

Ouch! There's a Stone in my Bladder!

Andre Hess MRCVS

Our 2014 Norfolk Terrier Breed Health Survey, the biggest on record for the breed at 1216 dogs, pointed to an incidence of Bladder Stones of 2.96%. This may seem high, and when anecdotal evidence and reports to our Health Snapshot are considered, might raise alarm.

When I last contacted the Urolith Centre in the USA, where most bladder stones were sent until recently, however, they confirmed that the Norfolk was not particularly predisposed to the problem when all breeds, and cross-breeds, were considered.

Furthermore, this is a current statement from Hills Pet Food USA: Small breeds, including the Welsh Corgi, Miniature Schnauzer, Pug, Lhasa Apso, Pekingese and Yorkshire Terrier are more commonly affected than are large breeds. The Beagle, Dachshund, Dalmatian, Bulldog, Basset Hounds, Cairn Terrier and Scottish Terrier are also susceptible. No mention of the Norfolk Terrier.

WHAT ARE BLADDER STONES?

These are actual stones that form in the bladder under the appropriate local conditions for them to do so. That is, the situation *inside* the bladder or the urinary tract. There conditions include, most importantly, the pH of the urine. When the pH is too low (acid), or too high (alkaline), the tendency to develop crystals and stones will arise. These crystals or stones grow around a core or *nidus*, which could be a red or white blood cell, or protein. When these grow sufficiently large, they become difficult to pass with normal urination, and will remain in the bladder where they cause irritation to the lining. The bitch is able to pass small stones and crystals for longer than the dog because of the relative size-difference in the urethra (the

tube that carries the urine from the bladder to the outside). I have surgically removed stones that resemble a handfull of sea-sand, and many as large as golf balls, and larger.

HOW DO I KNOW MY DOG HAS BLADDER STONES?

By the time your dog starts to show symptoms it is because the lining of the bladder has become inflamed and uncomfortable. This is due to the irritation caused by the crystals, small stones, large stones, or a single large stone. Your dog has a case of Cystitis caused by the mechanical presence of crystals or stones in the bladder. These are the signs to look out for:

- ≡ He or she seems to want to urinate more frequently.
- ≡ The individual patches of urine seem smaller than usual, and are getting smaller and smaller. Sometime they assume the pose to urinate, but produce no urine.
- ≡ The action of urinating appears painful (this is a symptom that occurs later in the course of the disease). This is not a reliable sign because our dogs try and endear themselves to us, and please us, especially while on walk.
- ≡ He or she arches her back at 'random' times and looks constipated. They may show pain when picked up.
- ≡ You notice blood in the urine. These are not always clots of blood, but can vary from pink-stained urine to urine that resembles blood. Sometimes your dog produces 'occult blood', which means blood that is not visible to the naked eye.

SOME MYTHS AROUND BLADDER STONES

- ≡ It is caused by the water in my area, or hard water.
- ≡ Bladder stones are like limescale.
- ≡ It is because my dog likes playing with stones.
- ≡ It is because of dry food.
- ≡ It is because of modern foods.
- ≡ It is caused by a conspiracy on the part of pet food manufacturers, scientists, science, the government, breeders of pedigree dogs, and other parties.
- ≡ It is because my dog eats the cat's food.
- ≡ It is because my dog does not drink enough water.

None of these are true.

THE ACTUAL CAUSES OF BLADDER STONES

Bladder stones or crystals (Urine Calculi/Urolithiasis/Renal Calculi) are caused by conditions in the renal system that encourages the urine to crystallise, or form clumps of cells/material around which other material can accumulate. They are most commonly associated with *urine of the incorrect pH* caused by a metabolic problem in the body or the kidney. Sometimes stones are associated with bladder infections.

Urine pH is the acidity or alkalinity of the urine. There is a pH range considered normal, in which crystals and stones will not form. Some stones, such as struvite, form in alkaline urine, whereas others, including calcium oxalate stones, form in acidic urine.

Sometimes bladder infection and the resulting inflammation of the bladder (cystitis) play a role in Struvite stone formation. Struvite crystal formation can be encouraged by urease-producing bacteria.

An infection is sometimes identified during urine testing, and the vet has to decide whether the infection is secondary to the bladder stones, or was already there as a cause of the stones. It is one of the reasons why further urine samples are called for. And why some bladder stones are a temporary or 'one-off' problem only.

These stones/crystals can be found anywhere in the renal system, from the kidney itself (ie. a kidney stone), to the bladder, to the urethra. A stone trapped in the neck of the bladder, or in the urethra, can cause a blockage and result in an emergency.

Urolithiasis (the tendency to develop bladder stones) is not age related.

HOW IS THE PROBLEM DIAGNOSED?

- ≡ By the description of symptoms you give to the veterinary surgeon.
- ≡ By palpation. This is important. The vet simply feels the bladder, and can tell whether there are stones there or not. Sometimes the bladder is filled with many small stones or one or more large stones. Crystals are too small to palpate, and require examination of the urine under the microscope. If the dog is too fat, it can be difficult to locate and palpate the bladder. Experienced vets are better at palpation than novice vets.
Experienced vets are better at palpation than novice vets who depend on imagery.

- ≡ The vet will be able to tell whether your dog's symptoms are being caused by stones or tumours. A tumour in the bladder can produce symptoms that resemble those of cystitis or stones.
- ≡ Imagery. This is the use of Xrays or Ultrasound scanning. Some stones do not show up with these methods.
- ≡ Always insist that the vet palpates the bladder, therefore.

HOW IS IT TREATED?

- ≡ Your dog is in distress and needs help as soon as possible. Humans with this condition describe it as 'excruciating' or 'very painful', and that it feels like the bladder is 'on fire'.
- ≡ The vet must immediately deal with the pain, inflammation, and infection. It is my view that you do not accept 'we must wait for the result before we do anything'. It is possible to treat the symptoms as they present themselves. It is a welfare issue.
- ≡ If the stones are easily palpable, surgery is recommended. It is best done in the days immediately after. The surgery is easier and less traumatic, even 24 hours later, after the symptoms have been treated. It is not difficult or lengthy surgery usually, and the recovery is simple. Your dog may have blood in its urine for a few days after the surgery.
- ≡ Complications may arise when the small stones have made their way down the urethra and are difficult to flush 'forward' or 'backward'. Sometimes these resemble sea-sand, and are spread throughout the bladder and urethra.

- ≡ Complications may arise when stones have formed before they even get to the bladder. In these cases they are present in the kidneys or in the ureters (these are the delicate little tubes that carry urine from the kidneys to the bladder)
- ≡ Then the vet needs to find out why the problem arose, and what kind of stone it is. This involves urine testing (urine multistix testing, in the consulting room, onsite microscopy of urine sediment, and more detailed testing by a professional laboratory, which takes a week) and stone analysis (which takes several weeks). An experienced vet may simply look at the stone and have a very good idea which one it is.
- ≡ If the vet identifies crystalluria rather than bladder stones, which can produce similar symptoms, he or she will treat the concurrent cystitis, and then proceed with a more detailed diagnosis. These can be dissolved in the bladder itself.
- ≡ Once it has been decided that the problem was caused by a pH problem in the urine, a prescription diet can be recommended to make that adjustment. As soon as the pH is returned to normal, no new stones will form, and no new crystals will form.
- ≡ Until relatively recently it was important to be clear about whether the urine was acid or alkaline, and which crystal/stone it was, before a specific prescription diet could be recommended. And before the advent of prescription diets vets and owners had to experiment with acids (vinegars, and other acids) and alkalines (bicarbonate of soda) added to the food. This meant testing the urine pH regularly, and making the necessary adjustments to the diet. Problems arose then dogs did not like the additions. I remember those good old days.
- ≡ The brilliant news: Now does not matter if your dog is producing urine that is too acid or too alkaline. The industry (yes, the industry) has produced a single prescription diet

that treats BOTH simultaneously! This food contains a ‘buffer’ or a ‘buffer solution’. Those of you who have not done chemistry, or have forgotten it all, might wonder what that is. A buffer solution is one which resists changes in pH when small quantities of an acid or an alkali comes into contact with it. In other words, it prevents something from becoming too acid or too alkaline.

- ≡ When the decision is made that your dog will benefit from such a prescription diet, this is followed by the decision as to whether he or she needs to be on it permanently or not.
- ≡ These foods are called, unimaginatively and insensitively, *Urinary Diets*, and are available as dry or tinned foods. They are made by most of the main dog and cat food manufacturers.
- ≡ This is important: when your dog is placed on this prescription diet, it must be on it exclusively. Anything else you may want to add must make up no more than a ‘garnish’, or be added in such small quantities so as to improve the taste only. This includes treats. If your dog dislikes the new food you may have to phase it in, add something small and tasty, or change brands. Please keep ‘mouth feel’ in mind – your dog would prefer the appropriate kibble size. Fortunately there are several to try.

IS IT HEREDITARY OR NOT?

We don’t know for certain. We know that it can be breed associated, as in the Dalmation and others, and we have seen an example of a greater than expected number of cases in offspring associated with particular breeding in the Norfolk Terrier. It is my view that by far the majority of bladder stone cases in our breed are ‘random’ in occurrence, and that a small number may be hereditary. If this is true, then the mode of inheritance is not yet understood.

CONCLUSION

Urolithiasis (or crystalluria) is caused by a metabolic problem or an infection, not the tap water or the diet. Small stones and crystals can be dissolved with a prescription diet recommended by your vet. Large stones have to be surgically removed.

The Norfolk Terrier is not particularly predisposed to it. The incidence is within the range found in small breeds and dogs as a whole.

The condition can now be managed by means of prescription diets, which your dog may or may not have to remain on. Prescription diets have vastly improved the quality of life for dogs with this problem. When this diet has been recommended by the vet, your dog has to stay on this diet almost exclusively (unless their problem was caused by an infection).

The Health Subcommittee of the Norfolk Terrier Club of Great Britain would appreciate it if you would report to us when your dog is diagnosed with the problem. We like to keep an eye on things!

Andre Hess MRCVS

ADDENDUM TO ARTICLE:

This is a message from the Urolith Centre in Illinois, in the USA, that came through as this article went to press. From their statement we can deduce that the Norfolk Terrier is not especially prone to bladder stones when all breeds and non-breeds are considered. I would like to thank Lisa Ulrich, Dr Carl Osborne, and Dr Jody Lulich on behalf of the Norfolk Terrier Club of Great Britain:

Dr. Hess:

Thanks for your work on behalf of all the Norfolk terriers and their owners. They are fun dogs!

Prevalence rates are generally used to describe the extent of a disease in a particular population during a specified time period, whereas incidence rates look at the rate at which new cases of disease develop.

The data below does not differentiate recurrence vs. first episode of urolithiasis.

The prevalence of Norfolk terriers in our canine urolith submissions from Jan 1-Dec 31, 2015 is less than 0.1% (61 samples). We did not separate the UK Norfolks from the rest of the world because of the small sample size. Of the uroliths received at the Minnesota Urolith Center in 2015 from Norfolk terriers, 80% were composed of calcium oxalate and 10% were composed of struvite.

The Minnesota Urolith Center is committed to the prevention and cure of diseases of the urinary system in animals. The Center provides quantitative urolith analysis and science-supported urolith management recommendations at no cost to veterinarians around the world. Urolith analysis is supported by a generous annual educational gift from Hill's Pet Nutrition, and essential contributions from veterinarians and pet owners around the world.

Thank you.

Lisa Ulrich, CVT for

Dr. Carl Osborne, DVM, PhD, DACVIM

Dr. Jody Lulich, DVM, PhD, DACVIM

Co-directors, Minnesota Urolith Center

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