Short communication

Multidrug resistant Fusarium keratitis

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ABSTRACT

Case report: We report a case of keratitis in a female contact lens wearer, who developed a deep corneal abscess. The culture of a corneal biopsy scraping was positive for multiresistant Fusarium solani. The patient has a complicated clinical course and failed to respond to local and systemic antifungal treatment, requiring eye enucleation.

Conclusion: Fusarium keratitis may progress to severe endophthalmitis. Clinical suspicion is paramount in order to start antifungal therapy without delay. Therapy is complex due to the high resistance of this organism to usual antifungal drugs.

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RESUMEN

Queratitis por Fusarium multirresistente

Caso clínico: Se presenta un caso de queratitis en una usuaria de lentes de contacto que desarrolló un absceso corneal profundo. En el cultivo de la biopsia corneal creció Fusarium solani multirresistente. La paciente empeoró progresivamente a pesar del tratamiento antifúngico local y sistémico y finalmente hubo que realizar una enucleación.

Conclusión: La queratitis por Fusarium puede progresar a una endoftalmitis con graves consecuencias. Es importante la sospecha diagnóstica para iniciar el tratamiento sin demora. El tratamiento es complejo dada la elevada resistencia de este hongo a los antifúngicos habituales.

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Introduction

Keratomycosis are severe infections, more predominant in tropical climates. Ocular surgery, prolonged treatment with topical steroids, use of contact lenses or previous traumatism constitute the main risk factors. A number of outbreaks have been described associated to contamination of contact lens maintenance liquids.\(^1\)

*Fusarium* is the most common fungus and *Fusarium solani* (*F. solani*), *Fusarium oxysporum* (*F. oxysporum*) and *Fusarium moniliforme* (*F. moniliforme*) are the most isolated species in human infections. Early diagnostic and treatment can be crucial in this process.

A fungal keratitis case is presented in a contact lens wearer that evolved toward endophthalmitis which could not be controlled and finally required enucleation.

Case report

Female, 62, who visited due to reddening and pain in the left eye with 2 weeks evolution. No relevant history was referred but she did refer the use of contact lenses and the use of an unusually yellowish-looking lens preservation solution.

Anterior biomicroscopy revealed mixed conjunctival hyperemia and corneal edema, with pseudo-dendritic ulceration, infiltrated in the stroma with synechiae in the pupil. Hypopyon was not observed. Corneal sample was taken for culture and antibiotic eye drops were prescribed. The culture produced the growth of *Pantoae agglomerans*. Contact lenses or the maintenance solution were not available for culture.

The patient returned a few days later with significant worsening of her condition and was admitted for observation.

Examination evidenced de-epithelized deep corneal abscess. A sample thereof was taken. Systemic treatment was established with ciprofloxacin and eyedrops of gentamicin, moxifloxacin, vancomycin and dexamethasone.

In the absence of improvement, 3 days later topical (1% eyedrops) and systemic voriconazole (300 mg/12 h the first day and 200 mg/12 h subsequent days). The following days the patient exhibited progressive worsening with significant inflammatory reaction in anterior chamber and hypopyon up to the inferior edge of the pupil (Fig. 1), which led to deep corneal biopsy.

The biopsy cultures produced a filament-like fungus (Fig. 2), which viewed under a microscope, showed septated hyphae and half moon-shaped macroconidium (Fig. 3). The fungus was identified as *F. solani*.

Antibacterial medication was withdrawn, switching voriconazole for i.v. liposomal amphotericin B (5 mg/kg/day) and i.v. caspofungin (70 mg/day the first day, followed by 50 mg/day).

The strand was referred to the National Microbiology Center, where the species was confirmed together with its resistance to posaconazole, itraconazole, caspofungin, voriconazole and amphotericin B.

On day 17, voriconazole and amphotericin B were injected intrastromal in the anterior chamber although the complete opacity of the cornea (Fig. 4) hindered follow-up. Due to the

Fig. 1 – Deep stromal abscess with immunological halo and hypopyon.

Fig. 2 – Culture in Sabouraud-chloramphenicol agar after 48 h incubation.

Fig. 3 – Staining with lactophenol blue: hyphae and half moon-shaped macroconidium.
impossibility of clinic control and the risk of dissemination, enucleation was decided on day 21 after admission. Systemic treatment was maintained 10 days.

Discussion

Fusarium is the most frequent fungus in fungal keratitis and endophthalmitis in humans. Epidemic outbreaks have been described in association to contact lenses, with the source related to specific conservation solution. It seems that reutilization of maintenance liquids constitutes the main risk factor. The patient of this case referred noticing a yellowish color in the maintenance solution, suggesting that this was the source of the infection although it was not possible to confirm this because it was not available for culture.

Fusarium spp. pathogenicity is related to the production of mycotoxin and its ability to replicate at 35°C, which allows it to invade the anterior chamber. Proliferation toward the posterior corneal stroma makes it very difficult to obtain samples with diagnostic performance by means of scraping.

F. solani has been associated to a higher rate of therapeutic penetrating keratoplasty. In vitro, the sample exhibits a greater capacity to make biofilms and greater resistance to antifungals, which would explain its higher comorbidity and the worst prognostic of the infections it causes.

The low penetration of antifungals in the corneal stroma increases the difficulty of treatment. The most widely used antifungals are natamycin, voriconazole and amphotericin B. However, when the infection progresses, it becomes necessary to carry out surgery (penetrating keratoplasty) and on some occasions enucleation.

Delays in establishing adequate treatment could involve worse prognostic. Accordingly the diagnostic should be based on a high suspicion rate in patients with risk factors. A definitive diagnostic is obtained culturing corneal scraping and biopsy materials. PCR techniques can be used as a culture supplement to accelerate the identification of the etiological agent.

In summary, keratitis due to Fusarium spp. can exhibit a very severe course. It is important to consider this pathogen in contact lens wearers and to establish treatment at the earliest stage. In the presence of deep keratitis and initial treatment failure, therapeutic keratoplasty should be performed. In addition, patients wearing contact lenses should be instructed about the adoption of hygiene measures and the potential danger of preservation solutions.

Conflict of interests

No conflict of interests has been declared by the authors.

REFERENCES