

Patient with longstanding mpox keratitis successfully treated with topical Cidofovir 0.5% eye drops: a case report

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Case Report

Keywords: mpox, Clade Ib, keratitis, corneal ulceration, blindness, cidofovir, topical antiviral, compassionate use

Posted Date: April 21st, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-9461464/v1>

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Additional Declarations: The authors declare no competing interests.

Abstract

Background: Mpox-associated ocular disease, including keratitis, is an emerging, vision-threatening complication. Management is challenging because no anti-viral therapy has yet been approved to prevent permanent corneal scarring or blindness.

Case presentation: We describe a 43-year-old female Ugandan health worker who acquired a Clade Ib mpox infection in July 2025 following occupational exposure during clinical examination of a patient with confirmed mpox attending a health facility in Kampala, Uganda. She developed severe ulcerative keratitis, with persistent epithelial defects and progressive stromal involvement despite standard-of-care treatment, including topical trifluridine and supportive therapy.

Diagnostic confirmation of mpox was made by real-time polymerase chain reaction (PCR) from lesion swabs, and Clade Ib was identified. The keratitis remained active and vision-threatening for more than four months after symptom onset. Because of ongoing deterioration and high risk of irreversible vision loss, the treating team initiated topical cidofovir 0.5% ophthalmic drops under emergency compassionate use. Subsequent improvement included epithelial closure, decreased stromal inflammation, and visual recovery after 8 weeks of treatment and has since remained stable for to date.

Conclusions: Topical cidofovir 0.5% may provide therapeutic benefit in severe, refractory mpox keratitis when trifluridine fails, and when no other effective, approved alternative exists. Controlled clinical evaluation and structured compassionate-use frameworks for cidofovir are urgently warranted given the risk of permanent blindness in mpox keratitis.

Background

Mpox virus infection can involve the ocular surface via autoinoculation or direct exposure, leading to conjunctivitis, blepharitis, keratitis, corneal ulceration, and permanent scarring (1). The prevalence and spectrum of ocular involvement appear to vary by viral clade and transmission context (2, 3).

Clade I mpox is mainly a zoonotic disease that is occasionally transmitted to hunters and people living in remote forest areas (3). In a cohort of 216 patients with Clade I mpox in the Democratic Republic of the Congo (DRC) (2007 to 2011) 8.3% developed ocular manifestations, including conjunctivitis, eyelid lesions, eyelid swelling, eye pain, orbital swelling, keratitis, and corneal staphyloma (4).

During the 2022–2023 Clade II / IIb global outbreak of, driven mainly by sexual transmission among men who have sex with men in non-endemic settings, ocular involvement was uncommon (< 1%), typically limited to mild conjunctivitis or keratitis (5).

Since late 2023, a distinct Clade Ib lineage (5) has driven a large regional epidemic in eastern DRC and neighboring countries, with subsequent international spillover. This Clade Ib outbreak has been associated not only with heterosexual transmission (5, 6) but also with severe ocular disease, including ulcerative keratitis, corneal perforation, and irreversible blindness in otherwise immunocompetent adults (2). In systematic ophthalmic screening of mpox patients in South Kivu Province, DRC, conjunctivitis occurred in roughly one third of patients, ulcerative and non-ulcerative keratitis were each observed in several percent of cases, and permanent visual disability including complete loss of functional vision was documented (2). These field data underscore that ocular mpox is not a rare cosmetic complication but a cause of major, lifelong disability in active Clade Ib transmission zones.

Current Centers for Disease Control and Prevention (CDC) guidance recommends urgent ophthalmologic evaluation and topical trifluridine for mpox keratitis, sometimes combined with systemic tecovirimat in severe disease (1). Trifluridine is a thymidine analogue licensed for herpes simplex keratitis and historically used in ocular vaccinia (7). However, prolonged trifluridine use may cause corneal epithelial toxicity, and progression of mpox keratitis has been described despite early initiation (8).

No topical antiviral is specifically approved for mpox keratitis. Cidofovir, a cytosine nucleotide analogue that inhibits viral DNA polymerase (9), is licensed systemically for cytomegalovirus (CMV) retinitis (10) and has shown potent anti-orthopoxvirus activity in animal models (11, 12). In rabbit models of adenoviral keratoconjunctivitis, topical cidofovir (0.5–1%) reduced viral load, shortened shedding, and improved corneal outcomes (13–15). Small pilot studies of adenoviral keratoconjunctivitis in humans suggested clinical benefit but also dose-dependent local toxicity at higher concentrations (16–17). While cidofovir is not routinely used for adenoviral keratitis, most adenoviral infections are self-limiting; the benefit-risk balance may differ in mpox keratitis, where corneal destruction can lead to permanent blindness.

Tecovirimat has been proposed as systemic anti-viral treatment for ocular mpox (1). However, randomized trial data from DRC indicate that systemic tecovirimat did not shorten time to lesion resolution in clade I mpox, underscoring the need for effective ocular-targeted options (18).

We report the first documented case (to our knowledge) of successful compassionate use of topical cidofovir 0.5% ophthalmic drops in severe, protracted Clade Ib mpox keratitis case unresponsive to trifluridine.

Case presentation

A 43-year-old female Ugandan health worker in Kampala, Uganda, developed bilateral severe keratitis following occupational exposure to mpox in July 2025.

Exposure and systemic illness.

She had examined a patient with laboratory-confirmed mpox infection during the Clade Ib outbreak affecting eastern DRC and neighboring countries. She had only used basic protective gear (mask, gloves and sanitizer). The clinical examination in close proximity with the patient had been prolonged. She also touched the patient's file to record her findings without gloves. No sexual or other high-risk exposures were identified, suggesting occupational acquisition through ocular contamination or autoinoculation.

Seven days post-exposure, she developed fever, malaise, and multiple vesiculopustular skin lesions on the face and upper extremities that evolved through the classic mpox stages (papular → vesicular → pustular → crusted) (Fig. 1). A swab from a cutaneous lesion and a conjunctival swab tested positive for mpox virus DNA by real-time PCR at the National Reference Laboratory; sequencing confirmed Clade Ib mpox virus. Test for HIV TPHA, VDRL, Herpes simplex types 1 and 2 were all negative.

Figure 1. Initial presentation of multiple vesiculopustular skin lesions on both lower and upper limbs

Ocular presentation.

Approximately three weeks after systemic onset, she developed marked ocular pain, photophobia, tearing, and decreased vision in both eyes. Slit-lamp examination, showed bilateral severe conjunctival hyperaemia and multifocal corneal epithelial defects with underlying stromal haze and early ulceration consistent with mpox keratitis, more severe in the left eye. There were no retinal lesions or signs of posterior uveitis. Best-corrected visual acuity (BCVA) in the more affected eye (left) declined to counting fingers (CF); the right eye visual acuity was 6/18.

Initial management followed current guidance: intensive topical trifluridine, preservative-free lubricants, and prophylactic topical antibiotics to prevent bacterial superinfection (1). Topical corticosteroids were avoided because of concern for exacerbating viral replication and corneal thinning in orthopoxvirus keratitis (1).

Clinical course prior to cidofovir.

Over the next several weeks, the corneal epithelial defects persisted and deepened, and stromal infiltrates enlarged despite ongoing trifluridine. Trifluridine was then tapered and stopped because of concern for cumulative epithelial toxicity. The patient continued intensive lubrication and topical antibiotic coverage. A bandage contact lens was placed in

her left eye. Nevertheless, about 4 months after onset (November 2025), the left cornea still showed dense stromal haze, persistent ulceration with irregular edges, and progressive scarring threatening the visual axis. BCVA remained severely reduced at CF, and there was a clear risk of irreversible, sight-limiting opacification (Fig. 2A).

Compassionate-use cidofovir.

Given the imminent risk of permanent vision loss, and in the absence of any approved, effective treatment, topical cidofovir 0.5% ophthalmic drops [preservative-free, q.i.d. initially; then increased to 6 times daily] was started under emergency compassionate use.

Because of the emergency context and the threat of irreversible blindness, it was decided to initiate topical cidofovir treatment before ethics committee approval could be obtained. However, the treating institution was informed, and the intervention and rationale were documented in the medical record. Written informed consent was obtained from the patient both for (i) off-label compassionate use of cidofovir and (ii) publication of pseudonymized clinical details and images.

Response to cidofovir.

Within seven days of initiating topical cidofovir 0.5%, the patient reported reduced ocular pain and photophobia. Serial slit-lamp examinations showed progressive re-epithelialization of the corneal defects, decreased stromal edema, and gradual clearing of the visual axis (Fig. 2B-C). By week 6, BCVA in the left eye had improved to 6/9, and the ulcerative process had stabilized without perforation. Her right eye had smaller lesions with remarkable improvement within two weeks of starting cidofovir.

No immediate sight-threatening local toxicity attributable to cidofovir (such as severe epithelial sloughing or scleral thinning) was observed, although mild punctate epitheliopathy at the drop sites was noted and managed conservatively with lubrication.

As of 4th November, 2025, the cornea demonstrated a residual paracentral stromal scar but no active ulceration. The patient had functional vision sufficient for clinical duties with protective eyewear, and further keratoplasty was not immediately required.

Figure 2. Sequential slit-lamp photographs of right and left eye showing progressive improvement of severe mpox keratitis after initiation of topical cidofovir 0.5%: (A) baseline before cidofovir: large epithelial defect and dense stromal infiltrates; (B) week 2 epithelial closure and reduced infiltrates; (C) week 6 decreased haze; (D) final visit quiescent cornea. V/A = visual acuity

Discussion

This case highlights several clinically relevant points:

Clade Ib may be uniquely vision-threatening.

During the 2022–2023 Clade II outbreak, ocular involvement was considered rare (< 1%) and often limited to conjunctivitis, periocular lesions, or mild keratitis in largely immunocompetent adults living in high-resource settings (1). In contrast, data from the current Clade Ib epidemic in eastern DRC and surrounding regions point to a substantially higher burden of aggressive corneal disease, including ulcerative keratitis, stromal melting, and permanent blindness, even in previously healthy, immunocompetent adults (2). This difference may reflect virologic factors of Clade Ib, inoculation route (direct ocular contamination during close contact care, possibly with high viral load), or delays in access to ophthalmic care in outbreak settings.

Standard-of-care therapy is limited and may fail.

CDC guidance recommends urgent ophthalmic consultation, topical trifluridine for keratitis, and consideration of systemic antivirals such as tecovirimat for severe mpox, particularly when vision is threatened (1). Trifluridine has in vitro activity against orthopoxviruses (7) and is the historically first-line agent for ocular vaccinia (1). However, prolonged trifluridine is epitheliotoxic, and corneal ulcers may continue to enlarge despite treatment (8). In addition, tecovirimat; although widely used systemically during mpox outbreaks, has not reliably prevented ocular deterioration in Clade I/Clade Ib infections and may have limited corneal penetration (18). These realities leave clinicians with an urgent problem: a potentially blinding corneal infection for which no approved, reliably effective ophthalmic antiviral exists.

Cidofovir is biologically plausible and clinically promising for mpox keratitis.

Cidofovir is a nucleotide analogue active against multiple DNA viruses, including orthopoxviruses. Topical cidofovir has shown potent antiviral effects in experimental adenoviral (13–15) and feline (19) and canine (20) herpes keratoconjunctivitis models, reducing viral titers, shortening shedding, and improving corneal clinical scores. Small pilot human studies using 0.2–1% cidofovir (sometimes alongside topical cyclosporine) suggested shorter disease course and less stromal haze but also reported concentration-dependent epithelial toxicity (16–17). These data, taken together with the extremely high morbidity of mpox keratitis, provide a strong mechanistic and clinical rationale for topical cidofovir as a rescue therapy when trifluridine fails, especially under monitored compassionate use.

In our case, initiation of compounded cidofovir 0.5% corresponded with re-epithelialization of persistent corneal ulceration, reduction in stromal inflammation, and partial visual

recovery after four months of progressive, sight-threatening disease that had not responded to trifluridine. While causality cannot be proven from a single uncontrolled case, the temporal association and magnitude of response are compelling.

Patient Perspective.

The patient expressed satisfaction with vision recovery and the opportunity to contribute to medical knowledge through publication of her experience recovery and the opportunity to contribute to medical knowledge through publication of her experience.

Ethical and public health implications.

This case illustrates the ethical challenges of managing severe mpox keratitis in outbreak settings. Rapid access to compassionate-use antivirals is essential when delay risks blindness. Such situations are likely to recur in regions where Clade Ib mpox is now endemic, healthcare workers are repeatedly exposed, and ophthalmic complications are common and severe. Protection of pregnant women and infants is an additional concern. Clade Ib infection during pregnancy has now been associated with vertical transmission across all trimesters and with adverse pregnancy outcomes, including foetal loss and neonatal infection (21). Severe ocular mpox in neonates and infants has not yet been systematically described, but based on the corneal pathology seen in adults, there is urgent need to anticipate, prevent, and treat potentially blinding congenital or perinatal mpox keratitis.

In short, mpox keratitis is no longer an exotic curiosity. It is an occupational hazard for frontline clinicians, a public health threat for patients in Clade Ib transmission zones, and a potential cause of preventable blindness.

Conclusions

This case demonstrates apparent clinical benefit of topical cidofovir 0.5% eye drops in severe, longstanding, vision-threatening mpox keratitis unresponsive to trifluridine. The patient's cornea re-epithelialized, and partially cleared after cidofovir, averting imminent irreversible blindness.

Given (i) the absence of an approved, consistently effective therapy for severe mpox keratitis, (ii) the high proportion of patients with disabling visual sequelae in Clade Ib outbreaks; and (iii) the biologic plausibility and observed clinical response to cidofovir in this case, we propose:

- Development of standardised compassionate-use protocols for topical cidofovir in refractory mpox keratitis;

- Expedited ethics approval pathways in outbreak settings where delaying therapy risks permanent blindness;
- Prospective clinical trials to establish optimal dosing, safety monitoring, and efficacy endpoints for cidofovir and other candidate antivirals in mpox-associated ocular disease.

Abbreviations

- BCVA

Best-corrected visual acuity

- CF

Counting fingers

- CDC

Centers for Disease Control and Prevention

- CMV

Cytomegalovirus

- DRC

Democratic Republic of the Congo

- PCR

Polymerase chain reaction

- MPXV

Monkeypox virus

- AI

Artificial intelligence

- Ocular MPXV

Mpox-associated ocular infection

Declarations

Ethics approval and consent to participate

Ethics approval for the compassionate use of topical cidofovir 0.5% eye drops for mpox keratitis was obtained from the Ethics committee of the Antwerp University Hospital and the University of Antwerp (Project ID 8153-Edge N/A-BUN N/A). The study adhered to the tenets of the Declaration of Helsinki.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images

Availability of data and materials

All data generated or analyzed during this study are included in this published article

Competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' contribution

JO-S: Conceptualization; Clinical management; Visualization; Writing: original draft; Supervision.

DM: Conceptualization, review and editing, contextualization of outbreak epidemiology

ND: Contextualization of outbreak epidemiology, manuscript review

RCL: Manuscript review and editing

IA: Manuscript review and editing

RC: Writing: review & editing; Contextualization of outbreak epidemiology. All authors read and approved the final manuscript.

Declaration of generative AI use.

During preparation of this manuscript, the authors used GPT-5 Thinking (OpenAI) to improve organization, and enhance clarity and readability. After this assistance, the authors reviewed, revised, and approved the text and take full responsibility for its integrity and accuracy.

Acknowledgements

We thank the clinical team at Georgina Eye Hospital, Kampala, for their dedicated care and meticulous documentation, and the patient for her courage and permission to share this experience. We thank Dr Piet Nowe and Dr Jeroen van Kampen for suggesting that cidofovir 0.5% could be useful for treating mpox keratitis.

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Figures



Figure 1

Initial presentation of multiple vesiculopustular skin lesions on both lower and upper limbs

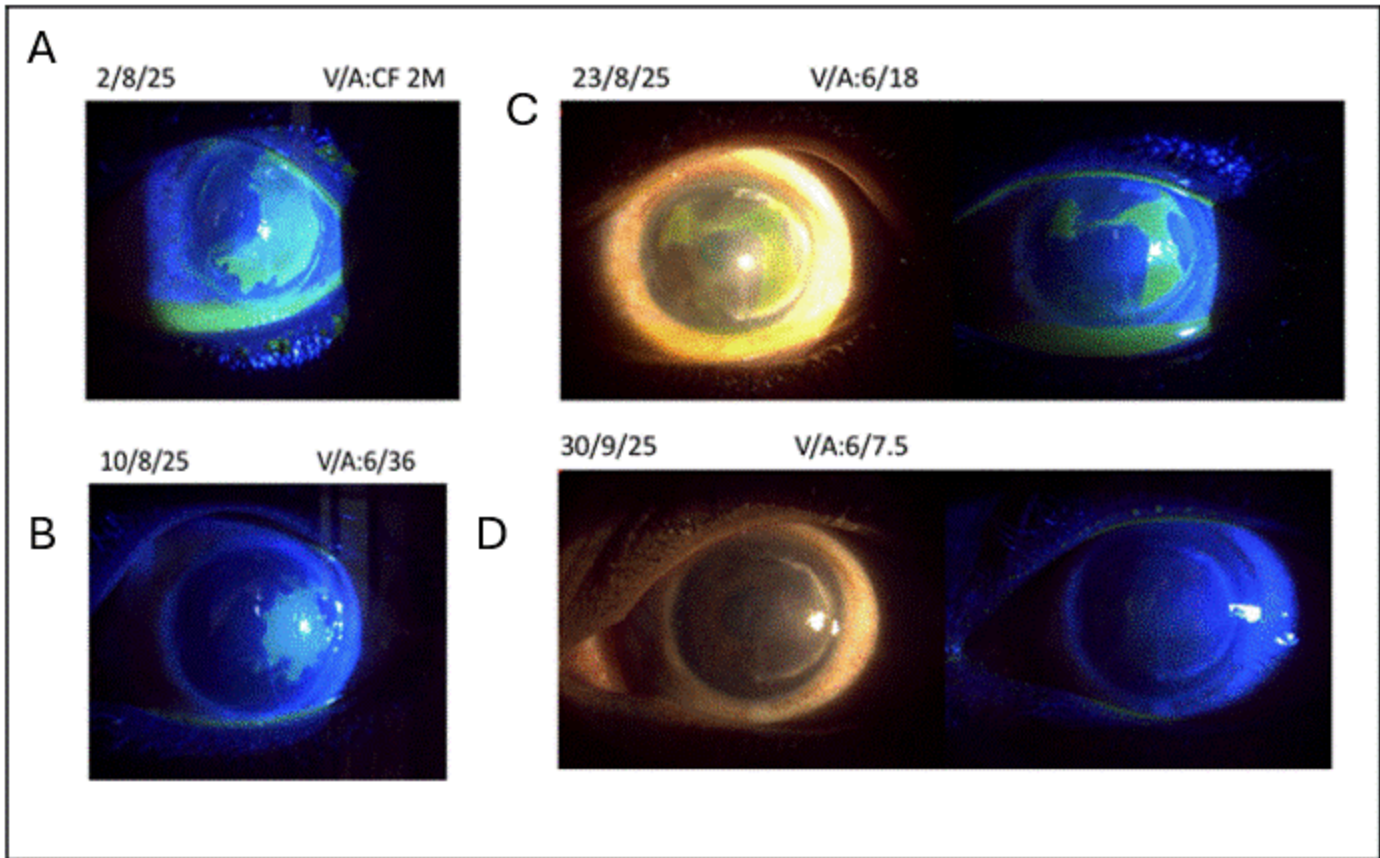


Figure 2

Sequential slit-lamp photographs of right and left eye showing progressive improvement of severe mpox keratitis after initiation of topical cidofovir 0.5%: (A) baseline before cidofovir: large epithelial defect and dense stromal infiltrates; (B) week 2 epithelial closure and reduced infiltrates; (C) week 6 decreased haze; (D) final visit quiescent cornea. V/A = visual acuity