Urinary Tract Disease in Rabbits

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Abstract

This bitesize lecture takes a detailed look at urinary tract disease in rabbits, such as cystitis, and provides an excellent resource for VNs who care for rabbits as in-patients or who may advise clients on pet rabbit care.

Learning Outcomes

- Understanding of the different diseases affecting the urinary tract of rabbits.
- Increased confidence in advising clients on rabbit care.

Notes

Urinary tract disease is a common finding in pet rabbits and clinical signs can also mimic those of other conditions.

Correct diagnosis and treatment is essential. This is often multi factored and also involves supporting the rabbit since they often become anorexic due to discomfort.

Calcium Metabolism

A rabbit fed a good, balanced diet shouldn’t be calcium deficient and does not require a calcium or mineral supplement.

Rabbits have an unusual calcium metabolism. In most mammals, the amount of calcium absorbed from the diet is regulated at gut level by Parathyroid hormone (PTH)
but rabbits predominantly absorb calcium in proportion to what is present in their diet, whether or not they require it. Any excess calcium that is absorbed into the bloodstream from the gut is excreted through the urinary tract, where it may be deposited and form calculi/sludge. Rabbits can form solid calcifications in their kidneys, ureters, bladder or urethra, as well as depositing thick calcium ‘sludge’ in their kidneys or bladder.

**Calculi (Urinary Tract Stones or Urolithiasis)**

One or more stones may develop, with or without sludge being present. Symptoms of calculi include: loss of appetite, loud painful teeth grinding, hunched posture, lethargy, unwillingness to move, pressing abdomen on the ground, loss of litter training, blood in the urine, perineal scalding and straining to urinate. One or more symptoms may appear gradually, or have a sudden onset and be intermittent. Treatment depends upon the location of the calcification/s. Calcifications show up on an x-ray or ultrasound scan, as the calcium content makes them radio-opaque.

A blood test is useful to determine the kidney function readings (Creatinine, Urea and phosphorous) and the blood calcium level. Calcium levels should be interpreted carefully and levels will rise after meals, especially if the foods given were high in calcium. The normal range of results for pet rabbits may differ from those obtained from laboratory rabbits. A urine test should also be taken to see if calcium crystals and/or a urinary infection (cystitis) are present.
Calcifications detected in the bladder, ureters or urethra should be surgically removed once the rabbit’s condition has been stabilised.

Rabbits suffering from calculi are often in a lot of pain and as a result will not eat or drink, subsequently being dehydrated and necessitating fluid therapy, gastrointestinal support and analgesia prior to surgery. Currently there is no known method of breaking up rabbit calculi and it is rare for the rabbit to pass them naturally, due to their often-jagged texture and size to which they can grow.

Ureteral calculi may cause hydronephrosis, due to obstructing urine flow from the kidney to the bladder. After stabilising the rabbit, prompt surgical intervention, to remove the calculi is vital to avoid irreparable damage.

Rabbits presenting with calculi in both kidneys and displaying clinical symptoms have a guarded to poor prognosis. Surgically removing calculi from the kidney is extremely hazardous, although such surgery is performed on other species. With such cases medical management may be the only treatment option, with their quality of life paramount.

If nephrolithiasis is only affecting one kidney, it may be possible to surgically remove the affected kidney, as the remaining kidney should have adequate function to keep the rabbit alive. However, if the remaining kidney becomes unable to work to near full capacity, the rabbit’s prognosis is extremely grave.

Once removed, full analysis of the calculi’s constituents, especially the nidus is useful.
Calcium Sludge

There are two schools of thought on calcium sludge in a rabbit's urinary tract. Some vets believe that it is a common and normal consequence of the diet rabbits are fed and rarely causes clinical problems. Others believe that despite being a common finding, it is still abnormal and requires correction even if it isn’t causing clinical problems.

Rabbits suffering from sludge may display any of the symptoms described above for calculi, as well as passing thick, white, gritty urine that in severe cases will become semi-solid when passed.

White or ‘sludgy urine’ on their own are common in rabbits and often occur after the rabbit has eaten high calcium foods. They aren’t necessarily indicative of sludge within the urinary tract; this must be confirmed.

Diagnosis is the same as that of calculi; as the sludge is made of calcium, it too will show up on an x-ray or ultrasound as a mass.

As some rabbits exhibiting no clinical symptoms can, upon investigation, be found to have some degree of sludge in their bladder or kidneys.

Reasons for Calculi/Sludge Development

It had been thought that rabbits suffering from urinary calculi and/or sludge were often fed excessive amounts of calcium in their diet. Whilst this may hold some logic, there is little conclusive evidence on what the exact cause/s may be and the causes are likely to be multi and far from clear.

Possible reasons include:
A Low Water Intake:
This is suspected to be one of the most important factors leading to the formation of urinary calculi. Less urine is produced with a low water intake and calcium precipitates out when urine is saturated with calcium. To rectify this problem owners must increase the rabbits fluid intake, which can be achieved by:

1. Adding apple juice or other sweet flavourings to their water.
2. Syringe-feeding fluids or regular subcutaneous fluids which most owners are more than happy to undertake.

Overweight Rabbits:
Overweight rabbits may be physically unable to completely empty their bladder, due to weak muscle tone, or adopt the correct position for urination, which will give any calcium in the urine a chance to settle in the bladder.

Kidney Damage:
The rabbits kidneys may be unable to manage the amount of calcium, which they are required to process. Kidney damage only shows up on blood tests when at least 50% - 70% of kidney function is lost.

Litter Training:
Most rabbits will only urinate in a select amount of places. If the rabbit is unable to reach these places (i.e. no litter tray in pen), it may wait until it can urinate in its desired area. Advise owners to ensure that the rabbit is always able to reach its toilet areas.
Other illnesses:

Any other illness, which causes the rabbit to sit around and not urinate regularly (osteoarthritis, spinal problems or anything causing discomfort/malaise etc). The underlying factor needs to be corrected, on top of addressing the sludge/calculi problem.

Feeding rabbits

Alfalfa hay is high in calcium and shouldn’t be fed to adult rabbits. Those who may have a need for extra calcium (Pregnant or lactating does), may benefit from being fed alfalfa hay. Adult rabbits should be fed a good quality hay (timothy, meadow, orchard hay etc), which is much lower in calcium. Vegetables that are deemed high in calcium (spinach, greens, carrot tops etc) are still mostly water and therefore should not be avoided.

Long-Term Goals

Once the initial condition has been treated, attention must focus on trying to prevent reoccurrence of the condition, but even then there is a possibility of further calculi or sludge forming, particularly if the rabbit still has sludge within their kidneys or bladder. The most successful approach to preventing recurrence of calculi or sludge seems to be by adopting a multi-tiered approach and tackling several possible factors concurrently:
1. Dried rabbit mixes/nuggets should be excluded from the diet or fed in tiny proportions as an occasional treat. Any alfalfa-based foods and calcium/mineral supplements should be permanently removed from the diet.

2. Feed a pile of vegetables every day to encourage increased fluid throughput.

3. Offer grass hays (timothy, fescues, ryegrass, bromegrass or orchard grass) ad lib.

4. Ensure the rabbit isn’t overweight and gets plenty of exercise.

5. Always ensure the rabbit can reach its toilet areas.

6. Implement careful monitoring. Periodic x-rays/ultrasounds can monitor the condition and detect any re-formation of calculi/sludge early on.

Changes in diet should be done over at least a couple of weeks to prevent digestive upsets. Feeding smaller quantities of numerous different foods, rather than larger quantities of a few foods is preferable. This gives the rabbit a variety, and also helps to achieve a balance of other minerals.

The vast majority of rabbits on a ‘hay and veggie’ diet manage fine, and get through a mound of fresh food their own body size daily. Hay and water must always be available.

Finally, it is vital to ensure the phosphorus intake doesn't exceed the calcium. Nutritionists employed by feed companies in the UK and US are often happy to discuss cases with veterinary professionals.