Canine Struvite Stones are called Infection Stones

Urinary tract infections (UTI) with urease producing bacteria, such as staphylococcus aureus and proteus, are the most common cause of struvite stones in dogs. Bacterial infection of the urinary tract affects approximately 14% of dogs during their lifetime. While no single breed of dog predominates, female dogs have a 2 – 4x higher incidence of struvite urolith formation than males, mainly because UTIs are more common in females. Due to the high correlation of UTI and canine struvite stones, treatment of the UTI should be the primary consideration when managing the condition.

Management of Canine UTI
- When UTI is suspected, bacterial culture of the urine is an important first step. By culturing the urine, the causative organism of the UTI can be determined and the appropriate antibiotic chosen for treatment. If a stone is removed, culture the stone, as it may also harbor bacteria. Be aware that the interior of the stone may reflect different composition and different organisms, relative to the exterior of the stone.

Between February, 1998, and April, 2003, 16,647 canine bladder stones were submitted and studied by the Canadian Veterinary Urolith Center in Guelph, Ontario. After analysis, it was determined that the largest percentage of stones found in dogs (43.8%) were magnesium ammonium phosphate (struvite) stones.1

The management of struvite uroliths in dogs differs from that of cats, and there may be confusion when determining the proper course of treatment. One common question relates to the importance of diet in the management of dogs with a history of struvite stones. This Nutrition Brief will discuss some general aspects of canine struvite management, as well as some misconceptions regarding collection, analysis and handling of urine samples.

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Significance of Crystalluria in Struvite Identification

- Crystals are a common finding in the urine of most normal dogs.
- Crystals that occur in patients with anatomically and functionally normal urinary tracts are usually harmless because the crystals will be eliminated before they aggregate and form stones.
- Crystalluria may be significant in patients with confirmed urolithiasis, or if the crystals are ammonium urate or cystine.
- Fresh urine samples should be evaluated for crystalluria, as cooling of the sample during refrigeration or storage can lead to the formation of crystals after collection.
- Interpret crystalluria in reference to urine concentration, i.e. specific gravity. For example, crystals detected in dilute urine have a greater significance than the same number of crystals detected in concentrated urine.

Common Mistakes in Handling Urine Samples

<table>
<thead>
<tr>
<th>TEST CONDITION</th>
<th>RESULTS</th>
<th>SOLUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine samples collected by owners</td>
<td>Collection in non-sterile containers, storage at improper temperatures, contamination</td>
<td>Encourage owners to allow veterinary professionals to collect the urine by cystocentesis</td>
</tr>
<tr>
<td>Uroliths or plugs submitted in formalin for mineral analysis</td>
<td>Formalin can dissolve and alter the chemical makeup of some minerals, particularly struvite</td>
<td>When submitting urethral plugs or uroliths for mineral analysis, submit them dry without preservative</td>
</tr>
<tr>
<td>Refrigerated urine samples for assessing in vivo crystalluria</td>
<td>As urine cools, solubility decreases and crystals precipitate out of solution</td>
<td>Evaluate urine sediment shortly after obtaining sample</td>
</tr>
</tbody>
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