CONDITION

Necrotizing fasciitis

Necrotizing fasciitis is a rapidly spreading bacterial infection that destroys tissue beneath the skin.

WHAT IT IS
Rapid, destructive infection of tissue beneath the skin

BODY SYSTEM
Skin and soft tissues

MAIN SYMPTOMS
Severe pain, rapid swelling, fever, skin discoloration

WHAT CAUSES IT
Bacterial infection, often entering through broken skin

HOW IT IS DIAGNOSED
Surgical findings and deep-tissue cultures

MAIN TREATMENT
Emergency surgery and intravenous antibiotics

CAN IT BE CURED?
Sometimes - prompt treatment can eliminate infection

IS IT AN EMERGENCY?
Yes - suspected cases need immediate hospital treatment

LONG-TERM OUTLOOK
Recovery is possible; tissue loss and disability may persist

Overview

Necrotizing fasciitis is a rare but severe bacterial infection of the tissues beneath the skin. It spreads along the fascia, which is the strong connective tissue surrounding muscles, nerves, fat, and blood vessels.

It is sometimes called "flesh-eating bacteria." The bacteria do not literally eat flesh. Instead, the infection and the body's response to it can damage blood vessels and cause nearby tissue to die. The medical word for tissue death is necrosis .

Necrotizing fasciitis can begin after a cut, puncture, surgical wound, burn, insect bite, or other break in the skin. The original wound may be very small. In some people, no clear entry point is found.

The condition can worsen over hours. Early symptoms may resemble a less serious skin infection, but the pain and illness often become severe quickly. Immediate hospital treatment is needed because antibiotics like amoxicillin or doxycycline alone may not reach tissue whose blood supply has been destroyed.

Necrotizing fasciitis can affect any part of the body. The arms, legs, trunk, and area between the genitals and anus are common locations. Infection in that last area is sometimes called Fournier gangrene .

Symptoms

Early symptoms often appear suddenly and get worse quickly. Pain may be much stronger than the skin changes would seem to explain. This is known as pain "out of proportion" to what can be seen.

Possible early symptoms include:

As tissue damage progresses, the skin may become dusky, purple, grey, or black. Fluid-filled blisters may form. Fluid may drain from the wound, and it can have an unpleasant smell.

Numbness can develop after severe pain because nerves have been damaged. Reduced pain is not necessarily a sign that the infection is improving.

The infection can also cause sepsis, an extreme body-wide response to infection. Signs may include confusion, rapid breathing, a fast heartbeat, dizziness, clammy skin, or passing very little urine.

Not everyone has every symptom. Fever may be absent, particularly early on or in someone whose immune system is weakened.

- Severe or rapidly increasing pain
- Redness, warmth, or swelling that spreads quickly
- Fever, chills, weakness, or feeling seriously unwell
- Tenderness extending beyond the visibly affected skin

Causes and risk factors

Necrotizing fasciitis is caused by bacteria. It is not one single infection caused by one specific germ.

Some cases involve one main type of bacterium, such as group A Streptococcus . Others

involve several bacteria acting together. Less commonly, bacteria associated with seawater, brackish water, or freshwater may cause a rapidly destructive wound infection.

Bacteria can enter through:

Anyone can develop necrotizing fasciitis. Some health conditions make infection or severe illness more likely. These include diabetes, reduced immune function, cancer, long-term kidney or liver disease, poor circulation, and obesity. Recent surgery, major injury, and injecting drugs can also increase risk.

Having a risk factor does not mean you will develop the condition. Some affected people were previously healthy and had only a minor injury.

Most necrotizing fasciitis is not easily passed from person to person. However, some bacteria that can cause it, including group A Streptococcus , can spread through close contact. A person exposed to the bacterium is far more likely to develop a mild infection than necrotizing fasciitis.

- Cuts, grazes, punctures, or injection sites
- Burns, bites, or open sores
- Surgical or childbirth-related wounds
- Wounds exposed to contaminated water
- Injuries that do not appear to break the skin

Diagnosis

Diagnosis begins with the symptoms, how quickly they are changing, and an examination of the affected area. Doctors may mark the edge of redness or swelling to see whether it is spreading.

Blood tests can show infection, inflammation, muscle damage, or strain on organs. Samples of blood, wound fluid, or deep tissue may be sent to a laboratory to identify the bacteria. These results help guide antibiotic treatment, but treatment starts before culture results are available.

A CT scan, MRI scan, ultrasound, or X-ray may show swelling, fluid, or gas within the tissues. Imaging can help when the diagnosis is unclear, but no scan or blood test can safely rule out every case. Testing should not delay surgery when the condition is strongly suspected.

The most reliable confirmation often comes from urgent surgical exploration. During an operation, the surgeon can examine the fascia and deeper tissues directly. Tissue is removed

for laboratory testing and examination under a microscope.

Treatment and management

Necrotizing fasciitis is treated in hospital, often in an intensive care unit. Treatment usually begins as soon as the condition is suspected.

Emergency surgery is central to treatment. The surgeon removes dead and severely infected tissue in a procedure called debridement . Removing this tissue helps stop further spread and allows antibiotics to reach healthier areas.

One operation may not be enough. The surgical team may need to inspect the area again and remove more damaged tissue. If an arm or leg cannot be saved, amputation may be necessary to control the infection. This is not required in every case.

Several intravenous antibiotics are usually given at first to cover the range of bacteria that might be responsible. Treatment can then be adjusted when culture results identify the bacteria. Antibiotics support surgery but do not replace it.

Other hospital treatment may include intravenous fluids, oxygen, pain relief, nutrition, and medicines to support blood pressure. A breathing machine or treatment for kidney failure may be needed if sepsis has affected major organs.

After the infection is controlled, the wound may be left open temporarily. Later care can include wound closure, skin grafts, or reconstructive surgery. Rehabilitation may involve physiotherapy, occupational therapy, mobility equipment, or a prosthetic limb.

Hyperbaric oxygen, which delivers oxygen at high pressure in a special chamber, is sometimes considered as an additional treatment. Evidence for its benefit is uncertain, and it must never delay surgery or antibiotics.

Complications

Necrotizing fasciitis can damage skin, fat, fascia, muscle, nerves, and blood vessels. The amount of damage is influenced by the infection's location, how far it has spread, the bacteria involved, and how quickly effective treatment begins.

Possible complications include:

The infection can be fatal despite treatment. Prompt recognition, surgery, antibiotics, and organ support offer the best chance of controlling it.

- Sepsis, shock, or failure of major organs
- Large wounds, scarring, or changes in appearance
- Loss of muscle, movement, sensation, or a limb
- Blood clots and complications of prolonged hospital care
- Ongoing pain, weakness, fatigue, or reduced mobility
- Anxiety, depression, or post-traumatic stress

Prevention

Necrotizing fasciitis cannot always be prevented. It may occur after a very small injury, and sometimes there is no visible wound.

Basic wound care may reduce the chance of bacterial infection. Wash cuts and grazes with soap and clean running water, and cover open wounds with a clean, dry dressing. Seek medical advice if a wound becomes increasingly painful, swollen, warm, or red.

Avoid swimming, hot tubs, and natural bodies of water while you have an open wound or recent surgical incision that has not healed. If water exposure cannot be avoided, use a waterproof covering and clean the wound afterward.

People with chronic liver disease or a weakened immune system have a higher risk of severe infection from certain bacteria found in coastal water and raw seafood. They should take particular care to keep wounds away from seawater, brackish water, and raw seafood juices.

Good hand hygiene and not sharing personal items that touch wounds can reduce the spread of bacteria. People who inject drugs can lower infection risk by using sterile equipment and never sharing needles or other injecting supplies.

Living with it and what to expect

Recovery differs greatly from person to person. It may involve weeks in hospital followed by months of wound care and rehabilitation. Some people need further operations after the infection has cleared.

Large wounds can take time to close. Skin grafts and reconstructed areas may look or feel different from the surrounding skin. Scars may tighten and restrict movement, but therapy and sometimes further surgery can help.

Weakness and fatigue are common after a severe infection, surgery, or intensive care. Activity

is usually rebuilt gradually. If an amputation was necessary, rehabilitation may include learning to use a prosthesis and adapting daily activities.

Emotional recovery also matters. Sudden severe illness, intensive care, changes in appearance, or limb loss can lead to distress, low mood, sleep problems, or upsetting memories. Psychological support and peer support may be useful alongside physical rehabilitation.

Once the bacteria have been eliminated and dead tissue has been removed, necrotizing fasciitis does not usually continue as a chronic infection. However, tissue loss, pain, reduced movement, and scarring may have lasting effects. Follow-up commonly focuses on wound healing, reconstructive needs, mobility, nutrition, and management of conditions such as diabetes.

When to get medical help

Treat possible necrotizing fasciitis as an emergency. Call emergency services or go to an emergency department now if you have rapidly worsening pain, redness, or swelling, especially when the pain seems much greater than the visible injury.

Emergency assessment is also needed for purple, grey, or black skin; spreading blisters; skin numbness after severe pain; confusion; faintness; difficulty breathing; clammy skin; or very little urine. Do not wait for all symptoms to appear.

If you recently had surgery, gave birth, sustained an injury, or developed a wound after water exposure, mention this during the emergency assessment. Do not delay care while trying to treat the area at home.

Routine follow-up is different. After discharge, contact your surgical or wound-care team as advised for dressing changes, wound healing, rehabilitation, or concerns about scars and movement. Seek earlier review if pain, drainage, redness, swelling, or fever returns or worsens.

Common questions

Is necrotizing fasciitis really caused by "flesh-eating bacteria"?

The phrase is a dramatic nickname. The bacteria do not eat tissue. The infection releases harmful substances and disrupts blood flow, which causes tissue to die.

How quickly does necrotizing fasciitis spread?

It can progress over hours, although the speed is not identical in every case. Rapidly worsening

pain or swelling is more important than the size or appearance of the original wound.

Can a tiny cut cause necrotizing fasciitis?

Yes. Bacteria may enter through a small cut, puncture, bite, burn, or injection site. Sometimes the skin break is too small to notice, and sometimes no entry point is found.

Is necrotizing fasciitis contagious?

The condition itself is not usually spread directly between people. Some bacteria that can cause it can spread through close contact, but most exposed people do not develop necrotizing fasciitis. Public health or infection specialists may advise close contacts in particular situations.

Can antibiotics cure it without surgery?

Usually not. Damaged tissue may have little or no blood supply, preventing antibiotics from reaching it effectively. Urgent surgery to remove dead tissue is therefore a key part of treatment.

Can you fully recover from necrotizing fasciitis?

Full recovery is possible, particularly when infection is recognised and treated early. Other people have lasting scars, weakness, reduced movement, chronic pain, or limb loss. Recovery may continue for months or longer.

Sources

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