Original Article

Clinical profile of medicolegal cases presenting to the eye casualty in a tertiary care center in India

Koushik Tripathy, Rohan Chawla, Pradeep Venkatesh, Rajpal Vohra, Yog Raj Sharma

Purpose: The purpose of this study was to analyze the clinical profile of medicolegal cases (MLCs) presenting to the eye casualty in a tertiary care hospital. **Materials and Methods:** Retrospective review of records. The cases were grouped according to the Ocular Trauma Classification Group classification system. **Results:** Out of 188 MLCs, 164 (87.2%) were male. Mean age (±standard deviation) was 31.6 (±12.7) years. Age ranged from 7 to 75 years. Twenty-six (13.8%) patients had bilateral involvement. The fist was the most common mode of injury, which was seen in 109 (58%) cases. A total of 27 (14.3%) patients had associated extraocular injury. No evidence of ocular or orbital trauma (malingering) could be found in 13 (7%) patients. Mechanical trauma was present in 169 (90%) patients with injury to globe in 129 (69%) patients and injury to lid or orbit without damage to the globe in 40 (21%) patients. Chemical injury was observed in 6 (3%) patients. Closed globe injury (CGI) was seen in 116 eyes and open globe injury (OGI) was noted in 29 eyes. The most common type of injury, zone, pupil, and grade of injury in CGI were Type A or contusion (79%), Zone I (72%), Pupil B (absence of relative afferent pupillary defect) in 95%, and Grade A [visual acuity (VA) ≥20/40] in 68% of the eyes, respectively. The most common type of injury, zone, pupil, and grade of injury in OGI were Type B or penetrating (48%), Zone II (38%), Pupil B (59%), and Grade D (VA 4/200-light perception) (42%), respectively. **Conclusions:** The most common form and mode of ocular injury in MLC were closed globe injury and fist, respectively. The most common type of injury in CGI and OGI was contusion and penetrating injury, respectively.

Key words: Birmingham eye trauma terminology, chemical injury of eye, malingering, ocular trauma, orbital trauma

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Medicolegal case (MLC) has been defined as "a case of injury/illness where the attending doctor, after eliciting history and examining the patient, thinks that some investigation by law enforcement agencies is essential to establish and fix responsibility for the case in accordance with the law of the land."[1] Encountering such cases is not uncommon in ophthalmic practice. However, there is a dearth of literature on the epidemiological data of MLCs in Ophthalmology.[2] The authors contemplated describing the clinical profile of MLCs attending the eye casualty of a tertiary care center in north India.

Materials and Methods

Retrospective data from MLC register of the institute from July 2012 to June 2014 were collected. The attending casualty medical officer, based on sound professional judgment, decided to label cases as MLC. The criteria for labeling a case as MLC included a history of assault, foul play or accidents including road traffic accidents (RTAs), patient's or patient's legal guardian's request to register as MLC, and medical officer's discretion. Details of each patient were taken in duplicate in a predesigned form. Details in each form included MLC number, patient's name, father's name, age, sex, caste, occupation, residence, name of accompanying person, date of examination, date and hour of arrival, number and date of police docket, number and name of constable, and date and hour of sending report to police. If the patient got admitted, the date of admission and discharge was also noted. The patient's signature or left thumb impression was taken in all cases. In all cases, the injury was classified into simple, grievous, or dangerous types. Grievous hurt was defined as per Section 320 of the Indian Penal Code (IPC) as a list of eight kinds of injury, which include "permanent privation of sight of either eye" and "fracture or dislocation of a bone or tooth." Dangerous injuries have been defined as those which cause imminent danger to the life by the involvement of important organs or structures or extensive areas of the body. All injuries which are not grievous are simple. A note was taken on "the kind of weapon used or poison suspected in case of poisoning" for all cases.

The cases were grouped according to the Ocular Trauma Classification Group classification system based on the Birmingham eye trauma terminology.[3] The study adhered to the tenets of the Declaration of Helsinki. A full-thickness wound of the eyewall (sclera and cornea) was defined as

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"open globe injury (OGI)." "Closed globe injury (CGI)" was defined as one, in which no full-thickness wound of the eyewall was present. OGI has been divided into five types - Type A or rupture, Type B or penetrating, Type C or intraocular foreign body (IOFB), Type D or perforating, and Type E or mixed. According to the presenting visual acuity (VA), both OGI and CGI have been classified into five grades – Grade A (≥20/40), Grade B (20/50–20/100), Grade C (19/100–5/200), Grade D (4/200 to light perception), and Grade E or no light perception (NLP). According to pupil, OGI and CGI have been classified as Pupil A or positive relative afferent pupillary defect (RAPD) in the injured eye and Pupil B or no RAPD in the injured eye. When pupil of an injured eye could not be visualized because of media opacity, it was assessed by observing the consensual response in the fellow eye.[3] According to the posterior most extent of the wound, OGI was divided into three zones - Zone I (cornea and limbus), Zone II (limbus to 5 mm behind the limbus at the sclera), and Zone III (posterior to 5 mm from the limbus). CGI was classified into four types - Type A (contusion), Type B (lamellar laceration), Type C (superficial foreign body), and Type D (mixed). Grade (VA) and pupil classification are identical for both CGI and OGI. According to the site of injury, CGI was classified into Zone I [external (limited to bulbar conjunctiva, sclera, and cornea)], Zone II [anterior segment (includes structures of the anterior segment and the pars plicata)], and Zone III [posterior segment (all internal structures posterior to the posterior lens capsule)].

Results

From July 2012 to June 2014, a total of 188 patients were registered as MLC. All the examination findings were complete except in one patient whose fundus findings were not noted as the patient absconded during dilatation of the pupils. Out of 188 MLCs, 164 (87.2%) were male. Age ranged from 7 to 75 years, with mean (±standard deviation) of 31.6 (±12.7) years. Thirty-one (16.5%) patients were 20-year-old or younger, 116 (61.7%) patients were aged between 21 and 40 years, 34 (18.1%) patients were aged between 41 and 60 years, and 7 (3.7%) patients were older than 61 years. Twenty-six (13.8%) patients had bilateral involvement. The most common mode of injury was trauma with the fist in 109 (58%) cases [Table 1]. The place of injury was street in 111 patients (59%), home in 57 (30%), factory in 5 (3%), school in 5 (3%), workplace (office) in 4 (2%), and others in 6 (3%) patients. In 22 (11.7%) cases, the injury was reportedly unintentional. No case of child abuse was recorded in the MLC register during our study.

Table 1: Distribution of the mode of injury

Mode of injury	Number of patients
Fist	109
RTA*	14
Stone	13
Wooden stick	12
Iron rod	10
Chemical	6
Blast	3
Gunshot	3
Others	18

*Road traffic accident

No evidence of fresh ocular or orbital trauma could be found (malingering) in 13 (7%) patients. Ten of these patients had a normal ocular examination with 20/20 vision in either eye while other patients claimed phthisis, corneal scar, and glaucomatous optic atrophy to be caused by a mechanical injury sustained 4–6 hours back.

Mechanical trauma was present in 169 (90%) patients with ocular injury in 129 (69%) patients and injury to lid or orbit without damage to the globe in 40 (21%) patients [Fig. 1]. A chemical injury was observed in 6 (3%) patients. CGI was seen in 116 eyes and OGI was seen in 29 eyes. Twelve (6.4%) patients were noted to have an alcoholic smell in their breath at the time of presentation. A total of 27 (14.3%) patients had a history of extraocular injury in the form of loss of consciousness in 7 (3.7%) patients, epistaxis in 8 (4.3%) patients, laceration at scalp, face, or neck in 6 (3.2%) patients, facial abrasions in 3 (1.6%), multiple skull fractures in 1 (0.5%), facial burns in 1 (0.5%), and fall of the upper left incisor tooth in 1 (0.5%) case. Twenty-five (12%) cases were graded as grievous injury. A dangerous injury was seen in 2 (1%) patients.

Of the total 116 eyes with CGI, 92 (79%) eyes had contusion (Type A injury), 20 (17%) eyes had a lamellar laceration or Type B injury, and in 4 (4%) eyes, there was a superficial foreign body (Type C injury) [Fig. 2]. According to zone, 84 (72%) eyes had Zone I involvement, 14 (12%) eyes had Zone II, and 18 (16%) eyes had Zone III involvement. RAPD was seen ('A' type of pupil involvement) in 6 (5%) eyes. According to VA, 79 (68%) eyes had Grade A, 13 (11%) eyes had Grade B, 8 (7%) eyes had Grade C, 12 (10%) eyes had Grade D, and 4 (4%) eyes suffered from Grade E injury.

Of the total 29 OGI eyes, 8 (28%) eyes had Type A (rupture) injury, 14 (48%) eyes had Type B injury (penetrating), 6 (21%) eyes had Type C injury (IOFB), and 1 (3%) eye had Type D (perforating) injury [Fig. 3]. Zone I was involved in 10 (34%), Zone II in 11 (38%), and Zone III in 8 (28%) eyes. RAPD was present or consensual reflex was absent in fellow eye (Pupil A) in 12 (41%) eyes. According to VA, Type A injury was seen in 3 (10%), Type B in none, Type C in 3 (10%), Type D in 12 (42%), and Type E in 11 (38%) eyes. Of the 13 eyes, in which VA was hand movements or better, 6 months' follow-up data were available for 10 eyes which underwent a repair of OGI. There was no significant difference ($P = 0.11$) between the median preoperative VA in logarithm of the minimum angle of resolution (1.15) and postoperative VA (1.05).

Forty (21%) patients had extraocular (lid or orbital) involvement without the involvement of globe. X-ray orbit was advised in all such cases and computed tomography (CT) of orbit when clinically indicated. Seventeen eyes had partial or full-thickness laceration of the upper or lower lid and 31 eyes had periorbital ecchymosis. Five eyes had an involvement of lid margin also, though only one eye had a canalicular injury (35-year-old male). Six eyes sustained Grade I chemical burn and two eyes had Grade VI ocular burn according to the Dua's classification.[4] The chemical was unknown in three cases, chilli powder in two cases, and acid in one case. There was no case of medical negligence.

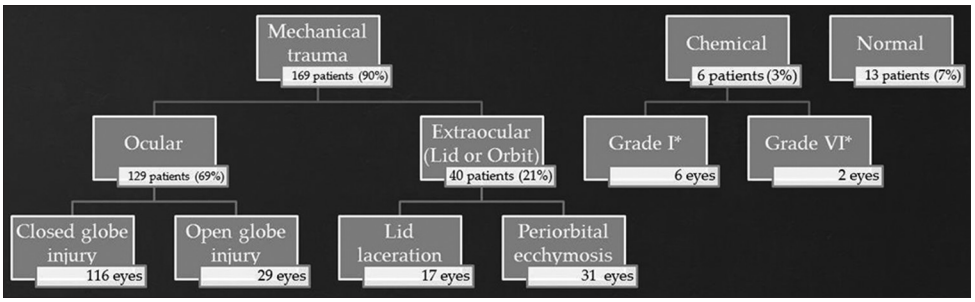

Figure 1: Clinical profile of medicolegal cases. *According to the Dua's classification[4]

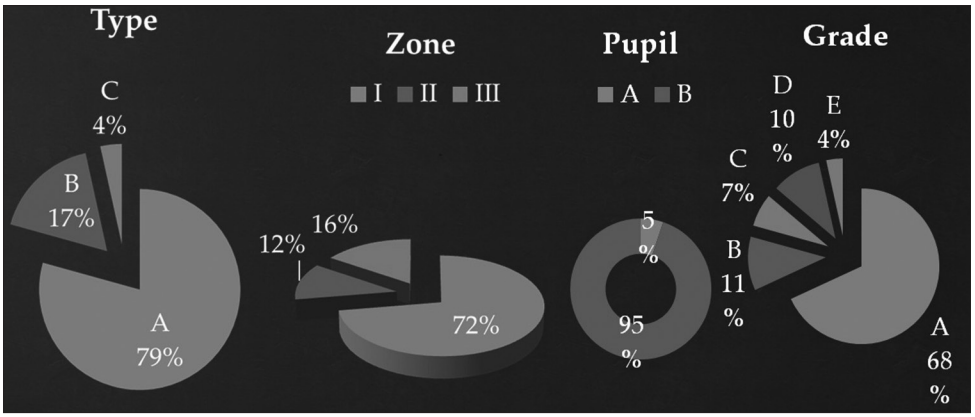

Figure 2: Clinical profile of closed globe injuries according to the Ocular Trauma Classification Group classification. Type A = contusion, Type B = lamellar laceration, C = superficial foreign body, Type D = mixed. Zone I = limited to the bulbar conjunctiva, sclera, and cornea, Zone II = anterior segment (includes structures of the anterior segment and the pars plicata), Zone III = posterior segment (all internal structures posterior to the posterior lens capsule). Pupil A = positive relative afferent pupillary defect in the injured eye and Pupil B = no relative afferent pupillary defect in the injured eye. Grading was done according to visual acuity: Grade A (≥20/40), Grade B (20/50–20/100), Grade C (19/100–5/200), Grade D (4/200 to light perception), and Grade E or no light perception

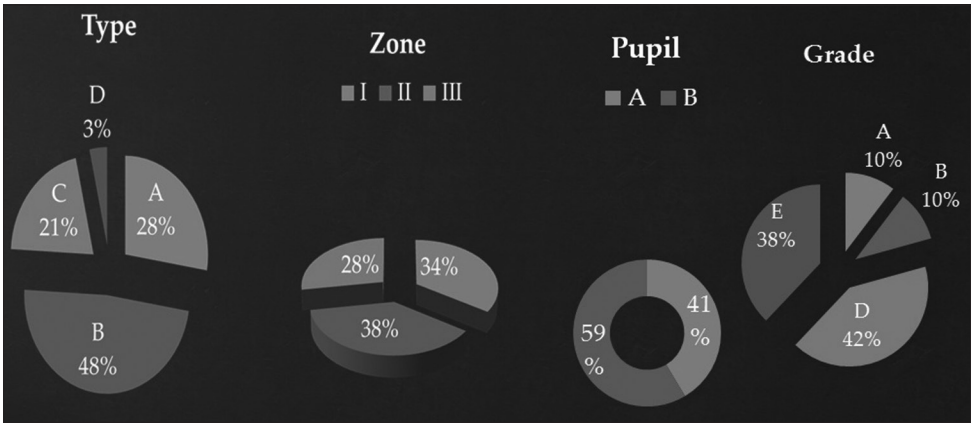

Figure 3: Clinical profile of open globe injuries according to the Ocular Trauma Classification Group classification. Type A = rupture, Type B = penetrating, Type C = intraocular foreign body, Type D = perforation, and Type E = mixed. Zone I = cornea and limbus, Zone II = limbus to 5 mm posterior into the sclera, and Zone III = posterior to 5 mm from the limbus. Pupil A = positive relative afferent pupillary defect in the injured eye and Pupil B = no relative afferent pupillary defect in the injured eye. Grading was done according to visual acuity: Grade A (≥20/40), Grade B (20/50–20/100), Grade C (19/100–5/200), Grade D (4/200 to light perception), and Grade E or no light perception

Discussion

MLCs represent an important aspect of clinical ophthalmological practice. The medicolegal report forms the basis for the documentary medical evidence in court. It has to be structured, detailed, accurate, and unbiased.[2] A proper medicolegal report demands minute professional examination along with clear documentation. MLC may imply further litigation against the accused, insurance claims, medical negligence claims, and workers' compensation issues. The consequences have many facets including legal, social, and economic.

The ophthalmologist should note all the relevant objective findings along with important negative signs in the report.[5]

The VA, intraocular pressure, and a drawing of the wounds are very important features to be documented. The report should be made immediately after the examination. If the report is more than one page, each page should bear the signature of the doctor at the bottom of the page. As the report demands a lot of responsibilities on the part of the doctor, great care should be taken, and exaggeration, superlatives, loose wordings, and careless statements should be avoided. The reports should avoid technical terms as far as possible. The opinions should be based on the objective signs and not on the history or information obtained from other sources. The report should include date, time, and place of the examination; the details of the patient; and details of the accompanying person. If a definitive opinion cannot be given immediately, relevant tests should be ordered, and the patient should be kept under observation. The report should be clear, legible, concise, complete, and should demonstrate competence of the doctor and lack of bias.

The eye being an important organ of senses, a significant trauma resulting in the permanent privation of sight has been termed as a grievous injury in the IPC. However, medicolegal aspects of ophthalmology including clinical profile have not been studied in the ophthalmic literature. As in most previous studies on ocular trauma, we also found a high male: female ratio (7:1). According to the literature, approximately, 80% of those injured are males;[6,7] male/female ratio in the United States Eye Injury Registry (USEIR) was 4.6:1.[8] Mostly, adults of third to fourth decades (62%) presented as MLC. According to the previous studies, most of those injured are young with an average age around 30 years.[8] The average age in the USEIR is 33 years. In our series, 21% of the patients presented with lid laceration or periorbital ecchymosis. This may reflect the effects of trauma with fist, which was the most common mode of injury. Seven percent of MLC were identified as having no evidence of fresh ocular injury. These patients registered as MLC either on request or with a history of alleged assault. However, careful examination revealed normal findings with 20/20 vision in either eye in ten such cases. Other malingerers claimed pre-existing ocular diseases to be caused by a recent trauma. A detailed examination and clear documentation in all MLCs are very important as monetary compensation or legal benefits may result from false claims by a malingering patient. Most commonly, contusion injury was seen with CGI. The most common zone involved was Zone I (72%), usually in the form of subconjunctival hemorrhage in 76 eyes (65%). Sixty-eight percent of the eyes had VA of more than 20/40, suggesting a lack of significant posterior segment trauma and the injury not causing media opacities in most CGI cases. In cases of CGI, RAPD was seen in six patients (5%). It was due to post-traumatic optic neuropathy in all such cases. In five of the six patients, intravenous pulse dexamethasone was given for consecutive 3 days. Follow-up data were available for four patients; none of them had improved vision at 6 months.

OGI cases presented with more severe involvement, with the most common type being penetrating (Type B) in 48% of the cases. In 66% of the cases, Zone II or III was involved. Eighty percent of the OGI had VA of 4/200 or worse. A significant number of eyes (11) had NLP (Grade E). The light perception was examined by using the brightest illumination of the indirect ophthalmoscope, as outlined by the "Endophthalmitis vitrectomy study."[9] Consensual pupillary response to light in the fellow eye was corroborated with the clinical findings of NLP in all these patients. Five of these eyes had Zone III and six eyes had Zone II injury. Two patients (four eyes) had bilateral NLP along with severely damaged distorted globes with extrusion of intraocular contents following RTA. Follow-up CT showed foreign bodies impinging on the optic nerve in other two eyes. Two other eyes had proptosis at presentation, for which a retrobulbar hemorrhage was suspected and CT scan was ordered. However, the details of the CT scan report were not available. Endophthalmitis was noted in one eye. For other two eyes, ultrasound showed retinal detachment with suprachoroidal hemorrhage, and visual-evoked response was extinguished.

Twenty-one percent of the patients had only lid or orbital trauma, with no evidence of trauma to the globe. X-ray orbit was reported to be normal in all cases. However, X-ray is only a screening tool and may miss 22–36% of the orbital fractures when compared with the CT, which is considered the gold standard.[10,11] Of the five patients whose CT of the brain was available at follow-up, four patients had evidence of small orbital fractures. One patient had also suffered from multiple fractures at the lower limb following a RTA. For other patients, the CT scan of orbit and brain was either not advised (19 patients) or not available due to the loss of follow-up (14 patients) and economic constraints of the patients (two patients).

Conclusions

CGIs were the most common injuries seen in MLCs of our series. The most common mode of blunt trauma causing CGI was fist injury. In our series, most cases involved Zone I or II with a good presenting vision. On the contrary, MLCs with OGI involved Zone II most frequently, of which many cases had lost the perception of light. There was no case of medical negligence in our series. We also saw some patients who feigned ocular trauma to register themselves as medicolegal cases. A substantial number of patients had trauma to lid or orbit without any evidence of injury to the globe. Minute examination with detailed professional documentation is very important in such cases.

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Conflicts of interest

There are no conflicts of interest.

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