



A CASE REPORT : RAPIDLY PROGRESSIVE KERATITIS WITH VISION LOSS DUE TO *FUSARIUM CHLAMYDOSPORUM* IN AN IMMUNOCOMPETENT INDIVIDUAL

Medical Microbiology

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ABSTRACT

Background: Keratomycosis is a serious ocular infection with potential catastrophic vision impairments due to various fungal species which are capable of colonizing human tissue occurring worldwide and its frequency is increasing day by day. The exact cause of increasing incidence of fungal keratitis is unknown in immunocompetent individuals. *Fusarium* is a filamentous fungus commonly found in the environment and is the major cause of fungal keratitis. We report a case of keratomycosis caused by *Fusarium chlamydosporum* in an immunocompetent patient admitted to the department of ophthalmology with complaints of foreign body sensation, pain, redness, orbital swelling, photosensitivity, diminished vision in right eye since 20 days whereas the other lab investigations of patient were within normal limits. **Materials & Methods:** Corneal scrapings with suspected etiologies was sent for fungal and pyogenic culture to the department of microbiology. The sample was inoculated on Sabouraud Dextrose Agar (SDA), MacConkey agar and Nutrient agar. Incubation and identification of culture was done according to standard microbiological procedure. The patient was started with empirical treatment with Voriconazole, Natamycin eye drops and tablet Fluconazole. **Results:** The sample was found pyogenically sterile. KOH mount revealed hyaline fungal hyphae while culture *Fusarium chlamydosporum* was isolated on culture. Rapid progressive keratitis with loss of vision was seen in this case due to corneal perforation. **Conclusion:** A prompt diagnosis and early treatment is necessary to prevent ocular morbidity.

KEYWORDS

Corneal perforation, Keratitis, *Fusarium* species.

INTRODUCTION

Corneal infections caused by fungal pathogens have an extreme impact on the visual quality of the global population. It is an important cause of vision loss. Mycotic keratitis is defined as an invasive infection which affects corneal stroma caused by certain opportunistic fungal agents.⁽¹⁾ It is more common in tropics and subtropics, where the major risk factor is trauma with vegetative material. Although considered an infrequent condition. The incidence is seen increasing due to the use of contact lenses and immunosuppressive drugs.⁽¹⁾ Currently, the most common fungal pathogen involved in the infections of corneal epithelium are several species of the genus *Fusarium*.⁽²⁾ The most common species is *Fusarium solani*, which is the most virulent, pan-drug resistant to many antifungals.^(2,4) An accurate diagnosis may aid early clinical suspicion that will allow timely institution of empirical therapy and prevent serious complications such as corneal perforation, ocular morbidities and irreversible vision loss.⁽⁵⁾

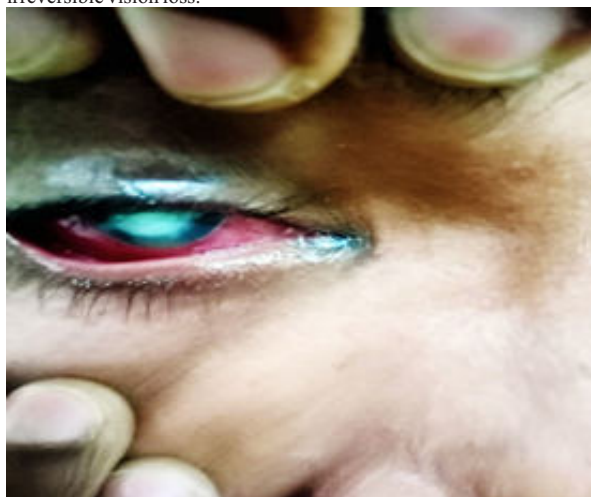


Figure1: Clinical presentation of fungal keratitis due to *Fusarium chlamydosporum* in the Rt. eye of the patient showing corneal ulcer.

CASE HISTORY

A 25-year-old immunocompetent male, farmer presented to ophthalmology outpatient department of our institute with complaints

of foreign body sensation, redness, orbital swelling and itching in right eye since 20 days. He gave history of painless foreign body sensation while sleeping at night. He also gave a history of vigorously rubbing his right eye leading to redness and itching and developed a white patch on cornea that progressed gradually and caused blurring of vision of right eye. On asking he gave a history of seeking treatment for 15 days from a local doctor who prescribed local antibiotic eye drops with no symptomatic relief.

Table1 : Slit Lamp Examination Findings

Eye parts	R/E	L/E
Eye lid	UL-Cystic lesion	Normal
Conjunctiva	Congested (due to opacity)	Normal
Ant. Chamber	Not seen (due to opacity)	Normal
Iris	Not seen (due to opacity)	Normal
Pupil	Not seen (due to opacity)	Normal
Vn	FC-1	6/6
Tn (IOP)	Digitally normal	Normal
Cornea	Corneal ulcer 5 x 5 mm in size with pericorneal degeneration, with a large central leukoma on the visual axis of 60% of the total corneal surface, irregular in shape	Normal
Corneal reflex	Normal	Normal

Routine blood tests were within normal limits. HIV and VDRL serologies were negative. Vital signs within normal limits. To establish the etiological diagnosis, the corneal scrapings were taken for direct microscopy and culture under strict aseptic conditions and immediately sent to the microbiology laboratory of the institution. The direct microscopy in a 10% KOH mount showed hyaline, septate branching fungal hyphae. Based on direct microscopy findings and slit lamp examination, the patient was started with topical 5% natamycin, 1% atropine sulphate, 0.5% antibiotic moxifloxacin, voriconazole 30 mg eye drops, and considering the suspicion of keratomycosis systemic oral fluconazole 200 mg BD was advised daily for 2 weeks.

Microbiological Examination:

Corneal scraping was inoculated in C-streaks on Sabouraud's Dextrose Agar and incubated at 22 °C and 37 °C. Within 48 hrs, similar fungal growth was obtained on both 22 °C and 37 °C. No bacterial growth was observed on MacConkey and Blood agar.

Macroscopic Features:

Culture revealed white feathery growth on SDA after 24 hrs of incubation with no pigment initially. A diffusible brown to purplish pigment was produced after 24 hrs on reverse side. At 22°C, the fungus grew rapidly. The growth was comparatively slower on media incubated at 37°C.

Microscopic Features:

In LCB mount, hyaline septate branched true fungal hyphae and septate microconidia seen. Here macroconidia are absent. A slide culture was set up from the growth and a lactophenol cotton blue mount was prepared after 48 hrs incubation. Microscopic examination revealed hyaline, septate branched hyphae bearing round to oval shape chlamydospores. The patient was followed up at our hospital for 3 days. On the treatment with no improvement on topical and systemic antifungals. He was subsequently referred to the regional corneal transplant center for therapeutic penetrating keratoplasty.

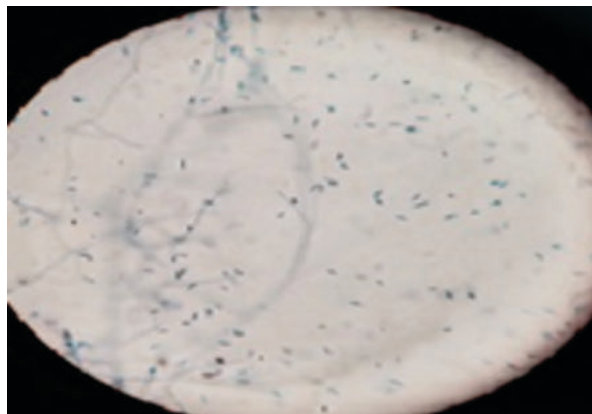


Figure 2 shows LCB under 100x magnification. Hyaline septate branched true fungal hyphae, septate Microconidia seen.

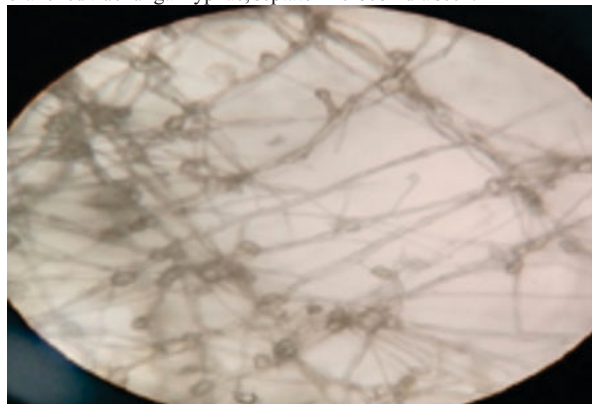


Figure 3 shows slide culture under 40x magnification. Hyaline septate branched true fungal hyphae, septate microconidia seen.

DISCUSSION

Fusarium keratitis is a potential cause of blindness with an increasing trend of keratomycosis cases yearly. It causes perforation and requires surgical removal in about a quarter of cases. *Fusarium* causes monocular blindness in nearly 60% of the cases even with treatment.^(5,6,7) A comprehensive review showed that the highest proportion of *Fusarium* keratitis cases reported are from India and Nepal.⁽⁶⁾ *Fusarium* alone constitutes nearly half of all cases of keratomycosis reported from India.⁽⁶⁾ The common species of *Fusarium* identified including the *F. solani* species complex, followed by the *F. dimerum* species complex, *F. fujikuroi* species complex, and *F. oxysporum* species complex. *Fusarium chlamydosporum*, as an etiology of keratomycosis, which has been frequently reported from the Indian subcontinent.

Microbiological examinations plays a crucial role in the treatment of *Fusarium* keratomycosis. Direct microscopy of a sample provides great information for rapid presumptive diagnosis. The KOH wet-mount preparation has proven extremely useful with more than 81% sensitivity and 83% specificity.⁽⁹⁾

availability of antifungals having varying susceptibility pattern to various antifungal agents. Usually, fungal corneal ulcers respond well with topical and systemic antifungals, if diagnosed early. However, an advanced disease threatening condition often requires therapeutic penetrating keratoplasty due to poor penetration of topical antifungal agents into tissues and the possible severity of infection which can cause corneal perforation and endophthalmitis.

Since in this case the patient did not present any obvious injury. Hence loss of vision may be due to corneal perforation caused by *Fusarium chlamydosporum*. However, this case highlights that early, rapid & accurate detection of fungal infection is important for timely institution of empirical antifungal therapy, which prevent invasion of fungi so that vision loss and other ocular morbidities can be minimised.

CONCLUSIONS

Fusarium keratomycosis is an important clinical condition which is responsible for ocular morbidities and permanent vision loss. It has found clinically challenging to identify, as it has similar characteristics to other microbial keratitis and possible complications. Direct microscopic examination and culture are essential for an early and specific diagnosis, which will allow the timely administration of empirical therapy to prevent irreversible complications, and also avoid inappropriate treatment that may only worsen the infection. Usually fungal keratitis is less common in immunocompetent host but in this particular case it may be due to involvement in outdoor agricultural activity, foreign body invasion. So proper hygiene practices & appropriate protective gears can save the vision loss due to fungal infections.

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The treatment of *Fusarium* keratitis is challenging due to restricted