

## PROFILE OF OPEN GLOBE INJURY IN CHILDREN AT LUMBINI EYE INSTITUTE

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### ABSTRACT

**INTRODUCTION:** Ocular trauma is preventable public health problem throughout the world that especially affects the young. During the last several decades the prognosis of open-globe injuries has significantly improved. The aim of this study was to describe the clinical profile of open globe injury in children and visual outcome after surgery.

**MATERIAL AND METHODS:** It is a prospective hospital based study that included children aged 1-15 yrs presenting to Lumbini Eye Institute (LEI), Bhairahawa with open globe injury. Visual acuity and Anterior and Posterior Segment examination findings were recorded at the time of presentation, after surgery and in three subsequent follow up visits.

**RESULTS:** Out of 26,538 pediatric patients, during the study period 0.26% (n=69) had open globe injury. The most common age group was 5-10 years comprising 43.5%, with a strong male preponderance of 74% and mean age of 8.06±3.6 years. Playing was the most common mode of injury comprising 58%, where as stick was the most common agent causing trauma consisting 51%. Fifty two percent were visually impaired and 39% were blind at the time of presentation and only 9% children had visual acuity better than 6/18. Improved vision was found in 52%, same vision in 34% and deteriorated vision in 13% till third follow up visit. Anatomical integrity of the globe was maintained in 88.4% and only 11.6% had Phthisis bulbi.

**CONCLUSION:** The incidence of open globe injury among children at Lumbini Eye Institute was 0.26%. Male children were more vulnerable. Stick was the most common traumatizing agent. There was a favorable outcome with improved vision in most children after surgery.

**KEYWORDS:** Ocular trauma; Open globe injury; Pediatrics eye injury

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## INTRODUCTION

Ocular trauma is an important cause of visual impairment worldwide. It is estimated that more than 2 million people suffer from ocular trauma annually and 40,000 become visually handicapped permanently.<sup>1</sup> A national survey conducted in 1981 has shown blindness due to ocular trauma to be 2.4%.<sup>2</sup>

Ocular trauma is a leading cause of severe anatomic and functional impairment of the visual system.<sup>1</sup> Eye injuries affect mostly the children and often tends to be open globe type. The greatest number of eye injury occurs during playtime, primarily attributable to fall and to free projectile hitting the globe at high frequency.<sup>3</sup> Children's eyes are particularly at stake in injuries because of their reduced ability to avoid or detect dangers.<sup>4</sup> During the last several decades, the prognosis for patients with open-globe injuries has significantly improved. This has been attributed to the advent of enhanced micro surgical techniques and instrumentation, along with an improved understanding of pathophysiologic mechanisms of ocular trauma.<sup>5</sup> However, little is known about the demographic profile and outcome of surgery in children with open globe injuries. Thus, this study was carried out to describe the clinical profile of open globe injury in children and the visual and anatomical outcome after surgery.

## MATERIAL AND METHODS

This is a prospective hospital based study including patients below 16 years of age and diagnosed as open globe injury who presented to Lumbini Eye Institute (LEI) from January 2012 AD to December 2012 AD and provided informed written consent for enrollment in the study. Patients' age, gender, laterality of the eye affected, object causing injury, duration between trauma and primary intervention, visual acuity, zone of injury and detailed examination of the anterior and posterior segment were recorded at the time of presentation and 3 follow up visits after surgery. Treatment was carried out as per the hospital protocol. First follow up was at 1 week after the day of discharge and second follow up was after 2 weeks from the day of first follow up. The Third follow up was after 8 weeks from the day of second follow up. Patient data were entered and the result analysis was done using SPSS 16.1.

## RESULTS

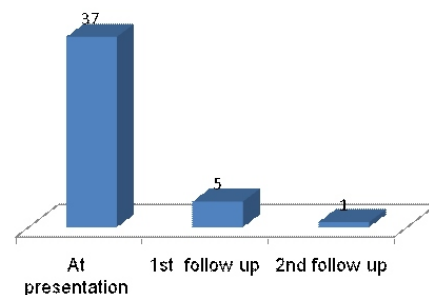
Out of 26,538 pediatric patients, 0.26% (n=69) had open globe injury. Among them (51) 74% were male and (18) 26% were female. The mean age of the children was  $8.06 \pm 3.6$  years. The most common age group to sustain open globe injury was 5-10

years comprising 30 (43%) followed by 0-5 years 20 (29%). (Table 1)

**Table 1: Age distribution of children with open globe injury**

Age range(years)	Frequency (%)
< /= 5	20 (29%)
>5-10	30 (43%)
>10	19 (28%)
Total	N=69 (100%)

Fifty eight percent (40) of the children sustained open globe injury during playing, followed by accidental injuries comprising 42% (29). Stick was the most common traumatizing object with prevalence of 51% (35), followed by iron 10% (7) and glasses 7% (5). Thirty five percent (24) children only presented within 24 hours after injury whereas 54% (37) presented between 24 hours to 7 days and 11% (8) presented after a week of injury.



**Figure 1: Development of traumatic cataract at different times**

Traumatic cataract was present in 54% (37) during initial presentation and 7% (5) during 1<sup>st</sup> follow up (Figure 1).

**Table 2: Status of visual acuity at the time of discharge**

Visual Acuity	Frequency n=69 (%)
Improved	36 (52%)
Same	24 (35%)
Detoriated	9 (13%)
Total	69 (100%)

Fifty two percent (36) had improved visual acuity, 35% (24) had same visual acuity and 13% (9) had deteriorated vision at the time of discharge. Ninety two percent (63) had visual acuity of < 3/60 PL at the time of presentation whereas at the time of discharge only 23% (16) had this visual acuity. Visual acuity (6/18-6/60) was present in only 1% at the time of presentation and this was improved to 19% at the third follow up. On 3<sup>rd</sup> follow up, 61 (88%) cases had normal anatomical appearance maintained and 8 (12%) had undergone phthisis of the eye. (Table 3)

**Table 3: Visual acuity at presentation and third followup**

Visual acuity category	At presentation % (n=69)	At 3rd follow up % (n=69)
6/6-6/18	0%	9%(6)
<6/18-6/60	1%(1)	19%(13)
<6/60-3/60	6% (4)	33%(23)
<3/60-PL	92% (63)	23%(16)
NPL	1% (1)	16%(11)
Total	100%(69)	100%(69)

## DISCUSSION

Ocular injury is an important cause of ocular morbidity in children; being a leading cause of non congenital unilateral blindness in this age group.<sup>6</sup> Most ocular injuries in children are preventable, particularly those by sports. These types of injuries are not common but when they do occur they tend to be more serious and frequently require surgical intervention. In our study, it was observed the age specific pattern of ocular injury with higher prevalence in the age group of 5 - 10 years (43.5%), which was similar to Dulal S (38.1%)<sup>7</sup> and Saxena R et al. (87.7%)<sup>8</sup>. The age group 5 - 10 years was most vulnerable to ocular injury as these age groups are relatively immature but more active and are exposed to varying surroundings leading to injuries. Male predominance was seen in our study that was 74% which was similar to Malik A et al. (77.5%)<sup>9</sup>, VK Gothwal, S.Adolph, TJ Naduvilath (86.6%)<sup>10</sup> and Dulal S et al. (62%).<sup>7</sup> The reason for this can be explained to the adventurous and aggressive nature of boys.

Regarding the different modes of trauma, our study showed the maximum number of injury were related with playing, accounting 40(58%) which is similar to Mc Grieshaber and R Stegmann<sup>11</sup> who found around 66% injuries during play.

The most common traumatizing agent was stick which accounted for 51% cases. Children get injured themselves by wood or stick as our part of the world is basically dependent on agriculture and people belong to low socioeconomic group. Children do work to help their parents which include collecting the woods, cutting the wood into pieces for cooking. The other reason is that, they don't have expensive toys to play with so they play with the stick either in the form of Bow and arrow or any other form finally getting injured by them. Similar to our study Abebe Bejiga found wood to be most common 67 (32.8%)<sup>12</sup>.

Open globe injuries are one of the marked reasons for acute and long-standing visual loss in children and young adults. Visual acuity was found to be improved in 36(52.17%), visual acuity remained same in 34.78% and further detreated in 13.04%. In a study done by Saxena et al.<sup>7</sup> 15% attained visual acuity of better than 6/12. The finding in this study was close to our finding that was 9%. In another study by Silveria S, the final visual acuity was 6/12 or better in 36% of children and <6/60 in 31%.<sup>13</sup>

The strength of this study is that it describes a cohort of children with open globe injury which is a serious form of ocular trauma that may lead to permanent blindness. The outcome after surgery is followed till third follow up including visual and anatomical outcome.

The limitation is that convenient sample size was taken that included children presented within one year duration only. Seasonal variation of the children presenting with injuries were not analyzed.

## CONCLUSION

Open globe injuries are one of the major causes of monocular blindness and more common in the age group 5-10 years with the incidence of 0.26%. Males are more vulnerable to open globe injury during playing. There was a favorable outcome with improved vision in most children after surgery.

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