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## ***Curvularia* A Most Common Missed Occulomycosis in Ocular Trauma**

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### **ABSTRACT**

*Curvularia keratitis typically presented as superficial feathery infiltration, rarely with visible pigmentation that gradually became locally suppurative. Smears of corneal scrapings often disclosed hyphae, and culture media showed dematiaceous fungal growth within 1 week. Natamycin had excellent in vitro activity and led to clinical resolution with good vision in most patients with corneal curvulariosis. Curvularia is a most common oculomycosis isolated in ocular traumas especially when the trauma is due to wooden or plant materials. Being, a most common laboratory contaminant, the patience required to maintain aseptic measures in the clinical microbiology laboratories and identification of the fungus on the basis of microscopic characteristics can help from not missing the diagnosis of Curvularia like oculomycosis and thus saving the critical time in management of corneal ulcers.*

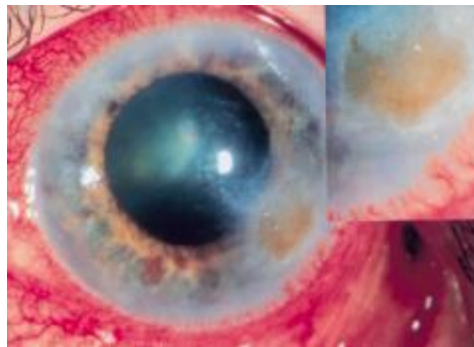
**Keywords-** *Curvularia, Occulomycosis, Monomorphic.*

## 1. INTRODUCTION

Fungal infections of the eye are growing threats that have substantial morbidity and cost<sup>1</sup>. *Aspergillus* and *Fusarium* are long recognized as ocular pathogens<sup>2</sup>, but the dematiaceous hyphomycetes have emerged as important opportunists<sup>3,4,5,6</sup>. Originally named for their tufted, floccose appearance in culture, dematiaceous fungi comprise those septate molds with melanin in their hyphae and conidia<sup>7</sup>. *Curvularia* is a prevalent member of these darkly pigmented fungi that received its current name in 1933<sup>8</sup>. This genus of filamentous fungi colonizes soil and vegetation and spreads by airborne spores. Some of the 40 *Curvularia* species are phytopathogens. Plant diseases range from seedling failure to leaf blight<sup>9</sup>, including grass “fade out” during hot, humid weather. Curvularial growth on stored grain, thatch, and other dead plant material looks like smudges of blackish dust. Several *Curvularia* species are zoopathogenic. Wound infection is the most common disease caused by *Curvularia* and ranges from onychomycosis to skin ulceration and subcutaneous mycetoma<sup>10,11</sup>. Other human *Curvularia* infections are invasive and allergic sinusitis and bronchopulmonary disease. Abscesses of the lung, brain, liver, and connective tissue have occurred. Nosocomial infections include dialysis-related peritonitis and postsurgical endocarditis<sup>12</sup>. Infection of the cornea, reported in 1959<sup>13</sup>, was the first human disease proved to be caused by *Curvularia*. Other ocular infections consist of conjunctivitis<sup>14</sup>, dacryocystitis, sino-orbital cellulitis, and endophthalmitis<sup>15,16</sup>. But the cornea is the most commonly infected site<sup>2,3,13,14</sup>. Some *Curvularia* species have been more extensively studied since they are known as cellulase producers<sup>17</sup>.

## 2. Case History

A young boy of 17 years of age came up at a tertiary care hospital situated at a rural place in Nagpur, Maharashtra, India with a foreign body injury probably a stick to the right eye with his cornea teared on the 2<sup>nd</sup> day after injury. Initially on the 1<sup>st</sup> day he noticed redness, lacrimation and slight pain in the eye on arriving at home which was relieved on hot fomentation for few minutes. On next day morning patient experienced severe lacrimation, pain and redness in the affected eye with blurring of vision.



**Fig.1 Corneal Ulcer With Fungal Overgrowth**

## 3. Treatment

The patient was immediately rushed to the ophthalmic surgery and dead, necrosed corneal tissue was removed with exophytic inflammatory fungal sequestration, treated by superficial lamellar keratectomy, and corneal perforation, managed by penetrating

keratoplasty. The patient was admitted in the ophthalmology ward with empirical antimicrobial and antifungal coverage.

#### 4. Laboratory Diagnosis

The corneal scrapping was sent in emergency for further diagnosis to the microbiology department. The corneal tissue was inoculated on blood agar at 37<sup>0</sup>C in an incubator, chocolate agar at 37<sup>0</sup>C in an incubator at capnophilic environment in a candle jar and on a slope of Sabouraud's Dextrose Agar (SDA) one at 37<sup>0</sup>C in an incubator and another at 25<sup>0</sup>C at room environment. All the medias were inoculated and incubated with aseptic precautions<sup>18</sup>. The Gram stained slide and the KOH mount of the corneal tissue was examined. The Gram's preparation showed 1-2 pus cells per High Power Field (HPF) with no Gram positive or negative organisms, no budding yeast cells, hyphae or pseudohyphae and no fungal hyphae on KOH mount were seen. Preliminary reports of Gram's stain and KOH mount were given with the information that culture report to be followed for the further 3 weeks on every Monday<sup>18</sup>. The blood agar and chocolate agar plates were examined for any growth after 24 hours and 48 hours of incubation. There was no growth on blood agar and chocolate agar. Both inoculated slopes of SDA were examined for any growth everyday for the 1st week and then twice a week for the next 2 weeks. There was no growth on a SDA slant incubated at 25<sup>0</sup>C at room environment even after 3 weeks and was discarded and thus any possibility of growth of a dimorphic fungus was ruled out<sup>18</sup>.

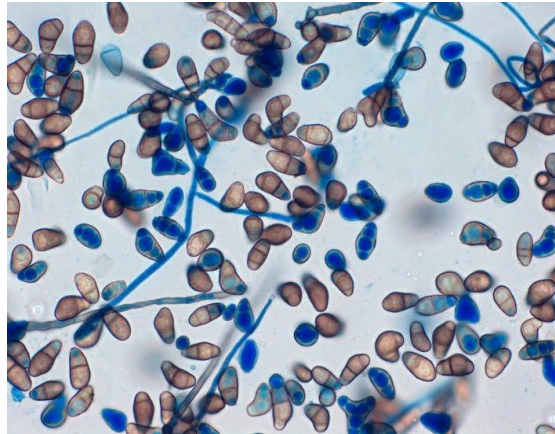
The slant which was incubated at 37<sup>0</sup>C in an incubator showed a growth after 6 days of incubation.

**Macroscopic examination:** The growth was woolly; greyish-black on obverse side and dark on reverse.



**Fig. 2 and 3 Growth characters of the *Curvularia* species on obverse and reverse side**

**Microscopic examination:** On Lacto-Phenol Cotton Blue (LCB) mount, it showed the growth of a monomorphic septate mycelium. Conidiophores were both simple and branched. Macroconidia were large, dark, curved due to swelling of central cell. There were not more than four cells in a branch. Few small chains of pigmented chlamydospores were also found.



**Fig.4 Microscopic morphology of *Curvularia* species on LCB mount**

## 5. Discussion

*Curvularia* is the most common oculomycosis<sup>2,3,13,14,19</sup> isolated in ocular traumas especially when the trauma is due to wooden or plant materials. Depending upon microscopic morphological characters, *Curvularia* species was differentiated from *Alternaria*<sup>20,21,22</sup> species, *Fusarium* species<sup>20,21,22,23</sup>, *Bipolaris*<sup>23</sup> species and *Exserohilum* species<sup>23</sup>. *Curvularia geniculata* and *C. lunata* are encountered to be the most common causative organisms of oculomycosis among *Curvularia* species<sup>23</sup>. Apart from keratomycosis, *Curvularia* is known to cause, sinusitis, onychomycosis, phaeohyphomycosis, eumycetoma, etc<sup>10,11,12,13,14,15,23</sup>. However, if proper aseptic precautions are not taken while inoculating and incubating the medias at appropriate temperatures this species is found to be the most common laboratory media contaminant<sup>22,23</sup>. The routine laboratory diagnosis on the basis of macroscopic and microscopic features are enough for patient's medical treatment management as soon as possible. Apart from this, immunodiagnosis<sup>23</sup> on the basis of molecular techniques and animal pathogenicity<sup>23</sup> can also be used for the diagnosis of oculomycosis. The only thing of being, a most common laboratory contaminant, the patience required to maintain the aseptic measures and identify on the basis of microscopic characteristics can help from not missing the diagnosis of *Curvularia* like oculomycosis.

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