

A case of trauma related *Acanthamoeba* keratitis

Kamel AGM¹, Faridah H², Yusof S³, Norazah A⁴ & Nakisah MA⁵

¹ Department of Biomedical Science, Faculty of Allied Health Sciences, Universiti Kebangsaan Malaysia 50300 Jalan Raja Muda Abdul Aziz, Kuala Lumpur, Malaysia.
E-mail: mkamal@medic.ukm.my

² Department of Ophthalmology, Hospital Universiti Kebangsaan Malaysia, Cheras, Kuala Lumpur, Malaysia.

³ Department of Parasitology, Faculty of Medicine, Universiti Kebangsaan Malaysia 50300 Jalan Raja Muda Abdul Aziz, Kuala Lumpur, Malaysia.

⁴ Division of Bacteriology, Institute for Medical Research, Jalan Pahang, Kuala Lumpur, Malaysia.

⁵ Faculty of Science and Technology, Kolej Universiti Terengganu

Abstract. *Acanthamoeba* is an uncommon cause of keratitis but one of the most severe because of the prolonged and painful course of the disease and poor visual outcome. Although contact lens use is the principal risk factor, about 10% of cases occur following trauma and exposure to contaminated soil or water. Two cases of *Acanthamoeba* keratitis involving women contact lens wearers have previously been reported in Malaysia but this is the first time, a non contact lens related *Acanthamoeba* keratitis is reported. The case involved a 28 year old Indonesian male construction worker who had a trauma of the right eye during work. His eye was struck by sand and dust particles after which he quickly washed with water from an open tank at the construction site. He experienced pain, redness, glaring and blurring of vision of the right eye three days later. The diagnosis was missed at initial presentation but culture of the corneal scraping had proven *Acanthamoeba* as the aetiological agent. The history and clinical findings of this trauma related *Acanthamoeba* keratitis are briefly discussed.

INTRODUCTION

Acanthamoeba spp. are ubiquitous free-living protozoa found in a wide range of environmental niches (De Jonckheere, 1991). They are resistant to disinfectants, temperature variation and dessication and are responsible for two recognized diseases in humans, granulomatous amoebic encephalitis and keratitis (Colin WB Walker, 1996).

Although rare, *Acanthamoeba* keratitis is one of the most severe and potentially sight threatening ocular parasitic infectious diseases and is recognized as the most challenging among ocular infections because of the protracted painful clinical course and frequently encountered treatment failures.

The first case was recognized in 1973 in the United States, but the disease remained very rare until the 1980's when an increase in incidence mainly associated with contact lens wear was reported (Bacon, *et al.*, 1993; Seal, Hay & Munro, 1994). In Malaysia, the first case of *Acanthamoeba* keratitis was reported in 1995 involving a woman contact lens wearer (Mohamed Kamel & Norazah, 1995). Subsequently more cases were seen (Mohamed Kamel, *et al.*, 2000), though not reported, and by the end of 2001 at least 10 cases were diagnosed at the Universiti Kebangsaan Malaysia Hospital (HUKM) alone (Kamel, *et al.*, 2003). We report the first case of trauma related *Acanthamoeba* keratitis in this paper.

CASE REPORT

The case involved a 28 year old Indonesian male construction worker who had a trauma of the right eye during work. His eye was struck by sand and dust particles after which he quickly washed with water from an open tank at the construction site. He experienced pain, redness, glaring and blurring of vision of the right eye three days later. He sought treatment from several general practitioners who had prescribed him with topical antibiotic eyedrops but the condition did not only improve but worsened. He was later referred to the eye specialist in UKM who suspected a diagnosis of *Acanthamoeba* keratitis. The clinical findings were conjunctival congestion, corneal ulcer measuring 5.4 x 6.7mm but no hypopyon.

Corneal specimens taken for culture were obtained by scraping the clinically involved epithelium and stroma with a Kimura spatula. The corneal specimens were then plated onto a non-nutrient agar medium with *Escherichia coli* overlay. *Acanthamoeba* was isolated from the culture confirming the diagnosis. He was treated with topical Propamidine isethionate (Brolene), Chlorhexidine 0.02% and fortified Gentamycin. The condition improved and after 12 days of treatment, the ulcer showed peripheral healing

and his vision became better and by day 32 the ulcer was barely visible. Unfortunately the patient absconded from the hospital and had never returned for follow up.

DISCUSSION

Early in its history, *Acanthamoeba* keratitis was associated with corneal trauma, which is the main portal of entry, followed by contaminated water. Recently however, *Acanthamoeba* keratitis is being diagnosed increasingly in persons who wear contact lenses. About 10% of cases occur following trauma and exposure to contaminated soil or water (Dart, 1995). The first case of *Acanthamoeba* keratitis in Malaysia was reported in 1995 involving a woman contact lens wearer (Mohamed Kamel & Norazah, 1995). Subsequently more cases were seen (Mohamed Kamel, *et al.* 2000), though not reported, and by the end of 2001 at least 10 cases were diagnosed at HUKM alone (Kamel, *et al.*, 2003). Most of the *Acanthamoeba* keratitis cases seen in Malaysia are contact lens related. In this case the infection was related to trauma to the right eye by sand and dust particles. It was possible that he could have acquired the organisms from these sources as *Acanthamoeba* has been isolated from various environments including soil (Mohamed Kamel, *et al.* 2004), water (Mohamed Kamel, *et al.*, 2000; Kamel, *et al.*, 2004) and air in Malaysia. Following the injury, he washed his eyes with water from an open tank at the construction site where he was working. This action could have also contributed to the exposure of the organism to the eye as *Acanthamoeba* is a known waterborne parasite (Seal, Hay & Munro, 1994). The patient then experienced acute onset of redness, pain, glaring and blurring of vision of the right eye and had sought treatment from several general practitioners who prescribed topical antibiotic without improvement. Only 3 weeks later that the patient was referred to the ophthalmologist who discovered that he had a big corneal ulcer.

The onset of corneal infection by *Acanthamoeba* may be rapid or subtle, depending on the route of entry of the amoebae. If the cornea is damaged by trauma, as in this case, a more rapid process develops with ulceration, severe pain and marked loss of vision. However, when the amoebae are introduced by the use of contaminated contact lenses, the symptoms develop more slowly and may be intermittent. The condition is

often misdiagnosed as other forms of microbial keratitis and therefore not treated correctly as happened in the initial diagnosis. The symptoms persist and there may be some delay before *Acanthamoeba* is identified as the cause, and the severity of the infections will have increased.

This case was initially misdiagnosed because the patient was not a contact lens wearer, therefore the diagnosis *Acanthamoeba* keratitis was overlooked. In developing countries, majority of *Acanthamoeba* keratitis cases are trauma related and not associated to contact lens wear (Sharma , *et al.*, 2000 ; Parija, *et al.*, 2001).

Studies done showed that trauma was the most important predisposing factor for *Acanthamoeba* keratitis cases seen in India and most of the patients (Sharma, *et al.*, 2000) were agricultural workers who gave a history of injury to the eye (Parija, *et al.*, 2001). In Malaysia the majority of *Acanthamoeba* keratitis cases are related to contact lens wear. Contact lens wear is gaining popularity worldwide (Seal, Hay & Kirkness, 1995) especially with women. Contact lenses are worn by 5% of the Malaysian populations (Anne, 2001). They offer great visual and cosmetic benefits. However, their improper usage is not without any risk, as where contact lenses are worn, this represents the greatest single risk factor for *Acanthamoeba* keratitis (Moore, McCulley & Newton, 1987 ; Kirkness, Seal, & Aitken,1994).

What makes such a relatively rare condition of such great interest is the devastating nature of the disease and its legendary resistance to treatment. Although treatments have evolved over the past several years, lengthy course of treatment, recalcitrant pain and threat of permanent, severe, visual loss are still common features in many cases. We have seen the difficulty in arriving at the right diagnosis eventhough the patient presented early. Very often in most cases, the patients are seen first by the general practitioner or family physician who might not be aware of such infection. The patients might be wrongly treated for other causes of keratitis which might not be effective for *Acanthamoeba*. They would only be referred to the ophthalmologist later, when their conditions had deteriorated, as seen in this case. Fortunately, the patient responded well to medical treatment with topical Propamidine isethionate (Brolene), Chlorhexidine 0.02% and fortified Gentamycin. These were the drugs used in one of our earlier case of *Acanthamoeba* keratitis involving a contact lens wearer who was successfully treated medically (Mohamed Kamel *et al.*, 2000).

We hope that this paper would help increase awareness among doctors as there is a need for increased clinical recognition of the signs and risk factors for *Acanthamoeba* keratitis, as early diagnosis and prompt treatment are associated with improved clinical outcome.

We feel that as *Acanthamoeba* keratitis is now seen frequently enough in Malaysia, it should be considered as part of the differential diagnosis of most cases of presumed microbial keratitis.

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