

URINARY OBSTRUCTION IN DOGS

Urinary Blockage- a medical & possible surgical emergency

Urinary blockage is a medical emergency and should be treated as soon as possible. Most dogs become blocked when a bladder stone(s) passes into the urethra and becomes lodged thus preventing the passage of urine. If the blockage is not relieved, severe electrolyte imbalances involving potassium (K+) ensue leading to the development of cardiac arrhythmias (abnormal heart beat) and eventually cardiac arrest & death. The urinary bladder can also rupture causing urine leakage into the abdominal cavity and a chemical peritonitis to develop.

Most dogs present for abdominal pain, crying / whining, and repeated attempts with straining to urinate. Some dogs become partially blocked when a stone acts as a ball valve in the urethra. These dogs can pass only small amounts of urine- usually only drops at a time which is not enough to empty the bladder nor prevent the electrolyte imbalance. Partially blocked dogs must be differentiated from those with urinary tract infections (UTI). Blockage occurs mostly in males who have long thin urethras. Females have much shorter and wider urethras and rarely become obstructed. Urinary tract infections (UTI) can also lead to blocking by causing irritation and spasms of the urethral smooth muscle. Dogs that have previously formed bladder stones should be maintained on a specially formulated diet for life and monitored closely for signs of repeat obstruction.

Bladder Stones (cystic calculi) in dogs

The formation of bladder stones is fairly common, especially in certain breeds of dogs. The three most common types of stones are struvite (triple phosphate), calcium oxalate, and uric acid stones. Dalmatians are predisposed to forming uric acid stones due to a genetic defect in uric acid metabolism leading to a much higher concentration of uric acid in the urine. Dogs with liver shunts are also at a higher risk for uric acid stone formation. Struvite and calcium oxalate stones seem to be more prevalent in small breed dogs, especially Miniature Schnauzers, Lhasa Apso's, and Shih Tzu's. Stones & crystals form in the kidneys or bladder when high concentrations of minerals precipitate out of urine. Struvite stones & crystals form when the urine is very alkaline (pH greater than 8) whereas calcium oxalate and uric acid stones and crystals form in acidic urine (pH less than 7). Urine is evaluated to look for the different types of crystals- identified based on their shape. Additionally, many dogs with stones also suffer from chronic urinary tract infections. Many dogs with crystals in their urine can be treated medically by placing them on a special diet designed to dissolve existing crystals and prevent future crystal & stone formation by limiting mineral intake and manipulating urine pH. Dogs with concurrent urinary tract infections should also be treated with antibiotics. Large bladder (and kidney) stones however will not dissolve completely and it is recommended that they be surgically removed. If the stones are not removed, at some point they are likely to pass into the urethra during urination and become lodged causing a urethral obstruction.

Symptoms of urinary obstruction

- Straining / crying when attempting to urinate (can be mistaken for constipation)
- Painful abdomen / reluctance to move
- Only drops or no urine passed
- History of recent UTI or blood in urine
- Vomiting
- Anorexia / Lethargy

***Dogs with bladder stones often have no clinical signs other than frequent urinary tract infections until they suddenly become obstructed.

Diagnosis

- **Urethral Obstruction**- based on history, clinical signs, and abdominal palpation where the bladder will be large, hard, and painful.
- Inability to pass a urinary catheter into the bladder.
- Changes on blood work (electrolyte imbalance & high kidney values-BUN & creatinine)
- Cardiac arrhythmias (abnormal heart rhythm)
- **Bladder stones**- rarely can be palpated. A radiograph (x-ray) is required to look for stones in the urinary tract (kidneys, bladder, & urethra).
- Calcium oxylate and struvite crystals are radio-opaque and show up easily on normal radiographs
- Uric acid stones are radiolucent and will not show up readily on regular films. A special contrast x-ray study or ultrasound of the bladder is needed to see uric acid stones.
- Urinalysis- look for infection & crystals- if present, check for urinary tract stones
- If a stone is retrieved surgically, it should be identified via stone analysis.

Treatment of Urethral Obstruction

- Treat for shock and electrolyte imbalances to stabilize the patient
- UNBLOCK the urethra- try with a urinary catheter, flush, and urethral lavage & retropulsion- pushes stone back into the bladder
- Once unblocked, the catheter should be left in the bladder & urethra until the dog has surgery
- If unable to unblock with a urinary catheter, the dog will require **emergency surgery**
- After unblocking, medical care includes IV fluids to help flush out the kidneys & bladder, antibiotics, antiinflammatories, and analgesics.
- Stones should be submitted for analysis

Treatment of Bladder Stones (cystic calculi)

- Once unblocked and stable, a Cystotomy surgery is recommended for patients who have remaining bladder stones seen on radiographs. If these stones are not removed, the dogs is likely to reblock in the future.
- Post-operative care varies, from minimal to intensive, depending on the patient.

- All dogs should be placed on a stone dissolving diet for at least three months (if not life) after being blocked

Prognosis

- Fair to good depending on early identification of bladder stones and blockages, followed by aggressive medical and surgical therapy.
- The dogs who do best are those maintained on special diets for life and whose urinary tract infections are controlled.