



News

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FELINE LOWER URINARY TRACT DISEASE

Feline Lower Urinary Tract Disease (LUTD) has been recognized in veterinary literature since 1925. Common clinical signs include hematuria, dysuria, and pollakiuria, with multiple etiologies such as urolithiasis, urinary tract infection, urethral stricture, neoplasia, congenital anomalies, and idiopathic inflammation. The latter category includes up to 58% of female and 79% of male cats presenting for lower urinary tract symptoms to veterinary hospitals today.

Diagnosis of cats with idiopathic lower urinary tract disease (iLUTD) depends on excluding all other potential causes. The first step in the workup of these cats is to perform the **urinalysis**. Although urine ideally should be obtained via cystocentesis, many of these cats have small bladders. Therefore, voided samples may be the only specimen available for urinalysis. The samples may be obtained from clean cat boxes without litter present or cat litter pans that use fish tank gravel which will not absorb urine. Obviously, if the cat is obstructed, urine is obtained via catheterization or cystocentesis. *The urinalysis should be performed as soon as possible after collection.* If the urine is over 24 hours old when examined, it is likely that the urine sediment information, including the presence of crystalluria, will be inaccurate.

The next step includes a **urine culture and radiography**. Urine culture is highly unlikely to be positive in the first incidence of iLUTD but should definitely be performed for any cat with multiple recurrences, or any cat where bacteria was noted on the urine sediment. *Cystocentesis is the ideal method of collection.* Urines collected by other means should be submitted in a sterile container for quantitative analysis. As opposed to cystocentesis in which any number of bacteria cultured would be considered significant, certain minimum numbers have been established for what is considered a positive culture for voided or catheterized

samples. Plain radiographs will identify radiopaque cystic calculi, and double contrast cystography should be performed to rule out radiolucent stones, an anatomical defect, or bladder neoplasia. Occasionally, intravenous pyelography may need to be performed to evaluate the size, shape, and excretory system of the kidneys for a potential renal involvement.

In evaluating cats with LUTD, two age groups have been identified. Based on studies from Ohio State University, if a cat is <10 years of age, 70% will have iLUTD, 13% have struvite or oxalate uroliths, 11% an anatomical defect, 9% are behavioral (lack of histologic abnormalities), 2% have neoplasia, and 1-2% have bacterial urinary tract infections. For cats >10 years of age with LUTD, 46% have urinary tract infections, 17% have urinary tract infections with calculi, 10% have urolithiasis without urinary tract infection, but only 5% have iLUTD.

Diagnosis of iLUTD is confirmed on cystoscopy by finding petechial hemorrhages in the bladder mucosa and classic histologic lesions called "glomerulations." On double contrast cystograms, bladder walls of these cats may be thickened and may show increased permeability of dye. The cats have concentrated urines (sp. gr. >1.025), with the presence of severe hematuria and mild pyuria, few to no crystals, and variable urine pH (but usually less than 6.5). Multiple theories have been brought forth to suggest the cause of the disorder but none have been proven at this time. There are some parallels to interstitial cystitis in people which is also of unknown etiology. In some human patients with interstitial cystitis, a functional defect of the urothelial glycosaminoglycan (GAG) layer occurs, which might permit urine to penetrate the urothelium and induce inflammation.

In the natural course of iLUTD, clinical signs spontaneously resolve within 10 days regardless of the treatment options offered. However, use of antibiotics, corticosteroids, and diet changes rarely prevent subsequent

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(cont'd.)

recurrences. Treatment options include: increasing the patient's water consumption by using moist foods, flavoring water with clam juice, or keeping a faucet dripping for the cat to lick from. The litterbox pattern should be assessed to assure acceptability by the cat. Antibiotic therapy is not indicated unless the cat has been catheterized or has a dilute urine suggesting other complications. Assuming the episode resolves, 30-70% of cases will recur and so an in-depth workup is indicated for cats with recurrent clinical signs (minimum data base of radiographs and possible cystoscopy). If symptoms persist or recur, an attempt to control pain may offer relief. Amitriptyline, a tricyclic antidepressant, has several potential benefits for cats with iLUTD, including analgesia, stabilization of mast cell membranes, norepinephrine reuptake inhibition, anticholinergic effects, and antagonism of both glutamate receptors and sodium channels. Because its long term safety has not been established, therapy should be reserved for refractory cases of iLUTD. The dosage is adjusted between 2.5-12.5 mg per cat q 24 hr to produce a barely perceptible calming effect on the cat. Although the clinical signs should improve with therapy, the cats may show no change in the urinalysis or cystoscopy findings. Side effects can include sluggishness (best to give at night time), excessive urine retention (anticholinergic effects), and elevation of liver enzymes. Liver enzyme concentrations should be evaluated before and 1 month after initiation of therapy. Treatment should be stopped if any abnormalities are noted.

A plethora of dietary options for feline LUTD are available today. When making dietary recommendations for patients, consider the following: canned food diets may be more beneficial to patients than dry foods simply because they result in more dilute urine, thereby lessening the chance of recurrence of most causes of feline LUTD, including iLUTD. Diets that are acidifying (urine pH 5.9-6.4) aim to control struvite-related problems, be it dissolution of struvite cystic calculi, post-cystotomy for struvite stones to lessen chances of recurrence, or feeding the cat after removing a struvite containing urethral plug. However, diets directed to provide the lowest pH ranges (5.9-6.1) run the risk of causing systemic acidosis and these cases should be monitored closely. Other diets available for struvite control aim for pH in the 6.2-6.4 range.

As calcium oxalate urolithiasis is much more frequent since the advent of the acidic diets, some newer diets attempt to raise urine pH to the 6.6-6.8 range to help lower calcium excretion, and thereby lessening the recurrence of calcium oxalate uroliths. Feeding low calcium containing diets to prevent recurrence of calcium oxalate uroliths is still a controversial issue. The so-called "stone neutral" diets are aimed at urine pH of 6.4-6.6, and are touted for management of either struvite and oxalate situations.

One thing we know, clients need assistance in their choice of diets as many of the "urinary tract diets" available commercially may be doing more harm than good for the cat with feline LUTD.

Note:

For Urine Protein / Creatinine Ratio, *always* perform a urinalysis as well. If urinalysis reveals inflammation, hematuria or neoplasia, the urine protein/creatinine ratio will be elevated.

Test code for Urine P/C Ratio & Urinalysis is: #9754; Price \$20.00.

LAB TIPS

BLADDER TUMOR ANTIGEN (BTA)

Urine dipstick test for BTA used in diagnosis of canine transitional cell carcinoma (TCC) was recently evaluated (Vet Clin Pathol 28(1): 33-38, 1999). Results appeared promising with an overall test sensitivity of 90% and specificity of 78%. False positives were obtained for urine samples with significant glucosuria (4+), proteinuria (4+), and pyuria or hematuria (>30-40 WBC or RBC/hpf).

Urinalysis parameters that did not affect test efficacy included collection method (cystocentesis or free catch), pH, specific gravity and presence of crystalluria, bilirubinuria, bacteriuria and casts.

Antech's Research Department evaluated 14 canine cases of suspected TCC with this urine BTA test. Ten cytologically confirmed TCC cases were BTA positive. Two gave false positive results (pyuria, chronic cystitis on histopathology). One BTA result was negative but had a suspected TCC on cytologic examination (biopsy and histopathology recommended), and a second BTA negative case was confirmed by cytology and histopathology to have TCC, although the urine from this case arrived at lab > 48 hours after collection (true false negative).

Conclusion: For canine patients with clinical signs of LUTD, the BTA urine test offers a practical adjunct screening method for TCC, and is best performed before hematuria and pyuria develop (may interfere with test specificity).

Sample requirement: Urine must be centrifuged and at least 2 mL of supernatant removed and transferred to a clean tube. Refrigerate sample and ensure that it reaches Antech within 48 hours of collection.

Test code: #4383; Price: \$30.00