

Postoperative endophthalmitis due to *Pseudomonas luteola*: First reported case of acute and virulent presentation from a tertiary eye care center in South India

Anmol U Naik, V Jaya Prakash, Pradeep Susvar,
K Lily Therese¹, C K Parameswari²

A 60-year-old male presented with pain and decreased vision 3 weeks following uneventful intracapsular cataract extraction with anterior vitrectomy for subluxated cataract. A diagnosis of acute endophthalmitis was made based on clinical and ultrasound features. Patient improved only after undergoing pars plana vitrectomies twice and repeated intravitreal antibiotic-steroid injections. Vitreous aspirate revealed Gram-negative bacillus identified as *Pseudomonas luteola* on culture. Patient returned with a retinal detachment at first follow-up which was treated with vitrectomy, endolaser,

and silicone oil tamponade. To the best of our knowledge, this is the first case of *P. luteola* causing acute onset, virulent endophthalmitis reported in literature.

Key words: Acute endophthalmitis, postoperative endophthalmitis, *Pseudomonas luteola*, retinal detachment

Postoperative endophthalmitis is a devastating complication that can occur after any intraocular surgery. Although there has been a considerable decline in its incidence in recent decades, it can have an unpredictable prognosis despite targeted therapy. When the organism is a rarely known etiological agent, there are additional challenges in the management as the course of infection and outcome of treatment are unknown. We report one such case of acute postoperative endophthalmitis caused by *Pseudomonas luteola*.

Case Report

A 60-year-old male presented with complaints of redness, pain, and diminution of vision in the right eye for 3 days. He underwent an uneventful intracapsular cataract extraction with anterior vitrectomy 3 weeks back for a subluxated cataract. Best-corrected visual acuity (BCVA) in the right eye was perception of light with inaccurate projection of rays. There was circumcorneal congestion, corneal edema, and iris prolapse through the superonasal limbal wound. Digital intraocular pressure was high. The anterior chamber was filled with yellowish exudates, obscuring the view of posterior segment. Ultrasound B-scan of the right eye revealed plenty of moderately reflective mobile dot echoes with an attached retina and diffuse choroidal thickening [Fig. 1a]. Based on clinical

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Shri Bhagwan Mahavir Vitreoretinal Services, Sankara Nethralaya, Medical Research Foundation, ¹Larsen and Toubro Microbiology Research Centre, Vision Research Foundation, Sankara Nethralaya, ²Jaslok Community Ophthalmic Centre, Sankara Nethralaya, Medical Research Foundation, Chennai, Tamil Nadu, India

Correspondence to: Dr. V Jaya Prakash, Associate Consultant, Shri Bhagwan Mahavir Vitreoretinal Services, Medical Research Foundation, Sankara Nethralaya, 18, College Road, Chennai – 600 006, Tamil Nadu, India. E-mail: drvjp@snmail.org

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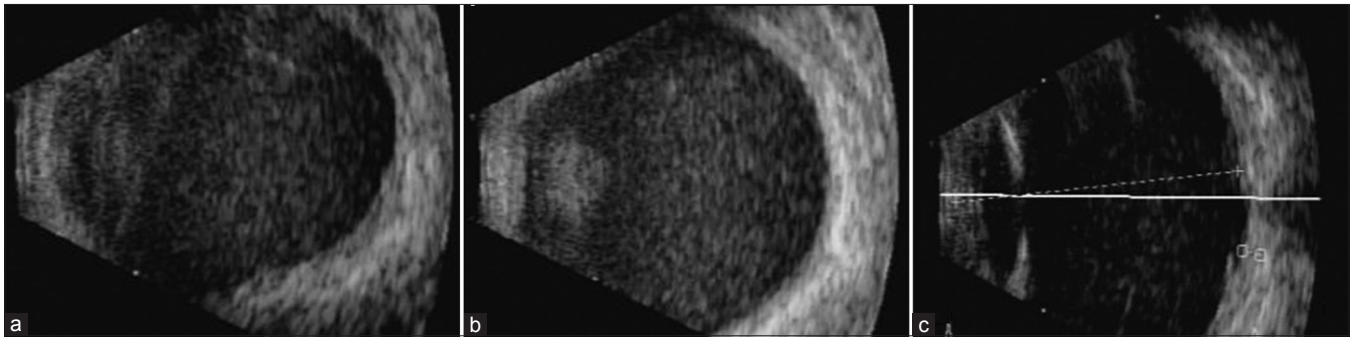


Figure 1: Serial ultrasound B-scans: (a) at presentation, (b) postoperative day 2 after first vitrectomy, (c) postoperative day 2 after second vitrectomy

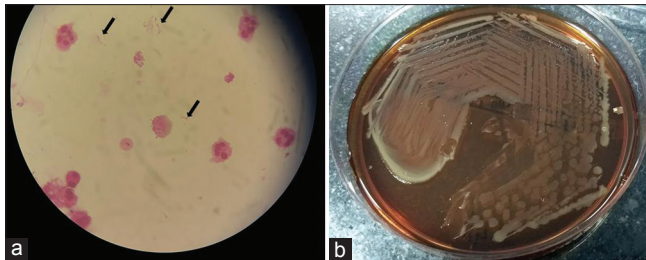


Figure 2: *Pseudomonas luteola*: (a) Gram-stain demonstrating occasional Gram-negative bacilli (b) Yellowish orange colonies on chocolate agar

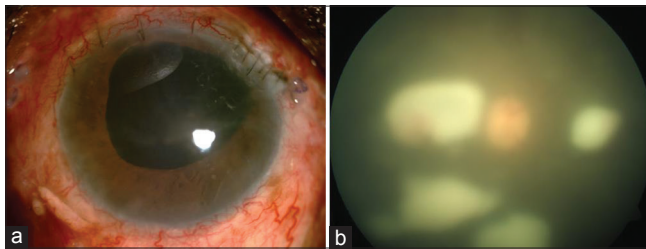


Figure 3: Third postoperative day after second vitrectomy: (a) Anterior segment and (b) fundus image

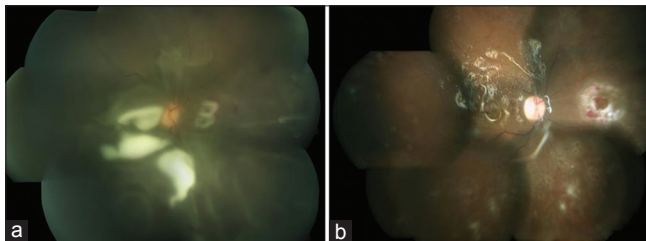


Figure 4: Status at first follow-up: (a) Total retinal detachment, (b) postoperative day 3 after re-vitrectomy, endolaser and silicone oil tamponade

presentation and ultrasound findings, a diagnosis of acute^[1] postoperative endophthalmitis was made.

The right eye underwent abscission of the prolapsed iris tissue, wound resuturing, three-port pars plana core vitrectomy, and intravitreal injection of vancomycin (V) (1 mg/0.1 ml), ceftazidime (C) (2.25 mg/0.1 ml), and dexamethasone (D) (400 µg/0.1 ml). The abscised iris tissue,

anterior chamber aspirate, and vitreous aspirate samples were sent for microbiological analysis [Gram and KOH stain, bacterial and fungal culture, and nested polymerase chain reaction (PCR) targeting 16S ribosomal RNA gene]. The vitreous sample demonstrated occasional Gram-negative bacilli [Fig. 2a], and nested PCR was positive for eubacterial and panfungal genome. However, based on presentation and progression of the clinical condition, a bacterial etiology was considered more likely and hence no antifungals were started. Intraoperatively, dense yellowish exudates were noted to fill the entire vitreous cavity. Postsurgery, the patient was started on intravenous cefotaxime (1 g BD), gentamycin (80 mg BD), oral prednisolone (50 mg/day) as well as topical prednisolone, moxifloxacin, tobramycin and atropine eye drops.

The condition worsened clinically as well as on ultrasound in the early postoperative period [Fig. 1b] and hence intravitreal V, C, and D were repeated daily for 3 days. The rapidity with which exudates increased prompted us to perform a re-vitrectomy with posterior vitreous detachment induction and intravitreal antibiotic injection on the 4th day itself. Undiluted vitreous sample was again sent for microbiological analysis which demonstrated occasional Gram-negative bacilli and nested PCR tested positive for eubacterial genome but negative for panfungal genome. Six days after first vitrectomy, the organism isolated from vitreous aspirate of first surgery grew yellowish-orange colonies on chocolate agar [Fig. 2b]. It was identified as *P. luteola* by VITEK 2 automated system, which reported an excellent probability with 99% match. As the exudates started recurring, intravitreal antibiotics were repeated daily for another 2 days, and the patient was shifted to oral ciprofloxacin (500 mg BD) based on culture sensitivity report. Improvement was noted on the 3rd day after second surgery in the form of decreasing corneal edema, retracting anterior chamber exudates [Fig. 3a], permitting view of the fundus [Fig. 3b] and corroborating with reduction in vitreous cavity echoes on B-scan [Fig. 1c]. Patient was subsequently discharged but returned with total retinal detachment at first follow-up (12 days post second surgery) [Fig. 4a]. The patient underwent a re-vitrectomy with endolaser and silicon oil tamponade to settle the detached retina. Intraoperatively, macular hole (sieve-like macula) was noted, responsible for the retinal detachment. No peripheral breaks were noted. At 6 weeks, the retina was attached [Fig. 4b] with no evidence of infection and BCVA of counting fingers at one meter.

Discussion

The bacterial genus *Pseudomonas*, first described in 1894, is a ubiquitous bacterial genus whose species has been isolated worldwide.^[2] Virulent endophthalmitis caused by *Pseudomonas aeruginosa* is a well-known entity. However, endophthalmitis caused by other species such as *Pseudomonas oryzihabitans*,^[3] *Pseudomonas stutzeri*,^[4] and *P. luteola*^[5] is rare. *P. luteola* is an aerobic, non spore-forming, Gram-negative, motile bacillus.^[6] It can be found in water, soil, and damp environments. The optimal temperature for its growth is 30°C and it produces yellow-orange colonies on various media such as blood agar, nutrient agar, MacConkey agar, or CASA agar.^[7] It was first described by Tatum *et al.*^[8] and was previously assigned to Centers for Disease Control and Prevention group Ve-1.^[9] It has been implicated to cause septicemia, endocarditis, empyema, and peritonitis among immunocompromised individuals and individuals with indwelling devices.^[6,7,10]

Uy *et al.*^[5] reported the only case available in English literature of a chronic course of postoperative endophthalmitis caused by *P. luteola* after an uneventful phacoemulsification surgery. In their report, the patient presented with indolent inflammation that began 2 weeks after the surgery and worsened despite medical treatment over the next 4 months. However, good visual outcome was obtained after topical medications, intravitreal injection of piperacillin/tazobactam, and oral trimethoprim/sulfamethoxazole.

P. luteola was believed to be a relatively non-virulent agent for postoperative endophthalmitis.^[5] To the best of our knowledge, this is the first reported case of an acute and virulent postoperative endophthalmitis caused by *P. luteola*. Despite prompt treatment with multiple vitrectomies, multiple intravitreal antibiotic-steroid injections, and systemic steroid-antibiotic cover, the patient had a poor visual outcome.

Conclusion

This case demonstrates that *P. luteola* can also cause a virulent form of postoperative endophthalmitis that can lead to poor visual outcome despite emergent medical and surgical therapy.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have

given his/her/their consent for his/her/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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Conflicts of interest

There are no conflicts of interest.

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