Lake Shore Pet Hospital

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 pet urinates), and the urethra (the tube from the bladder to the outside, through which urine flows out of the body)

SIGNALMENT/DESCRIPTION OF PET

Species

- Dogs
- Cats

Predominant Sex

- More common in males than in females

SIGNS/OBSERVED CHANGES IN THE PET

- Abnormal frequent passage of small volumes of urine (known as “pollakiuria”)—common
- Straining with slow, painful discharge of urine (known as “stranguria”)
- Reduced velocity or width of the urine stream or no urine flow during efforts to empty the bladder (voiding efforts)
- Crying out and frequent trips to the litter box (cats)
- 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 pet 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”); altered attitude, rapid heart rate (known as “tachycardia”) resulting from irregular heartbeats induced by stress and pain
- 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 (known as the “lumen”)
- Solid or semisolid structures including urinary tract stones (uroliths) most common in male dogs; accumulations of minerals and inflammatory materials in a matrix (known as “urethral plugs”) in cats; blood clots; and sloughed (shed) tissue fragments
- May be from functional blockage
- Most common site—the urethra

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—common cause in dogs
- Scar tissue (known as “fibrosis”) at a site of prior injury or inflammation can cause narrowing, which may impede urine flow or may be a site where debris becomes lodged within the ureter lumen or urethra
- Prostate disorders (cancer, infection and inflammation) in male dogs
- Fluid buildup (known as “edema”), bleeding, or spasm of muscular components can occur at sites of blockage or obstruction involving 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 diseases (FLUTD), particularly in males
- Prostate disease in male dogs

Treatment

HEALTH CARE

- Complete urinary tract obstruction is a medical emergency that can be life-threatening; treatment needs to be started immediately
- Partial urinary tract obstruction—may dribble or spot urine; these pets may be at risk for developing complete obstruction; may cause irreversible urinary tract damage
- Treat as an inpatient until the pet's ability to urinate adequately 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 “post-renal uremia”)—problems include dehydration; low body temperature (hypothermia); accumulation of acidic compounds in the body (known as “acidosis”); especially 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
- The veterinarian will give judicious fluid therapy to pets with dehydration or with excessive levels of urea and other nitrogenous waste products in the blood (uremia or azotemia), and provide therapy to correct electrolyte changes, and after the blockage is relieved, to maintain body fluid balance and counteract ongoing losses (known as "post-obstructive diuresis")
- When substantial generalized (systemic) problems exist, the veterinarian will start judicious fluid administration and other supportive measures first, before relieving the blockage or obstruction; careful decompression by tapping the bladder to remove urine (known as "cystocentesis") will relieve pressure on the bladder and may be performed before catheterization
- Pain management will be a focus of therapy

SURGERY

- Surgery is required sometimes following catheterization of the urethra—for example a cystostomy (surgical entry into the bladder) for removal of bladder stones
- Unblocking via urinary catheter under deep sedation or anesthesia requires removal of retained urine, and flushing urinary bladder with sterile solutions until clear; catheter may be left in (attached to a sterile collection system) to allow the bladder to rest after extreme distended bladder during blockage
- 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 blockage or obstruction require, sedatives, pain medicine and frequently, full anesthetics; agents will be selected based on patient status, possible kidney function issues; combinations of agents will be used to reduce potential for side effects (known as "balanced") as a variety of anesthetics or sedatives can give satisfactory results
- Antibiotics may be given if infection is confirmed
- After unblocking the obstruction, medicines such as acepromazine or prazosin may be beneficial in cats, or for patients with nervous system-related blockage

Follow-Up Care

PATIENT MONITORING

- Assessment of urine production and hydration status will be done frequently, and fluid administration rate adjusted accordingly
- Monitoring of kidney function will be done, electrolyte monitoring as well, frequency is dictated by stability of the patient
- When able to urinate adequately, and stabilization of derangements of fluid balance and electrolytes is completed, urine will be assessed, then the catheter will be removed
- Continued monitoring for ability to urinate will continue for 12-24 hours after catheter removal
- Cats may benefit from 5-7 days of pain medicine and urethra relaxants at home
- Increased water intake and environmental enrichment will also be recommended and discussed with the veterinarian before release from hospital
- When the electrocardiogram (ECG) indicates changes in the heart rhythm that potentially are life-threatening, the veterinarian will use continuous monitoring to guide treatment and evaluate response until fully stable

POSSIBLE COMPLICATIONS

- Death
- Injury to the urinary tract, while trying to relieve obstruction: a bladder tear (due to decompressive cystocentesis); stricture or narrowing/scarring of the blocked tissue area post-obstruction

- Low levels of potassium in the blood (hypokalemia) during post-obstruction diuresis; low heart rate during blockage due to high levels of potassium in the blood (hyperkalemia); potassium is very important for stability of the heart
- Recurrence of obstruction
- Residual kidney damage leading to increase in nitrogen wastes (known as “azotemia” or uremia”), high levels of phosphorus in the bloodstream and excess acidity in the bloodstream (known as “metabolic acidosis”) due to changes in metabolism

EXPECTED COURSE AND PROGNOSIS

- Long-term management and prognosis depend on the cause of the blockage or obstruction
- In older dogs with cancer or disease of the prostate, the underlying cause is often difficult to treat

Key Points

- Urinary tract obstruction is blockage of 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 should be started immediately
- Partial urinary tract obstruction—these pets may be at risk for developing complete obstruction; may cause irreversible urinary tract damage
- Long-term management and prognosis depend on the cause of the blockage or obstruction

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