

Keratomycosis Caused By *Graphium eumorphum* (*Graphium* State of *Scedosporium apiospermum*)

MANIKANDAN PALANISAMY¹, NARENDRAN VENKATAPATHY², VIJAYAKUMAR RAJENDRAN³, COIMBATORE SUBRAMANIAN SHOBANA⁴

ABSTRACT

Graphium eumorphum is rarely associated with mycotic keratitis. We report the case of a 30-year-old female presented with complaints of redness and defective vision in the left eye for one month. Gram staining and 10% KOH wet mount of corneal smears revealed fungal filaments. On potato dextrose agar, fast growing greyish white colonies turning grayish black on maturity was obtained. Lactophenol cotton blue (LPCB) staining confirmed the isolate as *Graphium eumorphum*. The infection was resolved with the combination of natamycin, econazole and itraconazole.

Keywords: Anamorphs, Antifungal susceptibility, Fungal keratitis

CASE REPORT

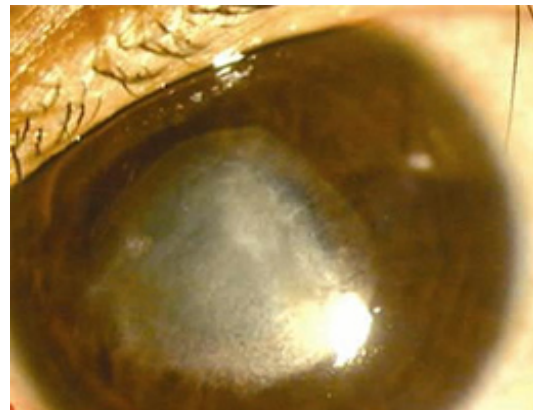
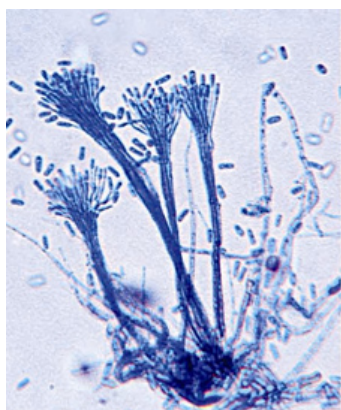
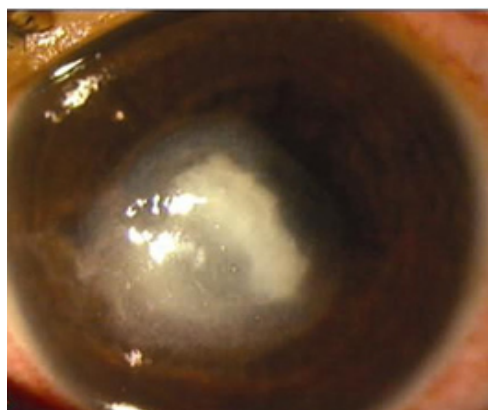
A 30-year-old otherwise healthy female presented at the cornea clinic, Aravind Eye Hospital (AEH), Coimbatore, India, by February 2012, with pain, redness and defective vision in the left eye for one month. On examination she had a central corneal ulcer of 4 × 4 mm size with well defined superficial stromal infiltration. The margins of the ulcer were healing with grayish scarring [Table/Fig-1]. There was minimal conjunctival congestion. The rest of the anterior segment was normal and her visual acuity in the eye was 6/60. It was a sudden onset of irritation and blurring of vision without the involvement of trauma. Initially she applied coconut water to the affected eye and was treated with soframycin by local doctors. As there was no relief, patient was admitted to a local eye clinic and was administered with natamycin and itraconazole. On day 5, the patient was discharged and was referred to our hospital. Based on the thorough ophthalmological examination, the patient was strongly suspected to have fungal keratitis. After instillation of 4% lignocaine, the ulcer bed and margins were scrapped and material was inoculated on to blood agar, chocolate agar and potato dextrose agar medium. The corneal smears were subjected to Gram staining and 10% KOH wet mount. On examination, both the smears revealed fungal filaments. Treatment was started topically with 5% natamycin & 2% econazole drops for every hour, itraconazole eye ointment 3 times a day & 1% homatropine drops two times a day. Fast growing greyish white colonies appeared on the 5th day in all inoculated media and on maturation became greyish black. Lactophenol cotton blue (LPCB)

staining of the pigmented fungal elements revealed long, erect, narrow, and cemented synnemata (the erect structure consisting of united conidiophores) and the isolate was confirmed as *Graphium eumorphum* [Table/Fig-2]. The conidia of *Scedosporium apiospermum* are often formed singly on the conidiophores, while those of *G. eumorphum* are arranged in clusters at the apices of each synnema. The total follow up period was 15 days and the ulcer healed completely without any reoccurrence. Patient was not presented for any other follow up visit [Table/Fig-3]. Antifungal susceptibility analysis revealed that, the isolate was less (16 µg/mL) susceptible to amphotericin B when compared to voriconazole (0.5 µg/mL). Both natamycin and itraconazole inhibited the growth of the isolate at the concentration of 4 µg/mL.

DISCUSSION

Members of *Scedosporium* have been described as “emerging fungal pathogens” as serious infections with this pathogen are on the rise. *S. apiospermum* are ubiquitous filamentous fungi present in soil, sewage, and polluted waters [1]. Keratitis is the most common manifestation of *S. apiospermum* ocular infection in immunocompetent people [2,3]. Pain, decreased visual acuity photophobia and lacrimation are the most frequent symptoms. In this case pain and decreased visual acuity was present along with redness. Most of the cases were preceded by a corneal injury, but in the present case, history of trauma was absent.

Morphology is the mainstay of diagnosis of infections caused by *G.*



[Table/Fig-1]: Clinical presentation of fungal corneal ulcer caused by *Graphium eumorphum* **[Table/Fig-2]:** Microscopic morphology of synnemata and conidia of *Graphium eumorphum* a synanamorph of *Pseudallescheria boydii* **[Table/Fig-3]:** *Graphium eumorphum* corneal ulcer healed after successful treatment (presentation on day 15)

eumorphum. Because, morphologically *P. boydii* may be confused with *Aspergillus fumigatus*, by its gray-black color on fungal culture media as compared to the characteristic green-turquoise colour of *Aspergillus* species [4]. A definitive diagnosis requires fungal culture which is also crucial for antifungal susceptibility. Both asexual and sexual state of these fungi could be obtained from corneal ulcers. Depending on the microscopic morphology, the diagnosis of *Scedosporium*, *Graphium* or *Pseudallescheria* can be made. The other approaches for the diagnosis are serodiagnosis, counter immunoelectrophoresis and PCR [2,5]. As in our case, it is often challenging to identify such rare fungal pathogens by conventional methods and hence definitive identification would be possible with DNA sequencing methods.

The therapeutic approach for patients with *Scedosporium* infections involves complete surgical resection of the lesion with or without antifungal therapy. As there is no ideal antimycotic drug (i.e. non-toxic, fungicidal and with good corneal penetration), the choice is often based on the response of an individual to the antimycotic used. Even *in vitro* antifungal susceptibility results have little correlation with the *in-vivo* responses [6]. However, in general it has been observed that *S. apiospermum* is sensitive to most of the antimycotics in use, while *S. prolificans* is resistant to the same. According to Bloom et al., [7], *P. boydii* infections can be successfully treated with amphotericin B either alone or in combination with nystatin or natamycin. However in this case the patient was successfully treated with the combination of natamycin, econazole and itraconazole. There are reports [8-10], where topical antifungal treatment did not appear to be efficacious and enucleation was often required to resolve *Scedosporium* ocular infections regardless of causative species. An added advantage of the use of itraconazole is that, the drug can also be used to treat neutropenic patients [11].

CONCLUSION

This is the first report of asexual coremial form of *S. apiospermum* (*G. eumorphum*) from a patient with mycotic keratitis. Given the ubiquitous nature, it is difficult to exclude *Scedosporium* from hospital environment. The results suggest that clinicians should be aware of the importance of such rare fungal pathogens and their anamorphs.

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PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Medical Laboratory Technology, College of Applied Medical Sciences, Majmaah University, Al-Majmaah, Kingdom of Saudi Arabia. Aravind Eye Hospital & Postgraduate Institute of Ophthalmology, Coimbatore, India.
2. Chief Medical Officer, Aravind Eye Hospital & Postgraduate Institute of Ophthalmology, Coimbatore, India.
3. Assistant Professor, Department of Medical Laboratory Technology, College of Science Al-Zulfi, Majmaah University, Kingdom of Saudi Arabia.
4. Associate Professor, Department of Microbiology, PSG College of Arts and Science, Coimbatore, Tamil nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. C.S. Shobana,
Associate Professor, Department of Microbiology, PSG College of Arts and Science, Coimbatore – 641 014, Tamilnadu, India.
E-mail : shobanasenthilkumar@gmail.com

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