CONDITION

Perirenal abscess

A perirenal abscess is a pocket of pus caused by infection in the tissue surrounding a kidney.

WHAT IT IS
A pus-filled infection in tissue surrounding a kidney

BODY SYSTEM
Kidneys and urinary system

MAIN SYMPTOMS
Fever, side or back pain, chills, tiredness

WHAT CAUSES IT
Bacterial infection spreading from kidney or bloodstream

HOW IT IS DIAGNOSED
Contrast CT, supported by blood and urine tests

MAIN TREATMENT
Antibiotics and image-guided drainage

CAN IT BE CURED?
Yes - prompt treatment usually clears infection

IS IT AN EMERGENCY?
Sometimes - confusion, breathlessness, or fainting may signal sepsis

LONG-TERM OUTLOOK
Most recover; persistent urinary blockage raises recurrence risk

Overview

A perirenal abscess is a collection of pus in the tissue surrounding a kidney. "Perirenal" means around the kidney. An abscess forms when the immune system tries to contain an infection, creating a pocket filled with bacteria, damaged tissue, and immune cells.

The kidneys sit toward the back of the upper abdomen. Each is surrounded by fat and a thin layer of tissue called a fascia. A perirenal abscess usually develops within this enclosed area. It may begin as a kidney infection that spreads beyond the kidney, or less often from bacteria carried through the bloodstream.

This condition is different from an uncomplicated urinary tract infection. Antibiotics like amoxicillin or doxycycline may not reach the centre of an abscess well, particularly if it is large or divided into separate pockets. Many people therefore need both antibiotics and a procedure

to drain the pus.

Prompt treatment matters because the infection can damage the kidney or spread into the bloodstream. With appropriate treatment, many people recover fully.

Symptoms

Symptoms may develop over several days or more gradually. They can be less obvious in older adults, people with diabetes, or people whose immune system is weakened.

Common symptoms include:

Some people also have symptoms of a urinary infection, such as pain when passing urine, needing to urinate more often, or cloudy urine. However, urinary symptoms may be absent because the abscess is outside the part of the kidney that collects urine.

A possible clue is a kidney infection that does not begin to improve after several days of appropriate antibiotics. Fever or side pain may continue even though treatment has started. This does not confirm an abscess, but it usually means further assessment and imaging are needed.

- Fever, chills, or sweating
- Pain in the side, back, or upper abdomen
- Marked tiredness or weakness
- Loss of appetite, nausea, or vomiting
- Pain or tenderness below the ribs on one side

Causes and risk factors

Most perirenal abscesses are caused by bacteria. Infection commonly starts in the bladder or urinary tract, travels upward into the kidney, and then spreads through the kidney into the surrounding tissue.

Bacteria involved in urinary infections, including Escherichia coli , may cause these abscesses. Other bacteria can reach the kidney through the bloodstream from an infection elsewhere in the body. Laboratory cultures are needed to identify the organism because symptoms alone cannot show which bacteria are responsible.

Anything that blocks or slows urine flow can increase the risk. Examples include a kidney stone, narrowing in the urinary tract, an enlarged prostate, or an abnormal urinary tract

structure. Blocked urine makes it harder to clear bacteria and may prevent an infection from responding fully to treatment.

Other factors linked with a higher risk include:

Having one of these risk factors does not mean that you have or will develop an abscess.

- Diabetes, especially when blood glucose is not well controlled
- Repeated or complicated urinary infections
- A weakened immune system
- Long-term urinary catheter use
- A recent urinary procedure or kidney surgery
- A kidney that does not drain normally
- A bloodstream infection

Diagnosis

A clinician will ask about your symptoms, previous urinary infections, kidney stones, recent procedures, and health conditions. Your abdomen and back may be examined for tenderness.

Blood tests can look for signs of infection and check kidney function. Urine and blood cultures may identify bacteria and show which antibiotics are likely to work. A urine culture can be negative, particularly when the abscess does not connect with the urine-collecting part of the kidney or antibiotics have already been taken.

Imaging is needed to confirm the diagnosis. A CT scan of the abdomen, usually with contrast dye given into a vein, is generally the most useful test. It can show the abscess, its size and location, and whether there is a stone or another blockage. It also helps clinicians plan drainage.

Ultrasound may be used when CT contrast is unsuitable or as a quick first test. However, it may miss smaller or less clearly defined collections. MRI is sometimes considered when CT cannot be used.

If the abscess is drained, a sample of pus is sent to a laboratory. This can provide the clearest information about the bacteria causing the infection and help guide antibiotic treatment.

Treatment and management

A perirenal abscess needs prompt medical treatment. Care often begins in hospital,

particularly if you are unwell, need antibiotics through a vein, or require drainage.

Antibiotics are started to treat the likely bacteria. They may be changed when blood, urine, or abscess culture results become available. Treatment often continues for several weeks, but the exact length is based on the infection, response to treatment, drainage results, and follow-up findings.

Many abscesses need to be drained. During image-guided drainage, a radiologist uses ultrasound or CT images to pass a needle or thin tube through the skin into the collection. The pus is removed, and a drainage tube may remain temporarily while the cavity empties.

A small, uncomplicated collection may sometimes respond to antibiotics alone. The decision depends on its size and location, the bacteria involved, your general health, and whether symptoms are improving. It should be monitored rather than assumed to be clearing.

Surgery is less commonly needed. It may be considered when image-guided drainage is not possible, the abscess has several separate pockets, damaged tissue must be removed, or the infection continues despite other treatment. Removal of a kidney is rarely necessary but may be considered if the kidney is severely damaged and remains a source of serious infection.

Treatment also addresses the underlying cause. A blocked urinary tract may need a stent, drainage tube, or later treatment for a stone or narrowing. Diabetes and other health conditions may need closer management during recovery.

Complications

The most serious complication is sepsis, a dangerous whole-body response to infection. Sepsis can affect blood pressure, breathing, the brain, and other organs. It requires emergency treatment.

Other possible complications include:

Complications are more likely when diagnosis or drainage is delayed, urine remains blocked, or the immune system is weakened.

- Permanent damage to part or all of the affected kidney
- Infection spreading into nearby muscles or abdominal tissues
- Infection extending toward the chest
- A persistent channel between infected tissue and another organ or the skin
- The abscess returning if the source of infection remains

- Reduced kidney function, particularly when both kidneys are affected or kidney disease already exists

Prevention

A perirenal abscess cannot always be prevented. It may develop despite appropriate care, and there is no screening test for people without symptoms.

The risk may be reduced by seeking assessment for urinary infections that are severe, keep returning, or do not improve as expected. Kidney stones, urinary blockage, and problems emptying the bladder should be followed up because they can allow infection to persist.

If you use a urinary catheter, following the care instructions given by your healthcare team may reduce infection risk. Good diabetes management also supports the immune system's ability to respond to infection.

Finishing an antibiotic course as directed is important, but taking leftover antibiotics or using someone else's medicine can delay the correct diagnosis and treatment.

Living with it and what to expect

Treatment usually takes place over weeks rather than days. Fever and pain should improve as antibiotics work and the abscess drains, but tiredness and reduced appetite may last longer. Recovery can be slower after sepsis, surgery, or a prolonged hospital stay.

If you have a drainage tube, the healthcare team will monitor how much fluid comes out and may repeat imaging before removing it. You may also need blood tests to check infection markers and kidney function.

Follow-up imaging is sometimes used to confirm that the collection is shrinking or has resolved. This is especially important when symptoms continue, drainage was incomplete, or antibiotics alone were used.

Many people return to their usual activities after the infection clears. Lasting kidney problems are less likely when the other kidney is healthy and treatment begins before major damage occurs. Recovery may be more complicated if there is longstanding urinary blockage, severe diabetes, existing kidney disease, or infection in several areas.

Routine follow-up focuses on confirming that the infection has cleared and correcting its cause. Keep planned appointments even if you feel better, particularly if a stone, narrowing, catheter, or abnormal urinary structure contributed to the infection.

When to get medical help

Seek urgent same-day medical assessment if you have fever with persistent pain in your side or back, especially if you also have a urinary infection, kidney stone, diabetes, a weakened immune system, or a recent urinary procedure.

You also need urgent review if symptoms from a diagnosed kidney infection are worsening or have not begun to improve after several days of prescribed treatment. Do not stop or change antibiotics without medical advice.

Call emergency services or go to an emergency department if you have possible signs of sepsis, including:

After treatment, contact your healthcare team promptly if fever or worsening pain returns, a drainage tube stops working or comes out, or the area around the tube becomes increasingly red, swollen, or painful.

- New confusion, unusual drowsiness, or difficulty staying awake
- Fainting, severe dizziness, or cold and clammy skin
- Trouble breathing or very rapid breathing
- Very little urine
- Severe weakness or a rapid worsening of your condition

Common questions

Is a perirenal abscess the same as a kidney infection?

No. A kidney infection affects the kidney tissue and urine-collecting system. A perirenal abscess is a pocket of pus around the kidney. It may develop as a complication of a kidney infection and usually needs imaging and more intensive treatment.

Can a perirenal abscess go away with antibiotics alone?

Some small, uncomplicated abscesses may clear with antibiotics. Larger collections, divided pockets, or infections that are not improving often need drainage. Imaging and your response to treatment guide this decision.

How long does recovery take?

Antibiotic treatment often lasts several weeks, while energy and appetite may take longer to return. Recovery time is influenced by the abscess size, whether drainage or surgery was needed, and whether there was sepsis, blockage, or kidney damage.

Is a perirenal abscess cancer?

No. It is an infection, not cancer. On imaging, an abscess can sometimes resemble a mass, so further imaging, drainage, or follow-up may be needed to clarify an uncertain finding.

Can it come back?

It can return if the infection did not fully clear or an underlying problem remains. Stones, urinary blockage, abnormal drainage, and repeated urinary infections may increase this risk. Follow-up is intended to identify and address these issues.

Will it permanently damage my kidney?

Permanent damage is possible, but it does not happen to everyone. The risk is affected by how extensive the infection is, how quickly it is treated, and whether urine flow is blocked. Blood tests and follow-up imaging can help assess kidney recovery.

Sources

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