CONDITION

Hydronephrosis of one kidney

Hydronephrosis of one kidney is swelling caused when urine does not drain normally from that kidney.

WHAT IT IS
Swelling of one kidney from backed-up urine

BODY SYSTEM
Kidneys and urinary system

MAIN SYMPTOMS
No symptoms, side pain, nausea, urinary changes

WHAT CAUSES IT
Urinary blockage, reflux, or an inborn narrowing

HOW IT IS DIAGNOSED
Ultrasound, often followed by CT or other imaging

MAIN TREATMENT
Monitoring or treatment of the underlying cause

CAN IT BE CURED?
Sometimes - when the cause can be corrected

IS IT AN EMERGENCY?
Sometimes - fever with side pain suggests infected blockage

LONG-TERM OUTLOOK
Often good when pressure is relieved before lasting damage

Overview

Hydronephrosis means that part of a kidney has become stretched or swollen because urine is not draining normally. Urine collects in the kidney's central drainage area instead of passing freely through the ureter, the tube connecting the kidney to the bladder.

When only one kidney is affected, it is called unilateral hydronephrosis. This does not necessarily mean that you have only one kidney. It means the swelling is on one side.

Hydronephrosis is a condition or imaging finding, not a disease by itself. The important questions are what is causing it, whether urine flow is blocked, and how well the affected kidney is working.

Some cases are mild and found by chance during an ultrasound or scan. Others cause

significant pain or infection. If pressure remains high for a long time, it can damage kidney tissue. Early assessment is especially important if the affected kidney is your only functioning kidney.

Symptoms

Hydronephrosis may cause no symptoms, particularly when it develops slowly or is mild. The amount of swelling seen on a scan does not always match how much discomfort you feel.

When symptoms occur, they may include:

A sudden blockage, such as a stone in the ureter, often causes intense pain that comes in waves. This is sometimes called renal colic. A blockage that develops gradually may cause a dull ache or no pain at all.

Babies and young children may not have clear urinary symptoms. Possible signs include poor feeding, vomiting, fever, slow growth, abdominal discomfort, or repeated urinary tract infections. Hydronephrosis is also sometimes found before birth during a pregnancy ultrasound.

- Pain in the side, back, abdomen, or groin
- Nausea or vomiting
- Needing to urinate more often or urgently
- Pain or burning when urinating
- Blood in the urine
- Fever or chills if an infection is present

Causes and risk factors

Hydronephrosis develops when urine cannot leave the kidney normally or flows backward toward it.

A kidney or ureter stone is a common cause of sudden one-sided hydronephrosis in adults. Even a small stone can block urine if it becomes lodged in a narrow part of the ureter.

Other possible causes include:

Some causes are present from birth. A baby may have a narrow drainage point, an unusually formed ureter, or urinary reflux. Mild hydronephrosis found before birth may improve as the urinary system matures, but follow-up is needed to confirm this.

Problems affecting the bladder or prostate more often cause swelling in both kidneys, although one side may be worse.

Previous kidney stones, urinary tract surgery, pelvic surgery, certain cancers, and repeated urinary infections can increase the chance of developing a blockage. Having one risk factor does not mean hydronephrosis will occur.

- A narrowing where the kidney joins the ureter, called ureteropelvic junction obstruction
- Scar tissue in the ureter after surgery, injury, inflammation, or radiation treatment
- A blood vessel or nearby structure pressing on the ureter
- A tumour in or near the urinary tract
- A blood clot or other material inside the ureter
- Endometriosis or other tissue pressing on a ureter
- Changes during pregnancy that slow urine drainage
- Vesicoureteral reflux, in which urine travels backward from the bladder

Diagnosis

Hydronephrosis is usually confirmed with imaging. An ultrasound uses sound waves to show widening of the kidney's drainage spaces. It does not use radiation and is often the first test, including during pregnancy and childhood.

An ultrasound can show that the kidney is enlarged, but it may not reveal the exact cause or prove that urine flow is currently blocked. Mild widening can sometimes remain after a previous blockage has resolved.

Further testing may include:

A renal scan uses a small amount of radioactive tracer. Some versions also use a medicine that increases urine flow, helping show whether the kidney drains freely.

Blood tests can measure creatinine, a waste product used to estimate overall kidney function. A normal result does not always rule out reduced function in one kidney because the other kidney may compensate.

Urine testing can look for infection, blood, or crystals. These tests help assess the effects and possible cause of hydronephrosis, but they do not confirm the swelling by themselves.

- A CT scan to look for stones, masses, or another cause of obstruction
- MRI or MR urography to examine the urinary tract without CT radiation

- A renal scan to measure drainage and compare each kidney's function
- A bladder scan to check whether urine remains after urination

Treatment and management

Treatment is based on the cause, the severity of the blockage, symptoms, infection risk, and the function of each kidney.

Mild hydronephrosis without infection or reduced kidney function may be monitored. Follow-up can include repeat ultrasound, blood or urine tests, and sometimes a renal scan. Monitoring is an active plan rather than ignoring the condition.

If a stone is responsible, it may pass without a procedure. Stones that do not pass, cause ongoing obstruction, or create other concerns can be treated with procedures such as ureteroscopy or shock-wave treatment. The suitable approach depends on the stone's size and location.

A narrowed drainage point may require surgery to create a wider connection. Scarred sections of ureter can sometimes be widened, supported with a stent, or repaired. Treatment for a tumour or external pressure is planned according to the underlying condition.

A ureteral stent is a thin internal tube that allows urine to pass from the kidney to the bladder. A nephrostomy tube drains urine directly from the kidney through the skin into a collection bag. Either may be used to relieve pressure quickly. They may be temporary while the underlying cause is treated.

An infected, obstructed kidney needs urgent drainage as well as antibiotics like amoxicillin or doxycycline . Antibiotics can treat the infection, but they do not remove a physical blockage.

Children with hydronephrosis may only need scheduled imaging. Some receive treatment for reflux or surgery for a significant narrowing. Decisions are guided by infections, kidney growth, drainage, and function over time.

Complications

The main concern is damage caused by continuing pressure inside the kidney. Prolonged or severe obstruction can reduce blood flow within the kidney and lead to permanent loss of function.

Possible complications include:

One-sided hydronephrosis usually does not cause complete kidney failure when the other

kidney works normally. However, normal overall blood results can hide declining function on the affected side.

An infection behind a blockage can spread into the bloodstream. This is why fever, chills, or feeling very unwell alongside side pain requires urgent assessment.

- Repeated urinary tract or kidney infections
- Ongoing pain, nausea, or vomiting
- Reduced function of the affected kidney
- High blood pressure related to kidney damage
- Kidney failure if both kidneys, or the only functioning kidney, are obstructed

Prevention

Hydronephrosis cannot always be prevented. Inborn narrowing, urinary reflux, tumours, scar tissue, and pressure from nearby structures may occur despite anything you do.

When kidney stones are the cause, reducing the chance of another stone may reduce future obstruction. Prevention is tailored to the stone type and may involve dietary changes, fluid goals, urine testing, or medicine. There is no single plan that is right for every type of stone.

Follow-up after urinary tract surgery, stone treatment, or a previous obstruction can identify renewed narrowing before kidney damage develops.

Do not try to force large amounts of fluid through a suspected blockage. This may increase pain and does not remove a fixed obstruction. Follow the fluid advice given for your situation.

Living with it and what to expect

The course of one-sided hydronephrosis is closely linked to its cause. A stone may cause a short episode that resolves after the stone passes or is removed. An inborn narrowing or scar may need long-term monitoring or a procedure.

Mild swelling can remain stable for months or years without harming kidney function. In other cases, drainage becomes worse over time. Regular imaging helps show whether the kidney is stable rather than relying on symptoms alone.

The kidney may stay somewhat enlarged after a blockage has been corrected. Persistent widening on a scan does not automatically mean that treatment failed. A drainage study or comparison with earlier scans may be needed to understand what the finding means.

Many people continue their usual work, exercise, travel, and family activities. Temporary changes may be needed during a painful stone episode, while a stent or nephrostomy tube is in place, or after surgery.

If part of the affected kidney's function has been lost, it may not fully return. The other kidney can often maintain normal overall function, but ongoing checks may include blood pressure, kidney blood tests, urine tests, and imaging.

Keep planned appointments even when you feel well. A slow blockage may not cause noticeable symptoms.

When to get medical help

Seek emergency medical care if you have:

These symptoms may indicate an infected or severe blockage that needs urgent drainage and treatment.

Contact a healthcare professional promptly for visible blood in your urine, new urinary pain, recurring side pain, or symptoms of a urinary infection. Pregnancy, reduced kidney function, or having only one functioning kidney can make earlier assessment important.

Routine follow-up is appropriate when hydronephrosis has already been assessed, symptoms are stable, and a monitoring plan is in place. Attend scheduled imaging and testing even if you have no pain.

- Fever or shaking chills with pain in your side or back
- Severe pain with repeated vomiting or an inability to keep fluids down
- Very little or no urine, especially if you have one functioning kidney
- Confusion, marked weakness, fainting, or rapidly worsening illness

Common questions

Can hydronephrosis of one kidney go away on its own?

Sometimes. Mild swelling may improve when a small stone passes or when temporary pressure resolves. Hydronephrosis caused by a fixed narrowing, scar, or mass is less likely to resolve without treatment. Imaging is needed to confirm improvement.

Does hydronephrosis mean my kidney is failing?

No. It means the kidney's drainage area is enlarged. Many affected kidneys continue to work

well. The risk of damage rises when obstruction is severe, lasts a long time, or occurs with infection.

Can I live normally with one kidney affected?

Many people can. Daily life is often unchanged when the other kidney works normally and the cause is monitored or treated. Follow-up remains important because symptoms and blood tests may not show changes in the affected kidney early.

How much water should I drink?

There is no single amount for everyone with hydronephrosis. Your needs may be influenced by stone risk, heart or kidney function, pregnancy, and whether drainage is blocked. Do not force fluids during severe pain from a suspected obstruction.

Can hydronephrosis come back after treatment?

Yes. Stones can recur, scar tissue can narrow again, and some long-term conditions continue to affect drainage. Follow-up depends on the original cause and how well the kidney is functioning.

Is hydronephrosis a sign of cancer?

Usually not, but a tumour in or near the urinary tract is one possible cause. Stones and non-cancerous narrowing are other causes. Imaging helps identify what is producing the swelling.

Sources

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