Fungal keratitis complicated with corneal perforation by dematiaceous fungi humicola fuscoatra

Jeffrey Ong Wei Kiat, MBChB[1,3], Michael Ngu Dau Bing, MBBS[2], Salwa Tharek, MD[1], Jemaima Che-Hamzah, MD[3]

[1]Department of Ophthalmology, Hospital Melaka, Melaka, [2]Department of Ophthalmology, Hospital Sarikei, Sarawak, [3]Department of Ophthalmology, Faculty of Medicine, Universiti Kebangsaan Malaysia, Cheras, Kuala Lumpur

SUMMARY

A 42-year-old immunocompetent man presented with a painful red eye with blurred vision in his right eye post-exposure to dust from wall scraping during a house renovation. His visual acuity was 6/24. He had a corneal ulcer with endothelial plaque, posterior synechiae, and hypopyon. He was empirically treated as fungal keratitis and corneal scraping yielded dematiaceous fungi, later identified as Humicola fuscoatra. He received topical, intrastromal, and intracameral amphotericin B but later developed corneal perforation. This was treated with corneal glue and bandage contact lens without needing penetrating keratoplasty. His vision improved to 6/12, though residual corneal scarring and anterior synechiae remained. Larger and deeper infiltration with hypopyon increases the risk of corneal perforation, and targeted therapies (intrastromal and intracameral injections) can help reduce infiltration size. In this case, topical, oral, and targeted therapy of fluconazole and amphotericin B effectively treated fungal keratitis caused by Humicola fuscoatra.

INTRODUCTION

Fungal keratitis has taken a significant role in causing ocular morbidity and preventable blindness, with higher incidence in subtropical and tropical countries.[1] Dematiaceous fungi are melanised fungi that produce pigments, with Curvularia spp reported most.[1] We would like to present a rare case of fungal keratitis complicated with a perforated ulcer caused by Humicola fuscoatra.

CASE PRESENTATION

A 42-year-old gentleman presented to our eye clinic with persistent right eye pain for eight days, with a foreign body sensation, redness, and tearing, since exposure to dust from wall scraping during a house renovation. He noticed an enlarging white spot in his right eye for one week, with increasing blurred vision. He had no significant previous medical or ocular history.

His right visual acuity was 6/24. The slit lamp examination noted a 3.4 x 3mm paracentral corneal ulcer with endothelial plaque touching the iris at the temporal region. There was posterior synechiae with 1mm hypopyon. The patient also had injected conjunctiva with grade II nasal pterygium (Figure 1). Intraocular pressure (IOP) was 12 mmHg, the lens was clear, and the fundus was normal. The left eye examination was unremarkable.

Corneal scraping was performed, yielding a fungal-like organism on Sabouraud dextrose agar (SBA). The sample was sent to the Institute for Medical Research in Kuala Lumpur for identification. The polymerase chain reaction (PCR) testing confirmed the presence of Humicola fuscoatra, but a susceptibility test was not done.

Based on the history and clinical examination he was treated as right eye fungal ulcer empirically and started on topical amphotericin B 0.15% and topical fluconazole 0.2% hourly, topical gentamicin 0.9% hourly, topical ceftazidime 0.9% hourly, topical atropine 1% three times daily, oral fluconazole 100 mg twice daily and tablet vitamin C 1 gram daily.

After four days of treatment, the ulcer's size was similar, but the infiltrate was deeper, and the endothelial plaque worsened. The right eye's IOP was 8 mmHg. A B-scan of the right eye showed no evidence of endophthalmitis. Subsequently, he received a combination of intrastromal and intracameral injections of 5 mcg/0.1 ml and 10 mcg/0.1 ml amphotericin B, respectively, once.

Post-procedure, there was an increase in flare and inflammation, with raised IOP to 25 mmHg, which was controlled with topical timolol 0.5% twice daily. The hypopyon was reduced, but the ulcer remained the same, with persistent endothelial plaque. After 5 days, the anterior chamber became shallow, with a positive Seidel's test, and he was treated as a perforated fungal ulcer. A bandage contact lens with cyanoacrylate glue was applied for one month, with the addition of topical moxifloxacin 0.5% 4 times daily (Figure 2a).

Three months later, the infiltrate and endothelial plaque improved with residual corneal scarring at the previous ulcer site. Anterior synechia was still present, and no cells were found in the anterior chamber. His vision improved to 6/12, and all medications were discontinued. (Figure 2b)

DISCUSSION

Humicola fuscoatra is a dematiaceous fungus from the Chaetomiaceae family, commonly isolated from soil, room

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Corresponding Author: Jeffrey Ong Wei Kiat
Email: ong_wei_kiat@hotmail.com

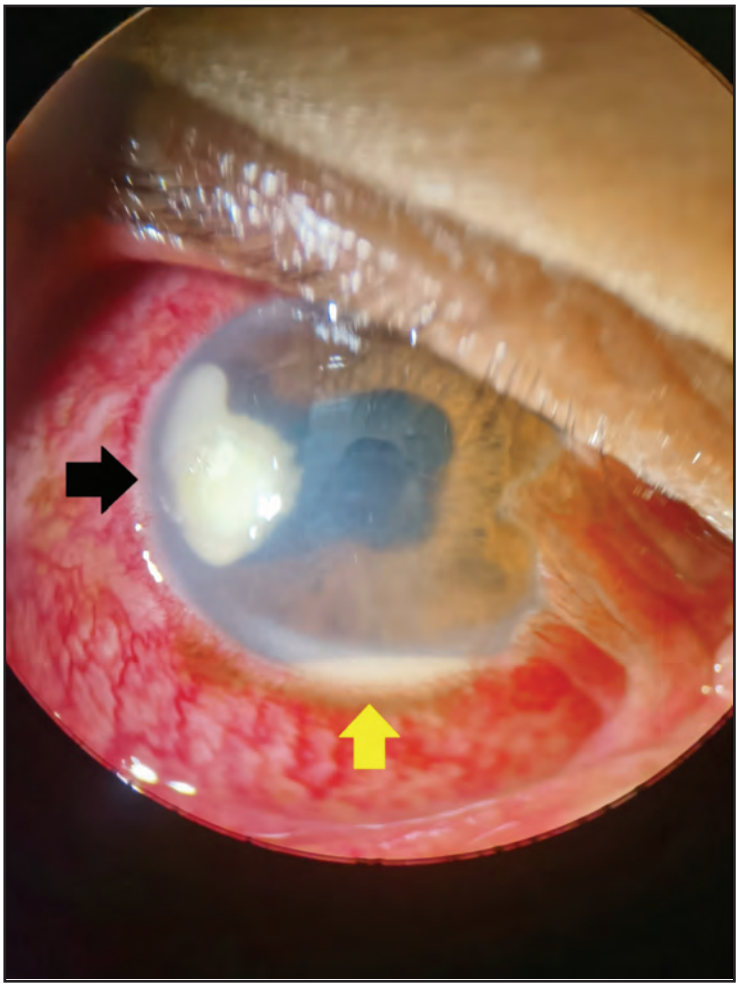

Fig. 1: paracentral corneal ulcer with endothelial plaque (black arrow) and hypopyon (yellow arrow) in right eye

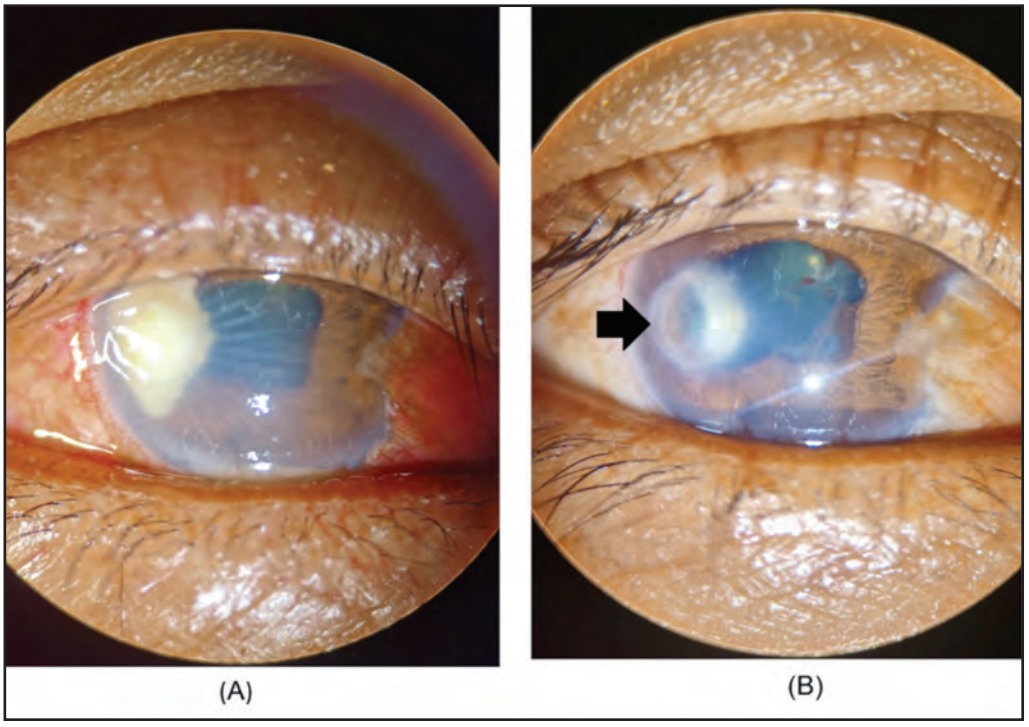

Fig. 2: (A) one month post intrastromal and intracameral Amphotericin B and healed corneal perforation (B) Three months post treatment discontinuation. Note the presence of corneal scarring (black arrow)

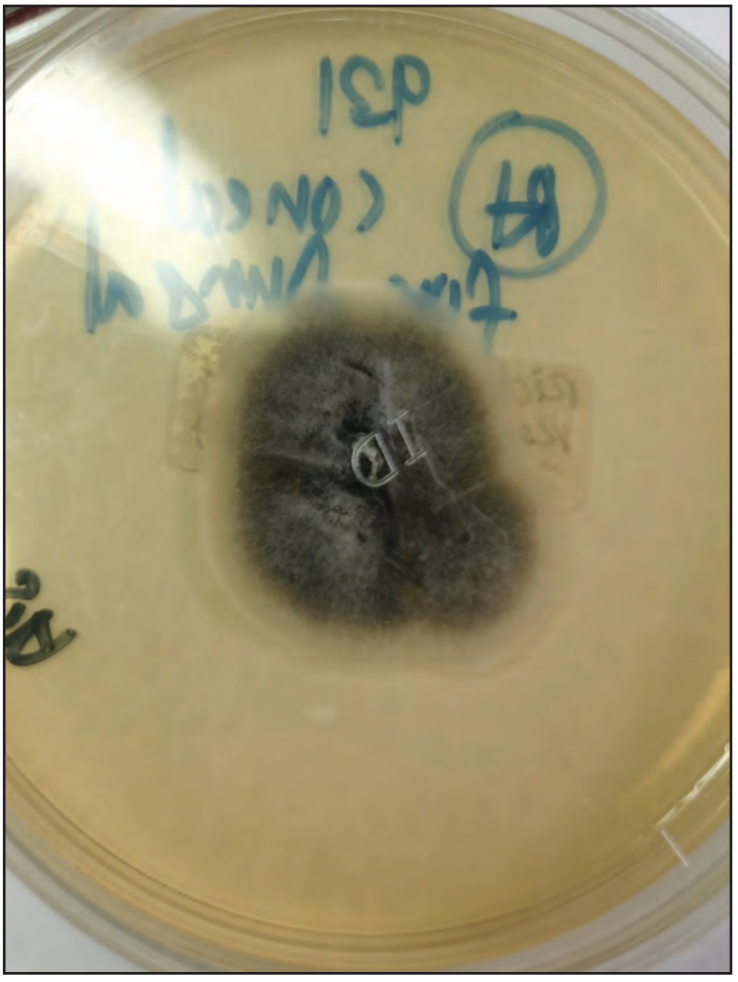

Fig. 3: Humicola fuscoatra on SBA. Dematiaceous fungi have black filaments and appear dark on the culture plate

environment, plant debris, or cat furs.[2] This hyphomycete genus fungus also produces thick-walled and single-celled spores, which are formed laterally or terminally on hyphae or conidiophores.[3] On SBA, it yields central white filamentous colonies with edge entire, black pigmentation at the edges when old (Figure 3).

Humicola sp also had the potential as a microbial biocontrol agent for plant disease, albeit commonly infecting tomato roots but not pathogenic.[3,4] It is also a rare cause of systemic human infection, with a reported case of Humicola-associated hypersensitivity pneumonitis as well as two cases of peritoneal dialysis-associated peritonitis, in which all patients were treated with antifungals or reduced exposure to the fungus.[2,5,6] To our knowledge, this was the third case of Humicola sp associated keratitis apart from the two cases of fungal keratitis reported by Garg et al.[7]

Natamycin is the first-line treatment for fungal keratitis, while voriconazole offers better coverage for filamentous fungi.[8] Our patient achieved satisfactory visual recovery despite being treated with Amphotericin B and fluconazole. We attribute this success to the patient's adherence to hourly topical treatments and the use of intrastromal and intracameral injections, which improve drug delivery and bioavailability for deep mycoses. However, optimal dosage and injection intervals remain to be determined, and further research is needed to assess the treatment's efficacy for filamentous dematiaceous fungi, especially in centres lacking access to penetrating keratoplasty.[9]

Severe fungal keratitis might lead to corneal perforations and severe vision loss. As the ulcerations and inflammation advance, it leads to corneal thinning through stromal lysis and the formation of descemetocele before perforation occurs. Early application of cyanoacrylate glue with soft contact lenses can help in impending perforations.[10]

CONCLUSION

In this case, we presented a classical presentation of fungal keratitis by the rare organism Humicola fuscoatra and the challenges of managing this case in a resource-limited district hospital. We found that the typical clinical features allowed early empirical treatment without formal corneal scraping results, which aids in hastening visual recovery. Moreover, even with the complications of corneal perforation and lack of cornea subspecialty service in the district hospitals, careful counselling and patient adherence to therapy can help to improve the visual prognosis. Intrastromal and intracameral antifungals can be considered in managing persistent endothelial plaque.

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DECLARATIONS
Patient consent was obtained, and no funding was provided.

CONFLICT OF INTEREST
There are no conflicts of interest to be declared by the authors.

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