

Eye Infections and its Surgical Techniques

Shaaban AM Elwan*

Ophthalmology Department, Security Forces Hospital, Riyadh, Kingdom of Saudi Arabia and Faculty of Medicine, Minia University, El-Minia, Egypt

***Corresponding Author:** Shaaban AM Elwan, Ophthalmology Department, Security Forces Hospital, Riyadh, Kingdom of Saudi Arabia and Faculty of Medicine, Minia University, El-Minia, Egypt.

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Eye infections is not uncommon eye diseases and its proper management in the early stage is very essential to safeguard vision. Fortunately, most common bacterial eye infections clear up, particularly with prompt treatment such as prescription of antibiotic eye drops or ointments and hot compresses. Many common viral eye infections resolve on their own. In cases of severe viral eye infections, an antiviral eye drops or ointments may be prescribed but some eye infections have high morbidity and needs urgent and prompt management like endophthalmitis. Eye infections occur when harmful microorganisms such as bacteria, fungi, viruses and parasites invade any part of the eyeball or its adenxa. This includes conjunctiva, eye lid, lacrimal system, orbit and the cornea.

Causative organisms for eye infections

Bacterial

Gram positive cocci includes: *Staphylococcus aureus* and *Staph. epidermidis*. *Streptococcus pneumoniae* and *Strept. pyogenes*.

Gram positive bacilli includes: *Propiobacterium acnes*, *corynebacterium diphtheriae*, *clostridium perfringens* and *septicum*.

Gram negative cocobacilli includes: *Neisseria gonorrhoea* and *moraxell lacunae*.

Gram negative bacilli includes: *Haemophilus influenza*, *pseudomonas aeruginosa*, *Chlamydia trachomatis* and *bartonella henselae*

Mycobacteria includes: *Mycobacterium tuberculosis*, *leprae*, *bovis*, *avium* and *itracellulare*.

Spirochetes includes: *Treponema pallidum* and *borrelia burgdorferi*.

Fungal

- **Yeast includes:** *Candida* and *cryptococcus neoformans* spp.

- **Mold includes:** *Aspergillus*, *penicillium*, *cephalosporium*, *fusarium* and *mucoraceae* spp.
- **Dimorph includes:** *Histoplasma capsulatum*, *sporothrix schenckii*, *blastomyces dermatidis* and *coccidioides immitis*.
- **Other** like Microsporidia.

Viral

- **DNA enveloped viruses** includes: *Poxviruses*, *vaccinia* and *Molluscum contagiosum*. *Herpes viruses*, *herpes simplex* and *zoster*, *Epstein-Barr virus* and *cytomegalovirus*.
- **DNA nonenveloped viruses includes:** *Adenovirus* and *papilloma virus*
- **RNA enveloped viruses includes:** *Influenza A&B*, *paramyxovirus* and *rubella*.
- **RNA nonenveloped viruses includes:** *Picorna virus* (*echo*, *entero*, *coxsachie* and *polio viruses*)

Parasitic

- **Protozoa includes:** *Acanthamoeba*, *leishmania donovani* and *toxoplasma gonodii*.
- **Nematodes includes:** *Onchocerca volvulus* and *loa loa*.
- **Helminthes includes:** *Toxocara canis* and *wuchereria bancrofti*

Prion

prion protein like Creutzfeldt-Jakob disease

The most common eye infections briefly includes

- **Eye lid infections:** Bacterial like as stye, chalzion, impetigo and necrotizing fasciitis caused by *S. aureus* and *pyogenes* treated by antibiotics and chalzion excision. Viral like as *molluscum contagiosum*, *herpes zoster* and *simplex*. Parasitic like as *phthiriasis palpebraum* caused by crab louse *phthirus pubis*.

- **Lacrimal system infections:** chronic canaliculitis caused by *Actinomyces Israeli*.
Acute dacryocystitis and chronic dacryocystitis due to nasolacrimal duct obstruction treated by oral antibiotics followed by DCR.
Acute dacryoadenitis.
- **Conjunctival infections:** Bacterial like as caused by *H. influenzae*, *S. pyogenes*, *moraxella catarrhals* and *N. meningioccoci* treated by topical and systemic antibiotics.
Viral like as adenoviral keratoconjunctivitis, molluscum contagiosum conjunctivitis, and acute haemorrhagic conjunctivitis caused by enterovirus and coxsackie virus.
- **Orbital infections:** Bacterial like as preseptal cellulitis, orbital cellulitis and periosteal abscess caused by *S. aureus*, *S. pyogenes* and *H. influenzae*. orbital cellulitis is the most important and needs prompt action and proper management.
Fungal like as Mucor mycosis.
- **Corneal infections and ulceration:** Bacterial like as bacterial keratitis, corneal abscess caused by *P. aeruginosa*, *S. aureus*, *S. pyogenes* and *S. pneumoniae* treated by topical, fortified eye drops, systemic and sub-conjunctival antibiotics.
Fungal like as fungal keratitis caused by aspergillus, fusarium solani and candida spp.
Viral like as herpes simplex keratitis, herpes zoster ophthalmicus.
Protozoa like as acanthamoeba keratitis.
- **Bleb related infections:** Post glaucoma surg. bleb associated bacterial infection treated by topical and systemic antibiotics.

Endophthalmitis

Endophthalmitis is an uncommon but sight threatening and so we will address it with some details. For definite endophthalmitis diagnosis analysis of intraocular fluids is very important. Aqueous tapping of 0.1- 0.2 ml can be performed as an outpatient paracentesis procedure and vitreous sample of 0.2 -0.4 ml is aspirated from mid vitreous cavity and cultured on blood agar, cooked meat broth and for gram stain as well as polymerase chain reaction (PCR) has become important for proper diagnosis. there are two types:

1. Acute postoperative endophthalmitis cased by coagulase-negative staph. epidermidis, gram positive bacteria (*S aureus* and *streptococcus* and gram negative bacteria (*pseudomonas* and *proteus*).
2. Delayed onset postoperative endophthalmitis caused by low virulence organisms like *P. acnes*, *Sepidermidis* co-cyne bacterium or candida.

Acute endophthalmitis is treatment by

- **Intravitreal antibiotic** such as ceftazidime 2 mg in 0.1 ml or amikacin 0.5 mg.
- **Subconjunctival antibiotic** such as vancomycin 50mg or ceftazidime 125mg or amikacin 50 mg.
- **Oral antibiotics** such as Moxifloxacin 400 mg daily for 10 days
- **Steroid** oral or periocular injections.
- **Pars plana vitrectomy** for eyes with PL visual acuity at presentation.

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