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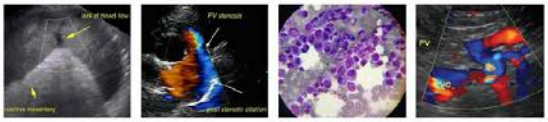

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pawsonography@gmail.com 530-786-8340

PATIENT

HoneyBunch Wilkenson

SPECIES

Feline

BREED

DLH

SEX

Spayed Female

AGE

8 Years

WEIGHT

9.7 Pounds

INTERPRETED BY

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING BY

Loetitia Saint-Jacques, LVT

HOSPITAL NAME

LuxPetVet

REFERRING VET

Dr. Kristin Kee

INVOICE

39336

DATE

7/8/22

PRESENTING CLINICAL SIGNS

CHIEF CONCERNS: - Prolonged hyporexia (about 5 weeks) that has progressed to anorexia despite Mirataz, Elura, Cerenia, and prednisone. - 5# weight loss. - 1-week duration anisocoria that has now progressed to blepharitis and serous ocular discharge OS. - Presents today with decreased deep pain response and CP in the LHL. - Presents today with crusty scale and hemorrhagic discharge to multiple claw folds and nails of multiple digits of both forelimb paws and the LHL paw. HISTORY: Patient presented 5 weeks ago for hyporexia and weight loss (about 2.5# over 2 months). Patient was usually a really good eater. Slightly unkempt coat and mild periodontal disease upon presentation otherwise NSF. CBC, chem, and USG was WNL. Owner declined all other diagnostics. Patient was started on Mirataz with no improvement in appetite. Patient presents 3 weeks later with anorexia and 2# weight loss. Recheck liver and kidney values WNL. Owner declined all other diagnostics. Patient was started on prednisolone and Cerenia. A few days later patient had some improvement to appetite and started eating dry kibble again. The next day patient was anorexic. Patient presents 1 week later with anorexia, lethargy, 0.6# weight loss, and anisocoria (mydriasis OD with indirect and direct PLRs absent; tonometry WNL). Owner opts to move forward with abdominal U/S, FeLV/FIV test (negative), and UA (NSF). Owner declines all other diagnostics and opts for Elura with prednisolone. Patient has been anorexic since with 0.5# weight loss today. Patient presents today with decreased deep pain response and CP in the LHL, anisocoria, and crusty scale and hemorrhagic discharge to multiple claw folds and nails of multiple digits of both forelimb paws and the LHL paw. SEDATION but still squirmy:Butorphanol IM
Abnormal PE/Chem/CBC/UA Results: LABS: - CBC and chem WNL. - FeLV/FIV negative. - USG: 1.045 RADS: Radiographs performed at time of abdominal U/S. Radioopaque lesions at the base of the heart, near the dorsal intrathoracic trachea, and caudodorsal lung field. Possible pleural effusion. Slightly irregular margins to the left kidney.

ULTRASONOGRAPHIC EXAMINATION OF THE HEART & ABDOMEN

Radiographs (brief overview)

Right lateral view

Radiodense mass at the level of carina, (i.e., it is dorsal to the heart) and is compressing the mainstem bronchus. The mass measures approximately 1 ¼ cm x 1 ½ cm. A second radio-dense mass is noted at the caudal border of the dorsal lung lobe, which is consistent with a metastasis.
Mild to moderate peribronchiolar lung pattern
Moderate interstitial lung pattern
It is difficult to assess the cardiac silhouette
Possible pleural fissure line
Pulmonary veins do not appear congested. The pulmonary artery may be very mildly enlarged, however, this is subjective.
Mildly irregular left kidney.

Left lateral view

Mass appears to be in contact with left atrium on this view
The metastasis in the caudal lung lobe is visualized and better defined on this view
A second echogenic nodule is noted at the level of the 4th rib, which may be a second metastatic lesion

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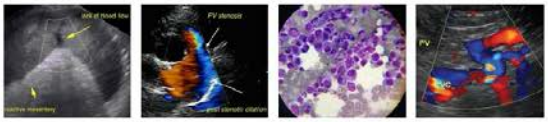

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The cardiac silhouette is within normal limits and subjectively, mildly decreased in size (hypovolemic)
Pleural fissure lines, consistent with pleural effusion

Ventral dorsal view
As above re: lungs
One metastatic lesion observed on right on one of the v/d views.
Unable to visualize mass effect dorsal to heart
Radiopaque structure originating at heart base and extending caudally; mass and consolidated lung lobes?

Echocardiographic findings

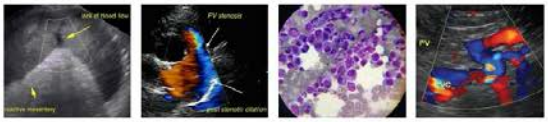
Mitral valve
- Valve leaflets: Mild thickening and irregularity of the septal leaflet, not hyperechoic
- Mitral regurgitation (MR): Moderate to severe
- Left atrium: Abnormal (see mass, below)
- Deviation of the left atrium by the mass causing deviation of the valves and mitral regurgitation.

The MR enters the pulmonary veins, giving the appearance of a shunt.
- LA: Ao ratio: N/E
- Left ventricle: No obvious abnormalities
- "smoke": No evidence

Tricuspid valve
- Valve leaflets: very mild thickening and irregularity of the septal leaflet (in region where the aortic leaflet inserts)
- Tricuspid regurgitation (TR): Trivial
- Ventricular septal defect: A very small VSD (**right to left shunt**) is observed while evaluating for TR
- Right atrium: No obvious enlargement
- Right ventricle: No obvious enlargement
- Right auricle: No obvious abnormalities
- Right to left shunt observed while evaluating for TR

Aortic valve
- Valve leaflets: One of the leaflets is markedly hyperechoic and thickened in the form of a nodule. Emerging endocarditis cannot be excluded.
- Vmax: 0.82 m/s (WNL)
- Aortic insufficiency: Absent
- Turbulent blood flow in the left ventricular outflow tract: Absent

Pulmonic valve
- Valve leaflets: Thickened and irregular
- Pulmonary insufficiency: Trivial, but turbulent blood flow
- Main pulmonary artery and bifurcations: High index of suspicion of metastasis or thrombus within the pulmonary artery (see mass, below)



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Other

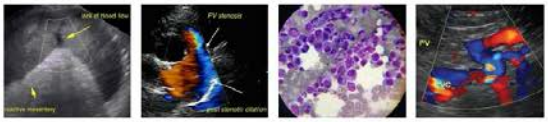
- Pulmonary edema: "B lines" observed, however, appearance more consistent with lung pathology, rather than pulmonary edema, i.e., absent
- Multiple pulmonary lesions are noted. Each lesion is characterized as an echogenic linear structure with "B lines" or "rocket sign" ventrally. This is consistent with what is seen radiographically.
- Pericardial effusion: Scant amount (left heart)
- Pleural effusion: Small amount
- Pulmonary veins: No obvious abnormalities.
- No evidence of hypertrophy of the papillary muscles
- Mass
    - Presence of an echogenic, very mildly heterogeneous mass, 0.73 cm in diameter x 2.31 cm in length. It appears to be involving the right ventricular wall and protrudes within the right ventricle.
    - In the right parasternal, short axis, 5 chamber view, the mass and the outer wall of the aorta contact one another.
    - Right parasternal, "oblique apical view": The mass appears bilobed and is noted dorsal to the left atrium. The larger portion of the mass measures approximately 1.20 cm in diameter x 2.44 cm in length. The smaller is 0.68 cm in diameter x 1.23 cm in length. In this same view, echogenic material is visualized within the pulmonary artery. Differential diagnoses include metastases or a thrombus. The mass or thrombus measures 1.50 cm in diameter x 1.63 cm in length.
    - Right parasternal, 4C apical view: The mass is compressing the left atrium, causing it to deviate. The mass may have invaded the left atrium, i.e., the wall of the left atrium does not appear intact and a small amount of ill-defined echogenic material is noted within the left atrium.
    - Multiple non-traditional views are examined, the mass wraps around the base of the heart, i.e., pulmonary artery, left atrium, and aorta. A trivial amount of blood flow is observed between the mass and the wall of the pulmonary artery with colour Doppler. A similar image is noted in the area of the left atrium, however, it is difficult to determine whether it the left atrium or summation with the pulmonary artery.
    - When evaluating the cardiac silhouette via the abdomen, many more pulmonary lesions are observed, in addition to extent of the mass, which measures at least 4 cm in length. This corresponds to the radiopaque structure on the ventral-dorsal view of the thoracic radiograph.

Urinary System

The **urinary bladder** is adequately distended with anechoic contents. The wall is smooth and regular. No abnormalities are present with the trigone or proximal urethra. A very small amount of free floating sediment is present, however, there is no evidence of cystoliths, polyps or a mass.

Kidneys

The **left** kidney measures 4.11 cm (3.80-4.40 cm). The capsule is irregular and deformed by multiple depressions. Multiple triangular shaped, hyperechoic, cortical lesions are observed, in addition to diffuse hyperechogenicity of the cortex. A marked loss of the normal definition of the cortico-medullary junction is present. An ill-defined, severely hyperechoic region, which does not cause an acoustic shadow, is observed within the pelvis. The kidney's appearance is suggestive of



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multiple infarcts, ischemic insults and fibrosis, however, there are cortical and medullary lesions that are heterogeneous and ill-defined, which may be due to neoplasia. Hydroureter is suspected (1.3 mm). The ureter can be followed for a few centimeters, where it becomes "dilated" and is then lost. An obvious obstruction is not visualized. The mesentery surrounding the kidney and ureter is moderately to markedly hyperechoic. Blood flow is present, but decreased.

The **right** kidney measures 4.04 cm (3.80-4.40 cm). The capsule is mildly irregular. A moderate loss of the normal definition of the cortico-medullary junction is present. The cortex is diffusely hyperechoic. Hyperechoic, cortical lesions are also observed at each pole, suggestive of ischemia. They are ill-defined and not consistent with infarcts. Metastases cannot be excluded. Mineralizations of the diverticulae and pelvis are present, without evidence of nephroliths or pyelectasia. An accumulation of intrapelvic fat is noted. The surrounding mesentery is not hyperechoic.

Aortic bifurcation/trifurcation
No abnormalities observed.

Adrenal Glands

The **left** adrenal gland measures 0.25 cm at the cranial pole, 0.26 cm at the caudal pole and 0.69 cm in length. 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 0.36 cm at the cranial pole, 0.31 cm at the caudal pole and 1.05 cm in length. 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 echotexture, and echogenicity. The capsule is smooth. It is decreased in size at 44 mm (normal = 10 mm), which could be due to hypovolemia. High index of suspicion of a thrombus of the splenic vein due to absence of colour Doppler of the splenic vasculature. The mesentery surrounding the splenic vein shows acoustic enhancement, suggestive of inflammation. A scant amount of anechoic effusion is observed surrounding the spleen.

Liver

There are no obvious signs of hepatomegaly and its borders are smooth, but mildly rounded. The liver's echotexture is homogeneous, but is diffusely hyperechoic, i.e., it is hyperechoic to the falciform fat. Focal lesions are not observed and no obvious abnormalities are observed with the hepatic vessels.

The gallbladder wall is within normal limits in thickness and echogenicity. A small amount of echogenic material is present within the GB and cystic duct. Neither cystic or the common bile duct is dilated or tortuous, i.e. there are no signs of an obstruction.

Gastrointestinal

The gastric wall is within normal limits in thickness and the wall layers are well defined. No obvious abnormalities are observed with its peristalsis.

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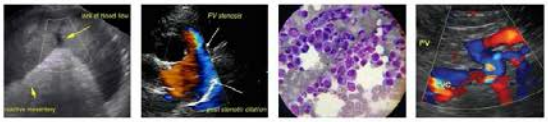

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Duodenum: Wall thickness is within normal limits and the definition of the wall layers is preserved, however the submucosa is more prominent than usual. Mild corrugation is also noted. The small intestinal wall thickness is within normal limits and the definition of the wall layers is preserved. No abnormalities are observed with the ileocecal colic junction.

Jejunum: one segment shows a hypoechoic soft tissue structure, approximately 0.44 cm in diameter x 0.88 cm in length. The surrounding area is severely hyperechoic. Differential diagnoses include a lymph node and extraluminal mass, as well as mesenteric nodules, suggestive of carcinomatosis. Abnormally dilated loops of bowel are not observed.
The colonic wall is not thickened and mural detail is considered normal.

Pancreas

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

Other

Lymph nodes

Lymphadenomegaly of the sublumbar lymph node with mild compression of the caudal vena cava, 1.06 cm in diameter x 3.07 cm in length.

Hypoechoic nodules

A few hypoechoic nodules are observed along the *abdominal wall*. Some are well defined with smooth borders, while others have a very mildly irregular border. A portion of one of the nodules is severely hyperechoic. They all measure approximately 0.40 cm in diameter x 0.80 cm in length. Lymphomatosis or carcinomatosis is suspected.

Abdominal effusion

A scant amount of anechoic effusion is visualized surrounding the spleen, as well as between two liver lobes.

Heart

An echogenic soft tissue mass is noted dorsal to the left atrium. It measures 0.60 cm in diameter x 1.67 cm in length. A trivial amount of pleural effusion is observed. An echocardiogram was performed; see report for details.

ULTRASONOGRAPHIC FINDINGS

- Unfortunately, HoneyBunch has a heart based mass that has enveloped the pulmonary artery and left atrium and the aorta. There is also evidence of invasion of the mass or a thrombus in the pulmonary artery, which has caused increased pressure and opening of right to left ventricular septal defect (albeit extremely small). Invasion of the mass into the left atrium is suspected, but cannot be confirmed, however, it is compressing the left atrium and causing it to deviate. This has led to thickening and irregularity of the mitral valve leaflets, and aortic valve leaflets. The septal leaflet of the tricuspid valve is mildly to moderately thickened due to the aortic valve and the VSD. There is no evidence of chamber enlargement at this time, however, there is concern of eventual pulmonary edema due to the mitral regurgitation entering the pulmonary veins.

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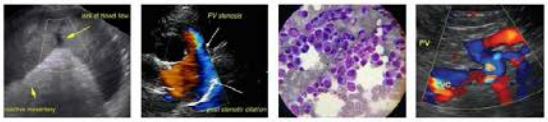

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- Based on the history, clinical signs, radiographs and ultrasound findings, a bronchogenic alveolar carcinoma is suspected with metastases to the toes, lungs and possibly carcinomatosis of the abdominal wall.
- **Kidneys**: Age-related degenerative changes are observed, as well as, multiple infarcts and areas suggestive of ischemia. However, metastases may also be present based on some of the heterogeneous, ill-defined lesions.
- **Spleen**: High index of suspicion of a thrombus or metastatic lesion, as well as hypovolemia (small size).
- **Lymph nodes**: Lymphadenomegaly is likely due to infiltration with neoplastic cells. Although reactive hyperplasia may be playing a role, neoplasia is considered less likely.
- **Abdominal wall/Hypoechoic nodules**: High index of suspicion of carcinomatosis.
- **Gastrointestinal tract**: A possible intramural mass is present in one of the jejunal segments, however, summation with a mesenteric nodule or lymph node cannot be excluded.
- **Ascites**: Ascites is most likely occurring due to increased vascular permeability secondary to neoplasia. Obstruction of the thoracic duct may also be playing a role.
- **Heart:** Pleural effusion and cardiac mass. Please see echo report for details.
- **Liver and Gallbladder**: Hepatic lipidosis is suspected due to hypo/anorexia. The gallbladder sludge is most likely clinically insignificant. However, one cannot exclude the possibility of a low grade cholangitis/cholangiohepatitis and cholecystitis secondary to stress.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

An arterial blood pressure

Monitoring of the resting (sleeping) respiratory rate (RRR) is highly recommended once a day. The RRR should NOT EXCEED 30 breaths per minute (bpm). If the respiratory rate is greater than 30 bpm, *or* if there is a gradual increase (over a day or two) toward 30 bpm, the patient should be evaluated immediately for congestive heart failure and the appropriate treatment initiated.

Other clinical signs clients should monitor for include, coughing, fatigue, lethargy, refusing to go up and down or stairs, or jumping on furniture, as well as syncope (collapsing or fainting spells). Restlessness, or agitation during the night, or being unable to find a comfortable position to sleep are also very common clinical signs.

Please see the abdominal ultrasound section of the report for further details.

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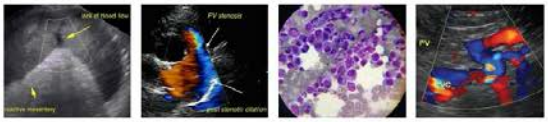

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A bronchogenic alveolar carcinoma is suspected with metastases to the toes, lungs and possibly carcinomatosis of the abdominal wall.

Referral to a board certified oncologist may be pursued to discuss possible treatment options for palliative care, however, the prognosis is guarded.

Possible palliative treatments for HoneyBunch include

Analgesia, such as buprenorphine and gabapentin

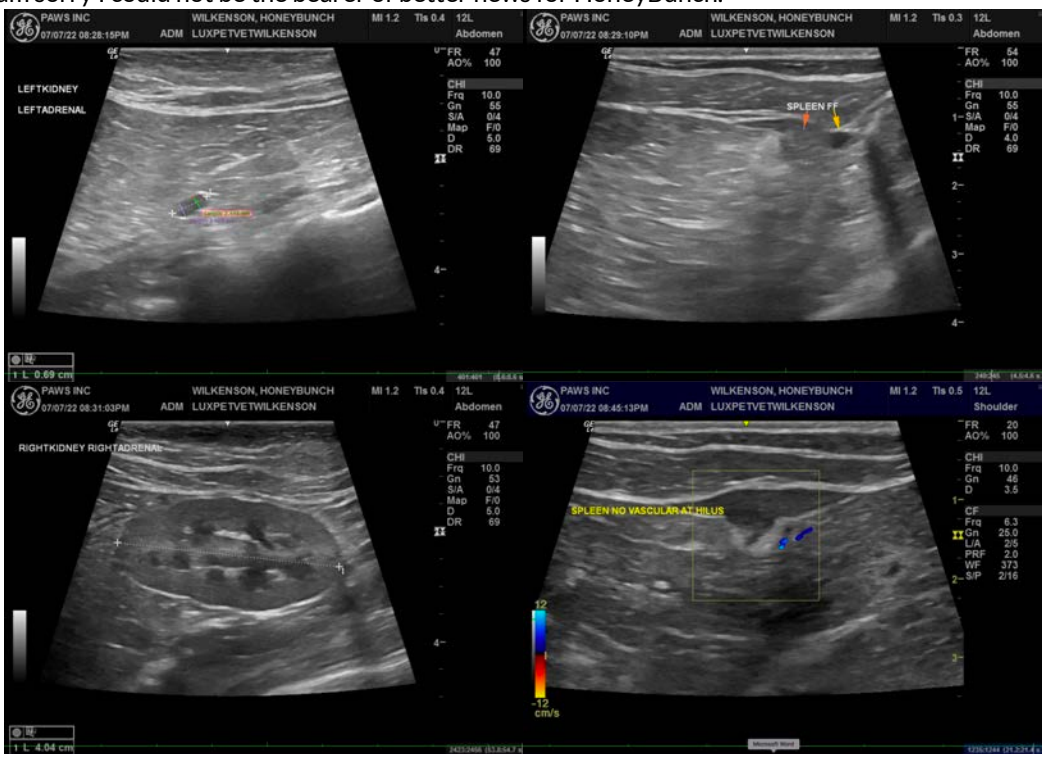
A non-steroidal anti-inflammatory, such as meloxicam or deracoxib, both of which have anti-neoplastic effects, may be prescribed, in addition to gabapentin.

toceranib (Palladia®), a tyrosine kinase inhibitor

+/- chlorambucil 2 mg by mouth every other day, with food

toceranib (Palladia®) can help slow down the progression of the tumour. It is administered by mouth three days a week, for example, Mondays, Wednesdays, Fridays. Routine blood work, consisting of a CBC and serum biochemical profile, is recommended to monitor for neutropenia and elevated liver enzyme activities, although this would not be as critical. For example, evaluation once, approximately 2 weeks after initiation of treatment and then once every 8 weeks thereafter.

I am sorry I could not be the bearer of better news for HoneyBunch.



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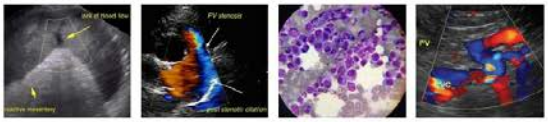

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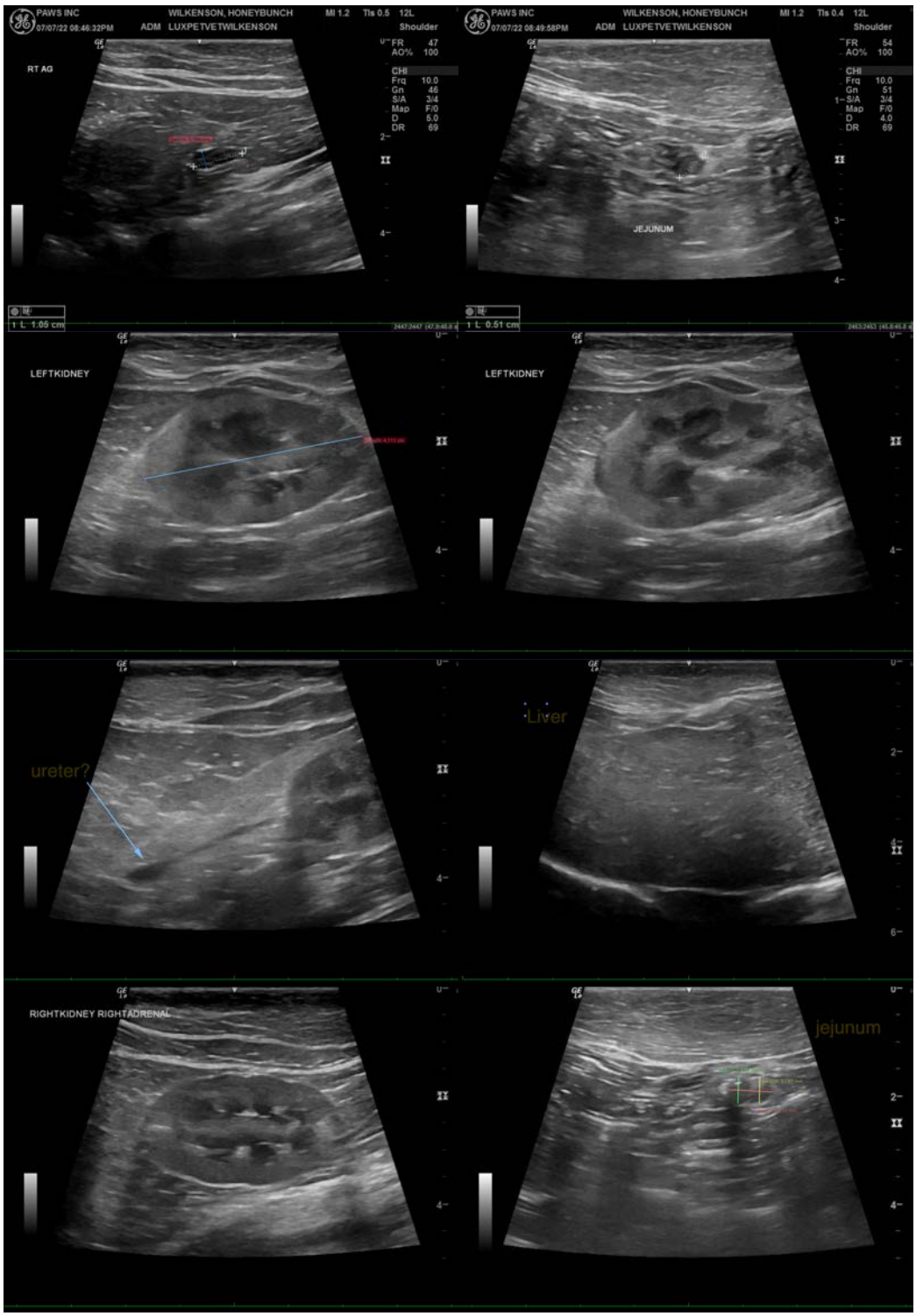

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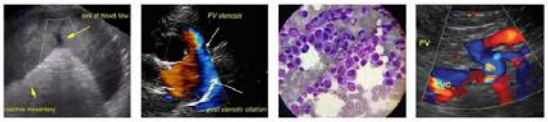

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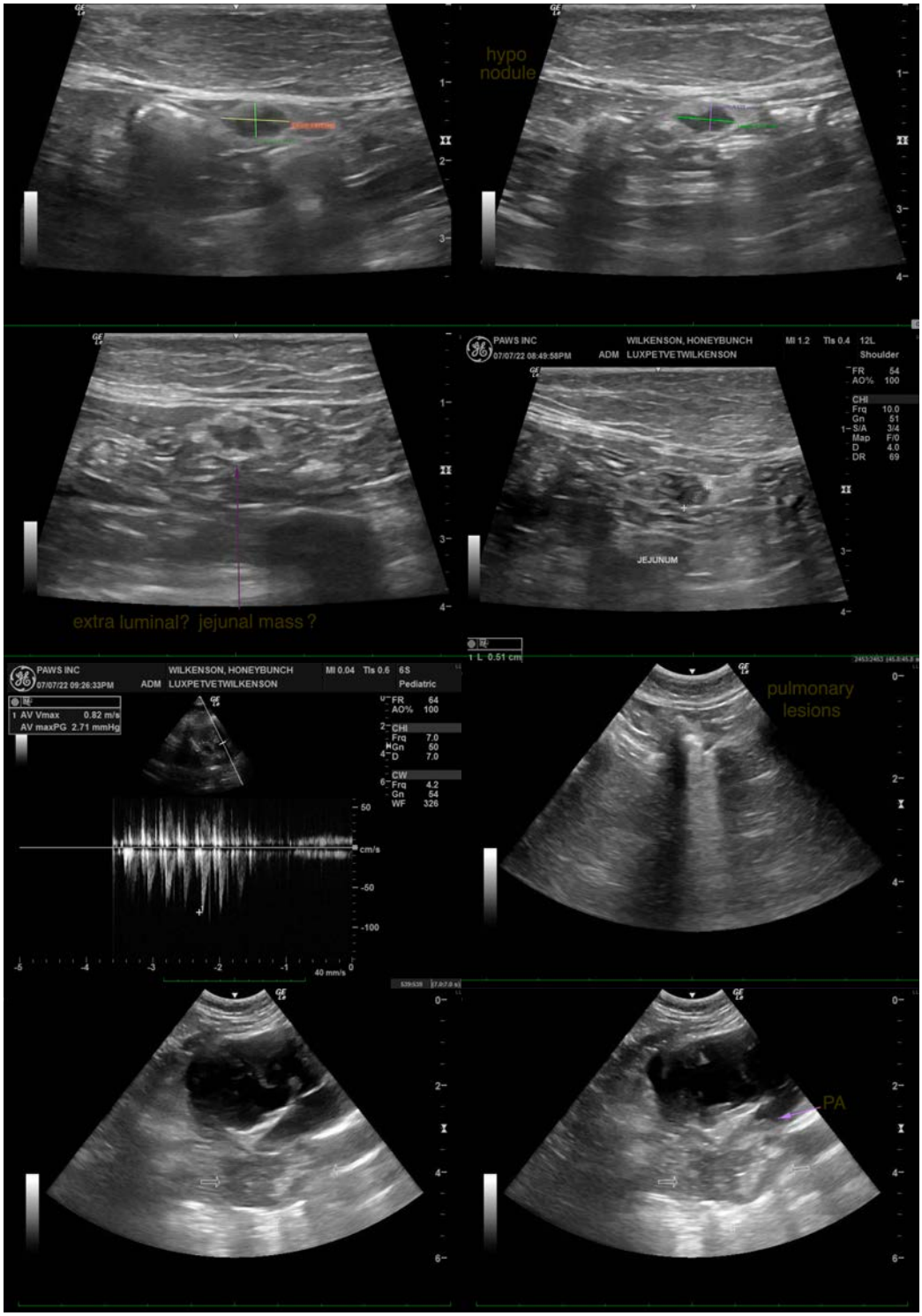

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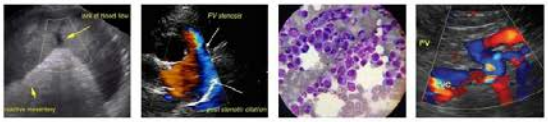

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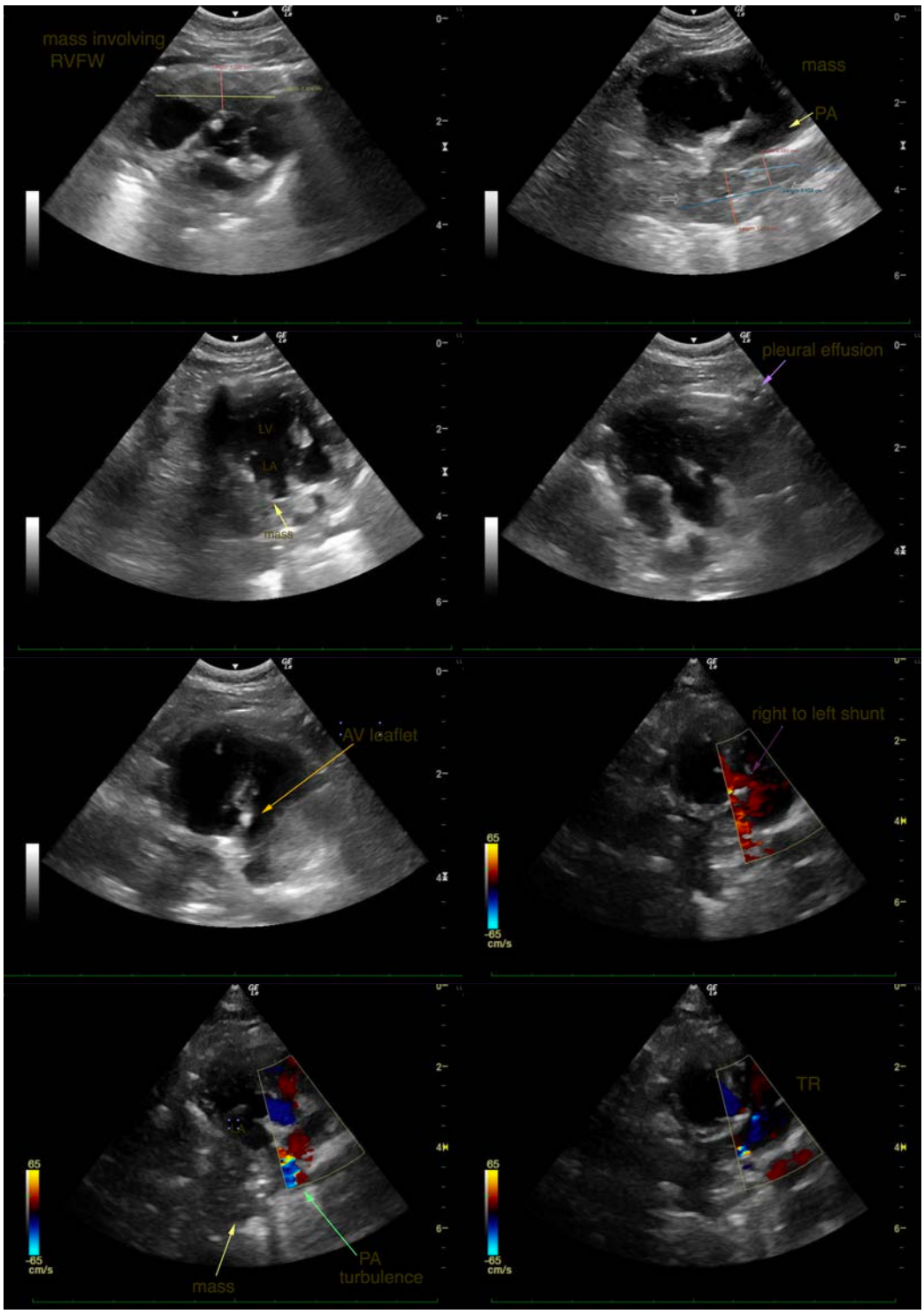

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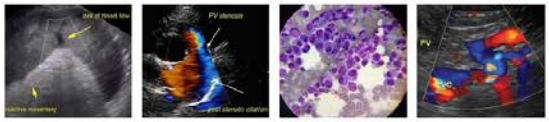


IMAGING PERFORMED BY
pawsonography@gmail.com 530-786-8340

PATIENT

HoneyBunch Wilkenson

SPECIES

Feline

BREED

DLH

SEX

Spayed Female

AGE

8 Years

WEIGHT

9.7 Pounds

INTERPRETED BY

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING BY

Loetitia Saint-Jacques, LVT

HOSPITAL NAME

LuxPetVet

REFERRING VET

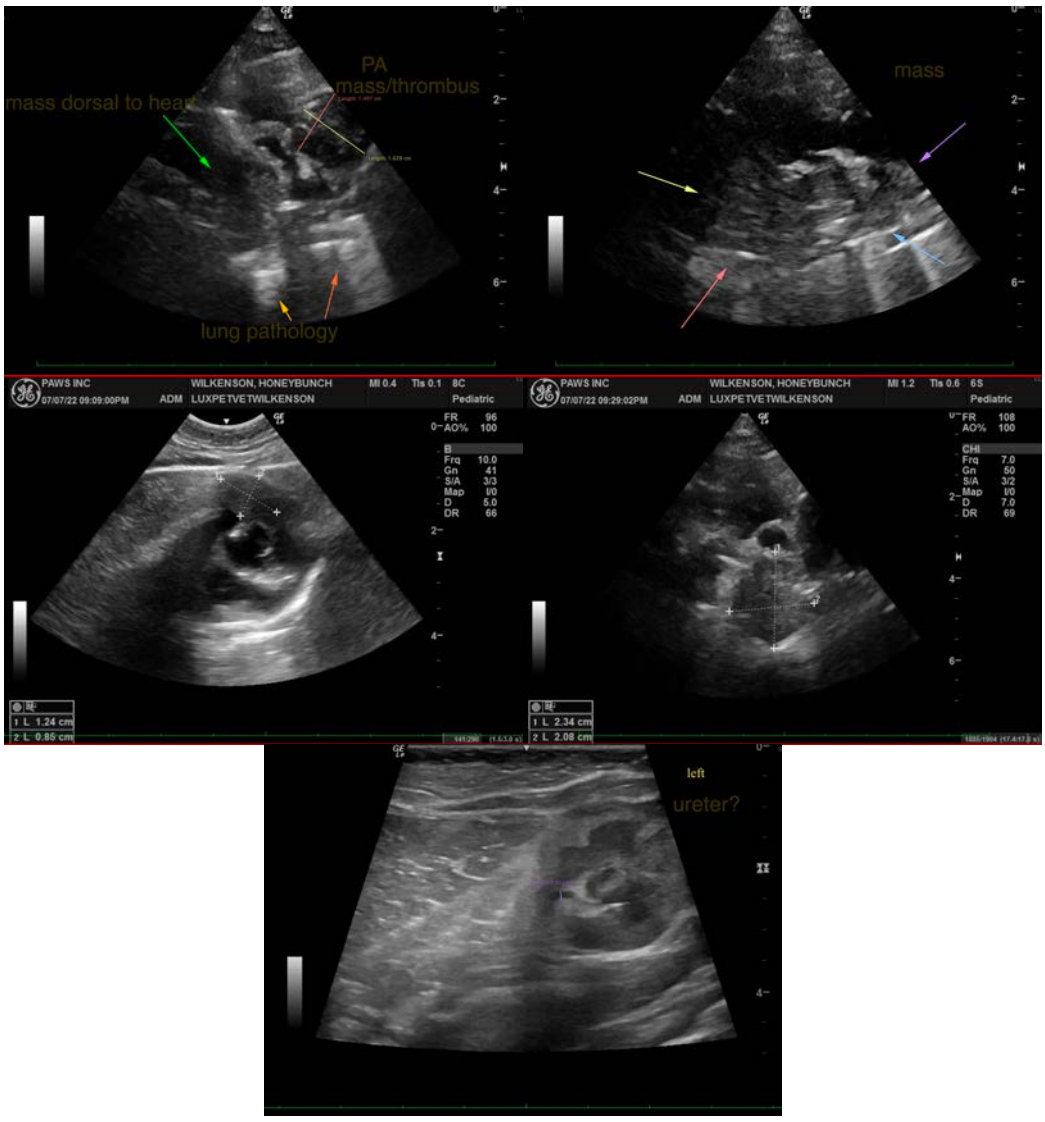
Dr. Kristin Kee

INVOICE

39336

DATE

7/8/22



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 AVIM

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