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## Management of dematiaceous fungal corneal ulcer : a case report



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### ABSTRACT

**Background:** Fungal corneal ulcer is a slowly progressive ulcer that may lead to blindness. It is still becoming a challenging problem to diagnose. A brownish plaque in cornea is a diagnostic clue for dematiaceous fungal corneal ulcer. The mainstay therapies are antifungal and debridement of the plaque. To report management of dematiaceous fungal corneal ulcer.

**Case report:** A 38 years old male patient came with chief complaint of brownish plaque in the center part of the right eye for one month earlier. There was a history of soaking in bevel water. Visual acuity of right eye was hand movement. Slit lamp examination revealed a dry whitish infiltration with feathery edge, a brownish pigmented lesion in the central cornea, and hypopion. This patient was diagnosed as dematiaceous fungal corneal ulcer. Treatment was

started with ketoconazole per oral, 5% natamycin eye drop, and 1% cyclopentolate eye drop. There was no clinical improvement after two weeks, therefore keratectomy, anterior chamber washes out, intrastromal and intracameral injection of fluconazole were performed. Corneal scrapping was performed intraoperatively. Potassium hydroxide dye showed fungus was found. There was improvement of visual acuity after surgery. There were no brownish plaque and hypopion remained as well as smaller whitish dry found. **Conclusion:** Dematiaceous is one of rare case of fungal corneal ulcer. Treatment of fungal keratitis is based on Topical, Systemic, and Targeted Therapy protocol. Surgical intervention is considered in unresponsive case.

**Keywords:** Corneal ulcer, dematiaceous fungus, keratectomy

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### INTRODUCTION

Corneal ulcer is an opened wound in corneal superficial layer. Corneal ulcer can be caused by bacterial infection, viral, fungal, and acanthamoeba. Fungal corneal ulcer is one of the most common keratitis etiologies in tropical countries with filamentous as the main etiologic agent. It responsible for 40%-50% of infectious corneal ulcer in India and South East Asia. Incidence of corneal ulcer in Indonesia is 5.5% based on riset kesehatan dasar in 2013.<sup>1-5</sup>

The main treatment of dematiaceous fungal corneal ulcer is antifungal and debridement. Antifungal given topically and orally. Topical natamycin acts as the first line treatment in fungal corneal ulcer. Superficial keratectomy and plaque removal are surgical intervention to enhance antifungal penetration. Keratoplasty performed in a deep keratomycosis or unresponsive cases with variability of success rate.<sup>6,7</sup>

The aim of this case report is to report keratectomy, anterior chamber wash out, and intrastromal and intracameral injection of

fluconazole as management for dematiaceous fungal corneal ulcer. Understanding the treatment of dematiaceous fungal corneal ulcer is helpful in daily clinical practice to reduce progressivity and prevent complications.

### CASE REPORT

A 38 years old man came with chief complaint of brownish plaque in the middle of right eye since one month earlier. He also complained pain, glare, and blurred vision. He had red eye since two months earlier and history of soaking the eye in betel leaves water. His previous medication one month earlier was topical eye drop of moxifloxacin and natamycin 5% but the he already stopped the medication one week earlier. History of systemic disease was denied.

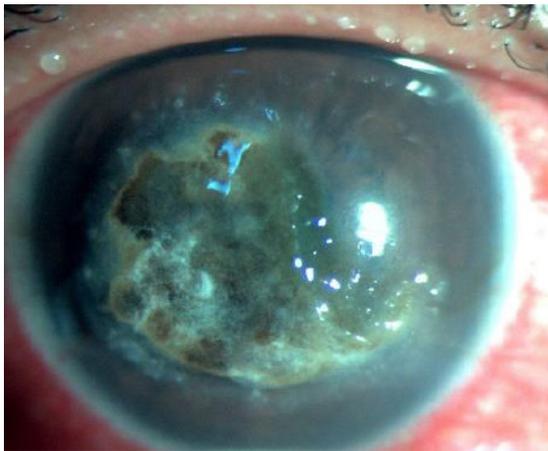
Visual acuity of right eye was hand movement and left eye was 1.0 (Snellen Chart). Slitlamp examination showed 6 mm x 6 mm whitish dry infiltrate with feathery edge and brownish plaque in central corneal stroma of the right eye. Anterior chamber revealed 0.4 mm greyish hypopion (**Figure 1**). Left eye was normal. Corneal scrapping showed

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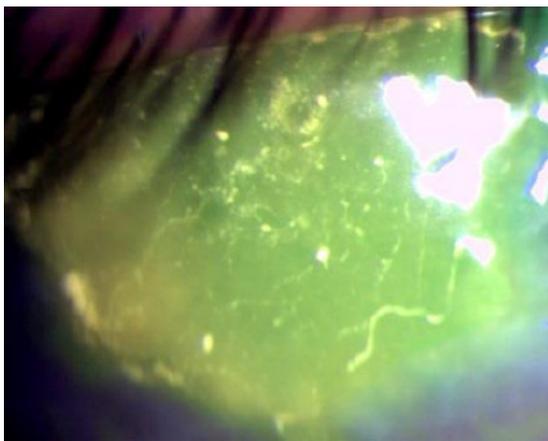
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**Figure 1.** Slit lamp examination showed whitish dry infiltrate with feathery edge and brownish plaque



**Figure 2.** Slit lamp examination showed whitish dry infiltrate with feathery edge and brownish plaque after five weeks antifungal treatment



**Figure 3.** Slit lamp examination one day after surgery showed whitish infiltrate

bacill negative gram with no fungal was found. Based on clinical manifestation the diagnosis was dematiaceous fungal corneal ulcer of right eye. Treatment of this patient was ketoconazole two times 300 mg per oral, natamycin eye drop 5% every hour, levofloxacin eye drop every hour, and cyclopentolate 1% eye drop three times daily. Whitish dry infiltrate with feathery edge, brownish plaque, and hipopion were not decreased one week after treatment (**Figure 2**). Therefore, keratectomy with anterior chamber wash out, intrastromal and intracameral fluconazole injection as well as corneal scrapping intraoperatively were scheduled for this patient.

Surgical intervention was performed as plan and fungus was found in corneal scrapping with KOH dye as well as gram positive cocci. Antifungal treatment was continued. One day postoperatively visual acuity was 1/60. There was no brownish plaque and hipopion remained. Whitish infiltrate was found with the size 4.8 mm x 5 mm (**Figure 3**).

Seven day postoperatively visual acuity increased to 1/60. There was no brownish plaque and hipopion remained. Whitish infiltrate was found with the size 4.2 mm x 4.6 mm (**Figure 4**). The prognosis of this patient was *quo ad vitam* was *bonam*, *quo ad functionam* was *dubia ad malam*, and *quo ad sanationam* was *dubia ad bonam*.

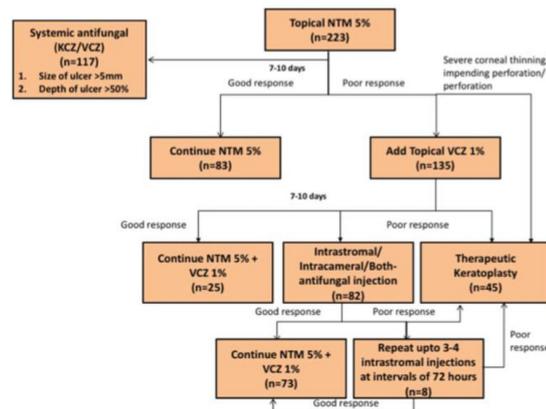
## DISCUSSION

Fungal corneal ulcer is still challenging to treat because of the difficulty in diagnosis. Thomas et al classified fungus as hyaline filamentous fungi, dematiaceous fungi, yeasts and zygomycetes, thermally dimorphic fungi, as well as fungi of uncertain classification. Dematiaceous fungal corneal ulcer is a rare case but it is remain an important etiology of fungal corneal ulcer. It is the third most common etiology after *aspergillus* and *fussarium*. Main predisposing factors are vegetative trauma, lens contact wearing, steroid, ocular surface disorder, diabetes mellitus, and immunocompromised. This patient had history of soaking in bevel water. Vegetative trauma is reported in 55%-65% cases of fungal corneal ulcer. Fungal corneal ulcer has slow progressivity as in this case the patient had two months onset of the disease.<sup>7,8</sup>

Clinical manifestation of fungal corneal ulcer in general is whitish dry ulcer with feathery edge or hyphate border, satellite lesion, and convex hipopion. This patient had dry ulcer with feathery edge, brownish plaque, and hipopion. Pigmented plaque is found in 42% of dematiaceous fungal corneal ulcer as reported by Garg, et al in 2000 and



**Figure 4.** Slit lamp examination seven days postoperative showed decreasing whitish infiltrate



**Figure 5.** TST Protocol in the treatment of fungal corneal ulcer.<sup>12</sup>

2004. Hipopion occurs in deep infiltration of the ulcer.<sup>8,9</sup>

Corneal scrapping in treated case should perform at least 24 hours after discontinuation of topical drugs. Corneal scrapping in this patient was performed one week after discontinuation. KOH dye in first examination did not reveal fungal agent. It can be caused by scrapping was limited only in superficial layer, miscarriage of specimen transport, and misinterpretation. Ten years retrospective study in India reported that 38.3% of clinically fungal ulcer case showed no fungal in KOH 10% dye. Corneal scrapping intraoperative revealed fungal in KOH 10% dye. Fungal culture is a gold standard of diagnosis; however it took two until 21 days of processing. Direct microscopic examination is a fast and effective technique in diagnosis of fungal corneal ulcer.<sup>2,10,11</sup>

Treatment of fungal keratitis is based on Topical, Systemic, and Targeted Therapy protocol (TST). It needs frequent and prolong use of antifungal more than 12 weeks of treatment. Ansari et al reported natamycin as first line therapy for fungal corneal ulcer. Deep stromal infiltration also needs systemic antifungal combination therapy. Systemic

ketoconazole had an adequate concentration in anterior chamber for deep ulcer. This patient has been treated with topical and systemic antifungal for more than six weeks because of deep stromal infiltration and hipopion (Figure 5).<sup>10,11-13</sup>

Surgical intervention is considered in unresponsive cases. Ansari et al concluded that consideration of surgical intervention was needed if patient did not show adequate responses after four weeks of antifungal therapy. Surgical intervention was performed five weeks after treatment in this case. Keratectomy was performed to eliminate pathologic agent and to enhance penetration of antifungal drug. The risk of perforation need to be considered before keratectomy. Cornea insufficiency occurred after keratectomy, adequate antifungal therapy is needed to eliminate the remaining fungal. Prakash et al reported intrastromal fluconazole injection had significant effect without tissue toxicity effect. Intracameral and intrastromal injection was performed in this patient in order to maintain and deliver high concentration of antifungal dose directly to focal infection.<sup>9,14,15</sup>

**CONCLUSION**

One of the rare case of fungal corneal ulcer is caused by dematiaceous. Treatment of fungal keratitis is based on TST protocol. Surgical intervention is considered in unresponsive case despite of adequate antifungal treatment.

**CONFLICT OF INTEREST**

None

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