

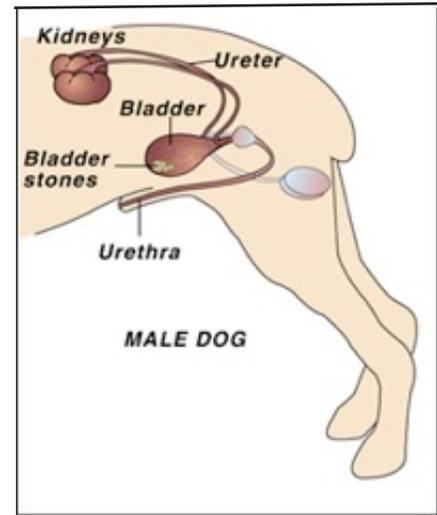
Bladder Stones

What are bladder stones?

Bladder stones (uroliths or cystic calculi) are rock-like collections of minerals that form in the urinary bladder. They may occur as a large, single stone or as collections of stones the size of large grains of sand or gravel.

What problems do bladder stones cause?

The two most common signs of bladder stones are hematuria (blood in the urine) and dysuria (straining to urinate). Hematuria occurs because the stones irritate the bladder wall causing bleeding. Dysuria occurs when stones obstruct the flow of urine out of the bladder. Large stones may cause a partial obstruction at the point where the urine leaves the bladder and enters the urethra; small stones may flow with the urine into the urethra and cause an obstruction there.



When an obstruction occurs, the bladder cannot be emptied and this is very painful. Your dog may cry in pain, especially if pressure is applied to the abdominal wall.

Hematuria and dysuria are the most common signs seen in dogs with bladder stones but with obstruction there is also pain. We know this because when bladder stones are removed surgically, many owners tell us how much better and more active their dog feels.

Why do bladder stones form?

There are several theories of dog bladder stone formation. The most commonly accepted theory is called the Precipitation-Crystallization Theory. This theory states that one or more stone-forming crystalline compounds are present in elevated levels in the urine. This may be due to abnormalities in diet or due to some previous disease in the bladder, especially infection with bacteria. Sometimes the condition may be due to a problem with the body's metabolism. When the amount of this compound reaches a threshold level, the urine is said to be supersaturated. This means that the level of the compound is so great that it cannot all be dissolved in the urine, so it precipitates and forms tiny crystals. These crystals stick together, usually due to mucus-like material within the bladder, and stones gradually form. As time passes, the stones enlarge and increase in number.



Radiograph (X-ray) of a dog's abdomen, showing large bladder stones (arrow)

How are bladder stones diagnosed?

Dogs and cats with bladder infections and bladder stones may have similar clinical signs. Most canine bladder stones are visible on radiographs (x-rays) or an ultrasound examination. These procedures are performed if stones are suspected. This includes animals that show unusual pain when the bladder is palpated, have recurrent hematuria and dysuria, or who have recurrent bacterial infections in the bladder.

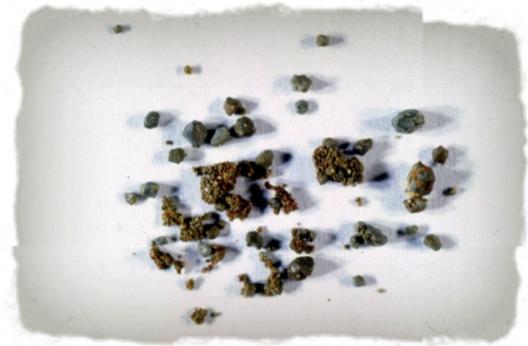
Some bladder stones are not visible on radiographs (radiolucent). This means that their mineral composition is such that they do not reflect the x-ray beam. These stones may be found with an ultrasound examination or with special radiographs that are made after placing a special dye (contrast material) in the bladder.

How are bladder stones treated?

The fastest way is to remove them surgically (a cystotomy). This requires surgery in which the abdomen and bladder are opened. Pets with urethral obstruction need surgery as soon as possible. Male cats may require a perineal urethrostomy.

In all cases, the stone is submitted for analysis to determine if there is a way to prevent them from reforming.

Depending on what type of stones are present, a special diet may be recommended, but with most types of stones the diet is not 100% effective in preventing stone reformation.



Bladder stones removed from a dog with a portosystemic shunt.