



A Surprising Cause of Vitreous Base Avulsion: Presence of an Intraocular Pen Tip

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Abstract

To present the outcomes in a patient who underwent acute vitreous base avulsion as a result of a penetrating ocular trauma with a pen and the intraocular retention of the pen tip. A 13-year-old female patient presented with a penetrating ocular injury with a pen. Upon ophthalmological examination, visual acuity was found to be 20/20 in the right eye, and counting fingers from 3 m in the left eye. Scleral penetration was observed 5 mm temporal from the limbus in the superotemporal region of the left eye. Acute vitreous base detachment was apparent with the slit lamp examination, which became visible as a vertical line in the temporal quadrant. The detachment was imaged with anterior segment and ultra-widefield fundus photography. An intraocular foreign body consisting of the tip of the pen was detected.

Although vitreous base avulsion is a common outcome of blunt ocular trauma, it is reported less frequently due to difficulties in its detection. To the best of our knowledge, this is the first case reporting vitreous base avulsion due to an intraocular pen tip, which was treated successfully.

Keywords: Blunt trauma, intraocular foreign body, penetrating injury, vitreous base avulsion, vitreous base detachment

Introduction

Traumatic avulsion of the vitreous base is characterized by the release of the vitreous base into the vitreous cavity due to ocular trauma. It generally accompanies blunt ocular traumas in which the vitreous base is separated from the retina and pars plana, and it is thought to occur as a result of anteroposterior compression and equatorial expansion of the globe due to the mechanical effect of the blunt trauma (1-3). Although vitreous base avulsion is frequently seen clinically, it can be difficult to detect with conventional methods (4).

The current study aimed to present a patient who underwent a penetrating ocular trauma with a pen, which resulted in the intraocular lodging of the pen tip and vitreous base avulsion.

Case Report

A 13-year-old female patient was referred from the emergency department to our clinic. The patient had a penetrating ocular injury with a pen. Upon ophthalmological examination, visual acuity was 20/20 in the right eye, and counting fingers from 3 m in the left eye. Examination of the anterior and posterior segments of the right eye revealed no abnormalities; intraocular pressure was also normal. Slit lamp examination revealed scleral penetration of approximately 1 mm in the superotemporal region, 5 mm temporal from the limbus in the left eye. Biomicroscopy revealed conjunctival injection, corneal edema, and mild fibrin reaction in the anterior chamber in the left eye. Slit lamp examination revealed

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acute vitreous base detachment, which became visible as a vertical line in the temporal quadrant (Fig. 1). In addition, vitreous base avulsion, in which the vitreous separates from the peripheral retina in the same area as the penetrating injury, was imaged with ultra-widefield fundus photography (Nidek Mirante, Nidek Co. Ltd., Gamagori, Japan) (Fig. 2). A hyperdense intraocular foreign body belonging to the pen tip was detected on computed tomography (Fig. 3).

The patient was hospitalized the same day as the trauma, and underwent scleral penetration repair, vitreoretinal surgery, and intraocular foreign body extraction in the same

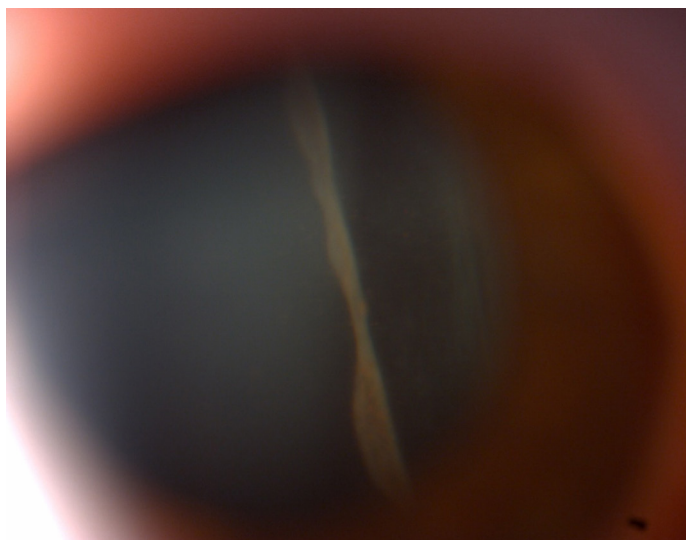


Figure 1. Vitreous base avulsion in the temporal quadrant in anterior segment photography.

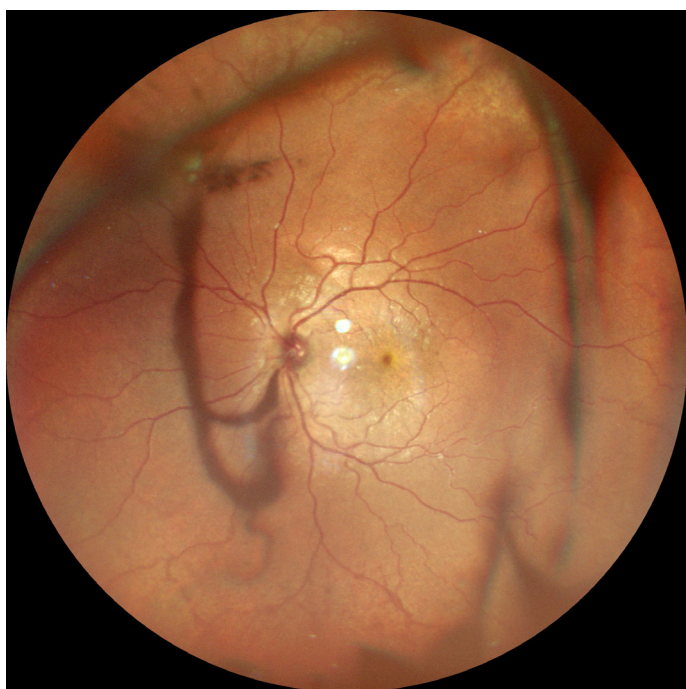


Figure 2. Ultra-widefield fundus photography.



Figure 3. A hyperdense intraocular foreign body in the left eye on computed tomography.

session. In the post-operative period, the patient was initiated on a regimen of systemic moxifloxacin (400 mg once daily), topical vancomycin (50 mg/mL), ceftazidime (50 mg/mL), and dexamethasone (1 mg/mL) every 2 h. Visual acuity increased to 20/20 at the post-operative 3rd week, and no complications were observed at the 6-month follow-up consultation after vitreoretinal surgery.

Written informed consent was obtained from the parents of the patient for the publication of images and the data.

Discussion

Open globe injury is a common cause of acquired unilateral blindness. Clinically, it can be caused by blunt trauma or sharp injury, and is characterized by rupture of the cornea or the sclera (5). Depending on the structure of the eyeball and the severity of the trauma, varying degrees of eye injury can be seen in different parts of the globe (6). In addition, children, especially boys, are reported to be at higher risk for eye injuries, whereby most injuries are caused by sharp objects (7). Eye injuries in children are known to occur commonly as home accidents, followed by injuries at school, locations where they spend most of their time (8).

In addition to clinical ophthalmological examination in orbital trauma, computed tomography contributes to the rapid and detailed evaluation of orbital bones, extraocular muscles, soft tissue, and globe integrity. It plays a role in detecting the presence of an intraocular foreign body (9). It is reported that intraocular foreign bodies can be detected at a rate of 46% with clinical examination, but the detection rate reaches 95% with computed tomography scanning (10).

Although vitreous base avulsion is a common condition after blunt ocular trauma, it is reported relatively infrequently in the literature due to challenges in its detection (2,11). The biomechanical effect of blunt trauma can lead to the occurrence of anteroposterior compression and equatorial

expansion in the eyeball, which can result in the separation of the vitreous base from the retina and pars plana (2). Vitreous base avulsion develops most frequently after ocular trauma; however, spontaneous vitreous base avulsion associated with systemic disease has also been reported (12).

A new classification has stated that vitreous base avulsion due to acute trauma most frequently occurs in closed globe injuries (4). In the current study, we report a rare case of the development of acute vitreous base avulsion without retinal detachment of vitreous hemorrhage upon open eye injury with an intraocular pen tip.

A study conducted with 484 children with intraocular foreign bodies indicated that 7% of the cases presented with an intraocular pencil tip; however, the development of vitreous base avulsion was not reported (13). Although there is no clear information in the literature, it is believed that the biomechanical changes in the globe that contribute to vitreous base avulsion are less likely to occur with the intraocular implantation of the pen tip. Open globe injury due to intraocular implantation of a pen tip is a rare event; moreover, to our knowledge, vitreous base avulsion as a result of such a trauma has not been reported previously.

Conclusion

Although vitreous base avulsion is a common outcome of blunt ocular trauma, it is reported less frequently due to difficulties in its detection. To the best of our knowledge, this is the first case reporting vitreous base avulsion due to an intraocular pen tip, which was treated successfully.

Disclosures

Informed Consent: Written informed consent was obtained from the parents of the patient for the publication of images and the data.

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