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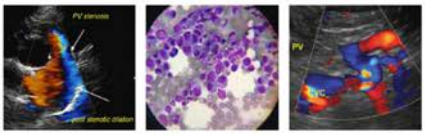

SonoPath
Clinical Sonography & Telecytology
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PATIENT
Oskar Quick

SPECIES
Canine

BREED
Schnoodle

SEX
Neutered Male

AGE
10 Years

WEIGHT
23 Pounds

INTERPRETED BY
Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY
Amy Mayhew, LVT

HOSPITAL NAME
SVS Imaging MI

REFERRING VET
Pinecrest AH

INVOICE
40059

DATE
8/2/22

PRESENTING CLINICAL SIGNS

Diarrhea since 7/27/2022 that is not improving. Chronic hepatopathy.
Abnormal PE/Chem/CBC/UA Results: H PLT 528 H PCT 0.61 H SDMA 18 H BUN 34 H ALT 798 ALKP too high to read w/o dilution H CHOL 447 H AMYL 1721 H LIPA 4676 L TT4 0.8 **Please see attached labs

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The **urinary bladder** is inadequately filled, thereby affecting the ability to accurately measure wall thickness. The wall is very mildly irregular. No abnormalities are noted with the trigone or proximal urethra. There is no evidence of sediment, cystoliths, polyps, or a mass.

The **prostate** is homogenous and measures 0.89 cm; within normal limits for a neutered male.

Kidneys

The **left** kidney measures 5.91 cm. The capsule is smooth. The cortex is mildly hyperechoic, i.e. it is isoechoic to the spleen. A mild loss of the normal definition of the cortico-medullary junction is present. Numerous, small, mineralizations are noted within the pelvis and diverticulae, without evidence of nephroliths or pyelectasia. Pinpoint hyperechoic foci, most consistent with mineralizations, are scattered throughout the cortex. The surrounding mesentery is not hyperechoic.

The **right** kidney measures 5.75 cm. A hyperechoic structure (0.36 cm) is present within the mineralization. Three very small anechoic subcapsular structures are noted within the cortex; they are consistent with benign cysts. Numerous, small, mineralizations are noted within the pelvis and diverticulae, without evidence of nephroliths or pyelectasia. Pinpoint hyperechoic foci, most consistent with mineralizations, are scattered throughout the cortex. The surrounding mesentery is not hyperechoic.

Aortic bifurcation/trifurcation No abnormalities observed.

Adrenal Glands

The **left** adrenal gland measures 0.81 cm at the cranial pole, 0.73 cm at the caudal pole. Both poles are enlarged for a dog of Oskar's stature, however, the cranial pole is more "plump". A discrete mass or nodule is not visualized. 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 0.79 cm at the cranial pole, 0.83 cm at the caudal pole. Both poles are enlarged, with the cranial pole appearing blunt or square, rather than rounded. No abnormalities are noted with its echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

Spleen

The spleen is within normal limits in size, architecture, echotexture, and echogenicity. The capsule is smooth. Mild to moderate perivascular cuffing, consistent with myelolipomas is observed; these are not considered clinically significant. Pinpoint hyperechoic foci are dispersed throughout the parenchyma. The latter are most consistent with mineralizations, which are also considered clinically insignificant. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified.

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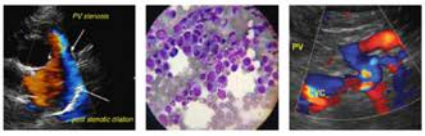

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Liver

Mild to moderate hepatomegaly is suspected, however, this is better characterized at the time of the ultrasound or radiographically. The liver's borders are smooth, but rounded. The liver is homogeneous and diffusely hyperechoic, i.e. it is isoechoic to the spleen and the cortex of the left kidney. However, the left kidney is hyperechoic compared to what is considered normal. It should be noted that the right kidney is severely hyperechoic to the liver. The porta hepatis has a mildly different appearance compared to the remainder of the liver, i.e. perivascular cuffing is observed, and the walls of the portal veins are more prominent due to hyperechogenicity. The accumulation of fat, inflammatory cells, fibrosis and mineralization may be contributing to these changes. Focal lesions are not observed and no abnormalities are observed with the hepatic vessels. No obvious abnormalities are noted with the hepatic veins.

The **gallbladder** (GB) is misshapen in certain views, i.e., it does not have a round or oval shape, rather irregular borders. A large amount of inspissated, free floating, and gravity-dependent echogenic material (sludge) is observed, some of which is adhered to the intramural wall. A cholelith is noted in one view. The parenchyma surrounding certain regions of the GB is hyperechoic. The GB wall is mildly thickened (1.98 mm) and hyperechoic. Multiple walls appear corrugated. High index of suspicion of one or two choledocholiths present within intrahepatic biliary ducts. The portions of the cystic and/or common bile ducts observed are not dilated or tortuous, i.e. there are no 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. No obvious abnormalities are observed with its peristalsis.

Duodenum: 0.55 cm (mildly thickened for a dog of Oskar's stature). The definition of the wall layers is preserved, however, fogging of the mucosa is noted.

Jejunum: Wall thickness is within normal limits and the definition of the wall layers is preserved, however, mild to moderate fogging and mild stippling of the mucosa are noted in multiple loops of bowel.

A large amount of gas is present in the transverse colon.

The colonic wall is thickened (0.27 cm – 0.34 cm), most importantly, the submucosa. In addition, fogging of the muscularis is observed, however, mural detail is conserved. A large amount of gas and loose stools are present in the colon.

Pancreas

No overt abnormalities are observed with the architecture, contours, echogenicity or echotexture of the pancreas. There is no evidence of hyperechogenicity of the surrounding mesentery, i.e., signs of active pancreatitis are not present.

Other

Lymph nodes No abnormalities are observed

Abdominal effusion

A scant amount of anechoic effusion is visualized surrounding the gallbladder and a loop of jejunum in right cranial quadrant (adjacent to the right adrenal gland), as well as between a few loops of jejunum mid-abdomen.

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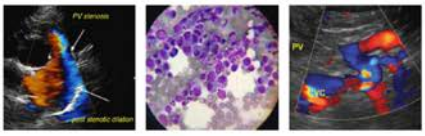

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ULTRASONOGRAPHIC FINDINGS

- **Liver:** A vacuolar hepatopathy is suspected which is consistent stress or chronic illness. Cholestasis is likely present. Hepatitis, cholangitis/cholangiohepatitis with an ascending bacterial infection from the gastrointestinal tract are possible differential diagnoses. There is no evidence of cirrhosis. A well differentiated hepatoma (adenoma) of the porta hepatis is possible, however, overt signs of neoplasia are not observed.

- **Gallbladder**: Gallbladder sludge, a cholelith, as well as signs of fibrosis of the wall, likely due to chronic intermittent episodes of cholecystitis. A mucocoele cannot be excluded, despite the absence of the classical "kiwi" appearance. An obvious rent or obstructive disease is not observed.

- **Kidneys**: Mild age-related degenerative changes of both kidneys, in addition to possible glomerulonephritis based on the severe hyperechogenicity of the cortex. However, pyelonephritis cannot be excluded despite the absence of classical sonographic signs given the blood work results.

- **Gastrointestinal (GI) tract**: Diffuse inflammatory changes of the small and large intestines are noted. A chronic enteropathy is suspected (food or fat intolerance, inflammatory bowel disease, dysbiosis, inadequate amounts of dietary fibre, etc.). Although wall layering is preserved, neoplasia cannot be excluded without performing tissue biopsies.

- **Adrenal glands**: Bilateral adrenomegaly most likely due to hyperplasia secondary to stress/ illness. Pituitary dependent HAC is unlikely based on the absence of clinical signs, although occult disease cannot be excluded.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The following are suggested/recommended:

Urinalysis, culture and sensitivity to exclude pyelonephritis

Consider enrofloxacin pending results.

If negative, a urine protein: creatinine ratio to exclude glomerulonephritis.

Arterial blood pressure, with the client present. This may not be possible due to Oskar's demeanour.

+/- Serum cobalamin, folate, TLI to exclude underlying EPI.

Differential diagnoses include cholecystitis, cholangitis/cholangiohepatitis, and secondary ascending bacterial infections. Although indiscriminate use of antibiotics is not recommended, consider broad-spectrum antibiotic with reassessment of liver enzymes, including GGT, in a few weeks, while *still receiving* the antibiotics. If an improvement is observed, continue antibiotic for an additional two weeks.

A cholecystectomy is strongly recommended, at which time, tissue biopsies, cultures and copper quantification of the liver and a culture of the bile should be performed (pending coagulation profile results), in addition to GI biopsies.

Vitamin K (0.5 mg/kg SQ q8-12h for 1-3 doses), even if PT/PTT within normal limits.

Evaluation of fasting triglycerides to exclude hyperlipidemia as underlying cause of or contributor to gallbladder sludge.

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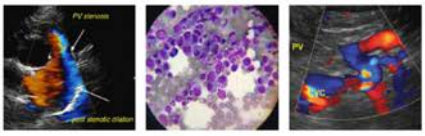

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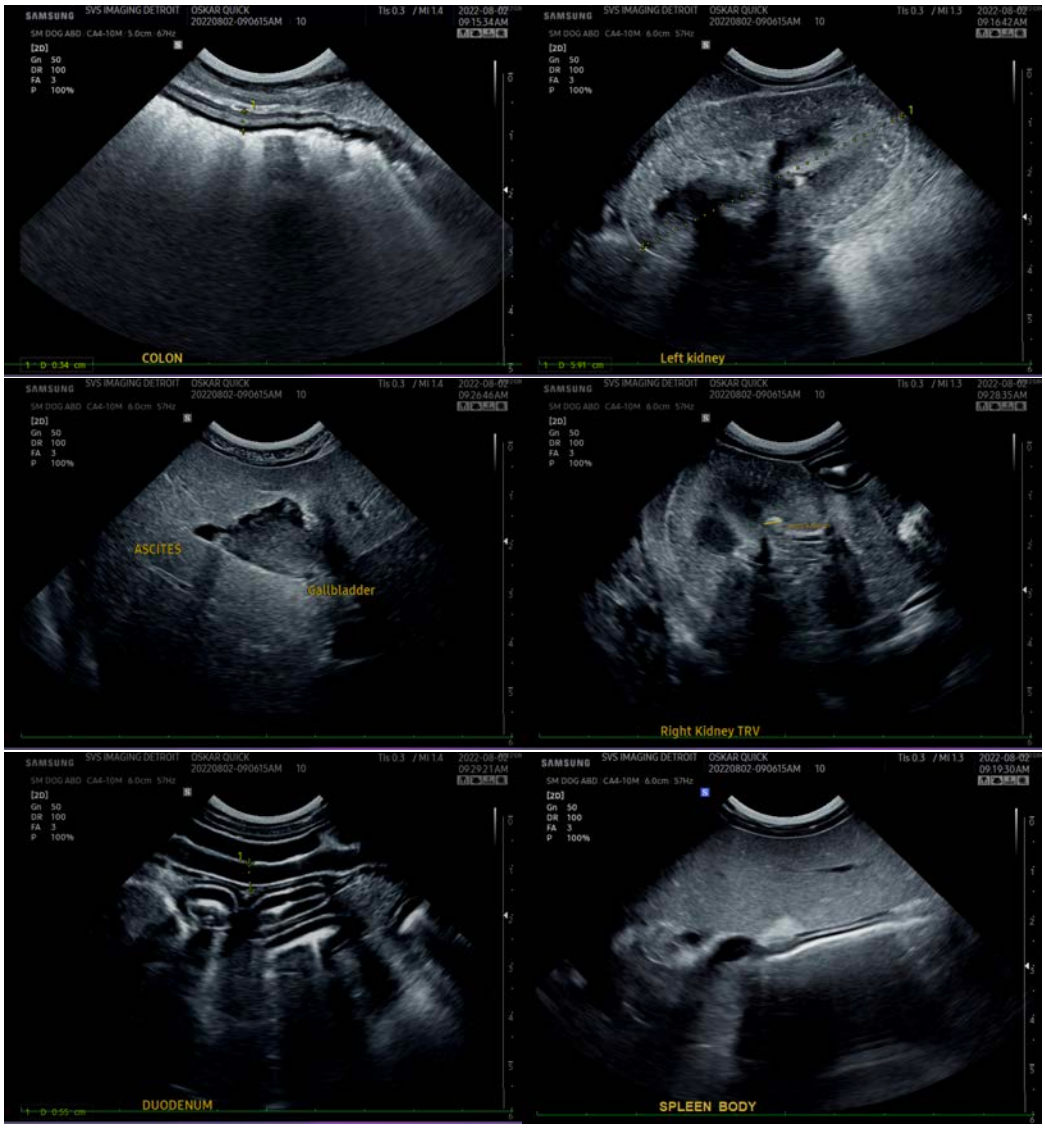
Analgesia to exclude visceral pain (gabapentin)

A clay based paste, containing montmorillonite and a synbiotic, may be administered during episodes of acute diarrhea.

Small, frequent meals

Supplementation of current diet with psyllium (soluble fibre)

A diet trial may be pursued depending on response to therapy, i.e., hydrolyzed, *low fat*, hypoallergenic diet (Purina HA)



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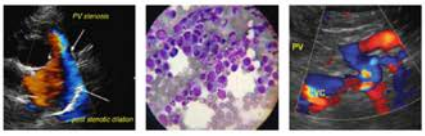

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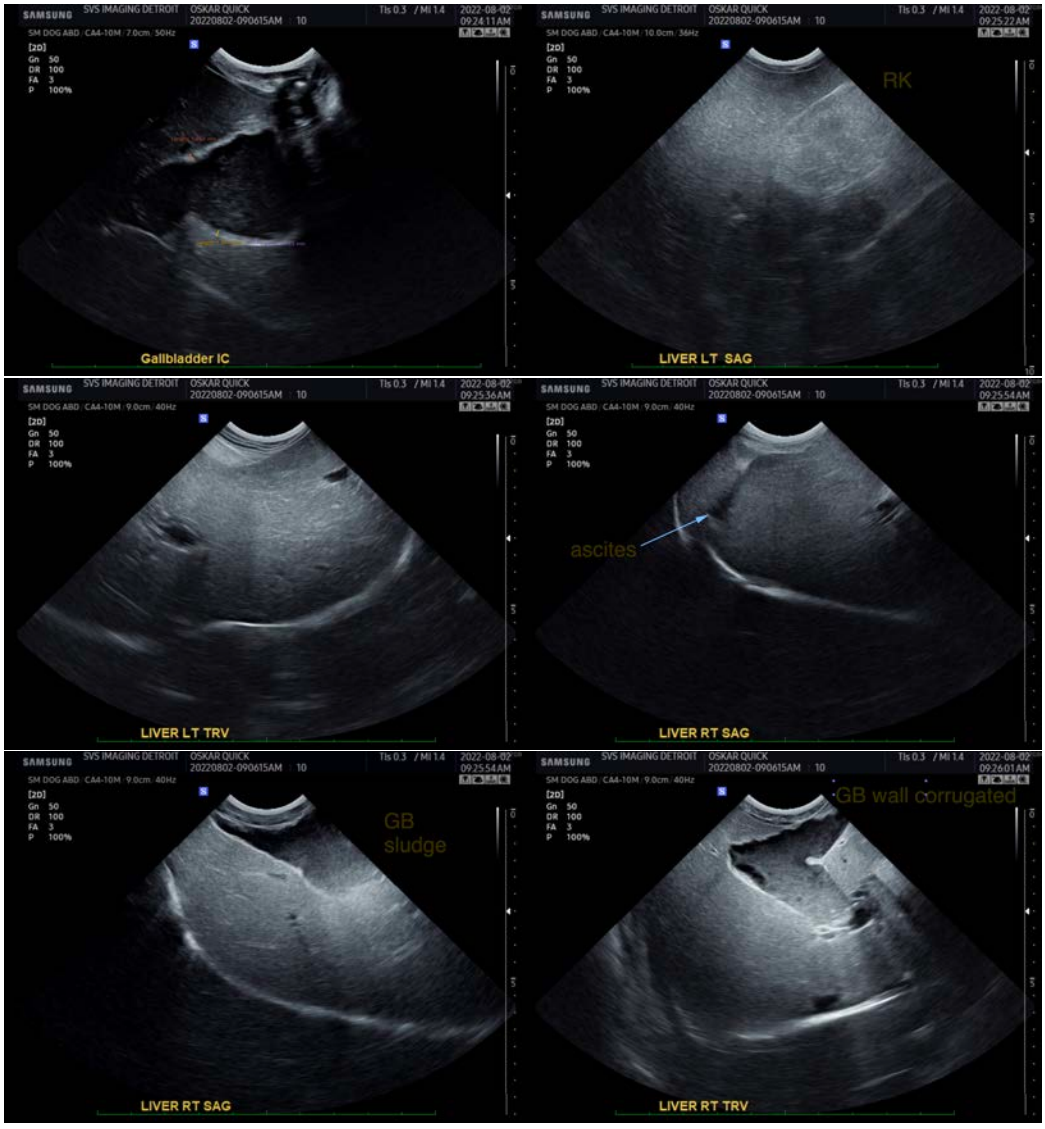

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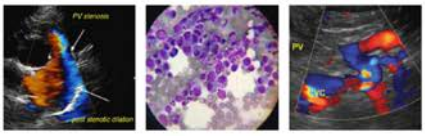

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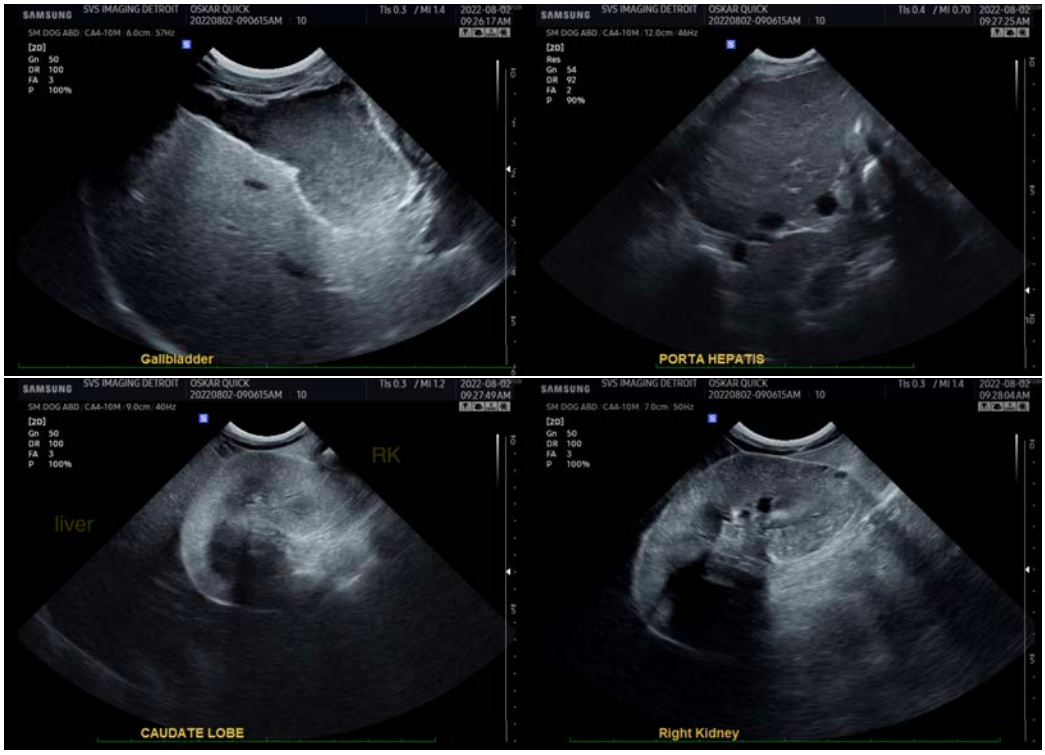

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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

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