

Clinical Images

Microsporidial superficial punctate keratitis: A clinical image highlighting diagnostic pitfalls

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ABSTRACT

Microsporidial epithelial keratitis is an unrecognized cause of superficial punctate keratitis in tropical low- and middle-income countries, especially after recreational or accidental contact with monsoon-related floodwater. In this vignette, a 29-year-old immunocompetent woman presented with sudden unilateral ocular pain, photophobia, and foreign-body sensation. Slit-lamp microscopy showed dense, coarse “stuck-on” punctate epithelial opacities with diffuse fluorescein staining over an otherwise clear stroma, raising suspicion for microsporidial epitheliopathy. Corneal scrapings examined by modified acid-fast staining revealed numerous oval spores with a characteristic waist-band morphology, confirming microsporidial epithelial keratitis. The patient received topical therapy without corticosteroids, achieving rapid symptomatic relief, complete epithelial restitution, and full visual recovery within 1 week. This case underscores microsporidia as a climate-sensitive environmental pathogen of the ocular surface and illustrates how simple, microscopy-based diagnostics can deliver high yield in resource-constrained settings, enabling steroid-sparing, vision-preserving management strategies.

Keywords: Keratitis, Ocular microsporidiosis, Superficial punctate keratitis

Microsporidial epithelial keratitis is an uncommon but increasingly recognized cause of superficial punctate keratitis in tropical low- and middle-income countries, where heavy monsoon rainfall and flooding promote exposure to contaminated surface water.^[1,2] The infection often clinically mimics adenoviral or herpetic epithelial keratitis, predisposing patients to empirical topical steroid therapy and delayed laboratory evaluation, with important implications for antimicrobial and diagnostic stewardship in resource-limited settings.

A 29-year-old immunocompetent woman presented with acute-onset left eye pain, redness, photophobia, and foreign-body sensation within 24 h of accidental exposure to stagnant floodwater. Visual acuity was 20/20 in the right eye and 20/30 in the left, with normal intraocular pressure and a quiet anterior chamber. Slit-lamp examination revealed multiple fine-to-coarse punctate epithelial elevations over the central and paracentral cornea displaying a classic “stuck-on” appearance with diffuse epithelial lesions on cobalt blue illumination with fluorescein staining [Figure 1a and b]. The anterior segment optical coherence tomography horizontal section showed multiple hyper-reflective epithelial lesions without stromal edema or deeper involvement [Figure 1c]. There were no subepithelial infiltrates, keratic precipitates, or signs of uveitis.

Corneal scrapings were obtained before initiating treatment and examined by potassium hydroxide mount and modified acid-fast staining. Microscopy demonstrated numerous 1–3 μ m

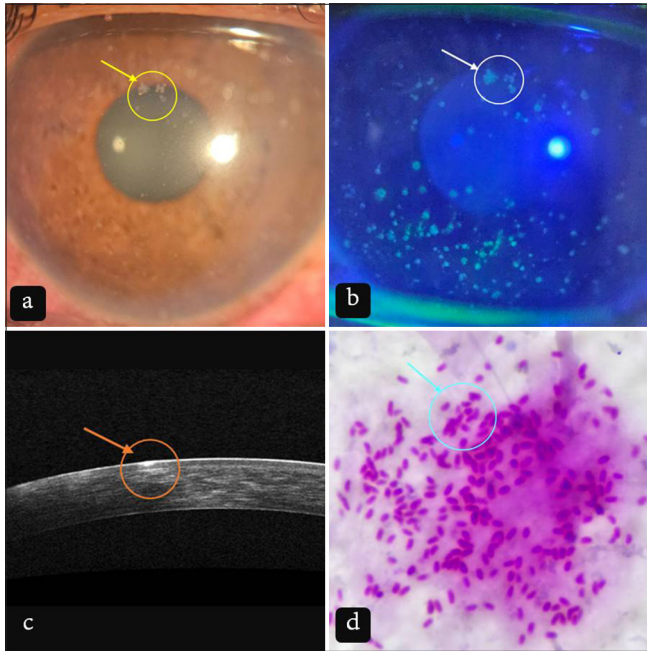


Figure 1: Left eye images of microsporidial keratoconjunctivitis in a 29-year-old immunocompetent woman. (a) Slit-lamp photograph (diffuse illumination) showing dense, coarse “stuck-on” punctate epithelial opacities with characteristic light reflex. (b) Slit-lamp photograph (cobalt blue illumination with fluorescein) demonstrating diffuse fluorescein staining of the punctate epithelial lesions. (c) Anterior segment optical coherence tomography horizontal section showing epithelial thickening and surface irregularity without stromal edema or deeper involvement. (d) Modified acid-fast stain of corneal scraping ($\times 1000$ oil immersion). Numerous reddish-pink 1–3 μm oval spores with a prominent belt-like central waist arranged in dense aggregates on the epithelial surface.

reddish-pink oval spores with a prominent waistband morphology arranged in dense aggregates on the epithelial surface on 1% modified acid-fast stain ([Figure 1d], magnification $\times 1000$), typical of ocular microsporidia, although this technique does not allow species-level identification.^[1] The patient was started on topical fluconazole 0.3% eye drops 6 times daily along with ciprofloxacin 0.3% and preservative-free carboxymethylcellulose lubricants, and topical steroids were strictly avoided. Symptoms improved within 72 h, with complete epithelial healing and restoration of baseline visual acuity at 1 week, and no recurrence at 3-month follow-up.

Microsporidia are obligate intracellular, spore-forming parasites that have emerged as important zoonotic and environmental pathogens, with ocular infections linked to exposure to contaminated water, soil, and animal reservoirs. Multiple series from Southeast Asia describe a clear temporal association between microsporidial keratoconjunctivitis

and the monsoon season, highlighting the role of rainfall and humidity in facilitating transmission through recreational or accidental water exposure.^[3] Despite this, microsporidial keratitis remains underrecognized and is frequently misdiagnosed as viral keratoconjunctivitis or toxic keratopathy due to its coarse, superficial punctate epithelial lesions with minimal stromal involvement.^[4]

This case underscores the need to consider microsporidial keratitis as a key differential diagnosis in patients presenting with acute superficial punctate keratitis following water exposure in endemic regions, especially when the clinical picture is atypical for adenoviral infection or fails to respond to empirical therapy. Systematic use of simple microscopy-based approaches particularly modified acid-fast staining can provide rapid, definitive diagnosis, and guide targeted therapy while avoiding inappropriate topical steroid use. Pan-microsporidial polymerase chain reaction (PCR) was not undertaken in this case, representing a limitation, as such assays can confirm infection and provide speciation but are not widely accessible and are typically reserved for atypical presentations or deep stromal involvement.^[1,5] In routine practice in endemic regions, modified acid-fast staining with characteristic morphologic features provides sufficient diagnostic certainty for clinical management. Strengthening access to these techniques and increasing clinician awareness of the characteristic “stuck-on” epithelial pattern can enhance diagnostic stewardship and help preserve vision in the context of climate-driven surges in environmental ocular infections.

Ethical approval: The Institutional Review Board approval is not required.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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