CONDITION

Orbital cellulitis

Orbital cellulitis is a serious bacterial infection of the tissues inside the eye socket.

WHAT IT IS
Infection of tissues inside the eye socket

BODY SYSTEM
Eyes and vision

MAIN SYMPTOMS
Eyelid swelling, painful eye movement, bulging eye, reduced vision

WHAT CAUSES IT
Bacterial infection, usually spreading from the sinuses

HOW IT IS DIAGNOSED
Eye examination and contrast CT or MRI

MAIN TREATMENT
Hospital antibiotics, sometimes surgical drainage

CAN IT BE CURED?
Yes, prompt treatment usually clears the infection

IS IT AN EMERGENCY?
Yes, suspected cases need immediate hospital assessment

LONG-TERM OUTLOOK
Most recover well when treatment starts promptly

Overview

Orbital cellulitis is an infection of the fat, muscles, and other tissues inside the eye socket, behind the thin layer that separates the eyelid from the deeper socket. It is usually caused by bacteria.

This condition is different from preseptal cellulitis , also called periorbital cellulitis. Preseptal cellulitis affects the eyelid and skin in front of the eye socket. Orbital cellulitis affects deeper tissues and can interfere with eye movement, vision, and the optic nerve, which carries visual information to the brain.

The infection most often spreads from a nearby sinus, particularly a sinus between the nose and eye. It can occur at any age, although sinus-related cases are common in children.

Orbital cellulitis needs emergency hospital assessment. Treatment started promptly is usually

effective, but untreated infection can damage vision or spread to nearby parts of the head.

Symptoms

Symptoms often develop over hours or a few days. One eye is usually affected, although swelling can sometimes make it difficult to examine both eyes properly.

Possible symptoms include:

Young children may not be able to describe changes in vision or pain with eye movement. They may resist having the eye examined, seem unusually sleepy or irritable, or stop opening the affected eye.

Eyelid swelling alone does not show whether an infection is in front of or behind the eye socket. Painful or restricted eye movement, bulging of the eye, double vision, or a change in vision makes deeper orbital infection more concerning.

- A swollen, red, or tender eyelid
- Pain when moving the eye
- Reduced or limited eye movement
- Double vision
- An eye that appears to bulge forward
- Blurred or reduced vision
- Colours appearing less bright in the affected eye
- Fever or feeling generally unwell
- Headache or pain around the eye

Causes and risk factors

Orbital cellulitis is usually caused by bacteria spreading from an infected sinus. The sinuses are air-filled spaces in the bones around the nose and eyes. The thin bone between some sinuses and the eye socket allows infection to spread.

Less often, bacteria enter the orbit through:

Several types of bacteria may be involved, and more than one type can be present. The likely bacteria can differ with age, the source of infection, recent medical care, and local patterns of antibiotic resistance.

Chronic or repeated sinus problems may increase the chance of a sinus infection spreading. A weakened immune system can also increase risk and may allow unusual bacteria or fungi to cause orbital infection. Fungal orbital infections are uncommon but can be especially serious in people with severe immune suppression or poorly controlled diabetes.

- An injury or wound near the eye
- Eye or sinus surgery
- An infected tooth
- An infected tear drainage system
- Infection carried through the bloodstream
- A foreign object entering tissue around the eye

Diagnosis

Orbital cellulitis is diagnosed through an urgent medical and eye assessment, usually supported by imaging.

The examination checks:

A contrast-enhanced CT scan commonly shows whether inflammation is behind the orbital barrier and whether there is a pocket of pus, called an abscess. It can also show infected sinuses. MRI may provide more detail about soft tissues, the optic nerve, or possible spread toward the brain, but it may take longer and is not always immediately available.

Blood tests can look for inflammation and help assess how unwell someone is. Blood cultures may identify bacteria in the bloodstream, although they do not always find the cause. If fluid is drained during surgery, it is usually sent to a laboratory to identify the germ and determine which antibiotics like amoxicillin or doxycycline are likely to work.

Severe eyelid swelling can make the eye difficult to examine. Repeated eye checks are therefore important, even after imaging has been completed.

- Vision in each eye
- Colour vision
- Pupil reactions
- Eye position and movement
- Pain with movement
- Pressure inside the eye when appropriate

- Eyelid and facial swelling
- Signs of sinus, dental, or neurological problems

Treatment and management

Orbital cellulitis is treated in hospital. Care often involves ophthalmology and ear, nose, and throat specialists, as well as paediatric or adult medical teams.

Antibiotics are given into a vein so treatment reaches the infection quickly. Initial treatment usually covers several likely bacteria. It may later be changed when laboratory results identify a specific germ or when the clinical response becomes clear.

Doctors regularly recheck vision, pupils, colour vision, eye movement, swelling, pain, and general health. These checks help show whether treatment is working or whether pressure and inflammation are threatening the eye.

Surgery may be needed to drain an abscess or infected sinus. It is more likely to be considered when:

Not every orbital abscess requires immediate surgery. Its location and size, the person's age, vision findings, and response to antibiotics all help specialists decide.

Once the infection is clearly improving, treatment may change from intravenous to oral antibiotics. The total treatment period is based on the source and severity of infection, scan findings, laboratory results, and progress. It is important to complete the course supplied at discharge unless the treating team changes it.

Pain relief, fluids, and treatment of the underlying sinus or dental infection may also be needed.

- Vision or pupil function is worsening
- Imaging shows an abscess that is unlikely to settle with antibiotics alone
- Pressure is affecting the optic nerve or eye
- The infection does not improve as expected
- A foreign object or dental source needs treatment
- A laboratory sample is needed to guide treatment

Complications

Complications are less likely when treatment begins promptly, but orbital cellulitis is monitored

closely because the eye socket lies beside the sinuses and brain.

Possible complications include:

These complications are not inevitable. Hospital treatment and repeated examinations are intended to detect changes early.

- An abscess inside or next to the eye socket
- Pressure or inflammation damaging the optic nerve
- Lasting reduction or loss of vision
- Infection in the cavernous sinus, a large vein behind the eyes
- Meningitis, which affects the lining around the brain
- A brain abscess
- Infection spreading into the bloodstream

Prevention

Orbital cellulitis cannot always be prevented. An ordinary sinus infection may occasionally spread even when there was no clear warning that this would happen.

Prompt assessment of worsening sinus symptoms, especially when eye swelling, painful eye movement, or visual changes develop, may allow complications to be identified earlier. Recommended routine vaccinations reduce some bacterial infections that can contribute to serious illness, but they do not prevent every case.

Cleaning and obtaining care for significant wounds near the eye can reduce infection risk. Ongoing sinus or dental problems should be managed through appropriate routine care, particularly after an episode linked to one of these sources.

Living with it and what to expect

Orbital cellulitis is usually a short-term infection rather than a lifelong condition. Most people improve with hospital antibiotics, with or without drainage. Fever and pain may begin to settle before eyelid swelling fully disappears.

The eye may remain puffy, red, or uncomfortable for days after the infection is controlled. Double vision or restricted movement can take longer to improve when the eye muscles and nearby tissues have been inflamed. Follow-up checks may continue until vision, eye movement, and the infection source are stable.

Some people need repeat imaging, particularly if improvement is slow or an abscess was present. Follow-up with an eye or sinus specialist may also be arranged after discharge. These are planned appointments, not signs that a complication is expected.

Most people return to usual activities after recovery. Lasting vision problems are uncommon when infection is recognised and treated promptly, but they can occur if the optic nerve or blood supply to the eye was affected.

Orbital cellulitis does not usually keep returning once the infection and its source have been treated. Repeated sinus, dental, or immune problems may require longer-term care to lower the chance of another episode.

When to get medical help

Seek immediate emergency assessment for possible orbital cellulitis. Do not wait for a routine appointment if eye or eyelid swelling occurs with any of the following:

Call emergency services for sudden loss of vision, collapse, a seizure, marked confusion, or difficulty waking the affected person.

After hospital treatment, attend planned follow-up appointments. Seek urgent reassessment if fever returns, swelling or pain worsens, eye movement becomes difficult, or vision changes. Mild swelling that is steadily improving can usually be discussed at the arranged follow-up rather than treated as a new emergency.

- Pain or difficulty when moving the eye
- Double vision, blurred vision, or loss of vision
- An eye that is bulging forward
- Colours looking faded in one eye
- Fever with worsening redness or swelling around the eye
- Severe headache, vomiting, unusual sleepiness, or confusion

Common questions

Is orbital cellulitis the same as an eyelid infection?

No. An eyelid infection in front of the eye socket is called preseptal or periorbital cellulitis. Orbital cellulitis is deeper. Painful eye movement, restricted movement, bulging, or vision changes suggest that tissues inside the socket may be involved. Examination and imaging may

be needed to tell them apart.

Can orbital cellulitis go away on its own?

It should not be left to settle without treatment. Orbital cellulitis generally requires hospital care and antibiotics given into a vein. Delaying assessment can allow swelling or infection to affect the optic nerve or spread beyond the orbit.

Can a sinus infection cause orbital cellulitis?

Yes. Spread from a nearby sinus is the most common cause. The thin bone separating the sinuses from the eye socket provides little distance for infection to cross. Most sinus infections do not lead to orbital cellulitis.

Will I need surgery?

Not everyone does. Antibiotics may be enough when vision remains stable and there is no concerning abscess. Drainage may be needed if an abscess threatens vision, the infection is not improving, or an infected sinus or other source requires treatment.

Is orbital cellulitis contagious?

Orbital cellulitis itself is not usually passed directly from person to person. Some respiratory infections that come before sinusitis can spread between people, but another person would not be expected to develop orbital cellulitis simply through ordinary contact.

Can orbital cellulitis cause permanent vision loss?

It can, but prompt treatment lowers the risk. Vision may be harmed if inflammation, pressure, an abscess, or impaired blood flow affects the optic nerve or eye. This is why vision and pupil responses are checked repeatedly during treatment.

Sources

- Tsirouki T, Dastiridou AI, Ibáñez Flores N, and colleagues. "Orbital cellulitis." Survey of Ophthalmology . 2018;63(4):534-553.
- Lee S, Yen MT. "Management of preseptal and orbital cellulitis." Saudi Journal of Ophthalmology . 2011;25(1):21-29.
- National Institute for Health and Care Excellence. Clinical Knowledge Summary: Cellulitis - acute , sections covering orbital and periorbital cellulitis.
- Royal Children's Hospital Melbourne. Clinical Practice Guideline: Periorbital and orbital cellulitis .
- Merck Manual Professional Edition. Preseptal and Orbital Cellulitis .



- American Academy of Ophthalmology EyeWiki. Orbital Cellulitis .