non-visualized flow abnormality could be present.

The lack of left or right heart chamber enlargement or evidence of stenotic disease indicates that the hemodynamic effects of the murmur are low and thus, the risk for complications secondary to the murmur is low at this time. Given this presentation, no overt indication for medications used to treat structural cardiomyopathy. Monitoring of the murmur for evidence of persistent or progression would be reasonable. Recheck echocardiogram is suggested in 4-6 months, sooner if clinical signs arise or if murmur intensity increases. Clinical signs associated with structural cardiomyopathy i.e., pulmonary edema, effusion, etc., are not expected at this time.

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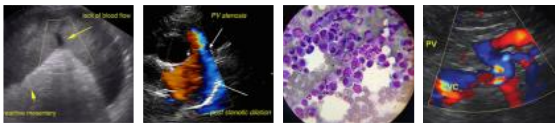

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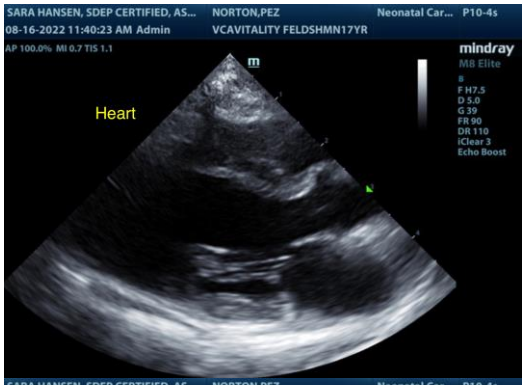

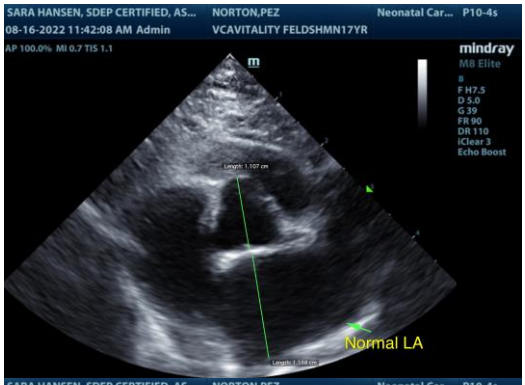

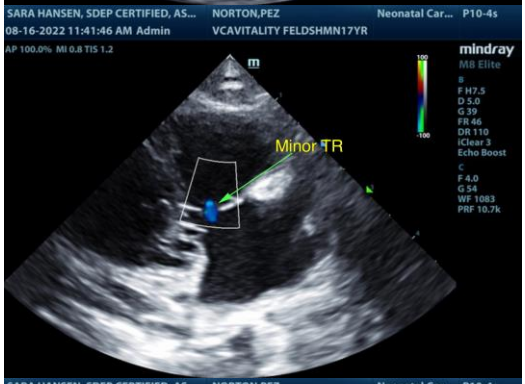

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

R. McKenzie Daniel, DVM, DABVP (Canine / Feline Practice)
info@SonoPath.com