

CELLULITIS

Cellulitis is an infection of soft tissues (like fat and muscle tissue). It can occur in any soft tissue, anywhere in the body.

When cellulitis affects the eyes, it is called ocular cellulitis. There are two forms of ocular cellulitis - periorbital and orbital. Both of these conditions usually begin with swelling or inflammation of one eye, which may or may not spread to the other eye.

Periorbital cellulitis, or preseptal cellulitis, is an infection of the soft tissues surrounding the eye. It is usually caused by an infection, such as conjunctivitis (pinkeye), which spreads from the membrane covering the outer part of the eye or from a bacterial infection of the nose or sinuses. Periorbital cellulitis, which accounts for 85-90% of all ocular cellulitis cases, is most prevalent among children under the age of five. Periorbital cellulitis cannot progress to orbital cellulitis because the septum serves as a protective fibrous barrier for the orbit (eye socket).

Orbital cellulitis is an infection of the soft tissue in the eye socket. The disease starts in the ethmoid sinus and the infection spreads into the subperiosteal lining of the orbit through the ethmoid bone. This form is considered more serious than periorbital cellulitis because it can cause permanent damage eye damage. In severe cases the infection can spread to the optic nerve, causing impaired vision. Orbital cellulitis is responsible for the remaining 10-15% of ocular cellulitis cases. This form is most common in children over the age of five.

CAUSES

Periorbital and orbital cellulitis are usually caused by bacterial or fungal infections of the sinuses near the nose. Insect bites or injuries that break the skin cause about 33% of ocular cellulitis cases. Ocular cellulitis may also occur in patients who have a history of dental infections.

Periorbital cellulitis: Periorbital cellulitis can be caused by local trauma (including insect bites), contagious infections (like conjunctivitis, hordeolum or lacrimal), infections caused by bacteria in the bloodstream or infections caused by sinusitis.

Orbital cellulitis: In children (especially ages six to seven), orbital cellulitis is usually the result of a bacterial sinus infection caused by *Haemophilus influenzae*. Other organisms such as *Staphylococcus aureus*, *Streptococcus pneumoniae*, and beta-hemolytic streptococci may also cause orbital cellulitis. Less common causes of orbital cellulitis include an infection or recent injury to the eyelid.

SYMPTOMS

Periorbital cellulitis: Common symptoms include swollen, painful and red eyelids, as well as runny nose and conjunctivitis (pinkeye). Conjunctivitis is an inflammation of the mucus membrane that surrounds the eyelid and covers the sclera (white part of the eyeball). Conjunctivitis can be caused by allergies or a bacterial or viral infection. Most patients do not experience fever.

Orbital cellulitis: Orbital cellulitis may progress very quickly in children, and requires immediate medical attention to avoid loss of vision. Children are especially at risk for severe infections that could result in blindness. Orbital cellulitis symptoms may include fever (usually 102 degrees Fahrenheit or higher), painful swelling of the upper and lower eyelids, red or purple eyelids, eye pain (especially with movement), decreased vision, proptosis (bulging or displacement of the eye), malaise (general feeling of discomfort), chemosis (swollen mucous membrane of the eyeball and eyelid) and ophthalmoplegia (paralysis of nerves that control eye movements).

Complications: Infections that spread beyond the eye socket may cause abscesses (collection of pus in cavities) in the brain or meninges (protective membranes that surrounds the brain), bacterial meningitis (infection and inflammation in the meninges), blood clots or vision loss. Complications can be prevented if antibiotics are started early to treat the infection.

DIAGNOSIS

Periorbital cellulitis:

Blood culture: A blood culture is used to detect the presence of organisms that cause infection. A sample of blood is taken and analyzed for harmful bacteria or fungus. The most common offenders include, H. influenzae, streptococcus, staphylococcus or diplococcus.

Computerized tomography (CT) scan: A computerized tomography (CT) scan of the eye socket should be conducted to rule out orbital cellulitis. A CT scan may also distinguish sinusitis as the cause of the infection.

Orbital cellulitis:

Blood culture: A blood culture is commonly used to detect the presence of organisms that cause infection. A sample of blood is taken and analyzed for harmful bacteria or fungus. The most common offenders include, H. influenzae, streptococcus, staphylococcus, or diplococcus.

Eye exam: An ophthalmologist (eye doctor) may examine the eye to evaluate the position of the eyeball and movement of the eye. A vision test may also be performed to detect any vision loss.

TREATMENT

General: Children typically suffer from more severe infections than adults, and they usually require hospitalization until the infection is under control. Infection usually improves rapidly with antibiotic or antifungal treatment. Intravenous antibiotics or antifungals are used to stop the spread of infection and prevent damage to the optic nerve. Different antibiotics/antifungals are prescribed depending on the organism that causes the infection. Depending on the severity of the infection, treatment can last anywhere from six hours to several days. If the infection has spread to the sinus cavity close to the brain, surgery may be necessary.

Cefuroxime (Ceftin®): One of the most commonly prescribed antibiotics is cefuroxime (Ceftin®). Cefuroxime has been administered intravenously to treat infections caused by *Proteus mirabilis*, *H. influenzae*, *E. coli*, *Klebsiella pneumoniae* and *Moraxella catarrhalis*.

Ceftriaxone and clindamycin: Ceftriaxone and clindamycin have been used concomitantly to treat bacterial infections associated with ocular cellulitis. Treatment generally lasts from six hours to three days.

Nafcillin (Unipen®): Nafcillin (Unipen®) has been used to treat infections caused by Staphylococcus or Streptococcus.

Ticarcillin (Ticar®): Ticarcillin (Ticar®) has been used to treat bacterial infections caused by many different organisms, including H. influenzae and S. aureus.

Antifungals: Antifungals like amphotericin B (AmBisome®) are used to treat fungal infections that cause ocular cellulitis. The medication is administered intravenously. In severe cases, antifungal treatment may begin before a diagnosis is confirmed.