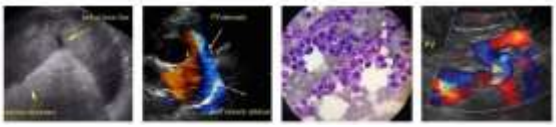

PATIENT

Toonces Calvery

SPECIES

Feline

BREED

DSH

SEX

MN

AGE

9 Years

WEIGHT

7.2 kg

INTERPRETED BY

R. McKenzie Daniel, DVM, DABVP

IMAGING PERFORMED BY

Kelly Reshny, RVT

HOSPITAL NAME

Beattie Pet Hosp
Stoney Creek

REFERRING VET

Sahar

INVOICE

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DATE

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PRESENTING CLINICAL SIGNS

O states when P urinates, only a small mount comes out. Also having diarrhea. P is still eating and drinking. O says that P is straining in the litterbox, not vocal. P is BAR, and PE is WNL, abdomen soft and non painful
Abnormal PE/Chem/CBC/UA Results: BW & UA-WNL rads: ABDOMEN July 16, 2021: Lateral and ventrodorsal views are provided for interpretation (3 total views). FINDINGS: The liver is normal. The spleen is normal. The stomach contains a moderate amount of mottled soft tissue material mixed with gas. Small intestinal bowel loops are normal in size and distribution and have a mixed pattern. The ascending and proximal descending colon contains formed desiccated feces, trivial granular mineralized debris, and gas. The mid to distal descending colon and rectum are empty. The kidneys are obscured by bowel. The caudal pole of the left kidney is diminished in size. The urinary bladder is mildly distended and unremarkable. CONCLUSIONS: 1. There is desiccated feces and trivial granular mineralized debris within the ascending to proximal descending colon which can be seen associated with dehydration. The distal descending colon to rectum is empty. A discrete mass involving the descending colon to rectum is not identified. 2. Mottled material within the stomach could be undigested food or foreign material. 3. Diminished size of the caudal pole of the left kidney would suggest early chronic nephritis. This could be subclinical. Chronic nephritis can be a cause of dehydration and secondary constipation.

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The urinary bladder presented a uniformly mildly thickened urinary bladder wall primarily in the ventral apical to apical urinary bladder wall and somewhat in the mid ventral wall. The luminal margin of the thickened urinary bladder wall was mildly asymmetrical in contour. The apical urinary bladder wall thickness measured 0.27 cm diameter. Moderate nondependent to dependent potentially adhered hyperechoic to mineralized sediment was present. The urinary bladder, trigone, cystourethral junction, and visible pelvic urethra, to a depth of 2.0 cm, exhibited normal tone. Anechoic urine was present in the lumen with no uroliths or sediment. The ureteral papillae were normal. The ureters were not visible which is normal. No evidence of neoplastic criteria.

The area of the residual prostate appeared normal and free of pathology.

No evidence of pathology in the area of the aortic trifurcation.

Normal size and margination was present in the kidneys. A normal 1:3 cortex / medulla ratio with minor loss of corticomedullary border demarcation and subtle uniform increased cortex echogenicity. No evidence of pyelectasia or overt pyelonephritis in either kidney. The left kidney measured 4.5 cm in length. The right kidney measured 4.4 cm in length.

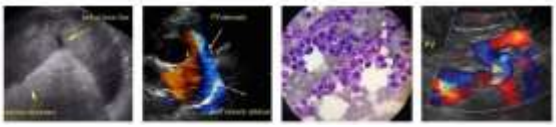
Adrenal Glands

The left adrenal gland was uniform in size and contour with a uniformly hypoechoic parenchyma. The left adrenal gland measured 0.31 cm width. The right adrenal gland was uniform in size and contour with a uniformly hypoechoic parenchyma. The right adrenal gland measured 0.34 cm width.

Spleen

The spleen exhibited a finely textured and homogenous parenchyma which was hyperechoic to the liver and renal cortical parenchyma. The capsule was smooth and regular without apparent expansion. The splenic vasculature at the hilus was normal in volume with no evidence of congestion or thrombosis. Acute to chronic inflammatory, neoplastic, or benign parenchyma changes were not noted. The spleen measured 0.59 cm width.

Liver



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The liver was subjectively normal in size, structure, and contour. The liver parenchyma was uniform and hypoechoic to the spleen with a mild coarse echotexture. The hepatic and portal vasculature were normal in appearance without signs of congestion. The gallbladder was non-distended in size with thin walls and primarily anechoic luminal content. The cystic and common bile ducts were normal.

Gastrointestinal

The visible gastric walls exhibited intact wall layering without mural pathology or hypertrophy. The stomach contained mild to moderate echogenic with progressive distal acoustic shadowing ingesta without overt evidence of obstruction to pyloric outflow. The gastric body wall measured 0.29 cm width.

The small intestine presented intact wall layering with 1:3 muscularis/mucosa ratio. The lumen of the small intestine was empty with no signs of ileus, obstruction or foreign material. The jejunum wall measured 0.20 cm width.

The visible colon was sonographically unremarkable containing formed feces without evidence of colonic distension. No evidence distal colonic mural pathology.

Pancreas

The parenchyma of the left limb, body and right limb of the pancreas presented isoechoic to the adjacent omental fat. A normal curvilinear capsule contour of the pancreas was present. The visible pancreatic duct was normal. No signs of active inflammation or neoplastic disease was evident.

Free Abdomen

No overt lymphadenopathy or peritoneal effusion was present.

ULTRASONOGRAPHIC FINDINGS

- Mild cystitis with moderate dependent to nondependent potentially adhered hyperechoic to mineralized sediment.
- Minor age related renal changes, no overt pyelonephritis or significant chronic nephritis.
- Gastric ingesta - post-prandial presentation, potential for some degree of gastric stasis or nonobstructive hairball density if document NPO or if previous history of hairballs.
- Sonographically unremarkable small bowel and visible colon/colorectum.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The cause of the patient's clinical signs is likely owing to cystitis. Urine culture and sensitivity on a sterile urine sample recommended to rule out underlying UTI. If no evidence of UTI, medical therapy for idiopathic / interstitial cystitis which may include dietary therapy, behavioral modifications/ environmental enrichment, increased water intake, and/or medical therapy may be considered based on the clinical impression of the patient. Fresh fecal analysis to assess for parasitic ova/giardia +/- GI panel may be indicated if persistent diarrhea or if evidence of weight loss.

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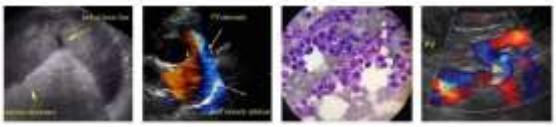

THE FOCAL ZONE
IMAGING PERFORMED BY
289-808-2608 info@thefocalzone.com

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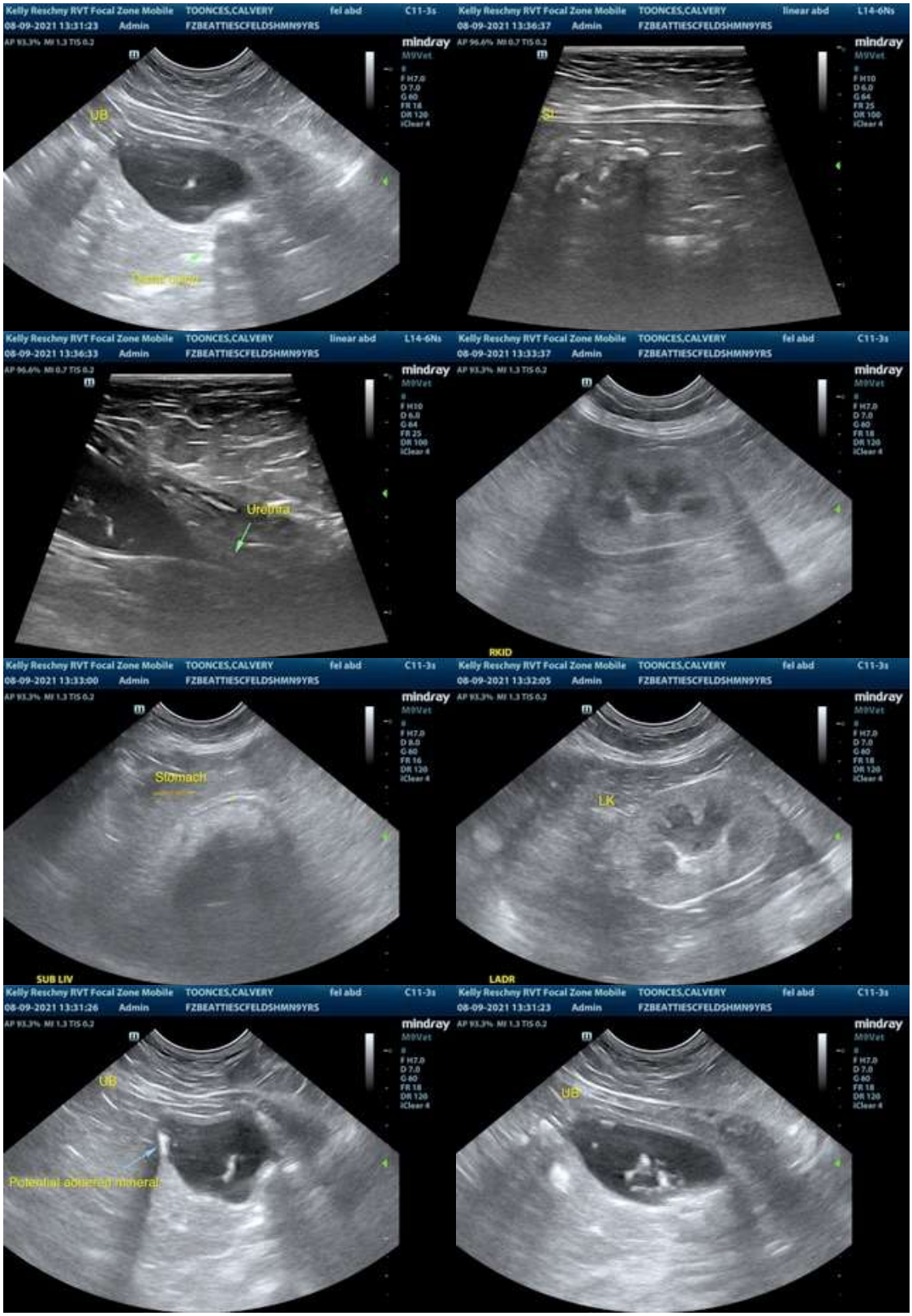

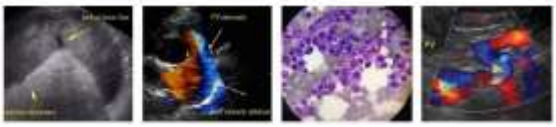

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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

R. McKenzie Daniel, DVM, DABVP (Canine / Feline Practice)

info@SonoPath.com

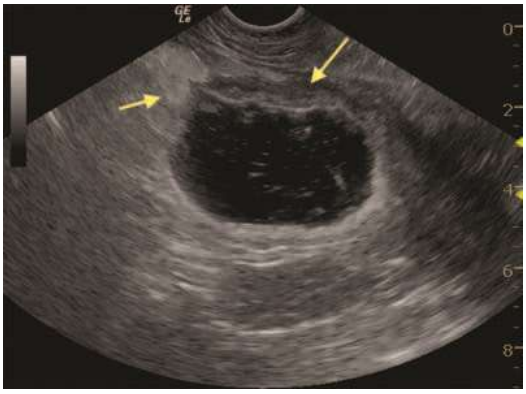
The following is an applicable excerpt from the *Curbside Guide to Diagnosis & Treatment of Sonographic Disease* offered by SonoPath.com Lindquist, Frank, L and Modler.

An essential quick guide for every general practitioner and sonographer.

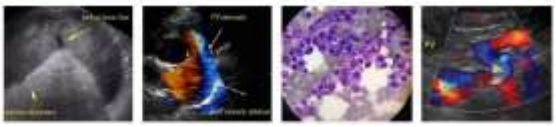
https://sonopath.com/products/curbside-guide-editing-due-release-12012015

Feline Idiopathic Cystitis

http://www.sonopath.com/FelineCystitis



Short axis of the urinary bladder in a cat with chronic cystitis. Note the severe thickening and undulating sur of the bladder wall. The regular layers of the urinary bla wall cannot be discerned (large arrow). There is a moder amount of echogenic debris seen within the anechoic uri Mild focal peritonitis is seen as echogenic perivesical fa (small arrow) consistent with adhesion formation stimul by transmural pathology.



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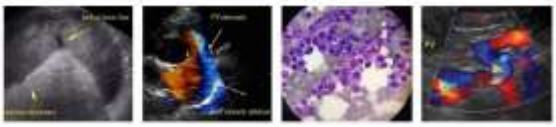
Description: Feline idiopathic cystitis (FIC) is defined as recurrent stranguria and hematuria in cats in the absence of an underlying cause. It is considered to be an exclusionary diagnosis once radiographs, ultrasound, coagulation profile, and aerobic urine culture by cystocentesis have eliminated the possibilities of urinary tract infection, urolithiasis, coagulopathies, and neoplasia. Clinical signs may resolve spontaneously within 3-7 days, with 30-50% recurrence within a year. Cats most frequently acquire the disease between the ages of 2 and 6, and although any breed is susceptible, Persian cats are overrepresented among those affected. Overweight spayed females and neutered males in a multi-cat household are at higher risk than their lean, solitary, or intact counterparts. Indoor, sedentary, dry-food eaters are at higher risk than outdoor cats that eat *ad libitum*. Psychosomatic influences—change of residence, new household members, pet additions, change of household objects—on the urinary bladder have been shown to play an important role in the pathophysiology of the disease. Neurogenic inflammation, decreased glycosaminoglycan concentration, and increased bladder permeability are tissue alterations found on histopathological review of affected bladders. Neurotransmitter P is increased in affected tissue and may be specifically targeted in eventual courses of treatment.

Clinical Signs: In the absence of an underlying urinary tract infection or evidence of neoplasia, FIC may present in an acute or chronic form with the following intermittent lower urinary tract symptoms: inappropriate urination (> 6 times/week in 70% of cases); stranguria (70%); hematuria (50%); and pollakiuria (80%).

Diagnostics: Since FIC is a diagnosis of exclusion, abdominal radiographs, abdominal ultrasound, blood pressure, coagulation profile, and urine culture are all required to rule out other differentials. Biopsy of the bladder wall can be useful to evaluate for lymphocytic plasmacytic inflammation, which can occur in some cases. Taking a history and having a thorough conversation about the cat's environmental stressors are imperative.

Treatment: Given that no specific cause has been cited and that FIC is considered a multifactorial disease, multimodal therapy is recommended. To date, no specific therapeutic has been effective in treating FIC. Palliation with pain management can be achieved with buprenorphine (0.02 mg/kg PO, IM, or IV BID-TID for 3-4 days). Practitioners have attempted the following with varying results: the introduction of a strict canned food diet; a change of feeding location in multi-cat households; and stimulating increased water intake using tuna or clam juice additives or circulating water fountains. To date, the most scientifically valid evidence points to the need for reducing urine concentration, which is achieved with canned food diets. In multiple studies, the simple act of switching to a canned therapeutic diet has been shown to reduce the risk of recurrence significantly. One study showed that only 11% of cats on a canned diet exhibited recurrent signs after a year, while those on a dry food diet displayed a 40% recurrence rate. Urine concentration can be reduced further by adding additional water into servings of canned food. Reduction of stress may be achieved by increasing litter box hygiene, placing the litter box in a quieter environment, and providing separate food, water, and litter areas for the affected patient in a multi-cat household. It has been suggested that Feliway, the feline facial pheromone, can be used as a calming agent for cats when they are in unfamiliar surroundings. Feliway mimics the natural facial hormone released when a cat marks his or her territory by face rubbing. For unresponsive or severe cases, amitriptyline (10 mg PO Q24hr at bedtime) has been shown to



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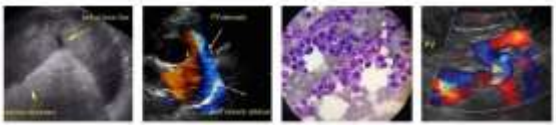
have visceral analgesic, anticholinergic, mucosal mast cell inhibition, and anti-noradrenergic properties. Amitriptyline is considered standard therapy, but is only pursued once the preceding husbandry and feeding practices have proven to be ineffective. Amitriptyline should be used with caution in patients with cardiac disease or arrhythmias, and if instituted, should be used long-term. Studies indicate that short-term use of amitriptyline can result in faster recurrences. Note: Urine retention may occur while therapy is being administered. Biochemical panels should be monitored while a patient is undergoing amitriptyline therapy as liver enzyme elevation can occur. Glycosaminoglycan supplementation (pentosan polysulphate 2-10 mg/kg PO BID) has shown modest success (10-20%) in human trials for idiopathic cystitis. If used, a powder form is recommended to avoid the stress of pill administration (feline Cosequin capsules contain a powder that can be sprinkled onto food). Antiviral agents have not been shown to be effective, and even though researchers have suggested that the concurrent presence of *Calicivirus* may play a role and virus-like particles have been identified in urethral plugs and urine, no adequate evidence of a viral etiology has yet been demonstrated. A double-blind placebo trial suggested that glucocorticoids had no clinical benefits in 12 cases. All cases were self-limiting, in spite of whether the subjects were medicated with corticosteroids or not.

If hematuria seems persistent despite therapy and does not follow a typical FIC pattern (i.e., resolving within one week but recurring within a few weeks), cystoscopy or surgical evaluation may be indicated. Biopsies can be obtained, which allows for histopathology and bladder wall culture.

Environmental enrichment is also important to reduce stress. Providing vertical climbing surfaces, such as cat trees, increasing the number of litter boxes on different floors of the house (the rule of thumb is the number of litter boxes per house should equal the number of cats plus one), and increasing owner attention time, scheduled playtime, as well as supervised outdoor activity can decrease stress for cats.

Conclusion: Effective treatment of FIC involves a multi-modal approach with a strong emphasis on husbandry. Pet owners should focus on the fastidious upkeep of litter boxes and feed their cats canned food to both increase dietary water intake and maintain their cat's lean body weight. Stress management is also key and can be facilitated with environmental enrichment as well as an understanding of feline behavior.



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Long axis view of 5-year-old FS feline bladder suffering from clinical signs of hematuria, inappropriate urination and straining. The ventral bladder wall is segmentally thickened. Feline interstitial cystitis is highly variable in presentation and can change sonographically from day to day. This enigma of a disease necessitates further investigation but sonographically, transmural erosion should be monitored as necrosis and perforation can occur.

References:

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