CONDITION

Bladder stones

Learn what bladder stones are, why they form, how they are diagnosed and treated, and which urinary symptoms need urgent care.

WHAT IT IS
Hard mineral deposits in the bladder

BODY SYSTEM
Urinary system

MAIN SYMPTOMS
Lower abdominal pain, painful urination, interrupted urine flow, blood in urine

WHAT CAUSES IT
Incomplete bladder emptying

HOW IT IS DIAGNOSED
Ultrasound, X-ray, CT scan or cystoscopy

MAIN TREATMENT
Procedural stone removal

CAN IT BE CURED?
Yes - stones can be removed

IS IT AN EMERGENCY?
Sometimes - inability to pass urine

LONG-TERM OUTLOOK
Stones can recur if emptying problems persist

Overview

Bladder stones are hard deposits of minerals that form inside the bladder. The bladder is the organ that stores urine before it leaves the body.

Stones often develop when urine remains in the bladder for too long. Minerals in the urine can become concentrated, form crystals, and gradually grow into stones. A stone may also begin in a kidney, travel down the urinary tract, and remain in the bladder.

Bladder stones range from small grains to much larger stones. A person may have one stone or several. Some cause no symptoms, while others irritate the bladder, block urine flow, or contribute to repeated urinary tract infections.

In adults, bladder stones are often linked to a condition that prevents complete bladder

emptying. An enlarged prostate is a common example. Nerve problems, narrowing of the urethra, bladder pouches, and urinary devices can also interfere with drainage.

Bladder stones are different from kidney stones, although the two conditions can occur together. Finding the reason a bladder stone formed is important because removing the stone alone may not prevent another one.

Symptoms

Small bladder stones may cause no noticeable symptoms. Symptoms can appear when a stone irritates the bladder wall or moves near the opening where urine leaves the bladder.

Possible symptoms include:

These symptoms are not specific to bladder stones. Prostate conditions, urinary infections, kidney stones, bladder inflammation, and other urinary disorders can cause similar problems.

Visible blood in the urine should be assessed promptly, even if it happens only once or goes away. It has several possible causes that may need investigation.

Seek urgent medical care if you cannot pass urine, especially if your lower abdomen is painful or swollen. Also seek urgent care for fever, chills, vomiting, marked weakness, confusion, or worsening pain with urinary symptoms. These can indicate severe obstruction or an infection that needs prompt treatment. Heavy bleeding or blood clots that make urination difficult also require urgent assessment.

- Pain or pressure in the lower abdomen
- Pain or burning during urination
- Needing to urinate more often, including at night
- A sudden, difficult-to-control need to urinate
- Trouble starting the urine stream
- A weak, interrupted, or stop-and-start stream
- Feeling that the bladder has not emptied completely
- Blood in the urine, which may look pink, red, or brown
- Cloudy or unusually dark urine
- Pain in the penis or testicles in some people
- Urine leakage

- Repeated urinary tract infections

Causes and risk factors

The main cause of bladder stones is incomplete bladder emptying. Urine that remains in the bladder becomes more concentrated, making it easier for minerals to collect and harden.

An enlarged prostate can press on the urethra, the tube that carries urine out of the body. This may slow or block urine flow. Prostate enlargement is therefore an important cause of bladder stones in adult men.

Other causes and risk factors include:

Children can also develop bladder stones. Causes may include urinary tract abnormalities, infection, difficulty emptying the bladder, and nutritional or hydration problems. The pattern of causes varies between regions and health care settings.

Different bladder stones contain different minerals. Their makeup may include uric acid, calcium compounds, infection-related minerals, or a mixture. Stone analysis can provide clues about why a stone formed.

- Nerve-related bladder problems: Conditions affecting the brain, spinal cord, or nerves may prevent the bladder muscle from contracting normally. This is sometimes called a neurogenic bladder.
- Urethral stricture: Scar tissue can narrow the urethra and restrict urine flow.
- Bladder diverticula: These are pouches in the bladder wall where urine can collect instead of draining normally.
- Urinary catheters and other foreign material: Mineral crystals can form on a catheter, surgical material, or another object in the bladder.
- Previous bladder surgery: Bladder reconstruction, urinary diversion, and some other procedures can change how urine is stored or emptied.
- Pelvic organ prolapse: In some women, a bladder that has shifted from its usual position may not empty fully.
- Urinary infection: Certain bacteria can change the chemistry of urine and contribute to some types of stones.
- A stone from the upper urinary tract: A kidney stone may travel down a ureter into the bladder and continue to grow if it does not pass.

- Low fluid intake or dehydration: Concentrated urine can support crystal formation, although dehydration is often only one part of the problem.

Diagnosis

A clinician will ask about urinary symptoms, previous stones, infections, operations, medicines, and conditions that affect the nerves or urinary tract. They may examine the lower abdomen and assess for causes of poor bladder emptying. Depending on the person, this may include a prostate, pelvic, or neurological examination.

Urine testing can look for blood, crystals, inflammation, and signs of infection. If infection is possible, a urine culture may be used to identify bacteria and help guide treatment.

Imaging can show whether a stone is present and may identify an underlying cause. Tests may include ultrasound, an abdominal X-ray, or a computed tomography scan, usually called a CT scan. Not every stone is visible on a standard X-ray, so another test may be needed if symptoms continue.

Cystoscopy allows a urologist to look directly inside the bladder. During this procedure, a thin instrument containing a camera is passed through the urethra. Local anesthetic gel, sedation, or anesthesia may be used, depending on the procedure and setting. Cystoscopy can identify stones as well as prostate obstruction, scar tissue, tumors, or other bladder changes.

Clinicians may also measure how much urine remains in the bladder after urination. This is called a post-void residual measurement. Urine flow testing can help assess obstruction or weak bladder function.

If a stone is removed or passed, it may be sent to a laboratory for analysis. Some people also need blood tests, a review of urine chemistry, or evaluation for kidney stones, especially if the cause is unclear or stones have occurred before.

Treatment and management

Treatment depends on the stone's size, symptoms, composition, and cause. Overall health and the ability to empty the bladder also matter.

Very small stones that entered the bladder from the upper urinary tract may sometimes pass in urine. This is more likely when bladder emptying is normal and there is no obstruction. Observation is not suitable for every stone, and drinking extra fluid does not reliably remove an established bladder stone.

Most symptomatic or persistent bladder stones are removed with a procedure. A common treatment is transurethral cystolithotripsy, also called cystolitholapaxy. A urologist passes an instrument through the urethra into the bladder. The stone is broken into smaller pieces with a laser, ultrasound, or mechanical device, and the pieces are washed or removed from the bladder.

Some stones are treated through a small opening made in the lower abdomen. This is known as a percutaneous approach. Open surgery may be considered for very large stones or when another bladder or prostate operation is needed. The choice of procedure depends on the stone, anatomy, available equipment, and the person's medical needs.

A urinary catheter may be left in place for a short time after treatment. Temporary burning, urinary urgency, and lightly blood-stained urine can occur after an instrument has passed through the urethra. The treating team should explain what to expect and when the catheter can be removed.

Medicines do not dissolve most bladder stones. In selected cases, a uric acid stone may be treated by carefully changing the acidity of the urine. This requires clinician supervision because the stone type must be reasonably certain and urine chemistry needs monitoring.

Treatment should also address why the stone formed. Depending on the cause, management may involve:

Antibiotics like amoxicillin or doxycycline treat bacterial infections, not the stone itself. When possible, treatment is guided by urine test results. A clinician should select the antibiotic based on the infection, health history, and local resistance patterns.

Adequate fluid intake may reduce urine concentration, but fluid needs differ for people with heart, kidney, or other medical conditions. Ask a clinician before making a major change in fluid intake. Broad dietary restrictions are usually not helpful unless stone analysis or urine testing identifies a specific reason.

- Treating prostate-related blockage with appropriate medicine or a procedure
- Treating a urethral narrowing
- Improving catheter care or changing the catheter plan
- Managing a nerve-related bladder with a structured emptying program
- Treating a confirmed urinary infection
- Correcting a bladder pouch, prolapse, or other structural problem when appropriate

Complications

An untreated bladder stone can continue to irritate the bladder or interfere with urine flow. Possible complications include repeated urinary infections, ongoing pain, blood in the urine, and sudden or chronic urinary retention.

Long-term obstruction may cause the bladder muscle to thicken or weaken. In severe cases, pressure can affect the upper urinary tract and kidney function. Complications are more likely when the underlying emptying problem is not corrected.

Stones can return after removal. Recurrence is more likely if urine continues to remain in the bladder, a catheter or foreign material is still present, or the original cause has not been managed.

Follow up

Follow-up should cover both recovery from treatment and prevention of another stone. The schedule depends on the procedure, stone type, and underlying urinary problem.

After stone removal, follow the care team's instructions about fluids, activity, catheter care, and restarting medicines. Contact the treating team promptly for increasing pain, worsening bleeding, foul-smelling urine, or symptoms that are not improving.

Seek urgent care after treatment if you cannot urinate, develop fever or chills, pass large blood clots, have persistent vomiting, or become very unwell. Mild burning and a small amount of blood may be expected for a short time after some procedures, but symptoms that are severe or worsening need assessment.

At routine follow-up, a clinician may review the stone analysis, check for infection, and measure whether the bladder is emptying properly. Repeat imaging or cystoscopy is not required for everyone. It may be recommended when symptoms return, the underlying cause remains, or there is a higher risk of recurrence.

Continue any plan for managing prostate obstruction, nerve-related bladder dysfunction, catheter use, or another identified cause. Report renewed difficulty urinating, repeated infections, or visible blood rather than waiting for the next routine visit.

Sources

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