

# URINARY TRACT OBSTRUCTION

## BASICS

### OVERVIEW

- Restricted flow of urine at any point in the urinary tract, from the kidneys to the external urethral orifice (the opening through which urine passes during urination)
- 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)

### SIGNALMENT/DESCRIPTION of ANIMAL

#### Species

- Dogs and cats

#### Predominant Sex

- More common in males than in females

### SIGNS/OBSERVED CHANGES in the ANIMAL

- Abnormal frequent passage of urine (known as “pollakiuria”)—common
- Straining with slow, painful discharge of urine (known as “stranguria”)
- Reduced velocity or caliber of the urine stream or no urine flow during efforts to empty the bladder (voiding efforts)
- Obvious blood in the urine (known as “gross hematuria”)
- Signs of excess levels of urea and other nitrogenous waste products in the blood (known as “uremia” or “azotemia”) that develop when urinary tract obstruction is complete (or nearly complete): sluggishness (lethargy), dull attitude, reduced appetite, and vomiting
- Excessive urine in the bladder (causing an overly large or tense/turgid bladder) or inappropriate retained urine (urine remains after voiding efforts); distension of the urinary bladder can be felt during physical examination
- Urinary tract stones (known as “uroliths”) often can be felt in the urethra (the tube from the bladder to the outside, through which urine flows out of the body) of an obstructed male dog, during physical examination
- Occasionally, an enlarged kidney or kidneys may be felt during physical examination in an animal with long-term (chronic) partial blockage or obstruction of the ureter(s), especially when the lesion involves only one side; the ureter is the tube running from the kidney to the bladder
- Signs of severely excessive levels of urea and other nitrogenous waste products in the blood (uremia or azotemia)—dehydration; weakness; low body temperature (known as “hypothermia”); low heart rate (known as “bradycardia”) with moderately increased levels of potassium in the blood (known as “hyperkalemia”); high rate of shallow respirations; stupor or coma; seizures occurring terminally; rapid heart rate (known as “tachycardia”) resulting from irregular heartbeats induced by severely increased levels of potassium in the blood (hyperkalemia)
- Signs of rupture or perforation of the urinary tract—leakage of urine into the abdomen causes abdominal pain and distension; leakage of urine into tissues around the urethra (the tube from the bladder to the outside, through which urine flows out of the body) causes pain and swelling in the pelvis or in the tissue between the anus and vulva in the female or anus and scrotum in the male, depending on the site of the urethral injury; fever

### CAUSES

#### **Intraluminal Causes (blockage or obstruction involving the inner, open space of the tubular ureters and urethra)**

- Solid or semisolid structures including urinary tract stones (uroliths); accumulations of minerals and inflammatory materials in a matrix (known as “urethral plugs”) in cats; blood clots; and sloughed tissue fragments
- Most common site—the urethra
- Urinary tract stones (urolithiasis)—most common cause in male dogs
- Accumulations of minerals and inflammatory materials in a matrix (urethral plugs)—most common cause in male cats

#### **Intramural Causes (blockage or obstruction involving the wall of a hollow organ, such as the bladder)**

- Tumors or cancer of the bladder neck (the junction between the bladder and the urethra) or urethra (the tube from the bladder to the outside, through which urine flows out of the body)—common cause in dogs
- Nodular inflammatory lesions, characterized by the presence of pus (known as “pyogranulomatous inflammatory lesions”) in the urethra—seen occasionally in dogs
- Scar tissue (known as “fibrosis”) at a site of prior injury or inflammation can cause narrowing (stricture or stenosis), which may impede urine flow or may be a site where debris becomes lodged within the lumen (the inner open space of the ureter [the tube from the kidney to the bladder] or urethra [the tube from the bladder to the outside, through which urine flows out of the body])
- Prostatic disorders in male dogs

- Fluid build-up (known as “edema”), bleeding, or spasm of muscular components can occur at sites of blockage or obstruction involving the inner, open space of the tubular ureters or urethra (intraluminal obstruction), and contribute to persistent or recurrent obstruction to urinary flow after removal of the intraluminal blockage; tissue changes might develop because of injury inflicted by the obstructing material, by the manipulations used to remove the obstructing material, or both
- Ruptures, lacerations, and punctures—usually caused by traumatic incidents

#### **Miscellaneous Causes**

- Displacement of the urinary bladder into a perineal hernia; a perineal hernia develops when the muscles supporting the rectum weaken and separate, allowing the rectum and/or bladder to slide under the skin and causing swelling in the area of the anus
- Nervous system disorders

#### **RISK FACTORS**

- Urinary tract stones (urolithiasis), particularly in males
- Feline lower urinary tract disease (FLUTD), particularly in males
- Prostatic disease in male dogs

### **TREATMENT**

#### **HEALTH CARE**

- Complete urinary tract obstruction is a medical emergency that can be life threatening; treatment usually should be started immediately
- Partial urinary tract obstruction—not necessarily an emergency, but these patients may be at risk for developing complete obstruction; may cause irreversible urinary tract damage, if not treated promptly
- Treat as an inpatient until the patient’s ability to urinate has been restored
- Treatment has three major components: 1) combating the problems associated with excess levels of urea and other nitrogenous waste products in the blood that build up due to the urinary tract obstruction (known as “postrenal uremia”)—problems include dehydration; low body temperature (hypothermia); accumulation of acidic compounds in the body (known as “acidosis”); increased levels of potassium in the blood (hyperkalemia); 2) restoring and maintaining an open pathway for urine outflow; and 3) implementing specific treatment for the underlying cause of urine retention and urinary tract obstruction
- Give fluid therapy to patients with dehydration or with excessive levels of urea and other nitrogenous waste products in the blood (uremia or azotemia)
- When substantial generalized (systemic) problems exist, start fluid administration and other supportive measures first; careful decompression by tapping the bladder to remove urine (known as “cystocentesis”) may be performed before anesthesia and catheterization

#### **SURGERY**

- Surgery is required sometimes
- Urinary diversion by tube cystostomy is useful in selected cases; tube cystostomy is surgical placement of a catheter from the bladder and exiting through the abdominal wall to allow urine to be removed from the body, thus bypassing blockage of the urethra

### **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.

- Procedures for relief of obstruction often require, or are facilitated by, giving sedatives or anesthetics; generally **isoflurane** is the anesthetic of choice; however, a variety of other anesthetics or sedatives can give satisfactory results

### **FOLLOW-UP CARE**

#### **PATIENT MONITORING**

- Assess urine production and hydration status frequently, and adjust fluid administration rate accordingly
- Verify ability to urinate adequately or use urinary catheterization to combat urine retention
- If catheter insertion requires repeated use of sedatives or anesthetics or is unduly traumatic, indwelling catheterization with closed drainage is appropriate; however, frequent brief catheterization may be a better choice, if the catheter can be inserted easily on a repeated basis
- When the electrocardiogram (ECG) indicates changes in the heart rhythm that potentially are life-threatening, use continuous monitoring to guide treatment and evaluate response

#### **POSSIBLE COMPLICATIONS**

- Death

- Injury to the urinary tract, while trying to relieve obstruction
- Low levels of potassium in the blood (hypokalemia) during postobstruction diuresis (a condition in which the body produces large volumes of urine after a urinary tract blockage has been relieved)
- Recurrence of obstruction

#### **EXPECTED COURSE AND PROGNOSIS**

- Long-term management and prognosis depend on the cause of the blockage or obstruction

#### **KEY POINTS**

- Urinary tract obstruction is restricted flow of urine at any point in the urinary tract, from the kidneys to the external urethral orifice, the opening through which urine passes during urination
- Complete urinary tract obstruction is a medical emergency that can be life threatening; treatment usually should be started immediately
- Partial urinary tract obstruction—not necessarily an emergency, but these patients may be at risk for developing complete obstruction; may cause irreversible urinary tract damage, if not treated promptly
- Long-term management and prognosis depend on the cause of the blockage or obstruction

