SonoPath
Clinical Sonography & Telecytology
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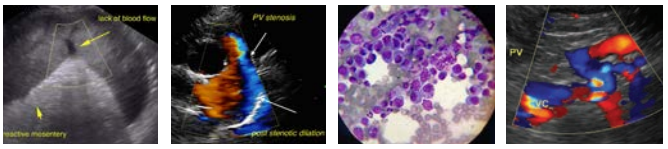


SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT
Zeus Dierking

SPECIES
Canine

BREED
Pug

SEX
Neutered Male

AGE
13 Years

WEIGHT
16.9 Pounds

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

IMAGING PERFORMED BY
Rachel Runnells, RVT

HOSPITAL NAME
SVS Imaging Kansas City

REFERRING VET
Dr. Elizabeth Oetting

INVOICE
24879

DATE
8/24/21

PRESENTING CLINICAL SIGNS

Bladder surgery to remove stones was performed August 2, 2021. He had urate stones. The Minnesota Urolith Center has recommendations for further testing because Pugs are one of the breeds at risk for developing this type of stone secondary to chronic low grade portosystemic shunt. Patient has been acting normal; no symptoms other than the stones.
Abnormal PE/Chem/CBC/UA Results: Previously Zeus' liver values and BUN have always been normal, but the most recent bloodwork just a couple weeks ago showed that Zeus' BUN was slightly below normal. Idexx Bile Acids Panel w/ Ammonia --------139.14 ----------11.74 - 70.45 µmol/L Bile Acids Preprandial / Random-------136.6 ----------0.0 - 14.9 µmol/L Bile Acids Postprandial--------a160.4---------- 0.0 - 29.9 µmol/L

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The urinary bladder presented uniformly thickened urinary bladder wall isoechoic to the adjacent normal urinary bladder wall. The luminal margin of the thickened urinary bladder wall was mildly asymmetrical in contour. Mineralization or echogenic foci within the thickened areas of urinary bladder wall was not present. Full evaluation of the urinary bladder was somewhat limited owing to lack of complete urine distention. Apical urinary bladder wall measured 0.54 cm in width. A focal hyperechoic linear mural echo was noted, likely indicative of retained suture given the previous cystotomy.

Normal size and margination were present in the kidneys. A normal 1:3 cortex / medulla ratio and normal corticomedullary definition were maintained. The echogenicity of the cortex was similar to or slightly less than normal liver parenchyma while the medulla echogenicity was hypoechoic to the cortex with no evidence of pelvic dilation. No evidence of medullary or pelvic mineralization. The right kidney measured 4.1 cm. The left kidney measured 4.2 cm.

Adrenal Glands

The adrenal glands were uniform in size and contour with a uniformly hypoechoic parenchyma. The right adrenal gland measured 0.39 cm at the cranial pole and 0.43 cm at the caudal pole. The left adrenal gland measured 0.37 cm at the cranial pole and 0.37 cm at the caudal pole.

Spleen

The spleen exhibited a finely textured and homogenous parenchyma which was hyperechoic to the liver and renal cortical parenchyma. The capsule was smooth and regular without apparent expansion. The splenic vasculature at the hilus was normal in volume with no evidence of congestion or thrombosis. Acute to chronic inflammatory, neoplastic, or benign parenchyma changes were not noted.

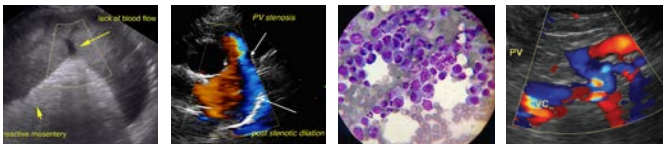
Liver

The liver exhibited subjective mild subnormal size, yet maintained symmetrical capsule contour. Normal overall hepatic parenchyma echogenicity with moderate coarse echotexture. No hepatic masses or nodules. Potential for subjective decreased portal vascular volume. The gallbladder was non distended in size with moderate, dependent to non-dependent, mildly congealed debris, primarily in the area of the caudal lumen and gallbladder neck. The common bile duct was normal.

Gastrointestinal

The stomach presented intact wall layering with a normal wall layer ratio. Mild gastric gas distention was present.

The small intestine presented intact wall layering with 1:3 muscularis/mucosa ratio. The lumen of the small intestine was empty with no signs of ileus, obstruction or foreign material.



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Normal visible colon wall layers were present with formed feces and luminal gas.

Pancreas

The parenchyma of the left limb, body and right limb of the pancreas presented isoechoic to the adjacent omental fat. A normal curvilinear capsule contour of the pancreas was present. The visible pancreatic duct was normal. No signs of active inflammation or neoplastic disease was evident.

ULTRASONOGRAPHIC FINDINGS

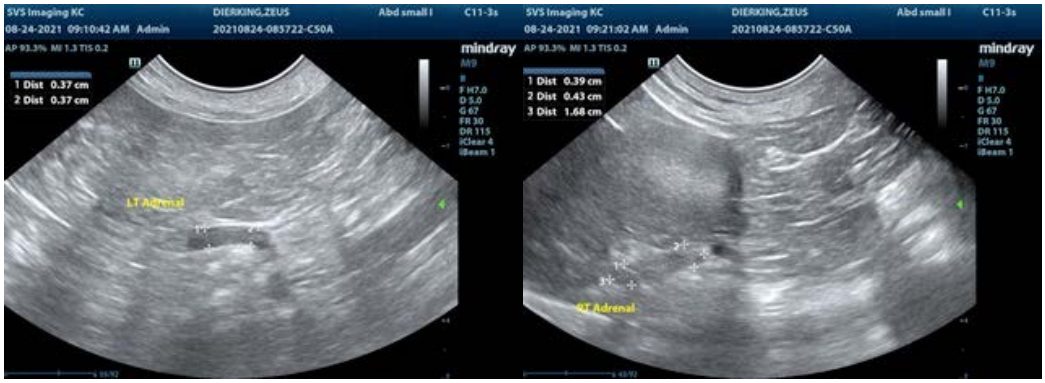
- Mild cystitis pattern – suspect mild secondary cystitis owing to recent cystotomy
- Mild age related kidneys – no evidence of medullary or pelvic mineralization or pyelonephritis
- Subjective mild subnormal liver size
- Moderate gallbladder debris (non-mucocele)

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

An obvious portosystemic shunt was not definitively evident in this study. However, given the previous diagnosis of urate stones, subjective mild subnormal liver size as well as elevated pre- and post-prandial bile acids, a small portosystemic shunt not visualized in this study (potentially owing to gas and regional colon gas artifact) may be considered a top differential diagnosis. Potential for primary hepatic parenchymal disease also possible. Either additional sonographic imaging following documented fast, or ideally gold standard CT with contrast recommended for further assessment. Empirically, hepatosupportive medications including Denamarin and Ursodiol are recommended. Alternatively, some or all of the follow protocol may be considered if clinically indicated.

Hepatic Support for Bile Acid Elevation +/- Hepatic Encephalopathy

Royal Canin Hepatic Support diet or Hills L/D, **Metronidazole** (7.5 mg/kg PO bid) over the next 14 days, **Lactulose** (Oral: 3.1-3.7 g/5 ml lactulose in a syrup base) long term to target 2-3 soft stools/day, with a **high-quality protein supplement** of minor amount of **yogurt** or **cheddar cheese**. Monitor bile acids, with attention paid to dropping albumin, BUN or cholesterol. SAMe and nutraceuticals as needed. **Ursodiol (**10-15 mg/kg p.o. q24h) can be considered as hepatoprotectant and to enhance bile flow. **Zinc** serum level keep between 200—500 ug/dl. If deficient then Tx zinc acetate 1-3 mg/kg/day. Gastrointestinal protectants are recommended if the patient is anorexic.



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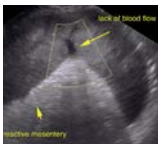
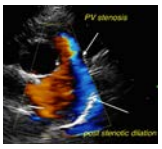
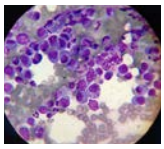
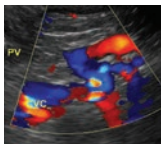

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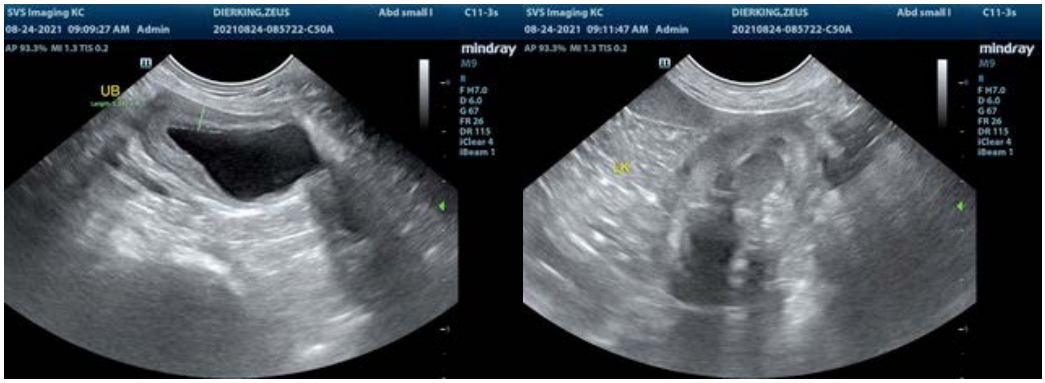

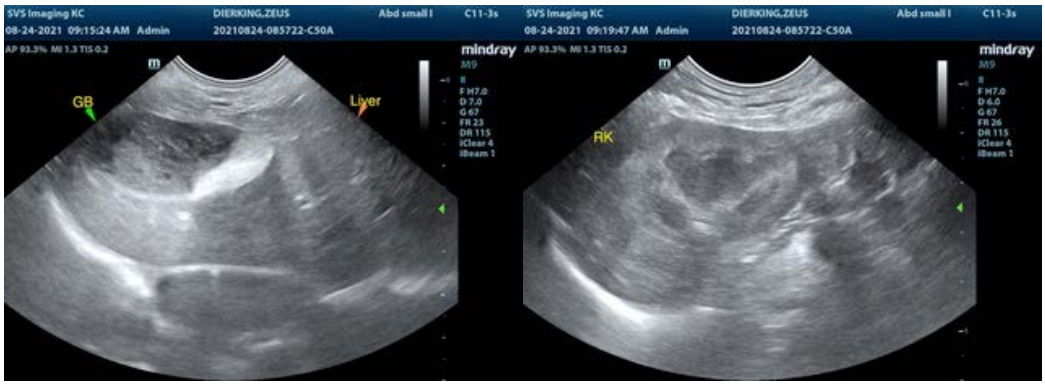

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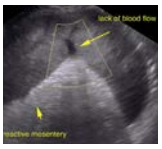
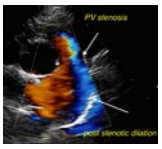
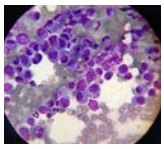
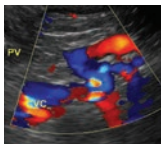

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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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