

Crystalline Lens Extrusion Secondary to Fungal Keratitis

 Suguru Nakagawa^{1,2,3},  Takashi Miyai³,  Kiyoshi Ishii¹

¹Department of Ophthalmology, Saitama Red Cross Hospital, Saitama, Japan

²Department of Ophthalmology, Saitama Medical Center, Jichi Medical University, Saitama, Japan

³Department of Ophthalmology, Graduate School of Medicine, University of Tokyo, Tokyo, Japan

A 78-year-old Japanese woman presented with hypopyon and a corneal ulcer accompanied by a ring-shaped abscess. She was referred to our department after failing to respond to antibacterial and steroid eyedrops (Figure 1a). Her visual acuity was reduced to light perception. Risk factors for fungal infection included agricultural work with soil exposure and a history of asthma, but she did not have diabetes.

Although initial cultures from the corneal scrapings were negative, Diff-Quick staining revealed mycelial-like structures. Consequently, steroid eyedrops were discontinued, and antifungal treatment was initiated. The regimen included natamycin 5% (eight times daily), voriconazole 1% (hourly), and povidone-iodine 0.5% (hourly), along with systemic itraconazole (200 mg/day).

On the fourth day of treatment, a corneal perforation with aqueous leakage was observed. However, the leakage was minimal and was successfully managed with a soft contact lens. By day 9, corneal thinning was noted (Figure 1b), which progressed to corneal perforation with extrusion of the crystalline lens on day 10 (Figure 1c). Urgent penetrating keratoplasty was performed, during which a corneal specimen was excised.

After surgery, the patient received moxifloxacin eyedrops six times daily for 9 days and then four times daily for 1 year. Voriconazole 1% was administered six times daily for 9 days, while betamethasone 0.1% was given four times daily for 1 year. Additionally, tobramycin 0.3%, povidone-iodine 0.5%, and natamycin 5% were used six times daily for the first two postoperative days.

Systemically, flomoxef (1 g) and betamethasone (4 mg) were administered intravenously for 3 days postoperatively, while oral itraconazole (200 mg/day) was given for 5 days.

Histopathological examination of the specimen using hematoxylin and eosin staining revealed dense neutrophil infiltration in the stroma (Figure 1d). Grocott staining identified rod-shaped fungi, confirming fungal keratitis (Figure 1e). Corneal scraping cultures

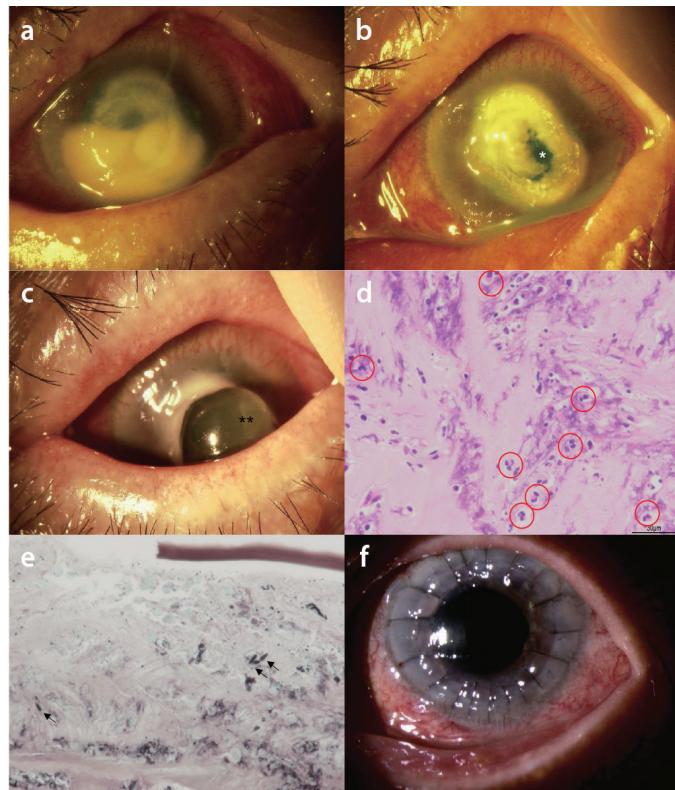


FIG. 1. (a) Initial presentation: ring-shaped corneal abscess and hypopyon; (b) Day 9: progressive corneal thinning (*asterisk indicates the area of corneal thinning); (c) Day 10: corneal perforation with lens extrusion (**double asterisks indicate the extruded lens); (d) Hematoxylin and eosin staining of the excised corneal specimen from keratoplasty showing dense neutrophil infiltration (red circles); (e) Grocott staining of the excised corneal specimen identifying rod-shaped fungal structures (arrow); (f) One year later: anterior segment photograph after the second optical penetrating keratoplasty with intrascleral intraocular lens fixation.



Corresponding author: Suguru Nakagawa, Department of Ophthalmology, Saitama Red Cross Hospital, Saitama, Japan

e-mail: snakagawa-ky@umin.ac.jp

Received: January 30, 2025 **Accepted:** February 15, 2025 **Available Online Date:** 01.09.2025 • **DOI:** 10.4274/balkanmedj.galenos.2025.2025-1-140

Available at www.balkanmedicaljournal.org

ORCID iDs of the authors: S.N. 0000-0001-9938-4881; T.M. 0000-0001-5286-8272; K.I. 0000-0001-7117-3361.

Cite this article as: Nakagawa S, Miyai T, Ishii K. Crystalline Lens Extrusion Secondary to Fungal Keratitis. Balkan Med J; 2025; 42(5):469-70.

Copyright@Author(s) - Available online at <http://balkanmedicaljournal.org>

remained negative, preventing species identification. However, the uniformly dark-stained rod-shaped structures resembled fungal spores rather than phialides, raising suspicion of *Fusarium*.^{1,2} *Fusarium* keratitis progresses rapidly and is often associated with necrosis and perforation. Other possible causes, such as *Paecilomyces* and *Acremonium*, were considered, but these infections typically progress more slowly and involve phialide formation.¹⁻³

Older individuals are more susceptible to fungal keratitis, a known cause of corneal melting.

Given Japan's rapidly aging population, increased awareness of this condition is essential.^{4,5} Fungal infection should be strongly considered in cases of keratitis, particularly in older patients, those unresponsive to prolonged antibiotic therapy, or individuals receiving corticosteroids. Early diagnosis and timely antifungal treatment are key to effective management.

Crystalline lens extrusion is a rare but serious complication of infectious keratitis with corneal perforation. Only a few cases have been documented, including one following severe burns,⁶ and a case of *Pseudomonas aeruginosa* infectious keratitis in an obtunded patient,⁷ and another in a patient with rheumatoid arthritis.⁸ To our knowledge, lens extrusion has not been previously reported in fungal keratitis. However, corneal melting due to fungal keratitis can lead to this complication, as observed in the present case. Once lens extrusion occurs, salvaging the natural lens is not possible. In this case, intrascleral intraocular lens fixation was performed 1 year after the initial surgery, along with a second penetrating keratoplasty using a fresh donor cornea, as the initial preserved cornea did not achieve sufficient transparency. Following these procedures, the patient's best corrected visual acuity improved to a decimal value of 0.07 (Figure 1f).

Urgent penetrating keratoplasty is recommended when progressive corneal thinning threatens the structural integrity of the cornea. This therapeutic procedure can eliminate the infectious focus, restore corneal stability, and reduce the risk of lens extrusion.

Acknowledgements: We thank Editage (www.editage.com) for English language editing.

Informed Consent: Written informed consent was obtained from the patient.

Authorship Contributions: Concept- S.N., T.M., K.I.; Design- S.N., T.M., K.I.; Supervision- T.M., K.I.; Funding- K.I.; Materials- S.N.; Data Collection and/or Processing- S.N., K.I.; Analysis and/or Interpretation- S.N., T.M., K.I.; Literature Review- S.N.; Writing- S.N., K.I.; Critical Review- S.N., T.M., K.I.

Conflict of Interest: No conflict of interest was declared by the authors.

REFERENCES

1. Guarner J, Brandt ME. Histopathologic diagnosis of fungal infections in the 21st century. *Clin Microbiol Rev*. 2011;24:247-280. [\[CrossRef\]](#)
2. Liu K, Howell DN, Perfect JR, Schell WA. Morphologic criteria for the preliminary identification of *Fusarium*, *Paecilomyces*, and *Acremonium* species by histopathology. *Am J Clin Pathol*. 1998;109:45-54. [\[CrossRef\]](#)
3. Thomas PA, Kaliamurthy J. Mycotic keratitis: epidemiology, diagnosis and management. *Clin Microbiol Infect*. 2013;19:210-220. [\[CrossRef\]](#)
4. Sharma N, Bagga B, Singhal D, et al. Fungal keratitis: a review of clinical presentations, treatment strategies and outcomes. *Ocul Surf*. 2022;24:22-30. [\[CrossRef\]](#)
5. Kim CK, Karslioglu MZ, Zhao SH, Lee OL. Infectious keratitis in patients over 65: a review on treatment and preserving eyesight. *Clin Interv Aging*. 2024;19:1393-1405. [\[CrossRef\]](#)
6. Ho WS, Leung TS, Ying SY. Corneal perforation with extrusion of lens in a burn patient. *Burns*. 2001;27:81-83. [\[CrossRef\]](#)
7. Van Meter WS, Conklin J. Penetrating keratoplasty for corneal perforation in an obtunded patient. *Ophthalmic Surg*. 1992;23:137-139. [\[CrossRef\]](#)
8. Saleh GM, Kazakos DC, Patel J, Gormley P. An unusual case of corneal perforation with crystalline lens extrusion secondary to pseudomonas keratitis in the presence of rheumatoid arthritis. *Eye*. 2004;18:437-439. [\[CrossRef\]](#)