

## To Describe Clinical Profile and Meticulous Documentation in Ocular Medico-Legal Cases at Tertiary Hospital in Ahmedabad

Dr Vijay Damor<sup>1\*</sup>, Dr Anupama Mahant<sup>2</sup>, Dr Rabab Ginwala<sup>3</sup>

<sup>1</sup> Assistant Professor, <sup>2</sup> Associate Professor, <sup>3</sup> Resident Doctor, AMC MET Medical College, Maninagar, Ahmedabad

**Corresponding Author:** Dr. Vijay Damor

**Email:** [vijaydamordams@gmail.com](mailto:vijaydamordams@gmail.com)



### Abstract:

**Background:** Ophthalmologists play an important role in the management and fixing of legal responsibility in ocular medico legal cases (MLCs). All penetrating or non-penetrating intentional ocular trauma causing loss of an organ or part of organ and which have as consequence the facial disfigurement or post trauma complication have forensic implications. **Objective:** To describe the clinical profile and meticulous documentation in ocular medico-legal cases attending the ophthalmic unit at a tertiary care hospital in Ahmedabad. **Methods:** Medical records of ocular MLC from May 2018 to November 2020 were considered. A total of 112 cases of ocular injury constituted the sample size. The injuries were categorized as adnexal and globe injuries. The clinical profile was recorded in the clinical record forms and analyzed accordingly. **Results:** A total of 112 patients with ocular trauma were recruited with follow up to 6 months following recruitment. The most affected age group was 26-40 years (25.89%). The most common mode of injury was assault with fist in 22 (18.74) of cases. Most patients had open globe injury (28, 25%), while 20 (16.5%) had closed globe injury, 38 (33.93%) had the adnexal injury, 7 (6.25%) had open plus adnexal, 7 (6.25%) had closed plus adnexal and 12 (10.71%) had chemical injury. Adnexal injuries were the most common (38,33.93%). Lid / periorbital contusion and sub-conjunctival hemorrhage were the most common presentations among adnexal and globe injuries respectively. Malingering was present in 3(3 %) cases. Furthermore, among the adult population, majority 28 (25%) had ocular injury at workplace, while most pediatrics injuries 23(20.54%) occurred at home during play. Incidence of monocular blindness was 2(9%) at 6 months follow up. Factor that was associated with monocular blindness was open globe injuries. **Conclusion:** Fist injury was the most common cause of trauma to the eye. A substantial number of patients who had adnexal injuries or sub-conjunctival hemorrhage had good vision, contrary to open globe injuries which resulted in very poor vision.

**Keywords:** Forensic medicine, Medico-legal case, ophthalmic MLC, ocular trauma

### Introduction

Ocular trauma has been a neglected disorder.<sup>1</sup> today ocular injury is one of the most common cause of unilateral blindness in the world.<sup>2,3</sup> The national population based survey of blindness in Nepal (1981) found a blindness prevalence rate of 0.84%, with ocular trauma responsible for 7.9% of monocular blindness.<sup>4</sup> Ocular injuries hold forensic significance when it occurs due to trauma to the body hampering the loss of eye ball and visual acuity.<sup>6</sup> The consequences have many facets including legal, social, and economic.<sup>7</sup> A medico-legal case (MLC) has been defined as an inflicted injury or disease process where the treating doctor establishes the diagnosis by a thorough history, clinical examination and investigations and determines responsibility according to the law of the land.<sup>8</sup>

Many cases of ocular trauma or illnesses are currently being registered as MLC (medico-legal cases) and

present to an ophthalmologist for optimal management and to determine liability as per law. An ophthalmologist's role is to confirm the etiology, assess the depth of injury, grade the type of injury, and establish the severity of the disability.<sup>9</sup> In practice, a legal opinion of ophthalmologist is essential as a treating ophthalmologist or expert or when the legal proceeding is against the favor of ophthalmologist during medical disputes.<sup>10</sup> Such precaution is necessary in civil matters where the patient claims compensation under Motor Vehicle Accident Act and Workmen's Compensation Act. Hence, the ophthalmologist must provide evidence of detailed eye examination, correct description of wounds and appropriate investigations to support the diagnosis.<sup>11</sup> If a medical practitioner completes all those processes like writing 'wound certificate' make a 'written consent' with the patient for examination and treatment, and 'if the matter is intimated to police', his medico-legal duties can be considered up to standard. If he fails to perform these duties, a negligence suit may be filed against him in the court of law. The eye being the bilateral organs of visual system; its involvement by injury has medico-legal implications, both of civil and criminal nature. So, every doctor must be familiar with the procedure of examination and recording of data for medico-legal purpose.

**Objective:** To describe the clinical profile of ocular medico-legal cases attending the ophthalmic unit at a tertiary care hospital in Ahmedabad.

### **Materials and method**

The present study was conducted at a tertiary care ophthalmic center in Ahmedabad. This was a hospital-based retrospective study, approved by the Institutional Ethics committee. The medical records of patients registered as ophthalmic MLC from May 2018 to November 2020 were considered. The criteria for labeling a case as a MLC included a history of assault, foul play or accident (including road traffic accidents), patient's/patient's legal guardian's request to register as MLC and the medical officer's opinion. Clinical findings were recorded in the predesigned proforma and descriptive analysis was done. Before eye examination, consent was acquired from all patients. Standard protocol for eye examination was adopted at the time of the medico-legal examination. Vision assessment on Snellen's chart, torchlight and slit lamp assisted ocular examination along with dilated fundus examination was done in all cases. USG(B) was carried out to assess posterior segment status particularly renal detachment, vitreous hemorrhage and to rule out retained intraocular foreign body in patients with hazy media. Other relevant investigations like X-ray orbit/skull, CT scan and MRI were done whenever indicated. The cases were grouped as adnexal (extra-ocular involving orbit and lid) and globe injuries. Globe injuries include closed and open globe injuries. A full-thickness wound of the sclera and cornea was defined as "open globe injury (OGI)." "Closed globe injury (CGI)" was defined as one in which no full-thickness wound of the sclera and cornea was present. Injuries were categorized for medico-legal purposes.

### **Results**

Hundred and twelve patients were identified as ocular MLC. 89 (79.46%) were male. The age ranged from 6 years to 60 years with a median and mean of  $28.30 \pm 19.86$  years. Of this, 36 (32.14%) were less than 16 years and 3 (2.68%) patients had bilateral eye involvement. The most common mode of injury was assault with fist in 22 (18.74%) of cases, followed by chemical 12 (%), fireworks 11(9.82%), and stone injury 10 (8.93%), RTA 9 (8.03%). Twenty -five percentage of patients were injured with a sharp object like objects in (table-1). Workplace injuries accounted for 28 (25%) of cases where five injuries occurred due to machine cutter. About 29 (25.89%) and 23 (20.54%) of cases were recorded from household injuries and child play respectively. Adnexal injuries were most common, 38(33.93%), while open globe injuries were accounted for 71(69%) of cases and close globe injury 17 (16.5%) of cases. Adnexal and globe combined injuries accounted for about 14 (12.50%) of cases.<sup>12</sup>

**Table 1: Age groups and mode of ocular trauma (n=112)**

Age (years)	Number	%	P-value
0-6	18	16.07	0.99
7-16	18	16.07	
17-25	18	16.07	
26-40	29	25.89	
41-60	22	19.64	
>60	7	6.25	
Causative agents		Number	%
Blunt	Fist*	22	18.74
	Stone	10	8.93
	Cricket ball	7	6.25
	Plastic bottle	2	1.78
	Wooden stick	7	6.25
	Toy	2	1.78
Sharp	Glass	3	2.68
	Knife	2	1.78
	Pencil	1	0.89
	Blouse hook	3	2.68
	Machine cutter	5	4.46
	Finger nail	2	1.78
	Kite thread	2	1.78
	Edge of bed/swing/spring	10	8.93
Falls (RTA)		09	8.03
Projectiles	Fire works	11	9.82
	Chemical	12	10.71
Cow's horn		2	1.78

**Table 2: Circumstances and type of ocular trauma (n=112)**

Circumstances of trauma	Number of patients	%
Child play*	23	20.54
Workplace*	28	25
Unintentional injury	1	0.89
Traveling	1	0.89
Assault	10	8.92
Household injuries	29	25.89
Chemical fall	12	10.71
Road traffic accident	09	8.03
<b>Total</b>	<b>112</b>	<b>100</b>
Type of injury		
Open globe*	28	25
Open globe + adnexal	7	6.25
Close globe	20	17.86
Close globe + adnexal	7	6.25
Adnexal	38	33.93
Chemical	12	10.71
<b>P value</b>	<b>0.0005</b>	

Among closed globe injuries, lid edema was present in 50 patients, sub-conjunctival haemorrhage present in 38, 35 patients had lid laceration and 29 patients had corneal laceration. The relative afferent pupillary defect was present in all patients with open globe injury and seven patients with closed globe injury. The common ocular presentations following trauma are shown in Table 3.

**Table 3: Common traumatic presentations in medico-legal cases of ocular trauma**

Ocular Finding*	n
Conjunctival laceration, FB, chemosis, subconjunctival hemorrhage	38
Lid edema	50
Corneal FB, ulcer/ abrasion, epidefect, generalized edema	37
Lid laceration	35
Corneal laceration	29
Anterior chamber reaction, exudates, hypopyon, exudative membrane	11
Corneal scleral laceration	11
Hyphaema	30
Traumatic cataract	19
Ruptured globe with rbh	1
scleral laceration	17
Dislocated lens	4
Traumatic cataract	7
Others	8
<b>Intervention given</b>	
<b>Treatment</b>	No. of cases
Lid tear repair	16
Medical management	41
Scleral wound repair	17
Conjunctival wound repair	19
Corneal wound repair	29
Marginal tear repair	19
Canalicular tear repair	19
Lateral canthal tear repair	2
Others	6

Others presentation: RD, orbital wall #, intra ocular FB, vitreous hemorrhage.

Total findings: (297) in table because of multiple finding in one eye in trauma patients.

None of the patients reported a pre-existing history of reduced vision before ocular injury and on initial assessment, (n=50) were blind in the injured eye following trauma. Following primary treatment, the proportion of monocular blindness by the 6 months dropped to (n=2).

**Table 4: Follow up of visual acuity**

WHO Classification Visual impairment	At Presentation	At 1 week	At 2 weeks	At 3 months	At 6 months
Normal (6/6<6/18)	29 (26.22)	69 (66.1)	33 (56.0)	16 (41.0)	14(63.6)
Moderate (6/18<6/60)	17 (15.78)	12 (11.52)	7 (11.9)	5(13.0)	4(18.0)
Severe (6/60<3/60)	2 (1.74)	4 (3.85)	3 (5.0)	3 (7.7)	2(9.0)
Blind (3/60-NPL)	50 (43.48)	13 (12.5)	13 (22.1)	13 (33.4)	2(9.0)
VA not done	14 (12.78)	6(6.03)	3 (5.0)	2(4.9)	0 (0.0)
Total	112 (100)	104 (100)	59 (100)	39 (100)	22 (100)

VA= visual acuity NPL= no perception of light.

In the present study, within 1 week of the follow-up of the 66.1% of the patients had normal vision compared to 25.22% at presentation and those with vision 3/60 reduced from 43.48% at presentation to 12.5%.

### **Discussion**

The present study highlighted the patient's clinical profile and ocular presentation in medico-legal cases presenting to the ophthalmic unit at a tertiary care hospital in Ahmedabad. The most common mode of injury in the present study was assault with fist. Adnexal injuries were most common, followed by globe injury and combined injuries, respectively. Lid / periorbital contusion and sub-conjunctival haemorrhage were the most common presentation among adnexal and globe injuries, respectively. The present study highlighted the importance of meticulous eye examination to rule out malingering. It also highlighted that, at times, the final report could not be given immediately, as the patient may require additional investigations and observation to report the definitive diagnosis. Similar to previous studies on ocular trauma, the present study has also shown male dominance with a male to female ratio of 3.9:1.<sup>13</sup> According to previous studies, a majority of injured patients were young, with an average age of around 30 years<sup>(13, 14)</sup> In the present study, patient age ranged from 6-60 years with a Mean + SD age of 28.30±19.86 years. In previous studies, the fist has been reported as the most common mode of trauma<sup>(13, 14)</sup> In the present study too, the most common cause of trauma among medico-legal cases is fist injury (18.74%), followed by chemical injury (10.71%). Adnexal (33.93%) / extra ocular injuries form a major group of injuries. Among adnexal injuries, lid contusion (44.64%) and adnexal laceration (31.25%) were the most common presentations. If severe, they can lead to facial disfigurement or functional impairment, leaving a considerable impact on patients' social, personal and psychological wellbeing. Among the injuries involving the globe, subconjunctival haemorrhage was present in (33.92%) of patients and was the most common presentation, followed by hyphaema, which was present in 26.78% of patients. Nearly 66% of patients had vision 6/18 or better, similar to previous study<sup>(13, 14)</sup>. Depicting adnexal and subconjunctival haemorrhage as the most common injury. Posterior segment involvement in the form of vitreous, choroid and retinal haemorrhage, traumatic macular hole and traumatic optic neuropathy were documented. In the present study, a patient with a superficial foreign body developed a central corneal ulcer, leading to decreased vision; similarly, a macular hole was noticed once the vitreous haemorrhage was resolved in one patient. Therefore, a definitive opinion should not be given immediately; patient should be kept under observation with relevant investigations as the visual disability changes till the final outcome. In specific scenarios, though the visual acuity returns to normal following treatment, there is always a risk of severe future complications. Like in the case of traumatic cataract, visual acuity may return to normal following cataract extraction with intraocular lens implantation. However, there is loss of accommodation in young patients and the surgery is also not always free of complications. Similarly, in vitreous haemorrhage and hyphaema, visual acuity may return to normal. However, there is a future risk of complications such as secondary glaucoma, proliferative vitreoretinopathy changes and retinal detachment. Hence despite favourable vision following treatment, such types of injuries are graded as grievous considering the risk associated. In the present study, in a majority of medico legal cases, the assailant is known. These injuries may be inflicted as a result of revenge, social conflicts, or for financial reasons. Patients complain of decreased vision after recent injury for unfair advantage. This study has also witnessed malingering in 3 patients. All presented with complaints of bleeding from the eye followed by a sudden diminution of vision ranging from counting fingers close to face to no perception of light. On evaluation, these patients were found to have haemorrhage from the conjunctiva or lid. It has been noted that patients attempt to take advantage of such situations by complaining of sudden diminution of vision. The ophthalmologist should have a comprehensive understanding of the legal aspects involved in these cases and perform a meticulous examination and note all relevant findings objectively along with important negative signs. Any evidence of malingering and signs which differentiate pre-existing illness from the recent injury should be documented appropriately. In some situations, the patient's insistence has lead the ophthalmologists to perform electrophysiological tests to rule out blindness. Illustrating the

wound diagrammatically with the measurements, determining VA (visual acuity), IOP (Intraocular pressure) and pupillary reaction are essential features of documentation. Such reports must be kept concise and comprehensible, with the doctor's signature and saved for future references. The records should be kept for three years or until the judgement has been given by court.<sup>14</sup>

### **Conclusion**

Ophthalmic medico legal cases are not uncommon to run into clinical practice and they are commonly caused by direct assault of fist in our cultural setting.

### **Recommendation**

Medico-legal cases require meticulous eye examination along with clear, concise and accurate documentation. It is necessary to correlate reduced vision with signs of recent injury to rule out malingering, pre-existing ocular morbidity and foul play by patients.

### **References**

1. Parver L. Eye trauma. The neglected disorder. *Arch Ophthalmol* 1986; 104(10):1452-3. PMID: 3767673
2. Chua D, Wong WL, Lamoureux EL, Aung T, Saw SM, and Tien Y. The Prevalence and Risk Factors of Ocular Trauma: The Singapore Indian Eye Study. *Ophthalmic Epidemiology*. 2011; 18 (4):164-70. PMID: 22053838
3. Soylyu M, Sizmaz S, Cayli S. Eye injury (ocular trauma) in southern Turkey: epidemiology, ocular survival, and visual outcome. *Int. Ophthalmol*. 2010; 30(2):143–8. PMID: 19190858
4. Khatry SK, Lewis AE, Schein OD, Thapa MD, Pradhan EK, Katz J. The epidemiology of ocular trauma in rural Nepal. *Br J Ophthalmol* 2003; 88(4): 456-60. PMID: 1772092.
5. Sapkota YD. The Epidemiology of Blindness in Nepal: 2012. Kathmandu: Nepal Netra Jyotisingh; 2012.
6. Parmar SPS and Desai SS. *Law of Disability (Medical and Non-Medical)*. Dwivedi and Co. Allahabad, India, 2004.
7. Tripathy K, Chawla R, Venkatesh P, Vohra R, Sharma YR. Clinical profile of medicolegal cases presenting to the eye casualty in a tertiary care center in India. *Indian J Ophthalmol* 2016; 64:422-6.
8. Lyon IB, Dogra TD, Rudra A. *Lyon's Medical Jurisprudence and Toxicology*. 11th ed. Delhi: India Delhi Law House; 2005. p. 367.
9. Shaw, M. (1976). I Eye Injuries: Medicolegal Aspects. *Proceedings of the Royal Society of Medicine*, 69(1), 65–66. <https://doi.org/10.1177/003591577606900134>.
10. Raju KV. Medico Legal Aspects of Ocular Injury, *Kerala Journal of Ophthalmology* 2010; 22(3):277-8.
11. Costea CF, Sava A, Dumitrescu GF, Albert M, Cucu A, Turliuc A et al. Forensic Aspects of Ocular Trauma. *Aperito J Ophthalmol* 2015; 1:109-13. DOI: 10.14437/AJO-1-109
12. Kuhn F, Morris R, Witherspoon CD, Heimann K, Jeffers JB, Treister G. A standardized classification of ocular trauma. *Ophthalmology* 1996; 103:204-3. PMID:8594508
13. Top of Form Tripathy K, Chawla R, Venkatesh P, et al. Clinical profile of medico legal cases presenting to the eye casualty in a tertiary care center in India. *Indian J of Ophthalmol*. 2016; 64(6):422-6. doi: 10.4103/ 0301-4738.187656.
14. Das S, Sharma M. Analysis of medico-legal cases registered at eye casualty in Fakhruddin Ali Ahmed medical college and hospital, Barpeta, Assam. *J Evolution Med Dent Sci*. 2017; 6(93):6717-22. doi: 10.14260/jemds/2017/1454.