



Ocular manifestations of infectious skin diseases



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Abstract Ocular complications of infectious skin diseases are a common occurrence. Managing the inflamed or infected eye in the emergency setting presents a diagnostic and therapeutic challenge to the emergency physician. Infectious agents may affect any part of the eye. Ocular findings may be the first sign of many infectious diseases, such as, for example, gonorrhea or chlamydia infection. Understanding the various forms of ocular involvement in these conditions is important, because untreated ophthalmic involvement can lead to severe vision loss. This review focuses on the significant ocular manifestations of the most common infectious diseases, including bacterial, viral, fungal, and parasitic infections, that both ophthalmologists and dermatologists may encounter.

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Introduction

Infectious diseases of the skin and sexually transmitted diseases (STDs) often affect not only the skin but also other organs and systems. Ocular findings may be the first sign of many infectious diseases. Ocular infection may be the primary infection, as with gonorrhea and chlamydia infections, or secondary, as in cases of acquired immunodeficiency syndrome (AIDS). This review focuses on the significant ocular manifestations of the most common infectious diseases, including bacterial, viral, fungal, and parasitic infections, confronting both ophthalmologists and dermatologists.

Bacterial diseases

Staphylococcal species are the most common causative organism in hordeolum.¹ A hordeolum represents purulent

infection of a cilium and the adjacent gland with the local formation of an abscess. Cellulitis may accompany the hordeolum. Treatment includes warm compresses several times a day for 10 minutes. To prevent local complications, topical antibiotics are also used.

Chalazions are granulomatous inflammatory lesions on the lid that occur from obstruction of the sebaceous gland. Clinically, they are often indistinguishable from a hordeolum. They may resolve spontaneously as does a hordeolum. Recurrent chalazions require an ophthalmologic referral for a possible biopsy and evaluation to rule out malignancy.²

Erysipelas (Figures 1 and 2) is usually caused by group A β -hemolytic streptococci, but similar lesions can be caused by group B, C, and G streptococci and less often by staphylococci, *Haemophilus influenzae*, *Pseudomonas aeruginosa*, and Enterobacteriaceae. The diagnosis is based on such classic clinical findings as a fiery red, tender, painful plaque with well-demarcated edges. Erysipelas classically involves the face, but currently the predominant location is the lower extremities. General symptoms and signs such as

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Fig. 1 Erysipelas of the face. Painful, shiny, erythematous, edematous plaques, involving the eyelids and cheeks.

fever, chills, and malaise, together with regional lymphadenopathy and laboratory findings including leukocytosis, elevated C-reactive protein, or erythrocyte sedimentation rate, are usually present. Penicillin is the empiric antibiotic of choice, and macrolides are usually recommended in patients allergic to penicillin.³

Chlamydia trachomatis is the most commonly reported bacterial STD in the United States.⁴ Chlamydial conjunctivitis is an STD, occurring most commonly in sexually active young adults. Autoinoculation is considered the main route of transmission. Swimming pools, insects, and other fomites may act as vectors.⁵ Adult inclusion conjunctivitis is caused by serotypes D-K. Ocular signs include red eye with stringy discharge, including conjunctival injection, superficial punctate keratitis, superior corneal pannus, peripheral subepithelial infiltrates, iritis, and follicles. A palpable preauricular node is almost always observed. Chlamydial

conjunctivitis is often a unilateral infection but can involve both eyes. Conventional diagnostic procedures are cell culture and direct immunofluorescent assay. Polymerase chain reaction may be helpful for incipient infection.⁵ Untreated chlamydial conjunctivitis resolves spontaneously in 6 to 8 months. Systemic antibiotic therapy with tetracycline or a macrolide is the mainstay treatment. Topically, tetracycline, erythromycin, or ciprofloxacin can be used.⁴

Gonorrhea is the second most common bacterial STD after chlamydia in the United States.⁴ The usual clinical manifestations in men are burning with urination and penile discharge. Fifty percent of women are either asymptomatic or have vaginal discharge and pelvic pain (pelvic inflammatory disease). Ocular infection with *Neisseria gonorrhoea* is usually transmitted by autoinoculation or direct inoculation from genital secretions of an infected partner. The disease includes red eye, profuse discharge, and lid swelling. The adult conjunctiva is especially susceptible to infection by *N gonorrhoea*. The main diagnostic procedures are bacterial culture and polymerase chain reaction. Treatment options include cephalosporins or fluoroquinolones in a single dose. For eye infections, topical antibiotics achieve much higher concentration in infected tissues than do systemic treatments.⁶

Ocular syphilis is uncommon. *Treponema pallidum* spreads to the eye via the hematogenous route. Ocular syphilis is caused either by the direct invasion by *T pallidum* or by an allergic reaction in tissues sensitized by the pathogen. The ocular manifestation can occur at any stage of the disease. Syphilis can affect the conjunctiva, sclera, cornea, lens, uveal tract, retina, retinal vasculature, optic nerve, pupillomotor pathways, and cranial nerves involved in extraocular movements. The most common ocular sign of syphilis is uveitis. It can occur 6 weeks after primary infection. The ocular inflammation may be granulomatous or nongranulomatous and may involve the anterior segment, posterior segment, or both. The classic pupillary finding in syphilis is Argyll Robertson pupil, including bilateral small pupils with light dissociation (they accommodate but do not react).⁷ The diagnosis of syphilis is based on clinical presentation and is supported by serologic testing. Parenterally administered benzathine penicillin is the drug of choice for the treatment of all stages of syphilis.^{4,8}

Viral diseases

Molluscum contagiosum (Figure 3) is commonly observed in children, sexually active adults, and immunosuppressed patients during therapy with tumor necrosis factor α antibodies, methotrexate, and steroids.⁹ Molluscum contagiosum infection produces discrete pearly pink, umbilicated papules. The lesions are usually multiple and grouped, sometimes with localized surrounding eczematous dermatitis. Molluscum contagiosum may affect the eyelid, the conjunctiva, and even the cornea.¹⁰ Although these lesions are generally self-limited, in patients with weakened immune systems, they may persist for



Fig. 2 Erysipelas of face. (Courtesy Prof. Robert Strohal.)

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