EXOTIC SMALL MAMMALS’ URINALYSIS AND URINARY DISEASES

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Exotic small mammals are commonly presented to veterinary clinics with a variety of urinary tract diseases (UTD) in general and urolithiasis specifically. However, these are often underdiagnosed. The close association with the reproductive tract, especially in females, often leads to combined urogenital disorders. Clinical signs of UTD can be nonspecific and clinicians are advised to follow a complete diagnostic route in order to rule out and specifically address urinary issues.

The urine composition of the ferret is in general similar to that of the domestic cat but dipstick urinalysis often indicates the presence of blood, protein and bilirubin and these might need to be followed with further testing to exclude disease conditions. A urinary pH of 5-6.5 is considered adequate in ferrets receiving an appropriate low-carbohydrate, and high live-protein and fat diet. The urine properties of pet rabbits and rodents normally show a cloudy appearance due to the presence of calcium, proteins and other amorphous particles. Handling stress can cause temporary hyperglycemia that can also show as urinary glucose in the urinalysis. A urinary pH of 8.0 is considered adequate in the captive small herbivore. Differently from most domestic mammals, rabbits do not concentrate their urine and their USG (normal 1.005-1.050) cannot reliably indicate the kidneys’ function.

Pigmenturia is considered abnormal in ferrets but can be normal in rabbits and rodents depending on their diets. True hematuria should be further confirmed by microscopic and chemical urinalysis. Red staining observed on the cage substrate or the fur in the perineal region should be further investigated to differentiate between urinary and reproductive system origins.

Calciuria is normal in rabbits and rodents but not in the ferret. Obese, debilitated and dehydrated rabbits can develop “sludgy” urine that can irritate the urinary tract mucosa and may show with urinary tract infection (UTI). Rehydration and exercise usually resolve this problem. Antibiotics (ex. enrofloxacin 20mg/kg sid SC/PO) can be used if indicated by urinary culture and susceptibility. NSAIDS (meloxicam 0.5-1.0mg/kg sid-bid, SC/IV/PO) can provide symptomatic relief and should only be
given if blood kidney biochemistry values are normal and the patient is well hydrated.

Urinary calculi can form at any point along the urinary tract, including the kidneys, ureters, and urethra, but are most commonly found in the urinary bladder. The exact etiology for calculi formation in all affected species is currently not clearly known but may be primarily related to a reduced water intake and also dietary calcium levels in rabbits and rodents. In rabbits and rodents, nearly 100% of the calculi identified consist of calcium carbonate, as calcium is a normal precipitant in their urine. Urinary tract infection (UTI) may or may not be present with subsequent formation of urinary calculi.

In reality, uroliths (and UTI) are likely to develop in many affected animals before they exhibit overt clinical signs of disease. The clinical presentation of a small mammal with urolithiasis is partially dependent on the region of the urinary tract affected. Across all species, the blockage of urinary outflow will result in a rapid deterioration of the patient’s status. In rodents and ferrets, males have an os penis and the urethra’s ability to expand is relatively low. The attempts to pass a cystolith can therefore result in urethral blockage, a symptom more commonly observed in males. Patients that are unable to urinate (complete urinary blockage) because of urolithiasis will likely demonstrate severe clinical presentation due to the developed metabolic imbalances and the associated pain. Animals that have an incomplete blockage or a urolith present further back in the urinary tract will usually show vague signs of a loss of body condition, reduced appetite and activity level, and dysuria. Stranguria, hematuria, painful vocalizations, perineal urine soiling and scalding are also common clinical signs. Pain may be noted on an abdominal palpation. Note that most urinary outflow obstructions in male ferrets are caused by prostatomegaly from the currently prevalent ferret adrenocortical disorder-related hyperandrogenism.

Because the vast majority of uroliths in small mammals are radiopaque, imaging is instrumental for the diagnosis of urolithiasis. General gas anesthesia or sedation is required for proper positioning with minimal two views (lateral and VD/DV) to show the presence of the disease and calculi location. It is imperative that the entire urinary tract is examined and in view radiographically. Follow-up with an abdominal ultrasound is recommended to identify smaller (<3mm) or radiolucent uroliths, to localize uroliths and to reveal other urinary tract pathologies such as hydronephrosis and ureteral dilation.

Cases with urethral blockage require immediate treatment as many affected animals may be in a state of metabolic shock. When possible, a blood sample should be collected on presentation to assess the patient’s hematologic condition before
administrating appropriate fluid therapy and attempting to catheterize the urethra. Careful sedation or gas anesthesia, dependent on the patient's status, may be required to catheterize the animal's urethra. Analgesia should be provided to all affected cases and the use of NSAIDS should be considered in regards to the patient's hematologic status. As urolith dissolution is usually unsuccessful, treatment requires manual retrieval. Both surgical and cystoscopic methods have been described to treat urolithiasis in exotic mammals. Prognosis varies from guarded to excellent depending on the specific condition but all owners should be advised about the high probability of recurrence.

References: