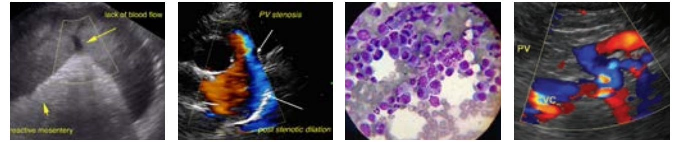

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1-800-838-4268 info@sonopath.com

PATIENT
Oliver VonHouwen

SPECIES
Feline

BREED
DSH

SEX
Neutered Male

AGE
13 Years

WEIGHT
12 Pounds

INTERPRETED BY
Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY
Diane McFadden

HOSPITAL NAME
Mt. Olive VH

REFERRING VET
Dr. Jones

INVOICE
39794

DATE
7/22/22

PRESENTING CLINICAL SIGNS

elevated liver values; not eating. on metronidazole, clavamox, onsior
Abnormal PE/Chem/CBC/UA Results: AST 590, ALT 1197, BUN 43, Mg 2.7, amylase 1545, PSL 37

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The **urinary bladder** is adequately distended. The wall is smooth and regular except for a mass effect (1.4 cm in length) arising from the mucosa along the ventral wall. It has a wide stalk and becomes thinner as it lengthens into a frond-like projection into the lumen. It is difficult to determine if this is a polyp as a result of chronic inflammation (cystitis) or a mass (early transitional cell carcinoma). No abnormalities are present with the trigone or proximal urethra. A very small amount of free floating sediment is also observed. There is no evidence of cystoliths.

Kidneys

The **left** kidney measures 4.17 cm (3.80-4.40 cm). The capsule is smooth. The cortex is hyperechoic causing an exaggerated definition of the cortico-medullary junction, however, a moderate to severe loss of architecture of both the medulla and pelvis is observed. Very mild mineralization of the medulla and pelvis is present, without evidence of nephroliths. The pelvis measures 0.99 cm (longitudinal view). Blood flow is decreased. The surrounding mesentery is not hyperechoic.

The **right** kidney measures 3.80 cm (3.80-4.40 cm). Findings are similar to the left kidney. Blood flow is also decreased, but not as severely. The pelvis measures 0.90 cm (longitudinal view).

Aortic bifurcation/trifurcation No abnormalities observed.

Adrenal Glands

The **left** adrenal gland measures 0.44 cm. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

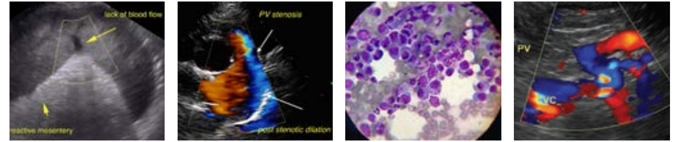
The **right** adrenal gland measures 0.45 cm. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

Spleen

Significant splenomegaly at 17.7 mm (normal = 10 mm). A diffusely mottled echotexture is noted. The capsule has slightly scalloped and expansile edges. It also appears "swollen" dorsally. It appears to be within normal limits in echogenicity. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified.

Liver

Mild hepatomegaly is suspected, however, this is better characterized at the time of the ultrasound or radiographically. Subjectively, the liver is "generous", with smooth, but mildly rounded borders. It is diffusely hyperechoic, i.e., it is isoechoic to the falciform fat, but homogeneous. Mildly prominent walls of the portal veins are noted, in addition to occasional perivascular cuffing, suggestive of deposition of fat, fibrosis and/or mineralization. Multiple hyperechoic nodules of variable size are scattered throughout the parenchyma haphazardly (0.45 cm in diameter x 0.38 cm in length). They are most likely a combination of mineralization and fibrosis as mild acoustic shadowing is observed. The mesentery medial to the liver is hyperechoic.



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The **gallbladder** (GB) is moderately distended with a moderate amount of free floating and inspissated echogenic material. The GB wall is mildly thickened (1.3 mm) and hyperechoic. A small amount of echogenic material is present within the GB and the cystic duct, which is mildly tortuous. Neither the cystic or common bile ducts is dilated, i.e. there are no signs of an obstruction. No obvious abnormalities are observed with the duodenal papilla. Focal areas of hyperechoic parenchyma surrounding the GB and cystic duct are noted. Possible mineralizations and multiple choledocholiths within the intrahepatic bile ducts (without signs of an obstruction).

Gastrointestinal

A moderate amount of gas is present within the lumen of the stomach. The gastric wall is within normal limits in thickness and the wall layers are well defined, however, the submucosa is mildly prominent. No obvious abnormalities are observed with its peristalsis. The mesentery surrounding the stomach and liver is hyperechoic.

Duodenum: Wall thickness is increased at 0.29 cm. The definition of the wall layers is preserved, except for two focal areas where very subtle loss is noted. Moderate fogging of the mucosa is present. The mesentery surrounding the duodenum at the level of the duodenal papilla is moderately hyperechoic; no obvious abnormalities are observed with the papilla.

Jejunum: Wall thickness is within normal limits, except for the occasional segment (high end of normal 0.28 cm). The definition of the wall layers is preserved, with mild prominence of the submucosa and mucosa, as well as fogging of the mucosa. Abnormally dilated loops of bowel are not observed. No abnormalities are observed with the ileo-cecal-colic junction.

Ingesta and gas are present within the transverse colon.

The colonic wall is not thickened and mural detail is considered normal.

Pancreas

No abnormalities are observed with the architecture, contours or size of the pancreas, however, it is mildly hypoechoic, particularly in the region of the common bile duct and stomach. The surrounding mesenteric fat is mildly to moderately hyperechoic. A mildly coarse echotexture is noted in the distal aspect of the left limb (in region of the spleen), which is attributed to age-related changes and/or possible fibrosis due to previous episodes of pancreatitis, amyloid deposition, etc. Overt signs of neoplasia are not noted.

Other

Lymph nodes (LN)

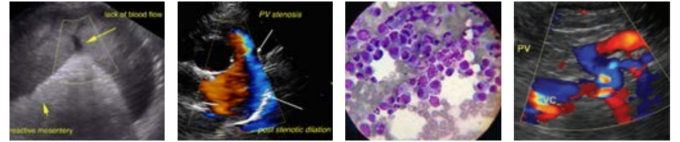
Mesenteric LNs: A few LNs are enlarged and hypoechoic with maintenance of smooth contours. The largest one measures 0.69 cm in diameter x 1.31 cm in length.

Abdominal effusion

A scant amount of anechoic ascites is visualized in the right cranial quadrant in the region of the transverse colon and right kidney.

ULTRASONOGRAPHIC FINDINGS

- **Spleen:** Neoplasia, such as lymphoma, or other round cell tumour, may the cause of the splenomegaly and mottled echotexture, however, splenitis, extramedullary hematopoiesis or reactive hyperplasia remain possible differential diagnoses based on Oliver's history. A fine needle aspirate is required to obtain a definitive diagnosis.



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- **Liver:** Cholestasis, cholangitis/cholangiohepatitis and cholecystitis are suspected, in addition to a secondary bacterial infection. Hepatic lipidosis may be contributing to the changes observed, as well as nodular regeneration and fibrosis (hyperechoic nodules). Obvious signs of neoplasia are not appreciated.

- **Gallbladder:** Signs of cholecystitis and multiple choledocholiths. There is no evidence of obstructive disease. A secondary suppurative component is possible.

- **Gastrointestinal tract**: Signs of mild, yet diffuse gastrointestinal inflammation are observed. Differential diagnoses include a chronic enteropathy, e.g., inflammatory bowel disease, food intolerance, etc. Although the definition of the wall layers is preserved, there is mild loss of wall architecture focally in two areas of the duodenum. Therefore, one cannot exclude emerging infiltrative disease, (lymphoma or other round cell tumour), definitively without performing tissue biopsies, and possibly immunohistochemistry and PARR. It should be noted that both IBD and lymphoma may occur concurrently in some cats.

- **Pancreas**: A smoldering pancreatitis, particularly in the vicinity surrounding the common bile duct cannot be excluded. Additional changes include age-related changes, possible fibrosis due to previous episodes of pancreatitis, and amyloid deposition.

- **Kidneys:** Age-related degeneration and glomerulonephrosis are suspected. Glomerulonephritis is possible. Abnormalities suggestive of pyelonephritis are not observed. Changes are not typical of neoplasia.

- **Urinary bladder**: Possible polyp or mass (early transitional cell carcinoma) along the ventral wall, in addition to a very small amount of free floating sediment. No abnormalities are present with the trigone or proximal urethra.

- **Lymph nodes**: Mild lymphadenomegaly, which is most consistent with reactive hyperplasia. Immune-mediated lymphadenitis and emerging infiltrative disease remain possible differential diagnoses.

- **Ascites**: Extravasation due to increased vascular permeability, vasculitis, neoplasia.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Fine needle aspirates of the spleen, liver and, if possible, the enlarged mesenteric lymph node.

Performing a coagulation profile prior to the final aspirates is suggested.

Administration of vitamin K (0.5 mg/kg SQ q8-12h for 1-3 doses) is suggested even if the results of the PT/PTT are within normal limits, or at the very least, one dose 45-60 minutes prior to the procedure.

Pending the above results or, if the former are not pursued, the following are suggested:

Analgesia for visceral pain, such as buprenorphine (0.005-0.01 mg/kg sublingually every 8-12 hours) for a minimum of 7-10 days. Continue for 3-4 weeks if an improvement is noted; the dose and frequency may be weaned to the minimum effective dose during that time.

+/- gabapentin

Supportive care (+/- IV fluids vs SQ fluids, maropitant, mirtazapine, etc.)

If signs of gastroesophageal reflux disease, 10-14 day trial with famotidine or omeprazole (0.7-1 mg/kg

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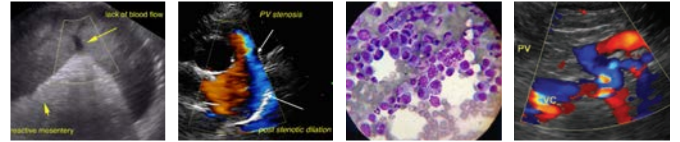

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Discontinuation of NSAIDs is suggested (hepatic metabolism and renal excretion)

Cholangitis/cholangiohepatitis and cholecystitis and secondary ascending bacterial infections are possible differential diagnoses. Although indiscriminate use of antibiotics is not normally recommended, one could begin treatment with a broad-spectrum antibiotic and assess clinical response. *If a response is observed, continue antibiotics for a total of 4 to 6 weeks.

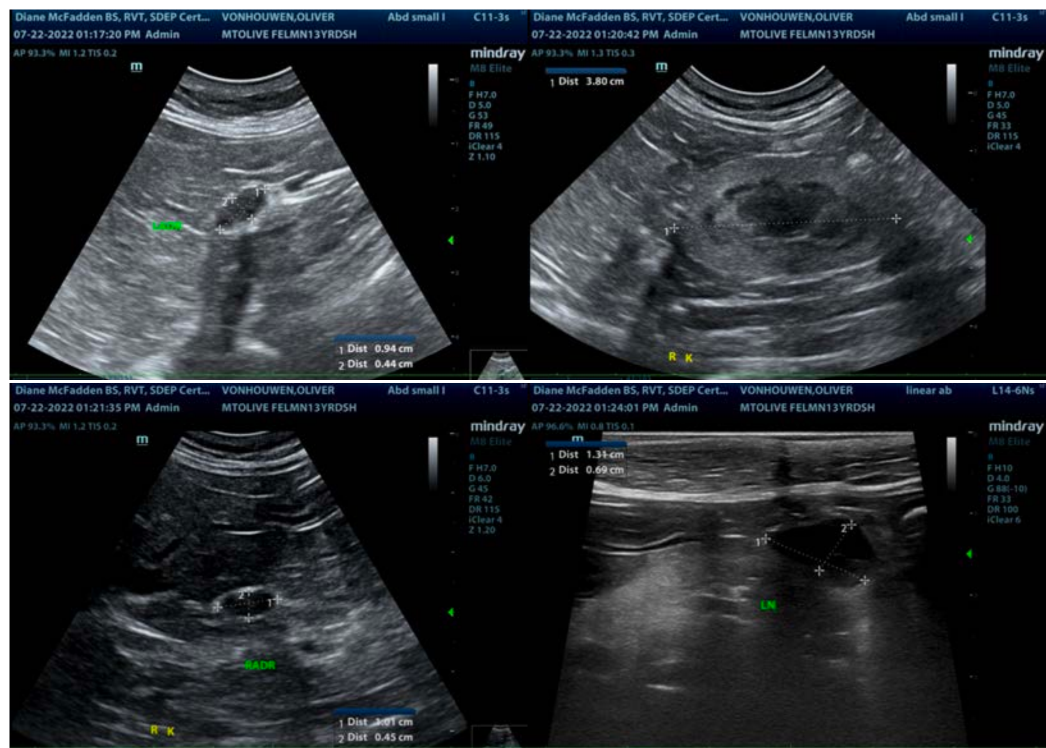
Small, frequent meals of a palatable diet, ideally with a neutral pH and canned food (increase water consumption due to urinary issues).

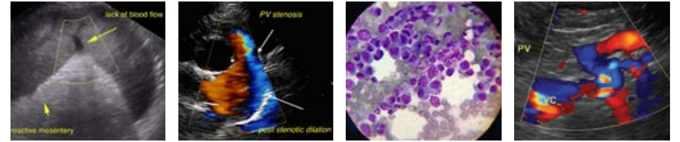
Urinalysis and culture and sensitivity to exclude cystitis/polyploid cystitis (ideally, a free flow sample should be obtained in case a TCC is present).

+/- serum cobalamin and folate, to assess for underlying malabsorption and dysbiosis. If not possible, consider administration of cobalamin supplementation and assess response to therapy.

If further diagnostics are not pursued, although not ideal, empirical treatment for inflammatory bowel disease is suggested. A dose of prednisolone (1 mg/kg/day) may be administered for 2 weeks, and then tapered to the minimum effective dose.

A re-assessment of the urinary bladder in 4 to 6 weeks is suggested. If the mass-effect is still present, evaluation with colour Doppler may help further characterize it.





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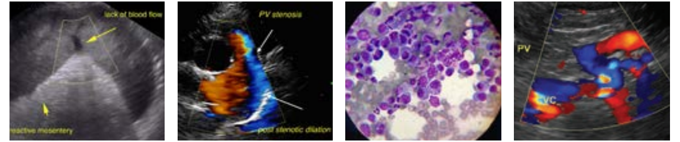

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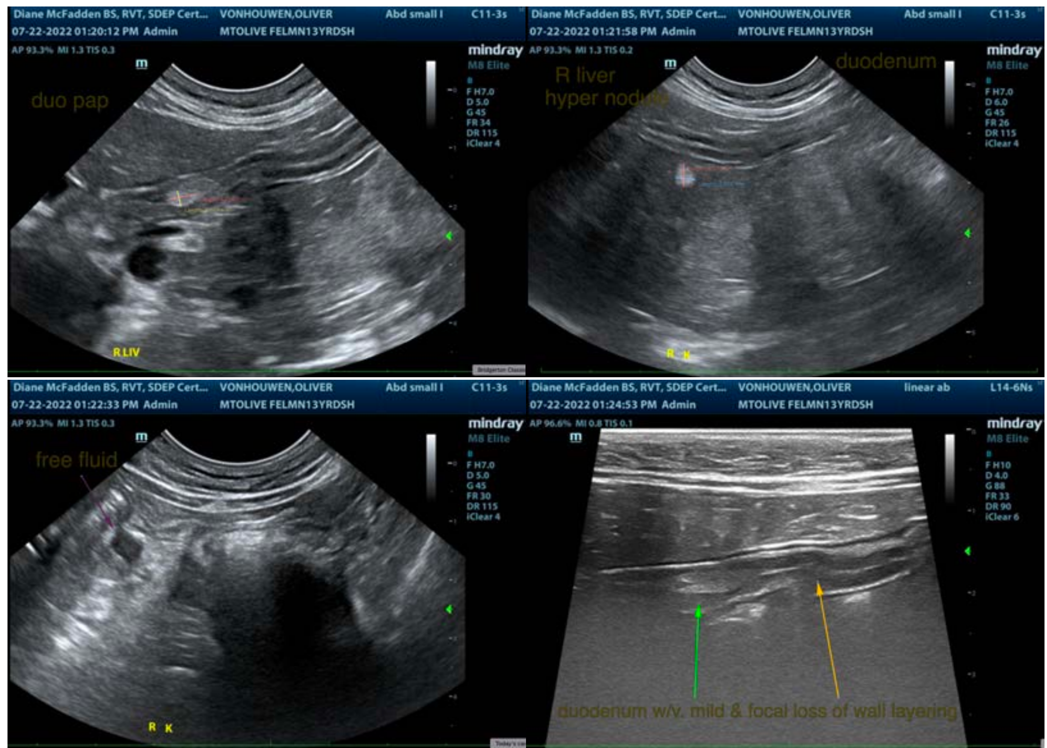

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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