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Case report

Sympathetic ophthalmia presenting 5 days after penetrating injury

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ABSTRACT

Purpose: To describe a rare case of early sympathetic ophthalmia that presented 5 days after penetrating injury.
Observations: A 13-year-old boy presented with a penetrating left globe injury from a BB metallic projectile that was emergently repaired. Five days later, routine dilated exam of the right eye revealed interval development of vitritis over the posterior pole. Optical coherence tomography revealed fine, vitreous hyper-reflective material. Intravenous and topical steroid therapy was started, and the patient underwent prompt enucleation of the traumatized eye. Histopathologic examination of the globe demonstrated lymphocytic choroiditis and macrophage infiltration, consistent with prior reports of early sympathetic ophthalmia. The sympathizing eye maintained 20/20 acuity and never caused visual complaints.
Conclusions and importance: This is the earliest reported case of sympathetic ophthalmia, to our knowledge, and it presented without visual symptoms only five days after penetrating trauma. This case suggests that routine examination should start before the typical 14 days associated with development of sympathetic ophthalmia.

1. Introduction

Sympathetic ophthalmia is a rare consequence of globe penetration that classically presents as bilateral granulomatous panuveitis weeks to years after the inciting injury. The incidence ranges from about 0.1% to 0.3% after trauma, with a rate of 0.24% among a cohort of pediatric patients who sustained an open globe injury.[1] The exact etiology of sympathetic ophthalmia is unknown. Based on clinical observation, it has been proposed that in its earliest stages sympathetic ophthalmia may present with inflammation limited to the posterior segment, which is associated with a better visual prognosis.[2]

Here, we report a case of early sympathetic ophthalmia that was diagnosed on routine dilated examination only 5 days after penetrating injury to the fellow eye.

1.1. Case report

A 13-year-old boy with no significant past medical or ocular history presented to the emergency department at our Children's Hospital after sustaining a penetrating BB gun injury to the left eye. At presentation, his visual acuity was 20/20 in the right eye and no light perception in the left eye. A full-thickness corneal laceration was present in the left eye, and computed tomography (CT) imaging was notable for retained BB in the orbit. A dilated fundus examination of the unaffected right eye was normal. The patient was taken to the operating room for emergent repair of the left open globe injury, which was completed without complication. At that time, the right eye was found again to be normal during scleral-depressed examination under anesthesia.

The patient remained hospitalized with antibiotic therapy for several days due to left eyelid edema and chemosis, which ultimately improved with conservative management. Flash and pattern visual evoked potentials were notable for visual pathway dysfunction with no consistent post-retinal activation in the left eye. Discussion was held with the patient and family about the poor visual prognosis of the traumatized eye, and plans were arranged for outpatient enucleation due to the rare risk of sympathetic ophthalmia.

On hospital day 5, the patient had a routine repeat dilated examination of the unaffected right eye before anticipated discharge. The visual acuity remained 20/20 and the patient had no visual complaints in the right eye. Dilated examination of the right eye showed mild vitreous haze and white condensation in the mid-vitreous overlying the inferonasal macula (Fig. 1A). There was no anterior segment inflammation, and there was no snowbanking or serous detachment. Spectral-domain optical coherence tomography (OCT) (Spectralis, Heidelberg,

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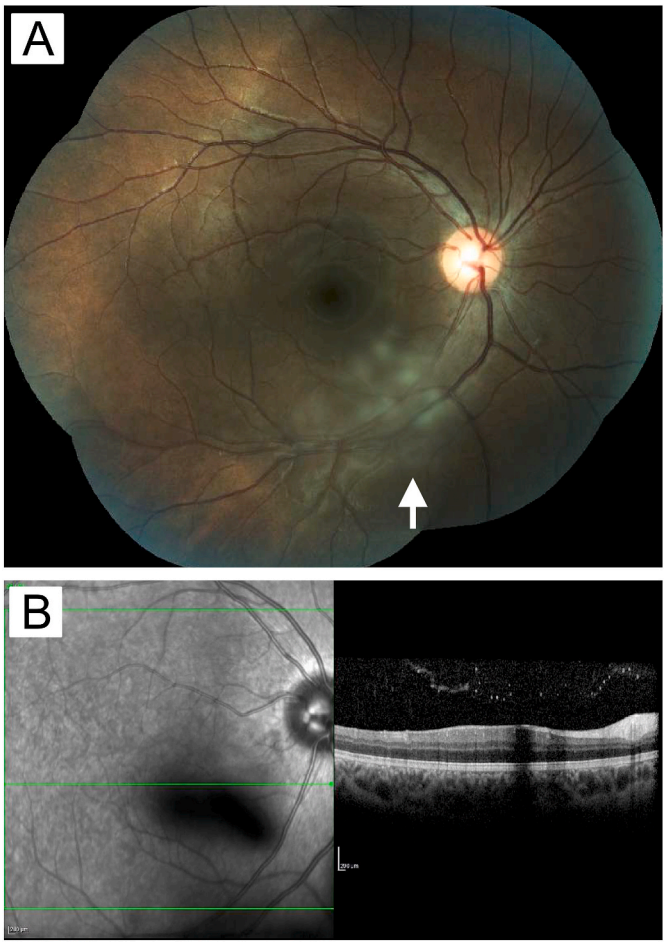

Fig. 1. Montage fundus photograph of the right eye taken 5 days after injury demonstrates new vitritis over the inferonasal macula (arrow) (A). Optical coherence tomography (OCT) demonstrates fine, hyper-reflective material in the vitreous, focal areas of hypotransmission due to vitreous opacity, and mild choroidal thickening.

Germany) was notable for fine hyper-reflective material in the vitreous consistent with posterior uveitis, focal areas of hypotransmission due to vitreous opacity, and possible mild choroidal thickening (Fig. 1B). Discharge was cancelled and the patient was started on intravenous methylprednisolone (1 g daily for 3 days) as well as topical prednisolone acetate (1% QID).

Laboratory investigation was conducted to rule out secondary causes of intermediate or posterior uveitis, with a differential diagnosis that included juvenile sarcoidosis, Blau syndrome, complement disorder, syphilis, Lyme disease, *Bartonella* infection, tuberculosis, and antibiotic-induced uveitis. All studies were normal, including angiotensin converting enzyme (ACE), rheumatoid factor, C3, C4, C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), complete blood count, venereal disease research laboratory (VDRL), Lyme, *Bartonella henselae* and *B. quintana*, and quantiferon. Fluorescein angiography was performed and notable for inferior vascular staining with mild leakage, mild disc leakage, and blockage effects over the posterior pole (Fig. 2).

In the setting of suspected sympathetic ophthalmia, enucleation of the traumatized left eye was promptly conducted without complication on hospital day 6. The pediatric rheumatology service was consulted to aid in management of anticipated long-term, steroid-sparing immunomodulatory therapy. Following 3 days of intravenous steroids, the patient was transitioned to 60 mg of prednisone daily and started on 15 mg of methotrexate weekly. The patient was discharged on hospital day 10.

During outpatient follow up, vitritis had resolved by 6 weeks after

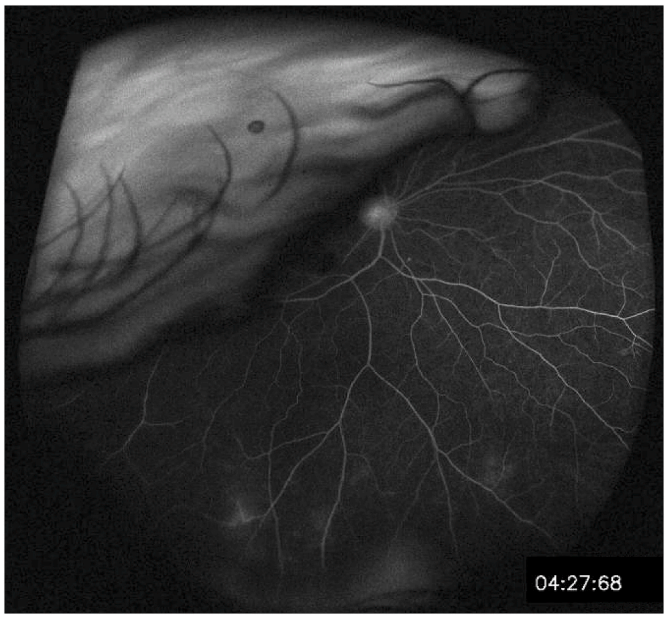

Fig. 2. Fluorescein angiogram of the right eye demonstrates inferior vascular staining with mild leakage and mild leakage at the optic disc.

discharge. Oral prednisone was tapered and the patient was maintained on methotrexate for long-term steroid-sparing therapy. He never reported symptoms in the right eye and maintained 20/20 acuity throughout his course, which extended to 74 days of follow up. Histopathology of the enucleated traumatized eye demonstrated choroidal hemorrhage with lymphocytic choroiditis and macrophage infiltration (Fig. 3). No granulomas were identified.

2. Discussion

The etiology of sympathetic ophthalmia remains unknown, but it has been proposed that the bilateral granulomatous hypersensitivity reaction is triggered by an inciting antigen from the injured eye. Signs of uveal granulomatous inflammation, including Dalen-Fuchs nodules, are classic clinicopathologic characteristics of the disease.[3] However, the process of granuloma formation takes several weeks.[4] The initial inflammatory response involves activation of CD4 T cells by antigen presenting cells, with later recruitment of monocytes and activation of macrophages to epithelioid cells.[4]

Early pathologic characteristics of sympathetic ophthalmia were previously described in a traumatized eye that was enucleated 14 weeks after injury and after 1 week of symptoms. The pathologic report from the enucleated globe revealed lymphocytic infiltration into the choroid with surrounding macrophages as seen in our case. The absence of granulomatous changes was attributed to prompt action after recognition of symptoms, and the authors conclude that infiltrating lymphocytes serve as a crucial diagnostic hint to histopathologic confirmation of sympathetic ophthalmia.[5] Along the same lines, it has been suggested that patients who present with only vitritis with mild disc edema represent an early clinical manifestation of the disease, and these patients have better visual acuity outcomes than those who present with granulomatous panuveitis.[2]

3. Conclusion

Our case illustrates clinical and histopathologic evidence of sympathetic ophthalmia that developed 5 days after penetrating injury and without symptoms. This finding highlights the importance of early surveillance for sympathetic ophthalmia, which may develop insidiously before the 14-day period that is classically reported in the

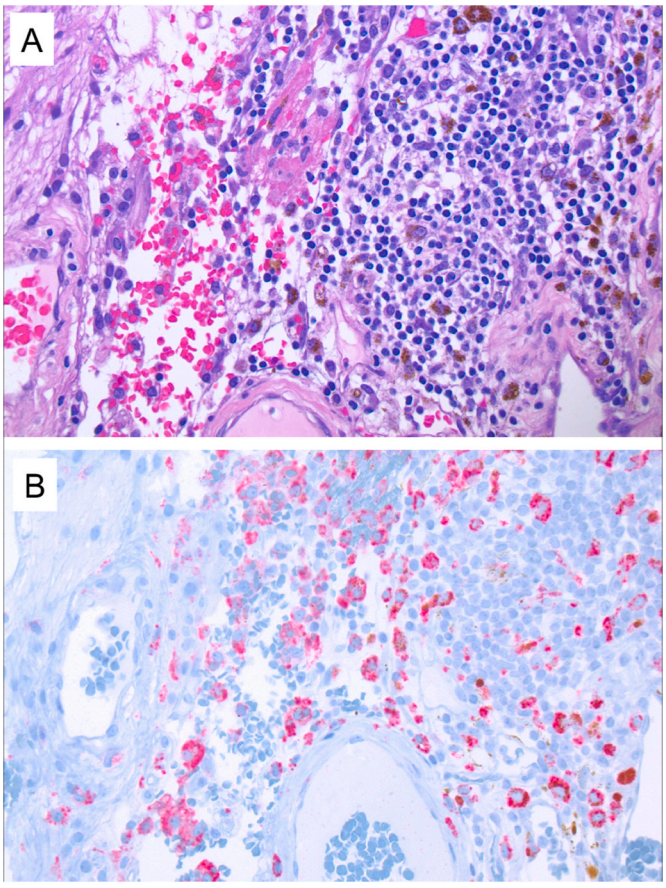

Fig. 3. Pathologic findings. (A) The choroid shows hemorrhage with erythrophages, lymphocytic choroiditis, and macrophage infiltration (H&E stain, 400x). (B) CD68 immunohistochemistry shows numerous macrophages, but no epithelioid histiocyte clusters (400x).

literature. These clinical and pathologic findings likely demonstrate the earliest stages of sympathetic ophthalmia.

Consent

Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

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A. uthorship

All authors attest that they meet the current ICMJE criteria for Authorship.

Declaration of competing interest

The following authors have no financial disclosures: AMW, AMS, CTC, KKN.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ajoc.2020.100816.

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