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Cosmetic Contact Lens-Related Eye Infection Associated with Irreversible Monocular Vision Loss: A Contemporary Clinical Case Report

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Abstract

Cosmetic contact lenses (CCLs), also known as beauty or aesthetic lenses, are increasingly popular for altering eye color and enhancing appearance without the need for refractive correction. However, inappropriate use and poor hygiene practices may result in severe ocular morbidity. We present the case of a 28-year-old female healthcare professional who developed culture-negative keratitis with hypopyon after prolonged CCL wear and documented hygiene noncompliance. Despite the early administration of broad-spectrum antimicrobial therapy, the condition deteriorated rapidly, culminating in irreversible monocular vision loss with no light perception. Although microbiological findings were negative, the clinical profile was strongly suggestive of Acanthamoeba keratitis. A therapeutic tarsorrhaphy successfully reduced intraocular inflammation but was insufficient to restore corneal function or visual capacity.

This contemporary case highlights the preventable, vision-threatening complications of CCL misuse. It emphasizes diagnostic challenges in culture-negative keratitis, the potential role of Acanthamoeba infection, and the importance of public education, strict regulation, and sustainable preventive strategies.

INTRODUCTION

Cosmetic contact lenses (CCLs), globally known as decorative or plano lenses, are increasingly popular for their ability to modify eye color and enhance aesthetics without refractive correction. Although marketed as fashion accessories, they are associated with significant ocular hazards, especially when obtained without a prescription, fitted inappropriately, or worn with poor hygiene. Inadequate lens care reduces oxygen permeability, creating an anaerobic microenvironment that promotes bacterial, amoebic, and fungal colonization,[1] thereby escalating the risk of severe

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infections. Furthermore, pigments used in lens manufacturing may compromise corneal physiology, predisposing wearers to keratitis and vision-threatening complications.[2] Microbial contamination of CCLs is a well-documented risk, with *Pseudomonas aeruginosa* and *Acanthamoeba* spp. representing common causative agents of CCL–related keratitis. Moreover, fungal pathogens such as *Fusarium* and *Candida* species can adhere to lens surfaces and proliferate under warm, moist conditions, leading to severe fungal keratitis.[3] Such infections may progress rapidly, particularly in individuals who wear lenses overnight, use them for extended periods, or neglect appropriate cleaning protocols.

CCL wearers worldwide experience ocular discomfort in **23–94%** of cases, with an annual keratitis incidence of **2–4 cases per 10,000 users**. Bacterial pathogens account for approximately **90%** of infections, while fungal and Acanthamoeba species collectively represent **20–30%** of cases.[4] Although mild corneal infiltrates may resolve spontaneously, bacterial keratitis frequently requires intensive antimicrobial therapy. Notably, 20-30% of fungal and Acanthamoeba infections necessitate urgent penetrating keratoplasty to prevent irreversible vision loss. [4, 5] Among these, *Acanthamoeba* keratitis remains diagnostically challenging because its early clinical features overlap with other keratitides, and conventional cultures frequently yield false-negative results. Such diagnostic delays significantly increase the likelihood of irreversible corneal damage and permanent vision loss.[6] Poor hygiene practices, noncompliance with manufacturer guidelines, and unregulated lens sales are key contributing factors to these preventable outcomes.[7] Non-adherence to recommended CCL care protocols remains a significant and growing public health concern, particularly among young adults. Epidemiological data from the United States report noncompliance rates ranging from 50% to 91%, with university populations exhibiting a disproportionately higher prevalence of corneal infiltrative events and microbial keratitis.[8]

Despite increasing awareness, long-term clinical data on CCL-related infections resulting in irreversible vision loss remain scarce. This contemporary case report highlights the clinical presentation, progressive deterioration, and surgical management of a healthcare professional

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who developed severe CCL-related keratitis culminating in irreversible unilateral vision loss. It underscores the urgent need for stronger public health education, improved adherence to lens hygiene practices, and regulatory measures to mitigate preventable contact lens–related ocular morbidity and ensure sustainable outcomes.

Case Report

Clinical Presentation and Progressive Deterioration

A 28-year-old female healthcare professional presented to the ophthalmology clinic on 03 April 2025 with acute-onset unilateral conjunctivitis in the right eye, which developed within 24 hours (Figure 1). The symptoms followed prolonged use of cosmetic contact lenses (CCLs) during her routine 8-hour work shifts, coupled with documented noncompliance with hygiene protocols. Initial presentation included sudden ocular irritation and conjunctival redness, progressing to photophobia and mucopurulent discharge within 12 hours. Medical treatment consisted of antibacterial therapy, along with instructions for strict lens discontinuation. Despite compliant treatment, symptoms progressively worsened, with notable chemosis evident at the 48-hour follow-up.

Due to continued clinical deterioration of the R.E, the patient was referred to a tertiary ophthalmology specialty center on day three for advanced evaluation and management. On 04 April 2025, despite initial management, the patient presented to a tertiary teaching eye hospital due to severe ocular pain, marked photophobia, increasing conjunctival congestion, and declining vision. Examination revealed a severe right eye infection with corneal involvement, characterized by an epithelial defect, stromal haze, and surrounding corneal edema. Significant chemosis and mucopurulent discharge were also observed (Figure 2). The overall clinical picture was consistent with aggressive infectious, prompting urgent microbiological investigations and escalation of antimicrobial therapy.

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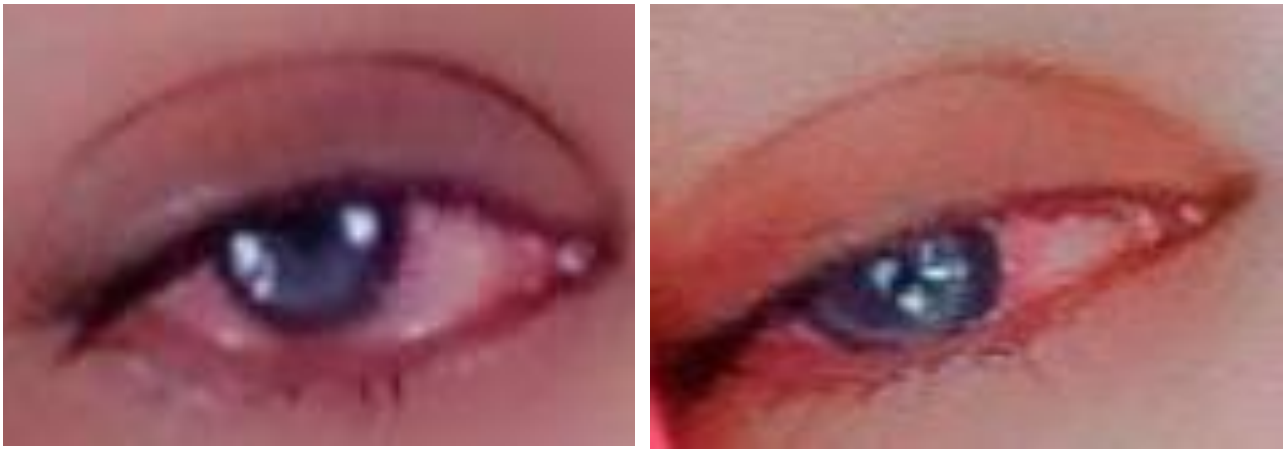

Figure 1. Right eye (R.E.) with acute-onset unilateral conjunctivitis

Figure 2. Severe R.E infection with corneal involvement and mucopurulent discharge

Diagnostic Assessment

Initial evaluation included corneal scrapings, which were subjected to microbiological examination and sent for culture and sensitivity testing. The culture results revealed no microbial, amoebic, or fungal growth, ruling out common pathogens. Ophthalmic examination identified a central corneal ulcer with an associated hypopyon in the R.E (Figure 3). Visual acuity was significantly reduced to 6/60 in the affected eye. Ocular B-scan ultrasonography, focused on the anterior segment, demonstrated corneal involvement without abnormalities in the optic nerve or posterior segment. Additionally, intraocular pressure (IOP) was elevated, with intraocular

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hypertension (IOH) measured at 25 mmHg. Based on clinical features—severe ocular pain disproportionate to clinical signs, stromal involvement, and poor response to standard antibacterial therapy—Acanthamoeba keratitis was suspected. This diagnosis was considered presumptive, relying on characteristic clinical findings in the absence of laboratory confirmation.

Surgical interventions

Following a comprehensive diagnostic evaluation, a therapeutic bandage containing a soft contact lens soaked in Hema Methafilcon-A (55% water) and immersed in 0.09% buffered saline was applied to the R.E for 24 hours. During this period, the patient experienced complete vision loss, no light perception (NLP) in the R.E, with IOH 25 mmHg. On 19 April 2025, she was admitted for a two-day inpatient stay. Subsequently, tarsorrhaphy—a surgical procedure in which the eyelids are partially or completely sutured to protect the cornea, limit exposure, and promote healing in severe keratitis, corneal ulcers, or lagophthalmos—was performed under general anesthesia, leaving a window for instillation of therapeutic eye drops (Figure 4). After two days, the tarso-bandage was removed, and the patient was discharged.

Figure 3. Central corneal ulcer with associated hypopyon in the R.E

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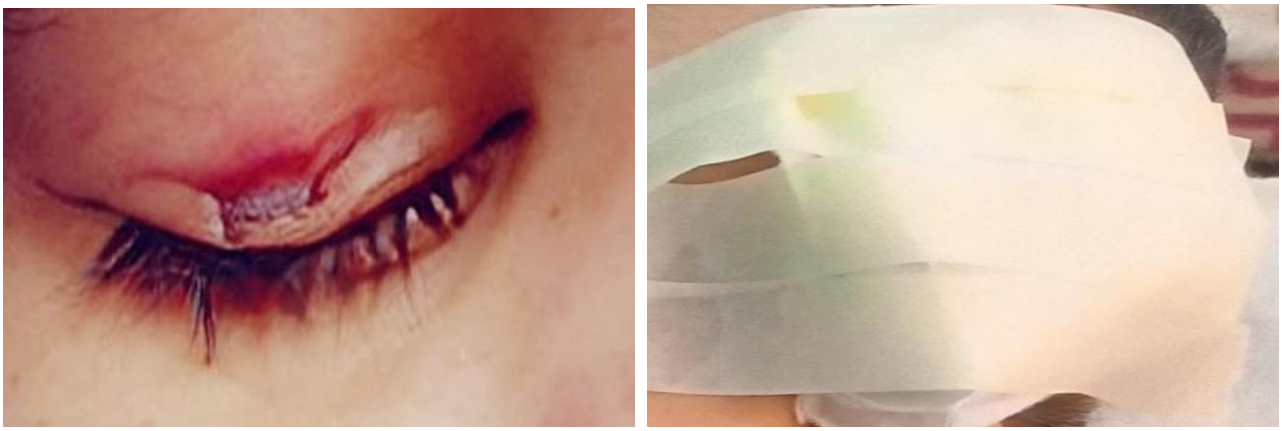

Figure 4. Tarsorrhaphy with window in the R.E

Pharmacological Management

Hospital Treatment:

Systemic Therapy:

- **Amikacin 33 mg/mL (Injection):** 1 mL intravenously every **hour**
- **Vancomycin 500 mg/100 mL (Injection):** intravenously every **hour**
- **Ceftazidime 50 mg/mL (Injection):** intravenously every **hour**
- **Voriconazole 200 mg (Tablet):** orally every **12 hours**
- **Sybelium (Itraconazole) 200 mg, Capsule:** orally every **12 hours**
- **Voltral (Diclofenac) 50 mg, Tablet:** orally every **8 hours**
- Acemox (Acetazolamide) 250 mg, Tablet: orally every 8 hours

Ocular Therapy (Eye Drops):

- **Atropine 1%:** instill in the affected eye every **4 hours**
- **Brolene 0.1%:** instill every **2 hours**
- **Fluconazole 0.3%:** instill every **4 hours**
- **Vancomycin 25 mg/mL:** instill every **8 hours**
- **Chlorhexidine 0.02%:** instill every **2 hours**
- **Vigamox (Moxifloxacin 0.5%):** instill every **8 hours**

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Discharge Medications:

Systemic Therapy (Oral):

- **Voriconazole 200 mg, Tablet:** orally every **12 hours** for **6 weeks**
- **Sybelium (Itraconazole) 200 mg, Capsule:** orally every **12 hours** for **6 weeks**
- **Voltral (Diclofenac) 50 mg, Tablet:** orally every **8 hours as needed** for **4 weeks**
- Acemox (Acetazolamide) 250 mg, Tablet: orally every 8 hours for 2 weeks, followed by once daily for 12 weeks

Ocular Therapy (Eye Drops):

- **Atropine 1%:** instill in the affected eye(s) every **8 hours** for **2 weeks**
- **Brolene 0.1%:** instill every **4 hours** for **4 weeks**
- **Fluconazole 0.3%:** instill every **6 hours** for **6 weeks**
- **Vancomycin 25 mg/mL:** instill every **8 hours** for **2 weeks**
- **Chlorhexidine 0.02%:** instill every **6 hours** for **3 weeks**
- **Vigamox (Moxifloxacin 0.5%):** instill every **8 hours** for **7 days**

Follow-up and Outcomes

During subsequent follow-up visits, progressive clinical improvement was observed. The hypopyon had resolved, confirming a reduction in intraocular inflammation, and IOP stabilized at 21 mmHg. At the two-month review, the tarsorrhaphy along with the internal sutures was removed (Figure 5). Two weeks later, the external eyelid sutures were also taken out, marking the completion of corneal surface rehabilitation. These measures restored the anatomical integrity of the ocular surface. However, despite successful structural recovery, the R.E showed no functional improvement, and vision remained NLP (Figure 6), indicating irreversible visual loss.

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Figure 5.hypopyon resolution and external suture removal

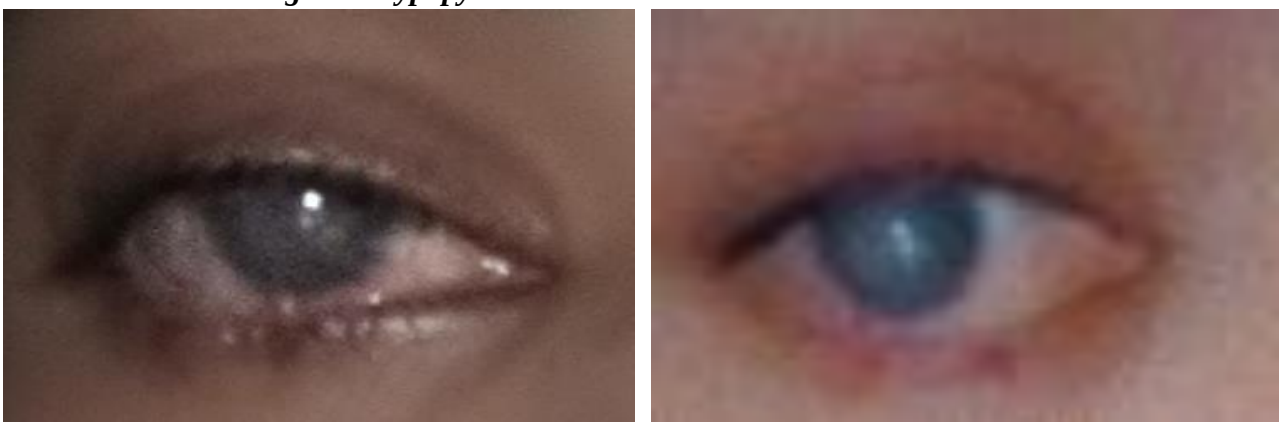

Figure 5. External suture removal with healed ocular surface; vision loss persisted in the R.E

Timeline of Therapeutic Interventions and Follow-Up

- 18 April 2025: Bandage containing a soft contact lens soaked in Hema Methafilcon-A (55% water) immersed in 0.09% buffered saline was applied to the right eye (R.E.) for 24 hours. During this period, the patient experienced a complete loss of vision in the R.E.
- 19 April 2025: Patient admitted for inpatient care for two days due to worsening ocular symptoms.
- After admission (19 April 2025): Tarsorrhaphy was performed under general anesthesia, leaving a window for instillation of therapeutic eye drops.
- 21 April 2025: Tarso-bandage removed and patient discharged.

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- **Follow-up (up to 16 June 2025):** Hypopyon in the R.E **had resolved**, indicating improvement in intraocular inflammation.
- Two-Month Follow-Up (23, June 2025): Tarsorrhaphy removed and internal sutures taken out.
- Two Weeks Later (07 July 2025): External eyelid sutures removed.

Discussion

This case represents the severe ocular consequences of cosmetic contact lens (CCL) misuse, culminating in irreversible vision loss despite appropriate interventions. The transition from acute conjunctivitis to culture-negative keratitis with hypopyon underscores the diagnostic challenges of atypical pathogens, particularly *Acanthamoeba* spp., which often evade detection by standard microbiological methods.[4] Paradoxically, the patient's role as a healthcare professional reflects a gap in preventive awareness. Her extended lens wear (>8 hours/day) and poor hygiene practices parallel behaviors reported in 50–91% of young adult users. The rapid progression despite antibacterial therapy aligns with reports of microbial keratitis advancing to stromal involvement within 72 hours.[5] Negative culture findings—documented in 15–30% of clinically confirmed *Acanthamoeba* keratitis cases—further highlight the importance of advanced diagnostics, including polymerase chain reaction (PCR) and in vivo confocal microscopy, particularly in refractory presentations.[7]

Although therapeutic tarsorrhaphy resolved intraocular inflammation, it could not reverse corneal damage, reflecting the poor prognosis of advanced CCL-related keratitis. This outcome aligns with epidemiological evidence indicating that a significant proportion of severe fungal or amoebic infections necessitate surgical intervention, frequently resulting in limited visual recovery.[8]

Ethical Considerations

This case report adhered to the principles outlined in the Declaration of Helsinki. The patient provided written informed consent for the publication of anonymized clinical details and associated images. All personal identifiers were omitted to protect privacy and confidentiality, while preserving the accuracy and integrity of the scientific content.

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Conclusion

This contemporary case highlights the severe consequences of CCLs, including permanent vision loss likely due to Acanthamoeba keratitis. The diagnostic challenge was compounded by negative microbiological findings, necessitating reliance on clinical indicators to guide urgent intervention. Despite surgical measures to preserve ocular structure, visual rehabilitation was unsuccessful. This underscores the critical need for awareness and early detection strategies in managing contact lens–related ocular infections for sustainable outcomes.

Recommendations

Stricter regulation of CCL sales, mandatory fitting by qualified professionals, and adherence to manufacturing standards are essential. Public education, particularly for young adults, should emphasize proper lens hygiene through screening, avoidance of CCL wear without authorized approval and certification, and timely medical consultation. Clinicians should remain vigilant for atypical pathogens even with negative cultures, and long-term surveillance should guide evidence-based prevention strategies.

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