

## Mechanical Eye Injuries in Children

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### **AIM**

1. To find out Profile of Ocular Injuries in children.
2. Different Modalities of Management.
3. Identify the Risk Factor.
4. Preventive Measures.

### **Introduction :**

Trauma is a common and established etiological factor affecting almost all systems of the body. Visual system is no exception. Ocular injuries are widespread and can potentially reduce the vision of the affected eye to a varying extent. In children, eye injuries are an important cause of ocular morbidity, being a leading cause of non-congenital unilateral and sometimes bilateral blindness in this age group.

Ocular injuries therefore assume unusual social and economic importance involving a huge cost in human unhappiness, economic insufficiency and monetary loss.

Pediatric ocular injuries are distinct from those in adults in many ways. Etiologically, such injuries are largely accidental, as opposed to those caused by intentional violent assault in adults. Children injure themselves accidentally by sharp edges and spikes of toys, pencils, arrows, thorns, and stones. In the Indian context, wooden stick injuries and those due to iron rods are common. Even objects like glass bangles, cycle spokes and tea cup handles can cause grave ocular injuries. Bird beak and animal horn injuries commonly occur in rural setting. Certain unusual agents for pediatric injuries such as hypodermic needle have also been reported from India.

A marked preponderance of injuries is seen in the 6-10 years age group. Children in this age group are relatively immature and exposed to varying surroundings

making them more vulnerable to injuries. Male children are affected more due to their adventurous and aggressive nature. Sports related injuries are common seen in children in the 5-14 years age group.

Visual impairment in childhood is of greater significance as, in addition to physical disability, it has major impact on social and psychological development of the victim. The other difficulties that might contribute are parents who discontinue treatment, the optical correction of monocular aphakia, and the possibility of amblyopia in children.

The American National Society for Prevention of Blindness has estimated that 55% of ocular injuries occur before the age of twenty-five years and that one-third of eye loss in the first decade of life is due to ocular trauma.

Anatomically trauma can be divided into anterior segment trauma, posterior segment trauma, adnexal trauma and orbital trauma. Non-penetrating corneal and ocular surface injuries usually respond to conservative management. Such injuries may lead to recurrent corneal epithelial erosions. Traumatic hyphaema is usually managed conservatively. Traumatic glaucoma may have an immediate, intermediate or delayed presentation. Angle recession glaucoma can occur years after the injury. Lens injury by blunt trauma can lead to contusion cataract as well as subluxation/dislocation of the crystalline lens. Anatomic position and stability of the lens dictates the type of surgical management in such cases. Penetrating anterior segment trauma may cause lacerations of the cornea, sclera or both. Each of these may be associated with varying degrees of uveal tissue, lens and vitreous involvement, Posterior segment trauma may manifest as commotion retinae, choroidal rupture, posterior sclera

rupture or retinal break in the form of retinal dialysis/detachment.

Ocular trauma in childhood is of great significance especially from the prophylactic view. It is important to determine the magnitude of the problem and identify the major cause for suggesting preventive strategies.

Early medical management in the form of tetanus prophylaxis and intravenous broad spectrum antibiotics is vital to prevent ocular infection. The aim of surgical repair in these cases is a complete watertight closure with restoration of structural integrity. Self-sealing wounds carry a potential risk of endophthalmitis and panophthalmitis. The reported incidence of post-Traumatic endophthalmitis is high, especially after open globe injuries (2.4-17%). The incidence of post traumatic endophthalmitis is known to double in a rural setting. Delayed diagnosis, lens disruption, extent of wound, vitreous prolapsed, posterior location of the wound, polymicrobial infections, infections by virulent organisms, presence of intraocular foreign bodies and rural setting adversely affect visual prognosis.

Good visual acuity at presentation and early primary repair are important favourable prognostic factor affecting final visual outcome in cases with ocular trauma. Penetrating injuries generally result in poorer visual outcomes, compared to blunt injuries. Posterior segment involvement adversely affects visual results. Restoration of tissue anatomy is easier and results are more gratifying, if repair is done early in case of adnexal, including eyelid and facial injuries.

#### **Materials and Methods :**

In this study Children below 16 years of age with history of mechanical injury only are taken up for evaluation .

#### **Following conditions are not Included**

1. Open globe injuries and lid trauma ( more than 5 days) with long standing infection and other complications.

2. Any injury involving bony orbit.
3. Cases where primary surgical management had been done elsewhere.
4. Eye injuries associated with life threatening condition requiring intensive care.
5. All types of chemical injury.

During the period of my study the total of 290 Trauma Cases were studied.

#### **Methods :**

A detailed history was taken and data such as age, sex, eye involved, cause of injury, place of injury, time of presentation, visual complaints and status of tetanus immunization were documented. Visual acuity was taken using Snellen chart (wherever possible). Pupillary reflex was checked for relative afferent pupillary defect. Ocular motility was checked. Periorbital area was examined for associated signs of injury. A complete slit lamp examination was done. The status of lid & adnexa, conjunctiva, sclera, cornea, anterior chamber, iris, pupil and lens was evaluated. The nature of injury including type/grade/ pupil/ zone was documented . IOP was taken by Applanation tonometry (wherever possible) in close globe injury only. Gonioscopy was performed in appropriate cases to rule out angle recession. Fundus was examined (wherever possible) with indirect ophthalmoscope after maximum possible pupillary dilatation to rule out posterior segment abnormalities. Whenever needed special investigations like B scan, X-ray and CT scan were ordered. Surgical and/or medical management was planned as per the need. In case of open globe injury a protective eye shield was applied to the affected eye. Systemic antibiotics were started in all open globe injuries.

#### **Results :**

A total of 290 cases were included in our study. The incidence of trauma in children was found to be 8.7% in all pediatric eye patients. Majority (40.4%) of the

children were in 6-10 years age group. Male to female ratio was found to be 2.5:1. There was a slight preponderance for left eye. Pointed objects, particularly sticks, were the most common causative agent found in our study. In 44.5% cases the circumstances of injury was unavoidable. Most of the injuries occurred during the outdoor activities. 42.1% cases presented within 24 hours of injury. Closed globe injury was found in 75.2% cases, open globe injury in 19.6% cases and in rest of the cases only ocular adnexa was involved. Most cases (79%) required conservation management only. At 6 months follow up, 91.8% had BCVA  $\geq$  6/10, 3.9% had  $<$ 6/60 and there was no PL in 4.3% cases.

**Summary :**

The study was conducted to find out details of ocular trauma in children , to identify the prognostic factors and so suggest preventive measures.

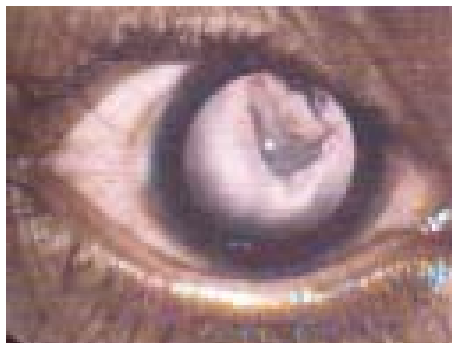
A total of 290 cases were included in our study with the male to female ratio 2.5:1. Out of them 218 were CGL, 57 were OGI and 15 cases were having only lid injury. 40.6% belonged to 6-10 yeas age group

with a slight preponderance of left eye. Pointed objects like stick was found to be most common agent causing injury. In 44.5% cases the circumstances of injury was unavoidable. Ocular injury commonly occurred during outdoor activities like playing. 42.1% children presented early within 24 hours of injury. Type A was found to be more common in both CGI and OGI. 86.5% children presented with grade 1 VA in CGI. Most (56.4%) of the children with OGI presented with poor vision (grade 4). Only 2 cases had RAPD. Zone 1 was found to be more common in both CGI and OGI. 60.7% had only superficial injury. Traumatic cataract was found in 5.1% cases and 3.8% had endophthalmitis. In 79% cases conservative management was sufficient. 91.8% had good VA. There was no perception of light in 4.3% cases. Delayed presentation and poor visual acuity at presentation were the main risk factors for poor visual outcome in our study.

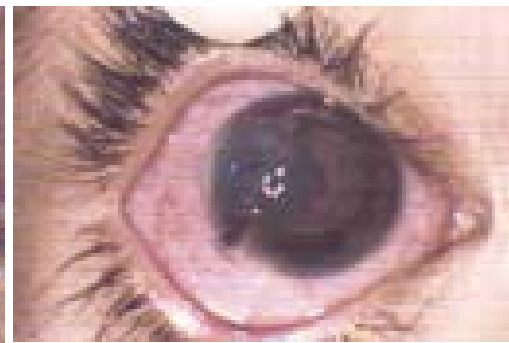
Our study shown, lack of parental supervision and general awareness to be the major factor for this type of non-congenital childhood blindness.



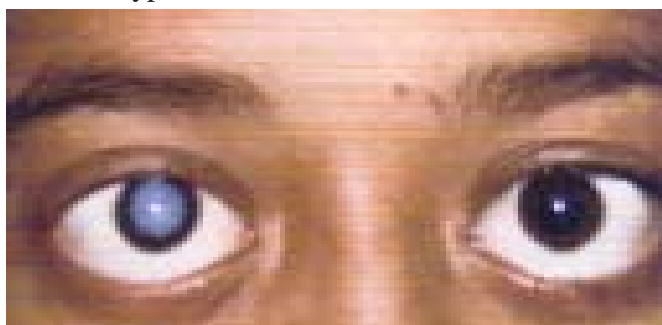
Endophthalmitis following OGI with Hypodermic needle.



Penetrating corneal injury



Corneal rupture with iris prolapse



Lower lid Laceration



Traumatic cataract

**Conclusion :**

Good visual acuity at presentation and prompt management are two important favourable prognostic factors affecting final visual outcome in case with ocular trauma. Penetrating injuries result in poor visual outcomes as compared to blunt injuries and posterior segment involvement adversely affects visual results.

This study shows, in 55.5% cases the injury was avoidable. But this may not be easy in children belong to preschool age group at home. Perhaps factors such as immature motor skills, carelessness, a uncontrolled emotions which are inherent in young children may be more important in causing injury.

Public education, general awareness and aggressive primary management may be indicated to improve the visual prognosis in children. Raising awareness of the dangers in the domestic situation by promoting avoidance and safer practices is the only method available.

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