



A SERIES OF CASE STUDIES ON KERATOMYCOSIS BY CURVULARIA LUNATA

Clinical Microbiology

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ABSTRACT

Purpose: To know the clinical presentation, laboratory diagnosis, and management of fungal keratitis which is a rare clinical entity. **Observations:** Fungal keratitis due to *Curvularia lunata* was diagnosed in three patients with no known comorbidities who presented with complaints of foreign body sensation and redness of the eye to Ophthalmology OPD. History of trauma was present in only 2 cases. Corneal ulcer with conjunctival congestion was found on examination in all cases. Lab diagnosis was done using growth characteristics and microscopy. Topical 5% Natamycin and 1% Voriconazole were effective for treatment resulting in minimal residual scar. **Conclusion:** Keratomycosis is one of the major causes of corneal blindness in tropical and subtropical countries. It is a rare eye infection and can be under-diagnosed, thus, clinicians need to maintain a high suspicion for it. To avoid severe complications, direct microscopic examination and culture are essential for an early specific diagnosis and treatment.

KEYWORDS

Keratitis, Blindness, Fungus, Natamycin

INTRODUCTION

Mycotic keratitis is a leading cause of ocular morbidity throughout the world, particularly in tropical and subtropical countries(1). It is a potentially blinding infection of the cornea(2). Over 100 causative agents have been identified, but the majority are caused by filamentous fungi such as *Fusarium spp.* and *Aspergillus spp.*(3)

The dematiaceous fungi such as *Alternaria*, *Curvularia*, and *Bipolaris* are relatively uncommon.(4) An estimated 57M of the 1.39B people in India (4.1%) suffer from a serious fungal disease. The annual incidence rate of fungal keratitis is 1.01M(5). It is important to diagnose and treat it early, to prevent blindness. Here we will discuss clinical presentations of three cases of *Curvularia* keratitis along with their lab diagnosis.

Case Details

CASE 1: A 23-year-old male, serving army officer, presented with pain and foreign body sensation in right eye for 4 days. He also gave history of dust particles getting into this eye while jogging 6days back. The ophthalmic examination revealed a corneal ulcer of size 2mm x 2mm with conjunctival congestion. Visual acuity in both the eyes was 6/6.

CASE 2: A 50-year-old male had foreign body sensation in his right eye for which he applied air pump on his eye and sustained injury. He presented with complaints of redness, pain, and unable to open his right eye. Examination revealed conjunctival congestion and hazy cornea.

CASE 3: 22yr old female k/c/o healed keratitis with corneal opacity in right eye underwent Deep Anterior Lamellar keratoplasty (Aug 2022) came to eye OPD with complaints of foreign body sensation, pain, redness, and opacity in right eye for 20 days.

On examination, her visual acuity was 6/36 in right eye, with circumciliary congestion and a fixed hypopyon of 1mm in the anterior chamber.

Investigations

Laboratory diagnosis was determined using microscopy and culture. Corneal scrape specimens were collected from the base and edge of the ulcer using a slit lamp and 21G needles after the application of topical proxymetacaine. Samples were processed for Gram Staining, potassium hydroxide mount and cultures.

a) Microscopy:

Gram Stain:

Gram positive septate, branched hyphae (melanized at few places) along with few inflammatory cells.

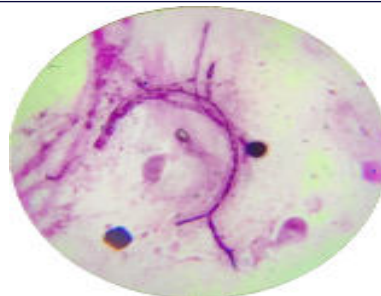


Figure 1: Gram stain showing gram positive branched, septate hyphae.

- 10% KOH mount: Septate, branched hyphae seen.

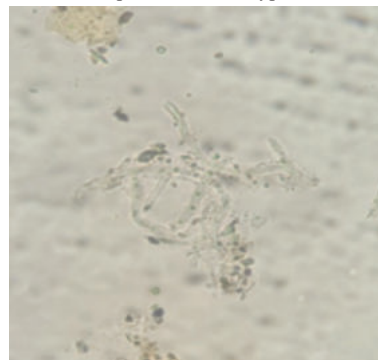


Figure 2: KOH mount showing septate branched hyphae

b) Culture:

Material was inoculated on Chocolate agar, Blood agar, incubated at 37°C, and Sabouraud dextrose agar (SDA) at 25°C and 37°C making 'C' shaped inoculum. Cultures were examined daily. Fungal growth was obtained in all. Growth was rapid and matured within 5 days. Colony morphology on SDA showed grayish-white colonies initially which turned black on maturation.

The surface was woolly, and reverse was black. Colonies were subjected to Lactophenol Cotton Blue (LPCB) Staining which showed both hyaline and pigmented septate hyphae. Conidiophores were simple, branched, and bent at points of conidium formation. Conidias were large containing 4 cells with 3 septas, and eventually appear curved due to swelling of a central cell s/o *Curvularia lunata*.

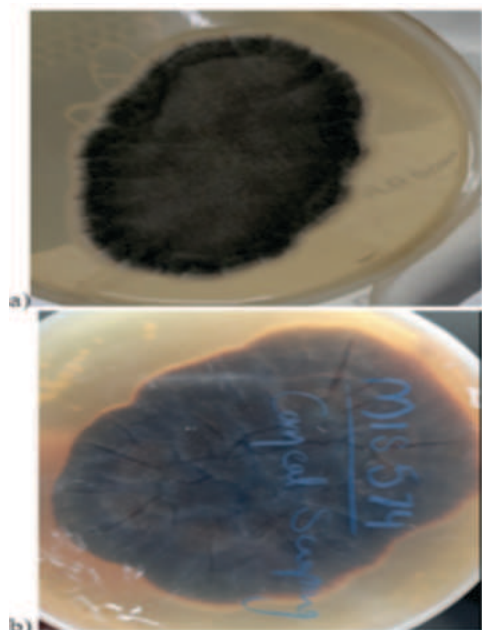


Figure 3: a) Black woolly surface on SDA, b) Reverse is black

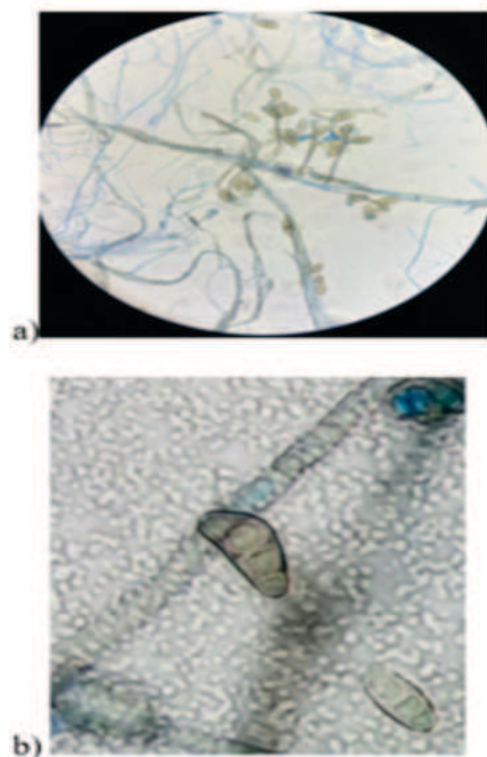


Figure 4: a) LPCB staining showing hyphae with conidia, b) 4-celled conidia

Based on colony morphology and microscopic findings the organism was identified as *Curvularia lunata* in all the cases.

All the patients were started on topical 5% Natamycin hourly during day and 2-hourly at night with addition of topical 1% Voriconazole hourly during the day and 2-hourly at night in the 3rd patient. Treatment was effective in all cases and resulted in resolution of the ulcer.

DISCUSSION

Curvularia is a saprophytic fungus that is found in soil but can cause various human diseases ranging from mild skin infection to life-threatening disseminated disease (6). It may also cause keratitis. Fungal keratitis is one of the most important causes of ophthalmic

mycosis. It is usually characterized by corneal epithelial defect and stromal infiltration(7). Risk factors associated with keratitis may be trauma, ocular surface disease, topical steroid use, and atopic disease(8). Clinical symptoms include subacute painful visual loss with redness, excessive tearing or discharge, and photophobia. In a severe case, fungal keratitis can progress to endophthalmitis(9) Fungal keratitis should be highly suspected in a patient with history of traumatic ocular injury which was present in 2 of our patients. Gram stain and KOH wet mount help in rapid screening of fungal keratitis infection. Early identification of the causative agent is necessary for targeted therapy to reduce further complications.

REFERENCES

1. Sharma N, Bagga B, Singhal D, Nagpal R, Kate A, Saluja G, et al. Fungal keratitis: A review of clinical presentations, treatment strategies and outcomes. *Ocul Surf.* 2022 Apr 1;24:22–30.
2. Hoffman JJ, Burton MJ, Leck A. Mycotic keratitis—a global threat from the filamentous fungi. Vol. 7, *Journal of Fungi*. 2021.
3. Brown L, Kamwiziku G, Oladele RO, Burton MJ, Prajna NV, Leitman TM, et al. The Case for Fungal Keratitis to Be Accepted as a Neglected Tropical Disease. *J Fungi*. 2022 Oct 1;8(10).
4. Sardana V, Verma SR. PROFILE OF KERATOMYCOSIS IN A TERTIARY CARE TEACHING HOSPITAL IN WESTERN UTTAR PRADESH, INDIA. *Int J Sci Res.* 2021;
5. Ray A, Adarsh Aayilliath K, Banerjee S, Chakrabarti A, Denning DW. Burden of Serious Fungal Infections in India. *Open Forum Infect Dis.* 2022;9(12).
6. Rinaldi MG, Phillips P, Schwartz JG, Winn RE, Holt GR, Shagets FW, et al. Human *Curvularia* infections. Report of five cases and review of the literature. *Diagn Microbiol Infect Dis.* 1987;6(1).
7. Erkan Pota Ç, Ayaz Y, Ünal M, Koyuncu Özyurt Ö. Fungal keratitis caused by *Scedosporium apiospermum*: a case report. *J Med Case Rep.* 2022;16(1).
8. Atta S, Perera C, Kowalski RP, Jhanji V. Fungal Keratitis: Clinical Features, Risk Factors, Treatment, and Outcomes. *J Fungi.* 2022;8(9).
9. Tangmonkongvoragul C, Chokesuwattanaskul S, Tananuvat N, Pongpom M, Upaphong P, Saysithidej S, et al. The clinical features and prognostic factors for treatment outcomes of dematiaceous fungal keratitis over 9 years at a tertiary eye care in northern thailand. *J Fungi.* 2021;7(7).