

BASIC INFORMATION

Description

Bladder stones (cystoliths, cystic calculi) are physical aggregations of minerals and other substances in the bladder. They may rub and irritate the lining of the bladder, increase the risk of bladder infections, or lodge in the urethra (the tube that carries urine from the bladder to outside the body), causing an obstruction.

Causes

The two most common types of bladder stones in cats are calcium oxalate stones and struvite stones. They occur with about equal frequency. Calcium oxalate stones are more likely to develop in acidic urine, whereas struvite stones are more likely to form in alkaline urine. Complex interactions between the animal's diet and stone formation affect the development of both of these types of stones.

Urate stones are uncommonly encountered in cats and are usually associated with liver disease or vascular shunts. Other types of stones are rare in cats.

Clinical Signs

Signs of bladder irritation include frequent trips to the litter box, voiding of small volumes of urine, blood in the urine, pain on urination, and urinating outside the litter box. Bladder stones may lodge in the urethra, causing a complete urinary obstruction. Urinary obstruction is more common in male cats. Signs of obstruction include straining to urinate without producing any urine and abdominal pain. Urinary obstruction is an emergency situation. (See the handout on **Urethral Obstruction in Cats**.)

Diagnostic Tests

Diagnostic steps that are often recommended include routine blood and urine tests (urinalysis, culture) and abdominal x-rays. Urinalysis may show microscopic calcium oxalate or struvite crystals. It is important to note that cats can have crystals in their urine without having stones, and they can have stones without having crystals.

Both calcium oxalate stones and struvite stones show up on plain x-rays, making x-rays an excellent test for detecting stones. Some stones are too small to be seen on x-rays, but an abdominal ultrasound can usually detect them.

Analysis of stones is necessary to be sure of their composition, so stones that are physically removed from the bladder are submitted for analysis.

TREATMENT AND FOLLOW-UP

Treatment Options

Struvite stones can often be dissolved by feeding a special, prescription diet (Hill's S/D). The cat must eat this diet exclusively; no supplemental treats or other foods are allowed. On average, it takes 3-4 weeks to dissolve struvite stones.

Calcium oxalate stones cannot be dissolved with dietary changes or medications. The only effective therapy is physical removal of the stones, which generally means bladder surgery (cystotomy) done through an abdominal incision. In certain cases, particularly in a large female cat with a solitary stone, the stone can be fragmented with a laser during cystoscopy (passage of a small fiberoptic viewing scope into the bladder) and the fragments flushed out. However, few veterinary hospitals have the equipment needed for cystoscopy and laser therapy. Surgery is generally a faster procedure. If the cat is a large female and the stones are small, it may be possible to flush them out with the animal under anesthesia.

With other types of stones, medications may be useful for dissolving them or preventing recurrence. After the stones are removed, preventive measures may include feeding a moist food and certain prescription diets. Prescription diets that are designed to simultaneously prevent struvite and calcium oxalate stones include Hill's Multicare C/D and Royal Canin's SO.

Follow-up Care

Following surgery, a recheck visit is usually scheduled at 10-14 days for suture removal. When medical therapy is used to dissolve the stones and also after surgery, urine pH (a measure of acidity) and x-rays are usually repeated at 1, 3, and 6 months to monitor for improvement or recurrence of stones. Longer-term monitoring may also be recommended.

Prognosis

Prognosis for resolution of bladder stones is excellent. For calcium oxalate and struvite stones, dietary management can decrease the risk of recurrence, although some cats develop more stones within 3-5 years.