Herpes Simplex Masquerade Syndrome:
Acanthamoeba Necrotizing Stromal Keratitis

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Abstract

Purpose: To report an atypical case of acanthamoeba keratitis.

Patients & Methods: A 19-year-old girl presented with a history of recurrent herpetic keratitis and a history of short-time contact lens wear. Laboratory work-up for herpetic, bacterial, and acanthamoeba sources were negative and the patient failed to follow up. On later presentation she had corneal necrotizing stromal ulcer needed penetrating keratoplasty. Histological examination revealed acanthamoeba cysts.

Conclusion: When bacterial cultures are negative other infectious agent should be suspected. If clinical and laboratory work-up confirms the diagnosis of herpetic keratitis but antiviral treatment fails, a possible mixed infection should be looked for. If our work-up is negative, due to lower sensitivity of acanthamoeba culture, acanthamoeba should be suspected and evaluated with proper methods such as polymerase chain reaction.

Key words: Herpetic Keratitis, Acanthamoeba Keratitis, Necrotizing Stromal Keratitis.


Introduction

The clinical diagnosis of acanthamoeba and herpes simplex keratitis is often challenging, because both share common clinical features.1-3 These include epithelial defects, punctate staining, epithelial haze, pseudodendrites, stromal edema, and stromal infiltrates. Melting and thinning of the corneal stroma are a frequent manifestation of stromal herpetic disease but also have been described in acanthamoeba infection.3 Decreased corneal sensitivity is another common sign for both corneal infections.4 Favorable response to antiviral medications has been reported for acanthamoeba keratitis, but the response is only temporary.1 Severe unique features of acanthamoeba infection may ease the differentiation from herpetic infection and include severe ocular pain and radial keratoneuritis.5

Because improper treatment of these infections may result in corneal necrosis and perforation or severe vascularized scarring, it is mandatory to determine the corneal diagnosis rather early, although laboratory diagnosis may frequently be difficult.6 It has been reported that keratitis may be caused by mixed infection of acanthamoeba and herpes simplex.7,8 Mixed infections are even more challenging to diagnosis, and if misdiagnosed may result in poor outcome.

To our best knowledge, our report describe, the masquerade syndrome of acanthamoeba in a patient who underwent penetrating keratoplasty due to stromal melting. Such a devastating event emphasizes the importance of early suspicion, diagnosis and treatment of acanthamoeba keratitis.
Case report
A 19-year-old girl from north of Iran was referred with a diagnosis of infectious keratitis. She said that she had two previous episodes of suspected herpetic keratitis that had been treated by topical acyclovir.

Her visual acuity was light perception. In the slit lamp examination, she had corneal necrotizing ulcer and hypopyon in anterior chamber. She said that two-week earlier she wore cosmetic contact lenses for a short time.

After taking samples for smear and culture for herpetic and bacterial laboratory survey, she treated with fortified vancomycin and amikacin drops in conjunction with oral acyclovir coverage for possible herpetic infection. Smear and culture was negative for both bacteria and herpes. Laboratory survey for herpes was also negative. 2 month after failing to follow up she referred with thinning and stromal necrosis in an area measured 5.5&4mm, which decided for performing penetrating keratoplasty (PK).

After performing PK she treated with oral acyclovir and betamethasone and chloramphenicol drop.

Histologic examination
Routine H&E and PAS stains sections revealed corneal tissue with polymorphonuclear leukocytes infiltration and amoebic (acanthamoeba) cysts in the stroma (Figure 1 and 2).

After taking histologic exam report, her treatment regimen changed to drop neosporin and propamidine. After one year follow-up, the corrected visual acuity was $6/10$ and the corneal graft remained clear.

Conclusion
Acanthamoeba seems to be an opportunistic infectious agent. The most commonly reported predisposing condition that compromised the epithelium and led to acanthamoeba infection was the use of contact lenses. It would seem that almost any condition that perturb the surface epithelium can lead to acanthamoeba keratitis. It is logical that herpes simplex virus (HSV) infection could also damage the corneal epithelium and predispose to the development of acanthamoeba keratitis. The irregular and damaged surface of the epithelium provides an opportunity for the acanthamoeba organism to attack to ocular surface.

An accurate early diagnosis of acanthamoeba is the key for proper management, avoiding irreversible damage, and scaring or even perforation of the infected cornea. Diagnosis is based mainly on clinical observation. In more than 50% of the cases with acanthamoeba keratitis, there is an initial misdiagnosis of herpetic keratitis (as in this case), because both microorganisms have similar clinical manifestations, and further complicating this picture is that both agent have been demonstrated coexisting in the same corneas. Acanthamoeba has been detected by tandem confocal microscopy in healthy corneas, where in other cases, it caused an active disease.

Acanthamoeba keratitis may be superimposed on herpetic epithelial keratitis, but it is unclear whether the HSV infection is always present prior to the acanthamoeba infection. Stress is known to be a factor in the inception or reactivation of herpetic keratitis, and acanthamoeba infection could induce pain and stress sufficient to activate latent virus. On the other hand breakdown of the corneal epithelium due to herpetic infection may be a predisposing factor for acanthamoeba infection allowing it to penetrate into the corneal stroma and proliferation. The epithelium and stromal debris may serve as nutrients for the amoeba.
Corneal transplant may be more prone to mixed infections than intact healthy corneas because of the frequent use of topical corticosteroids, discontinuity of the corneal epithelium at the graft-host interface and the presence of the sutures may serve as a nidus for infections. Acanthamoeba is a ubiquitous microorganism and is found in various liquid media including eyedrops. Therefore it is likely that acanthamoeba may be found in the future more often in corneal grafts.

It has been reported that patients with amoebic keratitis who were treated with topical corticosteroids, as in this case, may need PK in higher incidence than those who were not treated with those agents. The need for corneal transplantation due to amoebic keratitis was significantly increased when topical corticosteroids were administered.

In this article, we present evidence of one case of acanthamoeba keratitis with atypical presentation. When bacterial cultures are negative, or no response to wide-spectrum antibiotics is apparent, other infectious agents should be suspected. If clinical and laboratory investigation confirm the diagnosis of herpes keratitis but antiviral treatment fails, a possible mixed infection should also be suspected. A proper scraping or biopsy should be taken and examined by using special stains or polymerase chain reaction in addition to conventional cultures. In rare cases, when laboratory work-up is indecisive or inaccessible for acanthamoeba and/or herpes an empiric combined treatment with antiviral and antiamoebic agents may be tried. These patients should have an evaluation for acanthamoeba, including confocal microscopy, epithelial biopsy, or culture of the acanthamoeba, and receive appropriate treatment.

References