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Clinical Sonography & Telecytology
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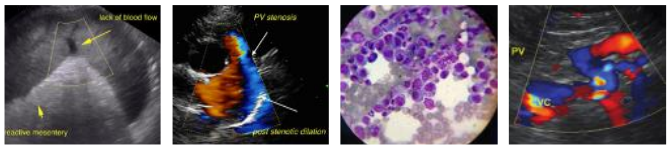

SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT

Willow McDonald

SPECIES

Feline

BREED

DLH

SEX

Spayed Female

AGE

13 Years

WEIGHT

5 kg

INTERPRETED BY

Eric Lindquist, DMV DABVP, Cert. IVUSS

IMAGING PERFORMED BY

Dr. Callihan

HOSPITAL NAME

Animal Emergency Care

REFERRING VET

Dr. Drummond

INVOICE

13797

DATE

2/5/22

PRESENTING CLINICAL SIGNS

History: -presented to ER as a transfer from her pcdvm (Chuckanut Feline) where she was seen for a several day history of lethargy, inappetence, and fever. -On presentation to CFC 2/2/22 (Wednesday) she was febrile (105.8) and had abdominal pain on palpation. CBC showed eosinopenia (0.07k) and thrombocytopenia (33k); chem showed hyperglycemia (236) and mild hypophosphatemia (2.9). -Supportive outpatient care with Onsior, Fluids, Convenia -She re-presented on 2/4/22 (Friday) and was still febrile (slight reduced at 104.9) and was now dehydrated with evidence of nausea (hypersalivation and ptyalism) and persistent abdominal pain. Abd radiographs showed gas filled stomach and no evidence of intestinal obstruction or overt pathology. -Tx with rDVM: SQF, buprenorphine, and Cerenia injection prior to transfer here -other history: current on preventive care, mostly indoors, accompanied by owner when outdoors, no ongoing health issues

Abnormal PE/Chem/CBC/UA Results: -she continues to actively retch despite Cerenia -On 2/2 CBC and Chems normal - today PCV is 25%, TP 5.8 g/dL; there is no melena on rectal exam -2 manual blood smears done in past 12 hours both show moderately reduced platelets but normal rbc and PLT morphology. PLT estimate is 90K; serum is icteric (have not rechecked liver values yet) -SNAP fPL normal -UA: concentrated 1.042, trace glucose and ketone, quiet sed

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 pelvic urethra was imaged 2.0 cm beyond the cystourethral junction.

Both **kidneys** were swollen with nephritis pattern. The left kidney measured 4.22 cm. Slight pyelectasia and pericapsular fat accumulation were noted in the left kidney. The right kidney measured 4.34 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 0.4 cm. The left adrenal gland measured 0.4 cm.

Spleen

The **spleen** was mildly enlarged with uniform, but subtly micronodular parenchyma, and undulating capsular contour. This is consistent with reactive spleen owing to immune stimulus or early infiltrative disease such as mast cell disease or lymphoma. 25-gauge FNA would be ideal if weight loss is an issue to differentiate early round cell neoplasia versus splenitis or reactive spleen all of which can present in this manner.

Liver

The **liver** was hypoechoic to surrounding fat with mild increased portal markings. The common bile duct measured 0.23 cm.

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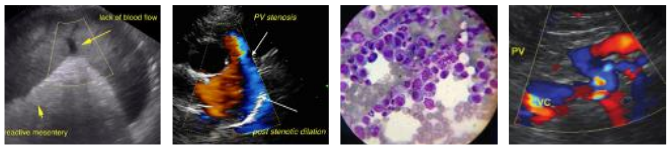

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Gastrointestinal

The **gastrointestinal tract** revealed variable minor thickening without loss of mural detail. Intestinal wall thickness measured up to 0.2 cm. The colonic wall was thickened without loss of mural detail with hypertrophied mucosa. Fluid filled colonic lumen noted.

Pancreas

The **pancreas** was hypoechoic with undulating contour. Enhanced mesentery was noted.

Free Abdomen

The mesenteric **lymph nodes** (up to 0.6 cm) presented normal length to width ratio with slight, swollen contour. There was no loss of parenchymal detail. This is most consistent with reactive lymphadenitis or lymphatic hyperplasia.

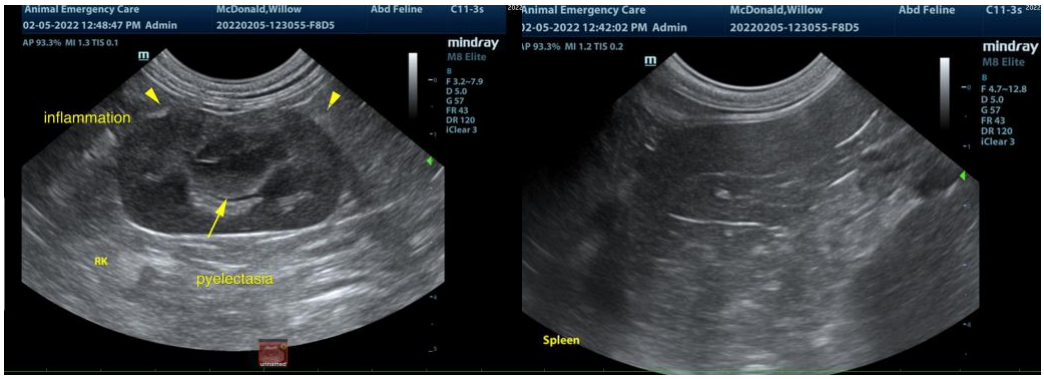
Reactive mesentery was noted throughout the mid abdomen.

ULTRASONOGRAPHIC FINDINGS

- Gastroenteritis/colitis pattern
- Nephritis
- Pancreatitis
- Reactive mesenteric lymph nodes
- Reactive mesentery
- Spleen, scalloping contour

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Infectious agents, such as toxoplasmosis or Bartonella should be considered as potential issues. IV fluid support, broad spectrum antibiotics, antiparasitic protocol and pain management warranted. Subxiphoid palpation is recommended to assess for pain or discomfort associated with the pancreas. Full urinary work up warranted. Colonoscopy would be ideal. Colonic scrapping may allow for further definition. Enrofloxacin/clindamycin combination may be effective along with supportive care. No overt evidence of neoplasia yet an emerging neoplastic process such as mast cell disease cannot be completely ruled out. If clinical signs are refractive to medical management, then FNA of the spleen would be indicated to ensure this is a reactive state.



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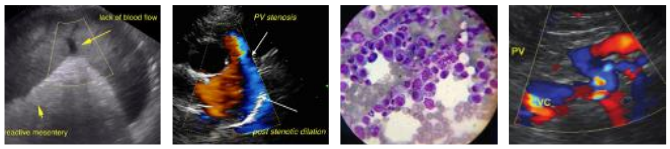

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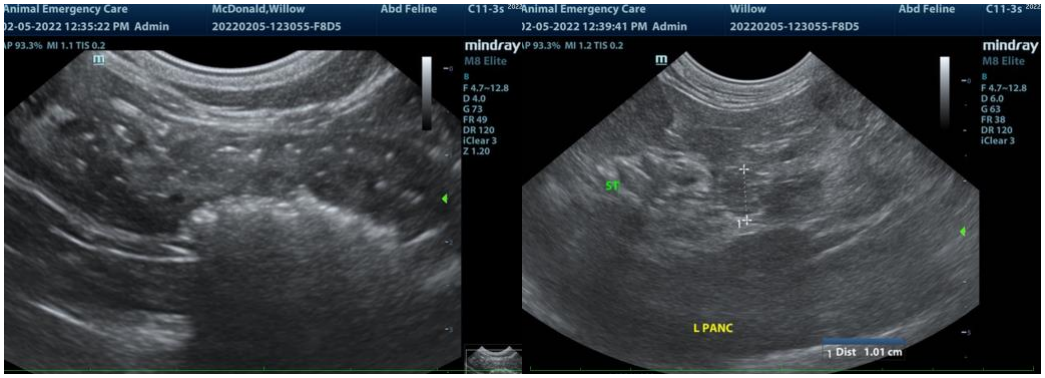
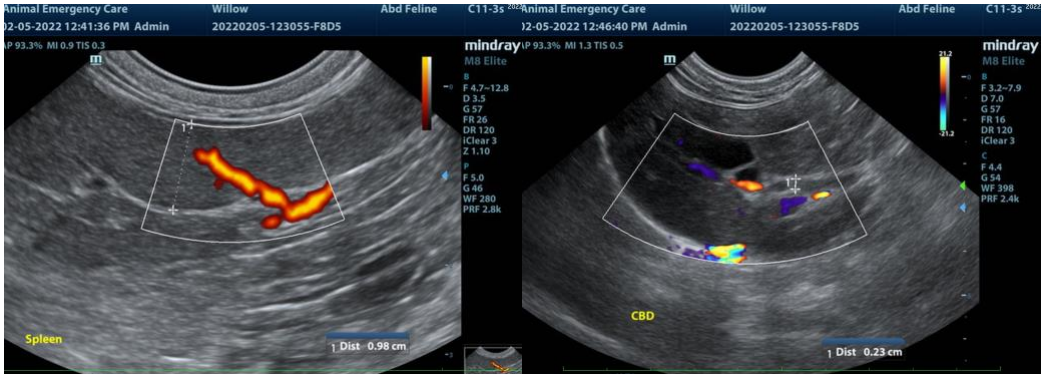
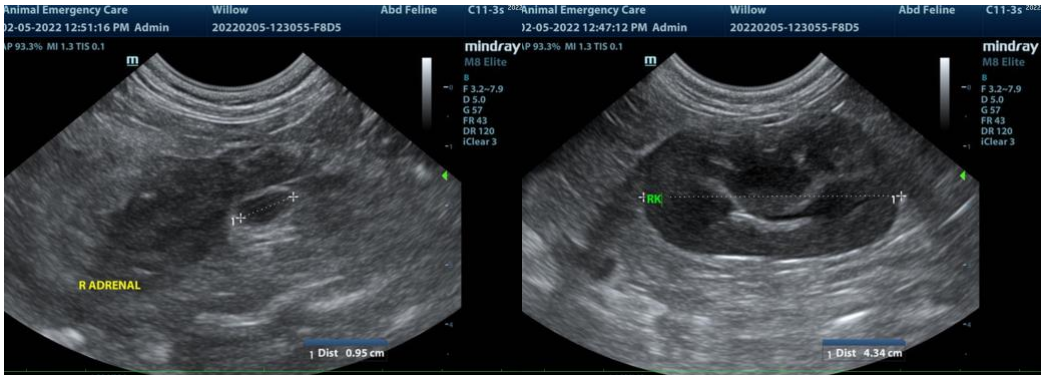
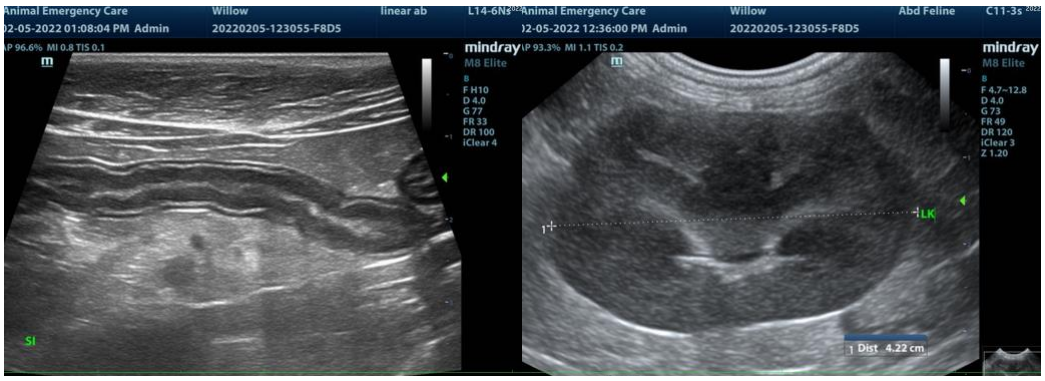
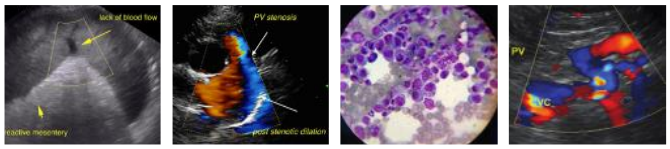








The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.



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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

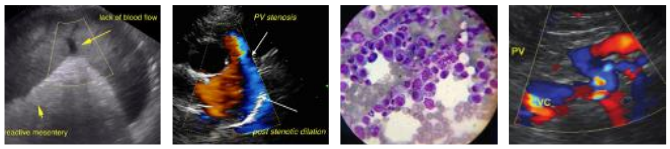
Fever of Unknown Origin

http://www.sonopath.com/FUO

Description: The definition of a fever of unknown origin (FUO) has not been clearly defined for animals. Currently, it is either understood to be a fever that does not resolve within the period one would expect for a "self-limiting infection" being treated with appropriate antimicrobial therapy, or that for which an underlying diagnosis has not been determined despite considerable diagnostic effort. The common causes of FUO were summarized concisely in a presentation at the American College of Veterinary Internal Medicine 2004 Forum. The presenters synthesized information from three veterinary papers on the subject, which suggested the following:

Final Diagnosis	Bennett (dogs & cats)	Dunn and Dunn (dogs only)	Lunn (dogs & one cat)	Total
Infection	21	16	10	47
Immune	18	22	6	46
Bone marrow disease	4	22	2	28
Neoplasia (outside marrow)	0	10	2	12
Miscellaneous	2	12	2	16
No diagnosis	0	19	2	21
TOTALS	45	101	24	170

The types of infection diagnosed in this case series were varied, ranging from discospondylitis (8 cases), blastomycosis (6), and bacterial endocarditis (4), to leishmaniasis (1), prostatitis (1), and *Ehrlichia canis* infection (1); a multitude of other infectious causes also fell within the spectrum. Of



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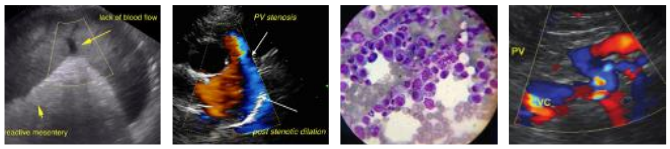
the cases in which immune-mediated disease was found, 44% had immune-mediated polyarthritis. Bone marrow diseases included myeloproliferative disease, myelodysplasia (8), lymphocytic leukemia (8), myeloma (3), chronic granulocytic leukemia (3), lymphoblastic leukemia, and malignant histiocytosis. The types of neoplasia located outside the bone marrow included lymphoma (6), metastatic disease (2), and neoplasms of the lung, spleen, and stomach. Finally, miscellaneous diseases included hypertrophic osteodystrophy (6), meningitis (3), portosystemic shunt (3), lymphadenitis (2), panosteitis, and intervertebral disc disease. Overall, the most common causes across all cases were polyarthritis (44), lymphoid neoplasia (15), discospondylitis (8), myelodysplasia (8), hypertrophic osteodystrophy (6), and blastomycosis (6).

Clinical Signs: Animals usually present with either persistent or waxing and waning fevers ranging from 103ºF to 106ºF. Other clinical signs depend on the underlying cause of the fever. Careful and thorough physical examination is required to assess potential causes.

Diagnostics: FUO etiologies are partly related to geography, and thus locale or travel history should factor into a practitioner's diagnostic approach. A patient's lifestyle may also provide clues regarding exposure to certain etiologic agents. Therefore, conducting a thorough history can unveil important pieces of the diagnostic puzzle. Physical examination is especially important and should include an inspection of all accessible lymph nodes, palpation and movement of the joints, a fundic examination, a neurological evaluation, spinal and limb palpation and range of motion tests, and a rectal examination.

A minimum database should include a CBC reviewed by a clinical pathologist, as well as a biochemical profile and urinalysis. Retroviral testing should also be considered in cats. In areas where tick-borne disease is prevalent, in-house testing should be performed early. Advanced laboratory work can include: urine culture, blood culture, and infectious disease panels (PCR and/or serology). In dogs, one may screen for the following infectious agents: *Ehrlichia* spp., *Borrelia burgdorferi*, Rock Mountain Spotted Fever, *Bartonella* spp. (culture and PCR), and *Leptospira* spp. in cases of hepatic or renal involvement. In cats, one should evaluate for FeLV, FIV, feline infectious peritonitis (FIP) virus, toxoplasmosis, *Hemoplasma* spp. (*Mycoplasma*), and *Bartonella* spp. (culture and PCR). Testing for *Ehrlichia* spp., *Rickettsia* spp., and *Anaplasma phagocytophilum* can also be considered. A fungal assay is indicated if the patient lives in or has had exposure to a region with a higher incidence of fungal disease. Other infectious disease tests may be performed depending on the geographical location of the pet. Screening for *Brucella* should be done in breeding dogs. Immune-mediated disease screening can include a Coomb's test, a slide agglutination test (if the patient is anemic), and an antinuclear antibody (ANA) test. Immune disease is often a diagnosis of exclusion.

Imaging should include thoracic radiographs, abdominal ultrasound, and/or abdominal radiographs. Ultrasound can be very useful for assessing evidence of cholangiohepatitis, pyelonephritis, chronic urinary tract infection, abscess formation, peritonitis, and neoplasia; it also permits an examination of the intra-abdominal lymph nodes. An echocardiogram can offer assessment for vegetative endocarditis, whereas spinal radiographs offer assessment for discospondylitis. In cases where all other testing has proven negative and the patient has not responded to broad-spectrum antibiotics and supportive care, arthrocentesis should be considered to evaluate for septic joint disease, immune-mediated polyarthritis, and infectious disease. Finally, one can consider assessing the



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cerebrospinal fluid for meningoencephalitis, GME, and meningitis/arteritis. A bone marrow exam should be performed if blood dyscrasias are noted on the CBC.

Treatment: Treatment of the fever depends entirely on the underlying cause. Ideally, a thorough diagnostic plan will yield a diagnosis that will guide the appropriate therapeutic course. However, if an exhaustive approach has not produced a definitive diagnosis and there is no response to broad-spectrum antibiotics, trial therapy with immunosuppressive agents such as prednisolone can be considered to treat presumed immune-mediated diseases. Given the potential for negative sequelae should an underlying infection be present, one must be certain that the investigation is thorough and monitor the patient's response carefully.

Conclusion: If a documented fever has not responded to antibiotics, antipyretics, or general nursing care, it is important to obtain a diagnosis to guide more specific treatment. A systematic physical examination and thorough history-taking will help inform further diagnostics in addition to what is revealed by the minimum database.

References:

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