

Determine the final visual outcome in the patients of blunt trauma to the eye (Study of 200 cases)

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Abstract

Background and Aim: To determine the ultimate visual function expected and reached as per the OCULAR TRAUMA SCORE and assessing the effect of different injuries on visual acuity of the patients having blunt trauma to the eye. **Material and Methodology:** The present prospective study was conducted on 200 cases of blunt ocular trauma with detailed history, OTS score and prognosis calculation. **Result:** Out of 200 patients, maximum numbers of cases 89 (44.5%) were included in ocular trauma score grade 5 (Score 92-100) **Conclusion:** 65% cases had near normal final visual acuity (between 6/6 to 6/12) at the follow up at 6 weeks after regular treatment.

Key Words: Blunt Trauma, Ocular Trauma Score, Ocular Injury

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INTERNATIONAL OCULAR TRAUMA CLASSIFICATION was given. In 2002, the ocular trauma score (OTS) was devised, which estimates the specific visual function 6 months after the ocular trauma. This scale is useful for guiding treatment and rehabilitation of patients with ocular trauma and guide about prognosis.^{2,3} A prospective study was done to determine the ultimate visual function expected and reached as per the OCULAR TRAUMA SCORE and to assess the effect of different injuries on visual acuity of the patients having blunt trauma to the eye.

INTRODUCTION

The eye is encased with in the orbital bony cavity cushioned with a layer of fat and covered with two vertically sliding lids each containing a protective shield of tarsal plate. In spite of this natural protection to eyes, injuries to globe occur frequently. Children at play, young men at work, in factories and construction sites, road side falls, Road Traffic Accident, sport injuries, fall upon projecting blunt objects and in a rural set up like ours; agricultural based injuries are the causes of minor and severe blunt injuries¹. According to WHO, ocular trauma approximately accounts for 1.6 million blindness per year. So to idealize eye trauma terminology system,

INTERNATIONAL OCULAR TRAUMA CLASSIFICATION AND ITS SCORING

- Type (based on the mechanism of injury)
- Grade (based on the initial visual acuity)
- Pupil (depending on the presence or absence of an relative afferent pupillary defect)
- Zone (based on the location of the wound in open globe injuries and on what the most posterior tissue that has been damaged is in closed globe injuries)

This classification is easily performed at the time of initial evaluation and primary injury repair. The advantage of this system is that it does not require

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specialised instruments and it helps in standardising the description of eye injuries required for comparison in different studies.

CLOSED GLOBE INJURY CLASSIFICATION:

- TYPE: A Contusion
- B Lamellar Laceration
- C Superficial Foreign Body
- D Mixed
- GRADE: 1 >20/40
- 2 20/50 To 20/100
- 3 19/100 To 5/200
- 4 4/200 to Light Perception
- 5 No Light Perception
- Pupil (Affected Eye)
- Positive: RAPD Present
- Negative: RAPD Absent
- Zone: 1 External (Bulbar conjunctiva, sclera, cornea)
- 2 Anterior Segment
- 3 Posterior Segment (Structures Posterior to the Posterior Lens Capsule)

Here, visual acuity is measured at a distance of 20 feet using the Snellen’s chart with correction and pinhole when appropriate.

OCULAR TRAUMA SCORE

The ocular trauma score can be used as an aid in the counselling and treatment of eye injuries and it is intended to direct attention towards resources, needs and rehabilitation during the treatment process. It is continually evolving scoring system to put to practical use. First, determine the patient’s visual acuity after the injury and their diagnosis. Second, assign a raw point value for initial visual acuity from table 1 and then subtract the appropriate raw points for each diagnosis. Table 2 shows the estimated probability of all potential visual outcomes after 6 months. For example, a patient with initial visual acuity of 1/60, scleral rupture and retinal detachment would receive a raw OTS score of 80-23-11=46.

Higher OTS scores tend to indicate a better prognosis.

Step 1

Determining The Raw Points	Variable	Raw Point Value
Initial Vision	NPL/Enucleation / Evisceration	60
	LP/HM	70
	1/60-5/60	80
	6/60-6/15	90
	>=6/12	100
	Rupture	-23
	Endophthalmitis	-17
	Perforating injury	-14
	Retinal detachment	-11
	RAPD	-10

Step 2: Conversion of Raw Points into the OTS and Predicting the Likely Visual Outcome (%)

Sum Of Raw Points	OTS	NPL	LP/HM	1/60-5/60	6/60-6/15	>=6/12
0-44	1	74	15	7	3	1
45-65	2	27	26	18	15	15
66-80	3	2	11	15	31	41
81-91	4	1	2	22	22	73
92-100	5	0	1	5	5	94

MATERIAL AND METHODOLOGY

The present prospective study was conducted on 200 cases of blunt ocular trauma involving the eye and the adnexal injury of the patient seen in the ophthalmology department, S.S.G. hospital, Vadodara during period of October 2014 to November 2015.

Criteria for case selection: Study population: Patients presenting with history of blunt injury to one or both eyes in outpatients department and in casualty and patient referred with blunt eye injury from other PHC, CHC, private setups and neighbouring states.

Inclusion criteria: Patient’s presenting with history of blunt injury to one or both eyes.

Exclusion criteria: Patient presenting with Penetrating or Perforating trauma to eye or having history of some ocular pathology in past and those who failed to give consent.

Written Informed Consent was taken in all the patients included in study.

Parameters studied: A standard protocol was developed and filled up for each patient. Detailed history was elicited from the patients who were co-operative and from parents / close relatives of patients who were very young

or not co-operative. Elaborative data was noted about the date of trauma, mode of trauma, the circumstances in which it occurred and causative agent responsible for the injury. History of symptoms related to ocular system was elucidated. Special inquiry was made as to the time elapsed between the occurrences of trauma and receiving the first treatment.

Ocular examination: This included vision, detailed torch light examination, slit lamp examination and fundus examination. Specific ocular investigations included intraocular pressure; sac syringing and USG B-scan, X-ray / CT orbit where required. Entries were made at each follow up.

Visual acuity: Best Corrected Visual Acuity (BCVA) using an illuminated Snellen's chart with the patient seated at 6 meters distance if possible at the time of first examination or during subsequent follow up. Vision before trauma was inquired. For illiterate patients E chart or Dots chart was used.

Grading and Scoring of the patients: Grading according to international trauma classification and its scoring

according to ocular trauma score was done in all patients. Each patient was graded depending on the type of injury – open / closed. The raw point values for each criterion deduced mainly based on initial visual acuity, presence or absence of RAPD, rupture, endophthalmitis, perforating injury and retinal detachment. Ocular trauma score thus obtained was used to determine the final visual outcome of the patient from the given tables.

Follow up: This was the most difficult and endeavouring yet very important phase of the study. Ocular manifestation was evaluated in each patient and all appropriate investigations were carried out. First follow-up was done after first week of discharge then on 2nd week and finally on 6th weeks.

Management protocols: Patients were given emergency care. Patients were treated either conservatively and / or surgically. All patients were treated according to standard guidelines as mentioned in standard textbooks including the recent advances in management protocols being followed worldwide and possible under present set-up.

RESULT

Table 1: Case Distribution according to OTS Grade

OTS grading	No of cases	Percentage
1	0	0%
2	2	1%
3	32	16%
4	75	37.5%
5	89	44.5%
Not applicable	2	1%
Total	200	100%

Out of 200 patients, maximum numbers of cases 89 (44.5%) were included in ocular trauma score grade 5 (Score 92-100), 75 patients were in category 4 (Score 81-91), 32 patients were in category 3 (Score 66-80), 2 patients were in category 2 (Score 45-65) and none of them was in OTS grade 1.

Table 2: INITIAL: FINAL visual acuity in patients presenting with blunt trauma of the eye

Visual acuity	Driving/ Travelling	Playing	Worker (Factory/Construction Site)	Household Activity	Farming	Quarrelling	Other Activities
6/6	11 : 15	09 : 16	06 : 12	06 : 07	00 : 00	00 : 02	01 : 03
6/9	02 : 30	04 : 12	04 : 09	03 : 05	00 : 02	01 : 02	02 : 02
6/12	21 : 04	10 : 03	00 : 02	02 : 01	00 : 01	01 : 00	01 : 02
6/18 to 6/24	10 : 09	04 : 04	02 : 03	01 : 01	03 : 02	01 : 01	05 : 06
6/36 to 6/60	11 : 05	05 : 05	13 : 05	00 : 01	03 : 01	02 : 02	04 : 01
FC 11 to 20 feet	10 : 03	11 : 06	05 : 04	02 : 00	01 : 03	02 : 00	02 : 01
FC 1 to 10 feet	04 : 04	03 : 00	04 : 00	01 : 00	03 : 01	-	01 : 01
HM, PL ±, PR ±	01 : 00	-	01 : 00	-	-	-	01 : 01
NO PL	-	-	-	-	-	-	-
TOTAL	70 : 70	46 : 46	35 : 35	15 : 15	10 : 10	07 : 07	17 : 17

Out of 200 patients, at presentation there were 33 patients having visual acuity of 6/6 which increased to 55 at the end of 6 weeks. At presentation 16 patients were having visual acuity of 6/9 which increased to 62 patients at the end of 6 weeks. 35 patients had visual acuity of 6/12 at presentation and 13 patients had visual acuity of 6 by 12 in the end. Visual acuity was improved to 6/6 to 6/9 in most of them. 26 patients had visual acuity between 6/18-6/24 at presentation and 25 patients had it at the end of 6 weeks. 38 patients had visual acuity between finger counting 11 to 20 feet at presentation and 18 patients had it at the end of 6 weeks. 16 patients had visual acuity between finger counting 1 to 10 feet at presentation and 6 patients had it at the end of 6 weeks. 3 patients had visual acuity in hand movement at presentation and 1 patient had it at the end of 6 weeks.

DISCUSSION

Vision: Out of total 200 cases, 38 eyes of purely subconjunctival haemorrhage had a best corrected visual acuity of 6/6; of the remaining 162 eyes 17 eyes gained a final visual acuity of 6/6, 62 eyes had a final visual acuity of 6/9, 13 eyes had a final visual acuity of 6/12, and 25 eyes had a final visual acuity of 6/18 to 6/24 and remaining 45 eyes, 25 had less than 6/60 in which 24 had vision in finger counting and 1 had hand movement close to the face. According to Palermo University, Italy (2001-2005) [4] final visual acuity was 20/40 (6/12) or better in 144 eyes (48.3%), 20/40-20/200 (6/12-6/60) in 90 eyes (30.2%) and <20/200 (6/60) or less in 46 eyes (15.5%). Eighteen (18) eyes (6%) had a final acuity of no light perception. Their findings coincide with our study.

Final Visual Acuity	Palermo Italy (2001-05)	Our study (2015-16)
6/6-6/9	48.3%	58.5%
6/12-6/60	30.2%	29%
< 6/60	15.5%	12.5%
No PL	6%	0%

CONCLUSION

- We had the prospective study of ocular manifestation of 200 cases of blunt ocular trauma presenting at us at SSG hospital, Vadodara between the periods of October 2014 to November 2015.
- 65% cases had near normal final visual acuity (between 6/6 to 6/12) at the follow up at 6 weeks after regular treatment.
- Highest incidence of blunt injuries among occupational injuries was mainly labourers at construction site, factory, shops and farms. Driving (Road Traffic Accidents) is major risk factor not drivers (Occupation). Road Traffic Accidents forms the major bulk of our study (35%) which was followed by sports and play

(23%), occupational injuries (17.5%) and agriculture (5%).

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