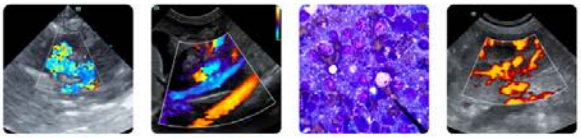


PATIENT

Biscuit Lucivero

SPECIES

Canine

BREED

Beagle

SEX

Spayed Female

AGE

13 Years 4 Months

WEIGHT

35 lbs

INTERPRETED BY

Brad Harris, DVM, DACVECC, DACVIM (cardiology)

IMAGING PERFORMED BY

Kerri Becker

HOSPITAL NAME

VCA Morris Plains Animal Hospital

REFERRING VET

Dr. Burke

INVOICE

73939

DATE

3/23/26

PRESENTING CLINICAL SIGNS

Vomiting, diarrhea, loss of appetite. P is BAR, congestive heart failure.

ULTRASONOGRAPHIC EXAMINATION OF THE HEART & ABDOMEN

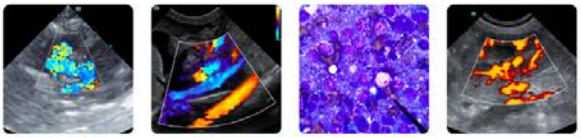
CANINE CARDIAC PARAMETERS	BW	HR BPM	LAD 4 ch Long	RAD 4 ch Long	La/Ao Heart Base	LVIDd	LVIDs
NORMAL PARAMETER		50-100			<1.6		
PATIENT	15.91	NM	4.46	1.83	1.92	3.22	1.78
CANINE CARDIAC PARAMETERS	**FS**	**EPSS**	**PV V MAX (m/s)**	**AV V Max (m/sec)**	**MR Vmax**	**TR Vmax**	**RPA distensibility (normal >30%)**
NORMAL PARAMETER	28-40	<0.6	0.7-1.6	0.7-1.7	4.5-5.5	< 2.7	
PATIENT	45	0.2	0.8	1.3	6.0	NM	NM

Cardiac Presentation

The left atrium is moderate to severely enlarged. The left ventricle is normal in dimension with normal systolic function. The right atrium and ventricle are normal in dimension with normal systolic function. The anterior and posterior mitral valve leaflets are thickened and redundant consistent with myxomatous changes, and there is moderate prolapse. There is moderate to severe mitral regurgitation identified. The tricuspid valve leaflets are thickened and redundant, with mild to moderate tricuspid regurgitation and no evidence of pulmonary hypertension. The left ventricular outflow tract demonstrated normal laminar flow and the visible aorta is unremarkable. The right ventricular outflow tract assessment revealed normal laminar flow and appropriate diameter and distensibility. There is no pulmonic and no aortic valve insufficiency identified. There is no visible pericardial, pleural, or free peritoneal fluid documented. No evidence of hepatic venous congestion is noted. The cardiac chambers, pericardial, and visible extra-cardiac regions were free of masses, spontaneous echo contrast, or thrombi.

Urinary System

The urinary bladder, trigone, and pelvic urethra are unremarkable with normal wall thicknesses and normal tone. The ureters were not visualized, which is a normal finding. There are no uroliths or sediment noted, and anechoic urine is present. The ureteral papillae appear normal. There is no evidence of inflammatory, infiltrative, or neoplastic disease.



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The kidneys are normal in size. Cortices were hyperechoic. Decreased corticomedullary distinction noted. Scattered multifocal renal cortical cysts were noted with mild dystrophic mineralization. No significant pyelectasis noted, but there are several hyperechoic nephroliths within the renal pelvis. The capsules are mildly irregular bilaterally. Left kidney measures 4.98 cm. Right kidney measures 5.54 cm. The ureters are non-distended with no evidence of obstructive disease.

Adrenal Glands

Both adrenal glands are visualized and have normal shape, size, position and echogenicity for this breed. The phrenic vasculature, glandular echogenicity and detail were unremarkable. Capsule, cortex, and medullary definition were normal for this age patient. Left measures 0.53 cm x 1.6 cm. Right measures 0.54 cm x 2.07 cm.

Spleen

The spleen measures 1.38 cm at the hilus. It is smooth with homogeneous parenchyma and hyperechoic to liver and renal cortical parenchyma. The capsule is without noticeable irregularity or deformation. The splenic vasculature is normal without signs of congestion, spontaneous echo contrast, or thrombosis. No evidence of acute or chronic inflammatory, neoplastic, or infarct are documented.

Liver

The liver is subjectively normal liver size, contour, and structure. Parenchymal echogenicity is naturally coarse and hypoechoic to the spleen. Vasculature is within normal limits with no evidence of congestion. The gallbladder contains a moderate amount of echogenic suspended debris and dependent sediment. The cystic and common bile ducts are normal. No intra- or extrahepatic biliary dilation.

Gastrointestinal

The stomach is non-distended with a patent pyloroduodenal junction. The gastrointestinal walls are normal in thickness with maintenance of normal wall layering. There are multifocal segments of small intestine with echogenic ingesta and no shadowing foreign material or overt concern for mechanical obstructive disease. The colon contains normal shadowing feces.

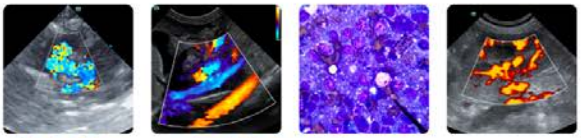
Pancreas

The visible pancreas is isoechoic to surrounding omental fat. The pancreatic duct and capsular contour are normal. There is no overt evidence of active inflammatory or neoplastic disease.

ULTRASONOGRAPHIC FINDINGS

- The cardiac findings are consistent with degenerative/myxomatous mitral valve disease with moderate hemodynamic effects consistent with at least ACVIM Stage B2. The distinction between ACVIM stage B2 and ACVIM Stage C (congestive heart failure) is made via evidence of pulmonary edema (traditionally via thoracic radiographs).

- There is increased renal cortical echogenicity and thickening with a mildly irregular capsular contour. Multifocal cystic cortical changes are noted. This is secondary cystic formation consistent with degenerative changes and remodeling. There is no evidence of abscessation or suspicion of neoplasia. Dystrophic mineralization was noted and is non-obstructive at this time, with no evidence of pylectasis.



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- The gallbladder contains echogenic, suspended and dependent unorganized debris. This is not yet to the level of an organized mucocele, however early/developing mucocele cannot be ruled out. This dependent sediment is often an incidental finding or may be associated with concurrent endocrine disease such as hyperadrenocorticism or diabetes mellitus.

- The gastrointestinal contents likely represent transit of normal ingesta. However, given the patient's gastrointestinal signs, an occult gastroenteritis or pancreatitis cannot be definitively excluded.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

A urinalysis and urine culture via cystocentesis are recommended to evaluate the urinary tract changes for potential urinary tract infection.

A complete blood cell count and serum biochemistry with electrolytes are indicated for further evaluation of the patients metabolic status.

A gastrointestinal panel (TLI, PLI, B12, folate) via Texas A&M gastrointestinal laboratory is indicated to further evaluate for potential chronic enteropathy. Ultimately, gastrointestinal biopsies may be required for a definitive diagnosis.

Consider a spec cPLI to further evaluate the pancreas for active inflammation or pancreatitis.

Cardiac Recommendations:

Given the degree of chamber dilation, cardiac therapy with enalapril (0.5 mg/kg BID assuming normotension and lack of renal insult) and Vetmedin (0.25-0.35 mg/kg BID) is recommended. If there is evidence of pulmonary edema on thoracic radiographs, the addition of furosemide (2mg/kg BID) is recommended. In the absence of pulmonary edema, a cough suppressant may help alleviate the cough associated with mainstem bronchi compression secondary to the left atrial dilation. While there is an increased risk of IV fluids, corticosteroids, or anesthesia, there is no overt objection, as the need likely outweighs the risks. Repeat chest X-rays, BP, and a chemistry should be performed again in 1-2 weeks. A repeat echo is indicated in 3-6 months. Consideration could be given to mitral valve repair (open heart surgery or transcatheter edge to edge repair). Owners should monitor resting respiratory rate at home. Values above 30 breaths/minute or an increase in respiratory rate 10% above baseline should prompt veterinary re-evaluation.

Anesthesia considerations:
While there is no CHF present, there is likely an increased anesthetic risk which must be considered prior to any anesthetic procedure. If anesthesia is necessary, then alpha-2 agonists, ketamine, high dose acepromazine, and Telazol should be avoided. If an ACE inhibitor (enalapril, benazepril) or spironolactone is being given, it should not be administered on the morning of general anesthesia. Other cardiac medications should be administered per the normal dosing schedule. Fluid therapy during anesthesia should be considered at a reduced rate (e.g., 5 ml/kg/hour) if possible. A shorter anesthetic duration will reduce the risk of complications. Pre-oxygenation is advised. Premedication with an opioid (i.e., butorphanol, hydromorphone, oxymorphone) with or without a benzodiazepine is generally the safest protocol. An induction agent such as Propofol, alfaxalone, or diazepam/etomidate can be used to effect. Maintenance of anesthesia with isoflurane or sevoflurane is reasonable. Dobutamine (2.5-10 µg/kg/min as a CRI, starting at 2.5 µg/kg/min and increasing the dosage incrementally) may be used in lieu of fluid boluses to augment systemic blood pressure.

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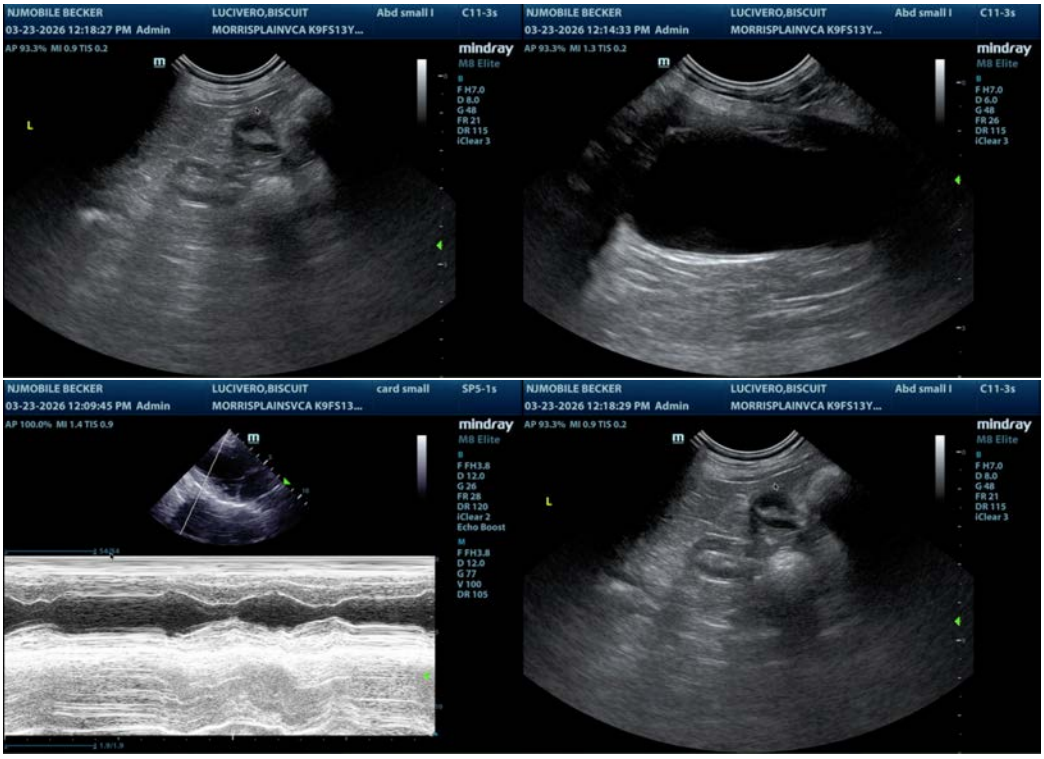
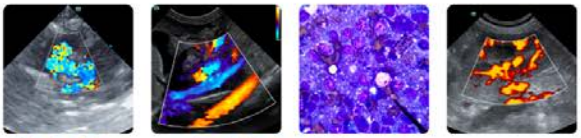
Diet:
A high-quality food from Hills, Royal Canin, Science Diet, Eukanuba, Iams, or Purina that is highly palatable with adequate protein and calories for maintaining an optimal body condition is recommended. Consider omega-3 fatty acid supplementation. Avoid any boutique, exotic, or grain-free diets.

Activity:
Moderate physical activity (meandering walks, exploring the backyard, playing with toys inside, getting excited when family gets home, etc.) is encouraged, but periods of strenuous aerobic activity (jogging, strenuous outdoor ball play, prolonged play at the dog park, etc.) should be avoided, especially during periods of high heat (> 80 F) and humidity. Dogs with heart disease tend to tolerate cool and cold temperatures much better than high temperatures. Avoid sudden increases in activity (e.g. 2 block walks during the week but 2 mile walks followed by 30 minutes at the dog park on the weekends) as this may be difficult for the cardiovascular system to deal with.



New Jersey Mobile
FUELED BY SONOPATH VETERINARY ULTRASOUND



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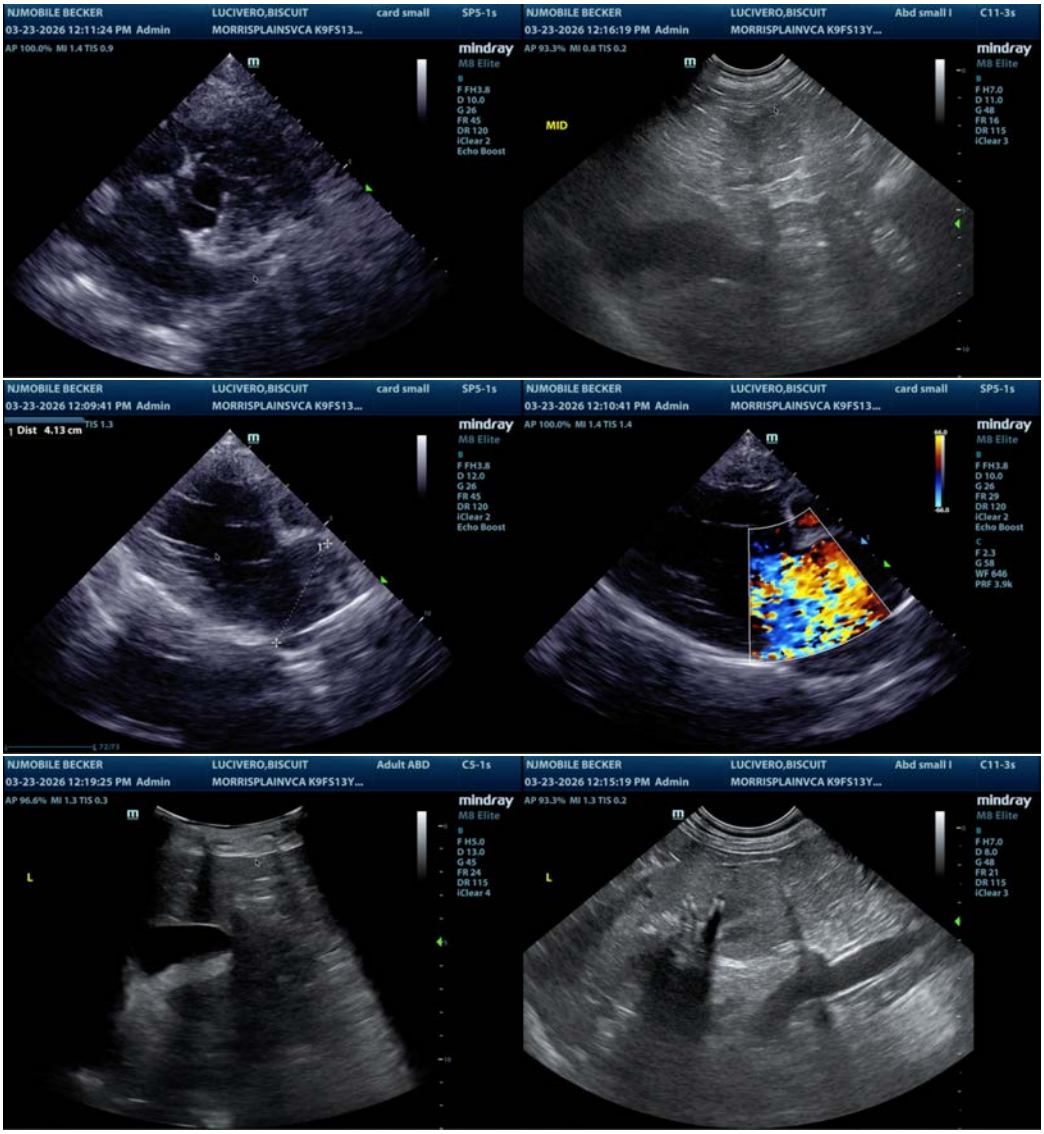

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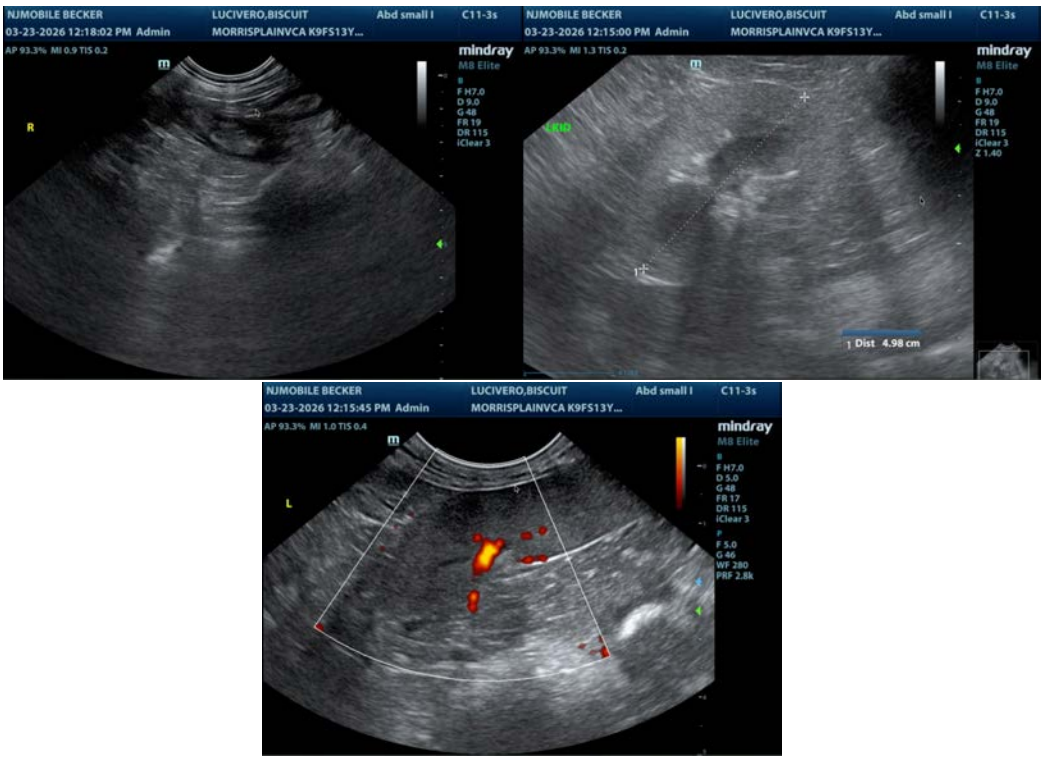

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Brad Harris, DVM, DACVECC, DACVIM (cardiology)

info@SonoPath.com