Infection of the Orbit

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Orbital infections often are local, self-limited lesions arising in different areas. They can potentially progress to damage the eye, produce blindness, or develop life-threatening intracranial complications (27). In addition to other laboratory examinations, imaging studies can help in the diagnosis and management of these infections by demonstrating the local lesion and its extent (if any) into surrounding anatomic structures (i.e., paranasal sinuses and intracranial spaces). All imaging methods may be employed in studying these infections. Ultrasonography, computed tomography (CT), and Magnetic Resonance Imaging (MRI) are especially helpful in showing soft tissues (12, 27). This information can indicate which lesions should be treated with antibiotics alone and which will require surgical drainage as well. High resolution CT scans and magnetic resonance image with surface coil can show changes of the intraocular structures which was previously not possible except by ultrasonography.

The bacteria most commonly involved in ophthalmologic infections are staphylococcus, streptococcus, pneumococcus, pseudomonas, neisseriaceae, hemophilus, and mycobacteria. Staphylococcus and streptococcus are causal agents of diseases of the eyelids, conjunctiva, and cornea. Pneumococcus is a common etiologic factor in infectious corneal ulcers. Pseudomonas is a cause of corneal ulcers, endophthalmitis, meibomianitis, and blepharoconjunctivitis. Neisseriaceae infection results in a purulent conjunctivitis. Hemophilus may be responsible for acute bacterial conjunctivitis, orbital cellulitis, episceritis, and a distinct form of preseptal cellulitis in children between 6–36 months of age (19). Mycobacterium tuberculosis can affect nearly all ocular tissues, often starting as a form of lupus vulgaris that may spread to produce ulceration, scarring, ectropion, and keratitis. Tuberculosis also may involve the uveal tract.

Herpes simplex and Herpes zoster are the major virus infections of the orbit. They may mimic orbital cellulitis, or a true cellulitis may develop from secondary infection. Herpes simplex often causes ocular disease, corneal dendritic scarring, blepharoconjunctivitis in the newborn, and (rarely) a diffuse chorioretinitis associated with encephalitis. Herpes simplex infection often begins as a keratoconjunctivitis. Herpes zoster infection usually involves the opthalmic division of the trigeminal nerve but any division may be involved. The skin lesions of Herpes zoster may involve the eyelids or lid margins and can lead to permanent scarring of these areas. Late complications may develop in almost any segment of the eye due to zoster involvement.

The number of fungal infections seen by the ophthalmologist has increased in the past 25 years secondary to the use of immunosuppressive drugs, the increased longevity of debilitated patients, and the long-standing use of intravenous (IV) hyperalimentation (4). Candida albicans is frequently implicated in endogenous fungal endophthalmitis. Aspergillus fumigatus, coccidioides immitis, blasto- myces dermatidis, cryptococcus neoformans, and other phycomycetes may be involved in ophthalmic infections. Actinomycoses may cause a canaliculitis and may form fungus balls in the tear sac.

In severely immune-suppressed patients (11)
and in the acidotic diabetic patient, mucormycosis
(Absidian rhizopus and Mucor infection) may de­
velop with a severe nasosinoorbital involvement
(see Chapter 13).

**Eyelid**

A knowledge of the anatomy of the eyelid is needed
to understand infections involving it. This anat­
omy is illustrated in Figure 15.1. Infection of the
skin of the eyelid with streptococci and staphylo­
cocci may lead to folliculitis, with multiple pustu­
tles surrounding individual hairs around pilose­
baceous orifices. Furuncles are in deeper position
in the eyelid, and they vary in size. External hor­
deolum (sty) essentially is a staphyloccocal abscess
of the eyelash follicle and gland of Zeis. An inter­
nal hordeolum (acute chalazion) is acute staphylo­
coccal infection of a meibomian gland. It
occurs on the conjunctival side of the eyelid. Chalazion
is a chronic granuloma of a meibomian gland char­
acterized by swelling due to retention of meibo­
mian secretions and by formation of granulation

tissue. It may remain contained in the tarsus or
it may break through anteriorly beneath the skin
(dumbbell chalazion); or it may break through on
the conjunctival side to produce a fistula through
which granulation tissue protrudes (1). Acute in­
fection of the eyelid is a very common condition.
The patient presents with pain in the lid margin.
There is generalized periorbital edema due to in­
flammation in the preseptal or postseptal spaces.
Pus may be discharged from the infected eyelid.
The CT scan generally shows periorbital swelling,
with distention of the preseptal space.

**Conjunctiva**

The conjunctiva forming the inner lining of the
eyelid is contiguous with the lining of the lacrimal
apparatus, is reflected over the globe, and is contin­
uous with the limbus of the cornea. Inflammation

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**Figure 15.1.** Diagram of the eyelid:
(1) Periosteum; (2) Bone; (3) Orbital
septum; (4) Preseptal space; (5) Or­
bicularis oculi; (6) Gland of Moll; (7)
Gland of Zeis; (8) Eyelash; (9) Tarsal
plate; (10) Meibomian gland; (11)
Conjunctiva; (12) Muller muscle; (13)
Fibers of levator muscle; (14) Gland
of Krause; (15) Postseptal space; (16)
Fat; (17) Frontal sinus.