



Case of the Month

May 2020

Julie Pearson, DVM

Sonopaws LLC

Hampton, Virginia

IVUSS Case of the Month

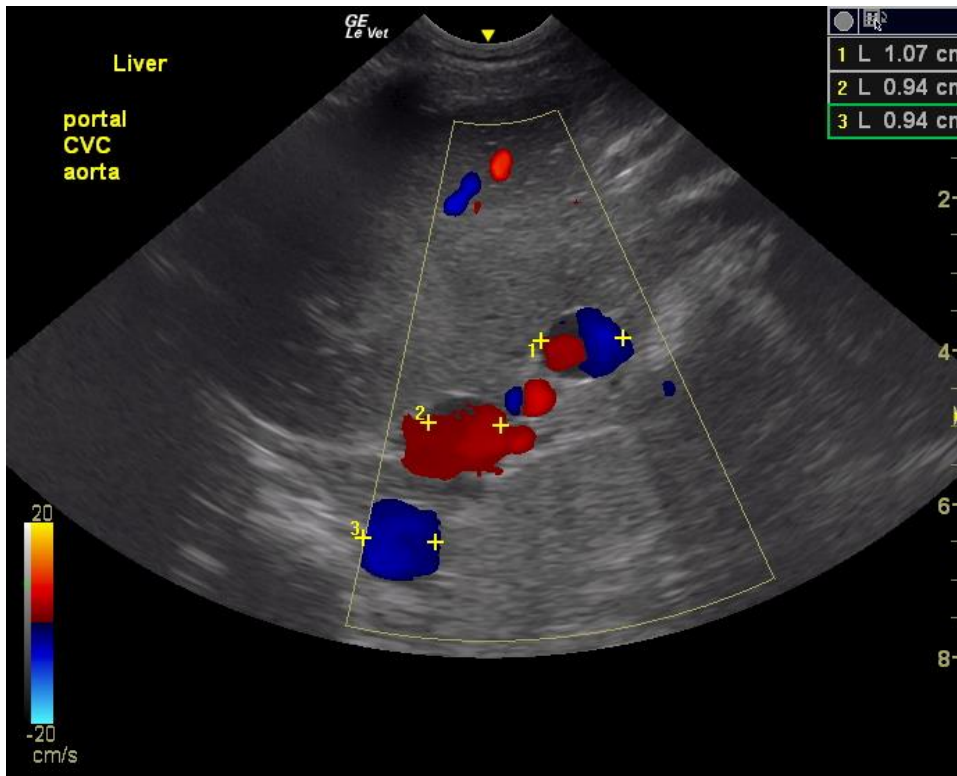
Julie Pearson, DVM
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8-month-old Australian Cattle dog with GI foreign bodies and an intra-hepatic liver shunt

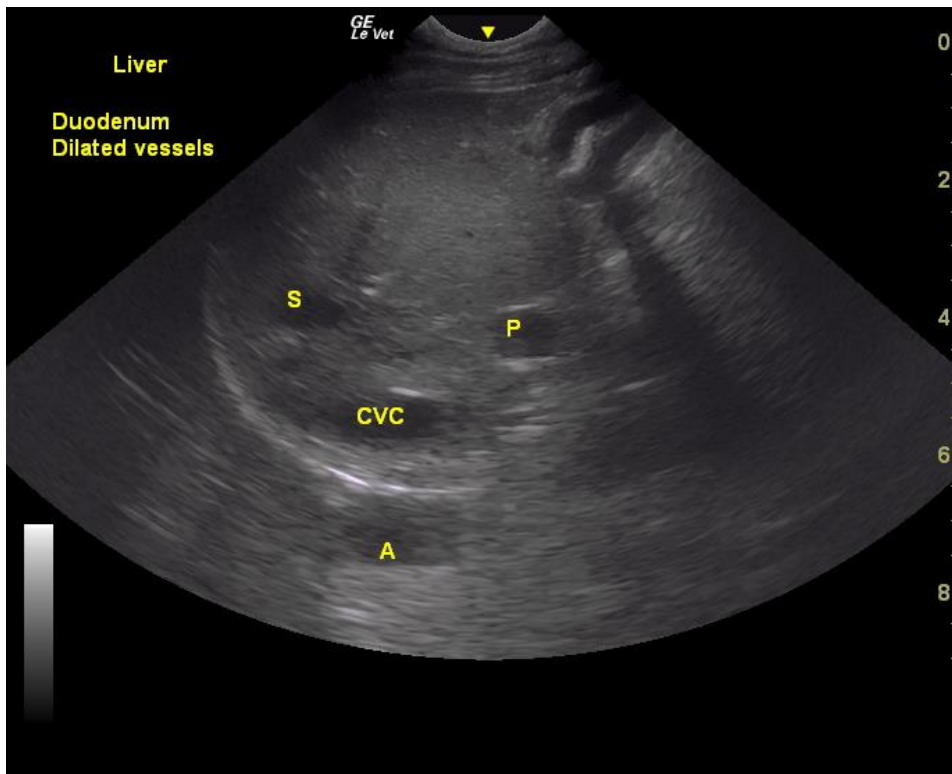
Presentation:

An 8-month-old, 20 lb, female intact Cattle dog presented for acute blindness, miosis, ataxia, head pressing, ptyalism and hyperthermia. Bloodwork showed increased ALP (293>150) indicative of bone growth, cholestasis or secondary cholangitis and ALT (181>118) indicative of primary or secondary hepatic inflammation (toxins vs hepatitis vs other). Toxin ingestion (mushrooms or other) was suspected since the patient was known for “eating everything”. The patient fully recovered within 12 hours with IV fluids and Cerenia. The patient presented for a similar neurologic episode 5 days later, along with severe abdominal pain. Repeat bloodwork showed increased ALP (374>150) with high normal ALT (119>118), leukocytosis (WBC 21>10) with neutrophilia (Neut 18.6>10), due to inflammation vs infection. An abdominal ultrasound was recommended to rule out a foreign body in the GI tract.

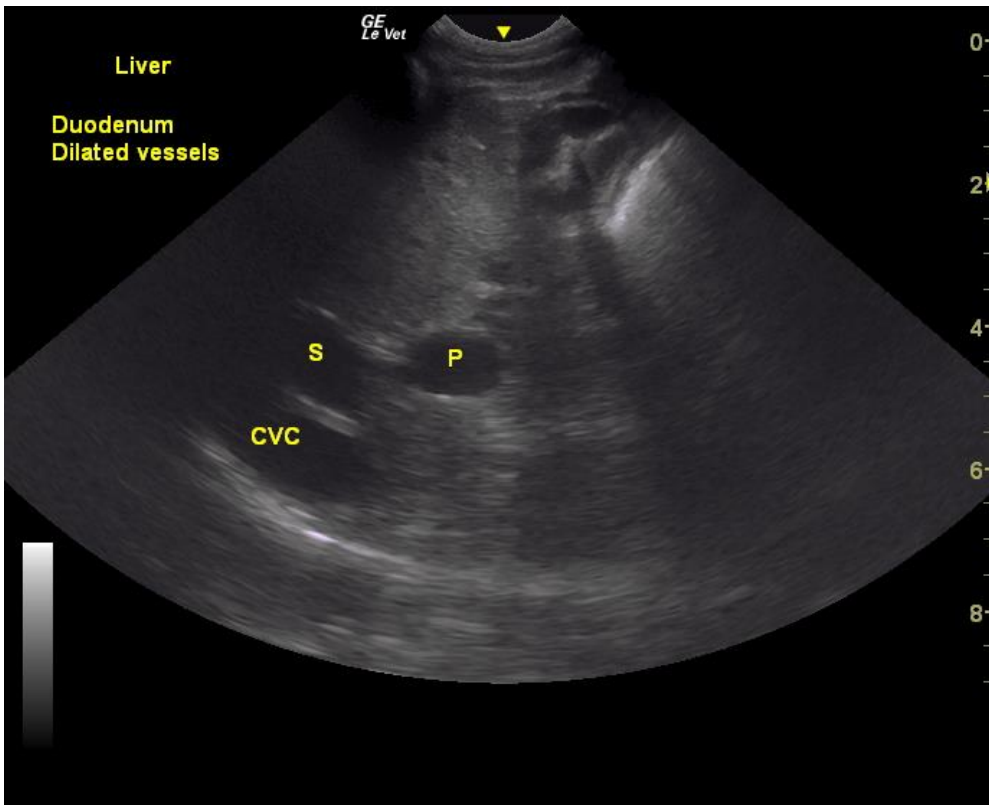
Ultrasound:



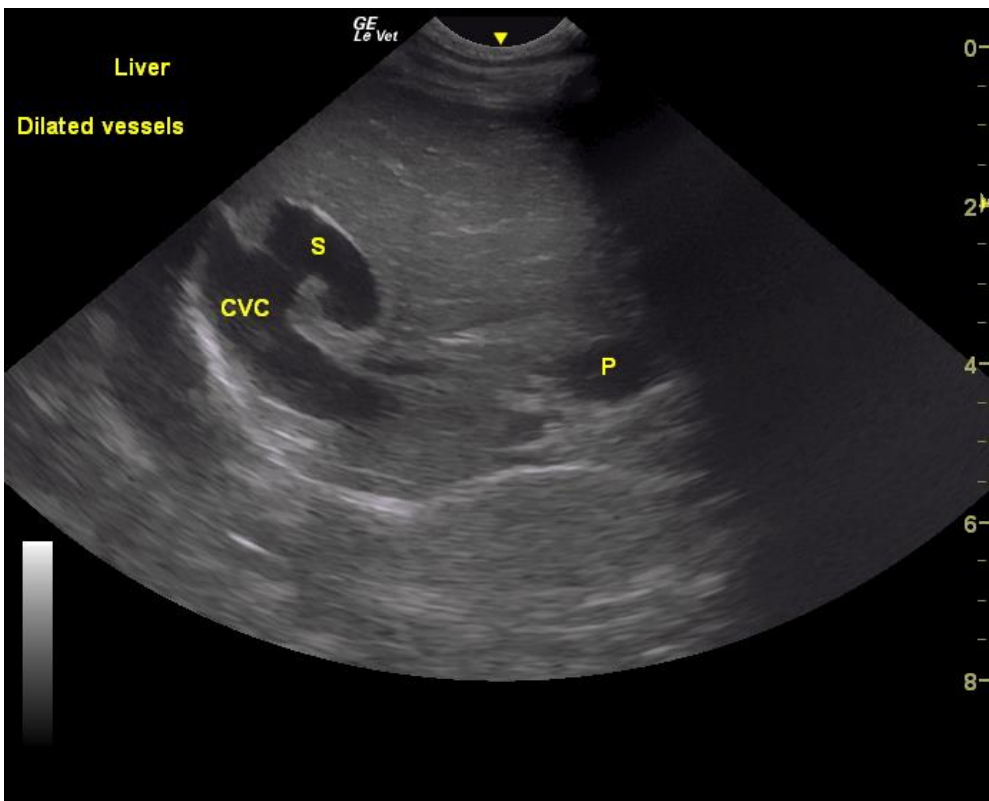
Liver: normal PV/CVC/Ao ratio



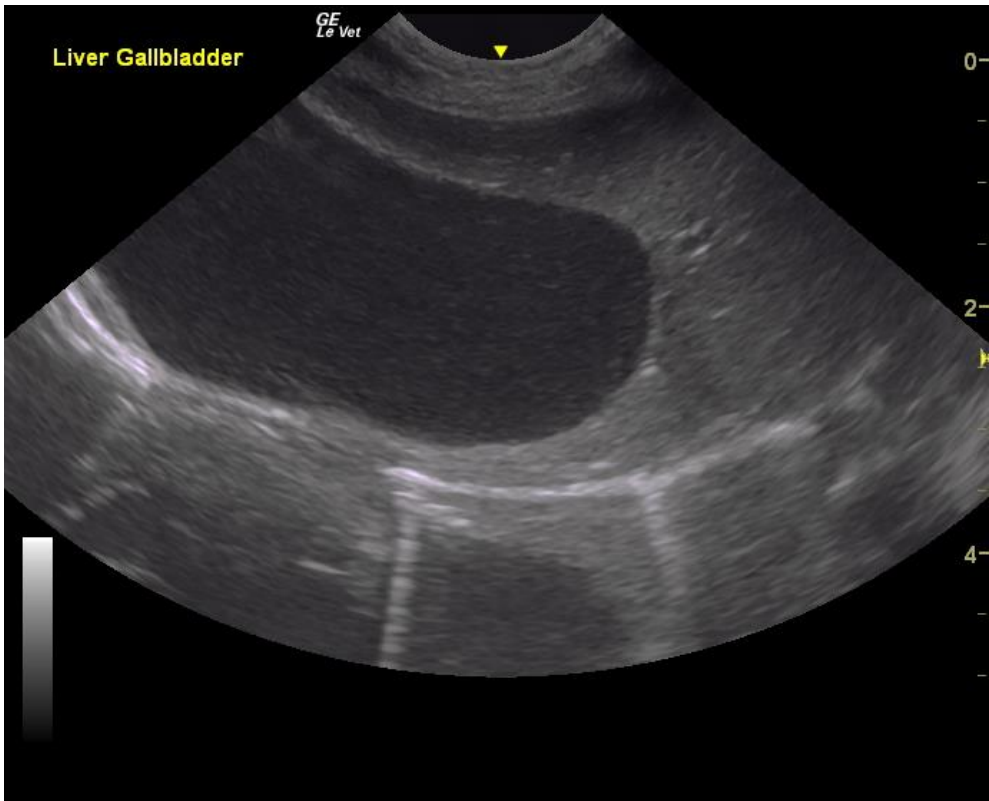
Liver: abnormal vessel in the right liver (S)



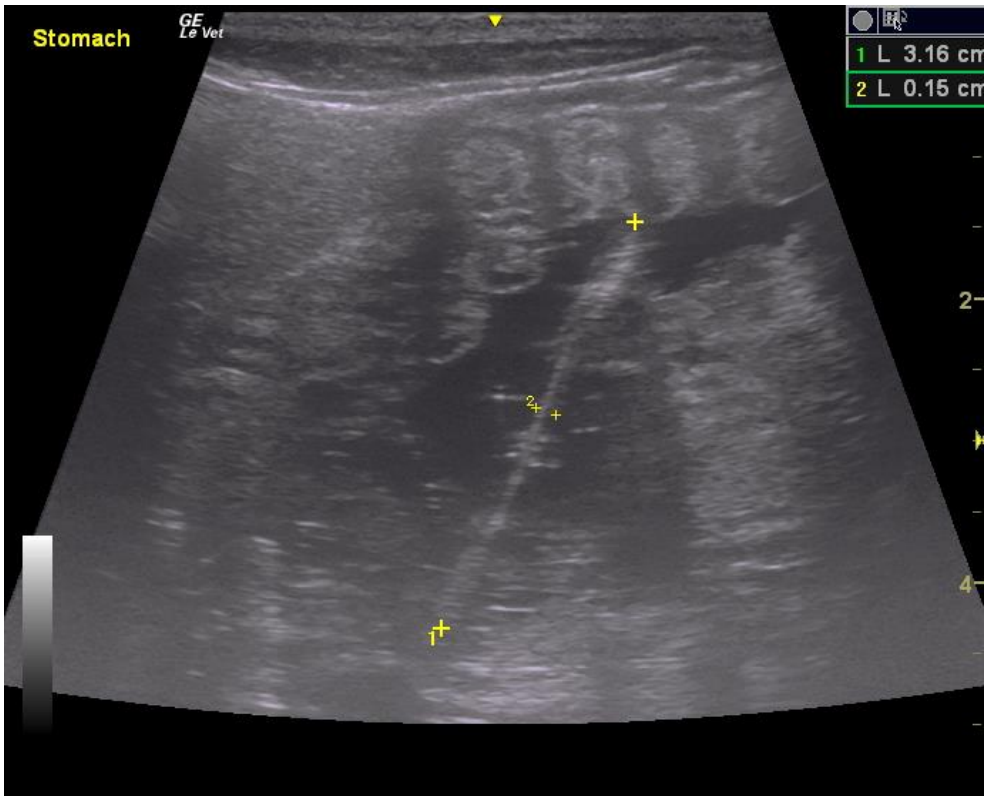
Liver: abnormal vessel (S) connects to the portal vein (P)



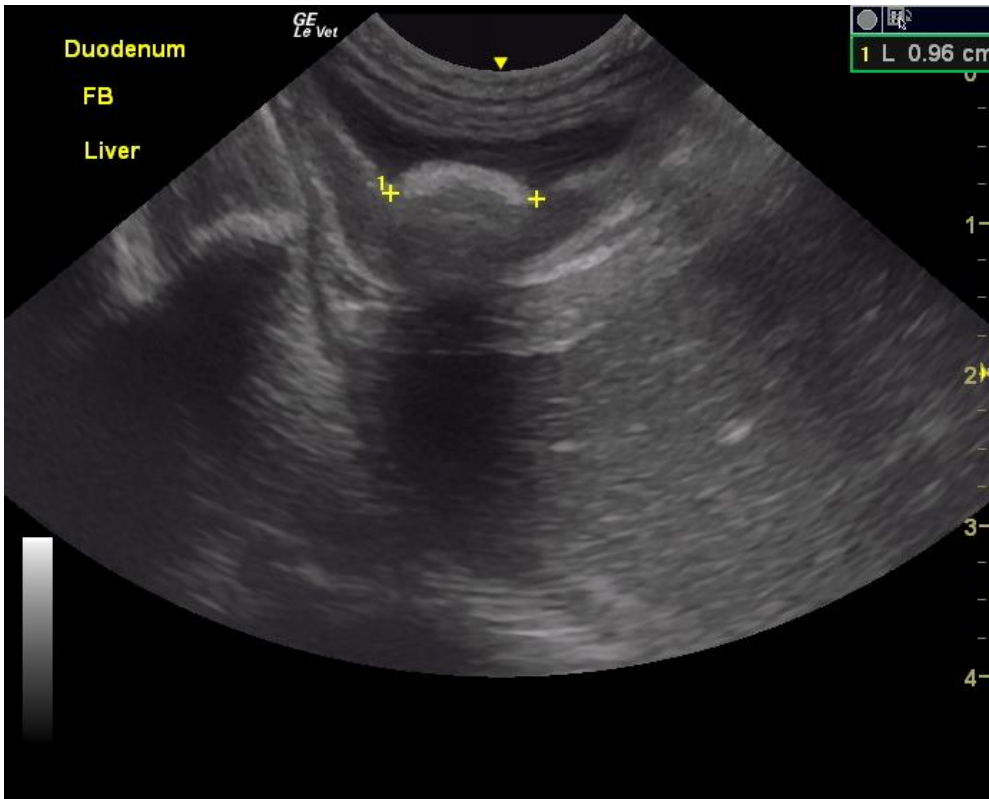
Liver: abnormal vessel (S) connects to the Caudal Vena Cava (CVC)



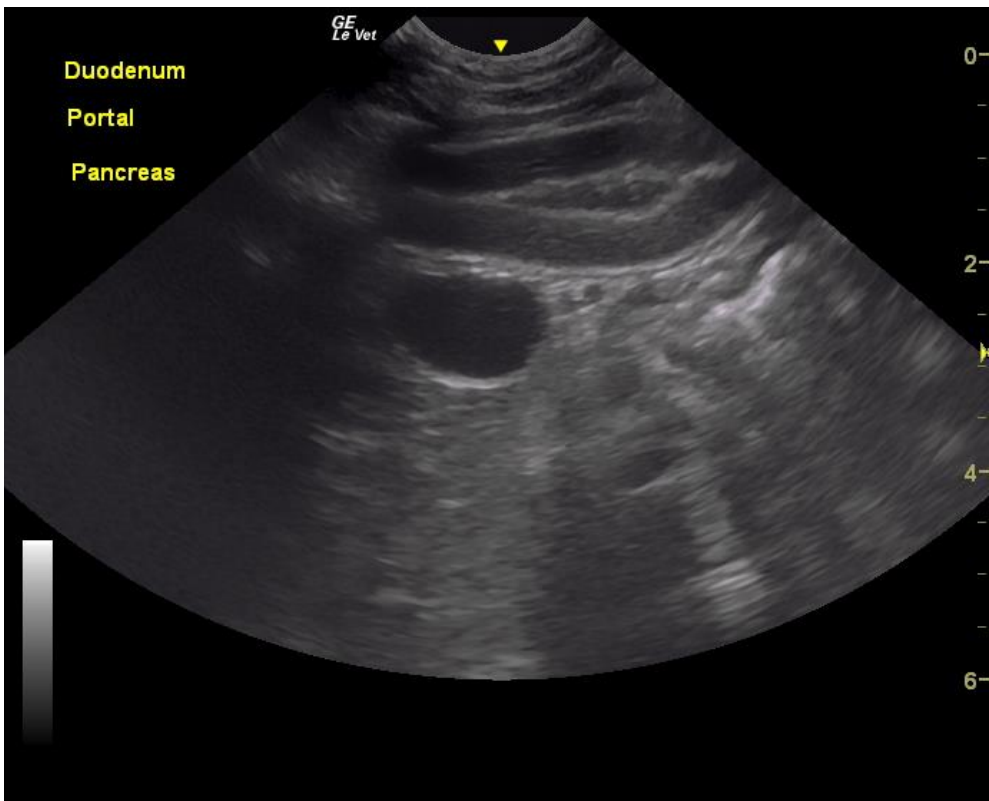
Gallbladder: severely distended, normal wall



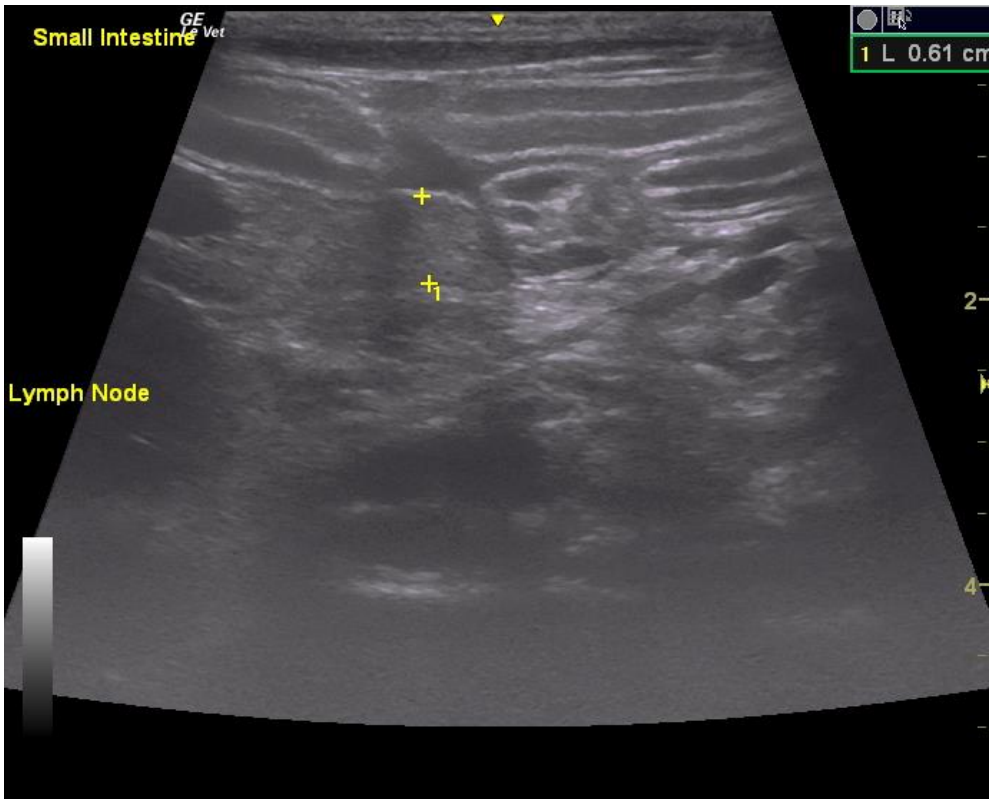
Stomach: hyperechoic shadowing structure in the lumen



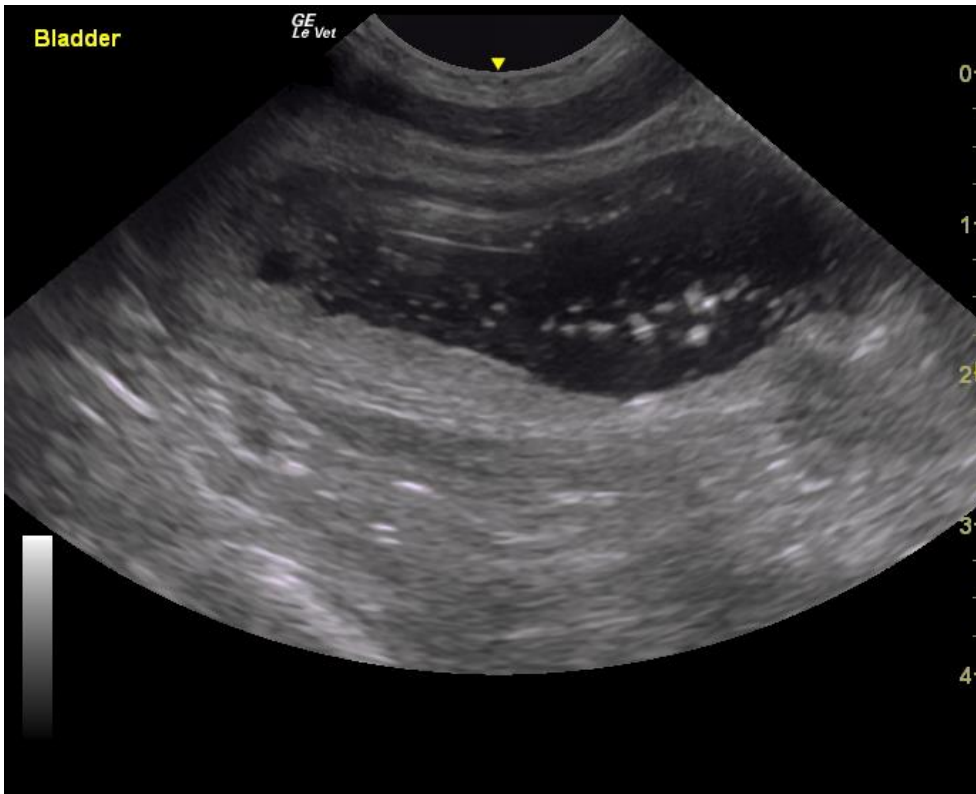
Duodenum: hyperechoic shadowing structure in the lumen



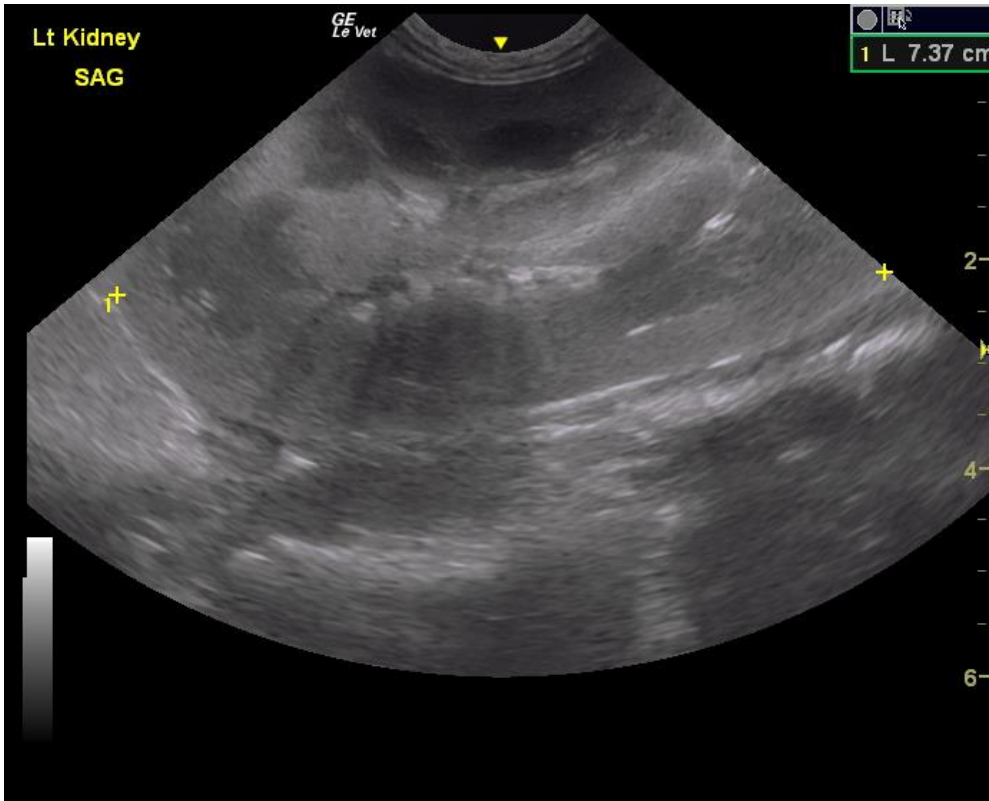
Duodenum, pancreas and portal vein



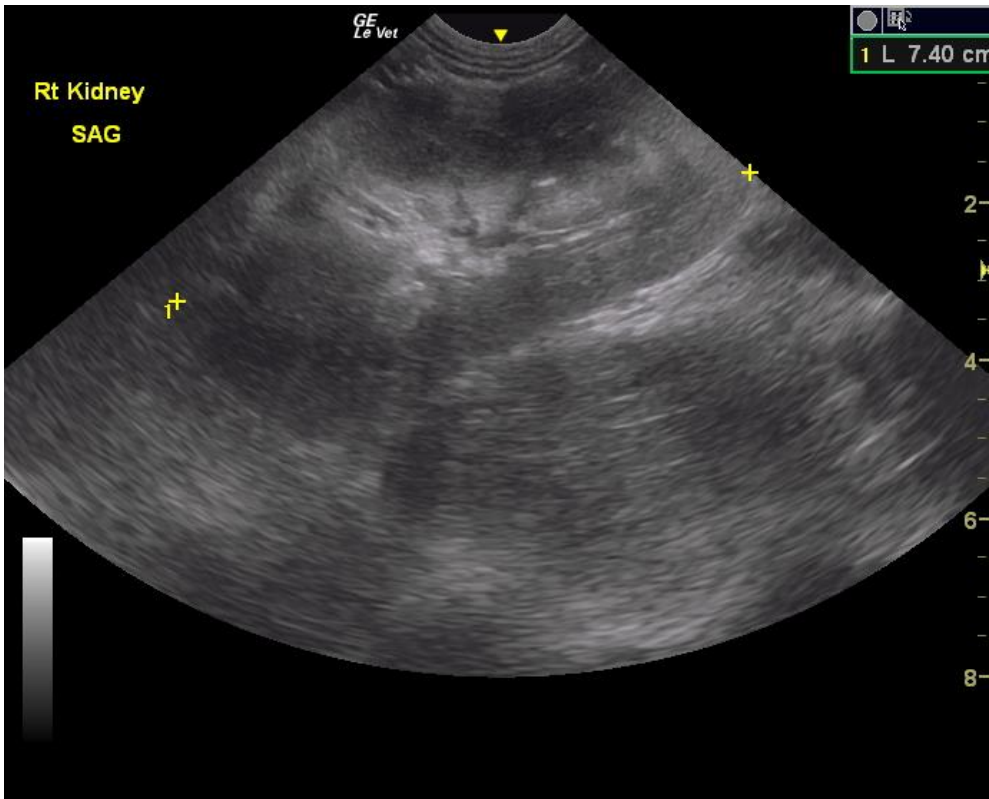
Normal small intestines, enlarged mesenteric lymph node



Urinary Bladder: diffusely thickened wall, hyperechoic sediment



Large left kidney, sagittal view



Large right kidney, sagittal view, measuring 7.4cm

Abdominal ultrasound findings:

Liver: The liver is subjectively normal in size and echogenicity. There is a normal Portal Vein/CVC/Aorta ratio. One tortuous anechoic structure is seen running between the portal vein and the CVC, compatible with an abnormal blood vessel.

Stomach: The stomach is dilated with anechoic fluid and a diffusely thickened wall. A thin hyperechoic shadowing structure, measuring at least 3 cm long is seen in the lumen.

Duodenum: A 1 cm long hyperechoic shadowing structure is seen in the lumen. The thickness (4.9mm) and layers are normal.

Mesenteric lymph nodes: There is a prominent hypoechoic LN, measuring up to 6mm in thickness.

Urinary bladder: The urinary bladder is small and contains anechoic urine and a large amount of mobile sediment. The wall is diffusely thickened.

Kidneys: Both kidneys are large and measure approximately 7.4 cm in length. They are symmetrical and have normal corticomedullary junctions and normal blood flow.

There is no free fluid. The spleen, intestines (except for duodenum), adrenals, and pancreas are normal.

Conclusion

- Liver: The normal Portal Vein/CVC/Aorta ratio rules out an extra-hepatic shunt. The abnormal blood vessel running between the portal vein and CVC is suspected to be an intra-hepatic shunt.

- Stomach: The structure in the lumen is compatible with a gastric foreign body. The lumen is dilated with anechoic fluid due to ileus and/or obstruction. The diffusely thickened wall is due to gastritis secondary to a foreign body ingestion +/- an intrahepatic shunt.

- Duodenum: The structure seen in the lumen is compatible with a foreign body.

- Mesenteric Lymph nodes: The prominent lymph node is compatible with a reactive node due to GI disease.

- Urinary bladder: The diffusely thickened wall is due to lack of distention or cystitis. The large amount of mobile hyperechoic sediment in the lumen is compatible with fat droplets or crystals which can be due to cystitis or a shunt.

- Kidneys: The large kidneys (7.4cm) for a 20# puppy are likely due to a liver shunt. Normal kidney size is up to 5.2cm for a 9kg dog, and up to 6.4cm for a 10 kg dog, per WSAVA World Congress, 2001.

The findings in the liver (abnormal vessel), along with large kidneys and urinary bladder sediment are highly suggestive of an intra-hepatic liver shunt. Referral was recommended for further work-up once patient is stable. The foreign bodies in the stomach and duodenum required an emergency exploratory surgery.

Treatment:

Jojo had an emergency exploratory to remove the foreign bodies. A pig hoof was removed from the stomach, and a piece of wood from the duodenum. The patient recovered well from the surgery. A urinalysis showed hematuria, proteinuria, marked rods and 2+ of calcium carbonate crystals. Clavamox 125mg 1 T BID PO for 2 weeks was prescribed for the UTI.

Jojo had another neurologic episode 10 days post-exploratory. She was referred to North Carolina State Teaching Hospital. Repeat bloodwork showed elevated pre-prandial and post-prandial bile acids (pre 78.1, post 255.6), hyperammonemia (301), low BUN (5<9), low cholesterol (88<131), elevated liver enzymes (ALP 280>150, ALT 87 WNL, GGT 5 WNL), mild microcytic, normochromic, non regenerative anemia (HCT 35.3<38.3, MCV 59.3, MCHC 32.6). A urinalysis showed another UTI (prot 2+, blood 3+, WBC 3+, RBC 3+, bact 2+, culture results not known). Jojo was started on long term Metronidazole 250mg ¼ T BID PO, a prescription liver diet, Denamarin, lactulose 10mg/15ml, 5ml PO BID, a course of fenbendazole and Enrofloxacin 68mg 1.5 T SID PO.

A CT scan was done a few weeks ago. The report confirmed a right divisional intrahepatic portocaval shunt, with subjective secondary microhepatica. Cranial to the insertion of the gastroduodenal vein on the portal vein, the right portal branch is dilated as it courses into a large caliber anomalous tortuous vessel (1.4cm diameter) that then inserts into the right aspect of the intrahepatic caudal vena cava. The cava measures 18mm x 25mm at the level of the shunt. The left portal vein is not definitively identified. The kidneys are at the upper limits of normal for size, no calculi in the kidneys or the bladder. The rest of the abdomen is normal.

Surgical correction of the liver shunt is planned for June, with copper coils in the shunt vessel that will provoke clots and occlusion of the vessel, as well as a mesh in the CVC to prevent the coils from moving into the systemic circulation. Jojo was doing well at the last recheck at North Carolina State University Veterinary hospital. She is on metronidazole, lactulose, prescription liver diet and Omeprazole 20mg ¾ T TID PO to

reduce the risk of gastric ulceration secondary to liver disease. Jojo will start Keppra 250mg 1 ¼ TID PO, 30 days before the procedure, to prevent any seizures.



Foreign Bodies: pig hoof and plant material



JoJo

Special thanks to Dr. Lauren Davis-McCarron and Dr. Martin Fink at Hilton Animal Hospital, Newport News, VA, primary care veterinarians on this case.

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