CONDITION

Corneal ulcers and infections

A corneal ulcer is an open sore on the eye's clear surface, often caused by infection.

WHAT IT IS
Open corneal sore, often with infection

BODY SYSTEM
Eyes and vision

MAIN SYMPTOMS
Eye pain, redness, light sensitivity, blurred vision

WHAT CAUSES IT
Usually infection after corneal surface damage

HOW IT IS DIAGNOSED
Slit-lamp exam, fluorescein dye, sometimes corneal scraping

MAIN TREATMENT
Cause-specific antimicrobial eye drops

CAN IT BE CURED?
Sometimes - infection clears, but scars can remain

IS IT AN EMERGENCY?
Yes - urgent treatment can protect sight

LONG-TERM OUTLOOK
Often heals; central or deep scars can reduce vision

Overview

The cornea is the clear, curved layer at the front of your eye. It helps focus light and protects the inside of the eye.

A corneal ulcer is an open sore in this layer. Many ulcers develop because the cornea has become infected, called infectious keratitis. Bacteria are a common cause, but fungi, parasites and viruses can also infect the cornea. Some ulcers are caused by severe inflammation or poor healing rather than infection.

A corneal ulcer needs prompt assessment. Without treatment, infection or inflammation can spread deeper into the eye. The cornea may scar, become thinner or develop a hole, permanently affecting vision.

Early treatment often controls the infection and limits damage. The outcome depends on the

cause, how deep and central the ulcer is, and how quickly effective treatment begins.

Symptoms

Symptoms usually affect one eye, although both eyes can be involved. They may develop quickly or worsen over several days.

Possible symptoms include:

A white spot may be too small to see without an eye examination. Do not wait for one to appear before seeking help.

Pain does not always show how serious an ulcer is. People with reduced corneal sensation, including some people with previous herpes infections, diabetes or nerve damage, may have less pain than expected.

- Eye pain or a gritty, foreign-body feeling
- Redness, especially around the coloured part of the eye
- Sensitivity to light
- Blurred or reduced vision
- Watering or discharge
- Swollen eyelids
- Difficulty keeping the eye open
- A white or grey spot on the cornea

Causes and risk factors

Bacterial infection is a common cause. Bacteria can enter through a tiny scratch or damaged area on the cornea. Contact lens wear is an important risk factor, especially when lenses are worn overnight or exposed to water.

Fungal keratitis can follow an injury involving plant material, soil or dust. It is also associated with contaminated contact lenses and medicines that reduce immune activity.

Acanthamoeba is a microscopic organism found in water and soil. Acanthamoeba keratitis is uncommon but can be difficult to treat. Most cases are linked to contact lenses, particularly when lenses or cases contact tap water, swimming pools or hot tubs.

Herpes simplex virus can reactivate in the eye after an earlier infection. Varicella-zoster virus,

which causes shingles, can also affect the cornea. These infections may reduce corneal sensation and return after apparently healing.

Other factors that can damage the cornea or make infection more likely include:

Not every corneal ulcer is infectious. Autoimmune conditions can cause inflammation and thinning near the cornea's edge. Severe surface disease or poor blood supply may also prevent normal healing.

- A scratch, foreign body, burn or eye surgery
- Severe dry eye
- Eyelids that do not close fully
- Eyelid or eyelash problems that rub against the cornea
- Reduced corneal sensation
- Use of steroid eye drops without appropriate supervision
- An immune system weakened by illness or treatment

Diagnosis

An optometrist, ophthalmologist or other trained eye professional examines the eye using a slit lamp, a microscope with a bright, narrow beam of light.

Fluorescein dye is placed on the eye. Damaged areas absorb the dye and become easier to see under blue light. The examination shows the ulcer's size, position and depth and checks for inflammation or dangerous thinning.

A sample may be taken by gently scraping the ulcer after numbing the eye. Testing can identify bacteria, fungi or Acanthamoeba and show which medicines may work. Sampling is particularly useful for large, deep, central, unusual or treatment-resistant ulcers.

Viral infection is often diagnosed from its appearance and your medical history. In uncertain cases, laboratory tests, specialised imaging or confocal microscopy may help identify the cause.

A negative test does not always exclude infection. Treatment may begin before results are available because delay could allow further damage.

Treatment and management

Treatment aims to remove infection, control damaging inflammation, relieve symptoms and

support healing. Care is usually led by an eye specialist.

Antimicrobial eye drops are chosen for the suspected cause:

Drops may be needed very frequently at first. The plan is adjusted as the ulcer improves and test results become available. Severe infections may require hospital treatment so medicines can be given reliably and the eye checked closely.

Medicines that widen the pupil may reduce painful muscle spasm inside the eye. Oral pain relief may also help.

Steroid eye drops can reduce inflammation in selected cases, but they can worsen some infections or slow healing. Use them only when an eye specialist has confirmed they are appropriate. Do not use leftover steroid or numbing drops.

Remove contact lenses and do not wear them again until an eye professional says it is safe. Your lenses, case and solution may be needed for testing, so ask the eye service before throwing them away.

If medicines do not control the problem, procedures may be needed to remove infected tissue, apply protective tissue or glue, or repair a hole. A corneal transplant is sometimes required for severe infection or later for vision-limiting scarring.

- Antibiotics like amoxicillin or doxycycline treat bacterial infection
- Antifungal medicines treat fungal infection
- Special antiseptic medicines treat Acanthamoeba
- Antiviral drops, gels or tablets may treat herpes infections

Complications

A healed ulcer may leave a corneal scar. A small scar near the edge may have little effect, while a central scar can blur or distort vision.

Other possible complications include:

These complications are not inevitable. Prompt treatment and close follow-up reduce the chance of lasting damage.

- Irregular corneal shape and astigmatism
- Long-lasting discomfort or light sensitivity
- Repeated infection or inflammation
- Corneal thinning

- A hole in the cornea, called a perforation
- Infection inside the eye
- Glaucoma or cataract related to inflammation or treatment
- Severe and permanent sight loss

Prevention

Not every corneal ulcer can be prevented. Viral infections can reactivate, and ulcers related to autoimmune inflammation or poor healing may occur despite careful eye care.

If you wear contact lenses:

Protective eyewear can reduce injuries involving dust, metal, chemicals or plant material. Seek prompt care if something enters or scratches the eye rather than trying to remove an embedded object yourself.

Managing severe dry eye, eyelid problems and conditions that reduce corneal sensation may lower the risk of surface breakdown. Use steroid eye drops only as directed and with appropriate follow-up.

- Wash and dry your hands before handling lenses
- Follow replacement and cleaning instructions
- Use fresh contact lens solution rather than tap water or saliva
- Do not top up old solution in the case
- Avoid sleeping in lenses unless specifically prescribed
- Remove lenses before swimming, showering or using a hot tub
- Replace the storage case regularly
- Stop wearing lenses if an eye becomes painful, red or unusually sensitive

Living with it and what to expect

During active treatment, you may need eye checks every day or every few days. These visits allow the specialist to measure the ulcer and change treatment if it is not responding. Keep these appointments even if the eye feels better.

Pain and redness may improve before the cornea has fully healed. Continue treatment for as long as instructed. Stopping early can allow infection to return.

Healing may take days to weeks. Deep, central, fungal or Acanthamoeba infections can take longer. Vision may remain blurred while the surface heals and change as a scar settles over following months.

Many small, promptly treated ulcers heal with little lasting effect. A central or deep ulcer may leave reduced vision, glare or distortion. Glasses or specialised contact lenses may help after healing. If a stable scar causes major sight problems, a corneal procedure or transplant may be considered.

Some conditions, particularly herpes infections or ongoing corneal surface problems, can recur. New pain, redness or light sensitivity should be assessed promptly rather than assumed to be part of an old scar.

When to get medical help

Seek same-day urgent eye care if you have eye pain, redness, light sensitivity or blurred vision that could be caused by a corneal ulcer. This is particularly important if you wear contact lenses, have injured your eye or can see a white spot on the cornea.

Go to an emergency eye service or emergency department if:

For a chemical exposure, begin rinsing the eye immediately with plenty of clean, lukewarm water and continue while arranging emergency help.

Once treatment has started, contact the treating eye service promptly if symptoms worsen, drops cannot be used as directed or new discharge, swelling or vision loss develops. Routine scheduled visits remain important when symptoms are stable or improving.

- Your vision suddenly or rapidly worsens
- Pain or redness is quickly becoming more severe
- You cannot open the eye
- The eye has been exposed to a chemical
- A sharp object has struck or entered the eye
- You have severe symptoms and cannot reach an urgent eye clinic

Common questions

Can a corneal ulcer heal on its own?

A minor surface scratch may heal without specific treatment, but an ulcer can look similar at

first and worsen quickly. Because infection can threaten vision, suspected ulcers should not be watched at home while waiting for them to heal.

How long does a corneal ulcer take to heal?

Small bacterial ulcers may begin improving within a few days of effective treatment, but complete healing can take longer. Deep, central, fungal or Acanthamoeba infections may require weeks or months of treatment. A scar can continue changing after the infection clears.

Is a corneal ulcer contagious?

Most bacterial corneal ulcers do not spread through ordinary contact. However, some viruses can spread between people, and contaminated contact lens equipment can carry germs. Wash your hands before and after touching the eye or using drops, and do not share towels, eye cosmetics or contact lens supplies.

Can I wear contact lenses after a corneal ulcer?

Do not wear lenses during an active ulcer. Once the cornea has healed, an eye professional can advise whether it is safe to restart. You may need new lenses, a new case and a review of the fit and cleaning routine.

Will my vision return to normal?

Vision often improves as infection and inflammation settle. The final result depends on the ulcer's position, depth and cause. A central or deep scar may leave lasting blur or distortion, while a small peripheral scar may cause few symptoms.

What does a corneal ulcer look like?

It may appear as a small white or grey spot on the clear front of the eye, with surrounding redness. Many ulcers cannot be seen without magnification and fluorescein dye, so appearance alone cannot confirm or exclude one.

Sources

- American Academy of Ophthalmology. Bacterial Keratitis Preferred Practice Pattern . 2023.
- American Academy of Ophthalmology EyeSmart. What Is a Corneal Ulcer (Keratitis)?
- Centers for Disease Control and Prevention. About Contact Lens Types and Contact Lens-Related Eye Infections . 2025.
- NHS. Keratitis .

- Austin A, Lietman T, Rose-Nussbaumer J. "Update on the Management of Infectious Keratitis." Ophthalmology . 2017;124(11):1678-1689.
- Merck Manual Professional Edition. Corneal Ulcer . Reviewed July 2024.