



## Post-traumatic endophthalmitis due to *Brevibacterium casei*: A case report

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### CASE REPORT

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### Abstract

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Endophthalmitis is a serious post-traumatic ocular complication that can lead to loss of vision. We report a case of acute post-traumatic endophthalmitis following a penetrating injury caused by an unusual organism, *Brevibacterium casei*. The patient was successfully treated with intravitreal antibiotics like ceftazidime and vancomycin, along with topical cefazolin and tobramycin. *Brevibacterium casei* can be added to the list of rare bacteria causing endophthalmitis and should be kept in mind by clinicians as a potential source of pathology.

#### Key Words

Ocular complications; Endophthalmitis; *Brevibacterium casei*

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#### Implications for Practice

As diagnostic technology improves an increasing number of organisms, especially those that are commensal, low-virulence or rare, are being identified as causing acute endophthalmitis. With good microbiological evaluation including drug sensitivity and timely intervention with appropriate medication vision can be saved.

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### Background

Endophthalmitis is an inflammatory process that involves the ocular cavity and adjacent structures. Bacteria are the most common aetiological agents comprising a heterogenous group and it is of foremost importance to establish a rapid and accurate diagnosis to facilitate appropriate and timely intervention.

Here we report a case of endophthalmitis caused by *Brevibacterium casei* after accidental trauma. The genus *Brevibacterium* currently consists of six species, namely, *B. linens*, *B. casei*, *B. epidermidis*, *B. iodinum*, *B. mcbrellneri*, and *B. otitidis*. Despite earlier reports of *Brevibacterium* spp. being isolated from humans, they had been considered a non-pathogenic species. It is now accepted that *B. casei* is by far the most frequently isolated species of *Brevibacterium* from otherwise sterile human sites.<sup>1</sup>

This is the first of such a case to the best of our knowledge and adds this species to the list of unusual pathogens complicating ocular infections.

### Case details

A 12-year-old immunocompetent male sustained a penetrating injury to the right eye with a small piece of wood while travelling in a bus. The patient reported to a regional institute of ophthalmology within six hours after trauma with redness and watering of their right eye. On examination, the patient had mild lid oedema, ciliary congestion and a central full thickness corneal tear with iris prolapse and a shallow anterior chamber. The view of the lens and posterior segment was hazy; vision was limited to counting fingers at 1m.

Informed consent from the parents was obtained for diagnosis and treatment. A primary repair of corneal tear with iris reposition was performed immediately. The patient was started on topical fortified cefazolin with fortified tobramycin and systemic antibiotics along with



homatropine 1% eye drops three times a day. The next day, vision had dropped to perception of light. A B-scan was performed which revealed multiple dot-like opacities in the vitreous which disappeared at low gain.

A presumptive diagnosis of endophthalmitis was made and 0.3ml vitreous tapped for Gram's stain, KOH mount and bacterial and fungal culture and sensitivity. Concurrent intravitreal injection of ceftazidime 2.25mg/0.1ml of saline and vancomycin 1 mg/0.1 ml of saline was given as a single dose. The vitreous sample was sent immediately to the microbiology department.

The patient was followed up daily and intra-venous cefazolin 25mg/kg was given for five days with the same topical antibiotics. In addition, bromfenac 0.9% TID was instituted for 10 days. The use of these antibiotics is as per the protocol followed at Minto Regional Institute of Ophthalmology, Bangalore.

The patient's vision had improved to being able to visualise hand movements by the fifth day. He was asked to follow-up on Day 3, 7, 14, 21 and then monthly. On the 21<sup>st</sup> day of follow up, healing of the corneal tear was seen, vision had improved to counting fingers half metres, and media was hazy due to traumatic cataract. At the end of six months the patient was advised to undergo cataract surgery and was then lost for follow-up.

#### Microbiological investigation

The vitreous tap was received at the Department of Microbiology, Bangalore Medical College and Research Institute. The Gram stain of the specimen showed plenty of pus cells with Gram-positive rods. The sample was processed by inoculating onto the nutrient agar, 5% sheep blood agar and brain heart infusion broth incubated at 37° C aerobically. Anaerobic culturing was undertaken using Robertson's cooked meat media and fungal cultures were put up on Sabouraud's dextrose agar.

After overnight inoculation, nutrient and blood agar revealed confluent growth of yellow, non-haemolytic colonies with cheesy odour. Gram's stain of the colonies revealed short, Gram-positive bacilli which were non-motile. Conventional tests showed that the organism was positive for catalase and hydrolysis of gelatine, tyrosine, and casein but negative for oxidase, growth on Potassium tellurite. Acid was not produced from glucose and other carbohydrates.

Presumptive identification of *Brevibacterium* spp was made and the isolate was further identified by commercially

available API Coryne system (version 2.0; bioMe'rieux, Marcy-l'Etoile, France) which identified the strain as *Brevibacterium casei*.

The isolate was tested for antibiotic sensitivity on Muller Hinton agar by Kirby Bauer disc diffusion technique using standard methods. The strain was sensitive to all antibiotics tested i.e. penicillin, cephalothin, cefotaxime, gentamicin, erythromycin, ciprofloxacin, and vancomycin as per Clinical and Laboratory Standards Institute (CLSI) guidelines by which only the representative antibiotic from each group is tested and if found sensitive, then all other antibiotics in that group are considered to be sensitive.

#### Discussion

Infectious endophthalmitis is a potentially devastating complication of penetrating ocular injuries. Polymicrobial traumatic endophthalmitis is not uncommon and usually causes a poor final visual outcome, especially with virulent organisms.<sup>2</sup>

Brevibacteria are gram-positive rods that show a marked rod-coccus cycle when growing on complex media. They are non-motile, non-fastidious, obligately aerobic (oxidative or indifferent toward sugars), halotolerant (6.5% NaCl), and catalase positive. Colonies of brevibacteria on blood agar after 24 hours are opaque, grey-white, up to 2mm or more in diameter, convex, and show a smooth, shiny and yellowish-green surface. They are non-haemolytic, and most give off a cheese-like odour.<sup>3</sup>

Since 1984, many strains of brevibacteria have been reported from human sources, particularly from skin or structures adjacent to the skin. In our case, the contaminated wooden piece could be the source of infection. Other diseases due to brevibacteria have also been described, including osteomyelitis,<sup>3</sup> CAPD peritonitis,<sup>4</sup> septicemia<sup>5</sup> and hydrocephalic shunt infection.<sup>3</sup> *Brevibacterium* causing post-traumatic endophthalmitis has not been previously described although a case of endogenous endophthalmitis has recently been reported.<sup>6</sup>

Standard treatment regimen of *Brevibacterium* endophthalmitis has not yet been established. However, our strain was sensitive to all antimicrobials such as cephalosporins and glycopeptides antimicrobials. Most of the ocular infectious organisms are susceptible to vancomycin or either ceftazidime or an aminoglycoside. In our case, although *Brevibacterium* spp rarely occur in infectious endophthalmitis, the above treatment still applied and the patient responded to single dose intravitreal ceftazidime and vancomycin with concurrent



systemic antibiotics. Therefore, intravitreal antibiotics are the most important component of therapy in eradicating infection in acute-onset bacterial endophthalmitis.

In conclusion, consideration of typical and unusual bacteria that have been reported to cause endophthalmitis, as well as the source of injury, should guide antibiotic choice. Since *Brevibacterium* may easily be confused with non-pathogenic corynebacteria, ophthalmologists treating patients with endophthalmitis should be aware of this bacterial genus as a potential cause of invasive infection.

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## PEER REVIEW

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## CONFLICTS OF INTEREST

The authors declare that they have no competing interests

## PATIENT CONSENT

The authors, Asima Banu, Sriprakash KS, Vidyadevi M and Nagraj ER declare that:

1. They have obtained written, informed consent for the publication of the details relating to the patient(s) in this report.
2. All possible steps have been taken to safeguard the identity of the patient(s).
3. This submission is compliant with the requirements of local research ethics committees.