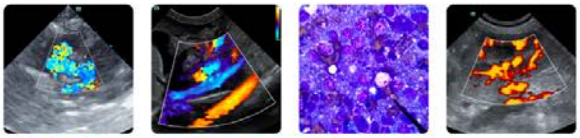

PATIENT

Brody Murawski

SPECIES

Canine

BREED

Mixed

SEX

Neutered Male

AGE

12 Years

WEIGHT

54 lbs

INTERPRETED BY

Eric Lindquist, DMV, DABVP (CFM), Cert. IVUSS

IMAGING PERFORMED BY

Kathleen Byrnes

HOSPITAL NAME

Aloha Veterinary Hospital

REFERRING VET

Dr. Lusk

INVOICE

75732

DATE

6/5/26

PRESENTING CLINICAL SIGNS

P presented for US due to 10# weight loss over 6 months. eating well. on prednisone for atypical addison's dz. Previous history of nerve sheath tumor removed from right leg, elevated liver enzymes for several years

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The **urinary bladder**, trigone, and pelvic urethra presented normal thicknesses and normal tone. The ureters were not visible which is normal. No uroliths or sediment were visualized and anechoic urine was present. No evidence of inflammatory or neoplastic changes were noted. Ureteral papillae were normal.

The residual prostate was uniform at 1.8 cm.

The **kidneys** revealed normal size and structure, corticomedullary definition and ratio for this age. The cortices presented largely uniform texture with normal echogenic relationship to liver and spleen. Medullary structure differed distinctly from the cortex and no evidence of pelvic dilation was present. The capsules were acceptably uniform without significant irregularities. Left kidney measured 7.25 cm. Right kidney measured 7.12 cm.

Adrenal Glands

Both **adrenal glands** were visualized and recognized as having normal shape, size, position and echogenicity for this breed. The phrenic vasculature, glandular echogenicity and detail were unremarkable. Capsule, cortex, and medullary definition were normal for this age patient. Right measured 2.22 cm x 0.71 cm at the cranial pole and 0.50 cm at the caudal pole. Left measured 2.78 cm x 0.52 cm at the caudal pole and 0.48 cm at the cranial pole.

Spleen

The **spleen** presented subtle micronodular changes, relatively normal size. The spleen was folded upon itself caudally.

Liver

A 12.0+ cm significantly cystic and parenchymal mass was noted that appeared to be deriving from the left medial **liver**. The mass is somewhat pedunculated. Nodular changes noted elsewhere in the liver. The mass impinges upon the common bile duct and portal vein medially, yet there is a large amount of fairly unremarkable age related hepatic parenchyma in the cranial liver.

Gastrointestinal

The **gastrointestinal tract** was structurally unremarkable other than retention of ingesta and deviation of the upper GI tract owing to underlying mass.

Pancreas

The base and limbs of the **pancreas** were observed to be largely isoechoic to surrounding omental fat. Some parenchymal remodeling, however, with mild deviation from curvilinear normalcy was observed. Pancreatic duct and capsular irregularities were present consistent with age related changes. If pain

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upon imaging (+ Murphy sign) was present or if the patient is focally painful in subxyphoid palpation then low-grade smoldering chronic pancreatitis should be suspected.

Free Abdomen

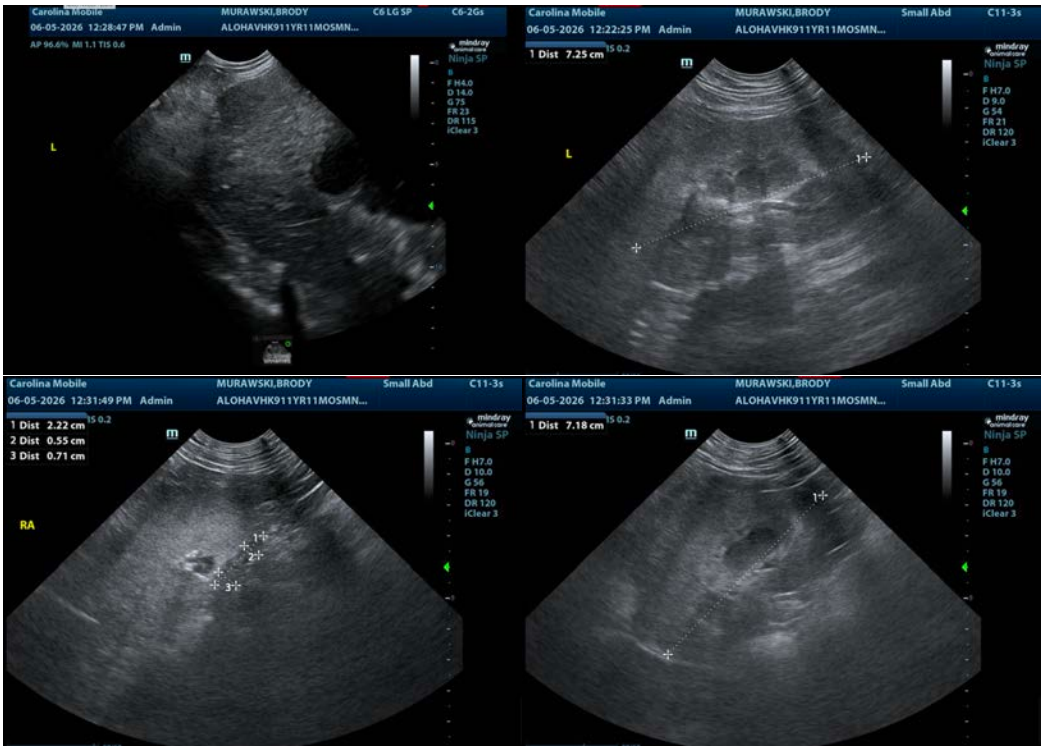
Free fluid noted in the cranial abdomen, likely owing to mass leakage.

ULTRASONOGRAPHIC FINDINGS

- Precarious cystic left medial liver mass – Hemangiosarcoma, carcinoma, abscessation, or complex hepatic cyst (which would be histopathologically benign) are all possible.
- Micronodular spleen.
- Retention of ingesta in GI tract.
- Age related pancreatic remodeling.
- Free fluid.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The mass is potentially resectable. CT evaluation warranted. This is a surgical urgency. This is a highly precarious presentation as the mass is at risk for rupture. Given the slight free fluid, some leakage has likely already occurred. Chest radiographs and abdominal CT for surgical planning and urgent surgical exploratory are all valid in this patient.



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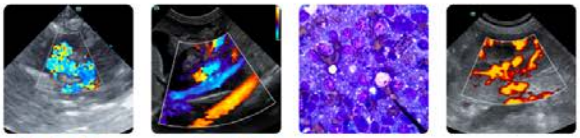

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Educational Teleconsultation Services™

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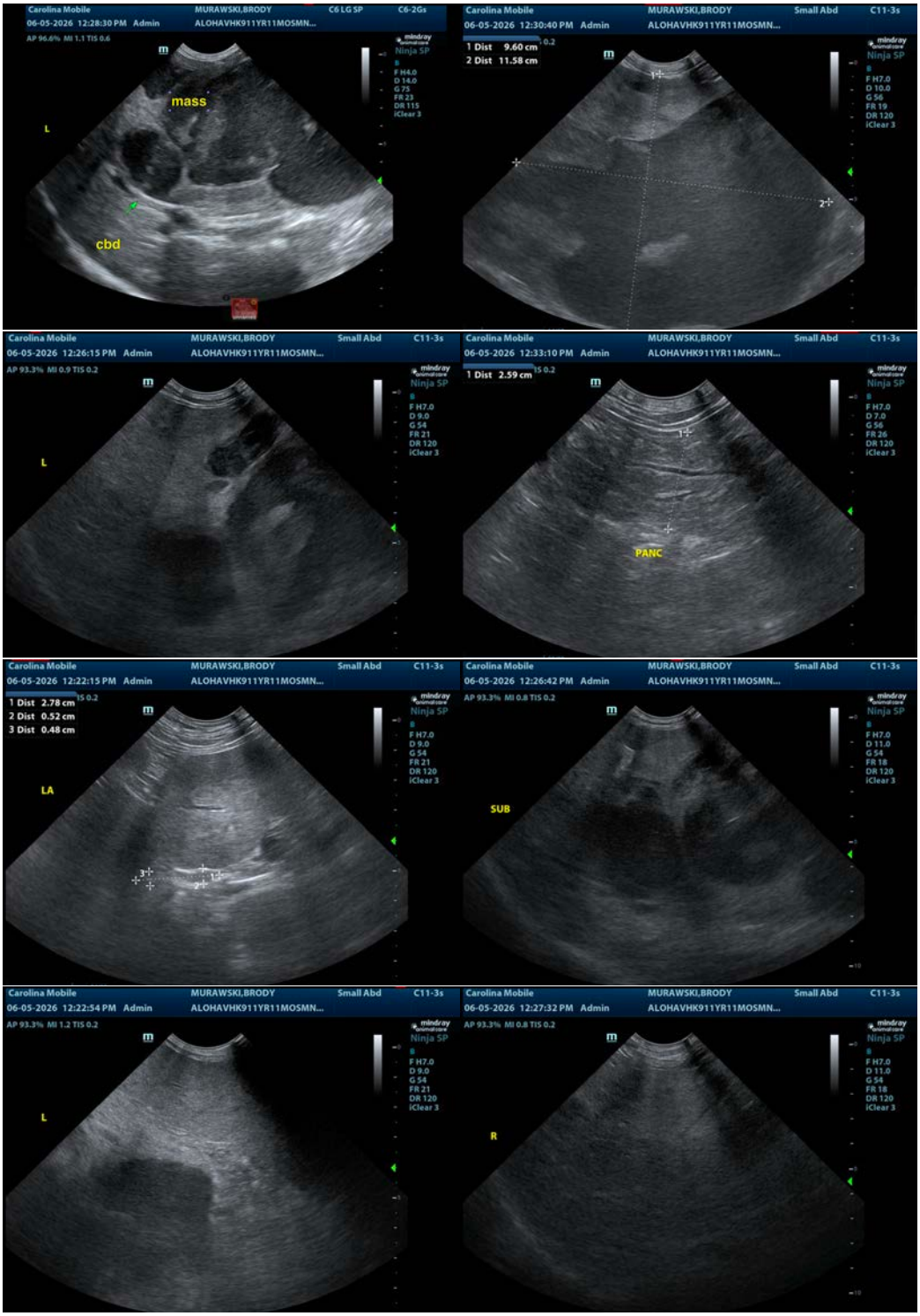

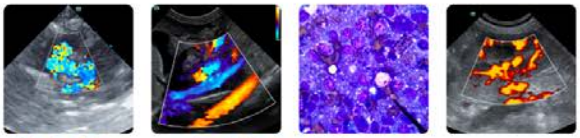

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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Eric Lindquist, DMV, DABVP(CFM), Cert. IVUSS,
CEO, Owner, Founder -- SonoPath.com
info@SonoPath.com

Excerpt from the Curbside Guide: https://sonopath.com/thecurbsideguide/

Hepatic Neoplasia, Biliary Neoplasia & Biliary Adenocarcinoma

DESCRIPTION Hepatocellular carcinoma typically manifests in the liver's left lateral lobes yet may cross over to the right lobes should it derive from the hilus. These masses often present cavitating, necrotic cores that are difficult to distinguish from hepatic abscesses. Vascular channels may also be involved, and bile duct obstruction is often present. Older felines often present solitary or multiple fluid-filled cysts within the hepatic parenchyma. The latter are typically benign cystadenomas and should be differentiated from cystic adenocarcinoma, hepatic lymphoma (usually diffusely hyperechoic and may be associated with FIV/FeLV), metastatic neoplasia (diffuse hyper- to hypoechoic nodules secondary to mammary adenocarcinoma, splenic hemangiosarcoma, or pancreatic or intestinal adenocarcinoma), benign nodular hyperplasia (accompanied by minimal to no clinical signs), hepatic cirrhosis (regenerative nodules), or rare carcinoids, fibrosarcomas, leiomyosarcomas, and osteosarcomas.

CLINICAL SIGNS Possible clinical signs and physical exam findings include cranial abdominal organomegaly, sudden collapse associated with mass rupture, vomiting, ascites, jaundice (severe cases), and hypoglycemia secondary to a paraneoplastic syndrome. Sepsis and fever associated with secondary abscessation of the mass may also occur. Cats usually present with anorexia and lethargy.

DIAGNOSTICS Routine biochemical analysis primarily shows liver enzyme elevation (i.e., ALT for cellular necrosis, SAP for hepatic congestion, elevated bilirubin for stasis/obstruction, bile acids > 75–100 μM/L for significant function impairment). Staging of the disease with three-view thoracic radiographs is essential, as is conducting a CBC, serum biochemistry, urinalysis, as well as abdominal and possibly also thoracic ultrasounds, in order to provide the owner with adequate and well-informed options. Surgical and oncological referral is recommended after a coagulation panel has been assessed and ultrasound-guided biopsies of both normal and pathological tissue have been performed, such that the disease is adequately characterized. In cases where surgical resection is impossible, direct chemoembolization of the tumor blood supply could be considered; however, this procedure is only performed at specific tertiary referral locations. Placement of palliative stents into the caudal vena cava (CVC) can be considered as well if compression by an unresectable tumor causes excessive ascitic fluid accumulation. Serum α-fetoprotein (AFP) has been shown to reemerge in dogs with malignant hepatobiliary adenocarcinoma. Ultrasound is important to localize the mass in relation to the portal hilus and gallbladder. The portal vein, CVC, aorta, gallbladder, and bile duct should all be identified with respect to the location of the

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mass to determine resectability. Ultrasound also allows for an examination of possible metastatic sites in the abdomen and, to some degree, in the thorax.

TREATMENT Hepatic adenoma, hepatoma, and adenocarcinoma are usually amenable to surgical resection via hepatic lobectomy should the pathology be isolated to single-lobe progression. Multi-lobar presentation may be amenable to lobectomy and debulking; this will be determined further during surgical consultation. These tumors tend to displace unaffected parenchyma, allowing for relatively straightforward surgical resection. Up to 80% of the liver can be removed without long-term functional deficits. Blood transfusions may be necessary during surgery. The development and implementation of the ligation-diving stapler (LDS) has helped to streamline the procedure. Most carcinomas have metastasized by the time of diagnosis yet tend to be slow growing; thus, it may be possible for a certain quality of life to be attained via surgical resection. Hepatic hemangiosarcoma has usually metastasized at the time of diagnosis and carries a much poorer prognosis. Surgical resection and chemotherapy are recommended but considered by many to be an "aggressive" approach. Preliminary trials have shown that gemcitabine is well tolerated and yields good responses in cases of hepatic as well as pancreatic, colonic, and gastric carcinomas. However, myelosuppression remains the key issue. Doxorubicin, cyclophosphamide, and fluorouracil combinations have also proven fruitful.

Nonsteroidal anti-inflammatory drugs (NSAIDs) have been demonstrated to have an antineoplastic effect due to their inhibition of COX-2 in certain tumor cells. The end product of the cyclooxygenase cascade is prostaglandin E2, which—when expressed in tumor cell lines and not expressed in normal cells of that particular cell line—results in inhibited apoptosis, immunosuppression, and increased angiogenesis, proliferation, and invasiveness. Inappropriate increases in COX-2 expression have been documented in certain neoplasias, including squamous cell carcinoma, mammary carcinomas, prostatic carcinoma, malignant melanoma, and transitional cell carcinoma.

Metronomic chemotherapy currently is being investigated and compared to traditional chemotherapy protocols; it is thought to be at least as effective as the latter, with substantially less toxic side effects. Metronomic chemotherapy is the practice of uninterrupted administration of low-dose cytotoxic drugs at regular and frequent intervals, as opposed to high-dose, shorter-term protocols characteristic

of traditional chemotherapeutic practices. The lower dose allows for long-term administration without toxic side effects and has been postulated as providing longer remission intervals. Moreover, it has the benefit of minimizing the intervals between drug regimens—the period during which tumor cells may repopulate the area—as well as reducing the chance of developing multi-drug-resistant genes. Metronomic chemotherapy has been used successfully in human patients who have undergone previous chemotherapy administration. It is thought to destroy endothelial cells, thereby retarding angiogenesis and targeting regulatory T cells. To date, there have only been a few small clinical trials in veterinary patients, and these have focused on animals that have hemangiosarcoma and soft tissue sarcomas.

CONCLUSION With respect to hepatic neoplasia, many surgical and chemotherapeutic options exist; however, it is best to consult with a local board-certified oncologist who can help determine the best course of action.

REFERENCES

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