

(CASE REPORT)



Aspergillus flavus corneal abscess: A case report

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Abstract

Aspergillosis refers to infections caused by fungi of the *Aspergillus* genus. These cosmopolitan hyalohyphomycetes mainly cause pulmonary infections in predisposed individuals but can also lead to extrapulmonary forms, including ocular involvement. This is a severe condition with a guarded prognosis, requiring appropriate management to prevent potentially blinding complications. We report a case of post-traumatic corneal abscess due to *Aspergillus flavus*.

A 58-year-old man presented with a painful, red left eye following minor trauma, associated with decreased visual acuity. Initial treatment with antibiotics and corticosteroids was ineffective. Ophthalmologic examination revealed visual acuity limited to hand movements and a central corneal abscess. Mycological examination showed fluffy white colonies at day 2, turning yellow at day 5 and green at day 10, with a brown reverse pigment. Microscopic analysis revealed uniseriate and biseriate aspergillar heads with radiating phialides, a spherical vesicle, a long rough conidiophore, and globose conidia, consistent with *Aspergillus flavus*. The patient was treated with topical voriconazole followed by intrastromal injection, without improvement, and ultimately required blepharorrhaphy.

Corneal abscess due to *Aspergillus flavus* represents an ophthalmologic emergency threatening visual prognosis. Its management remains a therapeutic challenge due to diagnostic difficulty and suboptimal response to antifungal therapy. Early diagnosis and appropriate treatment are essential to prevent severe complications.

Keywords: Fungal keratitis; *Aspergillus flavus*; Corneal abscess; Ocular mycosis; Voriconazole

1. Introduction

Aspergillosis is an infection caused by filamentous fungi of the genus *Aspergillus*. These cosmopolitan hyalohyphomycetes are mainly responsible for lung infections in patients with predisposing conditions, but they can also cause invasive and extrapulmonary forms, particularly eye infections [1].

A corneal abscess is a proliferation of microorganisms within the cornea, associated with an intense inflammatory reaction leading to tissue destruction. Fungal corneal abscess is an inoculation mycosis that occurs when spores are deposited on a wound or damaged mucosa. It is a serious condition with a guarded prognosis, requiring appropriate management to avoid potentially blinding complications.

We report here a rare case of post-traumatic corneal abscess secondary to a plant thorn, caused by *Aspergillus flavus*.

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2. Observation

This is a 58-year-old man with no particular medical history who presented to the emergency department with a red and painful left eye following a gardening accident involving a plant thorn, associated with a decrease in visual acuity over the previous 20 days. Following a consultation at an ophthalmology clinic, the patient was treated with antibiotics and corticosteroids, both locally and orally, without improvement, before being referred to the ophthalmology department of the Mohammed VI University Hospital in Marrakech for treatment.

On admission, examination of the left eye revealed reduced visual acuity to hand movements, normal intraocular pressure, conjunctival hyperemia, a perikeratic ring, an axial corneal abscess measuring 4.7×5.5 mm, stromal thinning, and hypopyon (Figure 1).

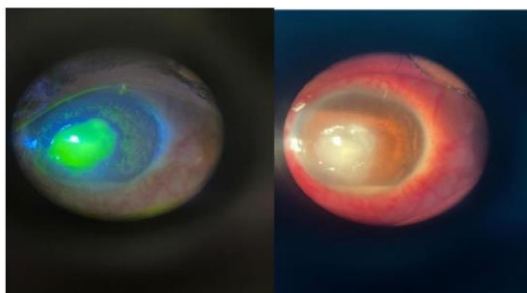


Figure 1 Axial corneal abscess with hypopyon

2.1. The orbital-ocular CT scan showed no abnormalities.

Two samples were taken from the abscess five days apart using a swab. Both samples underwent mycological examination at the parasitology-mycology department of Mohammed VI University Hospital in Marrakesh. Direct examination of the fresh samples and after MGG staining was negative. The samples were cultured on Sabouraud chloramphenicol medium and incubated at 27°C and 37°C.

Macroscopic examination of the colonies showed fluffy colonies with centrifugal extension on the front, white in color on day 2, then yellow on day 5 (Figure2), and green on day 10 of growth (Figure 3).

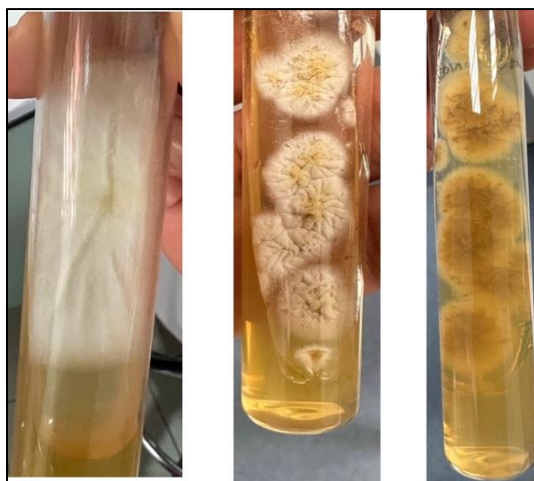


Figure 2 Transfer on day 2 of growth showing a whitish colony (left image), on day 5 of growth showing fluffy colonies with yellowish pigment on the front (middle image), and brown pigment colonies on the back (right image)

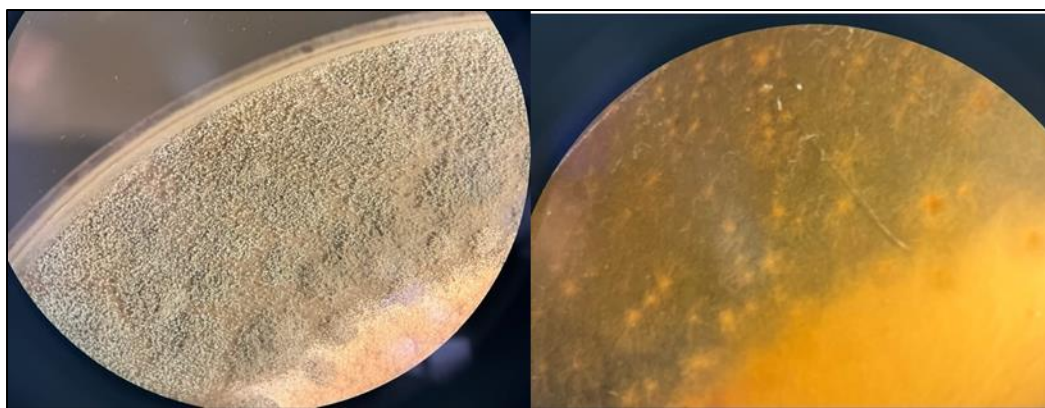


Figure 3 Transfer on day 10 of growth showing fluffy greenish colonies on the front (left image) and dark green on the back (right image)

Microscopic examination of the colonies revealed single and double-rowed, radiated aspergillum heads with a spherical vesicle, a long, hyaline, rough conidiophore, and globular, echinulate conidia, consistent with *Aspergillus flavus*.

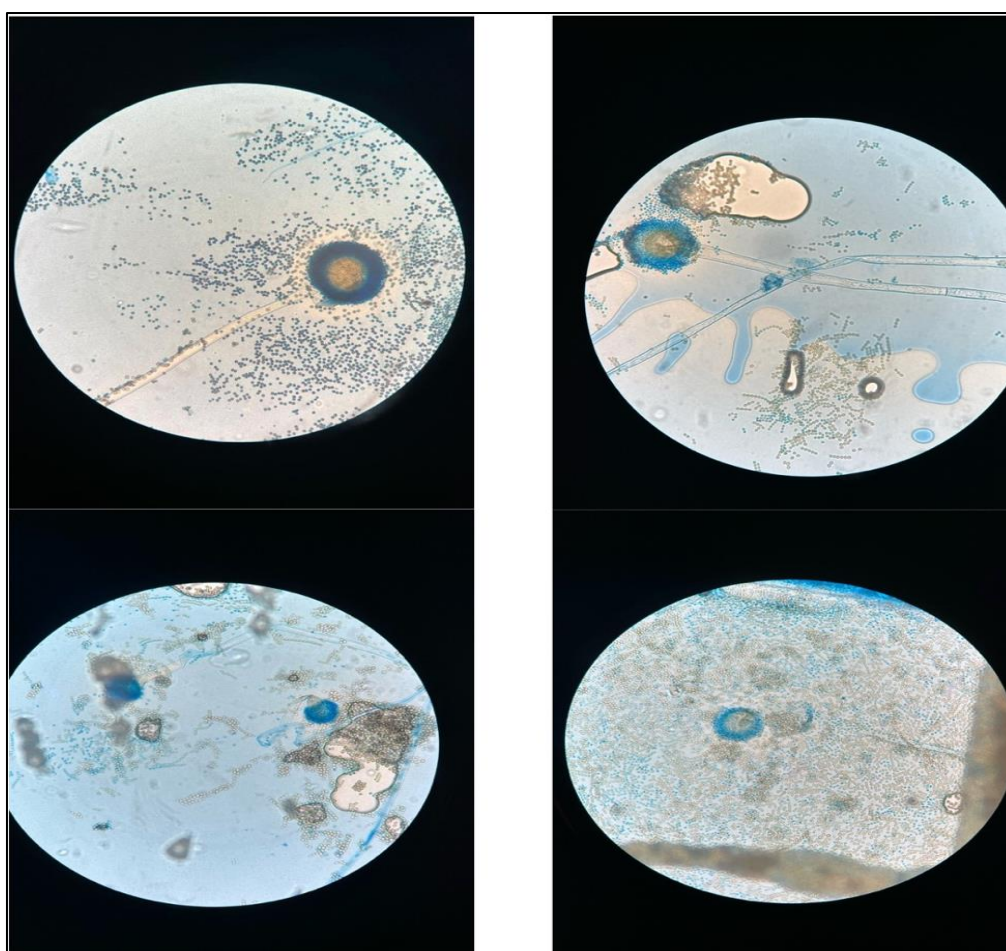


Figure 4 *Aspergillus* head with its conidiophore, microconidia (top images), spherical vesicle (bottom images).

The genus *Aspergillus flavus* was initially found in the first sample and then confirmed by a second sample.

The patient was treated with oral ciprofloxacin and eye drops containing vancomycin, ceftazidime, and voriconazole for five days, with no improvement. Given the poor response to treatment, the patient received an intrastromal injection of voriconazole, but the condition worsened: the abscess and hypopyon increased in size, followed by corneal perforation (Figure 5). In view of this complication, blepharoplasty was performed.

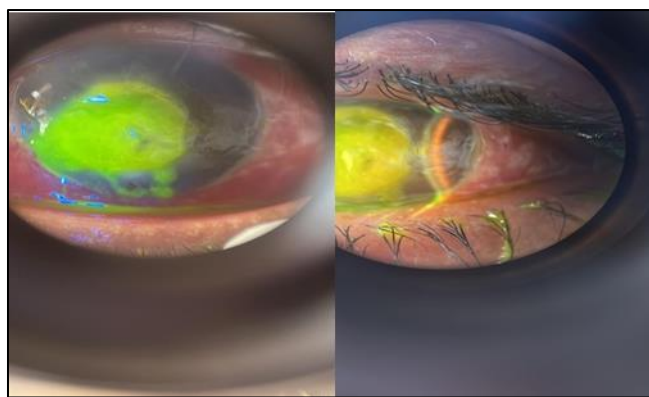


Figure 5 Corneal perforation (fluorescein injection).

3. Discussion

Keratitis is most often caused by bacteria or viruses. Fungal keratitis, on the other hand, is rare but serious and can lead to permanent vision loss. It is mainly caused by yeasts of the genus *Candida*, filamentous fungi of the genus *Fusarium*, and *Aspergillus* (*A. fumigatus* and *A. flavus*) [2,3].

The main risk factors for corneal abscess vary depending on the geographical context: contact lens wear is predominant in developed countries, while eye trauma caused by falling objects or plants is common in developing countries [4,5], as in the case reported here. Other predisposing factors include eyelid disorders, general or local immunosuppression, previous bacterial keratitis, and surgery. In our case, the patient received oral and local corticosteroid therapy. It is important to note that corticosteroids are contraindicated in the acute phase because they promote fungal spread and delay healing; however, they may be considered during the healing phase, under strict supervision and in combination with effective antifungal treatment [6,7].

Accurate identification of the fungal species is essential for establishing an etiological diagnosis, guiding antifungal treatment, and assessing prognosis. Incorrect identification can lead to ineffective treatment, delaying recovery and increasing morbidity and mortality. Studies have shown differences in therapeutic efficacy depending on the pathogen: natamycin is superior for *Fusarium* keratitis, while voriconazole is more suitable for *Aspergillus* infections. However, inter-species variability within the *Aspergillus* genus, as well as the emergence of resistant strains, justify accurate mycological diagnosis and determination of the minimum inhibitory concentration [8,9]. Morphological identification is based on growth time and macroscopic and microscopic features, supplemented by molecular and immunological techniques such as sequencing, MALDI TOF spectrometry, galactomannan detection, and serology [10,11].

The treatment of fungal keratitis is based on a combination of local, and sometimes systemic, antifungal therapy and surgery when necessary. The choice of treatment depends on the depth of the infiltrate, the extent of scleral involvement, the patient's immune status, and the initial clinical response. Topical treatment remains the cornerstone, with 1% voriconazole as the first option due to its good corneal diffusion, particularly for severe stromal forms [3-9,15]. 5% natamycin remains an alternative, particularly in cases of mixed infections, while amphotericin B is reserved for specific situations due to poor local tolerance [16-18].

In severe or extensive forms, systemic treatment may be indicated, particularly with voriconazole administered orally (200 mg, loading dose 400 mg) or intravenously in severe cases or in cases of digestive intolerance [19,20]. More invasive procedures such as intrastromal voriconazole injection, keratoplasty, or corneal transplantation may be necessary in cases of perforation or threat to ocular integrity [21-23]. Corneal debridement may facilitate the penetration of topical treatment.

The prognosis for aspergillosis keratitis remains poor without appropriate treatment, with a risk of stromal melting, corneal perforation, endophthalmitis, and blindness [3,22,24]. Studies show that intrastromal injection of voriconazole has variable results. Sharma et al. reported a refractory case despite several intrastromal injections, requiring keratoplasty [25]. Limited diffusion of the drug into the stroma often explains therapeutic failure. A randomized study published in 2013 showed that these injections did not systematically provide additional benefit over topical treatment [27].

In our observation, the associated corticosteroid therapy and the complexity of the case contributed to the severity of the infection. Despite appropriate antifungal treatment, progression to corneal perforation required blepharoplasty. This case illustrates the importance of early diagnosis, targeted treatment, and close monitoring, while highlighting the current limitations of therapeutic options for filamentous fungal keratitis.

4. Conclusion

Fungal corneal abscess caused by *Aspergillus flavus* is a serious condition and an ophthalmological emergency due to its potential to destroy corneal tissue and the threat it poses to the functional prognosis of the eye.

In our setting, delays in diagnosis and treatment are common, highlighting the importance of the role of the biologist in diagnostic guidance and treatment selection, as early management significantly improves the prognosis. Fungal etiology should be considered in all cases of corneal abscess, particularly in cases of resistance to antibiotic treatment, and corticosteroids should be used with caution in cases of diagnostic uncertainty in order to avoid worsening the disease.

Laboratory methods remain essential for identifying the fungal agent, predicting clinical progression, and optimizing the antifungal treatment strategy. The management of aspergillosis keratitis remains challenging due to its severity, initial diagnostic difficulties, and sometimes suboptimal response to antifungal agents.

Prevention relies on better management of eye trauma, including systematic assessment of its severity and risk of infection, early intervention, and awareness and training for non-ophthalmology staff. Effective interdisciplinary coordination, rapid diagnosis, and early initiation of appropriate antifungal treatment are essential to limit complications.

A better understanding of the pharmacokinetics of ocular antifungals and the standardization of treatment protocols could, in the future, preserve and improve the often poor visual prognosis of these infections.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no conflicts of interest in relation to this article.

Statement of informed consent

Informed consent was obtained by all participants in this study.

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