*Pseudomonas aeruginosa* endophthalmitis masquerading as chronic uveitis

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A 65-year-old male presented with decreased vision in the left eye of 15-day duration after having undergone an uneventful cataract surgery 10 months back. He had been previously treated with systemic steroids for recurrent uveitis postoperatively on three occasions in the same eye. B-scan ultrasonography showed multiple clumplike echoes suggestive of vitreous inflammation. Aqueous tap revealed *Pseudomonas aeruginosa* sensitive to ciprofloxacin. The patient was treated with intravitreal ciprofloxacin and vancomycin along with systemic ciprofloxacin with good clinical response. Even a virulent organism such as *P. aeruginosa* can present as a chronic uveitis, which, if missed, can lead to a delay in accurate diagnosis and appropriate management.

**Keywords:** Chronic uveitis, intravitreal ciprofloxacin, postoperative endophthalmitis, *Pseudomonas aeruginosa*

Postoperative infection is a devastating complication of any surgery. Likewise, in the eye, any intraocular surgery can give rise to postoperative endophthalmitis with significant morbidity. The incidence worldwide is less than 0.1% for postcataract surgery endophthalmitis and 0.09% in India.[1] Although the microbiological spectrum for postoperative endophthalmitis is varied, causative organisms for chronic endophthalmitis include coagulase-negative staphylococci, *Propionibacterium acnes*, *Propionibacterium arachnioides*, *Corynebacterium acnes*, *Propionibacterium arachnioides*, *Corynebacterium parvum*, *Aspergillus* spp., and so on.[2] The causes for a chronic, low-grade infection or late presentation could include low inoculum levels and/or low pathogenicity combined with the innate ocular defenses against infection.[3] Hence, an infection should always be ruled out before treating it as chronic uveitis. We report a case of delayed-onset postoperative endophthalmitis secondary to *Pseudomonas aeruginosa*, a virulent organism, which masqueraded as chronic uveitis.

**Case Report**

A 65-year-old male presented with decreased vision in the left eye of 15-day duration which was gradual in onset, progressive in nature, and associated with pain and redness. The patient had undergone an uneventful cataract surgery in another center, 10 months back, with good visual recovery. He had had similar episodes during the past 4–5 months and had been treated with steroids (topical and systemic) elsewhere for chronic uveitis. As his symptoms worsened with steroids this particular time, the patient was referred to us. He had lost vision in his right eye due to trauma 20 years back.

On examination of the left eye, his vision was perception of hand movements. Anterior segment findings included circumcorneal congestion and mild corneal haziness with keratic precipitates and pigments over the endothelium. The anterior chamber showed cells and flare 2+. The pupil was irregular in shape and dilated. The posterior chamber intraocular lens (IOL) was *in situ* with pigment dispersion on the IOL and yellowish exudates behind it. Details of the fundus were not visualized except for a yellow glow [Fig. 1]. B-scan ultrasonography showed multiple dot like echoes with low to moderate reflectivity in the vitreous suggestive of inflammatory debris [Fig. 2]. All other systemic investigations were normal except for a low hemoglobin level of 8mg/dL.

An aqueous tap was done and subjected to potassium hydroxide (KOH), Gram stain, and culture/sensitivity, followed by intravitreal antibiotics (ceftazidime 2.25 mg/0.1 mL and vancomycin 1 mg/0.1 mL). Aqueous tap revealed *P. aeruginosa* sensitive to ciprofloxacin. The patient was then started on systemic (tablet 750 mg twice a day) and intravitreal ciprofloxacin (0.2 mg/0.1 mL). As there was clinical improvement with this treatment regimen, repeat intravitreal injections of ciprofloxacin and vancomycin were given on two occasions subsequently. Once the exudates cleared, the patient was restarted on systemic steroids with one dose of intravitreal dexamethasone (400 μg/0.1 mL). The patient improved symptomatically and on the last follow-up at two months, his vision was counting fingers at three meters. Examination of the fundus revealed clearing media with the disc and third-order blood vessels well seen [Fig. 3].

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uveitis and treated with steroids. However, worsening of symptoms raises a suspicion of infection warranting further diagnostic and therapeutic procedures.[4]

_Pseudomonas_ species causing acute-onset postoperative endophthalmitis is well known. However, delayed-onset or chronic postoperative endophthalmitis secondary to _P. aeruginosa_ is rare. There have been reports of low-virulence species of _Pseudomonas_ causing late-onset endophthalmitis.[5,6] The virulence in this organism is both multifactorial and combinatorial, the result of a pool of pathogenicity-related genes that interact in various combinations in different genetic backgrounds.[7]

Reports of the clinical use of intravitreal ciprofloxacin are limited. Our patient showed good response to the same with no adverse effects. One study has shown good availability of active drug when injected intravitreally either alone or in combination with vancomycin.[8] It is also suggested to be a good alternative to ceftazidime and amikacin.

In a ‘one-eyed’ patient, one has to consider the risk-benefit ratio of early surgical intervention for endophthalmitis. Patients more often than not need IOL explantation as well. Intravitreal ciprofloxacin is effective in treating late-onset postoperative endophthalmitis secondary to _P. aeruginosa_ obviating the need for immediate surgical intervention.

In conclusion, we report a unique case of chronic postoperative _P. aeruginosa_ endophthalmitis that was initially diagnosed as chronic uveitis. Intravitreal and systemic ciprofloxacin therapy produced a good visual outcome.

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**Discussion**

Rare bacterial or fungal infections are most often the cause for delayed-onset, chronic, recurrent endophthalmitis which occur following cataract surgery. This type of chronic endophthalmitis is initially often misdiagnosed as chronic uveitis and treated with steroids. However, worsening of symptoms raises a suspicion of infection warranting further diagnostic and therapeutic procedures.[4]

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