

# Incidence of Glaucoma following Open Globe Injury in a Tertiary Centre

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**Abstract:** Ocular trauma remains one of the important causes for blindness worldwide. Trauma leading to blindness can be immediate or late depending upon the nature of the trauma and the degree of the tissue damage. Trauma leading to blindness can range from corneal scarring, lens injury, glaucoma, retinal hemorrhage, detachment to endophthalmitis affecting every part of eye. Development of glaucoma post trauma involves many different mechanisms. This article aims to identify the incidence of glaucoma post ocular trauma in patients attending a tertiary care centre over a period of 1 year. **Patients and methods:** This is a prospective study conducted over a period of 1 year from May 2017 to May 2018 and followed up for a period of 1 year. Patients who sustained ocular trauma were examined and relevant history regarding the nature of trauma, visual acuity, baseline IOP, globe assessment and detailed fundus examination was done including gonioscopy. **Results:** 120 patients, 80 eyes were included in this study after complete ocular examination. Of which 89% were males, 11% females. 80% of increased base line IOP (>21 mmHg) was seen in middle aged patients. Traumatic hyphaema was seen in 60% cases. Angle recession on gonioscopy was seen in 85% of patients having traumatic hyphaema. **Conclusion:** Traumatic glaucoma following open globe injuries is not uncommon. Several baseline risk factors have been identified that are significantly and independently associated with the development of glaucoma. Identifying the patients early who are at risk of developing glaucoma and treating them timely helps in saving the patients from becoming blind.

**Keywords:** Trauma, glaucoma following trauma, blindness

## 1. Introduction

Glaucoma is one of the sight threatening diseases occurring after trauma. Damage to optic disc occurs by the persistent elevated IOP causing blindness. There are various mechanisms for the development of glaucoma after trauma. So, identifying risk factors in patients and following them regularly with appropriate intervention will help in saving the vision. Traumatic glaucoma can be seen both in open and closed globe injuries that reflect the importance of gonioscopic examination. Risk factors associated with closed globe injuries were studied more than those involved in open globe injuries. Hence this article aims to identify the most common risk factors in open globe injury. The estimation and clinical management of traumatic glaucoma in open-globe injury still remain less known in the literature, and persistent IOP elevation remains a significant complication after open-globe injury that often requires attention. Medical treatment is always administered first, following which surgical intervention is employed when IOP is uncontrolled.

## 2. Materials and Methods

Open globe injury is defined as full-thickness injury to the cornea, sclera, or both. Extent of the open globe injury (cornea only [zone I], corneoscleral within 5 mm of the limbus [zone II], and corneoscleral extending 5 mm beyond the limbus [zone III]). Patients who suffered open globe injuries were selected based on the above mentioned criteria were enrolled for this study. Of which 120 patients were enrolled, 45 patients had open globe injury and 50 eyes were included in this study after complete ocular examination. 38 were males, and 7 females. 80 % (40 eyes) of increased base line IOP (>21 mmHg) was seen in the initial assessment and in the 1<sup>st</sup> follow up. Most of the IOP rise was seen in

relatively older aged patients. Traumatic hyphaema was seen in 20% (10 eyes) cases. Angle recession on gonioscopy was seen in most of patients having traumatic hyphaema. Persistent elevation of IOP in subsequent visits (3 months once post initial repair) was seen in 8 % (4 eyes) of the patients. Of which only 2 % (1 eye) needed surgical intervention.

## 3. Discussion

The causes of traumatic glaucoma are multifactorial depending on the amount and extent of the injured tissue. Numerous potential mechanisms have been raised; it can occur secondary to the disturbance of the trabecular meshwork or inflammatory scarring or stumbling block of the trabecular meshwork by direct inflammation, inflammatory debris, lens particles, coagulated blood components, red blood cells from a hyphema or from long-standing vitreous hemorrhage. Bai et al. divided the causes of ocular trauma related glaucoma into three stages, early, intermediate and late stage; current study included 45 patients of which 50 eyes were studied. In the previous study at the early stage (1–4 weeks) there were 8 eyes due to inflammation, 10 due to hyphema and 6 eyes due to lens dislocation; at the intermediate stage (1–6 months) there were 8 eyes due to pupillary block and 2 due to phacoanaphylactic glaucoma and at the advanced stage (more than 6 months), 8 eyes were due to angle recession. Milder et al. postulated that the mechanism of traumatic glaucoma may be due to blockage of the trabecular meshwork with inflammatory debris and inflammation that can lead to peripheral anterior Synechia or due to steroid use, epithelial/ stromal down growth and. De Leon and Girkin encountered an increase in the IOP to trabecular meshwork swelling without hyphema or angle recession. The several risk factors have been identified that are significantly and independently associated with the

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development of glaucoma, including advanced age, poor visual acuity at presentation, perforating rather than penetrating ocular injury, lens injury, presence of vitreous hemorrhage.

#### 4. Treatment

Prevention still has a role in management of glaucoma after OGI. Aggressive treatment is mandatory by frequent topical steroids to suppress the inflammation that can lead to peripheral anterior Synecchia. Lens removal with IOL and trabeculectomy procedure is considered in lens induced glaucoma. Surgical interventions like trabeculectomy with or without MMC plays an important role in management of glaucoma post closed and open globe injuries that is not responding well to medical treatment. Glaucoma drainage devices like Molteno implant and Ahmed valve are considered if filtering surgery is failed. Cyclophotocoagulation has also been considered successful in treating refractive traumatic glaucoma.

#### 5. Conclusion

Traumatic glaucoma is one of the important sequale post ocular injury which needs constant follow up of patients for avoiding potential visual loss. Several risk factors like mentioned above has to be screened for and Special attention should be paid to any early signs of glaucomatous changes, particularly in patients who are considered at high risk. Medical treatment is always available; however, uncontrolled cases need early surgical intervention.

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