

Case Report

Asian Pacific Journal of Tropical Medicine

doi: 10.4103/1995–7645.331259

5-Year Impact Factor: 2.285

Endophthalmitis caused by *Bacteroides fragilis* after pars plana vitrectomy and treatment approachHakan Yildirim^{1✉}, Mehmet Balbaba¹, Turgut Yilmaz², Zülal Asci Toraman³¹Faculty of Medicine, Department of Ophthalmology, Firat University, Elazig 23119, Turkey²Medical Park Hospital, Elazig, Turkey³Faculty of Medicine, Department of Microbiology, Firat University, Elazig 23119, Turkey

ABSTRACT

Rationale: Endophthalmitis is an uncommon but serious ocular infection often resulting in probable visual loss. *Bacteroides fragilis* is a rare cause of endophthalmitis.

Patient concerns: A 46-year-old male patient complained of eye pain and low vision after pars plana vitrectomy.

Diagnosis: *Bacteroides fragilis* endophthalmitis after pars plana vitrectomy was diagnosed.

Interventions: Pars plana vitrectomy and silicone oil implantation were performed.

Outcomes: Early treatment and choice of tamponade in endophthalmitis after pars plana vitrectomy may possibly prevent evisceration and progression of endophthalmitis.

Lessons: *Bacteroides fragilis* can be seen in cases of endophthalmitis after pars plana vitrectomy.

KEYWORDS: *Bacteroides fragilis*; Endophthalmitis; Pars plana vitrectomy

1. Introduction

Endophthalmitis is an uncommon but serious ocular infection often resulting in probable visual loss. The frequency of endophthalmitis after pars plana vitrectomy varies between 0.02% and 1.15%[1–3]. The most common causes of endophthalmitis after pars plana vitrectomy are coagulase-negative *Staphylococci*, *Pseudomonas* species, *Propionibacterium*, *Enterococci* and *Bacillus* species[4]. In this report, we aimed to present a case of endophthalmitis due to *Bacteroides (B.) fragilis* after pars plana vitrectomy, to our knowledge, which has not been reported in the literature so far. This case report is exempt from requiring ethical approval as per the

regulations of the Firat University Ethical Review Committee. The patient signed consent to participate in the study and publication.

2. Case report

A 46-year-old male patient presented with complaints of eye pain and low vision 48 hours after pars plana vitrectomy due to vitreous hemorrhage secondary to branch retinal vein occlusion in the left eye. In his examination, his left eye visual acuity was at light perception. In the biomicroscopic examination, the left eye had lid edema, chemosis, 4 mm hypopyon in the anterior chamber, corneal edema and poor red reflex. The sclerotomy site was hyperemic and there was no suture or leak. Vitreous condensation was present in the left ocular ultrasonography. There was no silicone, gas or air image in ocular ultrasonography. There was no pathology in the patient's medical history that would cause immunodeficiency.

The patient was considered to have acute postoperative endophthalmitis. A total of 0.1 mL vitreous sample was taken from the 3 mm posterior to limbus with 23 gauge (g) needle and then sent to the microbiology laboratory. In the same session, 1 mg/0.1 mL vancomycin and 2.25 mg/0.1 mL ceftazidime were administered intravitreally. In addition, fortified vancomycin (50 mg/mL) and ceftazidime (50 mg/mL) were started topically on an hourly basis

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How to cite this article: Yildirim H, Balbaba M, Yilmaz T, Toraman ZA. Endophthalmitis caused by *Bacteroides fragilis* after pars plana vitrectomy and treatment approach. Asian Pac J Trop Med 2022; 15(1): 44–46.

Article history: Received 7 August 2021 Revision 8 November 2021

Accepted 12 November 2021 Available online 20 January 2022

previously described[5]. Intravenous vancomycin 1 gram two times daily and 2 gram three times daily ceftazidime were started. At the 24-hour examination after first intravitreal antibiotic administration, it was observed that the hypopyon was diminished but the intense anterior chamber reaction continued (Figure 1). In the results of the microbiology report, no pathogenic factors were detected in microscopic evaluation and culture.

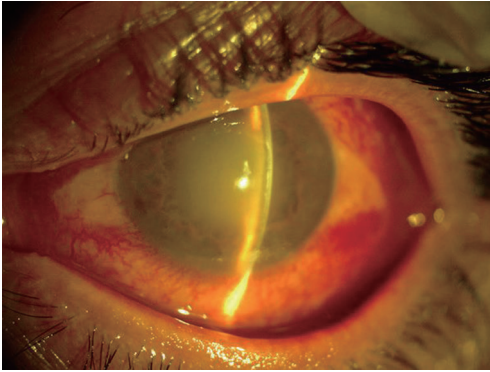


Figure 1. A 46-year-old male patient complained of eye pain and low vision 48 hours after pars plana vitrectomy due to vitreous hemorrhage secondary to branch retinal vein occlusion in the left eye. Slit-lamp examination showed that hypopyon decreased in the left eye after intravitreal vancomycin and ceftazidime, but anterior chamber reaction continued.

After intravitreal antibiotic administration, the patient underwent 23 g pars plana vitrectomy, lensectomy and silicone oil implantation, since his visual acuity was at the level of light perception and clinical findings did not regress. Samples were taken with the help of vitrector in the same session. The vitreous samples taken were cultured directly in the operating room since anaerobe production can be difficult if it is not done in the operating room. In the results of the microbiology report, *B. fragilis* was detected in microscopic evaluation and on sheep-blood agar plate in anaerobic culture (Figure 2). In the antibiogram, it was observed that the organism was sensitive to metronidazole, imipenem and meropenem. Intravenous metronidazole (500 mg) was started in consultation with division of infectious disease.

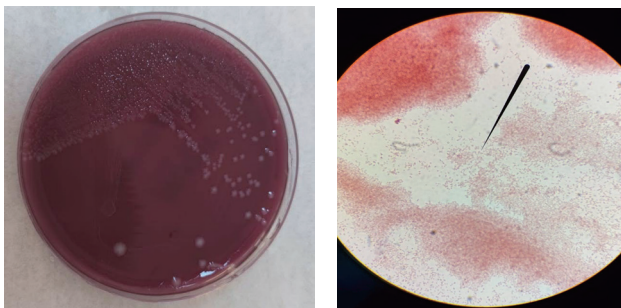


Figure 2. Culture and gram stain image of *Bacteroides fragilis*.

On the first postoperative day, there was 2 mm hyphema in the anterior chamber. Subretinal hemorrhage and exudation were observed in the fundus examination. The anterior chamber reaction decreased in one week (Figure 3). Systemic antibiotic treatment was used for 14 days. He was followed for 2 months and final visual acuity was at the level of hand motion.

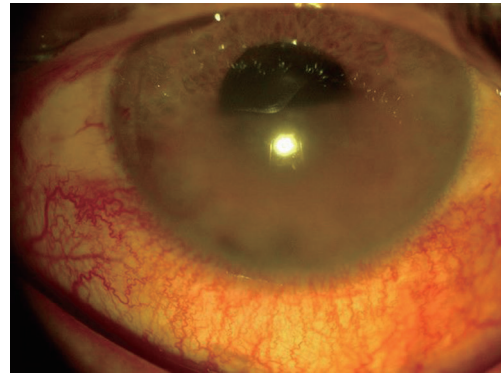


Figure 3. Slit-lamp examination showed that hypopyon and hyphema disappeared and anterior chamber reaction decreased in the first week after pars plana vitrectomy and lensectomy.

3. Discussion

Endophthalmitis is one of the most serious complications that can develop after eye surgeries, and has a poor prognosis. The risk of endophthalmitis after pars plana vitrectomy has been reported at different rates. Eifrig *et al.* reported that 0.039% of all pars plana vitrectomy cases had endophthalmitis[1]. Dave *et al.* reported incidence rates of endophthalmitis after vitrectomy surgery to be 0.052% with culture-positive endophthalmitis being 0.031%[3]. In other previous studies, the frequency of endophthalmitis after 23 g or 25 g transconjunctival pars plana vitrectomy and 20 g pars plana vitrectomy was evaluated. One found that the rate of endophthalmitis increased after transconjunctival pars plana vitrectomy, but another found that this rate did not increase[2,4].

B. fragilis, which is obligate anaerobe found in normal oral and intestinal flora, is Gram-negative bacterium[6]. *B. fragilis* is endotoxin synthesizing and highly antibiotic resistant. *B. fragilis* is less likely to live in an environment with a high oxygen concentration, such as the eye. In our literature review, it was found that the development of endophthalmitis caused by *B. fragilis* has been reported after extracapsular cataract extraction in one patient and after trabeculectomy in an immunocompetent patient[5,7]. Risk factors for postoperative endophthalmitis include leaky sclerotomies, vitreous wick after sclerotomy, wound formation, and vitreous bacterial inoculum in immunocompromised patients. In our case, we think that the absence of sutures and hyperemic sclerotomy area may be a

predisposing factor for endophthalmitis, even if there is no leakage at the sclerotomy site and ocular hypotonia[8].

We did not find any cases of endophthalmitis due to *B. fragilis* pars plana vitrectomy after searching online in PubMed literature, Google, and Google Scholar. *B. fragilis* is a bacterium that dies quickly in the face of sunlight, dryness and antiseptics[9]. In the sample taken for the second time, microorganisms such as *B. fragilis* should be sent under anaerobic conditions to laboratories. It is necessary to inform the relevant unit that we suspect the anaerobic factor. Despite all of the treatments, the process of endophthalmitis due to *B. fragilis* was aggressive in our case. Retinal damage caused by *B. fragilis* was severe and visual prognosis was poor.

In the experimental study conducted by Arici et al, *Propionibacterium acnes*, *Peptostreptococcus* spp., *Peptostreptococcus*, *B. fragilis*, *Fusobacterium* spp. and *Clostridium tertium* were infused into silicone oil. It was observed that anaerobic bacteria other than *Propionibacterium acnes* did not proliferate in silicone oil. It has been reported that silicone oil may be related to the disruption of the microbial nutrition and its toxicity against the microbial agent[10]. In our case, silicone was not used as a tamponade in the first pars plana vitrectomy of the patient. In the second pars plana vitrectomy, though, it was preferred as a tamponade.

Although many risk factors are stated in the literature after pars plana vitrectomy, we think that the absence of sutures and hyperemic sclerotomy area may be a predisposing factor for endophthalmitis, even if there is no leakage at the sclerotomy site and ocular hypotonia.

Early treatment can prevent evisceration, at least by stopping the progression of the pathogen. In transconjunctival sutureless pars plana vitrectomy, using silicone oil, gas or air as tamponade instead of a balanced solution may reduce the risk of endophthalmitis.

In conclusion, *B. fragilis* may be a factor in endophthalmitis after pars plana vitrectomy. Early pars plana vitrectomy and silicone tamponade are important in the treatment of these cases. We believe that a larger case series will provide more valuable information about the approach to treatment and vision prognosis.

Conflict of interest statement

The authors declare that there is no conflict of interest.

Authors' contributions

H.Y. performed surgery, concept, design, intellectual content and

drafting article. M.B. provided design, concept and intellectual content. T.Y. performed surgery and intellectual content. Z.A.T. did the microbiological analysis. All authors read and approved the final manuscript.

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