CONDITION

Ureteropelvic junction obstruction

Ureteropelvic junction obstruction is a blockage where urine leaves the kidney and enters the ureter.

WHAT IT IS
Blockage where the kidney joins the ureter

BODY SYSTEM
Kidneys and urinary tract

MAIN SYMPTOMS
Side pain, nausea, urinary infections, blood in urine

WHAT CAUSES IT
Usually congenital narrowing; sometimes crossing vessels or scarring

HOW IT IS DIAGNOSED
Ultrasound and a diuretic kidney scan

MAIN TREATMENT
Monitoring or surgery to improve drainage

CAN IT BE CURED?
Sometimes - surgery can correct the blockage

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

LONG-TERM OUTLOOK
Most retain good kidney function with monitoring or treatment

Overview

Ureteropelvic junction obstruction, often shortened to UPJ obstruction or UPJO, affects the place where the central collecting area of a kidney joins the ureter. The ureter is the tube that carries urine from the kidney to the bladder.

With UPJ obstruction, urine does not drain normally. It may collect inside the kidney and stretch its drainage spaces. This swelling is called hydronephrosis .

Many cases begin before birth because the junction did not develop normally. Prenatal ultrasound may find hydronephrosis even though the baby has no symptoms. Older children and adults may be diagnosed after pain, a urinary infection, blood in the urine, or an imaging test done for another reason.

Hydronephrosis does not always mean that urine flow is seriously blocked. Some widened kidneys drain adequately and continue to work well. Tests are used to assess drainage, kidney function, symptoms, and changes over time.

The condition matters because ongoing obstruction can sometimes reduce the affected kidney's function. It can also contribute to pain, infection, or kidney stones. Monitoring or treatment can help protect the kidney.

UPJ obstruction usually affects one kidney. It can affect both kidneys, although this is less common. It needs closer assessment when both kidneys are involved or when someone has only one working kidney.

Symptoms

Some people have no symptoms. This is particularly common when hydronephrosis is found during pregnancy or on an unrelated scan.

When symptoms occur, they may include:

Babies cannot describe pain. Possible signs include poor feeding, vomiting, irritability, slow weight gain, or a fever caused by a urinary infection. These signs have many possible causes and do not confirm UPJ obstruction.

Pain may come in waves because urine production changes through the day. Some people notice discomfort after drinking large amounts of fluid, alcohol, or drinks that increase urine production. Others have a steady ache.

The intensity of symptoms does not always show how well the kidney is working. A person can have marked hydronephrosis with few symptoms, or significant pain without permanent loss of kidney function.

- Pain in the side, back, or upper abdomen
- Pain that comes and goes, sometimes after drinking a lot
- Nausea or vomiting during painful episodes
- Blood in the urine, which may look pink, red, or brown
- Repeated urinary tract infections
- Kidney stones

Causes and risk factors

Most UPJ obstruction is congenital , meaning it developed before birth. The affected junction may have an unusually narrow segment or muscle that does not push urine forward normally. The ureter may also join the kidney at an angle that makes drainage difficult.

A blood vessel crossing over the junction can press on it or bend it. This is called a crossing vessel . It may contribute to obstruction, especially in older children and adults, but not every vessel seen near the junction causes a problem.

Less often, UPJ obstruction develops later because of:

Having hydronephrosis before birth increases the chance of finding UPJ obstruction, but many babies with prenatal hydronephrosis do not have a lasting blockage.

UPJ obstruction is not caused by something a pregnant person ate or did. It is also not caused by ordinary exercise, toilet habits, or drinking too much water.

- Scar tissue after surgery, inflammation, or injury
- A kidney stone near the junction
- Changes in the position of the kidney or ureter
- Rare external pressure from nearby tissue

Diagnosis

UPJ obstruction may first be suspected on an ultrasound. Ultrasound uses sound waves to show whether the kidney's collecting spaces are enlarged. It does not use radiation.

Ultrasound alone cannot always tell whether the kidney is truly obstructed. It also cannot fully measure how much each kidney contributes to overall kidney function.

A diuretic like furosemide or hydrochlorothiazide kidney scan , also called diuretic renography, is often used to assess drainage. A small amount of radioactive tracer is given into a vein. A diuretic, which makes the kidneys produce more urine, is then used while a camera follows the tracer through each kidney. The test estimates how well each kidney works and how quickly urine drains.

Blood tests may check overall kidney function. Urine tests can look for infection or blood.

CT urography or MR urography may be used in selected older children or adults to show detailed anatomy, stones, or crossing blood vessels. CT uses X-rays. MRI uses a magnetic field and does not use ionising radiation, although it may take longer.

Babies with hydronephrosis detected before birth usually have an ultrasound after delivery. The timing and need for further tests are based on the degree of swelling and whether the

ureters or bladder also appear abnormal.

Diagnosis is based on the whole picture. Kidney swelling, drainage test results, symptoms, infections, and changes on repeat imaging all matter.

Treatment and management

Not every UPJ obstruction needs immediate surgery. If symptoms are absent or mild and kidney function is stable, monitoring may be appropriate.

Monitoring can include repeat ultrasounds and, when needed, another kidney scan. Follow-up checks whether the swelling is increasing and whether the affected kidney continues to function well. Keeping these appointments is important even when there are no symptoms.

A urinary infection is treated with antibiotics like amoxicillin or doxycycline . Some infants at higher risk of infection may be offered preventive antibiotics while testing or monitoring continues, but this is not necessary for everyone.

Surgery may be considered when there is declining kidney function, worsening swelling, repeated infection, kidney stones, or troublesome pain. The main operation is pyeloplasty . During pyeloplasty, the poorly draining section is removed or reshaped, and the healthy ureter is reconnected to the kidney's drainage area.

Pyeloplasty may be performed through an open incision, laparoscopically through small cuts, or with robotic assistance. The approach depends on age, anatomy, local expertise, and previous operations. A temporary internal tube called a stent may be placed to keep urine flowing while the repair heals.

In selected adults, the narrowed area may be cut or widened from inside the urinary tract. This is called an endoscopic treatment or endopyelotomy. It is less invasive than pyeloplasty but is not suitable for every type of obstruction.

Removing the kidney is rarely necessary. It may be considered only when a kidney has very little useful function and is causing ongoing pain, infection, or other problems.

Treatment aims to improve drainage, preserve function, and control symptoms. A successful repair may not make hydronephrosis disappear completely. The kidney can remain somewhat enlarged even when drainage has improved.

Complications

Possible complications of untreated or persistent obstruction include:

An infected urinary system combined with obstruction needs prompt treatment because trapped urine may not drain properly.

Surgery also has possible complications, including bleeding, infection, urine leakage, stent discomfort, scar formation, or recurrent obstruction. Follow-up imaging helps check whether the repair remains open.

- Gradual loss of function in the affected kidney
- Repeated urinary tract or kidney infections
- Kidney stones
- Ongoing or repeated pain
- Rarely, reduced overall kidney function when both kidneys are affected

Prevention

Congenital UPJ obstruction cannot usually be prevented. It develops because of the way the kidney and ureter formed, not because of a person's diet, activity, or behaviour.

There is no proven home measure that can open a narrowed junction. Drinking extreme amounts of water does not correct the obstruction and may trigger pain in some people.

Prompt treatment of urinary infections and kidney stones may reduce complications, but it does not reverse a congenital narrowing. If monitoring has been recommended, attending follow-up scans is one of the most useful ways to identify changes before substantial kidney damage occurs.

Living with it and what to expect

Many babies and children with hydronephrosis remain well while being monitored. In some, the swelling becomes less noticeable as they grow. In others, drainage worsens or kidney function falls, making surgery more appropriate.

After a successful pyeloplasty, most people can return to ordinary activities once healing is complete. Pain and infections caused by the obstruction often improve. Follow-up is still needed because swelling may take months or longer to decrease, and some enlargement can remain.

The condition usually affects one kidney, so overall kidney function may stay normal even if the affected kidney contributes less. This can make blood test results look normal despite a

problem on one side. Kidney scans provide information about each kidney separately.

Routine follow-up may include asking about pain and infections, checking blood pressure, and repeating ultrasound or kidney function tests. The schedule is based on age, symptoms, previous results, and whether surgery was performed.

New pain, urinary infections, or blood in the urine should be assessed rather than simply waiting for the next routine appointment. These symptoms do not always mean that the obstruction has returned, but they may justify earlier testing.

UPJ obstruction does not usually prevent school, work, travel, exercise, or pregnancy. Individual advice may be needed if kidney function is reduced, stones or infections recur, or only one kidney works well.

When to get medical help

Arrange a routine medical appointment if you or your child has repeated side or upper abdominal pain, visible blood in the urine, repeated urinary infections, or a previously diagnosed hydronephrosis that is overdue for follow-up.

Seek prompt medical advice for burning during urination, frequent urination, cloudy urine, or new pain. These may be signs of a urinary infection or stone.

Get urgent medical help for:

Fever with flank pain can mean infection above an obstruction. This may require urgent drainage as well as antibiotics.

- Fever or chills together with side or back pain
- Severe pain that does not settle
- Repeated vomiting or inability to keep fluids down
- Very little or no urine
- Marked sleepiness, weakness, or confusion
- A baby under 3 months with a fever

Common questions

Is UPJ obstruction the same as hydronephrosis?

No. UPJ obstruction is a drainage problem at a particular junction. Hydronephrosis means that the kidney's collecting spaces are widened. UPJ obstruction can cause hydronephrosis, but

hydronephrosis can have other causes and does not always mean there is a fixed blockage.

Can UPJ obstruction go away on its own?

Some infants and children with suspected mild obstruction improve as they grow, while others remain stable. A true anatomical narrowing in an older child or adult is less likely to disappear. Repeat imaging is used to see what is happening over time.

Will I need surgery?

Not necessarily. Surgery is more likely when kidney function is declining, swelling is worsening, or there is repeated pain, infection, or stone formation. Stable cases without troublesome symptoms may be monitored.

Can UPJ obstruction damage both kidneys?

It usually affects one kidney. Both sides can be involved, and the risk to overall kidney function is greater in that situation. The same is true when there is only one functioning kidney.

Why does the pain sometimes start after drinking?

Drinking increases urine production. If urine cannot pass easily through the junction, pressure may temporarily rise inside the kidney and cause pain. This pattern can support further assessment but does not confirm the diagnosis by itself.

Can the obstruction come back after surgery?

It can recur, although pyeloplasty is generally effective. Persistent or returning pain does not always mean another blockage. Follow-up ultrasound and, when needed, a drainage scan can assess the repair.

Sources

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