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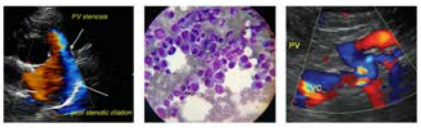

SonoPath
Clinical Sonography & Telecytology
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PATIENT

Jack Hamerly

SPECIES

Canine

BREED

Pug

SEX

Intact Male

AGE

4 Years

WEIGHT

23 Pounds

INTERPRETED BY

Beth Johnson, DVM DACVIM

IMAGING PERFORMED BY

Sarah Pender, CVT

HOSPITAL NAME

SVS Imaging QC

REFERRING VET

Dr. Westerhof

INVOICE

39004

DATE

6/23/22

PRESENTING CLINICAL SIGNS

Owner arrived home at 5pm yesterday and found him on bathroom floor extremely lethargic, heavy breathing, and with several piles of bloody diarrhea in house and vomit on dog bed. When pet sitter let him out earlier in the day he was acting fine. Was taken to emergency center. Urinary catheter placed and was started on IVF, ampicillin, and buprenorphine. Multiple episodes of bloody diarrhea at emergency center overnight. Post ultrasound passed moderate amount pudding consistency melena. Owner states the last time he ate was either Tuesday evening or maybe yesterday morning. No possible rodenticide ingestion.
Abnormal PE/Chem/CBC/UA Results: Radiographs where taken at AEC which showed a very large bladder and suspected of bladder stone in urethra. Urinary catheter placed with some difficulty. Dark bloody urine has been passing into collection bag. BUN 99, CA 12.5, PHOS 7.5, CREA 6.3, K+ 7.6, WBC 23.12, NEU 20.48, HGB 21.3, HCT 81%, PLT 1164, Patient is extremely lethargic to almost non responsive during scan.

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The urinary bladder is almost empty with a catheter in place, so the wall appears diffusely thick. Contents appear to include both anechoic urine as well as a large amount of mineral debris adhered to the mucosa. The presence of a cystoliths with acoustic shadowing is suspected, yet difficult to fully interpret due to the placement of the catheter. The caudal abdomen around the urinary bladder also contains free fluid and hyperechoic enhanced fat and mesentery.

Prostate is normal in size for an intact male. It has a normal homogenous echotexture and is hyperechoic in echogenicity, normal for intact male.

The right kidney is normal in size (5.41 cm), shape and echogenicity. It has smooth peripheral margination. There is a normal 1:3 cortex to medulla ratio with appropriate corticomedullary distinction. There is no evidence of pyelectasia, mineral or infarcts observed.

The left kidney is normal in size (5.29 cm), shape and echogenicity. It has smooth peripheral margination. There is a normal 1:3 cortex to medulla ratio with appropriate corticomedullary distinction. There is no evidence of mineral or infarcts observed. Moderate pyelectasia of 0.40 cm with a concurrently mildly dilated proximal ureter in the left kidney.

Both kidneys (but the left more than the right) are surrounded by a scant amount of free fluid and hyperechoic enhanced fat and mesentery.

Adrenal Glands

The right adrenal gland is normal in size (measurement), shape and contour. Corticomedullary structure is unremarkable. Visible surrounding vasculature appears normal.

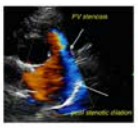
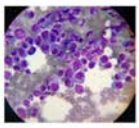
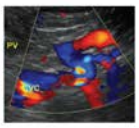
The left adrenal gland is normal in size (measurement), shape and contour. Corticomedullary structure is unremarkable. Visible surrounding vasculature appears normal.

Spleen

The spleen is largely normal in appearance (shape, echotexture and echogenicity); however, it is volume contracted. Hydration status assessment is recommended. A 0.7 cm hypo- to anechoic nodule is present, causing a small capsular bulge on the head of the spleen.

Liver

The liver is subjectively normal in size with normal smooth curvilinear peripheral contour. Parenchyma is appropriately hypoechoic to the spleen in echogenicity and appropriately mildly coarse and

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homogenous in echotexture. No focal lesions are observed. Visible vasculature and biliary tree appear normal without distension or congestion.

The gallbladder is non-distended in size. The wall is smooth without visible thickening. Luminal contents are primarily anechoic. There is no evidence of cystic or common bile duct dilation.

Gastrointestinal

The visible stomach wall is normal in thickness (canine < 0.5 cm and feline < 0.4 cm) and layering. However, the stomach is markedly fluid and chyme distended.

The visible small intestines are normal in wall thickness and layering (canine duodenum < 0.5 cm and feline duodenum < 0.4 cm; other < 0.3 cm). Small intestinal motility appears adequate (1-3 contractions per min). The duodenum is fluid distended and moderately to severely hyperperistaltic and corrugated with no evidence of obstruction, foreign material or infiltrative disease appreciated.

The visible colon is normal in wall thickness (< 0.2 cm) and layering. Contents are consistent with normal formed feces and gas.

Pancreas

The pancreatic parenchyma is appropriately isoechoic to surrounding tissue. Visible capsule is smooth and normal in contour. There is no visible pancreatic duct dilation. There is no evidence of active peripancreatic inflammation.

Free Abdomen

There is no apparent lymphadenopathy.

**See kidneys and bladder regarding free fluid and enhanced fat and mesentery in those areas.

ULTRASONOGRAPHIC FINDINGS

- Large amount of mineral debris and suspect cystoliths within the urinary bladder. A urinary catheter in place and an empty urinary bladder makes full assessment difficult.
- Pyelectasia and dilated proximal ureter on the left – concerning for urinary obstruction secondary to a ureterolith or stricture. However, pyelectasia secondary to pyelonephritis and ascending infection can't be ruled out.
- The free fluid and enhanced mesentery around the entire urinary system is suggestive of irritation and inflammation of the bladder wall as well as the kidneys, as can be seen with an obstruction or an acute nephritis or pyelonephritis, etc.
- Markedly fluid distended stomach and fluid distended proximal duodenum with hyperperistalsis noted – suggestive of gastroenteritis secondary to underlying irritation. Partial obstruction cannot be ruled out, but is considered less likely.
- Volume contracted spleen with a splenic nodule noted – both benign cyst, hematoma, extramedullary hematopoiesis, etc. as well as infiltrative neoplastic or metastatic lesions have to be considered.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

This patient has a variety of organ systems affected ultrasonographically, including the urinary tract as well as the proximal GI tract as well as the spleen, and it is difficult to determine which problem came first. However, given the history and the concurrent laboratory changes, it's plausible that this patient suffered a urinary obstruction, which resulted in severe metabolic and electrolyte derangements as well

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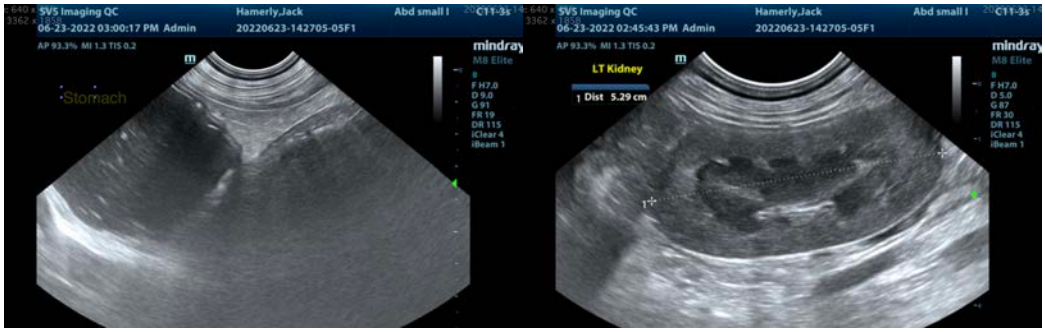
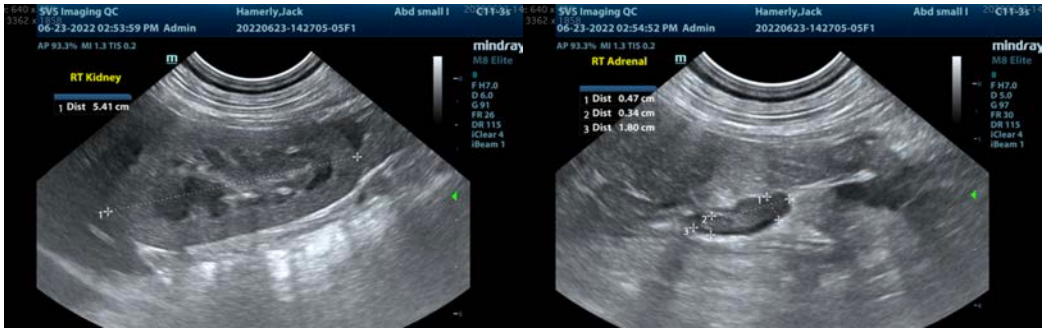
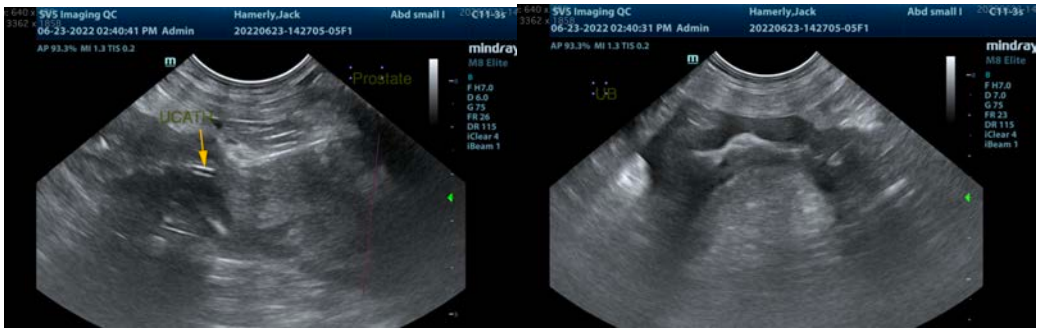
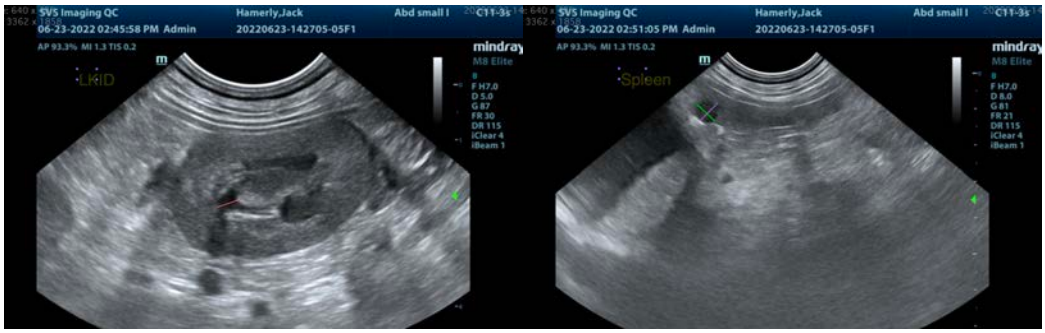
as severe hypovolemia, leading to possible ischemia of the bowel and the concurrent melena, gastroenteritis, etc. The combination of events also likely led to hyperviscosity syndrome or potential DIC, and given the polycythemia and the thrombocytosis, potentially even a pulmonary thromboembolism as a potential ultimate cause of death.

Other differentials for the marked severe azotemia include acute kidney insult secondary to toxin or an infectious disease such as Leptospirosis. However, given the mineral presence here and the reported urethral stone upon presentation, obstruction seems the most likely scenario.









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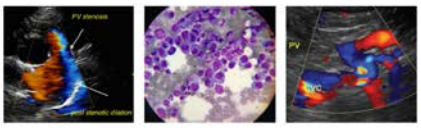

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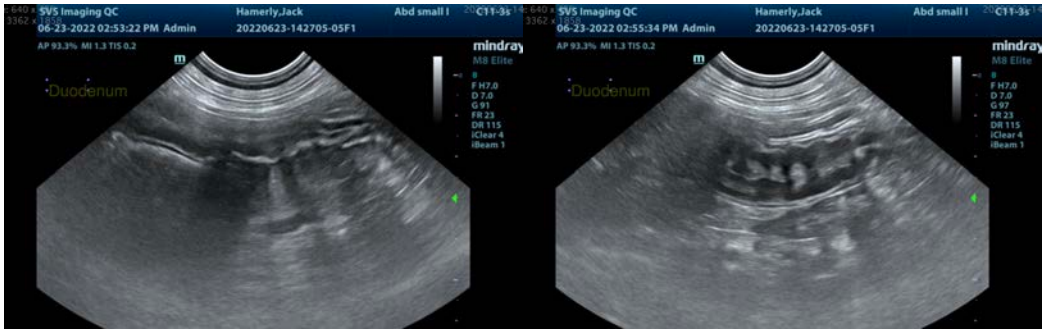

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Beth Johnson, DVM, DACVIM
Beth.Johnson@sonopath.com