A Case Report of Successfully Treated Microsporidial Keratitis at a Tertiary Care Centre in Western India

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ABSTRACT:

A 43 year old male patient, who was initially diagnosed with chronic viral stromal keratitis but was refractory to conventional treatment, underwent a corneal biopsy on the basis of strong clinical suspicion. The biopsy revealed the presence of multiple microsporidial spores. Treatment with Polyhexamethylene Biguanide (PHMB) and Chlorhexidine showed poor response. A therapeutic penetrating keratoplasty under the cover of Fluoroquinolones led to successful resolution of the infection. To our knowledge, this is the first case of microsporidial keratitis being reported from our region.

Keywords: Fluoroquinolones, Microsporidiosis, Penetrating keratoplasty, Stromal keratitis.

Introduction:

Microsporidia are spore-forming, obligate intracellular eukaryotic parasites. The eye is affected through direct inoculation of infectious material [1]. Microsporidial keratitis usually has two forms, a superficial punctate keratoconjunctivitis seen in immunocompromised patients and contact lens wearers, and a deep stromal keratitis that resembles herpetic disciform keratitis and is seen in immunocompetent patients [1, 2, 3, 4]. The stromal keratitis has a slowly progressive course [3.] An effective antimicrobial agent has not yet been established for the treatment of microsporidial stromal keratitis. Various agents including Polyhexamethylene Biguanide (PHMB), Chlorhexidine, Albendazole, Fumagillin, Itraconazole and Fluoroquinolones, have been tried with varied success. Hence the definitive treatment is surgical excision of the infected tissue and penetrating keratoplasty using healthy donor cornea. Complications like chronicity, vascularized scar formation, corneal ulceration leading to perforation and endophthalmitis can make this disease entity sight threatening and requires accurate diagnosis and cure.[1]

Case Report:

A 43 year old male presented with complaints of redness, watering, photophobia, minimal whitish discharge and diminution of vision in right eye (RE) of five days duration [3]. He gave recurrent history of such episodes since five years preceded by episodes of acute rhinitis [4, 5, 6, 7]. The patient was previously diagnosed with viral stromal keratitis and treated with acyclovir eye ointment and topical corticosteroids in the form

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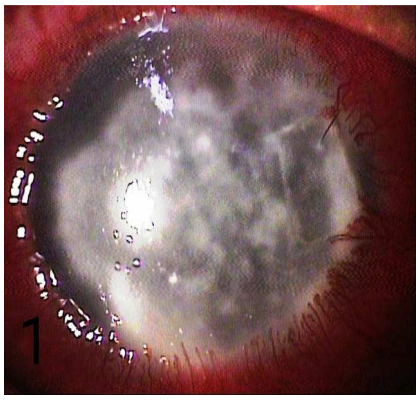
of Fluorometholone (0.5%) eye drops, and later Prednisolone acetate (1%) eye drops and systemic Acyclovir. [3, 6]. Symptoms improved mildly with treatment but recurred on stopping the medication. He had no history of systemic comorbidities or high-risk behaviour. Serology was negative for HIV I and HIV II antibodies.

Visual acuity in RE at presentation was HM+ PL+ PR 4+ and in left eye (LE) was 6/9 with spectacle correction. Mild lid edema was noted. Slit-lamp Biomicroscopy revealed both diffuse and circum-corneal conjunctival congestion. An eccentrically located, poorly circumscribed area of variably sized granular lesions in the cornea, spanning 7.5 mm x 9 mm was seen. Irregularity of the surface epithelium, stromal edema, and multiple granular clumps and confluent plaques on the endothelium were seen [Figure 1]. Fluorescein staining showed diffuse mottling over the surface of the lesion. Anterior chamber was well-formed, of normal depth and showed moderate flare-cells. The pupil was semi-dilated and fixed. Intraocular pressure was slightly elevated digitally. LE was found to be normal. Considering the past response to antiviral treatment, the patient was started on topical Difluprednate (0.5%) hourly, Atropine (1%) three times a day, Timolol (0.5%) twice a day, Carboxymethylcellulose (CMC 0.5%) eye drops one hourly and oral Acyclovir (400mg) five times a day. As the clinical picture led us to a strong clinical suspicion of microsporidial keratitis, confirmation through corneal biopsy was planned for these stromal lesions which were not likely to yield microbiologically through corneal scrapping. Corticosteroids were tapered with clinical improvement.

Reference for excision lamellar corneal biopsy for smear culture and histopathological examination was made to avail expert microbiological opinion. This revealed plenty of microsporidial spores in the smear from the biopsy [Image 1]. A large graft Therapeutic Penetrating Keratoplasty (TPK) with good quality tissue was advised. While awaiting suitable donor tissue, the antiviral treatment was stopped and treatment with PHMB (0.02%), Chlorhexidine (0.02%) and lubricating drops was begun. Supportive treatment in the form of cycloplegic (Cyclopentolate 0.5%) eye drops and anti-glaucoma medication (Timolol 0.5%) was administered. Only marginal relief was obtained. Symptoms and signs resurfaced on tapering of the topical steroid.

Image 1: Slit-lamp photograph showing multiple variably-sized granular lesions in the stroma with corneal edema. The sutured flap of corneal biopsy is seen nasally.



Before the TPK surgery, systemic co-morbidity in the patient was ruled out. Haematological investigations, Chest X-Ray and an Echocardiogram, done as part of the routine pre-operative assessment were within normal limits. Risks of the procedure involved, necessity of stringent postoperative care and chances of recurrence of infection in the graft tissue after surgery, were explained. Surgery was done under strict asepsis. On table the corneal involvement was measured with callipers and found to be 7.5 mm x 9 mm. Combined trephine and free-hand dissection was done to ensure adequate excision of all the area with the granular lesions. Edges were soggy. The button was sent for histopathological examination (HPE) and parasitological evaluation, which confirmed the biopsy findings. The host bed was coated with viscoelastic. The graft corneal button was then trephined and cut to a size of 9.5 mm, and placed on host corneal bed which was custom-dissected beforehand. Cardinal sutures at 3 and 9 o clock position were taken. A crescent-shaped margin was removed at superior aspect of graft for perfect apposition with the oval defect created by removal of the infected host cornea. Further strengthening of graft-host junction (GHJ) required 27 sutures in all. Viscoelastic was washed from anterior chamber; air bubble was injected to reattach a small area of Descemet's membrane (DM) detachment. Surface wash with gentamycin (20mg/0.5ml) was given while rotating sutures. Patient was advised, postoperatively, to lie in supine position or left lateral position considering the area of DM detachment. Intramuscular Gentamycin injections for 3 days (80 mg/ 2 ml 8 hourly) and oral Ciprofloxacin (500 mg twice a day) for 5 days were given. Oral Acetazolamide (250 mg four times a day) served to maintain intraocular pressure.

On first postoperative day, vision was counting fingers near face. The GHJ was well-apposed and sutures were in place. Anterior chamber was formed with moderate flare and plenty of cells. Preservative-free Moxifloxacin and CMC eye drops, both 1 hourly, with Tropicamide-Phenylephrine eye drops at bedtime were started. On third post-operative daymild lid edema, graft edema and membrane in pupillary area, and loose suture at 6 o clock were noted. Difluprednate (0.05%) in 1:9 dilution/ six times a day and Timolol (0.5%) eye drops twice a day with oral antihistaminic at bedtime were added. Graft edema persisted. Wrinkling and separation of DM in lower temporal quadrant was noted. Two weeks postoperatively, a mild disparity of graft-host junction, at the site of the single 6 o'clock loose suture removal, was observed. This was possibly due to the soggy host edge which may have failed to give adequate support, though the GHJ was well apposed previously. Wound strengthening was done with revision of inferior sutures and placement of additional sutures, from 6 to 9 o clock and at 12 o clock. In later course, loose suture removal was done, as required. Fluoroquinolone and Corticosteroid eye drops eye drops were continued. Subsequently the graft cleared, with decreasing anterior chamber cells and flare. Vision gradually improved to CF at 2m and vision with pinhole was 6/18(P). At two months follow-up, the graft was clear [Image 2], with best corrected vision of 6/36. At eight months follow-up, the patient underwent cataract extraction of the right eye. A Toric intraocular lens was implanted. On the first post-operative day, corrected visual acuity was 6/9 [Image 3]. Patient continued to do well on subsequent follow-up.

Image 2: Slit-lamp photograph showing the clear graft following penetrating keratoplasty at two months follow-up.

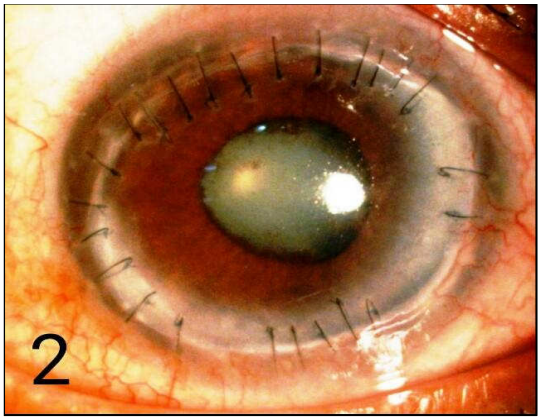
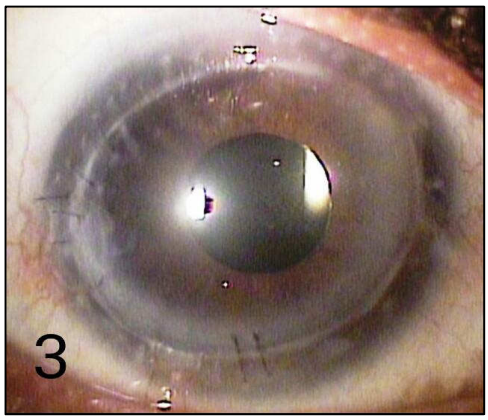


Image 3: Final rehabilitation, after cataract surgery.



Discussion:

Multiple cases of ocular microsporidiosis have been reported from various geographic areas [1, 4, 8, 9, 10]. This is the first report of microsporidial keratitis from Western India. Microsporidial keratitis mimics viral stromal keratitis [2]. Patients may be treated for extensive periods of time with antivirals and topical corticosteroids with poor results [3, 9, 10]. Approach to the above case was guided by strong clinical suspicion, based on corneal findings on SLE, and poor response to antiviral treatment. On confirmation of presence of microsporidia by corneal biopsy, TPK with large, good quality graft was done [2, 3, 6]. This involved meticulous excision of diseased cornea, and customization of size and shape of graft tissue, with both trephine and free-hand dissection. HPE of specimen established the diagnosis. Under cover of topical broad-spectrum Fluoroquinolones such as Moxifloxacin and Ciprofloxacin instead of PHMB (0.02%), post-operatively, graft showed no recurrence of disease. Although PHMB and Chlorhexidine have been successfully used to treat microsporidial keratitis, the poor response to these drugs in this case and successful use of Fluoroquinolones as monotherapy supports the conclusions drawn by previous reports [3, 4, 8]. Access to microbiological support is crucial to accurate diagnosis [1, 2, 3, 4, 5]. Well planned surgical management and stringent post-operative care along with appropriate anti-microbial drug therapy will keep the graft free from recurrence of disease [2, 10]. This case report may guide both the diagnosis and treatment regimes in cases with a similar clinical picture.

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