

# URATE UROLITHIASIS

## (URATE STONES IN THE URINARY TRACT)

### BASICS

#### OVERVIEW

- Urolithiasis” is the medical term for the presence of stones (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 animal 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 ANIMAL

##### *Species*

- Dogs and cats

##### *Breed Predispositions*

- Dalmatian, English bulldog, and breeds at risk for portosystemic shunt, 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 patients without portosystemic shunt is 3.5 years (range, 0.5 to greater than 10 years of age)
- Mean age in patients 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) is less than 1 year (range, 0.1 to greater than 10 years of age)

##### *Predominant Sex*

- More common in male dogs, in cases without a portosystemic shunt
- No sex predilection in dogs 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) or in cats

#### SIGNS/OBSERVED CHANGES in the ANIMAL

- Some animals 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”)
- 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 patients 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 (anorexia), disorientation, blindness, seizures, coma
- Blockage or obstruction of the urethra may cause enlargement of the urinary bladder; if the blockage is complete, animal 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 animal to urinate (condition known as “postrenal uremia”)

#### CAUSES

- Breed susceptibility (Dalmatian) to form urate stones (uroliths)
- Animals 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) 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 animal

## 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 low-purine, urine-alkalinizing diet (that is, a diet which makes the urine 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 studies or ultrasound every 1 to 2 months; if no recurrence in 6 months, evaluate every 2 to 4 months

### PREVENTIONS AND AVOIDANCE

- Low-purine, urine-alkalinizing diet (that is, a diet which makes the urine 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
- Dissolving the stones with medical treatment (allopurinol and diet) usually is not successful in cases 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
- Dalmatians have a breed susceptibility to forming urate stones (uroliths)
- Animals 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)