

# Corneal Scraping Revealing *Pythium insidiosum* Keratitis in a 65-Year-Old Male Farmer: A Case Report

R. Sujatha, Nashra Afaq\*

Professor and Head<sup>1</sup>, Department of Microbiology, Rama Medical College Hospital and Research Centre, Uttar Pradesh, India.

Assistant Professor<sup>2\*</sup>, Department of Microbiology and CRL, Rama Medical College Hospital and Research Centre, Uttar Pradesh, India.

**Corresponding Author: Dr. Nashra Afaq\***

**Email ID: nashra.abaan@gmail.com**

## *Abstract*

### *Background*

*Pythium insidiosum* is an emerging ocular pathogen causing severe keratitis, particularly in individuals exposed to agricultural environments and contaminated water sources. Due to its clinical resemblance to fungal keratitis, diagnosis is often delayed, leading to poor visual outcomes.

### *Case Presentation*

We report a case of a 65-year-old male farmer who presented with pain, redness, watering, and diminished vision in the right eye following exposure to vegetative matter during farming activities. Slit-lamp examination revealed a dense corneal ulcer with stromal infiltrates and tentacle-like extensions. Corneal scraping was performed and subjected to microbiological examination. Direct microscopy showed broad sparsely septate filamentous structures. Culture on blood agar and Sabouraud dextrose agar revealed characteristic growth suggestive of *Pythium insidiosum*. The patient was initially treated as fungal keratitis but showed poor response. Following microbiological confirmation, antibacterial therapy and therapeutic keratoplasty were advised.

### *Conclusion*

*Pythium insidiosum* keratitis should be considered in elderly agricultural workers presenting with non-resolving corneal ulcers. Early microbiological diagnosis using corneal scraping is essential for prompt treatment and prevention of visual loss.

**Keywords:** *Pythium insidiosum*, keratitis, corneal scraping, farmer, ocular infection, case report

## **Introduction**

*Keratitis* is a potentially vision-threatening ocular infection involving the cornea and may be caused by bacteria, fungi, viruses, or parasitic organisms.[1] In tropical and subtropical countries such as India, fungal keratitis is common among agricultural workers because of frequent ocular trauma with vegetative matter.[2] However, an emerging pathogen, *Pythium insidiosum*, has increasingly been recognized as an

important cause of severe keratitis that clinically mimics fungal infection.[3]

*Pythium insidiosum* is an aquatic oomycete belonging to the kingdom Stramenopila and differs biologically from true fungi because its cell wall lacks ergosterol and chitin.[4] Human infection occurs following exposure to contaminated water or soil, particularly in individuals involved in farming and outdoor activities.[5] Ocular pythiosis commonly presents as keratitis and is associated with

rapid corneal destruction and poor response to conventional antifungal therapy.[6]

Diagnosis of *Pythium insidiosum* keratitis is challenging because its clinical appearance resembles fungal keratitis.[7] Characteristic clinical features include tentacle-like stromal infiltrates, reticular dot infiltrates, peripheral guttering, and early limbal spread.[8] Laboratory diagnosis relies on direct microscopy, culture, histopathology, and molecular techniques.[9]

Early diagnosis is important because delayed identification often results in corneal perforation, endophthalmitis, and need for therapeutic keratoplasty or enucleation.[10] We report a case of *Pythium insidiosum* keratitis diagnosed by corneal scraping in a 65-year-old male farmer.

### Case Report

A 65-year-old male farmer presented to the ophthalmology outpatient department with complaints of pain, redness, watering, photophobia, and progressive diminution of vision in the right eye for 15 days. The patient gave a history of ocular trauma with vegetative matter while working in agricultural fields. There was no history of diabetes mellitus, hypertension, or previous ocular surgery.

On examination, visual acuity in the right eye was reduced to perception of hand movements close to face, while the left eye was normal. Slit-lamp examination of the right eye revealed conjunctival congestion, a large central corneal ulcer measuring approximately 5 × 4 mm with dense stromal infiltrates, feathery margins, and characteristic tentacle-like extensions

involving the peripheral cornea. Hypopyon was also present in the anterior chamber.

A provisional diagnosis of fungal keratitis was made, and corneal scraping was performed under aseptic precautions using a sterile Bard-Parker blade. The specimen was sent to the microbiology laboratory for direct microscopy and culture.

### Microbiological Findings

#### Direct Microscopy

Potassium hydroxide (10% KOH) mount revealed broad, ribbon-like, sparsely septate filamentous structures suggestive of oomycete infection. Gram staining showed poorly stained hyaline filaments.

#### Culture Findings

The specimen was inoculated onto:

- Blood agar
- Sabouraud dextrose agar (SDA)
- Chocolate agar

After incubation at 37°C, blood agar showed flat, colorless to whitish colonies with submerged growth. SDA demonstrated sparse cottony growth. Lactophenol cotton blue mount revealed broad aseptate filaments without true fungal branching.

Based on clinical findings and microbiological characteristics, the isolate was identified as *Pythium insidiosum*.

### Treatment and Outcome

The patient had initially received topical natamycin and voriconazole therapy before microbiological diagnosis but showed no clinical improvement. Following identification of *Pythium insidiosum*, antifungal therapy was discontinued, and the patient was started on topical linezolid 0.2%

and azithromycin eye drops along with supportive treatment.

Despite medical therapy, progression of stromal infiltration and corneal thinning was observed. Therapeutic penetrating keratoplasty was advised to prevent corneal perforation and preserve ocular integrity.

### Discussion

*Pythium insidiosum* keratitis is increasingly reported from tropical countries including India, Thailand, and China.[11] The organism is commonly associated with exposure to stagnant water and agricultural environments.[12] Farmers and laborers are particularly vulnerable because of frequent ocular trauma with vegetative matter.[13]

The present case involved a 65-year-old farmer with history of corneal trauma during farming activities, which is consistent with previously reported risk factors.[14] Clinically, the patient presented with stromal infiltrates having tentacle-like extensions, a characteristic feature described in ocular pythiosis.[15]

Diagnosis of *Pythium* keratitis remains difficult because it closely resembles fungal keratitis both clinically and microscopically.[16] In many cases, patients are initially treated with antifungal agents, resulting in delayed appropriate therapy.[17] In the present case also, the patient received antifungal treatment initially but failed to improve.

Unlike fungi, *Pythium insidiosum* lacks ergosterol in its cell membrane, making antifungal agents less effective.[18] Studies have shown better response to antibacterial agents such as linezolid, azithromycin, and tigecycline.[19] Advanced cases often

require therapeutic keratoplasty because of rapid corneal destruction.[20]

Microbiological diagnosis through corneal scraping remains essential for early detection.[21] KOH mount showing broad sparsely septate filaments along with culture characteristics can aid in diagnosis in resource-limited settings.[22] Molecular methods such as PCR provide definitive identification but may not be available in all centers.[23]

Early suspicion and prompt diagnosis are critical to prevent severe visual impairment and globe loss in ocular pythiosis.[24]

### Conclusion

*Pythium insidiosum* keratitis is an emerging and potentially vision-threatening ocular infection that commonly affects agricultural workers following trauma with vegetative matter. The disease often mimics fungal keratitis and shows poor response to antifungal therapy. Corneal scraping with microbiological examination plays a vital role in early diagnosis. Increased awareness among ophthalmologists and microbiologists is essential for timely management and improved visual outcomes.

### Declarations:

**Conflicts of interest:** There is no any conflict of interest associated with this study

**Consent to participate:** There is consent to participate.

**Consent for publication:** There is consent for the publication of this paper.

**Authors' contributions:** Author equally contributed the work.

## References

1. Thomas PA, Kalamurthy J. Mycotic keratitis: epidemiology, diagnosis and management. *Clin Microbiol Infect.* 2013;19(3):210-20.
2. Srinivasan M. Fungal keratitis. *Curr Opin Ophthalmol.* 2004;15(4):321-7.
3. Bagga B, Sharma S, Joseph J, et al. Current status of ocular pythiosis in India. *Indian J Ophthalmol.* 2019;67(10):1702-9.
4. Gaastra W, Lipman LJ, De Cock AW, et al. *Pythium insidiosum*: an overview. *Vet Microbiol.* 2010;146(1-2):1-16.
5. Mendoza L, Ajello L, McGinnis MR. Infection caused by the oomycetous pathogen *Pythium insidiosum*. *J Mycol Med.* 1996;6(4):151-64.
6. Agarwal S, Iyer G, Srinivasan B, et al. Clinical profile of ocular pythiosis. *Cornea.* 2015;34(1):42-7.
7. Sharma S, Balne PK, Motukupally SR, et al. *Pythium insidiosum* keratitis: clinical profile and role of DNA sequencing. *Eye.* 2015;29(6):846-54.
8. Bagga B, Kate A, Mohamed A, et al. Clinical and microbiological profile of *Pythium* keratitis. *Br J Ophthalmol.* 2018;102(5):688-93.
9. Kalaiselvi G, Narayana S, Krishnan T, et al. Corneal scraping in infectious keratitis. *Indian J Ophthalmol.* 2020;68(2):286-90.
10. Puangsricharern V, Reinprayoon U, Chindamporn A. Ocular pythiosis. *Semin Ophthalmol.* 2004;19(3-4):123-7.
11. Gurnani B, Kaur K. Epidemiology of ocular pythiosis. *Trop Doct.* 2021;51(2):260-5.
12. Krajaejun T, Sathapatayavongs B, Prachartam R, et al. Clinical and epidemiological analyses of human pythiosis. *Clin Infect Dis.* 2006;43(5):569-76.
13. Ramappa M, Nagpal R, Sharma S, et al. *Pythium* keratitis: clinical features and prognosis. *Cornea.* 2017;36(8):1013-8.
14. Bagga B, Kate A, Mohamed A, et al. Clinical outcomes in ocular pythiosis. *Cornea.* 2019;38(11):1428-33.
15. Hasika R, Lalitha P, Prajna NV, et al. *Pythium* keratitis in South India. *Indian J Med Microbiol.* 2019;37(2):249-52.
16. Shivaprakash MR, Appannanavar SB, Kindo AJ, et al. Ocular infections due to *Pythium insidiosum*. *Med Mycol.* 2011;49(8):872-6.
17. Chatterjee S, Agrawal D. Recent advances in diagnosis and management of pythiosis. *Indian J Med Microbiol.* 2018;36(3):329-36.
18. Permpalung N, Worasilchai N, Chindamporn A. Human pythiosis: emergence of fungal-like oomycete infection. *Med Mycol.* 2020;58(1):10-7.
19. Bagga B, Sharma S, Joseph J. Newer therapeutic options in ocular pythiosis. *Eye Vis.* 2021;8(1):1-9.
20. Srinivasan B, Panda A, Sharma N. Therapeutic keratoplasty in

- infectious keratitis. *Surv Ophthalmol.* 2020;65(3):297-305.
21. Bharathi MJ, Ramakrishnan R, Vasu S, et al. Microbiological diagnosis of infective keratitis. *Indian J Ophthalmol.* 2006;54(4):233-40.
22. Joseph J, Singh Y, Sharma S. Laboratory diagnosis of ocular pythiosis. *J Clin Microbiol.* 2018;56(8):e00450-18.
23. Krajaejun T, Kunakorn M, Niemhom S, et al. Identification of *Pythium insidiosum* by PCR. *J Clin Microbiol.* 2006;44(7):2607-9.
24. Bagga B, Kate A, Mohamed A. Emerging challenges in ocular pythiosis. *Indian J Ophthalmol.* 2020;68(9):1779-85.