

FUNCTIONAL URINARY RETENTION

(INCOMPLETE EMPTYING OF THE BLADDER)

BASICS

OVERVIEW

- Incomplete emptying of the urinary bladder (voiding), which is not associated with physical blockage of the lower urinary tract (known as “urinary obstruction”)
- The lower urinary tract consists of the urinary bladder and the urethra (the tube from the bladder to the outside, through which urine flows out of the body)
- The detrusor muscle is the muscular layer of the wall of the urinary bladder; it contracts to empty the bladder and to cause urine to leave the body through the urethra
- “Functional” is defined as being caused by a problem with the normal action of an organ

SIGNALMENT/DESCRIPTION of ANIMAL

Species

- Dogs and cats

Predominant Sex

- More common in male than in female dogs and cats

SIGNS/OBSERVED CHANGES in the ANIMAL

- Distended urinary bladder may be felt on physical examination; after attempts by the animal to empty the bladder (void), distension may persist or an excessive amount of urine may remain in the bladder (the inappropriate residual urine volume can be measured)
- Affected animals may demonstrate ineffective, frequent, or no attempts to urinate (void)
- Urine stream may be weak, thin or diminished (attenuated), or interrupted
- Abdominal distension, abdominal pain, or signs of excess levels of urea and other nitrogenous waste products in the blood (known as “uremia” or “azotemia”) due to inability to remove urine from the body (known as “postrenal azotemia”) may predominate in rare cases or with urinary tract rupture
- May contribute to recurrent urinary tract infection; functional urinary retention may be identified because of the recurrent infection
- Lack of control of urination or urine leakage due to overflow of urine (known as “overflow urinary incontinence”) may occur

CAUSES

Decreased Contraction (Hypocontractility) of the Urinary Bladder Detrusor Muscle (known as “Detrusor Atony”)

- Most commonly develops as a sequel to sudden (acute) or long-term (chronic) urinary bladder overdistension; many patients have a history of nervous system dysfunction or previous urinary blockage or obstruction
- Nervous system causes include lesions of the pelvic nerves, sacral spinal cord (the sacral spinal cord is located within the sacral vertebrae, which are found within the pelvis just before the vertebrae of the tail), and suprasacral spinal cord (that is, before the sacral spinal cord; for example, the lumbar spinal cord)
- Lesions of the sacral spinal cord (such as congenital malformations, cauda equina compression, lumbosacral disk disease, and vertebral fractures/dislocations) can result in a flaccid, overdistended urinary bladder with weak outlet resistance (outlet resistance is inhibition of the ability to pass urine through the urethra)
- Lesions of the suprasacral spinal cord (such as intervertebral disk protrusion, spinal fractures, and compressive tumors) can result in a distended, firm urinary bladder that is difficult to express or empty by gentle manual pressure
- Electrolyte disturbances, including excessive levels of potassium in the blood (known as “hyperkalemia”); inadequate levels of potassium in the blood (known as “hypokalemia”); excessive levels of calcium in the blood (known as “hypercalcemia”); inadequate levels of calcium in the blood (known as “hypocalcemia”); and other metabolic disturbances associated with generalized muscle weakness also can affect contraction of the urinary bladder detrusor muscle (detrusor muscle contractility)
- Decreased contraction of the detrusor muscle (detrusor atony) with urine retention is a feature of a disorder characterized by abnormal function of the autonomic nervous system (known as “dysautonomia”); dysautonomia is encountered primarily in cats in Great Britain; the disorder also has been described in dogs in certain geographic regions of the United States
- Some dogs with excessive levels of steroids produced by the adrenal glands (known as “hyperadrenocorticism” or “Cushing’s disease”) have increased urination (known as “polyuria”), urinary bladder distention and mild urine retention

Functional Urinary Obstruction (blockage or obstruction of urination related to abnormal action of the lower urinary tract)

- Occurs when excessive or inappropriate outlet resistance (inhibition of the ability to pass urine through the urethra) prevents complete emptying of the bladder (voiding) during urinary bladder contraction

- In patients with suprasacral spinal lesions or midbrain disorders, urethral outlet resistance (inhibition of the ability to pass urine through the urethra) becomes uninhibited and remains inappropriately excessive or fails to coordinate with voiding contractions (that is, the contraction of the detrusor muscle and the relaxation of the urethra are not coordinated, known as “detrusor-urethral dyssynergia”); the condition has been associated with sacral lesions, local nervous system disease (known as “neuropathy”), and unknown causes (so called “idiopathic” disease)
- Excessive urethral resistance (inhibition of the ability to pass urine through the urethra), usually attributed to spasm of muscular components of the urethra (known as “urethrospasm”), may be seen after urethral blockage or obstruction or urethral or pelvic surgery, urethral inflammation, or prostatic disease

RISK FACTORS

- Feline lower urinary tract disease (FLUTD)
- Urethral blockage or obstruction
- Pelvic or urethral surgery
- Anticholinergic medications, such as atropine

TREATMENT

HEALTH CARE

- Usually managed as inpatients, until adequate emptying of the bladder (voiding) returns
- Address primary disorders (such as electrolyte disturbances and nervous system lesions) and correct, if possible
- Manage excess levels of urea and other nitrogenous waste products in the blood (uremia or azotemia), electrolyte imbalances, and acid–base disturbances associated with sudden (acute) urine retention
- Identify urinary tract infection, and treat appropriately
- Keep the urinary bladder small by intermittent or indwelling catheterization or frequent manual compression; intermittent or indwelling urinary catheterization may be required temporarily to ensure urine flow

SURGERY

- May consider surgical options for salvaging the opening of the urethra in some patients; surgical removal of the penis and creation of a new opening in the urethra (known as “perineal urethrostomy”) may be required in male cats with unmanageable urethral resistance (inhibition of the ability to pass urine through the urethra) in the end 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.

Decreased Contraction (Hypocontractility) of the Urinary Bladder Detrusor Muscle (Detrusor Atony)

- **Bethanechol**—may increase contraction of the detrusor muscle in partially denervated or suddenly (acutely) overdistended urinary bladders
- **Metoclopramide**—may stimulate detrusor muscle contraction
- **Cisapride**—may promote bladder emptying

Functional Urinary Obstruction (blockage or obstruction of urination related to abnormal action of the lower urinary tract)

- **Prazosin** or phenoxybenzamine— α -adrenergic antagonists; reduces smooth muscle contraction in the urethra; more effective in dogs than in cats
- **Diazepam**—a short-acting, central skeletal muscle relaxant; relaxes striated muscle of the external urethral sphincter, the muscle that opens the urethra when the animal urinates (voids)
- **Acepromazine**—a phenothiazine tranquilizer; has general muscle relaxant and α -blocking effects on urethral tone; may be effective in cats with excessive urethral resistance (inhibition of the ability to pass urine through the urethra)
- **Dantrolene**—a muscle relaxant; appears to be effective in reducing distal urethral resistance (inhibition of the ability to pass urine through the urethra) in cats
- **Baclofen**—a spinal reflex inhibitor; acts as a skeletal muscle relaxant; clinical use in small animals has been limited

FOLLOW-UP CARE

PATIENT MONITORING

- As treatment progresses, assess residual urine volume by urinary bladder palpation or by periodic urinary catheterization
- In most patients, can withdraw medications slowly after primary causes are corrected and adequate emptying (voiding) function of the bladder has been sustained for several days
- Perform periodic urinalysis in patients with long-term (chronic) urine retention to detect urinary tract infection
- Complete bladder emptying (voiding) function may not return; pets should be monitored for signs of urinary blockage or obstruction or excess levels of urea and other nitrogenous waste products in the blood (uremia or azotemia)

POSSIBLE COMPLICATIONS

- Lower urinary tract infection and infection moving up the urinary tract to the kidneys (known as “ascending infection”)
- Permanent detrusor muscle injury and decreased contraction (atony); urinary bladder or urethral rupture
- Excess levels of urea and other nitrogenous waste products in the blood (uremia or azotemia) due to inability to remove urine from the body (postrenal azotemia)

EXPECTED COURSE AND PROGNOSIS

- Depend on cause and response to treatment

KEY POINTS

- Incomplete emptying of the urinary bladder (voiding), not associated with blockage of the lower urinary tract (known as “urinary obstruction”)
- Affected animals may demonstrate ineffective, frequent, or no attempts to void
- Urine stream may be weak, thin or diminished (attenuated), or interrupted
- May contribute to recurrent urinary tract infection
- Complete bladder emptying (voiding) function may not return; pets should be monitored for signs of urinary blockage or obstruction or excess levels of urea and other nitrogenous waste products in the blood (uremia or azotemia)

