Case Report

Chronic Post-operative Endophthalmitis caused by Acinetobacter Baumannii: A Case Presentation

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ABSTRACT

Introduction: Endophthalmitis caused by Acinetobacter baumannii (A. baumannii) has been rarely reported in literature.

Case: A case of chronic post-operative endophthalmitis (CPE) from A. baumannii is reported here. A 50-year-old hypertensive male did not gain good vision following implantation of a three-piece +20.0 diopter intraocular lens (IOL) in his left eye (LE). Five months later, he was referred to retina services with gross diminution of vision and whiteness of the cornea. An ultrasound B scan was done to assess the posterior segment. The pars plana vitrectomy could not be done due to corneal opacity. The specimen obtained from the anterior segment wash was sent for culture and sensitivity.

Observation: The left eye (LE) had perception of light with an inaccurate projection of rays in all quadrants. On slit lamp examination, the cornea showed oedema, Descemet's membrane folds, peripheral vascularisation and a blood-stained endothelium. The intraocular pressure (IOP), keratometry and axial length were 12 mmHg, 41.5 x 45.75 and 22.25 mm respectively. The ultrasound B scan showed a well-defined vitreous opacity with moderate to high echoes in the posterior segment pointing towards vitritis with IOL and cortical lens matter drop. There was choroidal detachment (CD) in one quadrant. The anterior segment specimen grew colonies of A. baumannii sensitive to co-trimoxazole, minocycline, and levofloxacin. Oral levofloxacin 750 mg once a day for ten days was prescribed, but his ocular condition did not improve. The IOP reduced to 8 mmHg, and a repeat ultrasound showed serous CD in two quadrants. Even with systemic steroids, inflammation did not resolve fully and LE had only perception of light one month later.

Conclusion: A. baumannii should be kept as a differential diagnosis in cases of CPE. As it is multidrug resistant and therapeutic options are limited, endophthalmitis caused by this bacterium has a poor prognosis.

Key words: Acinetobacter baumannii; chronic post-operative endophthalmitis; co-trimoxazole; levofloxacin; minocycline; post-operative endophthalmitis.

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INTRODUCTION

Endophthalmitis caused by *Acinetobacter baumannii (A. baumannii)* has been rarely reported in literature. The organism is a gram-negative coccobacillus, strictly aerobic, short stout, capsulated non-motile, which is usually a free-living saprophyte in soil and water, and causes opportunistic infection in predisposed individuals (Bitirgen et al., 2013; Chen et al., 2008; Joly-Guillou, 2005). Predisposing factors include prosthesis, endotracheal intubation, intravenous catheters, and prior antibiotic therapy in severely ill patients (Joly-Guillou, 2005). The genus causes a wide range of systemic infections, including pneumonia, endocarditis, meningitis, peritonitis, osteomyelitis, skin infection and urinary tract infection (Joly-Guillou, 2005), but the only ocular involvement reported include post-operative endophthalmitis (Talreja et al., 2014; Chen et al., 2008) and orbital cellulitis (Lai et al., 2023).

Here a case of chronic post-operative endophthalmitis (CPE) caused by A. *baumannii* in an immunocompetent individual following a complicated cataract surgery in his left eye (LE) is reported.

CASE REPORT

A 50 years hypertensive male underwent an uneventful phacoemulsification with intraocular lens (IOL) implantation in right eye (RE) followed by good gain of vision. He took 10 mg oral dihydropyridine calcium channel blocker once a day for controlling his blood pressure. His personal and family history was unremarkable for any other ocular or systemic disease including diabetes, coronary artery disease, tuberculosis, or breathlessness.

One month later, he underwent cataract surgery in his LE, but he had a posterior capsular rent, so a three-piece +20.0 D IOL was implanted. However, he did not gain useful vision. Five months later, he was referred to retina services with gross diminution of vision and whiteness of the cornea.

The systemic examination showed that he had a blood pressure of 130/80 mmHg, and the electrocardiogram showed a normal sinus rhythm. All laboratory investigations were within normal limits, including blood sugar measuring 117 mg/dl, glycosylated haemoglobin 5.5%, serum glutamic-oxaloacetic transaminase 16.1 units/litre, serum glutamate pyruvate transaminase 24.3 units/litre, blood urea 28 mg/dl, serum creatinine 0.8 mg/dl, serum triglyceride 234 mg/dl, blood cholesterol 222 mg/dl, and high-density lipoprotein cholesterol 46 mg/dl.

The ocular examination showed that his RE was pseudophakic with the best corrected visual acuity (BCVA) of LogMAR 0 (20/20; 6/6), while LE had only perception of light with inaccurate projection of rays in all quadrants. On slit lamp examination, the LE cornea showed oedema, Descemet's membrane folds, peripheral vascularisation, and blood-stained endothelium. The anterior chamber appeared shallow with blood clots in it. Due to corneal condition, the iris, pupil, lenticular area, retina, and optic nerve could not be examined. The intraocular pressure (IOP) was 18 mmHg and 12 mmHg; the keratometry was 42.5 x 42.75 and 41.5 x 45.75; and the axial length was 23 mm and 22.25 mm in RE and LE, respectively. The ultrasound B scan of LE showed a well-defined round opacity in the vitreous with moderate to

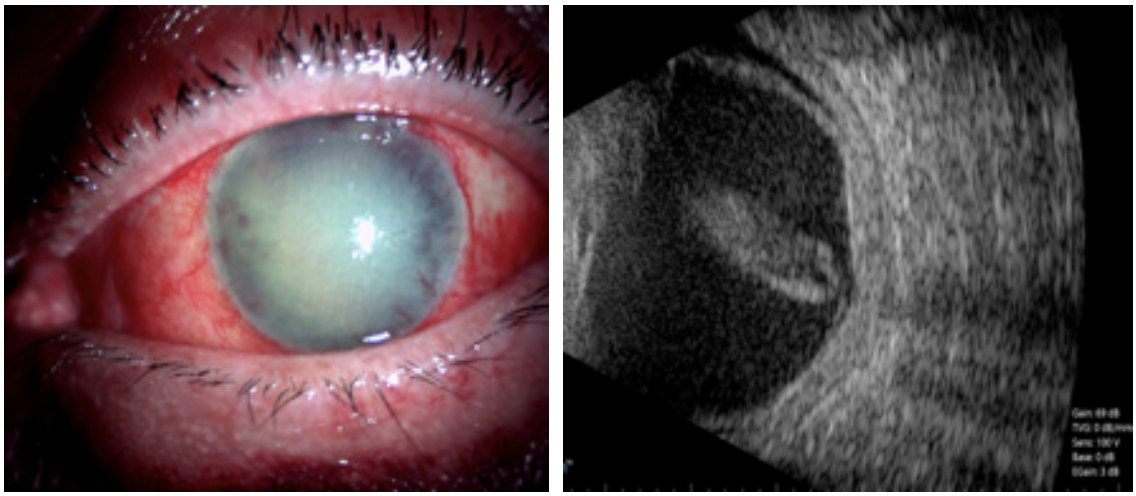

Figure 1a and 1b: Left eye of the patient showing corneal oedema, Descemet's membrane folds, peripheral vascularisation, and blood-stained endothelium; ultrasound B scan showed a well-defined vitreous opacity with moderate to high echoes in the posterior segment pointing towards intraocular lens with cortical lens matter drop.

high echoes in the posterior segment pointing towards IOL drop with cortical lens matter drop, vitritis and/or vitreous haemorrhage; there was choroidal detachment (CD) in one quadrant (Figures 1a, 1b).

We took the patient for an anterior chamber wash and possible anterior vitrectomy. The pars plana vitrectomy (PPV) could not be planned due to media opacity, but some vitreous lavage was done. However, very little clearing of pupillary area could be achieved. The limbal incision was sutured with 10-0 nylon. At conclusion, intracameral injections of 0.1 ml vancomycin (1 mg/0.1 ml) and 0.1 ml ceftazidime (2.25 mg/0.1 ml) were given. Additionally, the patient was given topical fortified vancomycin (50 mg/mL) and fortified ceftazidime (100 mg/mL) eight times a day along with oral ciprofloxacin 750 mg twice daily for 10 days.

The specimen obtained from anterior chamber wash and vitreous lavage was examined using Gram's stain and potassium hydroxide (KOH) stain. These did not show any organism, probably due to a lower infective load or insufficient sampling as PPV could not be done. Subsequent culture on 5-10% sheep blood agar and MacConkey's agar at 37^0C after overnight incubation in ambient air showed growth identified to be *A. baumannii* by standard conventional biochemical reactions and further confirmed by Matrix Assisted Laser Desorption Ionisation-Time of Flight Mass Spectrometry (MALDI-TOF MS) (Figure 2a). The Sabouraud dextrose agar did not show any growth. On performing antimicrobial susceptibility testing with Clinical and Laboratory Standards Institute (CLSI) guidelines, colonies were found sensitive to co-trimoxazole, minocycline, and levofloxacin but resistant to ceftazidime,

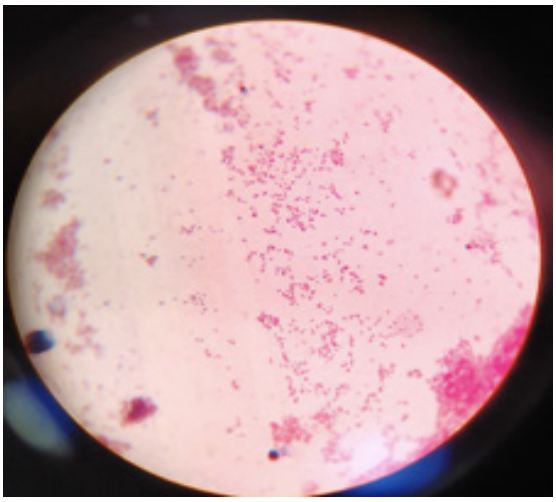

Figure 2a: Gram-negative coccobacilli identified as *Acinetobacter baumannii*.

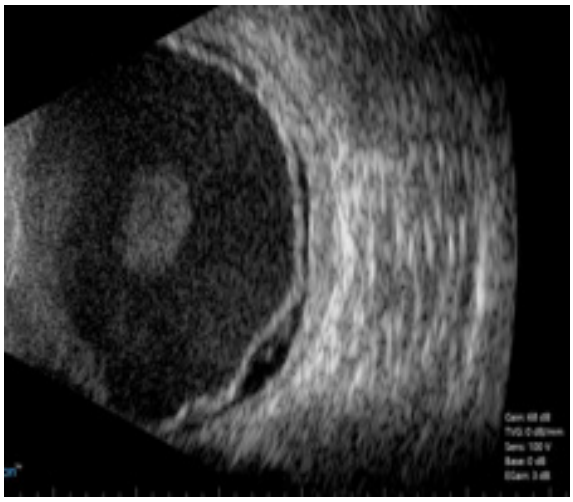

Figure 2b: Ultrasound B scan of left eye showing serous choroidal detachment and opacities in the posterior segment.

vancomycin, piperacillin-tazobactam, ciprofloxacin, amikacin, imipenem, and gentamicin. Hence, the patient was prescribed oral levofloxacin 750 mg once a day for 10 days.

The patient's ocular condition, including vision, did not improve. His IOP reduced further and measured 8 mmHg. The repeat ultrasound B Scan of LE showed serous CD and opacities in the posterior segment (Figure 2 b). Even with systemic steroids inflammation did not resolve fully and LE had only perception of light one month later. The anterior and posterior segment of RE were unremarkable.

DISCUSSION

A. *baumannii* is emerging as one of the most common causes of hospital-acquired infection globally.

Bitirgen et al., (2013) described a case of an immunocompetent 76-years-old male presenting with an acute PE having onset within 2-3 days of an uneventful phacoemulsification with IOL implantation in his RE. The patient had conjunctival hyperaemia, keratopathy, IOP of 12 mm Hg, obscured fundus details, and vitreous opacities with an attached retina on ultrasonography. Intravenous meropenem (1 g three times daily) along with 23 g PPV for removing vitreous opacities caused resolution of symptoms and improvement in vision to LogMAR 0 (6/6; 20/20).

Roy et al., (2013) retrospectively analysed four cases of A. *baumanni* endophthalmitis with an early presentation. One case had trauma, while others developed infection after cataract surgery. The vitrectomy specimens showed that the bacteria were sensitive to ciprofloxacin but tested resistant to ceftazidime. As one eye got phthisical, one had to be eviscerated, one developed retinal detachment, and only one eye achieved vision of 20/200 with clear media, the authors concluded that endophthalmitis from this bacterium has a poor visual and anatomical outcome.

Chen et al., (2008) reported one case of endogenous endophthalmitis in a 67-year-old hypertensive female with heart disease. These authors described another case of A. *baumannii* endophthalmitis in a 27-year-old male following keratoplasty. The use of intravitreal vancomycin, amikacin, and imipenem could not save their eyes.

Lai et al., (2023) reported a case of post-septal superior orbital cellulitis, caused by A. *baumannii* and *A. calcoaceticus,* in a 73-year-old woman, who had rheumatoid arthritis. Anterior orbitotomy with incisional biopsy of the right superior orbital lesion and treatment with intravenous amoxicillin and clavulanic acid for seven days resolved the disease condition.

A. *baumannii* can survive under a wide range of environmental conditions, persist on surfaces for extended periods (Larson, 1981) and is multidrug-resistant (Bitigren et al., 2013) due to its ability to up-regulate (Peleg et al., 2008). Lai et al., found the bacteria to be sensitive to ciprofloxacin, ampicillin, and gentamicin. Bitirgen et al., (2013) observed the disappearance of hypopyon with the use of intravitreal and topical vancomycin, and ceftazidime. However, out of systemically used drugs, the organism was sensitive to intravenous meropenem but resistant to moxifloxacin. Roy et al., (2013) found that *A. baumannii* isolated after vitrectomy was sensitive to ciprofloxacin but resistant to ceftazidime. The organisms isolated from cases described by Chen et al., (2008) were sensitive only to amikacin, ceftazidime, gentamicin, and imipenem. Though microbiological cure was achieved by intravitreal tigecycline injection in an experimental rabbit endophthalmitis model caused by imipenem-resistant *A. baumannii,* Horozoglu et al., (2012) observed a hypersensitivity-like reaction. Nagle et al., (2022) found that 2.5%, 5%, and 10% betadine are ineffective against *A. baumannii*. In current patient *A. baumannii* was found to be sensitive to only levofloxacin, minocycline, and co-trimoxazole but these drugs are not approved for intravitreal injections in humans.

Endophthalmitis caused by A. *baumannii* has a poor prognosis (Roy et al., 2013; Bitigren, et al., 2013), and the antimicrobial resistance significantly limits the therapeutic options for treating this infection (Bitigren et al., 2013).

CONCLUSION

This patient presented five months after surgery with media opacity, making it inappropriate to do vitreo-retinal surgery for clearing the vitreous and decreasing infective load. It was found that the organism to be sensitive to only three out of 10 antibiotics tested, but none of these could be used intravitreally. We recommend that an appropriate treatment regime may be formulated to treat PE caused by this bacterium.

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