

Profile of patients with orbital fracture following road traffic accident

¹Dr. Dhananjaya KH, ²Dr. Girish Kulkarni

¹Consultant Ophthalmologist, General Hospital, Arkalgud, Hassan, Karnataka, India

²Consultant Ophthalmologist, MM Joshi Eye Institute, Hubli, Karnataka, India

Corresponding Author: Dr. Girish Kulkarni

Abstract

A direct blow to the eye and the surrounding tissue will result in a contusional injury of varying severity; from “black eye” to severe intraocular disruption. When the eye is struck, an anteroposterior compression will result with concomitant stretch in the equatorial plane with subsequent contusional and tearing damage. A pre-structured and pretested questionnaire was used to gather information after obtaining an oral informed consent from the study subject and maintaining confidentiality. The relatives or attendants will be interviewed where the condition of the victims did not warrant the interview. In our study we found that 68% of the orbital fractures were unilateral while 32% were bilateral. Out of which the most common wall to be fractures was the floor 59(59%) patients followed by 34(34%) lateral wall fracture 31(31%) medial wall and 11(11%) had roof fracture.

Keywords: Orbital fracture, road traffic accident, black eye

Introduction

Orbital rim is rounded and thickened and protects the eye from facial impacts. The superior rim is the most prominent because of the expansion of underlying frontal sinus. The medial third of the superior rim is interrupted by a notch for the supraorbital neurovascular bundle. Medially the superior rim passes downwards to the posterior lacrimal crest and ends at the entrance to the lacrimal canal. The inferior rim is composed of the maxillary bone medially and zygomatic bone laterally. The infraorbital foramen conducting the infraorbital artery and nerve is located 4 to 11 mm below the central portion of the rim. The lateral rim is the thickest and it is composed of frontal process of the zygomatic bone and the zygomatic process of the frontal bone that meet at the frontozygomatic suture line. Blunt trauma to the eye results in a well-recognised pattern of injury ^[1].

A direct blow to the eye and the surrounding tissue will result in a contusional injury of varying severity; from “black eye” to severe intraocular disruption. When the eye is struck, an anteroposterior compression will result with concomitant stretch in the equatorial plane with subsequent contusional and tearing damage. The consequences following the strike result in flattening of the cornea and an immediate rise in intraocular pressure ^[2]. As the anterior chamber is compressed, the pupil can be forced to dilate rapidly with subsequent tear of the sphincter muscles of the iris (traumatic mydriasis). Furthermore, the aqueous humor will be forced to the periphery and damage the drainage angle, resulting in glaucoma. Tension on the peripheral iris may result in displacement from its root, into the vitreous (Iridodialysis). Iridodialysis manifests as a D-shaped pupil. The condition shows little tendency to heal, but does not affect the sight. Additionally, bleeding from these highly vascularised structures will result in hyphema, which is an accumulation of the blood in the anterior chamber. Hyphema is usually minimal and patients are advised to rest to avoid secondary bleeding. Injuries to the lens include contusional cataract or lens dislocation which is usually partial. Choroidal tears may result in loss of vision from vitreous haemorrhage if large ^[3].

Retinal haemorrhage may be single or multiple with variation in size, with obvious effects on vision. Retinal tears commonly occur at the anterior margin of the retina and may result in retinal detachment which may spread and affect the macula. The most common cause of

visual disturbance in concessional eyeball injuries is retinal oedema (Commotio retinae). It is usually resorbs spontaneously with residual pigmentation. The ophthalmic examination should include the pupil shape, size and the intraocular pressure, with an oval pupil or a pupil lying eccentrically suggesting blunt trauma or perforation of the globe. If the intraocular pressure increases above the normal level (10-22mm Hg) this may suggest glaucoma secondary to trauma. Intraocular pressure lower than 10 mm Hg suggests either perforation of the globe or hypotony which results from blunt trauma ^[4].

Methodology

Source of data

Study subjects: All cases of orbital fracture presenting to ophthalmology and emergency department detected on a CT.

Exclusion criteria

1. Ocular injuries without orbital fractures.
2. Brought dead cases or cases that died during the course of treatment.
3. All patients not giving consent.

Methods of collection of data

- **Study design:** Hospital based Prospective study.
- **Sample size:** All known cases orbital fracture satisfying the study criteria, presented to or referred to ophthalmology and emergency department were included in the study.

Study instrument: A pre structured and pre tested questionnaire was used. All clinical data was collected using standard data collection proforma.

Data collection: A pre-structured and pretested questionnaire was used to gather information after obtaining an oral informed consent from the study subject and maintaining confidentiality. The relatives or attendants will be interviewed where the condition of the victims did not warrant the interview.

Results

Table 1: Distribution of patients by Sex

Sex predilection	Percentage
Male	86%
Female	14%

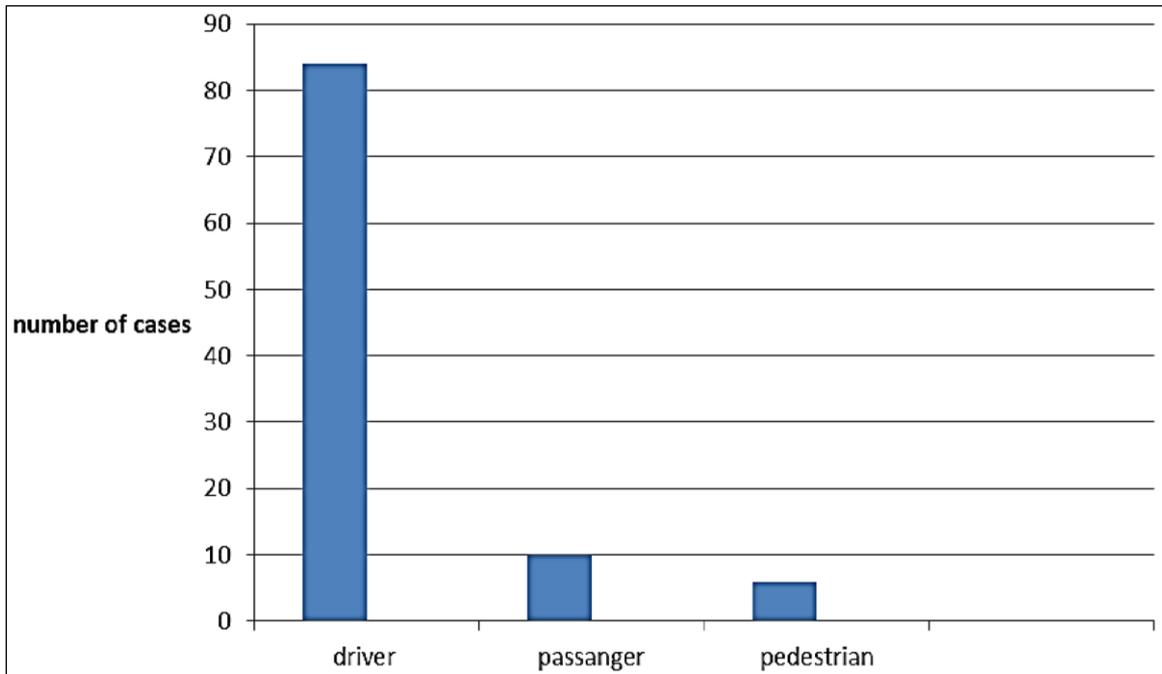


Fig 1: Occupation

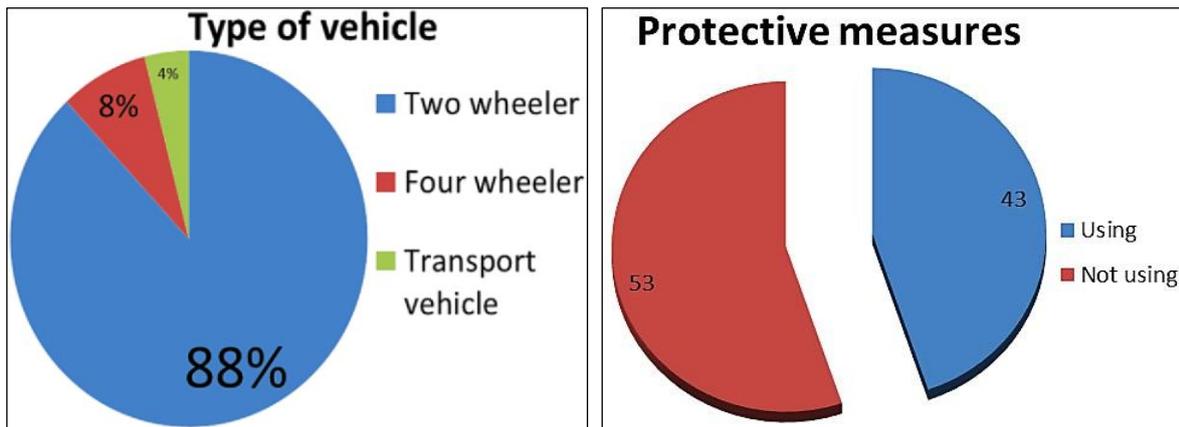


Fig 2: Type of Vehicle

Fig 3: Protective Measures

Table 2: Side Fractured

Side of fracture	No of cases
Unilateral	68
Bilateral	32

Table 3: Type of fracture

Wall fractured	Right eye	Left eye	No of cases.
Isolated floor	12	14	26
Isolated medial	5	3	8
Isolated lateral	2	3	5
Isolated roof	0	2	4

Discussion

There was a male predominance (86%) for orbital fractures. A similar pattern was seen in studies conducted by other authors: Jayamanne *et al.* ^[5] (89%), Makowski *et al.* ^[6] (78%), Zachariades *et al.* ^[7] (79%), Amrith S *et al.* ^[8] (83%), Ansari MH *et al.* ^[9] (79%), Barry C *et al.* ^[10] (88%) and Jamal BT *et al.* ^[11] (88%).

In our study we found that 68% of the orbital fractures were unilateral while 32% were bilateral. Out of which the most common wall to be fractures was the floor 59(59%) patients followed by 34(34%) lateral wall fracture 31(31%) medial wall and 11(11%) had roof fracture. similar results were observed by Karabekir Hs *et al.* ^[12] who reported in their case series of 58 cases with 69 orbital fracture they found that 81% of the cases were unilateral while 19% of the cases were bilateral. But in contrast to our study most common wall to be fracture was the lateral wall followed by floor and medial wall and the least common to be fracture was the roof of the orbit similar to the incidence reported in our study. ShanthaAmrith *et al.* ^[8] the blow out fractures involving the floor and the medial wall are more common. These results are comparable with our study.

This is in contrast to the results reported by studies by Chen *et al.* ^[13] which reports a incidence of (55.2%) medial orbital wall fracture, 3(39.5%), which had inferior wall fracture, 3 cases (4.0%), which had lateral wall fracture and 1 case (1.3%) had orbital superior wall fracture.

Our study showed isolated floor fracture in 26 cases (60%) cases which is comparable with the cook *et al.* study which showed high occurrence of isolated floor fractures of 84% Cook *et al.* ^[14] reported isolated medial wall fracture to be 0.2%, isolated lateral wall fracture to be 0.9%, Floor fracture to be 84.2%, combined medial/lateral wall 0.5%, medial/floor fracture 6.8%, latera/floor fracture 6.1% and medial/lateral/floor 1.2%, the large discrepancy in reports on types of fracture is because the above studies include all the other causes of orbital fracture like falls, industrial mishaps, domestic injuries, assault and sports related injuries.

Conclusion

- Males are more commonly affected than females and most common age group is from 20-30 years of age.
- Most common mode of injury is road traffic accidents by two-wheelers
- Floor is the most common wall to be involved.

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