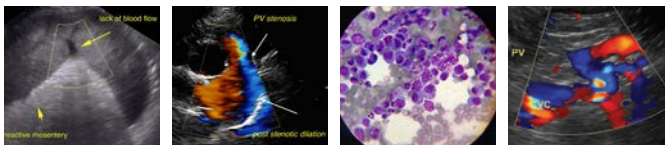


SonoPath.com™
1-800-838-4268 info@sonopath.com

PATIENT

Jesse Shea

SPECIES

Canine

BREED

Lab

SEX

Female

AGE

8 Years

WEIGHT

Not Provided

INTERPRETED BY

Eric Lindquist, DMV

DABVP, Cert. IVUSS

IMAGING PERFORMED BY

Jessia Miller

HOSPITAL NAME

Newton Vet Hospital

REFERRING VET

Dr. Kim

INVOICE

43553

DATE

12/19/22

PRESENTING CLINICAL SIGNS

Hypoglycemia- (while hunting- had seizures): genetically related housemate has lymphoma. Current meds: clavamox

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 **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. The right kidney measured 6.83 cm. The left kidney measured 7.1 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. The right adrenal gland measured 1.4 cm at the cranial pole and 0.60 cm at the caudal pole. The left adrenal gland measured 0.50 cm.

Spleen

The **spleen** presented a smooth homogeneous parenchyma hyperechoic to liver and renal cortical parenchyma. The capsule was smooth without noticeable expansion or deviation from within the spleen or adjacent pathology. The splenic vasculature demonstrated normal volume without signs of congestion or thrombosis. No sonographic evidence of acute or chronic inflammatory, neoplastic, or infarctual changes were noted.

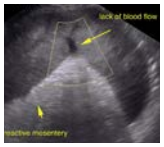
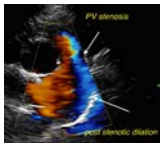
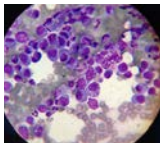
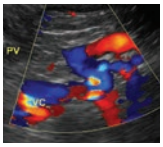
Liver

The **liver** images submitted revealed subjectively normal liver size, contour, and structure. Parenchymal echogenicity was naturally coarse and hypoechoic to the spleen. Vascular and biliary tracts were of normal volume with no evidence of congestion. The gallbladder presented acceptably thin walls with primarily anechoic content. The cystic and common bile ducts were normal. No pathological hepatic lymphadenopathy was evident. No overt structural evidence of inflammatory, infiltrative or regenerative pathology was evident.

Gastrointestinal

Examination of the **gastrointestinal tract** revealed a stomach and intestine free of stasis, of normal wall thickness, acceptable curvilinear mural detail, and peristaltic activity. Small and large intestine demonstrated normal luminal chyme and stool consistency respectively. No obstructive or overt infiltrative disease was noted. No associated abnormal lymphatic activity was noted.

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™

SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT
Jesse Shea

SPECIES
Canine

BREED
Lab

SEX
Female

AGE
8 Years

WEIGHT
Not Provided

INTERPRETED BY
Eric Lindquist, DMV
DABVP, Cert. IVUSS

IMAGING PERFORMED BY
Jessia Miller

HOSPITAL NAME
Newton Vet Hospital

REFERRING VET
Dr. Kim

INVOICE
43553

DATE
12/19/22

Pancreas

The base and limbs of the **pancreas** were observed to be largely isoechoic to surrounding omental fat. Pancreatic duct and capsular contour were acceptably normal and parenchyma respected normal curvilinear patterns. No overt evidence of active inflammatory or neoplastic disease was noted.

Free Abdomen

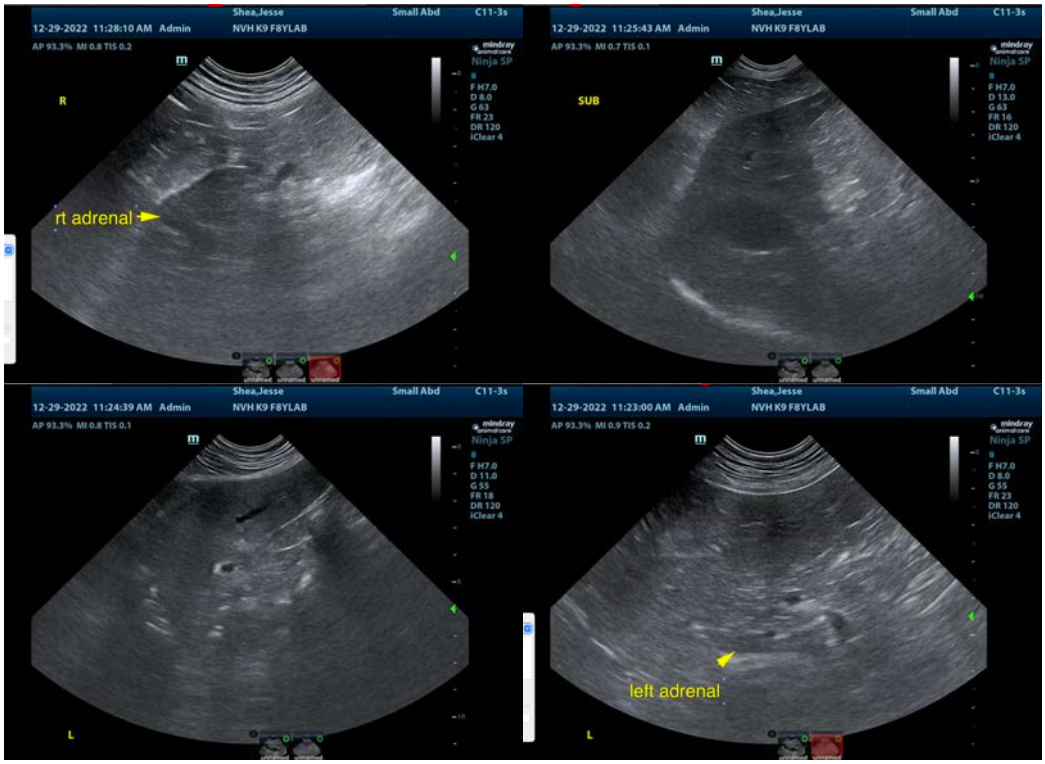
The left ovary was uniform measuring 1.3 cm x 0.84 cm. The right ovary was uniform measuring 1.71 cm x 1.14 cm. The left uterine horn was dilated up to 1.0 cm in width with a slight polypoid change at the proximal aspect. Minor echogenic debris noted. This should be monitored.

ULTRASONOGRAPHIC FINDINGS

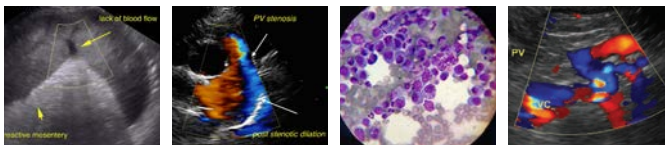
- Concern for early pyometra/mucometra, unremarkable abdomen otherwise.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

If this patient is not destined for breeding, then ovariohysterectomy should be considered. If the patient is to be used for breeding, then medical management for mucometra/pyometra would be indicated.



SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT

Jesse Shea

SPECIES

Canine

BREED

Lab

SEX

Female

AGE

8 Years

WEIGHT

Not Provided

INTERPRETED BY

Eric Lindquist, DMV

DABVP, Cert. IVUSS

IMAGING PERFORMED BY

Jessia Miller

HOSPITAL NAME

Newton Vet Hospital

REFERRING VET

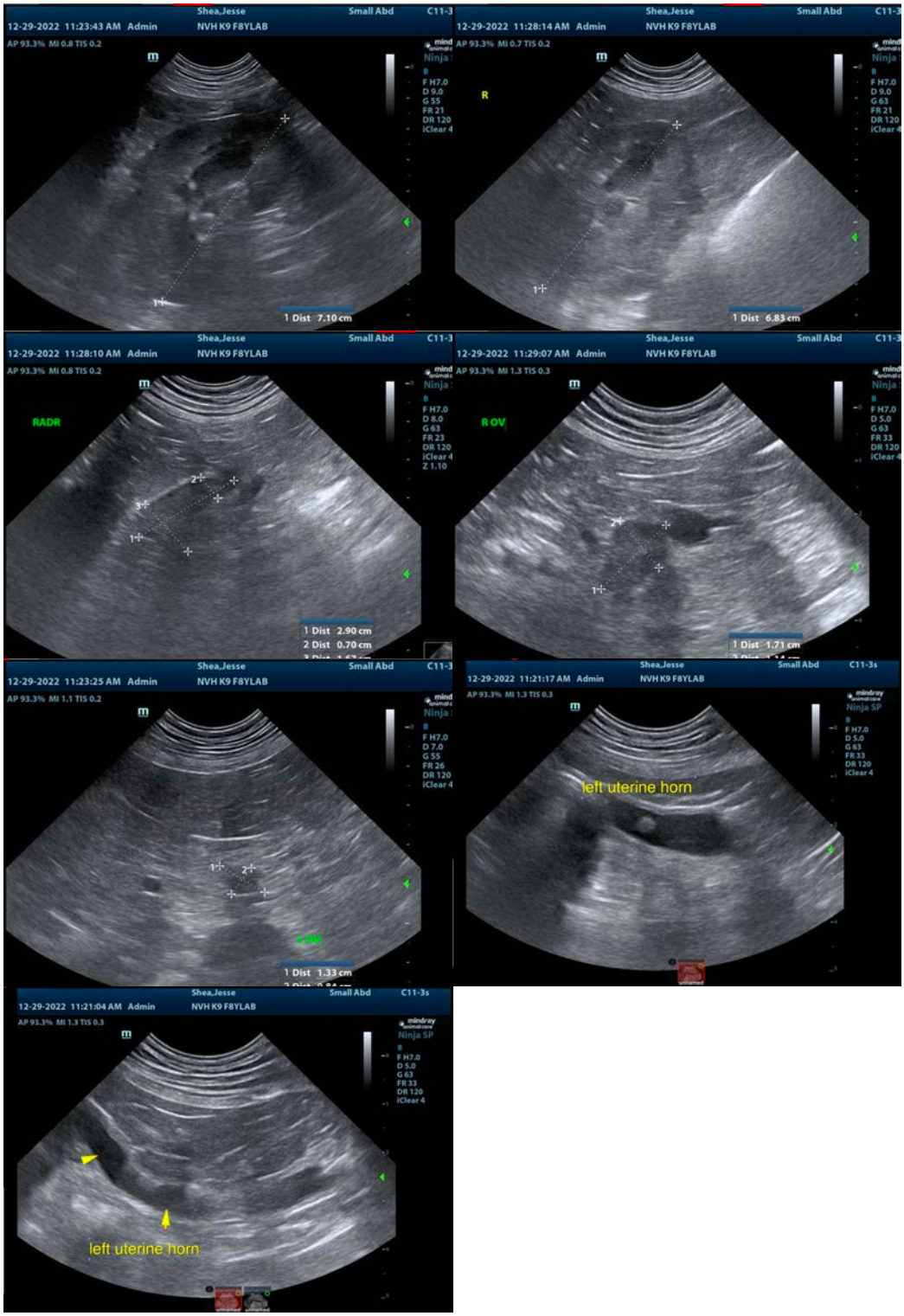
Dr. Kim

INVOICE

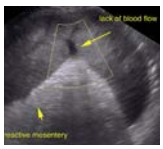
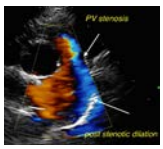
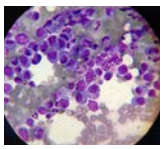
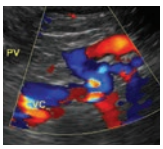
43553

DATE

12/19/22



SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™

SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT
Jesse Shea

SPECIES
Canine

BREED
Lab

SEX
Female

AGE
8 Years

WEIGHT
Not Provided

INTERPRETED BY
Eric Lindquist, DMV
DABVP, Cert. IVUSS

IMAGING PERFORMED BY
Jessia Miller

HOSPITAL NAME
Newton Vet Hospital

REFERRING VET
Dr. Kim

INVOICE
43553

DATE
12/19/22

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.

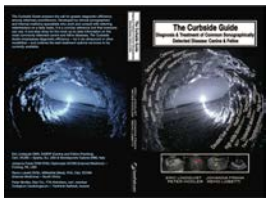
Thank you for this referral. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance please contact me.

Eric Lindquist, DMV, DABVP, Cert. IVUSS, CEO of SonoPath.com

info@SonoPath.com

The following is an applicable excerpt from the *Curbside Guide to Diagnosis & Treatment of Sonographic Disease* offered by SonoPath.com Lindquist, Frank, Lobetti, and Modler.

An essential quick guide for every general practitioner and sonographer.

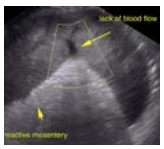
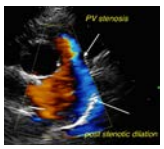
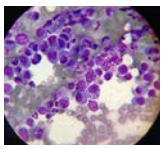
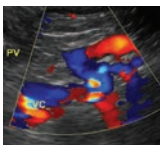


Hypoglycemic Syndrome: Insulinoma and Other

http://www.sonopath.com/Hypoglycemia

Short axis of the left pancreatic limb in a dog with an insulinoma seen as an ovoid hypoechoic mass lesion expanding the pancreatic capsule.

Description: Hypoglycemia can be found incidentally or associated with non-specific clinical signs, such as listlessness and weakness. It is essential to consider the multiple differentials for hypoglycemia in order to avoid a potential hypoglycemic crisis. One must perform a rapid and efficient workup to arrive at a

SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT
Jesse Shea

SPECIES
Canine

BREED
Lab

SEX
Female

AGE
8 Years

WEIGHT
Not Provided

INTERPRETED BY
Eric Lindquist, DMV
DABVP, Cert. IVUSS

IMAGING PERFORMED BY
Jessia Miller

HOSPITAL NAME
Newton Vet Hospital

REFERRING VET
Dr. Kim

INVOICE
43553

DATE
12/19/22

diagnosis and prescribe the proper therapy.

Differentials for hypoglycemia include: laboratory or handling error; sepsis; toxins (e.g. xylitol, ethylene glycol); hunting dog hypoglycemia; Addison's disease; polycythemia; liver failure; poorly regulated diabetes mellitus; and neoplasia (e.g. leiomyosarcoma, hepatic, lymphoma, and insulinoma).

Once other causes of hypoglycemia have been ruled out, one may initiate an investigation into the possibility of insulinoma. Insulinoma is a tumor of the pancreas that originates in the beta cells and leads to the unregulated secretion of insulin and hypoglycemic syndrome. The tumor can be a malignant carcinoma or a more benign form of adenoma. There is, however, controversy regarding the exact histopathology associated with insulinoma types.

Insulinoma patients are usually middle-aged dogs. Half of all cases present with metastasis to the lymph nodes, liver, and mesentery at the time of diagnosis. There are 3 stages of insulinoma:

Stage 1: Pancreatic localization

Stage 2: Pancreas and lymph nodes with a median survival time (MST) of 1.5 years

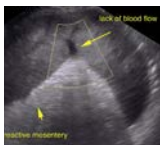
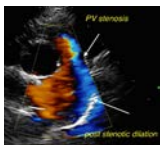
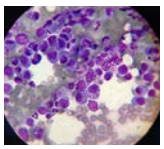
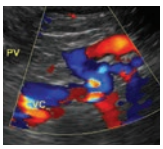
Stage 3: Organ metastasis with an MST of 6 months.

Clinical Signs: Neurogylocopenia syndrome results in lethargy, ataxia, collapse, and seizures. Catecholamine release from hypoglycemia leads to hunger, behavior changes, and muscle tremors. Postprandial exacerbation of clinical signs can occur.

Diagnostics: When investigating for insulinoma, one should use a fluoride-containing tube (i.e., a grey top tube) to obtain an accurate glucose level. A fasting glucose level below 60 mg/dl is diagnostic for hypoglycemia. Insulinoma is indicated when one observes the Whipple's triad of hypoglycemia, clinical signs consistent are with hypoglycemia, and the latter resolve with the administration of dextrose.

Fasting insulin and glucose ratio: A high normal to elevated insulin level with glucose < 60 mg/dl is diagnostic for insulinoma.

Imaging: Localizing the lesion with staging is best approached by ultrasound. The ability to localize the lesion may be highly operator- and/or machine-dependent given the often small or even microscopic nature of insulinoma, especially early on in the disease. Primary or secondary lesions associated with insulinoma can often be identified with higher resolution sonography. Appropriate ultrasound-guided sampling (FNA or core biopsy) can be performed of any enlarged lymph node or hepatic nodule if a primary pancreatic lesion

SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT

Jesse Shea

SPECIES

Canine

BREED

Lab

SEX

Female

AGE

8 Years

WEIGHT

Not Provided

INTERPRETED BY

Eric Lindquist, DMV

DABVP, Cert. IVUSS

IMAGING PERFORMED BY

Jessia Miller

HOSPITAL NAME

Newton Vet Hospital

REFERRING VET

Dr. Kim

INVOICE

43553

DATE

12/19/22

is not seen.

Computed tomography (CT) with contrast is likely more sensitive than the average sonographer when it comes to assessing insulinoma.

Tumor staging and histopathological characterization in conjunction with the Ki67 biomarker index will yield solid criteria for the prognostic evaluation of insulinoma.

Treatment:

In cases of emergency hypoglycemic crisis, apply corn syrup to the gums. Administer a dextrose bolus (0.5g/kg IV) and maintain 2.5-10% dextrose solution. If cerebral edema occurs, one should administer dexamethasone (2 mg/kg IV) and give mannitol (0.5 mg/kg IV) over a 20-minute period.

One should perform a surgical pancreatectomy if the tumor is localized (i.e., stage 1 insulinoma). Given that the lesion may be difficult to locate with the naked surgical eye or via palpation, the surgical procedure can be enhanced by intraoperative ultrasound.

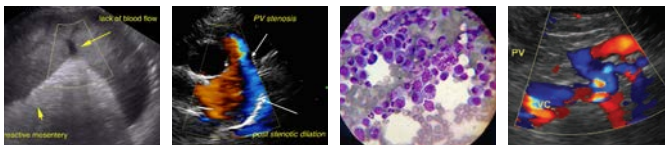
In cases of stage 2 and 3 insulinoma, administer prednisolone (0.25 mg/kg PO BID). A glucagon IV infusion has also been suggested; it should be infused with saline at 5 mg/kg/min for refractory cases. If prednisone is not adequate, one can supplement with benzothiadiazide diazixide (5 mg/kg PO BID).

Patients should be fed small, frequent portions of a diet high in fat, complex carbohydrates, and protein.

Chemotherapy: In some cases, the use of alloxan (65 mg/ kg IV) has been shown to be helpful.

Conclusion: The largest study of insulinoma patients identified a general MST of 547 days; however, the MST was 785 days for those undergoing pancreatectomy and 1316 days for those that relapsed after surgery and received treatment with prednisone. Other studies have reported an MST of 258 days with pancreatectomy. All of these results indicate that insulinoma is treatable. Using ultrasonography for staging and histopathological characterization is essential in order to determine whether the appropriate treatment should be surgical, medical, or both.

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



SonoPath.com™
1-800-838-4268 info@sonopath.com

PATIENT
Jesse Shea

SPECIES
Canine

BREED
Lab

SEX
Female

AGE
8 Years

WEIGHT
Not Provided

INTERPRETED BY
Eric Lindquist, DMV
DABVP, Cert. IVUSS

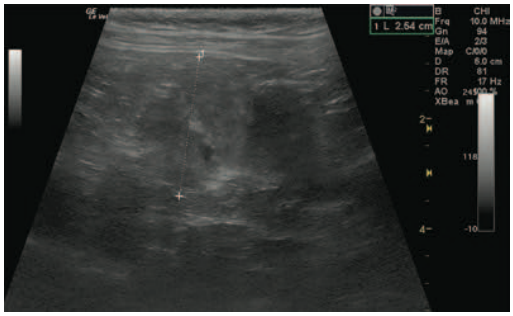
IMAGING PERFORMED BY
Jessia Miller

HOSPITAL NAME
Newton Vet Hospital

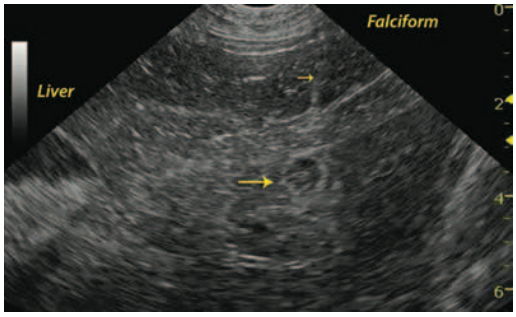
REFERRING VET
Dr. Kim

INVOICE
43553

DATE
12/19/22

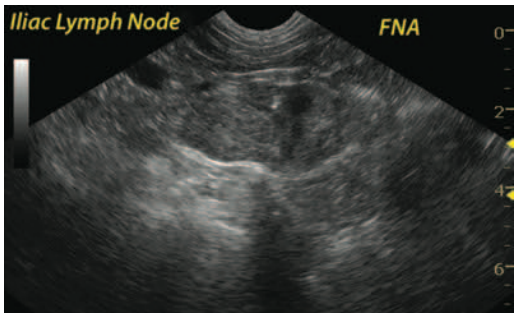


Short axis of the left pancreatic limb in a cat with an insulinoma seen as a complex heterogenous mass lesion expanding the pancreatic capsule (between calipers). Note the mass effect of the tumor displacing the transverse colon caudally.



Subxiphoidal short axis of the liver in a dog with an insulinoma during ultrasound guided sampling of a suspected metastatic lesion.

The needle trajectory is seen as a hyperechoic line (small arrow) approaching the hypoechoic nodule (large arrow) within the liver parenchyma.



Long axis of the medial iliac lymph node during ne needle aspiration in a dog with multifocal metastatic spread of an insulinoma. The echogenic needle tip is seen within the lymph node. The metastatic lymph node is enlarged, rounded, hypoechoic and heterogenous. The primary metastatic loci in insulinoma are the regional lymph nodes (hepatic, pancreaticoduodenal, gastric) and the liver. Hence, metastatic insulinoma lesions in the iliac lymph node in this case was not a typical occurrence.

References:

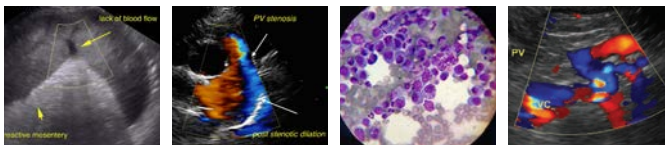
Buishand FO, Kik M, Kirpensteijn J. Evaluation of clinico-pathological criteria and the Ki67 index as prognostic indicators in canine insulinoma. *Vet J* 2010;185:62-67.

Fischer JR, Smith SA, Harkin KR: Glucagon constant-rate infusion: A novel strategy for management of hyperinsulinemic-hypoglycemia crisis in the dog. *J Am Anim Hosp Assoc* 2000;36:27-32.

Polton GA, White RN, Brearley MJ, et al. Improved survival in a retrospective cohort of 28 dogs with insulinoma. *J Small Anim Pract* 2000;48:151-56.

Steiner JM, Bruyette DS: Canine insulinoma. *Compend Contin Educ Pract Vet* 1996;18:31-36.

SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™



SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT

Jesse Shea

SPECIES

Canine

BREED

Lab

SEX

Female

AGE

8 Years

WEIGHT

Not Provided

INTERPRETED BY

Eric Lindquist, DMV

DABVP, Cert. IVUSS

IMAGING PERFORMED BY

Jessia Miller

HOSPITAL NAME

Newton Vet Hospital

REFERRING VET

Dr. Kim

INVOICE

43553

DATE

12/19/22

Tobin RL, Nelson RW, Lucroy MD, et al. Outcome of surgical versus medical treatment of dogs with beta cell neoplasia: 39 cases (1990-1997). *JAVMA* 1999;215:226-30.