

Acanthamoeba update – an illustrative case

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A monthly soft contact lens wearer presented to Moorfields Eye Hospital eye casualty, having been seen elsewhere and treated unsuccessfully for herpes simplex keratitis over the past 1 month.

At the time, she had a spectacle corrected visual acuity of 6/12 which pinholed to 6/9 in her right eye. A corneal epithelial defect with underlying haze, anterior chamber cells and conjunctival injection was seen. A diagnosis of herpes simplex keratitis with secondary uveitis was made. Ganciclovir eye ointment 5 times daily and Dexamethasone eye drops were prescribed. The patient was discharged and instructed to be followed up at her local eye unit.

Over the next month, her symptoms apparently improved on the above medication, however she was referred back to Moorfields Eye Hospital with a recurrence of her condition.

This time the visual acuity in the affected eye had deteriorated to hand motions only, while examination showed a very large epithelial defect with an underlying ring infiltrate (Fig 1). At this point, the underlying history of soft contact lens use and long duration of the problem raised the possibility of acanthaemoeba keratitis. Cultures for acanthamoeba were negative, but confocal microscopy showed the presence of numerous cysts in the corneal stroma (Fig 2). Treatment with hourly PHMB was initiated, with good effect, causing a reduction in the number of stromal cysts (Fig 3).

She has had a stormy clinical course since then, having multiple episodes of Acanthamoebal reactivation. Three months on, the epithelial defect still persists while her visual acuity remains at the hand motion level.

Discussion

This case is an unfortunate one, which should not have happened and could have been prevented. This case provides us with some key learning points which will be the subject of this Focus article.

Learning point 1: Acanthamoeba keratitis (AK) is easily misdiagnosed in contact lens wearers

The most important step in making a diagnosis of AK is to think of it.

Approximately 50% of AK cases are misdiagnosed as herpes simplex keratitis¹ due to its earliest clinical signs taking the form of an epitheliopathy closely resembling the pseudodendrites of herpes simplex infection.



Figure 1

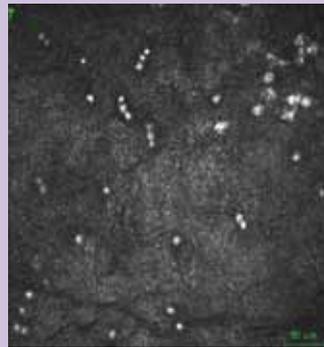


Figure 2

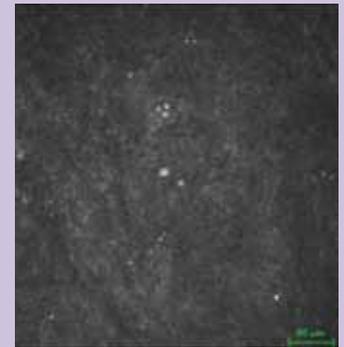


Figure 3

In the United Kingdom AK is more common than fungal keratitis and probably more common in contact lens wearers than HSV keratitis. AK should always be considered in contact lens patients presenting with what appears to be HSV keratitis.

Learning point 2: Early diagnosis is crucial

Had treatment been initiated sooner the final outcome would have been far better. Always consider AK in the event of failure to respond to first-line therapy for bacterial or HSV keratitis. Studies have shown that if effective treatment is delayed for 3 weeks or more the prognosis deteriorates.^{2,3,4}

A failure to consider Acanthamoeba as a cause of progressive keratitis is negligent.

Learning point 3: Acanthamoeba keratitis may be coinfecting with another pathogen

Always consider AK even when there has been a positive culture for another organism as 10-23% of AK cases may be polymicrobial,^{5,6,7} or co-infected with HSV.⁸

Learning point 4: Advances in laboratory techniques have improved AK diagnosis

Though the diagnosis in this case was established using confocal microscopy, it is important to realise its limitations (50% sensitivity and 65%-81% specificity in experienced hands).⁹ It is, at best, a useful adjunct to diagnosis.

In recent years, PCR testing for acanthamoeba 18S rRNA has sped up the process of obtaining a diagnosis. A result can be obtained within 3-4 days with a sensitivity of 90% and a specificity of 90.8%.¹⁰ A single PCR swab can be tested for bacterial, fungal and viral pathogens which increases its utility in the clinical setting.

Learning point 5: Steroids can make things worse

In this case, topical corticosteroids were initiated before the diagnosis of AK was made, largely due to the misdiagnosis of AK as herpetic keratitis. The initiation of steroids before making a diagnosis of AK has been shown to be highly predictive of a poorer visual outcome.¹¹

Learning point 6: Acanthamoeba keratitis is on the rise

In 2003, the incidence of AK in soft contact lens wearers was calculated to be approximately 21 per million per year compared to 17 per million in hard contact lens users.¹² Since then, there has been a gradual increase in the number of reported cases of AK throughout the United Kingdom, possibly due to two reasons.

Firstly, contact lens solutions have low concentrations of PHMB (<0.0001%), lacking adequate amoebicidal activity.¹³

Secondly, more silicone hydrogel extended wear contact lenses are being fitted to patients than in previous years. In 2015, 64% of all new soft contact lens fittings and 69% of all soft contact lens refittings, were silicone hydrogel lenses.¹⁴ In 2004, Silicone hydrogel materials accounted for 6% of new fits and 16% of refits.¹⁵

The fact that more patients are using silicone hydrogel contact lenses is concerning as studies have shown these materials to be "stickier" to acanthamoeba.^{16,17}

Learning point 7: An ounce of prevention is worth a pound of cure

The only truly effective way of ensuring that this story does not happen again, is to make AK teaching mandatory for all doctors prior to starting a new job, and at regular intervals during employment. Formal pathways must also be put into place, escalating patients with non-resolving keratitis attending accident and emergency on multiple occasions for the same problem.

Opticians must also be involved in this effort, particularly in terms of stressing the importance of good contact lens hygiene to patients. For example, many contact lens users tend to "top-up" solution in their cases rather than replace the solution completely, promoting biofilm formation. This alone can cause a four-fold increase in the likelihood of contracting acanthamoeba keratitis.

Conclusion

AK is a visually devastating condition, which can be detected early if clinicians have a high degree of suspicion while treating contact lens wearers with atypical looking infections. Failure to do so is negligent and can have disabling and life changing effects on patients lives.

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Editor, Focus

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