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A Retrospective Observational Study on the Posterior Segment Manifestations of Blunt Ocular Trauma and Their Visual Outcomes at Tertiary Eye Care Centre in Eastern India

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ABSTRACT:Background: Ocular trauma is a significant cause of monocular blindness worldwide. Eye injuries involving the posterior segment have been a matter of concern particularly due to the related poor visual outcome. These injuries require specialized follow up care to achieve best possible visual outcome.
This study is aimed at give baseline information on pattern of posterior segment eye and visual outcomes.
Material and Methods:A retrospective observational study on the posterior segment manifestation of blunt ocular trauma and their visual outcomes. Retrospective case series from June 2019 to May 2020 of eye injuries involving posterior segment .A structured questionnaire was the main data collection tool from hospital records. The follow up time was 12 months.
Results: Fifty three eyes of fifty one patients were reviewed. Thirty six patients (71.6%) were male and majority (49.01%)were in the 31-40 years age group. The most known circumstance of injury was road traffic accident in 30 patients (58.8%) with metal being the most common agent causing these injuries in 17 eyes (34.7%). Thirty nine eyes (74.5%) were closed globe injuries with retinal detachment(46.2%) and vitreous hemorrhage(44.3%) being the most common finding respectively. There was a marked improvement in the visual acuity presentation and at final review after various interventions with 19eyes (37.9%) having a final visual acuity of 6/36 or better . Retina was attached in 38 eyes(72.3%) after retinal detachment surgery at final follow up. Eyes which had more number of surgical interventions had worse visual outcome .
Conclusion: Ocular injuries involving the posterior segment were most common in young males (20-40 years age group). Timely surgical intervention done in posterior segment injury results in good visual outcome.

KEY WORDS: Profile ,Patients, Blunt ocular trauma, Posterior segments, Tertiary Hospital, Eastern India.

I. INTRODUCTION:

The most significant cause of monocular blindness, globally is trauma. WHO stated that about 55 million eye injuries cause restriction of daily activities, among whom 1.6 million go blind every day. Human body with its constant activity is always prone to injuries. Ocular trauma may occur in isolation or with multisystem involvement.Trauma affecting posterior segment of eye is always taken as emergency because of late manifestation and may lead to blindness. Best treatment of ocular trauma is prevention itself.The outcome on posterior segment ocular trauma is quite poor and may lead to blindness.

The aim of the study was to study profile of patients presenting with posterior segment manifestation of blunt ocular trauma and to study their visual outcomes.

II. MATERIAL AND METHODS:

A retrospective observational study on the posterior segment manifestation of blunt ocular trauma and their visual outcomes was performed in a case series from 1stJune 2019 to 31stMay 2020 of eye injuries involving posterior segment .A structured questionnaire was the main data collection tool from hospital records.

Age, gender,causative agents of blunt ocular trauma , type of posterior segment manifestations,duration of presentation to hospital after injury, and follow- up were recorded. The follow up time was 12 months. Statistical analysis was done using MS Excel and SPSS version 25.

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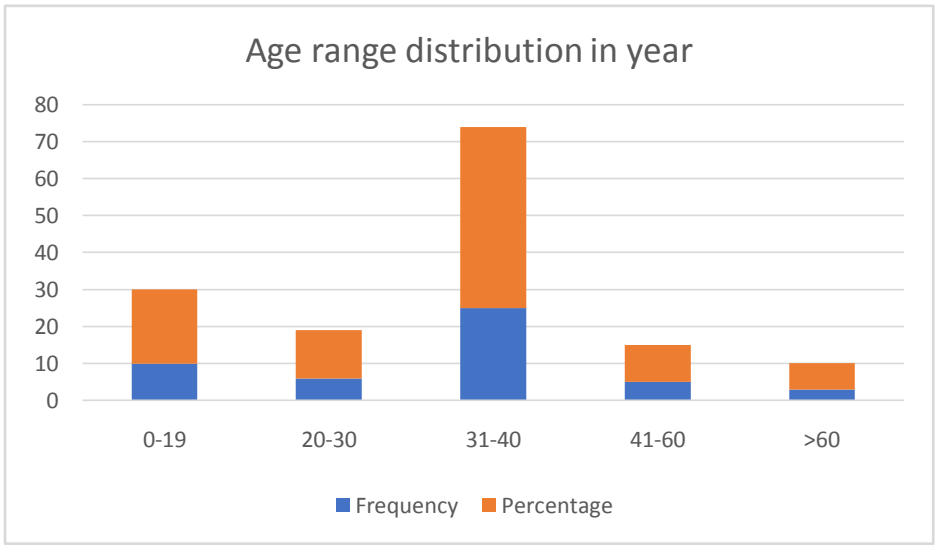
III. RESULTS:AGE RANGE DISTRIBUTION

Table 1:

Age range (years)	Frequency	Percentage
0-19	10	20.04
20-30	6	13.08
31-40	25	49.01
41-60	5	10.06
>60	3	7.09

Graph:1



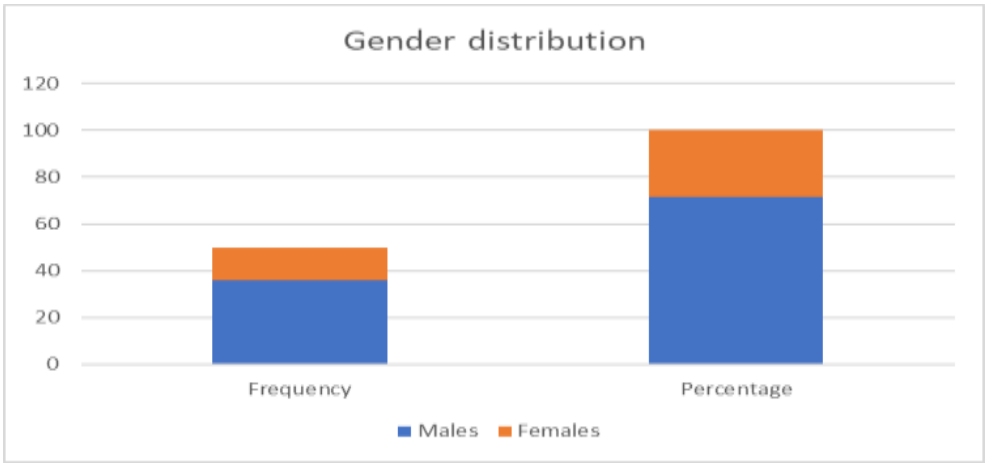
Among fifty one patients majority (49.01%) were in the 31-40 years age group.

Gender distribution

Table 2:

Gender	Frequency	Percentage
Males	36	71.6
Females	14	28.4

Graph:2



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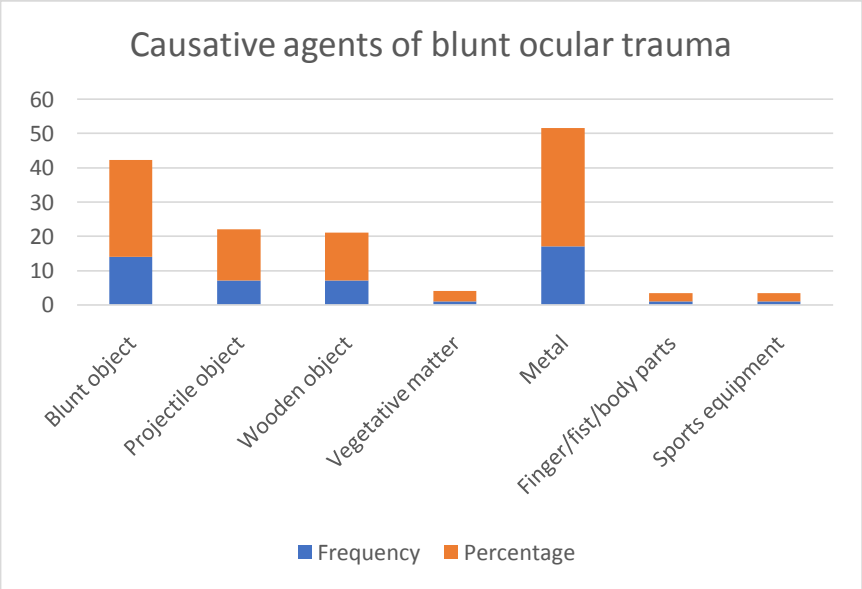
Male were more affected with blunt ocular trauma with Thirty six patients (71.6%) being male and fourteen patients (28.4%) were female.

Causative agents of blunt ocular trauma

Table 3:

Cause of injury	Frequency	Percentage
Blunt object	14	28.3
Projectile object	7	15.1
Wooden object	7	14.1
Vegetative matter	1	3.1
Metal	17	34.7
Finger/fist/body parts	1	2.3
Sports equipment	1	2.4

Graph:3



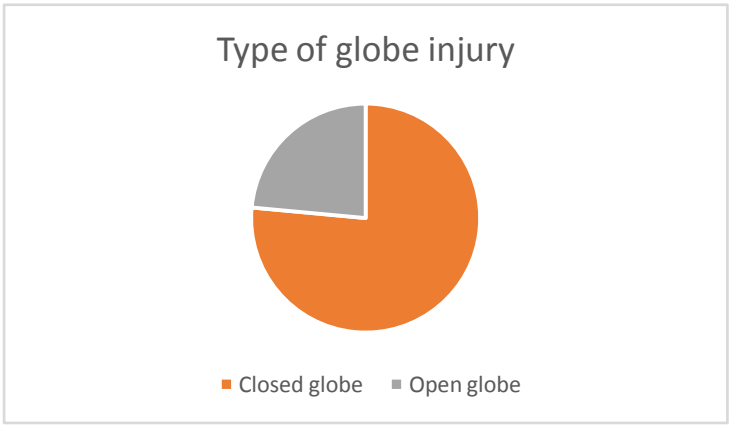
Metallic object is the most common(34.7%) agent causing these injury.

Type of globe injury

Table:4

Type of injury	Frequency	percentage
Closed globe	39	74.5
Open globe	12	24.5

Graph:4



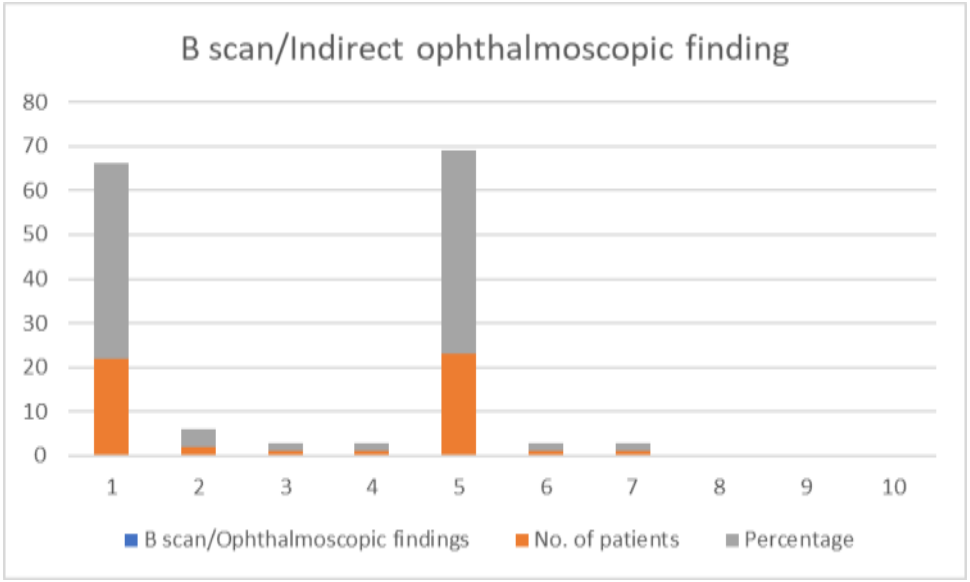
Thirty nine eyes (74.5%) had closed globe injuries and 12 eyes(24.5%) had open globe injuries

B scan/Indirect ophthalmoscopic finding

Table:5

B scan/Ophthalmoscopic findings	Frequency	Percentage
Vitreous haemorrhage	22	44.3
Posterior Vitreous Detachment	2	3.9
Choroidal detachment	1	1.9
Macular oedema	1	1.9
Retinal Detachment	23	46.2
Retinal tear or dialysis	1	1.9
Optic nerve atrophy	1	1.9

Graph:5



Retinal detachment(46.2%) and Vitreous hemorrhage(44.3%) being the most common finding respectively.

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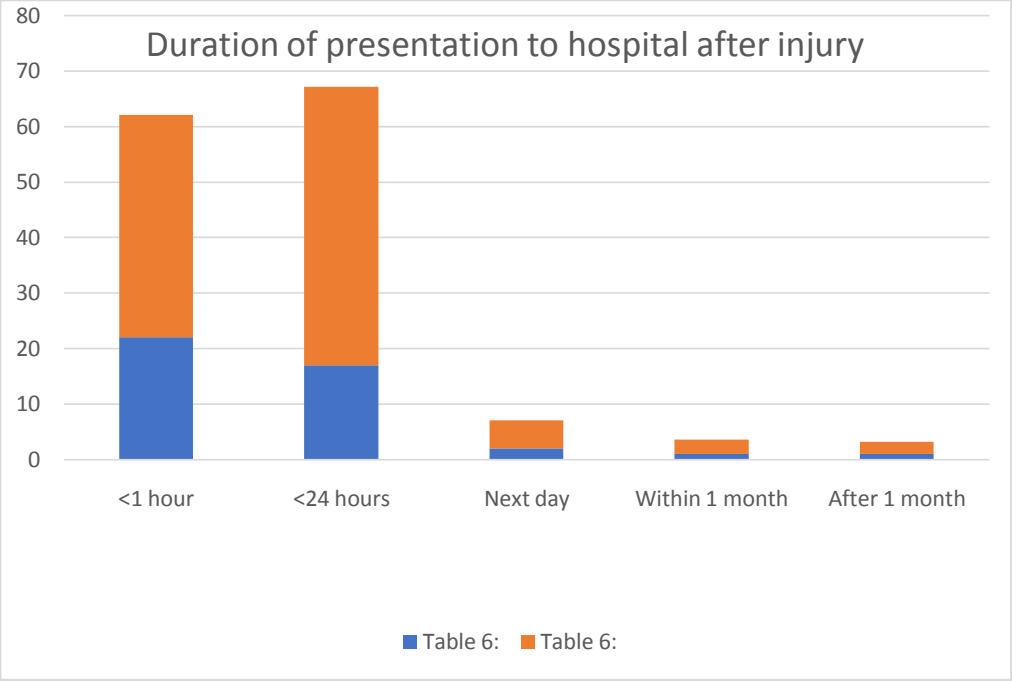
Duration of presentation to hospital after injury

Table :6

Duration after injury	Frequency	Percentage
<1 hour	22	40.1
<24 hours	17	50.1
Next day	2	5
Within 1 month	1	2.6
After 1 month	1	2.2

Graph 6:



Most (90.2%) of patients presented within 24 hours of injury
Visual acuity at presentation

Table:7

Visual acuity at presentation	Frequency	Percentage
6/36	1	2.8
6/60	2	3.9
5/60	2	3.9
4/60	3	6.5
3/60	4	7.3
2/60	3	6.1
1/60	7	15
Counting fingers/ close to face/hand motion	6	12.3
Perception of light + PR accurate	3	5.7
Perception of light + PR inaccurate	2	4.0
No perception of light	1	2.1

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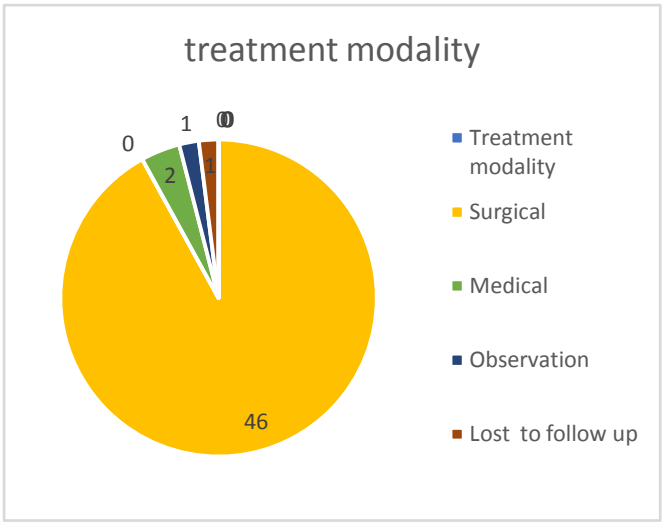
All the patients had visual acuity of <=6/36 with most common visual acuity of patients being 1/60 (15%).

Treatment modality

Table:8

Treatment modality	Frequency	Percentage
Surgical	46	91.5
Medical	2	5.1
Observation	1	2.3
Lost to follow up	1	2.1

Graph:7



Most of the patients 46(91.5%) required a surgical intervention common intervention.

Final visual outcome

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Table:9

Majority of patients 38.3% having vision limited to finger counting and 37.9% patient had final visual acuity of >=6/36 .

6/18	2	4.2
6/24	1	3.2
6/36	19	37.9
6/60	6	12.2
FC 2feet,PL+,PR+	19	38.3
HM+PL+PR	2	4.2
HM- hand movement, PL-perception of light, PR-perception of ray. FC - finger counting.		

Visual acuity at various time intervals (frequency)

Table:10

Visual acuity	At presentation	At 1 month	At 3month	At 6 months	At 12 months
6/36	1	1	2	4	5
6/60	2	2	2	1	1
5/60	2	1	5	3	1
4/60	3	3	1	1	2
3/60	4	7	4	2	2
2/60	3	4			
1/60	7	3	1	1	1
Counting fingers/ close to face/hand motion	6	5	5	5	5
Perception of light + PR accurate	3	2	2	2	2
Perception of light + PR inaccurate	2	2	1	1	1
No perception of light	1	2	2	3	3

IV. DISCUSSION:

This retrospective observational hospital based study throws light on the pattern of serious blunt ocular injuries with emphasis on posterior segment involvement in patients admitted to a tertiary eye carecentre. Epidemiological spectrum of ocular trauma varies in developing and developed countries. Public awareness, economical background and availability of resources are attributable for these differences. This data is helpful in defining target population and accordingly, preventive measures can be taken. The ratio of patients admitted with blunt ocular injuries with posterior segment involvement to total number of patients with ocular injuries was 25% in present study which is comparable (16.09%) to a study done by Matti.[1]

Majority of the patients who sought treatment for blunt ocular trauma were males as highlighted by male preponderance in all age groups. Similar results were obtained by Misra[2] with male dominance of 71.6% and Wong[3]whose study revealed that males are four times vulnerable to ocular trauma as compared to females. Studies in the past[4-6] have highlighted this aspect citing male gender preponderance attributable to their common involvement in agricultural and industrial work.

Young adults in age group 31-40 years were the commonest group to be afflicted (49.01%) which is comparable to study done by Vats[7] and

various other literature published from developing and developed world confirming to this aspect of ocular trauma.[8-10.]

Lack of data in present study limits the comparison between urban and rural population however the majority of patients presenting with eye injury belong to urban background.

The reporting time of majority (90.2%) of patients was <24 hours of ocular injury which is on higher side as compared to Kirti singh[11] of 68% and Gyasi[12] to be 57.3% cases conferring medical attention within 48 hours of injury. Early presentation (within 48 hours) was one of the main determinants of good visual outcome as compared to poor outcome in cases presenting beyond 48 hours of injury.

Various objects made up of wood or metal including other agents as vegetable matter, animal body parts or sports objects can cause ocular injuries of various degree. In our study metal constituted major cause (34.7%) of blunt trauma which is similar to study done by Sukhumma[13]who found a preponderance of 40.42% injury caused due to blunt trauma.

B scan or indirect ophthalmoscopic findings revealed retinal detachment to be most common (46.2%) finding followed by vitreous haemorrhage (44.2%) in patients presenting with posterior segmenttrauma. Similarly, Erdurman et al found retinal detachment to be most frequent (31%) finding while vitreous haemorrhage occurred in 20% in eyes involving posterior segment injury .[14]

Vitreous haemorrhage had to undergo vitrectomy after 1 week of trauma and retinal detachment were offered s vitrectomy followed by encircle with endo laser/Gas/ silicon oil. Re surgery was required in which vitrectomy was done in a case ofnonresolving vitreous haemorrhage.

Final visual outcome was poor in majority of patients having vision limited to finger counting in 38.3% cases and > 6/36 in 37.9% cases. Our findings are comparable to Kirti singh[11] who in his study of 103 patients showed a poor visual outcome (final vision <6/60) in 49.5% (51) cases in which 48 patients had concomitant posterior segment involvement along with anterior segment.

V. CONCLUSION:

Timely surgical intervention done in posterior segment injury with result in good visual outcome. However with posterior segment involvement long term prognosis remains poor.

There was a male preponderance with metal being the most common agent involving the posterior segment.

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