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Bladder and Urinary Tract Stones in Guinea Pigs

Basics

OVERVIEW

- The urinary tract consists of the kidneys, the ureters (the tubes running from the kidneys to the bladder), the urinary bladder (that collects urine and stores it until the animal urinates), and the urethra (the tube from the bladder to the outside, through which urine flows out of the body).
- Crystals or stones composed of calcium salts can form anywhere within the urinary tract. Most often, stones form in the bladder or urethra.
- Guinea pigs that develop urinary stones are more likely to be fed a diet high in overall percentage pellets, low in percentage hay, and less variety of vegetables and fruits. Alfalfa-based pellets and hay contain higher concentrations of calcium, and it has been suggested this may also contribute to urinary stone formation in guinea pigs.
- Inadequate water intake leading to a more concentrated urine and factors that impair complete evacuation of the bladder, such as lack of exercise, obesity, nervous disorders, or bone or muscle diseases may be associated with these signs. Without frequent urination and dilute urine, calcium crystals may precipitate out from the urine within the bladder.
- Uroliths may also form in the kidneys or ureters, as well as the bladder.
- Some guinea pigs, especially females, may have a bacterial bladder infection that contributes to the formation of bladder stones.



SIGNALMENT

- All breeds are equally affected.
- Stones caused by bacterial bladder infections are more common in females.
- Seen most commonly in middle-aged guinea pigs 3–5 years old.

SIGNS

- Some animals have no sign of disease (known as asymptomatic).
- Depend on location, size, and number of urinary tract stones (uroliths)

- Straining to urinate, small, frequent urinations, and/or urinating when picked up
- Bloody urine—very common in guinea pigs with bladder stones
- Urine staining in the hindquarters, urine scald (inflamed, red skin)
- Anorexia, weight loss, lethargy, bruxism, and a hunched posture in guinea pigs with chronic or obstructive low and lower urinary tract disease
- Hunched posture, vocalizing during urination due to pain
- Stones in the kidneys and ureters (the tubes running from the kidneys to the bladder; stones are called nephroureteroliths) may be asymptomatic. When the stones are passing or moving down the ureters, there may be signs of pain such as a hunched posture, grinding teeth, not moving around, and not eating.
- Stones in the bladder (urocystoliths) may be detected during physical examination; failure to feel stones does not exclude them from consideration.
- Enlarged urinary bladder if patient has complete blockage or obstruction of the urethra (the tube from the bladder to the outside, through which urine flows out of the body)

CAUSES

- Presence of high levels of calcium in the urine, leading to the formation of stones. The cause is not completely understood but occurs most often in guinea pigs that are fed diets consisting of mostly pellets with little to no hay or fresh vegetables, and those that do not exercise or are obese.
- Sometimes caused by bacterial urinary tract infection—*E. coli*, *Streptococcus pyogenes*, *Staphylococcus* spp., and occasionally other bacteria have been reported.

RISK FACTORS

- Inadequate water intake (dirty water bowls, unpalatable water, changing water sources, inadequate water provision)
- Urine retention (cage confinement, neurologic disease, bone or muscular disease)
- Inadequate cleaning of litter box or cage may cause some guinea pigs to avoid urinating for abnormally long periods.
- Obesity
- Pain and a reluctance to move
- Lack of exercise
- Feeding of exclusively commercial pelleted diets, especially alfalfa-based pellets
- Calcium or mineral supplements added to the diet

TREATMENT

APPROPRIATE HEALTH CARE

- Surgery is needed to remove the stones. Very few are small enough to be flushed out of the bladder or urethra without surgery.
- Guinea pigs with urinary obstruction should be hospitalized and emergency supportive therapy provided until surgical intervention to relieve the obstruction can be performed. If bladder is completely obstructed by a stone, hospitalization is usually necessary until the stone can be removed.

ACTIVITY

- Restrict in the immediate postoperative period until the incision has healed.
- Long term, encourage exercise; provide large exercise areas. Guinea pigs that exercise drink and urinate more, which keeps the calcium dissolved in the liquid urine so that it can be passed during urination.

DIET

- Increasing water consumption is essential to prevention and treatment of urinary stones. Provide multiple sources of fresh water. Provide a variety of clean, fresh, leafy vegetables such as cilantro, lettuces, parsley, and carrots tops sprayed or soaked with water.
- Following treatment, reduction in the amount of calcium in the diet may help to prevent or delay recurrence. Decrease feeding of pellets, add timothy and grass hay, and offer large volumes of fresh, green, leafy vegetables that have been soaked in water, along with fruits and other vegetables.
- Guinea pigs have an absolute requirement for oral vitamin C. Vitamin C can be provided through food sources such as citrus fruits and through commercially available vitamin C treats.

SURGERY

- Surgical removal is necessary for stones in the bladder, urethra, or ureters.

MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered all-inclusive.

- No available drugs effectively dissolve calcium stones (uroliths).
- Pain medication is used to treat guinea pigs that are not urinating as frequently due to painful conditions, and to treat postoperative pain.
- Antibiotics to treat bacterial bladder infections. Common antibiotics safe to use in guinea pigs include trimethoprim-sulfa, enrofloxacin, ciprofloxacin, chloramphenicol, and metronidazole. Do not use antibiotics unless prescribed for your guinea pig by your veterinarian. Many antibiotics commonly used in other pets (such as dogs and cats) can cause a potentially fatal overgrowth of intestinal bacteria.
- Diuretics such as hydrochlorothiazide have been used in guinea pigs with recurrent stones or sludge to increase water intake and urination when husbandry changes alone were not successful in preventing recurrence.

FOLLOW-UP

PATIENT MONITORING

- Postsurgical X-rays are essential to verify complete stone (urolith) removal.
- To attempt to prevent the need for repeat surgery, evaluate abdominal X-rays every 3 to 5 months. Treatment is more successful with early detection of stones.

PREVENTION/AVOIDANCE

- Increase water consumption for the remainder of the guinea pig's life.
- Feed diets containing a high percentage of timothy, oat, or grass hays, a lower overall percentage of pellets, and a wider variety of vegetables and fruits to decrease the risk of stone development.
- Increase exercise—Guinea pigs that exercise drink and urinate more frequently.

POSSIBLE COMPLICATIONS

- Kidney failure, urinary tract obstruction
- Urine scald

EXPECTED COURSE AND PROGNOSIS

- The prognosis following surgical removal of stones is fair to good.
- Although husbandry changes and dietary management may decrease the likelihood of recurrence, many guinea pigs will develop clinical disease again within 1–2 years.

KEY POINTS

- Stone (urolith) removal does not alter the factors responsible for their formation; eliminating risk factors is necessary to minimize recurrence.
- Providing leafy greens and encouraging water intake and frequent urination are essential to prevent stone formation. However, many will have a recurrence of stones within 1–2 years, even with husbandry changes.

Notes

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