

# Culture Negative Confoscan Positive Acanthamoeba Keratitis A relentless course

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## زراعة مخبرية سالبة وفحص موجب بالأشعة الضوئية المركزة لخلايا القرنية المصابة بالتهاب شوكميبي مساق قاس

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**الملخص:** التهاب العين الشوكمبي هو التهاب طفيلي ينتج عادة عن استخدام سوائل غير معقمة . مثل المحلول الملحي المستخدم لتنظيف العدسات اللاصقة. ندرج هنا تقرير عن حالة حصل فيها تأخير في تشخيص التهاب القرنية الشوكمبي نتيجة لعدم توفر الفحوص المخبرية وتأخر العلاج الطبي مما أدى لمساق مؤلم للمرض. كان لجهاز الفحص بالأشعة الضوئية المركزة دور كبير في تشخيص هذا المرض على الرغم من وجود نتائج مخبرية سالبة.

**مفتاح الكلمات:** التهاب القرنية الشوكمبي. مجهر كمفوسكان. رأب القرنية النافذ. تقرير حالة. عُمان.

**ABSTRACT:** Acanthamoeba keratitis is a protozoal infection of the eye, mainly due to the use of non-sterile solutions, like saline for disinfecting contact lenses. We report a case where delay in the diagnosis of acanthamoeba keratitis due to inadequate laboratory investigations and clinical management led to an excruciatingly painful course of the disease. The importance of non-invasive imaging techniques of confocal microscopy in the diagnosis of acanthamoeba keratitis, in the absence of positive culture reports, is highlighted in this case.

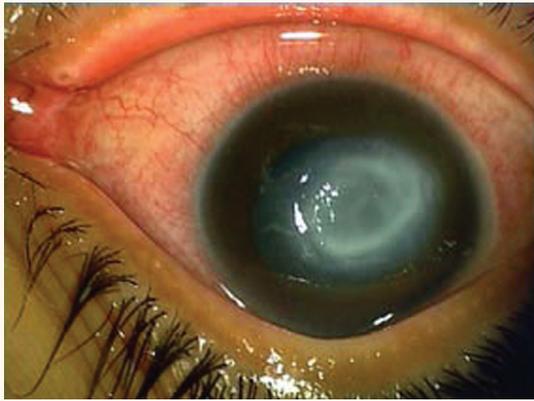
**Key words:** Acanthamoeba keratitis; Confocal microscopy; Penetrating keratoplasty; Case report; Oman.

**A**CANTHAMOEBA KERATITIS IS A SERIOUS protozoal corneal infection, more so in medical and cosmetic contact lens users.<sup>1</sup> Morbidity can increase when diagnosis is delayed because of demanding laboratory investigations. Unhygienic contact lens cases and solutions, contaminated water sources and even air remain the most common causes of this infection despite education and warnings. We describe a case of contact lens induced acanthamoeba keratitis which was repeatedly culture negative, and treated on the basis of clinical signs and symptoms aided by ConfoScan (corneal confocal microscope) findings. This case illustrates how much pain and suffering this infection can cause if not prevented, diagnosed and treated early in its course.

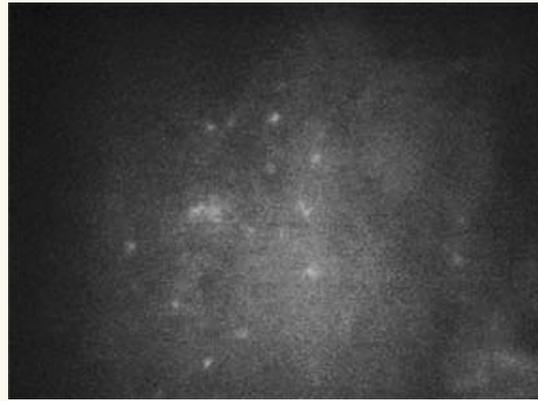
## Case report

A 28 year-old female teacher was referred from a peripheral hospital to Sultan Qaboos University Hospital, Oman for non-responding contact lens-induced bacterial keratitis which had developed four months previously in her right eye. She complained of excruciating pain, decreased vision, extreme photophobia, lacrimation, and appeared depressed. She had enough visual acuity to count fingers at one meter. She had been treated with a cocktail of medications which included topical chloramphenicol, tetracycline, aminoglycosides, fluoroquinolones, acyclovir, and prednisolone acetate. She showed signs of chronic fatigue due to long standing pain and insomnia, as well as family and professional burdens.<sup>2</sup>

A slit-lamp examination revealed a corneal ring lesion with an overlying epithelial defect (4.4mm x



**Figure 1:** An infiltrative ring lesion with clear periphery.



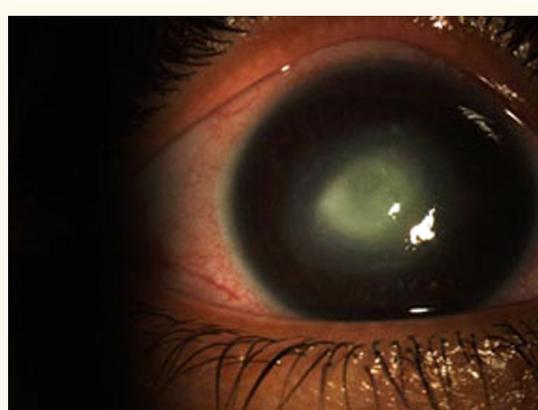
**Figure 2:** Confoscan 2 revealed multiple refractile cysts in the stroma.

4.1mm) with surrounding infiltrate involving two-thirds of the stroma, sparing the peripheral cornea [Figure 1]. Corneal sensation was normal. There were no dendrites or pseudo-dendrites. No satellite lesions could be observed. The endothelium had grayish white deposits. Corneal scrapings from two sites (edge and the base) were sent for culture (blood agar, non-nutrient agar laden with *E.coli*, chocolate agar, Sabourad medium) and staining (Giemsa and Calcoflour). Meanwhile, the patient was started on amphotericin-B (liposomal 0.15%) and moxifloxacin eye drops. The epithelial defect increased in size (6.5mm x 5mm) and there was no relief in symptoms. The patient had to be referred to a pain clinic for unbearable pain, as she was not responding to non-steroidal anti-inflammatory drugs (NSAIDS). She was put on narcotic analgesics and amitryptilline. The first culture report was available after 5 days, and reported for negative for bacteria, fungus and parasites (including acanthamoeba). One week after beginning treatment at our hospital, there was no remission, both clinically and symptomatically. A Confoscan revealed multiple refractile bodies [Figure 2] though not all with the classical double ring sign. A corneal biopsy was done twice and reported negative. It was decided to start the patient on a combination of propamidine isethionate 0.1%, chlorhexidine 0.02% and polyhexamethylene biguanide (PHMB) 0.02% (these three medications were obtained from Moorfields Eye Hospital, UK) as well as moxifloxacin 0.5% eye drops, plus oral ketoconazole. Anterior chamber reaction, endothelial precipitates, stromal infiltration and pain all showed moderate improvement within two weeks. Twelve weeks later, the epithelial defect

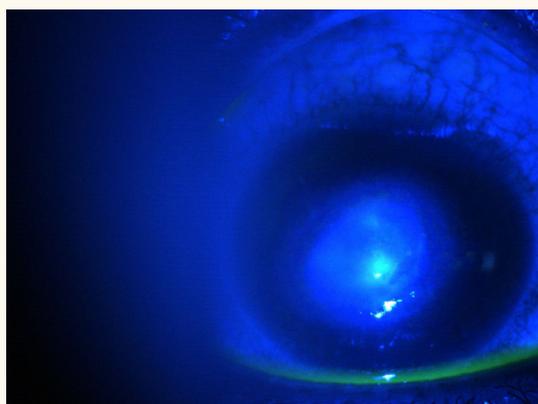
closed with no staining [Figure 3] leaving an opacified cornea. At this stage, visual acuity had dropped to hand motion and all five medications were being continued. Follow-up after two weeks showed a recurrence of the epithelial defect [Figure 4], keratouveitis and pain. She was advised to undergo therapeutic penetrating keratoplasty which was performed in India. Her last visit with us (six weeks following the therapeutic graft) showed a clear, large graft [Figure 5], with no pain. Post-operatively, the patient was on propamidine isethionate 0.1%, moxifloxacin 0.5% and dexamethasone 0.1% eye drops.

## Discussion

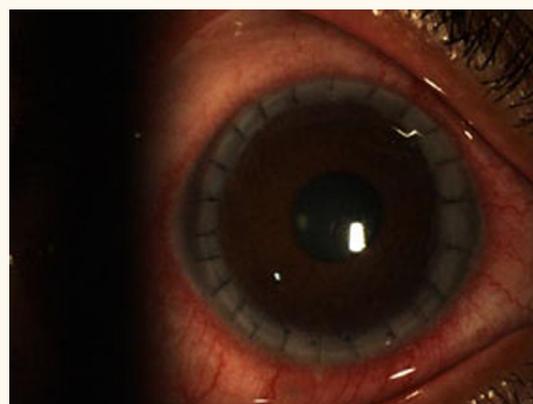
Acanthamoeba keratitis invariably poses a dilemma as far as diagnosis is concerned. Since it mimics herpetic and bacterial infections, the correct treatment is not only delayed, but the



**Figure 3:** A healed, scarred lesion 12 weeks after treatment.



**Figure 4:** Recurrence of the epithelial defect two weeks after lesion had closed.



**Figure 5:** A large clear graft after penetrating keratoplasty.

treatment administered for herpetic and/or bacterial infections leads to a worse outcome both clinically and prognostically. Classical features of acanthamoeba keratitis, like radial keratoneuritis<sup>3</sup> and pseudodendrites, may not always be observable especially in later stages.<sup>4</sup> The response to treatment is positive only when the infection is treated within four weeks of the onset of symptoms.<sup>5</sup> It is important to look for pseudo-dendritiform epithelial lesions and epithelial oedema with necrotic appearance in the very early stages because these can differentiate acanthamoeba lesions from herpetic infections, thereby saving precious time for diagnosis, investigations and treatment. Acanthamoeba is difficult to culture in routine media; however, no laboratory investigation is complete unless the tissue is cultured in non-nutrient agar seeded with *E. coli*, which remains the standard culture for this organism. It may not be always possible to grow the organism in culture as occurred in our case. Pfister *et al.* reported a case where acanthamoeba keratitis was diagnosed on the basis of confocal microscopy in the absence of the culture growth.<sup>6</sup> Pain which is out of proportion to the lesion should warn of acanthamoeba infection, unless proven otherwise. Our patient had already lost four vital months in diagnosis and treatment. By that time, the ring infiltrate had already set in. An important observation at this stage is a clear or mildly oedematous peripheral cornea despite a severe central lesion. In long-standing untreated patients, this infection can present as a corneal plaque.

This patient had to pay a heavy price in terms of time, money and suffering, due to the lack of early clinical suspicion of acanthamoeba keratitis and

the delay in laboratory investigations. It is obvious that clinical knowledge and microbiology remain the mainstays in the diagnosis of acanthamoeba keratitis. Confocal corneal microscopy could also be an aid to the diagnosis.<sup>7</sup>

## Conclusion

Acanthamoeba keratitis should be suspected in cases where there is a failure to respond to the usual anti-infective medications. Early diagnosis, laboratory investigations and specific treatment are mandatory in preventing the suffering and vision-threatening complications of acanthamoeba keratitis. The course of acanthamoeba keratitis may be a story of pain, suffering, misery, frustration and despair, but one not without hope as this patient has shown, illustrating yet again that prevention is better than cure.

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