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Case Report Open Access

Presentation and Management of Traumatic Pediatric Glaucoma

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Case Report

A 10 y/o African American male presents for an intra-ocular pressure check and 24-2 visual field OD/OS for management of traumatic pediatric glaucoma. This patient previous reported to the clinic 2 years prior with a swollen and bruised left eye secondary to trauma from a schoolbook being thrown at his eye. Initial diagnosis was ecchymosis and a corneal abrasion, which was confirmed by bruising of the orbit and positive staining with fluorescein. However subsequent testing, which was at first met by resistance by both the patient and the guardian, relieved high intraocular pressure which warranted additional testing. At the present visit, the patient reported no change in vision since the trauma and no symptoms of floaters or flashes of light. For the last year he has been on a regimen of Lumigan QHS and Simbrinza BID, with good self-compliance. There were no other systemic conditions noted since the trauma and no other ocular complaints.

His entering visual acuities at the follow up visit were 20/20 OD/OS/OU both at distance and near. Pupils were equal and reactive to light with no relative afferent pupillary defects noted. His right eye had an IOP of 20 mmHg and his left eye had an IOP of 25 mmHg. A subsequent dilated fundus exam showed asymmetric cupping with the optic disc in the right eye having a 0.3 C/D ratio with good color and definition, while the left eye had an optic nerve with a 0.7 C/D ratio with inferior and superior rim thinning, but no signs of hemorrhages. The maximum intraocular pressure upon original presentation was 24 mmHg OD and 27 mmHg OS. Gonioscopy revealed open angels OD and angle recession OS.

Humphrey Visual Fields, 24-2, showed scattered defects in the right eye, but non-glaucomatous in nature and had poor reliability. On the contrary, the left eye had fair reliability and showed a possible inferior nasal step. The patient was continued on his current medications and asked to return on a later date to repeat the visual field and consult with a pediatric ophthalmologist for a surgical evaluation.

Pediatric glaucoma is a well-researched condition; however pediatric glaucoma due to a traumatic event is not as well documented or reported. In fact, only about 160,000 to 280,000 children under the age of 15 who sustain an ocular trauma are admitted to the hospital and seek medical treatment each year [1,2]. However, ocular injuries that do not require hospitalization but which can still cause serious ocular morbidity to children, such as glaucoma, is estimated to be 3.3 to 5.7 million annually [3]. In other words, less than 8% of these children are being properly diagnosed and treated, leaving their vision at great risk. According to De Leon-Ortega, traumatic glaucoma is defined as glaucoma resulting from a blunt or penetrating injury. The mechanisms of raised IOP in this condition can be caused by several factors including uveitis, hyphema, angle recession, ghost-cell glaucoma, or a dislocated lens [4]. Kaur et al. [3] expanded this definition and clarified that traumatic pediatric glaucoma is when an eye with post traumatic IOP>21 mmHg, which may be acute or chronic, occurs in a child younger than 12 years old with a history of either a blunt or penetrating trauma, with or without the establishment of a glaucomatous optic neuropathy on visual field testing. The incidence of angle recession following an ocular trauma ranges from 20 to 94%, since specific rates of angle recession are not well documented, however about 5-20% of patients with angle recession have been found to develop glaucoma [5]. The larger the area of angle recession, i.e. greater than 180 degrees, the greater the risk for developing glaucoma. According to the United States eye injury registry, about 2.67% of all penetrating ocular injuries result in traumatic glaucoma [6].

When managing pediatric glaucoma, surgery is main management option considering the long life expectance of the child [7]. According to Marchini et al, ocular drops are adequate for temporarily lowering and maintaining IOP while waiting for surgery, but for longer term treatment, glaucoma drops could have significant effects of the developing child's system. For example Lumigan (Bimatoprost) while relatively safe can cause uveitis, and Simbrinza (brinzolamide/brimonidine tartrate ophthalmic suspension) is a combination of a carbonic anhydrase inhibitor, which may cause lethargy, paresthesia, anorexia, diarrhea, metabolic acidosis, urolithiasis, growth suppression, and enuresis [5] and an alpha 2 adrenergic receptor agonist, which can cause CNS toxicity with chronic use [5]. For these reason, surgery should be the main line of treatment in cases of traumatic pediatric glaucoma, along with close monitoring of both intraocular pressure, visual fields and the architecture of the optic nerve head.

While glaucoma is not initially expected when a patient, especially a child, presents with a history of trauma, all unlikely diagnoses need to be considered. As stated above in the current case, the initially attempt to measure the intraocular pressure and exam the fundus was met with resistance. Yet, it was the comprehensive examination and testing that revealed the life long and potentially blinding condition that had resulted from the trauma. When emergency patients are added into ever-busy schedules, it can add undo stress and chaos to an optometric practice. Often, the emergency patients simply want to receive just quick note of reassurance and be on their way. However, in the ever-busy practice of Optometry, it is of up most importance to always do our due diligence. We need to work to reduce the number of cases of traumatic pediatric glaucoma and other uncommon traumatic conditions that go undiagnosed and overlooked in the health care system.

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