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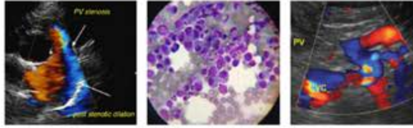

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
1-800-838-4268 info@sonopath.com SonoPath.com

PATIENT

Macey Krygier

SPECIES

Canine

BREED

Yorkie

SEX

Spayed Female

AGE

12 Years

WEIGHT

6 lb 12 oz

INTERPRETED BY

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY

Amy Mayhew, LVT

HOSPITAL NAME

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INVOICE

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PRESENTING CLINICAL SIGNS

Anorexia, lethargy, vomiting, painful abdomen--acute onset
Abnormal PE/Chem/CBC/UA Results: Tense on abdominal palpation, dehydrated (6-8%). Increased alt, alkp, globulins, and neutrophilia. Please see attached labs.

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. A scant amount of anechoic fluid is noted cranial to the urinary bladder.

Kidneys

The **left** kidney measures 3.81 cm. The capsule is smooth. The cortex is mildly hyperechoic (i.e., the cortex is isoechoic to the spleen), and a mild loss of the normal definition of the cortico-medullary junction is present. Very small mineralizations of the diverticulae and pelvis are present. There are no signs of nephroliths or significant pyelectasia (pelvis 1.0 mm). The surrounding mesentery is mildly hyperechoic.

The **right** kidney measures 3.65 cm. Its overall architecture, including the definition of the cortico-medullary junction, is preserved. There are no signs of nephroliths or significant pyelectasia (pelvis 1.7 mm). The surrounding mesentery is moderately to severely hyperechoic.

Aortic bifurcation/trifurcation No abnormalities observed.

Adrenal Glands

The **left** adrenal gland measures 0.52 cm at the cranial pole, 0.48 cm at the caudal pole. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

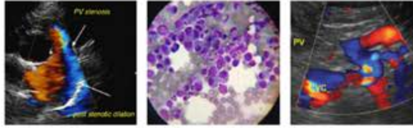
The **right** adrenal gland measures 0.43 cm at the cranial pole, 0.43 cm at the caudal pole. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

Spleen

The spleen is within normal limits in size, architecture, echotexture, and echogenicity. The capsule is smooth. A well-defined hyperechoic nodule is noted mid-body (approximately 3 mm x 1 mm). It is most consistent with mineralization, deposition of fat, fibrosis or a combination of these differential diagnoses. 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. The liver's borders are smooth and sharp, with a few being mildly rounded. An in-depth evaluation of the entire liver is difficult to perform due to gas and ingesta in the surrounding GIT, as well as Macey's severe discomfort, despite the administration of analgesics. It appears to be within normal limits in echogenicity, i.e., it is hypoechoic to the spleen, except in regions adjacent to the gallbladder (see below). The majority of the liver visualized is homogeneous, however one of the lobes is moderately heterogeneous with multiple anechoic to hypoechoic nodules scattered throughout the parenchyma. Some of the nodules are well-defined, while others are ill-defined. An example of an ill-defined nodule, measuring 1.01 cm in diameter x 1.10 cm in length, is noted at the dorsal aspect. It does



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not disrupt the integrity of the capsule. This particular liver lobe appears cystic, however, two possible target lesions are noted depending on the angle of the probe. A very small amount of anechoic fluid is observed between the diaphragm and liver.

The **gallbladder** (GB) is moderately distended with a large cholelith and a small amount of free floating and aggregated echogenic material (sludge). The cholelith measures at least 1.26 cm. The GB wall is just above normal (1.1 mm). It is mildly to moderately hyperechoic. The cystic and common bile ducts (CBD) cannot be followed due to gas and ingesta in the surrounding GIT, as well as Macey's severe discomfort, despite the administration of analgesics. The hepatic parenchyma surrounding the GB is severely hyperechoic. Obvious intra-hepatic biliary duct dilation is not evident, however an in-depth evaluation of the liver is not possible for the same reasons the cystic duct and CBD cannot be followed.

Gastrointestinal

A large amount of ingesta and gas are present in the lumen of the stomach. The gastric wall is within normal limits in thickness and the wall layers are well defined, however, subjectively, the mucosa, submucosa and muscularis are more prominent than usual and both fogging and stippling of the mucosa and muscularis are present. Peristalsis is difficult to evaluate due to the large amount of ingesta.

The duodenum is mildly thickened at 0.63 cm. Stippling, fogging and striations of the mucosa are present. Subjectively, the submucosa is mildly prominent in certain angles.

The small intestinal wall thickness is within normal limits and the definition of the wall layers is preserved. A large amount of ingesta and fluid are present in the jejuni with signs of ineffective peristalsis ("a to and fro" motion). Mild fogging of the mucosa of the jejuni is also noted. Abnormally dilated loops of bowel are not observed. There are no signs of a foreign body, mass or an obstruction.

Transverse colon: No abnormal findings. The colonic wall is not thickened and mural detail is considered normal. Soft stools and gas are present in the colon.

Pancreas

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

The **right limb** is mildly to moderately hypoechoic, with smooth borders. The mesentery surrounding the limb and duodenum is moderately to severely hyperechoic, i.e., signs are suggestive of active pancreatitis.

Other

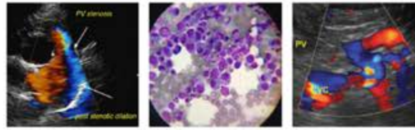
Lymph nodes No abnormalities are observed

Abdominal effusion

A scant amount of anechoic fluid is noted cranial to the urinary bladder. A very small amount of anechoic fluid is also visualized in the region of the right adrenal, and between the diaphragm and liver.

ULTRASONOGRAPHIC FINDINGS

- **Gallbladder (GB)**: Mild to moderate gallbladder dilation with presence of a cholelith and some sludge, with subsequent severe inflammation of the surrounding hepatic parenchyma. Obvious edema or fluid accumulation immediately surrounding the GB is not observed, however, a circumferential view is not available. Furthermore, the cystic and common bile ducts (CBD) could not be followed due to gas and ingesta in the surrounding GIT, and Macey's severe



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discomfort, despite the administration of analgesics. Therefore, a small rent in the GB cannot be excluded.

- **Ascites**: A very small amount of anechoic ascites is noted in the in the region of the right adrenal, and between the diaphragm and liver, as well as cranial to the urinary bladder. A small rent in the GB cannot be excluded, vs. vasculitis or increased permeability due to inflammation.

- **Liver**: A vacuolar hepatopathy secondary to stress and chronic illness cannot be excluded, despite the absence of hyperechogenicity. Cholestasis is suspected. Hepatomegaly may occur due to inflammation as a result of non-specific inflammation (secondary to cholecystitis, cholangitis/cholangiohepatitis, with a secondary bacterial infection). Underlying immune-mediated hepatitis is less likely given the appearance of the liver and Macey's history, however, a biopsy is required to confirm or exclude this diagnosis. Multiple anechoic to hypoechoic cyst-like lesions are noted in one of the lobes. They are most likely benign cysts and age-related nodular hyperplasia or regeneration, however, two of the nodules have very subtle changes that may be consistent with early target-like lesions. Therefore, neoplasia cannot be excluded with certainty.

- **Pancreas**: Active pancreatitis of the right limb is suspected. It is likely associated with its anatomical proximity to the CBD and duodenum, rather than a "primary" pancreatitis.

- **Gastrointestinal tract**: If Macey was fasted, delayed gastric emptying is suspected i.e., a large amount of ingesta remains in Macey's stomach. Signs of gastroenteritis are present, which may be due to her recent vomiting episodes, however, signs of possible lymphangiectasia and underlying chronic inflammation (underlying inflammatory bowel disease) cannot be excluded (striations). There are no signs of neoplasia.

- **Kidneys**: Very mild age-related changes are observed. The mild hyperechogenicity of the surrounding mesentery may be due to inflammation associated with the gallbladder and pancreas, however, pyelonephritis cannot be excluded.

- **Spleen**: The hyperechoic splenic nodule is most consistent with mineralization, deposition of fat, fibrosis or a combination of these differential diagnoses. It is not considered clinically significant.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The following are suggested/recommended

Urinalysis and urine culture to exclude pyelonephritis.

Coagulation profile, followed by vitamin K injections (pending the results of the coagulation profile).

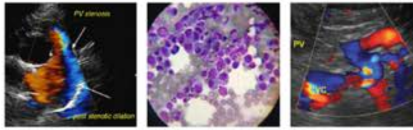
Vitamin K (0.5 mg/kg SQ q8-12h for 1-3 doses), even if PT/PTT within normal limits.

Intravenous fluids, if not already receiving

A bolus of 10-20 ml/kg over 20 minutes is suggested. Her hydration status should be reassessed and an additional bolus of 10-20 ml/kg over 20 minutes may be administered, if necessary.

Monitor weight twice a day (due to heart murmur); helps monitor ins and outs to maintain hydration and avoid volume overload.

Analgesia – IV, ideally a CRI of an opioid (e.g. fentanyl), and CRI of lidocaine and ketamine. Not sure if she will tolerate gabapentin orally, in addition to IV analgesics.



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Intravenous antibiotics with ampicillin or ticarcillin IV and enrofloxacin IV

Pantoprazole IV twice a day

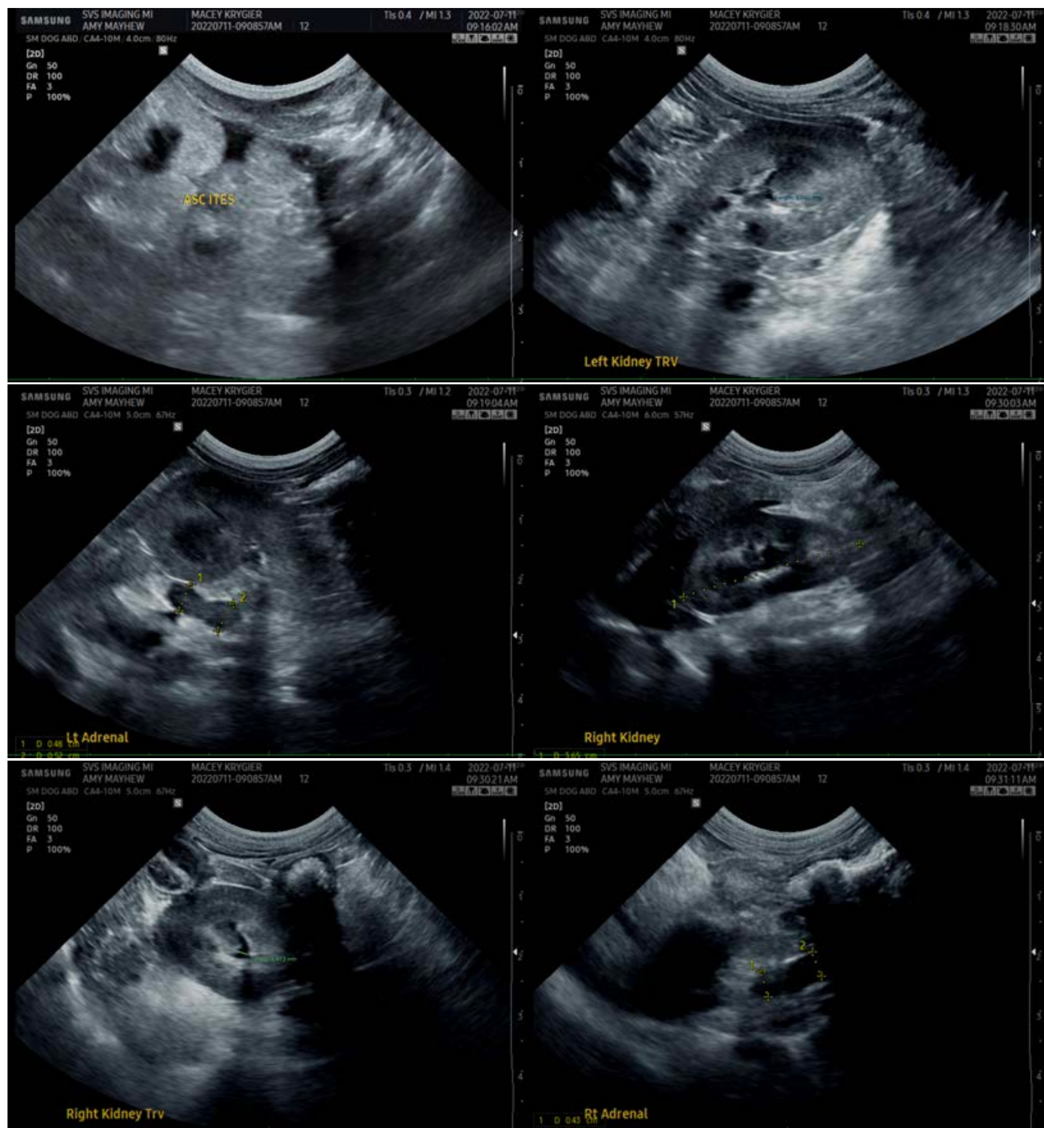
Maropitant (Cerenia) intravenously, at 1 mg/kg. If it is ineffective, you could try combining it with metoclopramide as a CRI. Ondansetron is another option (IV), although it is more expensive.

Once stable hemodynamically, an emergency laparotomy with a board certified surgeon is suggested, with the goal of performing a cholecystectomy and liver biopsy.

If clients are not ready to pursue surgery, can consider a CT scan and angiogram, which may help determine if a partial GB rupture has occurred. If this is also not an option, continue aggressive medical therapy.

Monitor temperature multiple times a day

Evaluate CBC smear for toxic/degenerative neutrophils and blood glucose (sepsis)



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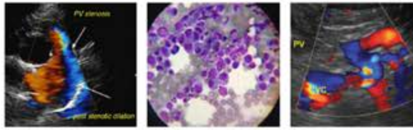

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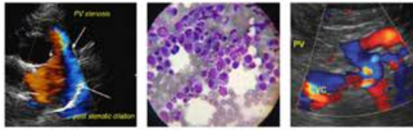

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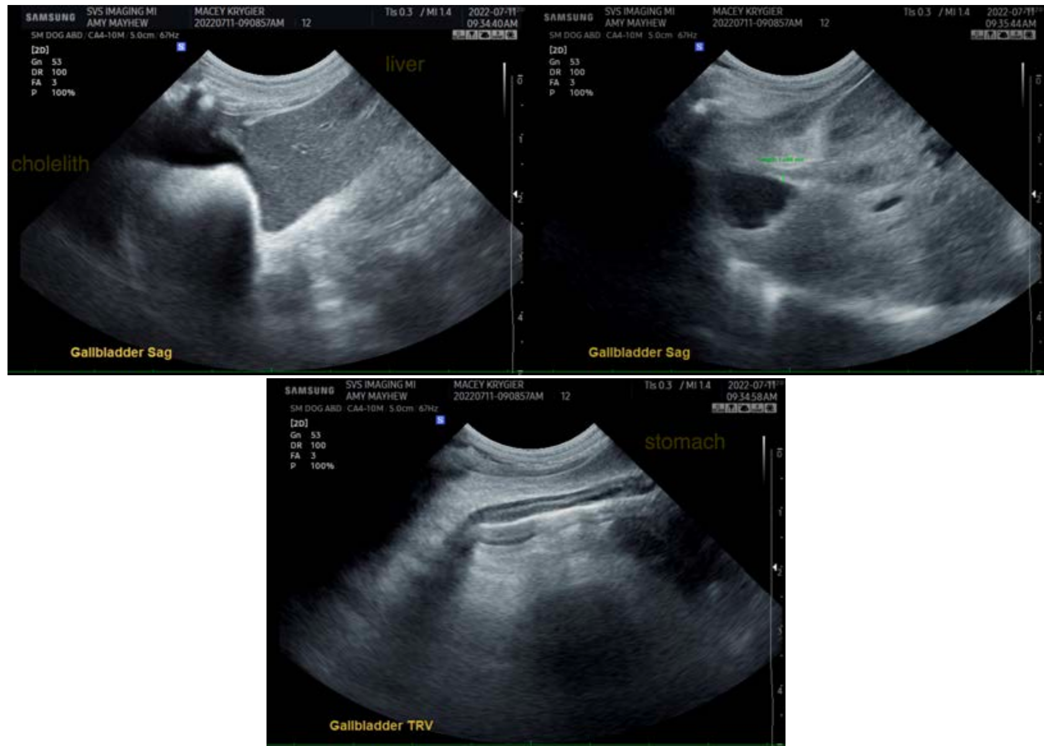

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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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