Canine Xanthine

Hereditary xanthinuria is a rare autosomal recessive disorder of purine metabolism caused by mutations in xanthine dehydrogenase (Type I) or molybdenum cofactor sulfatase (Type II) genes, and causes xanthine uroliths. Breeds with hereditary xanthinuria include Toy Manchester Terrier, Cavalier King Charles Spaniel, English Cocker Spaniel, Dachshund, Chihuahua, and mixed breed dogs. Xanthine uroliths can also develop as an adverse consequence of xanthine dehydrogenase inhibitors (allopurinol), especially when given in higher doses and without dietary purine/protein reduction. Xanthine uroliths associated with allopurinol administration can be rapidly dissolved by stopping allopurinol and feeding a low-purine, urine-alkalinizing diet.

Minimizing Recurrence

Diagnostic Considerations

Eliminate Xanthine dehydrogenase inhibitors (e.g. allopurinol) as a cause. Perform tests for Type 1 (xanthine dehydrogenase deficiency) and Type 2 (molybdenum cofactor sulfatase deficiency) genetic variants in dogs not receiving Xanthine dehydrogenase inhibitors. (UMN Canine Genetics Lab)

Medical Considerations

Eliminate or reduce xanthine dehydrogenase inhibitors (e.g. allopurinol, februxostat). Potassium citrate if urine pH is consistently <6.5 to 7 (starting dose: 75mg/kg q12-24h)

Nutritional Considerations

Lower purine/protein foods formulated with low purine ingredients (e.g. egg, dairy, or vegetable protein) that result in a neutral or alkaline urine (e.g. Hill’s l/d, i/d Sensitive, u/d, HA vegetarian, others). If needed, feed canned therapeutic food or add water to food to lower urine specific gravity below 1.020.

Monitoring Considerations

Urinalysis every 3 to 6 months to adjust pH to ≥ 6.5, and urine specific gravity < 1.020. Medical imaging every 3 to 6 months to detect recurrent stones when small to permit their removal without surgery.

** Review manufacturer’s therapeutic food literature to determine indications/contraindications. For pets with multiple health concerns, consult a veterinary nutritionist to select an optimal food.

Support from Hills Pet Nutrition, veterinarians, and pet owners make our work possible.