



## DELAYED ENDOPHTHALMITIS DUE TO SEVERE CORNEAL ULCER

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### Abstrak

Secara global, diperkirakan 1,2-2 juta kasus keratitis terjadi setiap tahunnya, dengan pengobatan yang tertunda menyebabkan endoftalmitis pada 6-12% kasus. Endoftalmitis merupakan kondisi kegawatdaruratan oftalmologis yang terjadi karena peradangan intraokular parah akibat infeksi, kondisi ini memerlukan intervensi segera untuk mencegah kebutaan permanen. Di Indonesia, ulkus kornea menduduki peringkat kedua penyebab kebutaan secara nasional, dengan 30-40% kasusnya terkait dengan cedera di area pertanian. Penanganan ulkus kornea yang tertunda dapat menyebabkan komplikasi seperti endoftalmitis. Studi ini menyoroti pentingnya pemahaman dan intervensi dini mengenai endoftalmitis terkait dengan keadaan darurat oftalmologis yang dapat mengakibatkan kebutaan. Kami melaporkan seorang pria berusia 66 tahun dengan riwayat mata terkena padi sudah berobat ke puskesmas namun tidak dapat tertangani. Datang ke Poliklinik Mata RS Wongsonegoro mengeluhkan nyeri terus-menerus pada mata kirinya selama sebulan terakhir. Visus mata kanan 6/60, mata kiri 1/~ LP. Pada pemeriksaan oftalmologis mata kiri ditemukan *mixed injection*, hipopion di COA di segmen depan dan belakang dengan TIO digital yang meningkat. Terdapat lesi ulkus infiltrat pada jam 1-6 di bagian temporal. Pemeriksaan funduskopi tidak dilakukan. Pasien mendapatkan obat anti nyeri, antibiotik, vitamin C, *artificial tears* dan direncanakan tindakan eviserasi bulbi.

**Kata Kunci:** *Endoftalmitis, Eviserasi, Endoftalmitis Akibat Ulkus Kornea Berat, Keterlambatan Pengobatan, Ulkus Kornea*

### Abstract

Globally, an estimated 1.2–2.0 million cases of infectious keratitis occur annually, with delayed treatment leading to endophthalmitis in 6–12% of cases. Endophthalmitis is an ophthalmological emergency condition that occurs due to severe intraocular inflammation caused by infection. This condition requires immediate intervention to prevent permanent blindness. In Indonesia, corneal ulcers rank as the second-leading cause of blindness nationally, with 30–40% of cases linked to agricultural injuries. Delayed corneal ulcer management can lead to complications like endophthalmitis. This study highlights the importance of understanding and early intervention regarding endophthalmitis associated with ophthalmological emergencies that can result in blindness. We reported a 66-year-old man with a history of eye contact with rice had gone to the community health center, but it could not be treated. Came to the Wongsonegoro Hospital Ophthalmology Clinic with complaints of constant pain in his left eye for the last month. Visual acuity OD 6/60 and OS 1/~ LP. Ophthalmological examinations of the left eye revealed mixed injection, hypopyon in COA in the anterior and posterior segment involvement with elevated digital IOP. Infiltrative ulcer lesions were observed at 1–6 o'clock in the temporal region. Funduscopy examination was not performed. He received analgesics, antibiotics, vitamin C, and artificial tears and was planned for evisceration.

**Keywords:** *Endophthalmitis, Evisceration, Endophthalmitis Due To Corneal Ulcer, Delayed Treatment, Corneal Ulcer*

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## INTRODUCTION

Endophthalmitis, a vision-threatening intraocular infection, remains a global ophthalmologic emergency with significant epidemiological variability. While postoperative cases (e.g., after cataract surgery) dominate in high-income countries, traumatic endophthalmitis is particularly associated. Globally, an estimated 1.2–2.0 million cases of infectious keratitis occur annually, with delayed treatment leading to endophthalmitis in 6–12% of cases, particularly in low-resource settings (Ung et al., 2020; Ting et al., 2021). Agricultural workers in LMICs are disproportionately affected due to occupational exposure to soil, plant matter, and inadequate protective measures. For example, in China, a 2021 study found that 45% of corneal ulcers in rural populations progressed to endophthalmitis when treatment was delayed beyond 7 days, with *Fusarium species* and *Pseudomonas aeruginosa* as predominant pathogens (Xie et al., 2021). Similarly, in Thailand, fungal keratitis accounts for 60% of corneal ulcers in farming communities, with a 25% risk of intraocular invasion if antifungal therapy is delayed (Tananuvat et al., 2022).

In India, corneal ulcers are the fourth leading cause of blindness, with *Fusarium* and *Aspergillus species* implicated in 30–40% of fungal keratitis cases, often progressing to intraocular infection due to delayed healthcare access (Thomas, 2003; Srinivasan et al., 2004). In sub-Saharan Africa, systemic barriers such as limited access to ophthalmic care exacerbate outcomes. A 2023 Nigerian study reported that 68% of patients with traumatic corneal injuries presented to tertiary centers only after complications such as hypopyon or no light perception vision had developed, resulting in evisceration rates of 40% (Mahmoud et al., 2023). By contrast, high-income countries like the United States report lower rates of delayed endophthalmitis (2–4%), attributed to prompt antibiotic prophylaxis and advanced diagnostic tools (Sharma et al., 2020).

Indonesia, a tropical agrarian nation, faces unique challenges. Corneal ulcers rank as the second-leading cause of blindness nationally, with 30–40% of cases linked to agricultural injuries (Susiyanti et al., 2017). A 2020 study in East Java revealed that 55% of farmers with corneal trauma initially sought traditional remedies, delaying biomedical care by an average of 14 days, resulting in a 30% incidence of endophthalmitis (Widyaningrum et al., 2020). Compounding this issue, Indonesia's rural health centers often lack corneal scraping tools and antifungal agents, leading to empirical treatments that may miss fungal etiologies (Lumbanraja et al., 2021).

In sub-Saharan Africa, only 20% of patients with corneal ulcers receive appropriate antimicrobial therapy within 48 hours of symptom

onset, drastically increasing the risk of endophthalmitis (Lewallen & Courtright, 2001). Similarly, in Indonesia, a study found that 70% of patients initially sought treatment from non-ophthalmologists, leading to mismanagement and progression to endophthalmitis (Susiyanti et al., 2017). Microbial resistance further complicates management. In South Asia, *Aspergillus flavus* and multidrug-resistant *Staphylococcus aureus* are increasingly implicated in endophthalmitis, with fluoroquinolone resistance reported in 20–35% of bacterial isolates (Prajna et al., 2017; Das et al., 2022). Meanwhile, Southeast Asian fungal isolates show increasing resistance to natamycin, necessitating adjunctive therapies like voriconazole (Tananuvat et al., 2022). These trends highlight the urgent need for region-specific treatment guidelines and affordable rapid diagnostics in LMICs.

This study highlights the importance of understanding and early intervention regarding endophthalmitis associated with ophthalmological emergencies that can result in blindness.

## METHODS

This retrospective case report analyzes medical records from Wongsonegoro Hospital. Data included patient history, clinical examinations, diagnostic findings, and treatment outcomes. Ethical adherence ensured patient anonymity and informed consent.

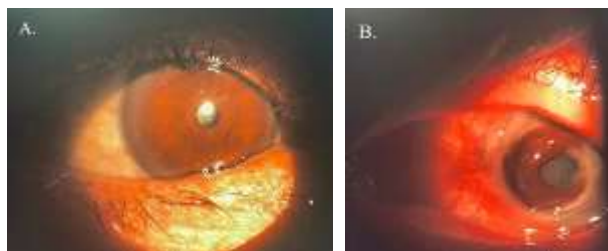
## CASE REPORT

A 66-year-old male patient came to the Wongsonegoro Hospital Ophthalmology Clinic with complaints of constant pain in his left eye for the last month. Previously, the patient admitted that grain got into his eyes while the patient was working in the rice fields. After work, the patient felt a sensation of a lump in the eye as if a foreign object had entered the left eye, it felt very sore, the pain was constant (VAS 7/10), the vision in the left eye became suddenly blurry, and it became increasingly red. He had gone to the community health center but it could not be treated.

The patient denied a history of using glasses, using steroid eye drops, and a history of previous eye surgery. The patient works as a farmer and sometimes smokes 1 pack/day. similar complaints were previously denied. Family history of similar complaints was denied. Denied history of hypertension and diabetes mellitus. Allergies denied.

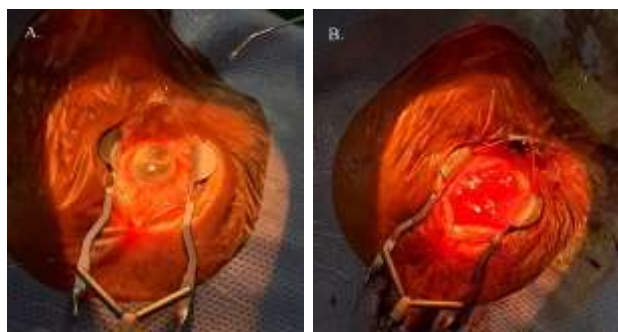
Vital signs examination revealed grade 2 hypertension (175/71 mmHg), other vital signs were normal. Visus OD reported 6/60 and OS 1/~LP. In the left ophthalmic status, there were mixed injection, conjunctival bulbar chemosis with corneal edema and infiltrative lesions at 1-6 o'clock in the temporal region and hypopyon in

COA in the anterior and posterior segment involvement with elevated digital IOP. The fundus examination was not performed.



**Figure 1.** Ocular Examinations with slit-lamp (a) Ocular dextra; (b) Ocular sinistra

From the history and ocular examination, the patient's diagnosis was delayed endophthalmitis due to severe corneal ulcer. The patient was given treatment in the form of vitamin C 2x50 mg, artificial tears 8x1 drops of ODS, and painkiller (mefenamate acid 3x500 mg). The patient is also educated and plans to undergo evisceration. Before surgery, the patient was given levofloxacin eye drops.



**Figure 2.** Evisceration OS (a) Pre-evisceration; (b) Post-evisceration

## DISCUSSIONS

Delayed treatment of corneal ulcers significantly worsens outcomes. Delayed endophthalmitis often arises from untreated corneal ulcers, allowing pathogens to penetrate the anterior chamber (Speaker et al., 1991). In this case, the month-long progression of symptoms suggests inadequate initial management, enabling microbial invasion and hypopyon formation. The patient sought care at a community health center initially but experienced treatment failure, likely due to inadequate antimicrobial coverage or misdiagnosis (Austin et al., 2017). Delays exceeding 7 days correlate with a 60% risk of perforation or endophthalmitis (Ung et al., 2019). Agricultural workers are at high risk of ocular trauma due to exposure to organic foreign bodies, such as grains, soil, and plant matter (Lockwood et al., 2015). In this case, the patient's occupation as a rice farmer directly contributed to the entry of a grain particle into his eye, triggering a cascade of

complications. Studies show that 30–40% of corneal ulcers in rural populations are linked to agricultural activities, often due to delayed care (Cabrera-Aguas et al., 2022).

Fungal keratitis, common in tropical climates and agricultural settings, is frequently caused by *Aspergillus* or *Fusarium* species (Lalitha et al., 2017). The patient's exposure to rice fields suggests potential fungal inoculation, although bacterial pathogens cannot be excluded. Fungal ulcers often present with dense infiltrates, hypopyon, and rapid progression, as seen here (Thomas & Kaliyamurthy, 2013). This results in the characteristic clinical signs of endophthalmitis, such as pain, redness, hypopyon, and vision loss (Durand, 2017). Hypopyon, a hallmark of severe intraocular inflammation, indicates breakdown of the blood-aqueous barrier and microbial invasion (Durand, 2017). Its presence in this case confirmed progression to endophthalmitis, necessitating aggressive intervention. Hypopyon in fungal endophthalmitis is typically sterile but may reflect immune response to fungal antigens (Klotz et al., 2000). Delayed or inadequate treatment can lead to irreversible damage to the retina, optic nerve, and other intraocular structures, potentially resulting in permanent vision loss (Kernt & Kampik, 2010). Limited access to advanced diagnostics, such as confocal microscopy or PCR, delayed pathogen identification in this case. Rural clinics often rely on clinical signs alone, leading to misdiagnosis of fungal vs. bacterial ulcers (Garg et al., 2016).

The patient's one-month delay in seeking specialized care likely exacerbated inflammation. Early symptoms, including foreign body sensation and pain, were mismanaged at the community health center, underscoring gaps in primary ocular trauma care. Corneal edema and media opacity precluded funduscopy, limiting diagnostic precision (American Academy of Ophthalmology [AAO], 2019). The patient's smoking history (1 pack/day) likely compromised local immunity. Smoking reduces tear film stability and impairs neutrophil function, increasing susceptibility to infections (Solberg et al., 1998). Smokers with corneal ulcers have a 2.5-fold higher risk of poor outcomes (Moss et al., 2000). Smoking is linked to delayed wound healing and poor prognosis in ocular trauma (Thompson et al., 1993). As a farmer in a resource-limited setting, the patient faced barriers to timely referral. Geographic and financial constraints often delay specialized care, worsening outcomes in rural populations (Ahmed et al., 2012). The patient's grade 2 hypertension (175/71 mmHg) may have impaired ocular perfusion, exacerbating ischemic damage in the inflamed eye (Wong & Mitchell, 2007). Chronic hypertension is linked to microvascular dysfunction, potentially delaying corneal healing (Klaassen et al., 2013).



Evisceration was warranted due to irreversible vision loss, unrelenting pain, and infection threatening orbital spread (Chaudhry et al., 2018). Studies report evisceration rates of 15–20% in endophthalmitis cases with panophthalmitis (Shah et al., 2020). The EVS guidelines advocate pars plana vitrectomy for patients with light perception-only vision (Endophthalmitis Vitrectomy Study Group, 1995). However, this patient's severe structural damage (corneal infiltrates, edema) rendered salvage impossible, necessitating evisceration—an outcome consistent with EVS-reported evisceration rates of 15–30% in delayed cases. While analgesics are palliative, their role is secondary to infection control. Mefenamic acid provided adjunctive relief but did not address the underlying pathology (AAO, 2019). The administration of artificial tears aims to mitigate oxidative stress and corneal dryness. Vitamin C was prescribed to support collagen synthesis, although evidence for its efficacy in infectious keratitis is limited (Pfister et al., 2001). Antioxidants may reduce oxidative stress in inflamed corneas, but their role remains adjunctive (Choi et al., 2015). Current guidelines recommend topical and systemic antibiotics for open-globe injuries. The community clinic's omission of antibiotics represents a critical deviation from standards, highlighting training gaps (Thompson et al., 1993). Levofloxacin's broad-spectrum coverage targets common pathogens, but resistance is increasing in agricultural regions (Kowalski et al., 2011). Subconjunctival or intravitreal antibiotics might have improved efficacy pre-surgery (Endophthalmitis Vitrectomy Study Group, 1995).

Community health workers must recognize “red flags” such as hypopyon and urgent referral indications (Tuft & Burton, 2020). Training programs in microbial keratitis management are critical (Upadhyay et al., 2001). This case underscores the need for rural eye care programs. Mobile clinics and farmer education on protective eyewear could reduce incidence (Limburg et al., 2008). In Southeast Asia, only 30% of agricultural workers use eye protection (Whitcher et al., 2001).

## CONCLUSION

Delayed endophthalmitis secondary to severe corneal ulceration remains a critical cause of preventable blindness worldwide, with disparities in incidence and outcomes shaped by socioeconomic and geographic factors. Emphasis on immediate referral, imaging, and antibiotic therapy is critical. Farmers require protective gear and education to mitigate risks. Evisceration, although radical, became inevitable due to advanced infection, highlighting the need for early specialist intervention. This case calls for multidisciplinary collaboration among policymakers, occupational health experts, and

ophthalmologists to reduce preventable blindness in high-risk populations.

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