

Case Report

A Rare Case Of Acanthamoeba Endophthalmitis Following Cataract Surgery

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Abstract *Acanthamoeba* are ubiquitous microorganisms and are considered opportunistic pathogens in humans. *Acanthamoeba* infection involving the vitreous, retina or choroid is uncommon and is mostly seen following corneal infections or corneal transplant surgeries. (1,2) We present a rare case of post-operative endophthalmitis due to *Acanthamoeba* in a 30-year old gentleman who underwent cataract surgery in his left eye. The initial routine microscopy and culture reports were negative for bacteria and fungus, and inspite of empirical treatment for endophthalmitis, the patient's ocular condition worsened. Following multiple vitrectomy surgery and repeated negative culture as well as polymerase chain reaction (PCR) for bacteria, virus and fungi, PCR for *Acanthamoeba* species was reported positive. On starting the patient on intravitreal and topical voriconazole along with oral ketoconazole the patient's eye condition improved with moderate recovery of visual acuity. To the best of our knowledge, this is the first case reported of *Acanthamoeba* endophthalmitis following cataract surgery.

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Introduction

A 30-year old gentleman presented to us with sudden diminution of vision, redness and pain in the left eye following cataract surgery. He had been operated for posterior subcapsular cataract 12 days earlier, and he had loss of vision 2 days after cataract surgery. He was diagnosed to have acute post-operative endophthalmitis and underwent vitreous biopsy, pars plana vitrectomy with intraocular antibiotics the following day. Before presenting to us, in view of worsening of eye condition, the intraocular lens was removed and he received multiple intraocular antibiotic injections (IOAB). The microbiology smear and culture did not show any organism. He was using topical antibiotics, steroids along with oral steroids.

At presentation to us, the best-corrected visual acuity in the right eye was 20/30, N6 and hand motions in the left eye. The right eye showed central posterior subcapsular cataract with normal posterior segment. Anterior segment in the left eye showed diffuse microcystic corneal edema with Descemet's folds, and cellular reaction of grade 3. The view of the posterior segment was not clear. The integrity of the posterior capsule could not be verified on slit lamp examination. B-scan revealed low reflective dot echoes with attached retina (Figure 1a). In view of persistent infection and negative culture reports, vitreous biopsy along with IOAB (vancomycin 0.1 ml+ ceftazidime 0.1 ml) was performed. On post-operative day 3, his vision improved to 20/160 with aphakic correction, and media clarity improved as disc and first order vessels were seen. The patient was advised topical ciprofloxacin and fortified vancomycin, along with topical and oral steroids. Microbiology reports for smear as well as culture were negative. Polymerase chain reaction (PCR) report was also negative for eubacterial and panfungal genome. On day 10, the patient complained of sudden drop in vision to hand motions with severe pain and redness.

Anterior segment showed cells 3+ with diffuse stromal edema along with cellularity, and trace hypopyon in the anterior chamber (Figure 1 b). B scan revealed multiple dot echoes in vitreous cavity with attached retina. Ultrasound biomicroscopy (UBM) revealed an intact posterior capsule (Figure 1c). In view of persistent infection, we performed vitreous lavage with posterior capsulectomy, and silicone oil injection. PCR reports was negative for bacteria, fungi, herpes simplex 1 and 2, cytomegalovirus, varicella zoster virus and Mycobacterium tuberculosis. PCR was positive result for *Acanthamoeba*, which made us to revisit previous slides of Gram and calcofluor-white where on careful microscopic examination few *Acanthamoeba* cysts having characteristic double-walled structure with inner wall were identified. In view of this, the patient received intravitreal voriconazole half dose (25 microgram / 0.05 ml) along with voriconazole eye drops every 2 hourly and oral ketoconazole tablet 200 mg twice a day. At 1 week, there were no vitreous exudates, but presence of thick fibrinous membrane in the pupillary area (Figure 1d). The intraocular pressure recorded was 35 mm of HG and hence a yag peripheral iridotomy (PI) was done to relieve pupillary block. At 3 weeks, the vision had improved to 20/320 with complete resolution of exudates, but there was a corneal scarring, shallowing of anterior chamber, along with thick fibrous membrane in pupillary area. At week 6, oral antifungal treatment was stopped and patient was maintained on topical voriconazole 2 times/day with topical prednisolone eye drops 2 times/ day. At month 2, the infection had completely resolved (Figure 1e). At last follow up at 1 year, after silicone oil removal vision improved to 20/250 in the left eye. Fundus examination at this visit showed attached retina with preretinal membrane at superior arcade (Figure 1f) with no evidence of any recurrence of infection.

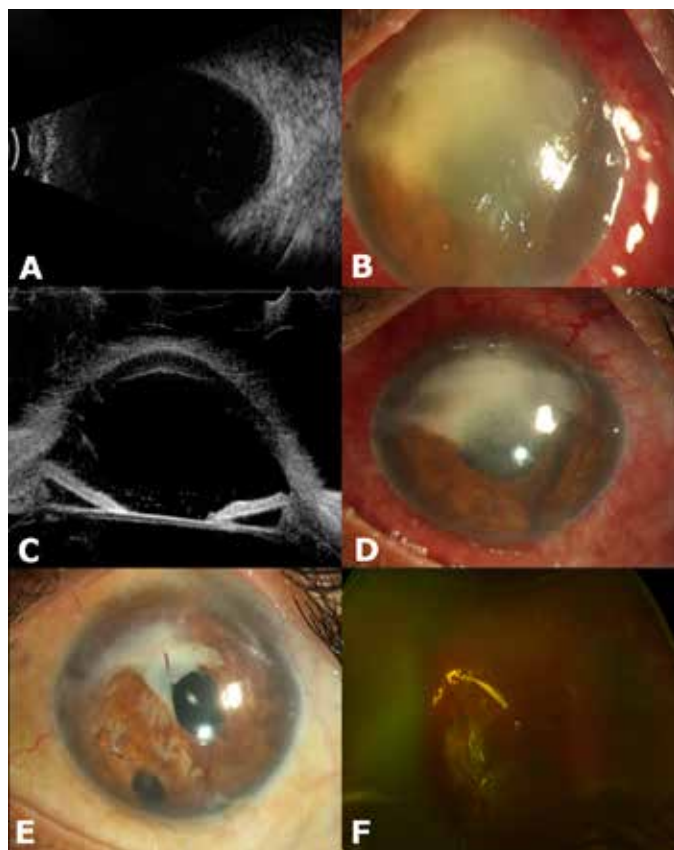


Figure A : B scan showing few low reflective vitreous dot echoes with attached retina

Figure B : Slit lamp (diffuse illumination) showing diffuse stromal edema with exudates seen in superior quadrant along with trace hypopyon.

Figure C : Ultrasound biomicroscopy showing presence of increased corneal thickness with intact posterior capsule.

Figure D : Slit lamp (diffuse illumination) showing resolving corneal infection with scarring and thick fibrin membrane in pupillary area with superiorly shallow anterior chamber.

Figure E : Corneal scarring with central opening in pupillary area with patent iridectomy inferiorly.

Figure F : Wide field colour fundus photograph showing attached retina with silicone in situ.

Discussion

Acanthamoeba are ubiquitous microorganisms present in soil and water; and are considered opportunistic pathogens in humans. In India, Acanthamoeba accounts for 2% of all cases of culture-positive corneal ulcers at tertiary eye care centers³ and most developing countries where contact lenses are not popular, trauma and exposure to contaminated soil and water is the most common predisposing factor for corneal infections.^{4,5} Acanthamoeba infection directly involving the posterior segment of the eye is not reported earlier however if affected it is usually secondary to associated infective keratitis or following corneal procedures like full thickness penetrating keratoplasty, lamellar kaeratoplasty or radial keratotomy.^{1,2}

Davis et al⁶ reported a case of Acanthamoeba keratitis followed by endophthalmitis. In this case, vitreous cultures were positive for Acanthamoeba, but no organisms were identified in the posterior segment on histopathology of the enucleated globe. Mammo Z et al⁷ reported a patient with

Acanthamoeba keratitis, who despite intensive therapy, progressed to sclerokeratitis and endophthalmitis requiring therapeutic enucleation. To our knowledge, our case is the first case of Acanthamoeba endophthalmitis following cataract surgery.

The organism was not detected by routine smear and culture done for identification of bacteria and fungi. The initial PCR too was negative for bacteria and fungi. After multiple vitrectomies and for eubacterial genome, panfungal genome, mycobacterium tuberculosis, cytomegalovirus and herpes virus being negative, we were surprised a positive PCR for Acanthamoeba. As we never suspected Acanthamoeba, we reexamined to note all previous microscopy slides of Gram and calco-flour white by an expert microbiologist to look for Acanthamoeba cyst. We could identify Acanthamoeba the typical double-walled cyst which confirmed our diagnosis. A study by Parischa et al⁸ has shown that sensitivity of PCR was the same as that of smear (87.5%) in the identification of Acanthamoeba parasite. The source of infection in our case could be possibly due to exposure to contaminated water or some trivial trauma following cataract surgery.

Topical biguanides with or without the addition of diamidines are the main stay of medical management of this disease. At our center, a combination of PHMB 0.02% and chlorhexidine 0.02% is used as the primary therapy. There are reports on successful treatment of infection with the addition of voriconazole in patients not responding to conventional anti-Acanthamoeba treatment.⁹ in our case, the infection was limited to the posterior segment and hence biguanides were not considered. Following treatment with intravitreal and topical voriconazole eye drops, and oral Ketoconazole for 2 months, the patient responded with complete resolution of infection.

To our knowledge this is the first reported case of Acanthamoeba endophthalmitis following cataract surgery. Early diagnosis still remains a challenge. Our case highlights the need to be aware of this rare entity particularly in acute low-grade post-operative endophthalmitis where routine microscopy and culture reports are negative for bacteria and fungus, and where the patient's condition is worsening despite treatment.

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