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CASE REPORT

Propionibacterium Acnes Endophthalmitis

NAYAK N., VERMA L., SATPATHY G., VENKATESH P

ABSTRACT

Background & objective Endophthalmitis due to *Propionibacterium acnes* following cataract surgery has infrequently been reported. This is due to the difficulty in isolating this organism because of its sequestration in the posterior capsular bag. The objective was to isolate and identify this rare micro-aerophilic organism, *P acnes* from 2 cases of endophthalmitis following cataract surgery with intra-ocular implant.

Methods Thorough clinical examination was conducted on the two cases of endophthalmitis occurring after 2 and 3 months of surgery respectively. Vitreous specimens were cultured under micro-aerophilic conditions. Bacterial identification and antibiotic sensitivity were performed by recommended procedures.

Results *P.acnes* was isolated on both the occasions. Both the isolates were sensitive to ciprofloxacin and ceftazidime, but resistant to vancomycin and aminoglycosides.

Interpretation & Conclusion *P.acnes* can cause post-operative endophthalmitis and should be suspected especially in late onset cases. Being sequestered in the capsular bag, it can create serious problems in management.

Keywords *Propionibacterium acnes*, Post-operative endophthalmitis, Bacterial endophthalmitis

Introduction

Bacterial endophthalmitis is the most severe vision threatening infection[1]. Endophthalmitis caused by *Propionibacterium acnes*, though well known, is a rare therapeutically challenging entity following surgery, trauma or bacterial keratitis[1],[2],[3]. *P acnes* is a micro-aerophilic Gram positive pleomorphic bacillus that demonstrates extremely slow growth characteristics on culture media[4],[5]. The most important clinical feature of *P acnes* endophthalmitis is the presence of a white

intracapsular plaque composed of sequestered micro-organisms in the capsular bag[6].

Due to such localised nature of this infection and its varied early clinical manifestations, management of this clinical condition is often difficult.

In this paper, we present 2 cases of this rare complication of *P.acnes* infection involving both the anterior and posterior segments of the eye.

Case-1

A 48 year old patient presented with a history of decrease in vision and redness of his right eye 8 weeks after cataract surgery. Prior to this i.e. in the early post-operative period he had recovered a best corrected visual acuity of 6/6. Cataract extraction had been undertaken by phaco-emulsification

Corresponding Author Dr. Gita Satpathy, M.D.
Professor, Dr. R.P. Centre for Ophthalmic Sciences
AIIMS, Ansari Nagar, New Delhi – 110029.
E-mail : gitasatpathy@hotmail.com
Fax: 91-11-26852919

through a temporal small incision and a foldable intra-ocular lens had been implanted into the capsular bag. The patient did not have any other symptoms or systemic illnesses.

On ocular examination, he had a best corrected visual acuity of 6/12 (hazy) in the right eye. Ocular adnexa and ocular motility were normal. The cornea was transparent. In the anterior chamber, there was a 2mm hypopyon along with 2+ cells and flare. Pupil and iris were normal.

The intraocular implant was situated within the capsular bag and was well centered. In the supero-temporal region of the posterior capsule, there was a small whitish plaque. On ophthalmoscopic evaluation, there was mild vitritis. However, the disc and macula were normal.

Based upon these clinical symptoms and signs, a diagnosis of delayed onset endophthalmitis was made. The patient was treated with an intravitreal injection of vancomycin (1000µg) and ceftazidime (2.25mg) along with topical ciprofloxacin drops (0.3%) every hour (ciplox; cipla), prednisolone acetate 1% eye drops (Pred forte-Allergan) every 4 hours; homatropine hydrobromide 2% (Homide) every 6 hours and oral prednisolone (1mg/kg). Over the next 48 hours, the hypopyon decreased; media clarity improved and the patient's vision improved to 6/9. He was discharged on systemic and topical steroids, which were gradually tapered over the next 3 weeks. The patient again presented with similar signs and symptoms, two weeks after discontinuing therapy.

A diagnosis of *P. acnes* endophthalmitis was considered and a three-port vitrectomy with partial capsulectomy was done. Topical and systemic treatment as above were re-started. Clinical improvement was evident over the subsequent 4 weeks, when he again presented with a hypopyon on discontinuation of steroids. He was re-admitted and explantation of the intra-ocular implant was undertaken. Following this there had been no recurrence over the next sixteen months and the patient maintained a vision of 6/9^p.

Case-2

Three months following cataract extraction by phaco-emulsification through a superior incision, a 60 year old male patient was referred to us with a diagnosis of low grade endophthalmitis. He had apparently responded partially to an intravitreal injection of vancomycin and amikacin given by the referring eye specialist.

At presentation to us he had a best corrected visual acuity of 6/18^p in the symptomatic left eye. On

ocular examination, there was a 1mm hypopyon as well as 2+ cells and flare in the anterior chamber.

The intra-ocular implant was situated within the capsular bag. A whitish plaque was visible on the posterior capsule and there was mild to moderate vitreous reaction. He was given an injection of intra-vitreous vancomycin and ceftazidime and was simultaneously started on systemic and topical steroids. There was satisfactory improvement for the subsequent 2 weeks when he again presented with a hypopyon.

He was re-admitted and three port vitrectomy along with partial capsulectomy was done. Following this, his inflammation subsided and vision improved to 6/12. However, at the last follow up 3 months after the surgical intervention, he had again developed a hypopyon but continued to maintain a vision of 6/9. Explantation of the intra-ocular implant was planned in case of further worsening.

Microbiological Investigations

Collection of vitreous samples

About 200µl of uncontaminated vitreous fluid was aspirated by sterile syringe connected to the vitreous suction cutter through the pars plana sclerotomy. After the air in the syringe was expelled carefully without causing aerosols, the needle was aseptically bent at its tip and sent to the laboratory immediately[7].

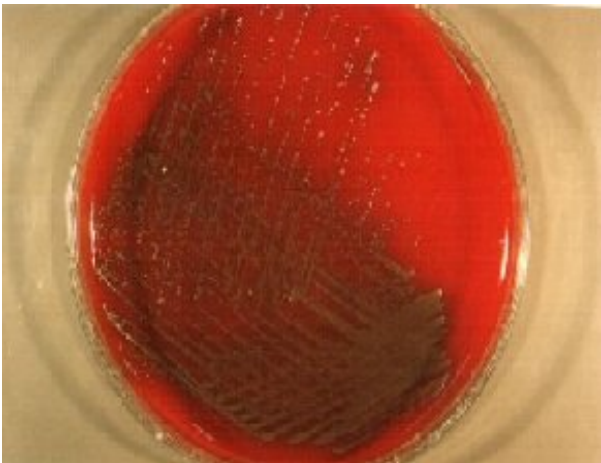
Processing of specimens and bacterial identification

The specimens were processed within 15-30 minutes of their collection. Inoculation was done onto blood agar and chocolate agar plates, which were incubated at 37°C in a candle jar for up to 10 days. Bacteria were identified by their typical colonial morphology of being minute (<1mm in diameter), glistening, smooth and dome shaped [Table/Fig1] which, on Gram staining exhibited Gram positive short pleomorphic bacillary forms[5]. Complete identification, however, was done by employing standard biochemical tests[6]. All biochemical test media were incubated under similar conditions as described above and observed daily for 7-10 days.

Antibiotic Sensitivity Testing

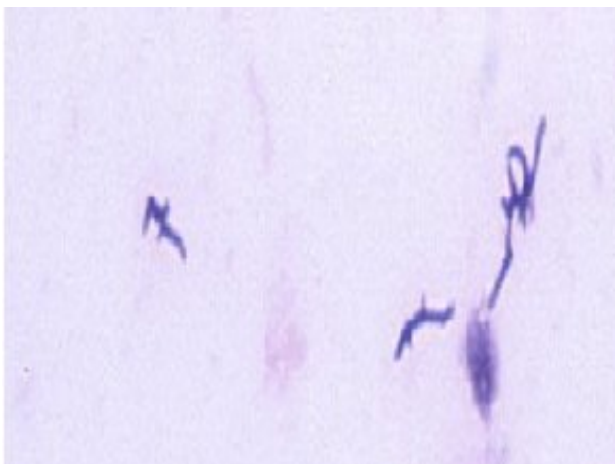
Tests for antibiotic sensitivity were put up according to the standard disc diffusion technique, devised by Buer et al[8]. The antibiotics (Himedia, Mumbai, India) used were Tetracycline (30µg/disc), Gentamicin (10µg/disc), Tobramycin (10µg/disc), Chloramphenicol (30µg/disc),

Table/Fig 1



Photograph of a blood agar plate showing glistening, smooth, small, dome shaped colonies of *Propionibacterium acnes*

Table/Fig 2



Photograph of the gram stained preparation of the organism showing short pleomorphic gram positive bacillary forms

Soframycin (100µg/disc), Ciprofloxacin (10µg/disc), Cloxacillin (1µg/disc), Vancomycin(10µg/disc), Cephazolin (30µg/disc), Amikacin (30µg/disc) and Ceftazidime (30µg/disc). The isolate from case 1 was sensitive to Ciprofloxacin, Chloramphenicol, Tetracycline, Ceftazidime and resistant to Amikacin, Tobramycin, Gentamicin, Soframycin, Cloxacillin, Vancomycin and Cephazolin; whereas the isolate from case 2 was sensitive to Ciprofloxacin,

Tetracycline, Soframycin, Cloxacillin, Ceftazidime, but resistant to Amikacin, Tobramycin, Vancomycin, Cefazolin, Chloramphenicol and Gentamicin.

Discussion

Endophthalmitis due to *P.acnes* has occasionally been reported earlier[9],[10],[11],[12]. Despite these reports, microbiological investigations of vitreous fluid have often failed to detect the infecting organism, mainly as a consequence of the delayed onset endophthalmitis in most of the cases[1],[13]. Failure to detect the organism may also be due to the in vivo adaptation and sequestration by way of encapsulation within biofilms[14]. These intra-ocular events have a definite impact on therapeutic management and visual acuity outcome[2]. This phenomenon of biofilm formation is not only true for *P.acnes*, but for other micro-organisms such as coagulase negative *Staphylococci*, *Staphylococcus aureus*, *Bacillus* species and *Corynebacterium* species as well[3],[13].

P.acnes endophthalmitis has been described in the literature as a rare event[11],[12]. It could be that the presence of *P.acnes* in such cases might have been considered as mere culture contamination[7]. However, appropriate culture techniques and identification procedures could rule out such possibilities[14].

As stated above, management of endophthalmitis caused by *P.acnes* can be difficult. This may be due to several reasons. Firstly, the intra-ocular inflammation may mimic a sterile post-operative inflammatory reaction during its early stage. Secondly, the subtle clinical picture and initial favourable response to topical steroids may often lead to delayed recognition and diagnosis[4]. Finally, adequate drug levels by intra-vitreous antibiotic injection may not be achieved for sufficient time to kill the micro-organism, as it remains sequestered in the capsular bag.

Thus, from the viewpoint of the above mentioned shortcomings in the management of such cases, it is imperative that proper and timely laboratory diagnosis be made and appropriate therapy be instituted for achieving a better prognosis.

Regarding antibiotic sensitivity patterns in both the cases reported by us, the organisms were sensitive to ciprofloxacin. However, world literature review highlights that the strains of *P.acnes* are now showing resistance not only to ciprofloxacin, but also to fourth generation fluoroquinolones like gatifloxacin and moxifloxacin[15].

In addition to this, ophthalmic isolates of P acnes have been shown to be resistant to meropenem, cefepime, the MIC values ranging between 0.094 µg/ml to 1.5µg/ml and 1µg/ml to 12µg/ml respectively [16]

The above mentioned observations do have a lot of clinical implications, especially so, while treating patients with clinically suspected P acnes endophthalmitis.[7],[17]

Conflict of Interest: None declared

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