

Urate Urolithiasis

(Urate Stones in the Urinary Tract)

Basics

OVERVIEW

- “Urolithiasis” is the medical term for the presence of stones (known as “uroliths”) in the urinary tract
- The most common minerals found in the stones (uroliths) are used to name the particular stone; in this type of stone, uric acid or urate makes up the composition of the stone, and thus the name “urate urolithiasis”
- 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 pet urinates), and the urethra (the tube from the bladder to the outside, through which urine flows out of the body)
- Urate stones (uroliths) are composed of uric acid, sodium urate, or ammonium urate

GENETICS

- Dalmatians have a breed susceptibility to forming urate stones (uroliths); the genetics of this condition are unknown

SIGNALMENT/DESCRIPTION OF PET

Species

- Dogs
- Cats

Breed Predispositions

- Dalmatian, English bulldog, and breeds at risk for portosystemic shunts, such as the Yorkshire terrier (“portosystemic shunt” is a condition in which abnormal blood vessels allow blood to flow between the portal vein [vein that normally carries blood from the digestive organs to the liver] and the body circulation without first going through the liver)

Mean Age and Range

- Mean age in pets without portosystemic shunts is 3.5 years (range, 0.5–greater than 10 years of age)
- Mean age in pets with portosystemic shunts (condition in which abnormal blood vessels allow blood to flow between the portal vein [vein that normally carries blood from the digestive organs to the liver] and the body circulation without first going through the liver) is less than 1 year (range, 0.1–greater than 10 years of age)

Predominant Sex

- More common in male dogs, in cases without a portosystemic shunt
- No sex predisposition in dogs with portosystemic shunts (condition in which abnormal blood vessels allow blood to flow between the portal vein [vein that normally carries blood from the digestive organs to the liver] and the body circulation without first going through the liver) or in cats



SIGNS/OBSERVED CHANGES IN THE PET

- Some pets have no signs of disease (known as “asymptomatic”)
- Depend on location, size, and number of urinary tract stones (uroliths)
- Blood in the urine (known as “hematuria”)
- Difficulty urinating (known as “dysuria”)
- Abnormal frequent passage of urine (known as “pollakiuria”)
- Possible signs of a nervous system disorder caused by accumulation of ammonia in the system due to inability of the liver to rid the body of ammonia (known as “hepatic encephalopathy”) in pets with portosystemic shunt (condition in which abnormal blood vessels allow blood to flow between the portal vein [vein that normally carries blood from the digestive organs to the liver] and the body circulation without first going through the liver); signs include sluggishness (lethargy), lack of appetite (known as “anorexia”), disorientation, blindness, seizures, coma
- Blockage or obstruction of the urethra may cause enlargement of the urinary bladder; if the blockage is complete, pet may have signs (such as lack of appetite [anorexia] and vomiting) due to excess levels of urea and other nitrogenous waste products in the blood due to the inability of the pet to urinate (condition known as “post-renal uremia”)

CAUSES

- Breed susceptibility (Dalmatian) to form urate stones (uroliths)
- Pets with portosystemic shunts (condition in which abnormal blood vessels allow blood to flow between the portal vein [vein that normally carries blood from the digestive organs to the liver] and the body circulation without first going through the liver) may develop urate stones (uroliths)

RISK FACTORS

- High purine (a nitrogen-containing compound) intake in the diet, especially eating glandular meat
- Persistent acidic urine (low urine pH; known as “aciduria”) in a susceptible pet
- Eating a high purine diet, while receiving allopurinol for treatment of urate stones (uroliths)

Treatment

HEALTH CARE

- Blockage of the urethra (the tube from the bladder to the outside, through which urine flows out of the body) or ureter (the tube running from the kidney to the bladder) may require inpatient treatment
- Urate stones (uroliths) can be dissolved on outpatient basis
- Fluid therapy to correct dehydration

ACTIVITY

- Usually not restricted, except after surgery

DIET

- For dissolution and prevention of urate stones, a high-moisture, low-purine, urine-alkalinizing diet (that is, a diet which makes the urine more dilute and more alkaline or raises the urine pH)

SURGERY

- Surgery to remove stones from the bladder (known as “cystotomy”), urethra (known as “urethrotomy”), or kidney (known as “nephrotomy”)
- Surgery to tie off abnormal blood vessels that allow blood to flow between the portal vein (vein that normally carries blood from the digestive organs to the liver) and the body circulation without first going through the liver (known as “portosystemic shunt ligation”)

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 as all inclusive

- Allopurinol, a xanthine-oxidase inhibitor, for dissolving urate stones

Follow-Up Care

PATIENT MONITORING

- Monitor with urinalysis and x-ray (radiograph) studies or ultrasound every 1–2 months; if no recurrence in 6 months, evaluate every 2–4 months

PREVENTIONS AND AVOIDANCE

- High-moisture, low-purine, urine-alkalinizing diet (that is, a diet which makes the urine more dilute and more alkaline or raises the urine pH)

POSSIBLE COMPLICATIONS

- Blockage or obstruction of the urethra
- Urate stones (uroliths) likely to recur, if no preventive measures are taken

EXPECTED COURSE AND PROGNOSIS

- Dissolving the stones with medical treatment (allopurinol and diet) takes an average of 4 weeks, if the owner carefully follows the treatment plan
- Dissolving the stones with medical treatment (allopurinol and diet) usually is not successful in pets with portosystemic shunts (condition in which abnormal blood vessels allow blood to flow between the portal vein [vein that normally carries blood from the digestive organs to the liver] and the body circulation without first going through the liver)

Key Points

- Recurrence of urate stones (uroliths) is possible, especially if no preventive measures are taken; discuss a plan to minimize recurrence with your pet's veterinarian
- Dalmatians have a breed susceptibility to forming urate stones (uroliths)
- Pets with portosystemic shunts (condition in which abnormal blood vessels allow blood to flow between the portal vein [vein that normally carries blood from the digestive organs to the liver] and the body circulation without first going through the liver) may develop urate stones (uroliths)