**PATIENT**

Oreo Thompson

SPECIES

Feline

BREED

Domestic Shorthair

SEX

Neutered Male

AGE

21 years

WEIGHT

6.76 lbs

INTERPRETED BYLisa Carioto, DVM,
DVSc, Diplomate
ACVIM**IMAGING
PERFORMED BY**

Amy Mayhew LVT

HOSPITAL NAME

SVS Imaging Michigan

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DATE

1/10/20

PRESENTING CLINICAL SIGNS

Current Medications: Methimazole 5mg TD BID (just recently increased from 2.5mg BID), Cosequin capsules, Royal canin renal diet Patient History: Chronic renal disease 6/2016, Hyperthyroidism 1/2019, thickened bowels loops and inflamed pancreas on AUS on 4/8/2020. Recent history of weight loss, vocalization and voracious appetite.

Abnormal PE/Chem/CBC/UA Results: Abnormal Examination Findings: haziness to lenses OU; mild tartar/gingivitis diffuse; right and left sided 3/6 parasternal murmur; small intestines feel thickened, no masses palpated, kidneys are small and smooth; front declawed; thin BCS 2/5 Chem/CBC: mild eosinophilia; BUN 51, creat 1.6, T4 >8, ALT 243, GGT 14, elevated amylase UA-hematuria, USG 1.025, mild proteinuria **SEE ATTACHED LABS AND PREVIOUS AUS

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN**Urinary System**

The urinary bladder is well distended with anechoic contents. The wall is smooth and regular. No abnormalities are noted with the trigone or proximal urethra, and there is no evidence of sediment, cystoliths, polyps or a mass.

Kidneys

The **left** kidney measures 3.25 cm (3.80-4.40 cm). The capsule is smooth. The cortex is hyperechoic, i.e. it is isoechoic to the spleen. A mild loss of the normal definition of the cortico-medullary junction is present. Pyelectasia of 0.14 cm (transverse view) is noted. The surrounding mesentery is moderately hyperechoic.

The **right** kidney measures 3.68 cm (3.80-4.40 cm). The capsule is smooth. The cortex is hyperechoic. A mild loss of the normal definition of the cortico-medullary junction is present. An anechoic structure consistent with a cyst (2.2 mm in diameter x 2.7 mm in length) is present at the caudal pole. Pyelectasia of 0.28 cm (transverse view) is noted. The surrounding mesentery is mildly to moderately hyperechoic.

Aortic bifurcation/trifurcation

No abnormalities observed.

Adrenal Glands

The **left** adrenal gland measures 0.43 cm in diameter. 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 0.58 cm in diameter. 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

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The spleen is within normal limits in size 7.0 mm (normal = 10 mm), echotexture, and echogenicity. The capsule is smooth. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified.

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Liver

There are no obvious signs of hepatomegaly. The liver's borders are smooth, but mildly rounded.

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Left liver (transverse view): multiple heterogeneous masses are observed, one of which measures approximately 2.39 cm in diameter x 2.31 cm in length. The latter is comprised of anechoic structures, consistent with cysts. Ill-defined hyperechoic "patches" are scattered haphazardly amongst the cysts.

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Right liver (transverse view): a mass, measuring 3.08 cm in diameter x 3.04 cm in length, is noted. The centre of the mass is anechoic while anechoic, cystic lacunae are present perpendicularly to the centre of the mass. The surrounding parenchyma is severely hyperechoic, with occasional, small anechoic and hypoechoic nodules.

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Right liver (sagittal view): a subcapsular, anechoic structure with a thin capsule, 1.54 cm in diameter x 1.45 cm in length, is present. The structure, which is most consistent with a cyst, does not disrupt the integrity of the liver.

No obvious abnormalities are noted with the hepatic vessels.

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Gallbladder

The gallbladder (GB) is mildly dilated. A small amount of free floating and gravity-dependent echogenic material is present within the GB. The GB wall is within normal limits in thickness and echogenicity. Sludge is present within the cystic duct, however, it, and the common bile duct, are not dilated or tortuous, i.e. there are no signs of an obstruction. The parenchyma surrounding the GB is not hyperechoic.

INTERPRETED BYLisa Carioto, DVM,
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Oreo is supposed to have been fasted, however, a large amount of food 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 more prominent than usual.

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The duodenum is thicker than normal, measuring 0.314 cm. Although wall layering is within normal limits, the submucosa is thicker than normal. Fluid and ingesta are also present within the lumen of the duodenum.

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The muscularis of the small intestines is thicker than normal, and some loops show a more prominent mucosa with moderate to severe fogging, as well as occasional stippling. Multiple loops of bowel are thicker, measuring between 0.27 cm and up to 0.36 cm, yet the definition of the wall layers is preserved. The mesentery surrounding the GI tract is moderately to markedly hyperechoic.

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The ileo-cecal-colic junction is thicker than normal (0.42 cm) with thickening of the muscularis. No abnormalities are noted with wall layering.

Abnormally dilated loops of bowel are not observed, however, a moderate amount of fluid is present within their lumen. A mild decrease in peristalsis is noted throughout the gastrointestinal tract, including the duodenum, i.e. a "to and fro" movement is observed, which is suggestive of an ileus.

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The colonic wall is not thickened and mural detail is considered normal. Semi-formed stools are present within the lumen.

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Pancreas

The **left** and **right limbs** are prominent and diffusely hypoechoic. Their contours are relatively smooth. The surrounding mesenteric fat is moderately to severely hyperechoic. These findings are highly suggestive of active pancreatitis. Overt signs of neoplasia are not noted.

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Other**Lymph nodes**

Mesenteric lymph nodes, particularly surrounding the ICCJ, are not enlarged, but slightly rounder and more "plump" and the surrounding mesentery is mildly hyperechoic.

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Abdominal effusion is not visualized.

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ULTRASONOGRAPHIC FINDINGS**INTERPRETED BY**Lisa Carioto, DVM,
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- **Gastrointestinal (GI) tract:** A delay in gastric emptying is suspected if Oreo was fasted for the ultrasound. Other findings are suggestive of a mild, but diffuse ileus of the GI tract. High index of suspicion of a chronic enteropathy, including severe eosinophilic inflammatory bowel disease or food intolerance. Although the definition of the wall layers is preserved, neoplasia, such as lymphoma or mast cell tumour, cannot be excluded, both of which can cause eosinophilia. The eosinophilia is mild.
- **Lymph nodes:** Reactive hyperplasia or inflammation could explain the very mild changes observed with the mesenteric lymph nodes, i.e. not enlarged, but slightly rounder and more "plump".
- **Liver and Gallbladder:** The hepatic changes are most consistent with biliary cystadenomas. Cystadenocarcinomas cannot be excluded, but are considered less likely as cystic changes were first observed two years ago at the time of his original abdominal ultrasound on 4/8/2020. The elevated ALT and GGT enzyme activities may be secondary to the former changes, however, hyperthyroidism may also be contributing to the increased ALT. Gallbladder sludge is often clinically insignificant, however, cholangitis/cholangiohepatitis, and cholecystitis may occur. The latter are considered less likely, but cannot be excluded without performing further diagnostics.
- **Pancreas:** Active pancreatitis is suspected. Overt signs of neoplasia are not appreciated.
- *Note, based on the above findings, severe "triaditis" cannot be excluded.*
- **Kidneys:** Changes are suggestive of age-related degeneration and mild renal disease. Very mild, bilateral pyelectasia may occur due to polydipsia/polyuria secondary to renal disease and pyelonephritis, both of which may be present in Oreo's situation. Intravenous fluid therapy is unlikely based on his history provided. Blood work and USG results are consistent with chronic renal disease, which may be complicated by pyelonephritis.

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The following are suggested/recommended

- A urinalysis and urine culture and sensitivity to exclude pyelonephritis.
- Treatment for pancreatitis, most importantly, analgesia, such as buprenorphine (0.005-0.01 mg/kg, sublingually, every 8-12 hours) with or without gabapentin. Continue for 3-4 weeks, or longer, as needed.
- TLI, serum cobalamin, and folate to exclude cobalamin deficiencies and exocrine pancreatic insufficiency (EPI) and secondary dysbiosis.
- If signs of gastro-esophageal reflux disease (GERD) due to IBD, pancreatitis or renal disease, consider 10-14 day trial with famotidine or omeprazole (0.7-1 mg/kg PO **q12h**)
- Diet trial (veterinary prescription brand hypoallergenic, i.e., hydrolyzed or novel protein) that is also renal friendly, i.e. Royal Canin Renal Support/HP diet. *Note, additional soluble source of fibre (psyllium) may be required, as hydrolyzed diets are often restricted in fibre.*
- Small, frequent meals
- Supplementation with cobalamin
- Subcutaneous fluids at home, if possible, a few days a week due to renal disease
- Cholangitis/cholangiohepatitis and cholecystitis, including a secondary ascending bacterial infection, cannot be excluded. Although indiscriminate use of antibiotics is not normally recommended, one could start treatment with a broad-spectrum antibiotic if an improvement is not observed with the above therapies.
- Endoscopy and biopsies of the upper and lower GI tract would be ideal to obtain a definitive diagnosis, however, Oreo is not the ideal candidate for general anesthesia, therefore, empirical treatment with corticosteroids (for IBD, triaditis, or lymphoma) may eventually be pursued depending on his response to the above treatment suggestions.
 - ⇒ *Note, dexamethasone is preferable to prednisolone due to the heart murmur (less mineralocorticoid effects). Dexamethasone (0.03-0.05 mg/kg) PO once a day for 7- 14 days, then tapered. Although the initial dose may be increased to 0.10 mg/kg/day, if necessary.

A consultation with an internist may be considered in the future due to Oreo's complicated medical history and co-morbidities.



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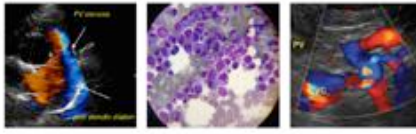
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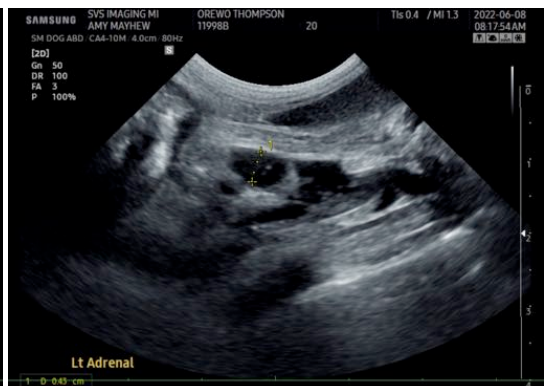
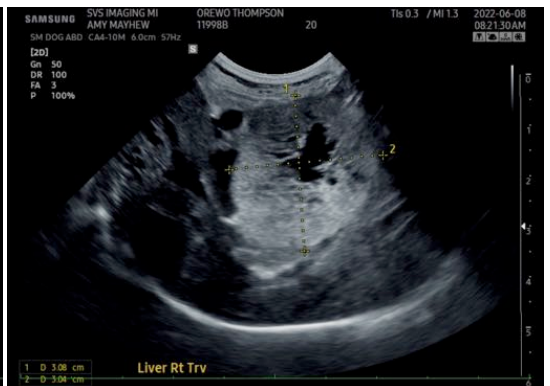
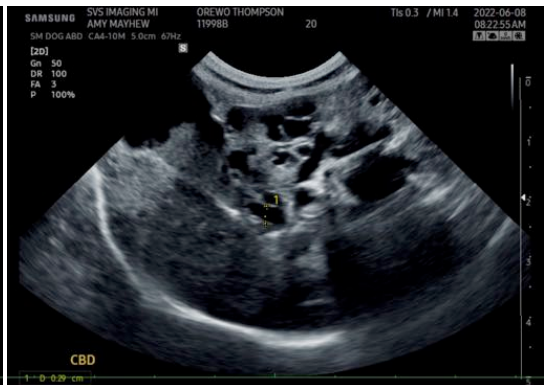
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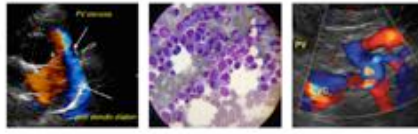
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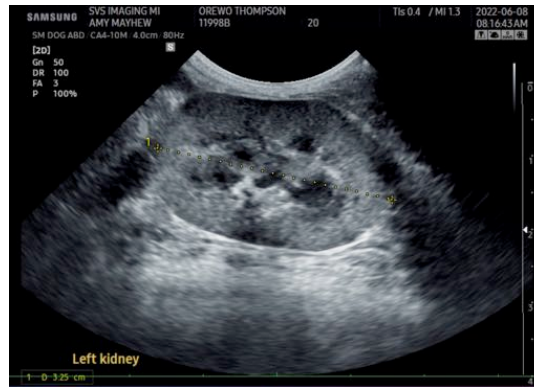
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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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