
Research Article,

Clinical Profile and Visual Outcome of Blunt Ocular Trauma in a Tertiary Care Centre of Central India: A Prospective Study

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Abstract:

Introduction: Ocular trauma is a major cause of visual morbidity and Visual impairment leading to injury of the globe, optic nerve and adnexa ranging from superficial to vision threatening complications.

Objective: To study the factors leading to blunt ocular trauma, its characteristics, presentation and Outcome.

Methods: Hospital based prospective study conducted at tertiary care centre of central India. Patient were assessed and if required, admitted. They were followed up on 1st week, 1st month, 6th month and were assessed for visual outcome and complications.

Results: Male constituted 66% and female 34% of all patients. This study had patients of age ranging from 3 to 90 years. Most of the patients were found in the age group of 31-40 years (20.3%). In our study which included 103 cases, there were 20% cases of RTA and 80% cases of non-RTA. 85(82.5%) had lid oedema with chemosis of conjunctiva. 87(84.4%) patients had sub-conjunctival haemorrhage. 16 patients (15.5%) presented with corneal abrasion. 32 patients(31.06%) presented with traumatic hyphaema. 2 patients(1.9%) had traumatic optic neuropathy. 7 patients(6.7%) presented with Berlin's oedema and 8(8.1%) presented with angle recession glaucoma. Final visual outcome of patients were, 1 patient(0.97%) had no perception of light, 4 patients(3.8%) had visual acuity of perception of light and projection of rays inaccurate. 7 patients(6.7%) had vision perception of light and projection of rays accurate. 45(43.68%) patients regained visual acuity of 6/6

Conclusion: Blunt trauma was more common in males. Most common age group was 4th decade. Road traffic accidents constituted large number of blunt injuries. Road traffic accidents had a high rate of visual loss due to optic nerve injury.

Key words: Trauma, visual acuity, visual impairment.

Introduction:

Trauma can result in wide spectrum of eye injury of the globe, optic nerve and adnexa ranging from superficial to vision threatening complications. Our understanding of pathophysiology and management of these disorders has advanced tremendously over the last 30 years, and it is critical that a standardized classification system of terminology and assessment should be used by both ophthalmologists and non-ophthalmologists when describing and communicating clinical findings. Blindness has regularly been found the

most feared of all disabilities and any threat to vision is emotionally wrenching. Humans rely heavily on vision to avoid bodily trauma, and therefore it is particularly shocking if the eye itself is injured. Ocular trauma is a preventable public health problem throughout the world. It is one of the common causes of ophthalmic morbidity and monocular blindness in all parts of the world. The global annual incidence of ocular trauma is around 55 million of which 750000 cases require hospital admission every year.^[1] These injuries occur in sports, home, assault, agriculture, industrial and

road traffic accident. In India reported incidence of ocular trauma varies from 1% to 5%.

In India reported incidence of ocular trauma varies from 1 to 5%. The global annual incidence of ocular trauma is around 55 million of which 750000 cases require hospital admission every year.^[1]

Aim and Objectives-To study factors leading to blunt ocular trauma, it's demographic characteristics, various clinical presentations and final visual outcome.

Material and Methods:

Study was conducted at Indira Gandhi Govt. Medical College and Mayo hospital Nagpur. The cases were taken from the patients attending Ophthalmology department and emergency department of Indira Gandhi Govt. Medical College. The study period was of 12 months from April 2018 to April 2019. 103 cases of blunt ocular trauma were taken up for the study. Patient included in this study were those with definite history of recent blunt ocular trauma of all age groups who were willing to participate. Patients with history of penetrating ocular injury, Patients with orbital injuries involving fractures, Old ocular injuries >1 month before consultation at our hospital were excluded from the study.

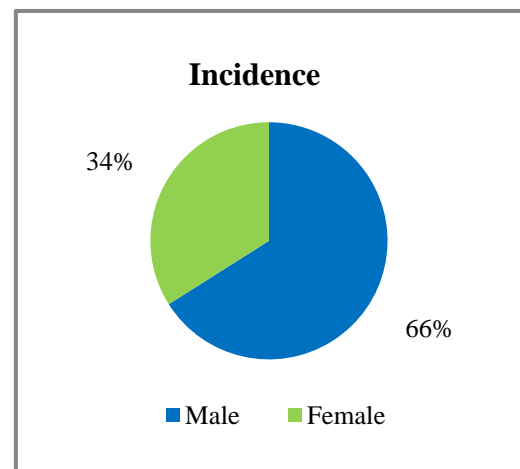
A detailed history was taken to know the mode of injury and duration between injury and presentation. Examination started with visual acuity testing with Snellen's chart, anterior segment examination done with slit lamp biomicroscopy. Intraocular pressure recording was done after ruling out globe rupture with the help of

Schiotz tonometer/Applanation tonometer. Gonioscopy was done in appropriate cases. Posterior segment examination was done with direct and indirect ophthalmoscope. Field charting was carried out in relevant cases Investigations like X-ray orbit, computerized tomography scan, ultrasound, B mode ultrasonography were done. All cases were followed at regular intervals to assess the visual outcome and complications.

Results:

Observation No1: Gender distribution in blunt ocular trauma.

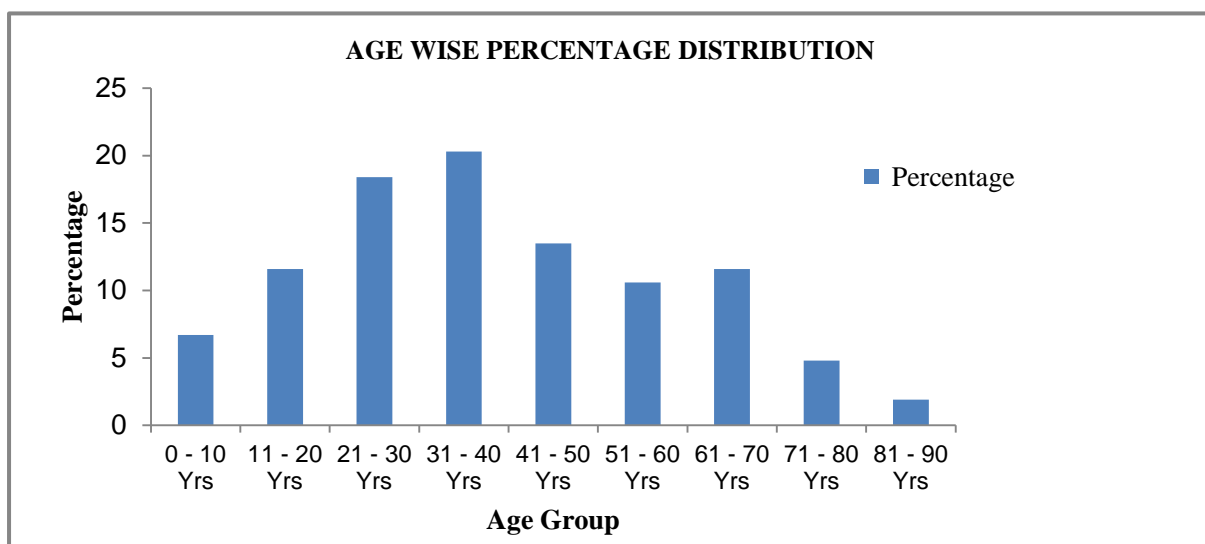
Graph No.1 –Showing Gender Distribution:



Gender distribution: out of 103 patients 68 were males and 35 were females in which 5 were children. Male patients constituted 66% and female constituted 34% of all patients and male to female ratio was approximately is 2 :1.

Observation No. 2: Age distribution in blunt ocular trauma.

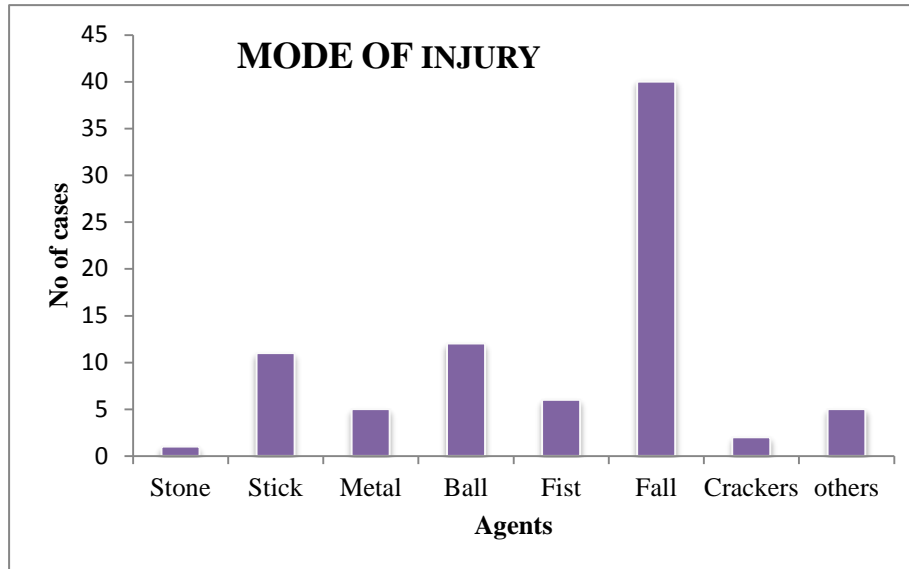
Graph No. 2 – Showing Age wise Distribution



This study had patients of age ranging from 3 to 90 years. Most of the patients were found in the age group of 31-40 years i.e. in the fourth decade. It was found that patients with old age had less number of blunt ocular trauma.

Observation No. 3: Mode of Injury

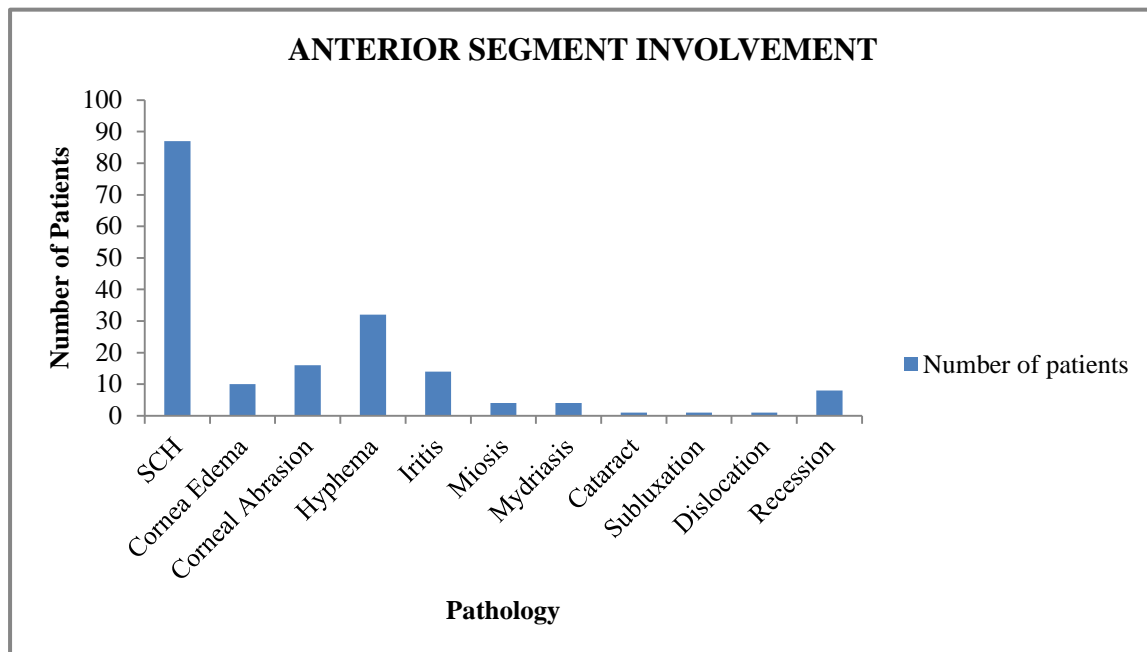
Graph No. 3. Mode of Injury



In our study it was found that fall was the most common mode of injury in blunt ocular trauma followed by ball and stick. Few patients were of cracker injury.

Observation No. 4: Anterior segment pathology in blunt ocular trauma

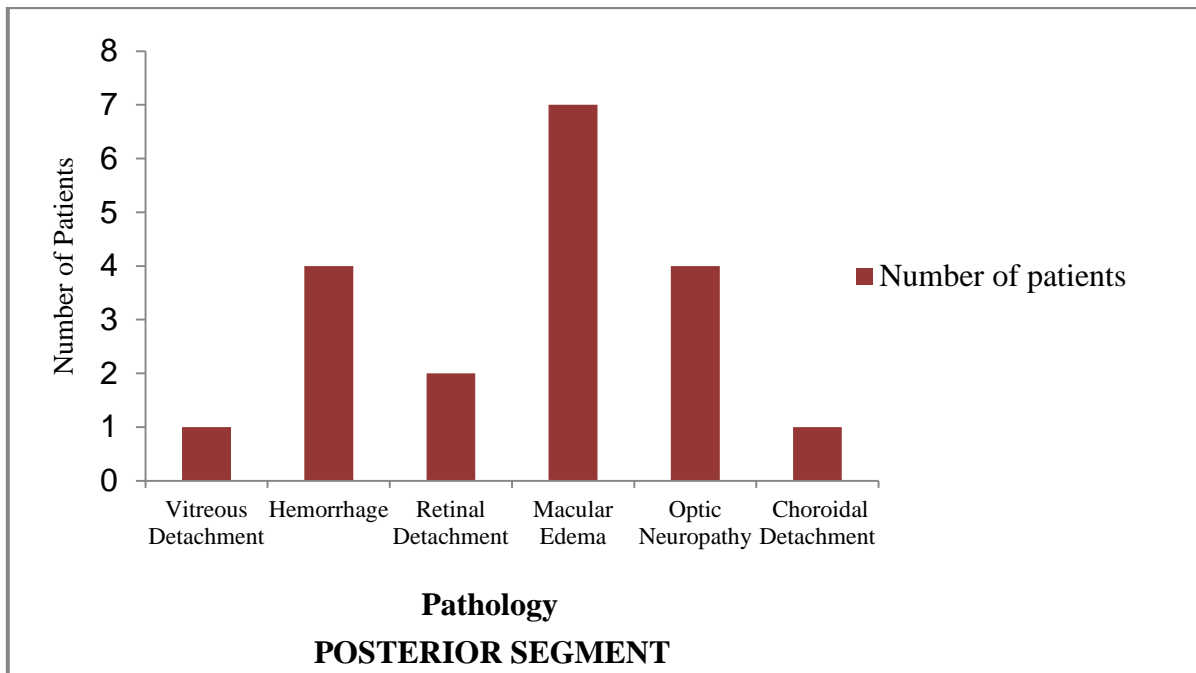
Graph No. 4: Anterior segment pathology.



In our study most of the patients suffered from blunt ocular trauma had sub-conjunctival haemorrhage followed by hyphaema followed by iritis and traumatic mydriasis. Few people suffered from dislocation and subluxation of lens.

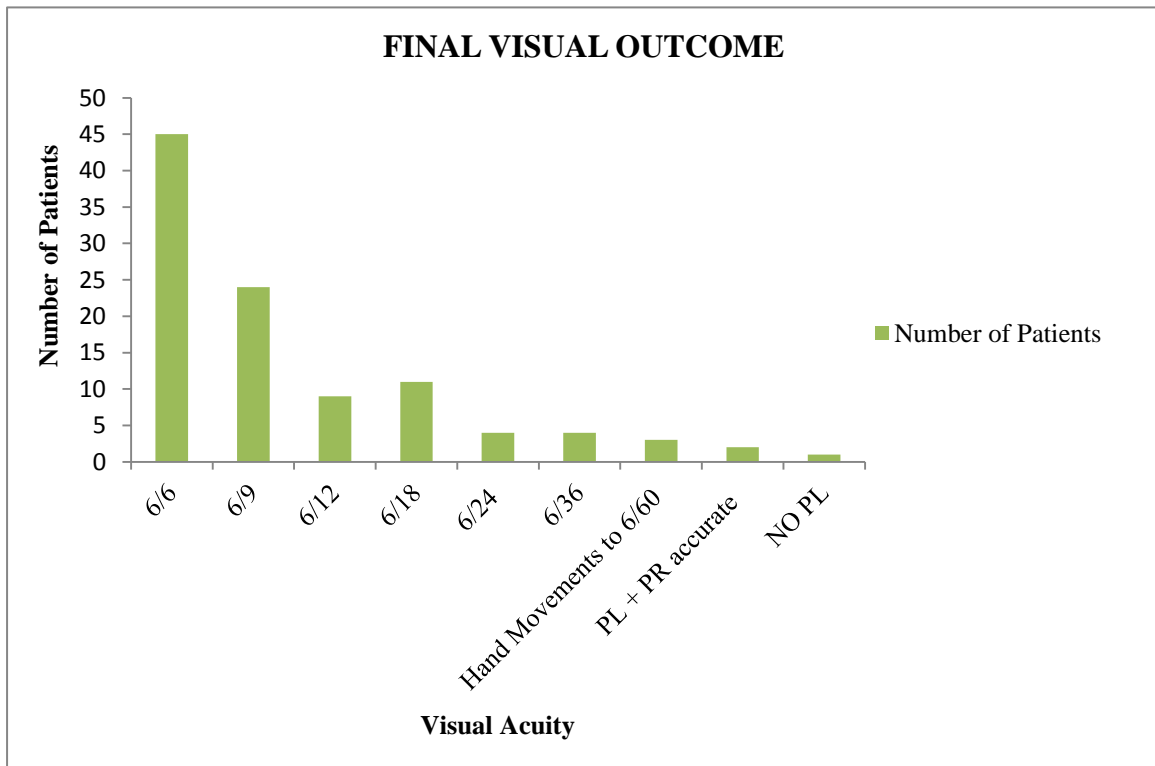
Observation No. 5: Posterior segment pathology in blunt ocular trauma.

Graph No. 5: Posterior segment pathology.



In our study it was found that most of the patients suffering from blunt ocular trauma had pathology in the macula followed by vitreous and optic nerve. Few people also suffered from retinal detachment.

Observation No. 6: Final Visual Outcome after Blunt Ocular Trauma
Graph No. 6: Final visual outcome.



In our study it was found that most of the patients who suffered from blunt ocular trauma regained final visual acuity of 6/6. Few people had visual acuity of counting finger and perception of light. Some patients had no perception of light ever after complete management.

Discussion:

The present study on 103 patients with blunt injury to the eye included patients with trivial to gross external injuries, with mild to gross visual loss

1) In our study there were 68 males and 35 females. Male is to female ratio is 2:1. Incidence of blunt trauma was more in Male probably due to increased exposure of men to Road traffic accidents and work place accidents. According to Jain BS et al (1993) incidence was 69.3% in males and 30.7% in females.^[2] Another study carried out by Misra S et al has recorded the percentage of 71.67% as males and 28.3% as females suffering from blunt ocular trauma.^[3]

2) In our study age group in which blunt trauma to eye was common was 31 to 40 years i.e. in the fourth decade. Road traffic accident constituted 20.38 % of total injuries. High incidence of trauma to eye was at the fourth decade. This is probably due to increased work-related exposure in this group. Children of non-school going age along with students of school going age are more common in our study, as this group is engaged in playing various types of sports and can lead to various types of blunt injuries to the eye. Incidence was less in the extremes of life because of less exposure to accident prone environment as they spend most of the time at home and thus are less exposed to Road traffic accident. This is consistent with the study carried out by Ozougwu NS et al^[4] on ocular trauma, the 18-35 years age group was most affected and the right eye was more frequently involved.

3) In our study it was found that ball was the most common mode of blunt ocular trauma followed by stick (10.6%), fist (5.8%), metal (4.8%), stone (0.97%), Ball (11.6%) crackers (1.9%). Fall (38%) contributed to the largest number after these modes of injury taken together. Most common object caused blunt trauma to the eye was stone (18%), followed by stick (12%), and fist (12%), Road Traffic Accident (9%), iron rod (7%), bull gore (6%), ball (5%), branch of tree (4%) etc. The commonest mode of injury was by stones (Ref) similar to study by Jain BS et al^[2]. The study conducted in Arvind eye hospital found that the most common site for ocular injury farm (26%) followed by workplace (23%). Injuries at home were found in 20% injuries on street were found to be 13.75%. Urban slum population study found higher prevalence of ocular trauma at workplace. This is comparable to a study carried out by Singh DV et al which reports 7.6% injuries at

recreational venue.^[5] In this study, injuries on street accounted for 13.75% cases. These were in the form of ocular involvement in vehicular accidents or foreign bodies. Nirmalan also observed blunt objects to be the common cause of injury in 54.9% of their cases.^[6] Krishnaiah et al have reported that majority of eye injuries occurred at the workplace (55.9%) followed by home (21.7%). Playgrounds & schools accounted for 4% injuries in our study.^[7]

4) Comparison of our study with other studies in anterior segment pathologies:

Ocular involvement	Our study	Sumana JK et al ^[8]	Zagelbaum et al ^[9]
Corneal abrasion	16%	21.8%	23%
Traumatic iritis	13%	9.3%	32%
Sub conjunctival haemorrhage	66%	37.5%	23%
Ecchymosis and lid edema	82.5%	62.5%	40%
Lid laceration	18%	31.2%	13%
Hyphaema	31%	12.5%	5%
Iris injury	13%	15.5%	4%
Lens dislocation	0.9%	3.1%	2%
Traumatic cataract	0.9%	-	2%

5) Comparison of our study with other studies in Posterior Segment Pathologies:

Ocular involvement	Our study	Sumana JK et al ^[8]	Zagelbaum et al ^[9]
Retinal/choroidal haemorrhage	0.9%	-	2%
Berlin's edema	7%	6.25%	5%
Vitreous haemorrhage	3.88%	3.1%	2%
Retinal detachment	2%	-	1%
Ruptured globe	-	-	1%
Angle recession	7.7%	-	1%
Choroidal rupture	0.9%	-	1%

6) Final visual outcome

In our study it was found that patient presenting early after blunt ocular trauma and having pathologies like black eye, subconjunctival hemorrhage, corneal abrasions and corneal edema regained normal vision after proper management and timely intervention. 45 patients out of 103 regained normal visions. Nearly 50 patients regained near to normal vision like 6/9 as most of them had hyphema, traumatic iritis, mydriasis. Patients with hyphema resolved after few days after proper management and got good vision but those suffering from recurrent bleed and those who developed blood stained endothelium got less vision as they reported to the hospital with some delay.

Few patients developed glaucoma as Intraocular pressure was not controlled. Few patients presenting to us with dislocated and subluxated lenses which were operated but as the damage was great leading to posterior capsular tear and zonular dehiscence were left aphakic after removal of cataractous lens and got thick glasses post operatively leading to vision of 6/60 or less but did not get normal vision. They were planned in future for secondary Intraocular lens and got some improvement of vision leading to better quality of life.

Few patients presenting to us had gross deterioration of vision near to hand movements and perception of light as they suffered trauma to the posterior segment leading to macular edema and traumatic optic neuropathy. After proper treatment patients with macular edema recovered to few lines but did not get full normal vision. Patients with traumatic optic neuropathy after treatment improved to few extent to 6/36 but many did not as they reported to us late and presented for the first time when already traumatic optic atrophy has ensued. This is consistent with the study carried out by Kirti Singh et al one hundred and three cases of incident ocular injury were included in the study. Good outcome (vision of > 6/60 Snellen) could be achieved in 50% cases, of which 53% had purely anterior segment injury and 20% concomitant retinal injury. Good outcome had a direct correlation with early presentation in 57% and poor outcome with late presentation seen in 64% cases.^[10]

Few patients presented to us with mere perception of light with projection of rays inaccurate as they suffered with retinal detachment. All of them were operated and most of them remained with only projection of rays accurate and did not even

improve to counting fingers and hand movements giving us message that retinal detachment carries poor prognosis even after timely management with expert hands. Thus it can be said that posterior segment pathologies carry somewhat poor prognosis as compared to anterior segment pathologies even if intervened properly and timely. In a study conducted by Simanjuntak GWS et al included 97 patients, with males showing preponderance, the ratio being 9:1. Poor visual outcome was due to vitreous hemorrhage, cataract, iridodialysis, and choroidal rupture. On statistical analysis, significant risk factors were causality (P = 0.018), IVA (P = 0.026), onset of injury (0.000), and grade of hyphema (P = 0.000).^[11]

Conclusion:

Blunt trauma was more common in males. Most common age group was 4th decade. Road traffic accidents constituted large number of blunt injuries. Road traffic accidents had a high rate of visual loss due to optic nerve injury. Work related injuries were common among non – Road traffic accident patients. Visual loss was not severe in anterior segment lesion. Even trivial anterior segment injury can present with vision threatening pathologies in the posterior segment. So it is very important to examine posterior segment in all the patients with injury to the anterior segment. Posterior segment lesion led to gross visual loss due to retinal detachment, vitreous hemorrhage, choroidal tear and optic nerve injury. Globe rupture led to severe visual loss.

References:

- [1.] Maiya AS, Dharmesh AM, Jayaram R. Clinical profile of ocular blunt trauma in a rural hospital. *Journal of Clinical Ophthalmology and Research*, 2018; 6(1): 3-7.
- [2.] Jain BS and Soni SR. Ocular injuries: An analytical study in a teaching general hospital. *Indian J Ophthalmol* 1987; 35:112-6.
- [3.] Misra S, Nandwani R, Gogri P, and Misra N. Clinical profile and visual outcome of ocular injuries in a rural area of western India. *Australas Med J*. 2013; 6(11): 560–564.
- [4.] Ozougwu NS, Adeyekun AA, ESE-Onakewhor NJ and Efe-Aluta EE. Sonographic features of patients with ocular trauma at the University of Benin Teaching Hospital, Benin-City. *Annals of Health*

- Research; July-December 2018;4(2):174-181.
- [5.] Karve S, Kolte A, Alfia A and Rathi H. Study of clinical profile of ocular trauma at a tertiary eye care centre. International Journal of Contemporary Medical Research 2017; 4(12):4-7.
- [6.] Thulasiraj RD, Nirmalan PK, Ramakrishnan R, Krishnadas R, Manimekalai TK, Baburajan NP et al. Ophthalmology. 2003 Aug; 110(8):1491-8.
- [7.] Krishnaiah S, Nirmalan PK, Shamanna BR, Srinivas M, Rao GN and Thomas R. Ocular Trauma in a Rural Population of Southern India. Ophthalmology. 2006; 113(7):1159-1164.
- [8.] Pai SG, Kamath SJ, D'Souza S and Dudeja L. A clinical study of blunt ocular trauma in a tertiary care centre. Online J Health Allied Scs. 2013;12(2):10.
- [9.] Zigelbaum BM, Tostanoski JR, Kerner DJ, Hersh PS. Urban eye trauma. A one-year prospective study. Ophthalmology. 1993 Jun; 100(6):851-856.
- [10.] Singh K, Mutreja A, Bhattacharyya M, and Dangda S. Epidemiology and implications of ocular trauma admitted to a tertiary care hospital in North India. US Ophthalmic Review, 2017; 10(1):64–8.
- [11.] Simanjuntak GW, Farinthska G, M Simanjuntak GA, Artini W, Natali R. Risk factors for poor visual outcome in traumatic hyphaema: Jakarta eye trauma study. Niger J Clin Pract 2018; 21:921-4.