

What's Your Diagnosis?

Courtney S. Wait

Signalment:

11 year old FS Labrador Retriever

Presenting Complaint/History:

The patient presented to the referring DVM for inappetance, vomiting, lethargy, and anorexia. Bloodwork and physical examination at the rDVM showed azotemia, anemia, and a palpable abdominal mass. She was referred to KSU VHC Small Animal Medicine service after 5 days of clinical symptoms.

Physical Exam Findings:

- Temperature: 100.2° F
- Weight: 40.4 kg
- Pulse: Strong
- Mucus Membranes: pale pink and moist
- Heart Rate: 70 bpm
- CRT: <2 sec
- Respiratory Rate: 25 bpm
- Moderate dental tartar bilaterally
- Abdominal palpation: mass palpable in the cranial abdomen, tense and painful
- Bilaterally enlarged lymph nodes (prescapular, axillary, popliteal)
- Several firm subcutaneous masses palpable over the entire body

Bloodwork (noted from rDVM):

Regenerative anemia

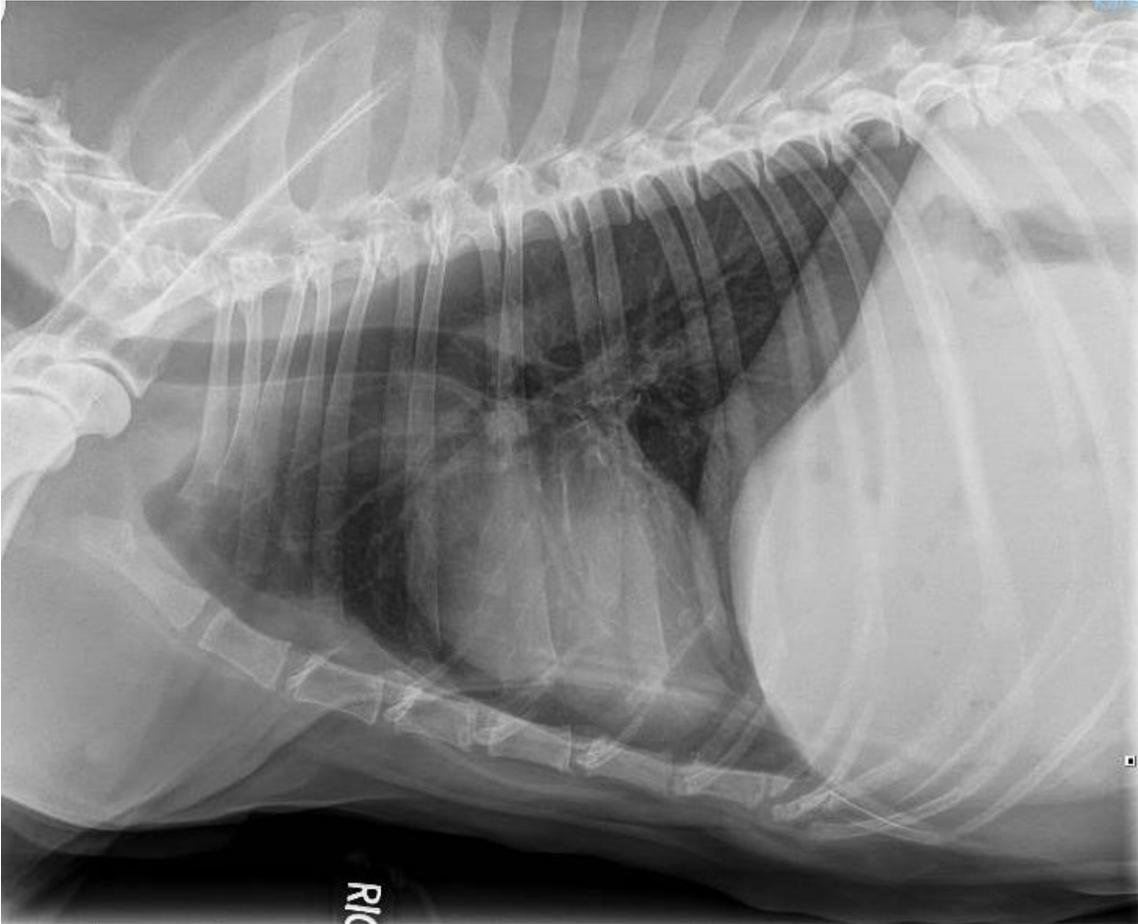
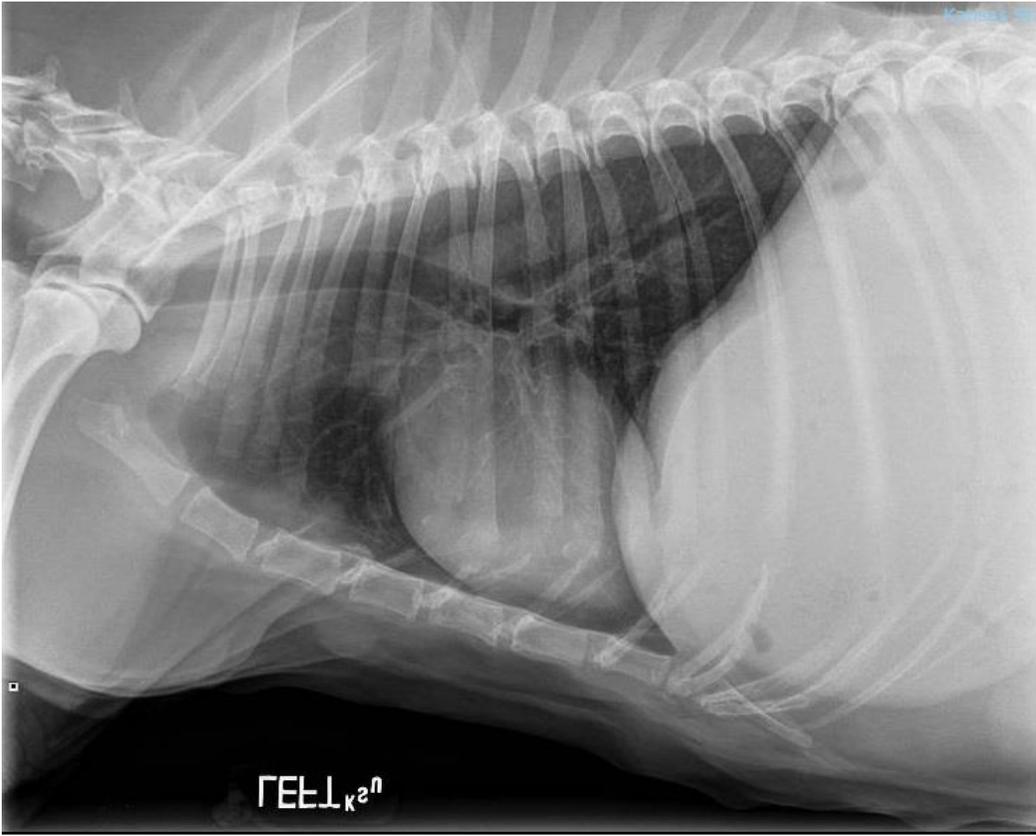
Azotemia (BUN: 103, Cr: 5.9)

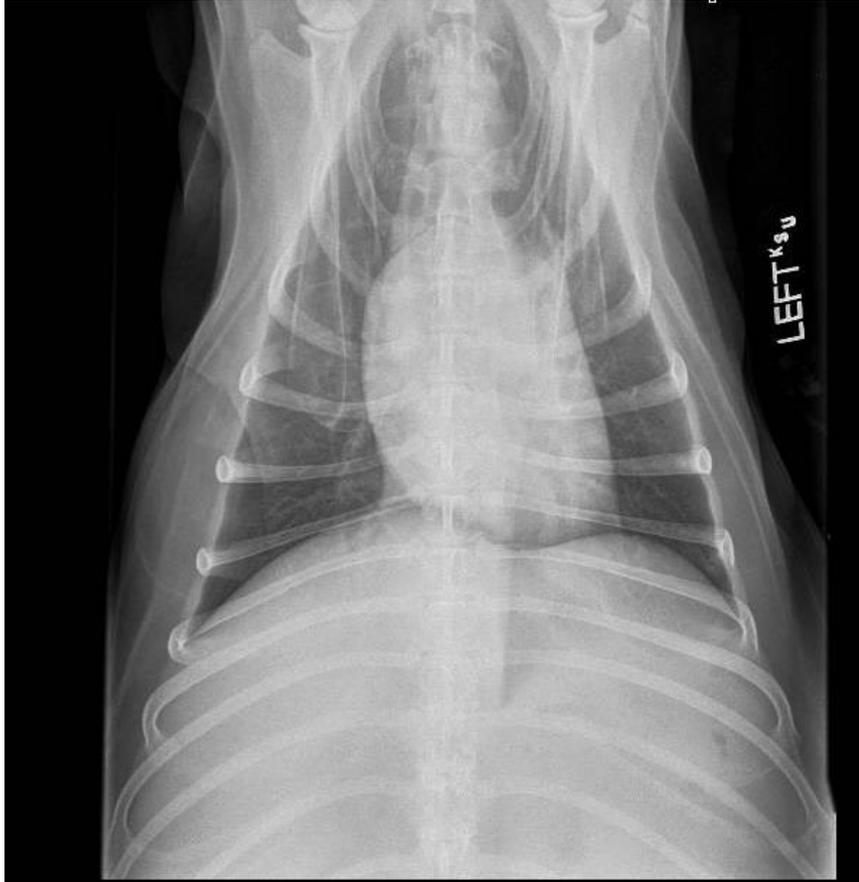
Elevated phosphate

Elevated ALP and ALK

Diagnostic Plan:

Step 1: Thoracic Radiographs (3 view)





Radiographic Findings:

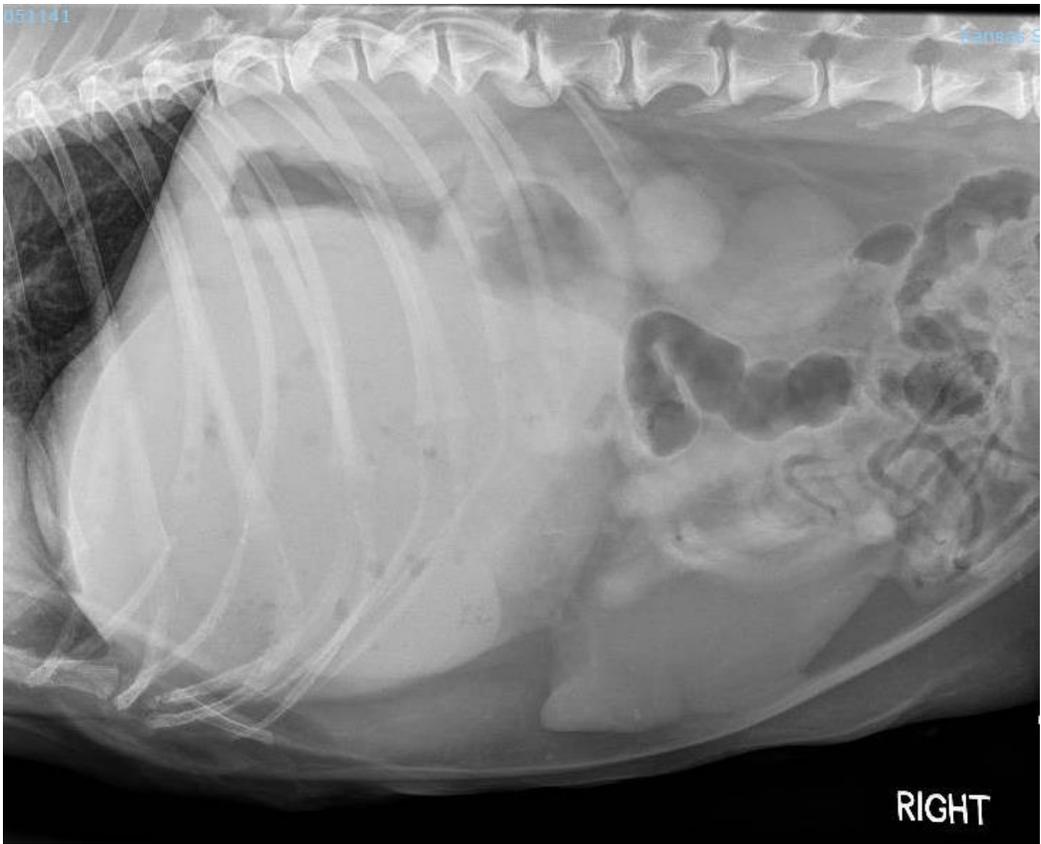
Three-view thorax:

The cardiac silhouette, pulmonary vasculature, and pulmonary parenchyma are within normal limits. There is a rounded soft tissue opacity dorsal to the second and third sternebra, consistent in location with sternal lymph node. In the limited view of the cranial abdomen, the gastric axis is severely displaced caudal dorsally. There are multiple irregularly-shaped gas foci superimposed with the enlarged liver.

Radiographic Impressions:

1. Cranial abdominal mass effect with gas, is consistent with liver, and has differentials of necrotic neoplasm or abscess.
2. Sternal lymphadenopathy is either metastatic or reactive.

Step 2: Abdominal Radiographs



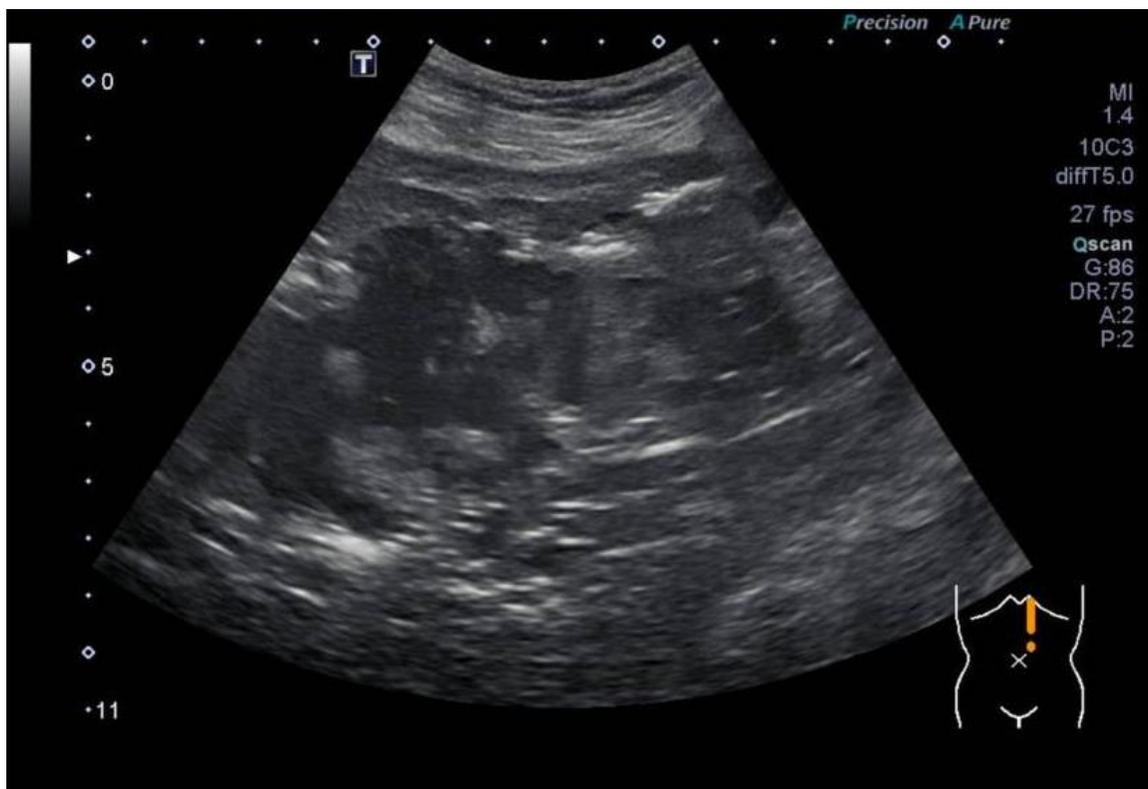
Abdominal Radiograph Findings:

The gastric axis is severely displaced caudal dorsally. There are multiple irregularly-shaped gas foci superimposed with the enlarged rounded liver.

Impressions:

1. Cranial abdominal mass effect with gas, is consistent with liver, and has differentials of necrotic neoplasm or abscess.

Step 3: Abdominal Ultrasound



Ultrasound Findings:

Abdomen:

There was a very large complex hepatic mass measuring greater than 15 cm dimension in the left cranial abdomen. There were cystic and large irregularly shaped fluid filled regions throughout this mass, and a very large amount of punctate and small gas foci, diffusely. There was no normal left sided hepatic parenchyma appreciated. Right-sided hepatic parenchyma was diffusely hyperechoic with poorly defined hypoechoic nodules measuring up to approximately 1 cm. There was an irregularly shaped, poorly defined, very mildly hypoechoic 1.2 cm nodule in the spleen. There was a thin hypoechoic rim measuring approximately 1-2 mm thick surrounding the left and right renal cortices. The right kidney was irregularly marginated, and contained a few anechoic through

transmitting cysts that measured up to 2 cm diameter. There was suspended particulate debris in the urinary bladder. The left adrenal gland measured 8.6 mm thick, and there is a heterogeneous mass in the caudal pole of the right adrenal gland that measured 2.5 cm thick and 3.3 cm in length. There was a scant amount of anechoic peritoneal effusion.

The gastrointestinal tract was within normal limits.

Fine needle aspirates of the hepatic mass obtained without immediate complication.

Ultrasound Impressions:

1. Large hepatic complex mass is most consistent with necrotizing neoplasia, with much less consideration given to a primary hepatic abscess.
2. Diffuse hepatic changes have differentials of nodular hyperplasia and less likely neoplasia.
3. Splenic nodule may represent neoplasia or hyperplasia.
4. Right adrenal nodule is most consistent with a primary or metastatic neoplasia.
5. Hypoechoic rim surrounding the left and right kidneys has differentials of neoplasia, interstitial/glomerulonephritis or a normal variation.
6. Mild left adrenomegaly may be neoplastic or hyperplastic.
7. Urinary bladder proteinaceous or cellular debris.
8. Scant peritoneal effusion is in exudate, neoplastic, or hemorrhage.

Step 4: Fine Needle Aspirate of Hepatic Mass

Findings:

Moderate to marked neutrophilic inflammation with a mild macrophagic component

Marked necrosis

Evidence of previous hemorrhage (hematoidin crystals)

Outcome

Because the patient had severe renal failure, surgery under general anesthesia was not recommended. Due to the expense of treatment and the high likelihood of neoplastic disease, the patient was sent to the referring veterinarian to be humanely euthanized.

Discussion

Radiographic gas opacity within the liver is a rare occurrence in dogs and cats. There are three ways gas may enter the liver: ascension through the biliary system, ascension through the portal venous system, or primary gas production through liver abscessation. Gas within the portal vessels may occur as a result of severe necrotizing gastritis or enteritis, gastrointestinal ulceration, distention, trauma, or interventional procedures. When gas enters the portal vessels, a linear branching radiolucent appearance (similar

to an air bronchogram) may be visible. Gas in or around the gallbladder occurs with emphysematous cholecystitis, or may also be seen after surgery of the duodenum or biliary system. Hepatic abscesses often contain anaerobic bacteria, which produce gas opacities within the hepatic parenchyma.

Based on the radiographic pattern of gas foci within the liver and severe hepatomegaly, hepatic neoplasia with secondary necrosis and abscessation was the primary differential in this case. Hepatic abscessation can be caused by several etiologies including hematogenous spread, direct extension from pancreatitis or peritonitis, traumatic penetrating wounds, and ischemic damage to the liver. In this patient's case, the abscessation was caused by ischemic damage. Primary and metastatic neoplasia in the liver causes destruction of normal vascular supply and disruption of normal phagocytic defenses. This allows bacteria within the liver to proliferate and cause central necrosis. Some of the bacteria are gas-forming organisms, and they create radiolucent areas within the hepatic parenchyma. These areas appear as irregularly stippled or mottled gas patterns. However, not all hepatic abscesses contain gas and if it is not seen radiographically, hepatic abscesses cannot be ruled out.

Typically, the treatment of any hepatic abscess is drainage and removal of the affected tissue. Supportive fluid therapy, systemic antibiotics, and treatment of any underlying disease process is also warranted. Preemptively, the antibiotic course should be a cephalosporin or penicillin combined with an aminoglycoside for broad spectrum coverage. Ideally, antibiotic therapy should be based off of culture and sensitivity. The procedure of choice in dogs is an abdominal exploratory so that all organs may be assessed for infection. Hepatic lobectomies may be necessary. Complications include abscess rupture, abdominal contamination, and septic peritonitis.

References:

- Grooters, Amy M., Robert G. Sherding, and Susan E. Johnson. "Hepatic Abscesses in Dogs." *Compendium on Continuing Education for the Practicing Veterinarian* 17.6 (1995): 833-40. Web.
- Grooters, Amy M., Robert G. Sherding, David S. Biller, and Susan E. Johnson. "Hepatic Abscesses Associated With Diabetes Mellitus in Two Dogs." *Journal of Veterinary Internal Medicine* 8.3 (1994): 203-06. *Wiley Online Library*. Web. 17 June 2017.
- Larson, Martha Moon, and Donald E. Thrall. "Chapter 37: The Liver and Spleen." *Textbook of Veterinary Diagnostic Radiology*. 6th ed. St. Louis: Saunders Elsevier, 2013. 684-85. Print.
- Schwarz, Leslie A., Dominique G. Penninck, and Cynthia Leveille-Webster. "Hepatic Abscesses In 13 Dogs: A Review Of The Ultrasonographic Findings, Clinical Data And Therapeutic Options." *Veterinary Radiology Ultrasound* 39.4 (1998): 357-65. *PubMed*. Web. 17 June 2017.

