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Bacillus cereus Endophthalmitis in a Child with Hemophilia: A Case Report

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Dear Editor,

Endogenous endophthalmitis is an intraocular infection caused by microorganisms. It is rare compared to exogenous endophthalmitis and typically occurs in immunocompromised patients. *Bacillus cereus* is commonly known to cause posttraumatic endophthalmitis, but endogenous cases are less well known [1]. This report describes a unique case of *B. cereus* endogenous endophthalmitis in a child with hemophilia A, attributed to a long-term indwelling chemoport, despite the patient being immunocompetent. Written informed consent for publication of the research details and clinical images was obtained from the patient's parent.

A 9-year-old male patient with hemophilia A presented to the emergency department with right eye pain, headache, abdominal pain, and vomiting lasting 1 day. Examination revealed high fever (38.3 °C), severely reduced vision (best-corrected visual acuity of 0.01), elevated intraocular pressure (IOP) of 45 mmHg, corneal and conjunctival edema, and 4+ inflammatory cells in the anterior chamber of the right eye. The patient's white blood cell (WBC) count was 16.40 × 10^3/μL, erythrocyte sedimentation rate (ESR) was 27 mm/hr, and C-reactive protein (CRP) was 5.7 mg/L. Given the potential for a systemic infection, he was administered systemic ceftriaxone. Despite IOP-lowering eye drops and intravenous mannitol, the IOP in the right eye remained elevated at 46 mmHg.

The next day, the patient's right eye exhibited increased eyelid swelling and proptosis (Fig. 1A, 1B). His WBC count had risen to 18.95 × 10^3/μL, and inflammatory markers were significantly elevated (ESR, 110 mm/hr; CRP, 83.4mg/L). He was treated with topical cefazolin and tobramycin eye drops, systemic ceftriaxone, and IOP-lowering agents. B scan and orbital computed tomography (CT) scans showed retrobulbar infiltration, intraocular haziness, and scleral thickening, leading to a suspicion of endophthalmitis (Fig. 1C, 1D). A vitrectomy was planned for diagnostic and therapeutic purposes. Due to the patient's bleeding tendency and poor cooperation, general anesthesia was required, necessitating coordination with the pediatric hematology department. The patient underwent vitrectomy and lensectomy with subconjunctival and intravitreal injections of vancomycin, ceftazidime, voriconazole, and dexamethasone. Intraoperative findings include a fibrinous membrane overlying the pupil and diffuse retinal necrosis (Fig. 1E). Samples of vitreous and anterior chamber aqueous humor were collected for laboratory analysis. Blood samples from the indwelling chemoport were also repeatedly cultured for bacteria and fungi, and multiple viral polymerase chain reaction (PCR) tests were conducted.

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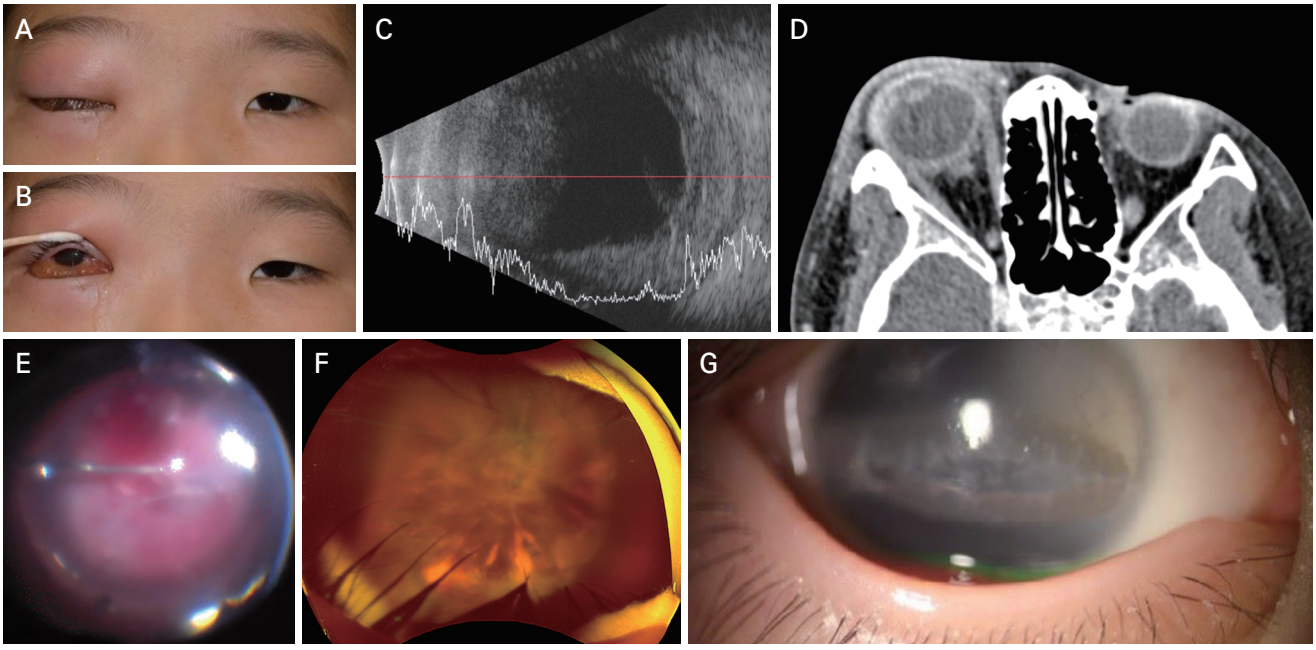

Fig. 1. Images of the 9-year-old male patient presenting with *Bacillus cereus* endogenous endophthalmitis. (A,B) Gross photograph showing eyelid swelling, chemosis, and erythema of the right eye. (C) Ultrasonographic image of the right eye showing intraocular haziness and scleral thickening. (D) Contrast-enhanced orbit computed tomography scan showing protrusion and retrobulbar infiltration of the right eye. (E) Intraoperative image showing necrotic retina with hemorrhage. (F) A wide-field fundus photo of right eye taken on the 10th postoperative day. (G) Anterior segment photograph of the right eye revealed band keratopathy at 8 months postoperative. Written informed consent for publication of the clinical images was obtained from the patient's parent.

Brain and abdominal CT scans were performed.

Postsurgery, the patient's fever, eye pain, periorbital and conjunctival edema, and proptosis resolved. WBC levels normalized ($7.38 \times 10^3/\mu L$), and inflammatory markers decreased (ESR, 50mm/hr; CRP, 7.5mg/L). The IOP dropped to 10 mmHg. Despite these improvements, the patient's vision in the right eye remained negative for light perception. Blood fungal culture and viral PCR tests were negative, and the brain/abdominal CT scans did not show abnormalities. Blood cultures from the chemoport consistently identified *B. cereus* before and after surgery, as did bacterial cultures of the aqueous humor. The bacterial antibiotic susceptibility test led to a switch in systemic antibiotics to levofloxacin. The chemoport, considered the infection source, was removed and cultured, though results were negative, likely due to antibiotic use. Following two additional intravitreal vancomycin injections, the endophthalmitis was controlled, although the retina remained necrotic and the patient's vision in the right eye was permanently lost (Fig. 1F). Over the next month, the patient was treated with moxifloxacin, prednisolone, bromfenac, and homatropine eye drops, alongside systemic levofloxacin. Eight months later, the patient reported irritation in the right eye, and an examination revealed band keratopathy with a corneal epithelial defect (Fig. 1G).

B. cereus is a Gram-positive bacterium commonly known as a causative agent of posttraumatic endophthalmitis [2,3]. Compared to other bacteria that cause endophthalmitis, it is particularly virulent to the eye, replicates rapidly, and spreads toxins that induce periorbital and conjunctival edema [1]. It can cause irreversible vision loss within 12 to 48 hours, sometimes necessitating enucleation [1]. Comprehensive medical evaluation is vital for high-risk groups, including those with diabetes, immunosuppression, intravenous drug use, neonates, and patients with intraventricular shunts. A pediatric hemophilia patient with a systemic *B. cereus* infection from an indwelling catheter has been reported [4], but without any signs of endophthalmitis.

This case is the first known instance of *B. cereus* endophthalmitis caused by an indwelling catheter in a hemophilia patient. Despite the patient's systemic condition improving without further complications, the right eye's vision was irreversibly lost. This case underscores the im-

portance of considering infectious origin as a primary differential diagnosis for ocular inflammation in patients with hemophilia and central lines.

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