
**“A ONE YEAR CROSS SECTIONAL STUDY TO
ASSESS THE CLINICAL PROFILE OF PATIENTS
PRESENTING WITH OCULAR TRAUMA TO KLES
DR. PRABHAKAR KORE HOSPITAL AND
MEDICAL RESEARCH CENTRE, BELAGAVI”**

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LIST OF ABBREVIATIONS

CT	:	Computed Tomography
ECCE	:	Extra capsular cataract extraction
HM	:	Hand movements
IOFB	:	Intra ocular foreign body
IOP	:	Intra Ocular Pressure
MRI	:	Magnetic Resonance Imaging
NPL	:	No perception of light
PL	:	Perception of light
RAPD	:	Relative afferent pupillary defect
RPE	:	Retinal pigment epithelium
RTA	:	Road traffic accident
VA	:	Visual acuity

ABSTRACT

BACKGROUND

Ocular trauma is responsible for the blindness of nearly half a million individuals globally, with many more suffering from partial blindness. Trauma is often the leading cause of unilateral vision loss, especially in impoverished nations. Although there is a lifetime risk of ocular injuries and vision loss, the real prevalence of eye-related incidents remains unknown.

After the hands and feet, the eyes are the third most often injured organ. The eyes make up just 0.1 percent of the total body surface and 0.27 percent of the frontal body surface, according to statistics. Ocular injuries may result in job loss, substantial lifestyle adjustments, and aesthetic impairment, as well as having a significant financial and psychological effect. They are a major source of monocular vision impairment. Ocular trauma is the most dangerous of the few ophthalmic emergencies, and it may result in lifelong impairment.

OBJECTIVES:

To assess the clinical profile of patients of ocular trauma presenting to KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi

MATERIALS AND METHODS :

This prospective study was carried out by the Department of Ophthalmology at at KLE's J N Medical College and Hospital attached Dr. Prabhakar Kore Hospital and Medical Research Center, Belagavi from 1st January 2021 to 31st December 2021.

Considering the Overall prevalence of Ocular Injuries from Assault to be at 10.2%, with 5% Margin of error and at 95% confidence interval using the below mentioned formula the estimated sample size was 141 but for the ease of calculation the sample size taken was to be 150.

A proforma was drawn up and following details were recorded for each patient with ocular trauma: age, sex, signs and symptoms following the injury. Detailed history and ophthalmological examination of all patients was carried out. Visual-acuity, anterior segment examination, posterior segment examination, Intraocular pressure measurement and Gonioscopy was done in closed globe injuries. Necessary radiological investigations were done whenever and wherever needed.

The patients were followed up after two days, one week & thereafter as per requirement. BETTS i.e. Birmingham Eye Trauma Technology classification was used.

RESULTS

There were 201 subjects in the study.

In the study minimum age and maximum age observed was 1 day and 96 years respectively. Mean age observed was 37.08 ± 19.81 years. Below table and plot summarises the age distribution. There were only 27 (13.43%) females in the study and 86.57% were males.

Majority of the subjects (56.72%) got admitted between 1-2 days after injury. The next common duration was ≥ 7 days (29.85%).

In the study mode of injury were found from various items and mode of injury among those majority of injury was observed by RTA, followed by wooden stick injury in significant numbers. In the study, use of safety could not be assessed in majority (53.23%). Among the remaining, only 8.46% had used the safety precautions still sustained the injuries. In the study, blunt object (56.22%) caused the injury for majority of subjects, followed by sharp object in 41.29% and 2.49% had burns injury. Non occupational injuries (81.59%) was observed in the study. Most common type of injury observed was contusion (51.74%) followed by laceration in 15.42% and penetrating injury in 14.93%.

In the study, the adnexa was normal in majority (67.16%). The next common presentation was edema (13.43%) and laceration (13.43%). In the study 90.05% of the subjects had normal lacrimal apparatus. Only 19 (9.45%) presented with canalicular laceration. The eyelids in the study 34.83% of them were normal. Among the remaining, ecchymosis (28.86%) was commonly seen followed by 23.38% of them had edema. The sclera was found to be normal in majority (85.07%) of the subjects. Among the remaining, perforation (4.98%) was commonly seen. The conjunctiva was normal in 26.87% of the subjects. The common presentation was congestion (38.81%).

The cornea was clear in majority (60.2%) of the subjects. Among the remaining, abrasion (9.95%), Hazy cornea (8.46%), laceration (7.96%) was seen among the study subjects. The anterior chamber was normal in majority (57.71%). Among the remaining, it was shallow in 23.38% of the subjects. The iris was normal in majority (73.13%). Among the remaining, DNMO (9.95%) was commonly seen. The pupil was normal (RRR) in majority (38.31%). Among the remaining, pupil was

sluggish in 17.41% of the subjects. The vitreous was normal in majority (62.69%). Among the remaining, DNMO (20.40%) was commonly seen. The retina was normal in majority (67.16%). Among the remaining, DNMO (23.88%) was commonly seen. The optic nerve was normal in majority (65.17%). Among the remaining, DNMO (23.88%) was commonly seen.

Majority of the subjects were managed by surgical procedure (63.68%) in the study. Accordingly, RTA was the common mode of injury in the month of September (19.15%). On the contrary, non RTA was the common mode of injury in the month of January (18.69%)

CONCLUSION:

With the data of this study, preventive and management strategies can be formulated to manage ocular trauma in a better way. Adequate follow-up and awareness about need for timely surgical intervention is a must for better visual outcome. Since blunt injury eye leads to severe visual impairment its prevention is better. Creating awareness among school children regarding eye protection during sports activity is also important. With meticulous management and prevention measures, the cause for blindness due to trauma can be limited .

KEYWORDS

Ocular Trauma, Road Traffic Accident, Birmingham Eye Trauma Technology classification

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INTRODUCTION :

Ocular trauma has caused whole or partial blindness in over 500,000 persons throughout the globe. Particularly in developing countries, trauma is frequently the main factor contributing to unilateral vision loss. The true prevalence of eye-related accidents is unknown, despite the lifetime risk of ocular injury and vision loss.¹

The eyes are the third most often damaged organ, after the hands and feet. Statistics show that the surface area of the eye is just 0.271 percent of the frontal body surface and only 0.1 percent of the whole body. Ocular injuries may have a large financial and psychological impact in addition to job loss, severe lifestyle changes, and aesthetic harm. They substantially contribute to deteriorated monocular vision. Ocular trauma, one of the rare ophthalmic emergencies, is the most dangerous and may result in permanent harm.^{2,3}

Loss of eyesight is frequently caused by ocular trauma. If the patient presents with severely impaired visual acuity, the prognosis is poor. The eye's delicate tissues may be damaged if not shown immediately. Population-based data on the severity and risk factors for ocular trauma may be difficult to obtain, despite the issue's importance for public health. this is especially true in developing countries.

The eyeball, optic nerve, and adnexa are all vulnerable to minor to severe damage from trauma. Ophthalmologists and non-ophthalmologists alike must use a standardised grading system of nomenclature and assessment when describing and communicating clinical findings because our understanding of the pathophysiology and treatment of these abnormalities has advanced significantly over the past 30 years.^{4,5}

Eye trauma affects more men than women and is visible as early as infancy. Therefore, those with lower socioeconomic position are more likely to suffer from eye injuries. The most frequent places of injury are the workplace and, increasingly, automobiles.⁶

Accidents that occur at home, however, are often under reported. In many developing countries, the prevalence of superficial corneal injury from agricultural activities, which typically causes rapidly progressing corneal ulcers and vision loss, is especially important. The impact of ocular trauma definitely justifies the strengthening of preventative measures when it comes to the cost of medical treatment, missed wages, and rehabilitation services.^{7,8}

Eye injuries caused by blunt force, piercing objects, burns, or irritating substances account for a sizable percentage of global cases of impairment and blindness. Many of these wounds might perhaps be avoided. In general, men are more prone than women to sustain eye injuries. Treatment for eye injuries should focus on minimising further damage while protecting the patient's remaining eyesight.⁹

According to the World Health Organization (WHO), there are 55 million cases of ocular trauma each year, leading to 1.6 million cases of blindness. Five percent to sixteen percent of all annual hospitalizations are due to eye injuries per 1,000,000 people. Between 0.6% and 0.8% of the population suffers from traumatic blindness every year. Since there is a low rate of usage of eye protective devices in India, the country has a relatively high yearly incidence of ocular trauma when compared to worldwide annual incidence rates.^{10,11}

Ocular trauma is more widespread as a consequence of urbanisation and industrialisation in the United States, and its most common causes have shifted over time. As a result of an increase in traffic accidents, penetrating damage has replaced blunt trauma as the main cause of ocular trauma, which had previously been due to blunt trauma. There is a substantial information gap on ocular trauma techniques and categorization systems, as was highlighted in earlier articles.^{12,13}

Vision impairment, cosmetic problems, and psychological problems are all brought on by ocular trauma. By taking simple precautions like reading and being observant, the majority of eye injuries can be prevented. Trauma avoidance is crucial since trauma-induced eyesight loss is irreversible.

Eye injuries acquired on the job may significantly affect a person's health and quality of life. It is a health problem that could be prevented. It affects the working population, impeding the social and economic development of a nation. It might put a burden on the nation's budget and healthcare system. Blindness has an impact on a person's quality of life as well as their ability to work during the remaining years of their life.^{14,15,16}

Protective equipment has been proved to lessen the number of accidents that occur on the job, but several studies have shown that workers either don't use it at all or don't use it properly, especially when it comes to eyewear.¹⁷

We believe that our study will help overcome this knowledge gap and lead to more effective care for ocular injuries. The results of this study will improve the organisation and delivery of eye care in this area, as well as the implementation of preventive and safety measures. Multiple ocular dangers may be avoided if the public

had a deeper understanding of their causes and the harmful effects of certain medications.

This research aims to collect epidemiological information on ocular injuries in a part of northern Karnataka. Injuries and their root causes are both considered in this inquiry.

OBJECTIVES:

Ocular trauma patients at KLES Dr. Prabhakar Kore Hospital and Medical Research Center, Belagavi: a clinical profile analysis.

REVIEW OF LITERATURE:

There is no denying that eye damage causes a great deal of pain across the world. According to Pizzarello, this is "probably the leading or second cause of monocular blindness in the world" and has a significant impact on the affected person, their family, and society at large. Eye injury is rare as a cause of blindness since "nearly 90% of this blindness may be prevented by fairly basic methods" ¹⁸

There are 1.6 million people who are blind, 2.3 million who are visually impaired, and 19 million who are monocularly blind in the world, as reported by Negrel & Thylefors in 1998.¹⁹ According to research conducted by Pizzarello (1998), 90% of eye injuries may be avoided if "proper eye safety procedures were made accessible and effectively executed." The authors agree with this estimate.²⁰ In 2002, Thompson, Kumar, Billson, and Martin came at the same conclusion.²¹

Anatomy of the Eye : ^{22,23}

The eyeball and all its supporting structures (muscles, blood vessels, fat, nerves, and lacrimal system) are contained within two bony chambers called orbits. The best protection, support, and field of view for the eye is provided by a pyramid with four sides: apex, base, roof, floor, medial, and lateral walls.

All seven orbital bones originate from neural crest cells in the brain.

- Frontal skeleton
- Maxillary bone
- Bone zygomatic
- cricoid bone

- Osteoid bone
- pharyngeal bone
- cranial bone

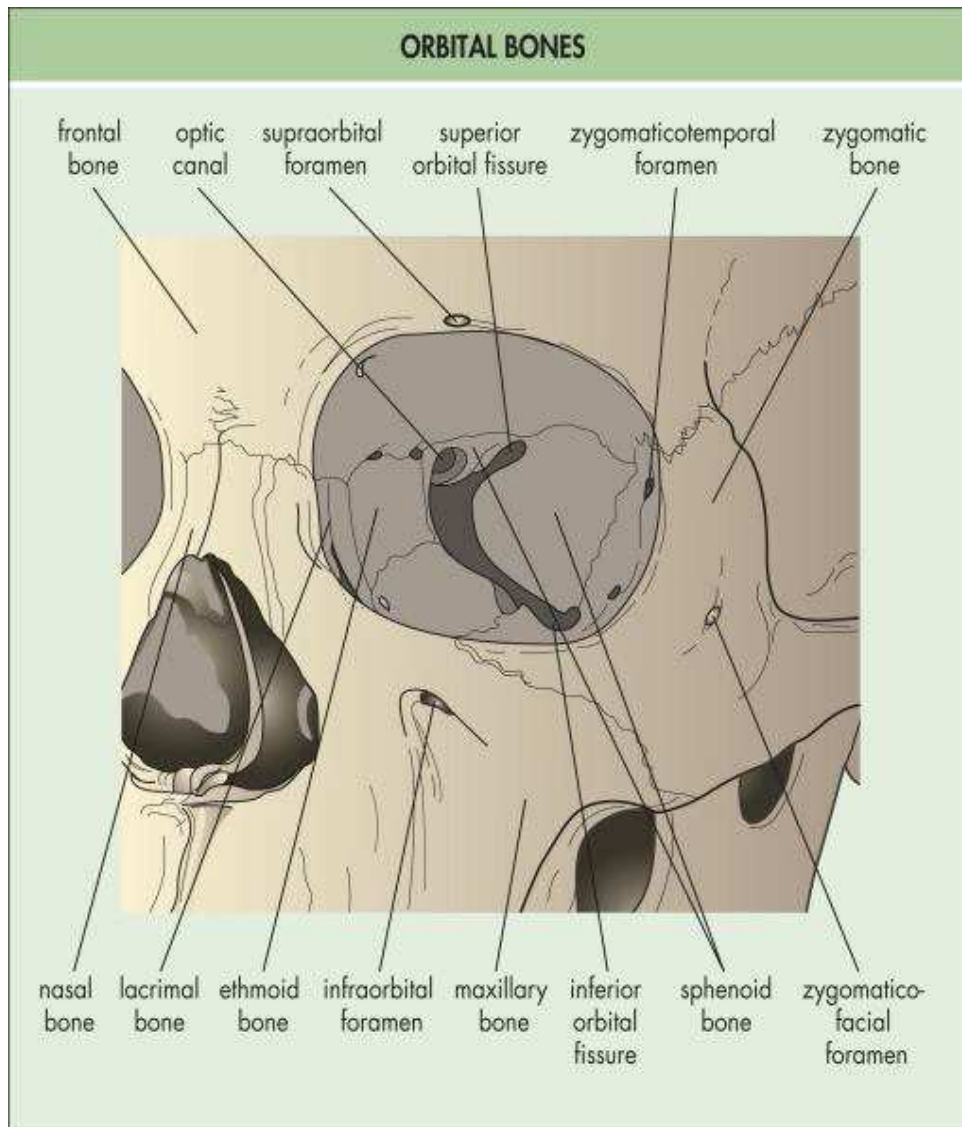


Figure 1 : Orbital Bones Of The Eye

The orbit is characterized as a pear-shaped hollow, with walls that conform to the data in the table below.

Table 1: Walls of orbit

Roof	Orbital plate of Frontal bone, Lesser wing of sphenoid
Medial Wall	Maxillary, lacrimal, ethmoid, sphenoid
Lateral Wall	Greater wing of sphenoid, zygomatic
Floor	Zygomatic, maxillary, palatine

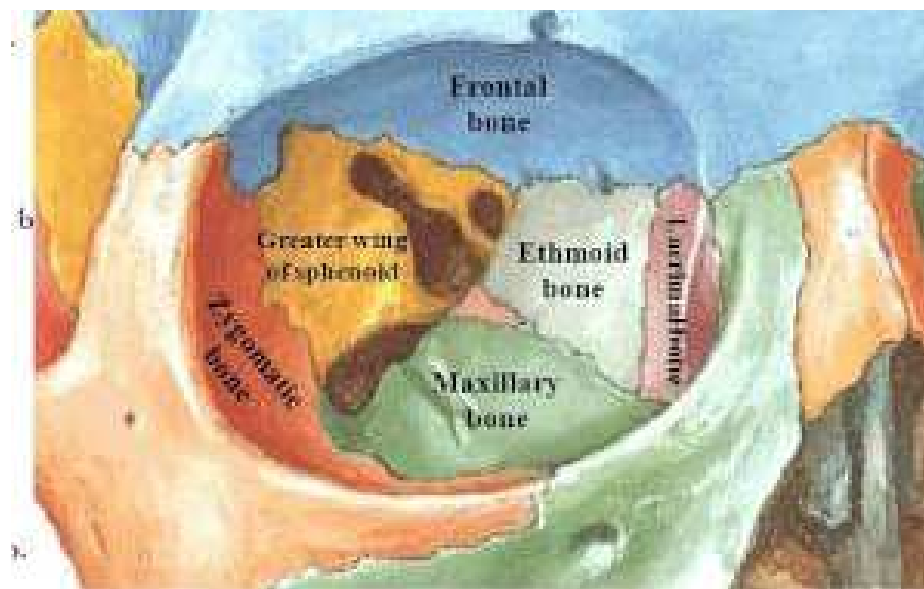


Figure 2 : Bones of orbit

The eye is a central nervous system development, according to embryology. With the brain, it shares many morphological and physiological traits. Both have two blood supply to the retina's vital nerve layer, strong fibrous coverings, and protective bone walls. Fluids of the same make up and pressure are circulated throughout the entire brain and eye. Since the retina and optic nerve are brain extensions, it is not

shocking that the same disease processes affect the eye and central nervous system. If you have a disease that might impact both your eyes and your central nervous system, let your doctor know.

Basic Structure of the Eye and Supporting Structures: ^{24,25}

The adult orbit may store between 25 and 30 mL. Around 7 mL, or 25% of the overall capacity, is filled by the globe. The depth of the orbit is around 45 mm, as measured from the geometric center of the orbit's boundary to its peak. 6.8 millimeters from the floor, 4 millimeters from the top, 4.5 millimeters from the lateral wall, and 6.5 millimeters from the medial wall are the distances at which the globe is situated. ²⁶

The orbit's lateral walls are 90 degrees apart, while its medial walls measure between 40 and 45 mm in length. This bone orientation tends to cause the eyes to diverge; however, the medial rectus muscles tonically maintain them in adduction to create appropriate ocular alignment.

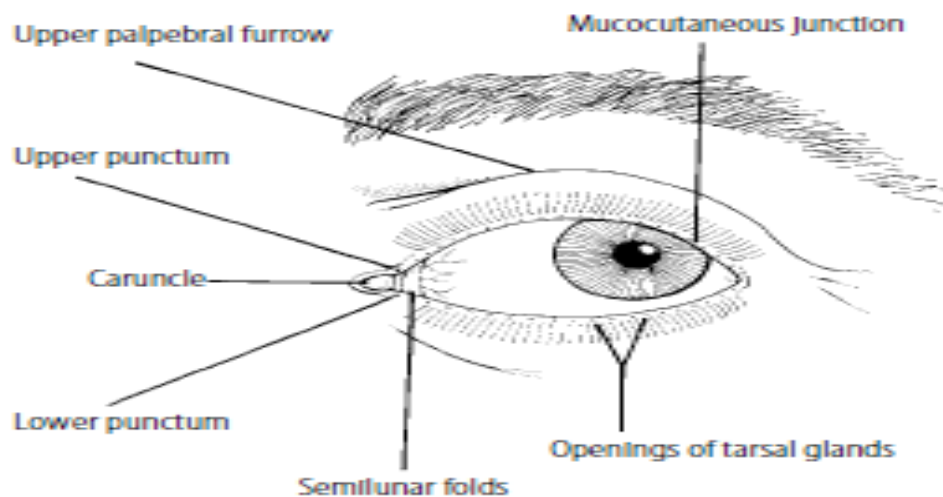


Figure 3: Landmarks along the eyelids

The Globe:²⁷

There are three layers of protective membrane, three fluids, and three chambers in the eye.

There are three layers to the eye, and they are as follows:

- I. Outer fibrous layer:
 - Cornea
 - The whites of your eyes, or sclera
 - Lamina cribrosa.
- II. Middle vascular layer ("uveal tract"):
 - Iris
 - The pars plicata and pars plana of the ciliary body
 - * Choroids.
- III. Inner nervous layer:
 - The Retinal Pigment Epithelium
 - Photoreceptors in the retina
 - "Retinal neurons".

Following are the three eye compartments:

- a. The region of the eye between the cornea and the iris diaphragm is referred to as the "anterior chamber."
- b. The posterior chamber is the triangle-shaped area behind the iris, lens, and ciliary body.
- c. There is the vitreous chamber, also known as the zonule and lens.

The three intraocular fluids are as follows:

1. Aqueous humor, which resembles tissue fluids but contains less protein, is a transparent, watery combination of electrolytes and other substances.
2. A three-dimensional network of collagen fibers compensates the translucent gel known as vitreous humor, and water fills the gaps between polymerized hyaluronic acid molecules. Its function is to occupy the space between the ciliary body, the retina, and the back of the lens.
3. Blood: In addition to its other jobs, blood also keeps the intraocular pressure steady. The choroid is where most of the blood flow in the eye is contained. The biggest blood flow in the body goes to the choroidal tissue. The choroidal vasculature serves purposes other than supplying nutrients to the retina, as shown by the mild desaturation of efferent choroidal blood. Perhaps the retina absorbs heat when light hits the retinal pigment epithelium and transfers it to the choroid as heat.

The eye may be broken down into two sections from a clinical point of view:

1. Everything in front of the lens is called the "anterior."
2. The term "posterior segment" refers to everything in the eye other than the lens.

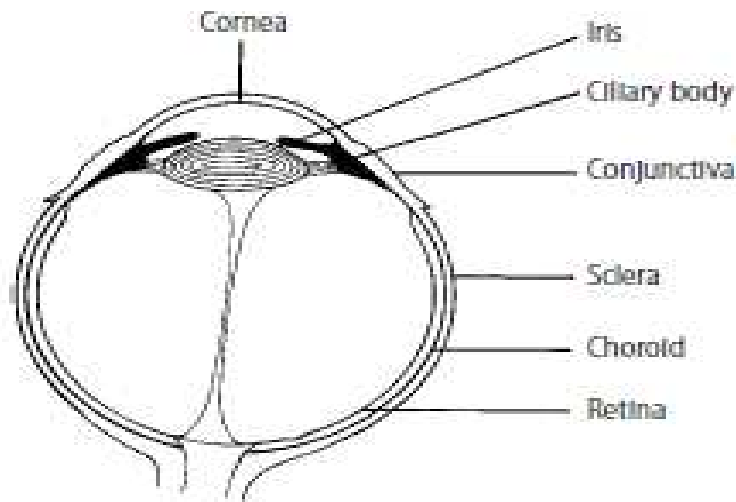


Figure 4: Section of the human eye

The Outer Layer of the Eye: ²⁸

The cornea constitutes about 1/6 of the front eye's fibrous layer. The back of a person's head consists of the sclera and lamina cribrosa. The white sclera is translucent, and it runs parallel to the cornea. The limbus is the part of the eye at the interface between the cornea and sclera. There are five external layers that make up the cornea.

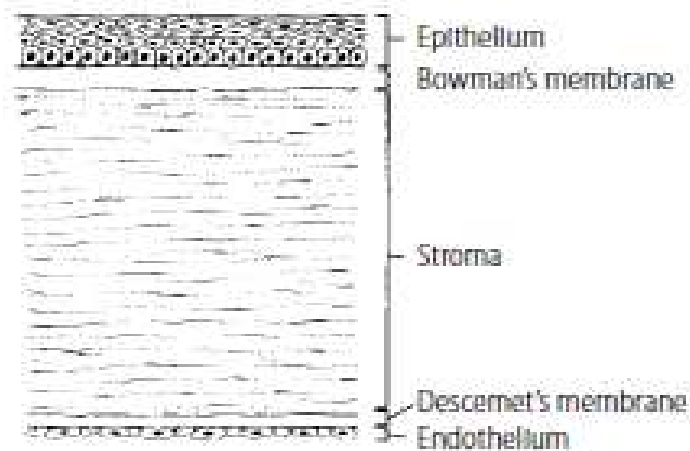


Figure 5: Layers of Cornea

1. The basement membrane and the five to six regular cell layers that make up the epithelium, both of which belong to the stratified squamous epithelium.
2. A uniform film of modified stroma, known as Bowman's layer.
3. About 90% of the corneal thickness is stroma. collagen lamellae, ground material, and cells make up this.
4. Descemet's membrane, sometimes referred to as the endothelium's basement membrane,
5. Descemet's membrane is lined on the inside by a single layer of cells called endothelium.

The thin, nonkeratinizing mucous membrane called the conjunctiva is protected from the front of the sclera by the loose connective tissue of the limbus region. The underside of your upper and lower eyelids may reflect your conjunctiva. As a result, the mucous membrane that lines the inside of the eyelids forms a mucocutaneous junction at the lid margin. The conjunctiva may be separated into the palpebral (tarsal), bulbar, and fornix sections despite its continuity.

The sclera's lamellar-shaped collagen fibers give the tissue an appearance of evanescent waves. As they make their way from the retina to the optic nerve, nerve fibers pass through the lamina cribrosa, a fenestrated layer of strong collagen fibers located in the inner third of the sclera. The outer two-thirds of the sclera are attached to the dural sheath, which protects the optic nerve. The sclera tapers to its narrowest point just below the recti muscle insertions and widens to its greatest extent behind the eyes. Below the conjunctiva and above the sclera is a flimsy layer of connective tissue called the episclera.

Middle Layer :

The intermediate layer has a number of blood vessels. Due to the uvea's heavy pigmentation and vascularity, the intermediate layer would resemble a grape if the sclera were to be removed from it, which is a challenging task. Iritis, also known as anterior uveitis or iritis, is an inflammation of the eye that occurs when the lining of the anterior uvea, which contains the iris body, becomes infected. The uvea's opposite side is called the choroid. The iris sits in the front of the uvea. A small, round disc having a hole carved out of the center to accommodate the pupil. Muscle contractions in the iris sphincter and the dilator pupillae cause the pupil to constrict and dilate, respectively.

The ciliary body does the same thing posteriorly, whereas the uvea does it anteriorly, connecting the iris and scleral spur to the choroid and retina. The intermediate uvea is also known as the ciliary body. The cross-section of the ciliary body is triangular. At the anterior chamber angle, where the iris grows, the ciliary body is at its shortest. The triangle's exterior is made up of the sclera (mostly the ciliary muscles).

The two divisions of the inner surface are the pars plana and the pars plicata. The last 4.5 mm of the ciliary body is flat and covered with ciliary processes, unlike the pars plicata, which is the first 2 mm of the ciliary body. The pars plana is where the retina and choroid are connected.

The following elements make up the choroid:

- Retinal pigment epithelium outside A membrane of the kind described by Bruch (RPE). Choriocapillaris and RPE cell basement membrane make up this structure. Between the two layers of basement membrane are the basement membrane's elastic and collagenous layers. A druse is an area of Bruch's membrane that has become abnormally thick (which get thicker with age).
- The choriocapillaris is an intricate system of capillaries responsible for delivering nutrients to the peripheral pigment epithelium of the retina.
- The choriocapillaris layer does not include the larger choroidal blood vessels.
- Choroid with dispersed pigmented cells outside the choriocapillaris.

Inside Layer

The vascular uvea is found within the neurosensory layer of the eye. Back at the back of the eye, this layer forms the retina, and up front, it forms a junction with the iris and the inner surface of the ciliary body. Rods, cones, bipolar cells, and ganglion cells make up the retina's inner sensory layer, while the outer pigment epithelium shields these more delicate inner layers from damage. The ora serrata, also called the scalloped border, is the junction of the retina and pars plana.

Remember that the photoreceptor cells of the sensory retina are found in the periphery of the retina. Insight into how the retina's various parts work together could be gained by studying the optic cup. The optic vesicle, originally composed of a single cell layer, "invaginates" to become the optic cup, a structure composed of two layers of cells. The retinal pigment epithelium (RPE) forms on the outside of the optic vesicle, on the side of the dissolving chamber that is not occupied by the

photoreceptors. The inner layer of the optic cup contains neurons that are different from those in the sensory retina.

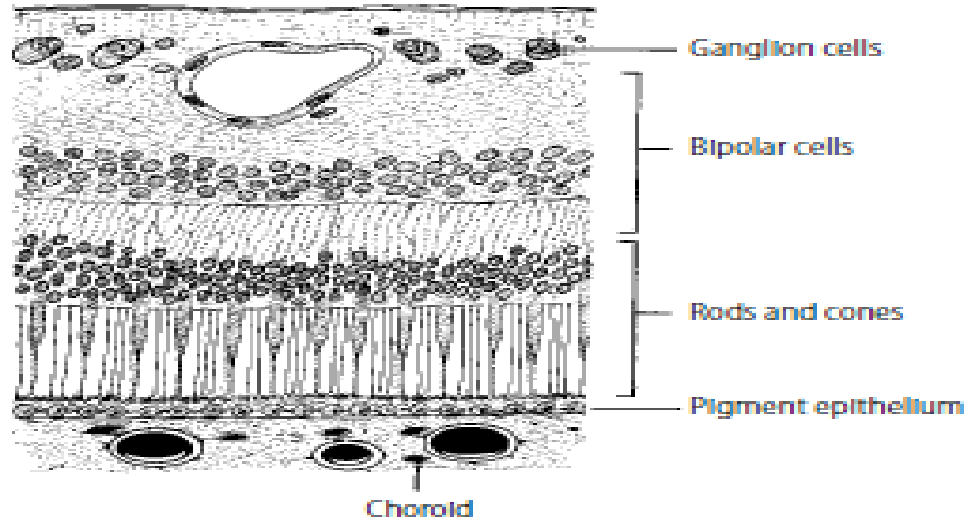


Figure 6: Outer layers of the retina

Blood Supply of the Eye:²⁹

A few of the arteries that provide blood to the eyeball are the ciliary arteries, the anterior and posterior ciliary arteries, and the central retinal artery. The ocular artery, a branch of the internal carotid artery, is the source of all of these blood vessels. As it passes through the inner surface of the retina, the central retinal artery nourishes the optic nerve. Prior to leaving the globe at the iris root and entering another arterial circle in the ciliary body, the anterior ciliary arteries get blood from the recti muscle insertion.

The smaller ophthalmic artery branches known as the posterior ciliary arteries reach beyond the eye's optic nerve. The arterial circle in the ciliary body is linked by two or more larger arteries that go anteriorly. Some of these arteries provide nutrients to the choroid. The smaller vessels are identified by short posterior ciliary arteries,

whilst the larger ones are identified by long posterior ciliary arteries. Four vortex veins drain the choroid, ciliary body, and iris, and each branch of the primary retinal artery is connected to a vein. When the retina surgeon follows these markers out of the four corners of the eye, they will be easily recognizable.

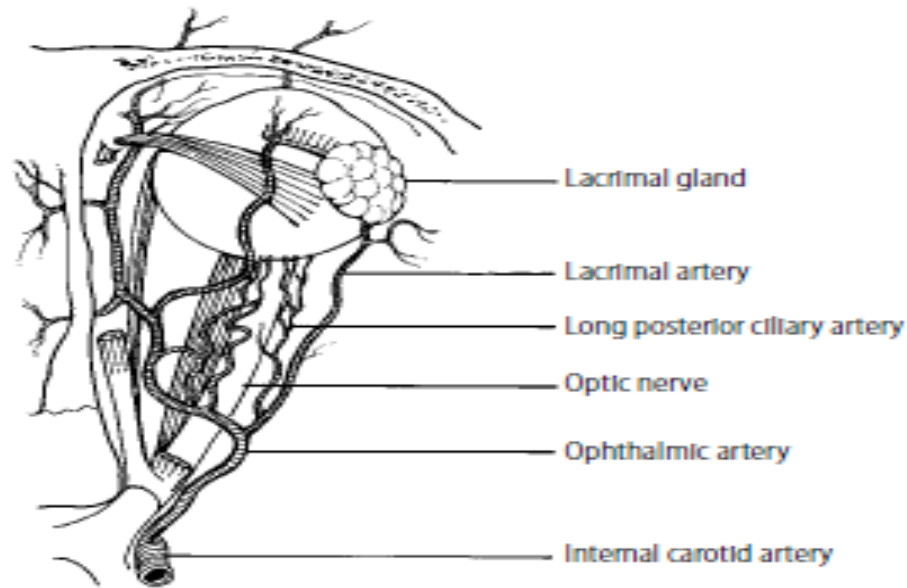


Figure 7: Blood supply of the orbit

Optic Nerve :^{30,31}

The optic nerve travels across the top half of Earth, slightly nasal to the back of the planet, and slightly above the horizontal meridian. In the eye, there is a structure known as the optic disc. Due to a deficiency of photoreceptor cells in the optic disc, the blind spot is visible to the naked eye. Each of the optic nerve's one million nerve fibers has its own cell body, which can be found in the retina's ganglion cell layer. The deepest area of the retina is traversed by nerve fibers on their way to the optic disc. Using an ophthalmoscope, one may observe them by observing how light bounces off the retina's inner surface.

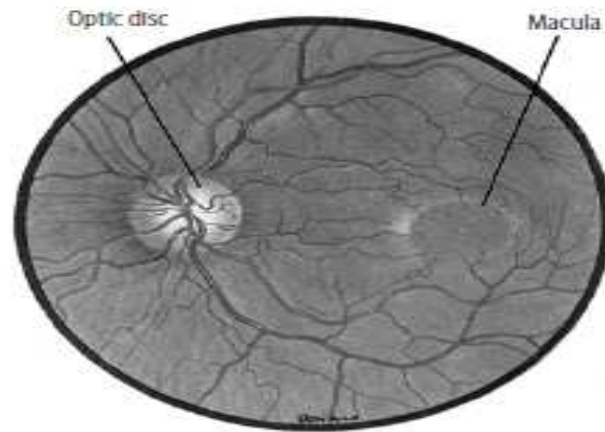


Figure 8: Fundus picture showing optic disc and macula

Retinal vessels are also implanted into the retina's inner layer. The thickness of the retina separates the vascular retina from the pigmented epithelium, which is stippled. The optic nerve and several branches of the ciliary nerve can be found in the back of the eyeball. This is where most of the parasympathetic, sympathetic, and sensory nerve fibers that the ciliary body and iris depend on are originating from (ciliary muscles). This would seem to demonstrate that the iris and choroid both contain sensory fibers. Without the proper local anesthetic, touching the iris can cause pain in patients, and chorioretina laser coagulation therapy can also be uncomfortable. Even though the cornea only has pain receptors as sensory endpoints, it is extremely sensitive.

The following are some of the visual pathways:

1. Retinal cells, including rods, cones, bipolars, and ganglions.
2. Vision and the pathways for the pupillary reflex are carried by the ganglion cells in the retina, the optic nerve, the optic chiasm, and the optic tract.
3. Subcortical relays and centers

Pretectal nuclei govern pupillary reflexes, the superior colliculus controls reflex eye movements, and the lateral geniculate body relays information from the brain.

Fourth, cortical connections

- Areas 18 and 19, which are part of the Light Emission Association, the frontal eye field, and area 17 of the visual cortex all contribute to vision and reflex eye movements.

The dorsal root ganglia's first-order sensory neurons are analogous to bipolar cells, and the sense organs that detect touch, pressure, temperature, and other sensations are analogous to rods and cones. Similar to retinal ganglion cells, second-order sensory neurons have their cell bodies in the medulla or spinal cord.

The Eyelids : ^{32,33}

The mucocutaneous junction separates the front and back of the eyelids. Hair follicles produce eyelashes anterior to the grey line, whereas meibomian glands (modified sebaceous glands) drain their ducts posterior to the grey line. Long and skinny, the meibomian glands extend all the way to the lid's rim. They rest on the eyelid's tarsal plate. The strength and flexibility of the eyelids depend on the tarsal plate. Top and bottom tarsal plates each measure about 1 mm thick. There are about 10-12 mm in height on the upper tarsus, but only about 5 mm on the lower tarsus. Orbicularis oculi, the muscle responsible for closing the eyelids, is located between the epidermis and the tarsus. The facial nerve provides the necessary power. Subcutaneous tissue and skin around the eyes are especially vulnerable. The thin membrane that lines the inside of your eyelids is called palpebral conjunctiva.

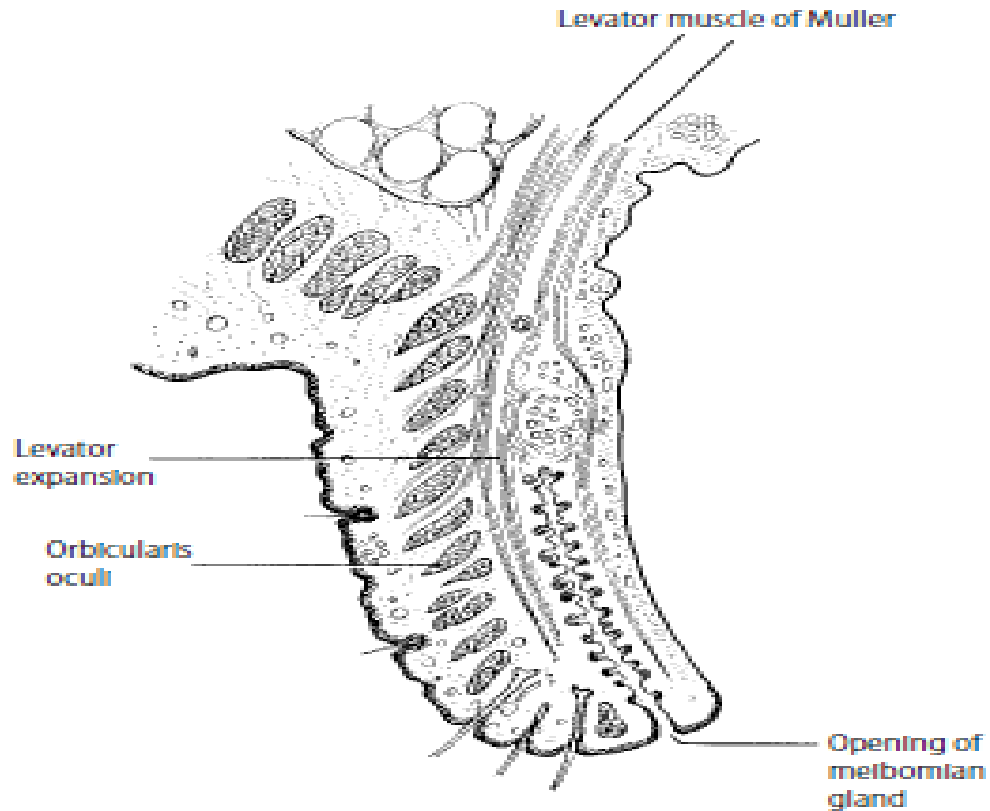


Figure 9: Anatomy of the eyelid

The Lacrimal Apparatus: ^{34,35}

The main lacrimal gland is found in the orbit's superior temporal anterior region. The palpebral conjunctiva, found just above the anterior upper bone, receives drainage from its ducts. It is in the medial part of the palpebral fissure that tears are collected before they travel down the canaliculi and puncta and out of the lacrimal sac into the inferior nasolacrimal duct. The nasolacrimal duct drains tears from the nose through the inferior meatus.

The Extraocular Muscles :^{36,37}

There are six extraocular muscles that work together to move the eye in various directions. These include the superior, inferior, medial, lateral, superior, and inferior recti, and the superior and inferior obliques. All of these muscles receive signals from the third cranial nerve, with the exception of the superior oblique and lateral rectus, which instead receive impulses from the sixth nerve (fourth nerve).

The annulus of Zinn is a fibrous ring that surrounds the visual cortex at the apex of the orbit and gives rise to all extraocular muscles except the inferior oblique. When the muscles are tensed and then projected outward, toward the eye, a "muscle cone" is formed. When viewed from above, the recti muscles are located anterior to the equator, while the oblique muscles attach to the eyeball from behind. The optic nerve, the ophthalmic blood vessels, and the nerves to the extraocular muscles are all located in the muscular cone (excluding the fourth nerve).

It is linked to the superior levator palpebrae rectus. It begins just above the annulus of Zinn, travels along the orbital rim, and wraps around the superior rectus before merging with the upper lid skin and the anterior edge of the upper lid tarsal plate. The fascia of the underlying muscles is covered in a straight line by a piece of connective tissue called Tenon's capsule, which serves to protect the eyes from harm.

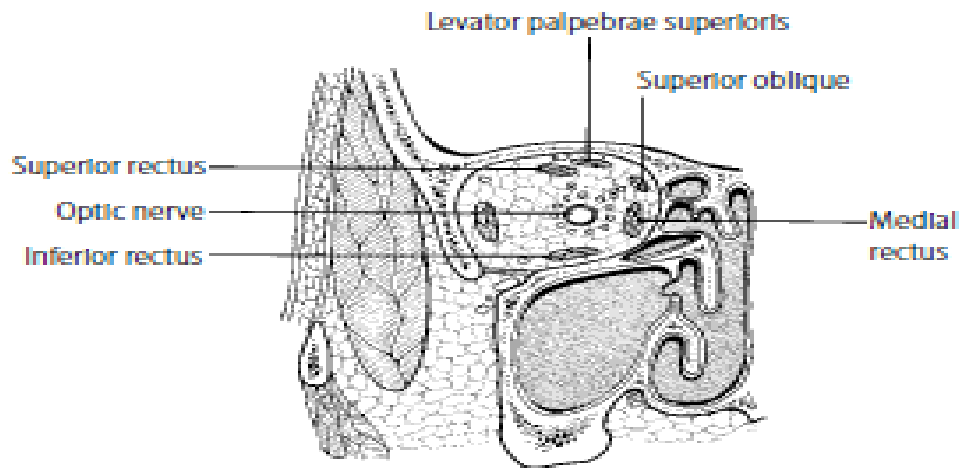


Figure 10: Extra-ocular muscles

Physiology of the Eye:

A true representation of our surroundings is the eye's primary role. The optic nerve and the posterior visual pathways carry these visual signals to the brain. Therefore, the adnexa and surrounding tissues have adapted to aid in this procedure.

The Tear Film: ^{38, 39}

The tear film is composed of three distinct layers: aqueous, oily, and mucoid. In the cornea, the mucoid layer is found directly beneath the epithelium. Previously, tears were unable to adequately soak surfaces, but now they can. This substance is produced by the conjunctival epithelium's goblet cells. The primary lacrimal gland, found in the superotemporal area of the orbit, and the auxiliary lacrimal glands, found in the conjunctival stroma, are responsible for producing the watery (aqueous) layer. All the essentials are in this solution: electrolytes, proteins, lysozyme, immunoglobulins, glucose, and dissolved oxygen (from the atmosphere). The meibomian glands, which are essentially modified sebaceous glands, are situated near

the margins of the eyelids and secrete an oily film that protects the eye (superficial layer of the tear film). Tears are slowed by a sticky coating on the vertical column between the upper and lower lids. The lacrimal sac, nasolacrimal duct, nasociliary duct, nasociliary punctum, nasociliary canaliculus, inferior canaliculus, and superior canaliculus are all parts of the lacrimal system (which drains into the nose).

The Cornea : ^{40,41}

Refraction is the cornea's main purpose. This function requires the cornea to be transparent, have a smooth, uniform surface, have a spherical curvature with the proper refractive power, and have the proper index of refraction.

Corneal transparency is contributed to by anatomical and physiological factors:

1. Anatomical:

The epithelium in humans is unaltered, the cells are closely packed, a mucous layer keeps the surface lubricated and smooth, the membranes are homogeneous (Bowman's and Descemet's), and the corneal lamellae are arranged in a predictable pattern (collagen fibers inside each lamella are parallel, whereas neighboring lamellae are perpendicular.). There are less lamellar-flattened corneal stromal cells and fewer blood vessels in the interspaces when things are regular, like in the cornea.

2. Physiological:

The corneal endothelium's $\text{Na}^+/\text{HCO}_3^-$ metabolic pump actively dehydrates the cornea. The epithelium and endothelium of the cornea create a physical barrier in addition to the dehydration.

The Aqueous Humor: ^{42, 43}

In the eyeball, the aqueous humor is responsible for delivering an electrolyte solution to the area between the cornea and the lens (in water). The typical amount is 0.3 ml. Its duty is to maintain the cornea's and lens's health. The posterior chamber's ciliary processes actively secrete fluid, which is then filtered by ultrafiltration to produce aqueous. It then moves into the anterior chamber, where it drains via the conjunctival episcleral veins, Schlemm canal, and trabecular meshwork. Aqueous solution, in contrast to plasma, contains more ascorbic acid and has a lower protein concentration. Proteins from the iris circulation seep into the aqueous humor and cause inflammation of the anterior uvea (plasmoid aqueous).

The Vitreous Body :⁴⁴

Three-dimensional collagen fibers form the vitreous, with highly water-retentive polymerized hyaluronic acid molecules filling the interstices. The vitreous, which typically does not flow, can allow a little amount of aqueous to leak through. After some time has passed, the jelly begins to melt, and floaters form from the broken off pieces. The eyesight loss in myopes usually starts at a young age.

The Lens :⁴⁵

Just like the cornea, the lens is see-through. It has no circulatory system and can only drink water. It has an enormous elastic capsule that prevents molecules like proteins from entering or leaving. Younger lens fibers migrate inward toward the nucleus as a person ages, whereas older lens fibers sprout outward. The lens contains approximately 35% protein and 65% water. As we age, the water content in our lenses

decreases, reducing their pliability. To keep the lens in place, the zonule extends from the ciliary body and resides in the lens capsule near the equator.

The Ciliary Body : ⁴⁶

A smooth muscular mass that wraps around the globe and connects anteriorly to the scleral spur is the ciliary muscle, also known as the ciliary body.

There are two primary components to it:

1. The outer layers of the choroid are made up of longitudinal (meridional) fibers that travel in from the scleral spur. When this muscle contracts, it pulls on the choroid, the retina, and the trabecular meshwork.
2. The inner part is made up of circumferentially running circular fibers. As the ciliary processing moves inward and near the center of the pupil, contraction causes the zonules to relax.

Accommodation: ⁴⁷

The lens may globulate and gain more refractive power when accommodation causes the zonular fibers to split. When the ciliary muscles loosen up, the lens becomes flatter and less refractive because the zonular fibers tighten. This correlates with a smaller pupil size and enhanced clarity of vision.

Visual fuzziness and/or knowledge of the object of interest's proximity both serve to initiate the accommodation response. The amount of accommodation possible is limited by the lens's rigidity and the ciliary muscle's contractility (amplitude of accommodation). As lenses get more rigid with ageing, accommodation decreases

(and ciliary body contractions decrease). Without presbyopia correction, close work such as reading is challenging.

The Retina : ^{48,49}

Light is converted into electrical energy and sent to the brain via the eye's "photographic film."

It consists of two main parts:

1. The inner layer of the embryological optic cup gives rise to all retinal layers known as the neuroretina.
2. The retinal epithelium (RPE) is a layer of cells located within the optic cup. Bruch's membrane has a single layer of cells attached to it. The outer retina is located on the opposite side of Bruch's membrane from the choroid.

Due to the optic cup being reversed, the retinal photoreceptors are arranged such that their photosensitive regions are in close contact with the opaque RPE cells. This reduces light dispersion and enhances visual acuity. In addition, the RPE is crucial for the regeneration and recycling of the eye's photopigments as well as adaptability to light and darkness.

The retina has to be totally see-through so that light may reach its inner layers and form distinct images. Because retinal neurons do not have myelin fibers, they seem translucent. The axons of retinal ganglion cells sometimes may not reach the optic nerve until they have passed through the optic disc, delaying the onset of myelination. Rods and cones are the two most common types of photoreceptors in the retina. The cone photoreceptors found exclusively in the fovea centralis are crucial for both color vision and sharp, central vision (visual details). Rods predominate in the

peripheral retina, which is farther from the fovea. Rods are crucial for both peripheral vision and night vision because of how well they perform in low light.

Only the inner nuclear layer and a tiny portion of the outer plexiform layer receive nutrients from the capillary network of the central retinal artery. At the blood vessel's tip, there is a device that works. The RPE and photoreceptors are fed by the choroid (by diffusion of nutrients). The outer retina is devoid of blood vessels. The central fovea is completely avascular and receives all of its nutrition from the choroidal circulatory diffusion. Therefore, healthy choroidal and retinal circulation is required for optimum retinal function.

Ocular Injuries : An Overview^{50,51,52}

Although all ocular tissues are vulnerable to damage, the location of the damage is typically determined by the source and method of the damage¹. The cornea, conjunctiva, trabecular meshwork, anterior chamber, iris, and crystalline lens make up the anterior segment of the eye, which is the part of the eye that is most exposed to environmental hazards and where damage to the retina, choroid, and optic nerve¹ can occur. In most cases, when both the front and the rear of the eye are harmed, the result is complete blindness.

Open globe and closed globe ocular injuries are the two main categories. However, depending on the circumstances surrounding the damage, there may be some overlap between the two types. Trauma to the eyeball, either blunt or penetrating, may entirely incise the corneoscleral wall, resulting in a ruptured globe (an injury penetrating into the globe). Open globe injuries include a wide variety of lacerations, which may be further classified as piercing, perforating, or involving an intraocular foreign object.

The most frequent cause of closed globe injuries is violent trauma, which results in a partial thickness corneal incision and leaves the globe's corneoscleral wall intact but with apparent intraocular damage. The three categories are lamellar lacerations, burns, and blunt trauma/contusions. Rips are brought on by blunt items, and the wound is truly made from the inside out. If the object that wounds you is blunt, it may rupture or result in a contusion (open globe).

The New Ocular Trauma Terminology 53 defines these terms as follows:

Table 2: Definitions according to New Ocular Trauma Terminology

Eyewall	Rigid structures of sclera and cornea
Closed globe injury	There is no full-thickness damage to the eyewall. The eye has no obvious scratches on the cornea or sclera (contusion). Moderately thick (lamellar laceration)
Open globe injury	A large cut in the eyewall
Rupture	A full-thickness wound to the eyewall is caused by blunt trauma, and this leads in a decrease in eye pressure. The weakest part of the eyewall has giving rise.
Laceration	Full thickness wound due to sharp objects
Penetrating injury	One can only get a laceration to the eyewall from a sharp item. No exit wound
IOFB	Retained IOFB causing entrance laceration
Perforating injury	Two complete slits in the orbital lining (entrance and exit)

CLASSIFICATION OF OCULAR TRAUMA:

1. BETT's Classification ⁵⁴

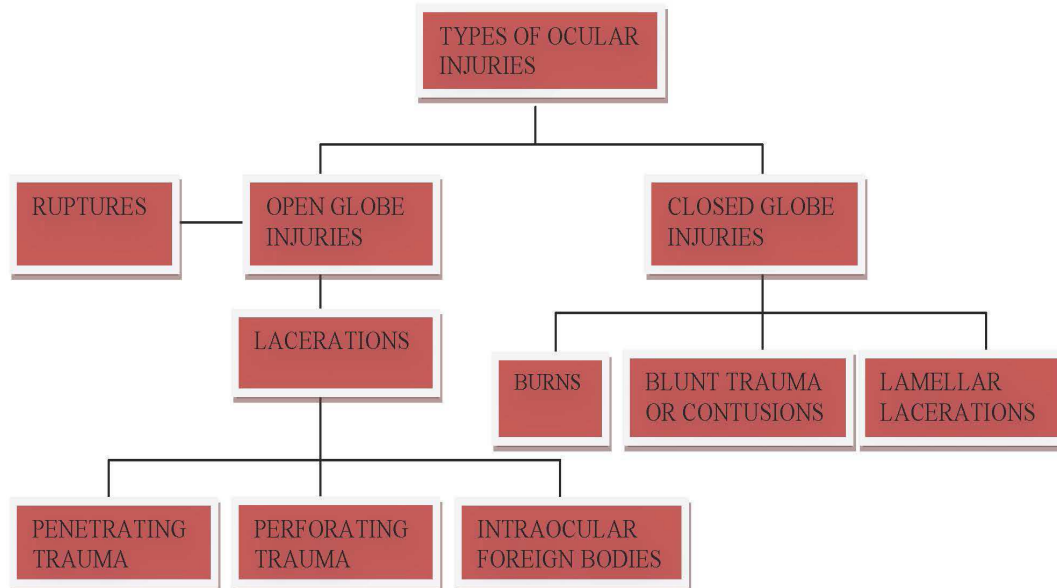


Figure 11: Classification of ocular trauma

2. Classification proposed by Rychwalski et al ⁵⁵ and Pieramici et al ⁵⁶

OPEN GLOBE CLASSIFICATION:

Tables 3: Classification of Open globe injuries

I. TYPE

A	Rupture
B	Penetrating
C	IOFB
D	Perforating
E	Mixed

II. VISUAL ACUITY:

A	>20/40
B	20/50 to 20/100
C	19/100 to 5/200
D	4/200 to light perception
E	No light perception

III. PUPIL

A	Positive RAPD
B	Negative APD

IV. ZONE

I	Isolated to cornea
II	Corneoscleral limbus to 5mm posterior into the sclera
III	Posterior to anterior 5mm of sclera

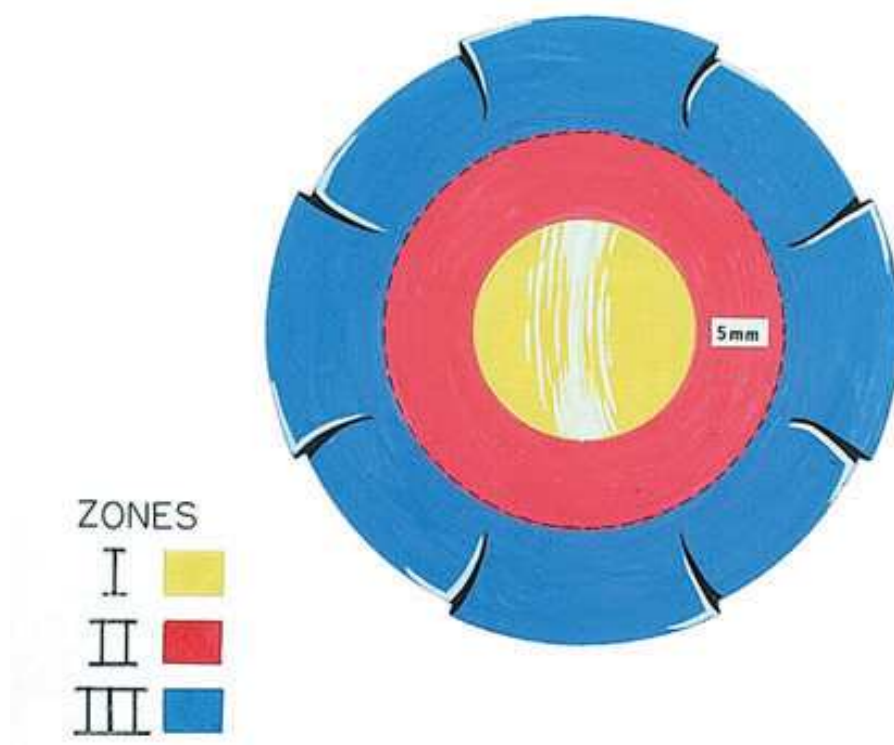


Figure 12: Zones of open globe injuries

CLOSED GLOBE CLASSIFICATION:

Tables 4: Closed globe injuries

I. TYPE

A	Contusion
B	Lamellar Laceration
C	Superficial Foreign Body
D	Mixed

II. VISUAL ACUITY:

A	>20/40
B	20/50 to 20/100
C	19/100 to 5/200
D	4/200 to light perception
E	No light perception

III. PUPIL

A	Positive RAPD
B	Negative APD

IV. ZONE

I	External (limited to bulbar conjunctiva, sclera, cornea)
II	anterior portion (includes structures of the anterior segment and the pars plicata)
III	posterior part (all internal structures posterior to the posterior lens capsule)

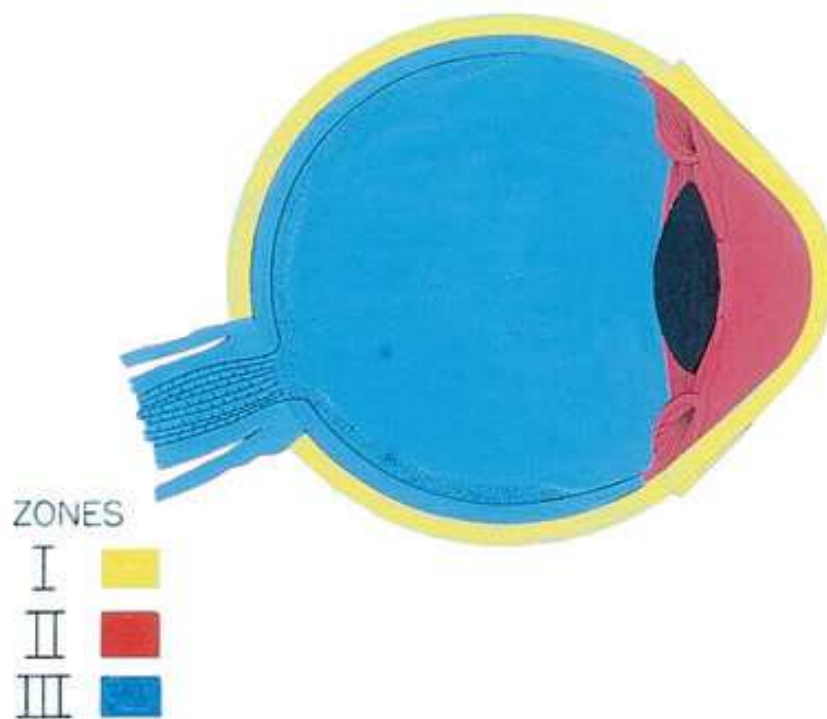


Figure 13: Zones of closed globe injuries

OCULAR TRAUMA SCORE ⁵⁷

This rating is used to forecast how individuals with open globe ocular injuries would see after treatment. This prediction score has an around 80% predictive accuracy and might be used to offer guidance to patients following open globe damage.

Table 5: Methods for calculation of OTS

INITIAL VISUAL FACTOR	RAW POINTS
Initial raw score (based on initial VA)	>20/40 = 100 20/200- 20/50 = 90 1/200 – 19/200 = 80 PL or HM =70 NPL = 60
Globe rupture	-23
Endophthalmitis	-17
Perforating injury	-14
Retinal detachment	-11
RAPD	-10

Table 6: Probability of follow up

Probability of follow up visual acuity category at 6 months

Raw Score Sum	OTS Score	NLP	LP/HM	1/200-19/200	20/200 to 20/50	20/40
0-44	1	73%	17%	7%	2%	1%
45-65	2	28%	26%	18%	13%	15%
66-80	3	2%	11%	15%	28%	44%
81-91	4	1%	2%	2%	21%	74%
92-100	5	0%	1%	2%	5%	92%

PROCEDURE TO CALCULATE OTS

1. Based on the first visual acuity, provide a raw starting score.
2. Reduce the raw score by one point for each of the criteria in the first table.
3. Once the raw score has been established, the appropriate category in the second table and the related OTS score may be found using the raw score.

We can effectively plan, manage, and track a variety of ocular ailments brought on by mechanical stress thanks to the OTS score.

OCULAR MANIFESTATIONS OF TRAUMA: ⁵⁸

EYE LIDS :^{59,60}

Eyelid injuries have been encountered by humans ever since our species first emerged. Eyelid injuries is typically caused by sharp objects, flint knives, and animal attacks. Despite significant eyelid wounds, Phillip of Macedonia, Alexander the Great's father, lived long enough to launch his son. Eyelid wounds, on the other hand, may indicate deadly trauma, according to archaeological findings. During the Battle of Hastings, Harold of England's eyelids were injured. According to mythology and the Bayeux tapestry, he was assassinated by an arrow that penetrated his head through his eyelid.

In ancient Egyptian and Greek literature, eyelid wounds were repaired. When the first words to describe surgical methods were penned, bandages and sutures were readily accessible. Modern sources of trauma still include sharp items, animal bites, battles, and burns, but additional sources have emerged, such as high-speed missiles and motor vehicle collisions (MVCs). This chapter discusses the most up-to-date methods for dealing with individuals who have sustained damage to their eyelids and lacrimal system.

Multiple forms of eyelid injuries are possible depending on the cause of the accident.

1. Periorbital edema and ecchymosis:

This is a significant issue since it is the most typical unavoidable side effect of an eyelid injury. Redness and purple discoloration of the skin, known medically as ecchymosis, result from blood collecting under the skin. It can occur as a result of

Table 7: Difference between ecchymosis due to ACF fracture and local causes

Ecchymosis due to ACF fracture	Ecchymosis due to local causes
Extravasated blood is limited sharply to orbital margin	No limitation
Colour is purplish red	Bluffy red
Hemorrhage does not move with movement of conjunctiva	Hemorrhage moves with movement of conjunctiva

2. Emphysema:

It's the excessive accumulation of air under the skin of the orbit. Lamina papyracea damage on the orbital floor or medial wall causes this condition. Orbital compartment syndrome, caused by an excessive amount of air entering the orbit, might cause a rise in intra-orbital pressure. Three different forms of ocular emphysema were described by Heerfordt.

Table 8: Types of orbital emphysema

TYPE 1 -Palpebral or Pre septal	The eyelids are the only areas where air is present, hence the orbital septum is unharmed.
TYPE 2- True orbital	occurs at the same time as a bone fracture in the orbital wall and a buildup of air behind a sealed nasal septum.
TYPE 3- Orbito palpebral	The internal pressure of an orbit increases as air accumulates inside.

3. Ptosis:

Mechanical ptosis caused by edema in the lids is considered traumatic ptosis along with traumatic disinsertion, direct injury to the levator palpebrae superioris aponeurosis, palsy of the oculomotor nerve, and traumatic alterations. Levator aponeurosis dehiscence is often observed in trauma patients whose levator function is normal. Levator aponeurosis disinsertion is simply preventable by the accident-related swelling. A satisfying lid height and shape should result with levator aponeurosis repair. The most reliable indicator of surgical success is levator function.



Figure 14 :Ptosis

4. Laceration:

Injuries to the eyelid may be rather serious, thus it's important to have a thorough understanding of eyelid and surrounding anatomy before making any assessments. The protection of the eyes is the primary objective of the eyelid.

1. CANALICULAR LACERATIONS: ^{61,62}

Repairing canalicular lacerations requires the surgeon to have expert knowledge of the anatomy of the canalicular system and its connections to the nasal and eyelid tissues. If the patient has concerns about these structures, they should be sent to a qualified oculoplastic surgeon. Each damaged canalicular system needs to be repaired. It could be difficult to diagnose a canalicular system that has been injured. The canalicular system can be impacted by even very little eyelid abrasions. Diagnosis may involve a light prodding and/or irrigating of the nasal-lacrimal system.

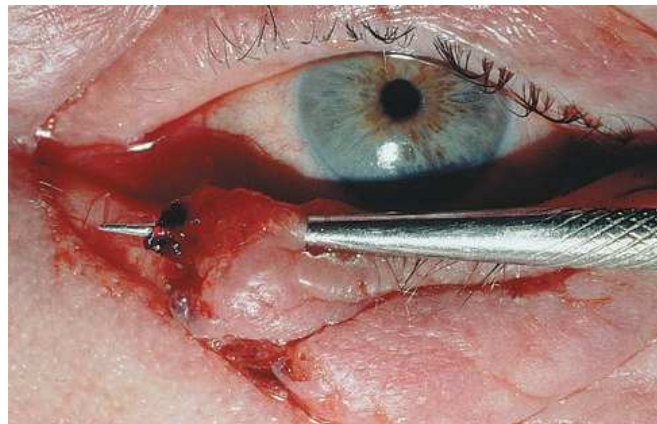


Figure 15: Canalicular laceration

CONJUNCTIVA: ^{63,64}

The conjunctiva is the innermost layer of the eyelids and the first layer to sustain damage in the event of an eye problem. Despite having inadequate inherent structural strength, it provides great resistance against low-momentum foreign objects and chemical agents. As a result, careful evaluation of its entire surface should always be included in the assessment. Examine the bulbar and palpebral

conjunctiva with the penlight to see whether there are any open globe injuries before opening the lids.

1.Subconjunctival hemorrhage:

On the skin, it seems to be a typical bruise—"it's like an eye bruise." It's a common affliction, yet it presents itself as a shocking eye emergency. Redness on the white of the eye, either as a single spot or a few smaller ones.. The reason is blood beneath the conjunctiva. It often doesn't hurt too bad and has no impact on vision. Conjunctival blood vessels can bleed quickly and are relatively sensitive, making them common in trauma. The hue changes from blazing red to orange and eventually yellow as the blood is absorbed.

Grading of subconjunctival hemorrhage:

Table 9: Grades of subconjunctival hemorrhage

GRADE	QUADRANTS INVOLVED
I	ONE
II	TWO
III	THREE
IV	FOUR

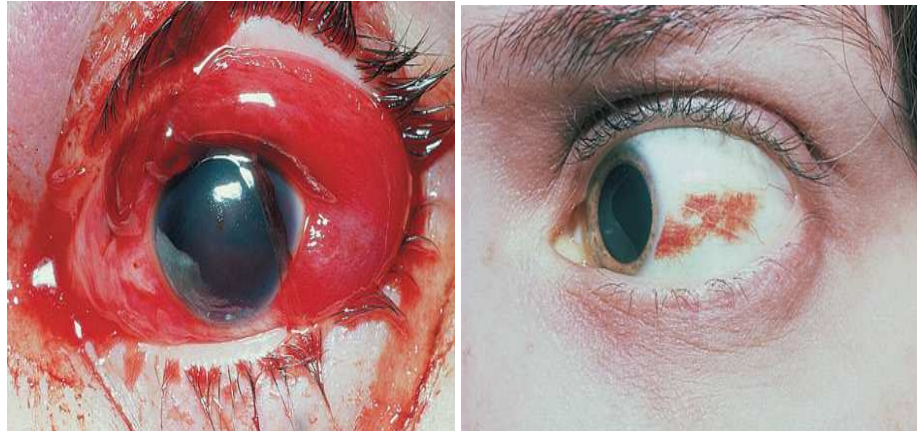


Figure 16 :Sub Conjunctival Hemorrhage

2.Chemosis:

Conjunctival swelling is a common response to many injuries or irritants, and it reflects a fundamental dysfunction of the conjunctival vascular endothelium. causes of increased intraocular pressure include orbital congestion following a contusion and carotid cavernous fistula, while increased intravenous pressure is seen in cases of trauma to the carotid artery. Chemosis at initial examination is not usually indicative of the final extent of damage, but severe alkali injuries may initially show very little chemosis. Chemosis will be present in the majority of cases of ocular trauma.

3.Conjunctival laceration:

Because the conjunctiva is so thin, a direct impact lacerates it. It can occur on its own or as part of a larger ocular injury. Chemosis and subconjunctival hemorrhage are possible causes. Conjunctival laceration is rarely severe since the conjunctiva is freely movable.

4.Foreign Bodies

Foreign bodies in the conjunctiva are very prevalent. They must always be ruled out since they may signal the likelihood of a deeper, more intrusive damage. c Using a cotton swab or a 30-gauge needle, most foreign bodies in the conjunctiva may be removed.

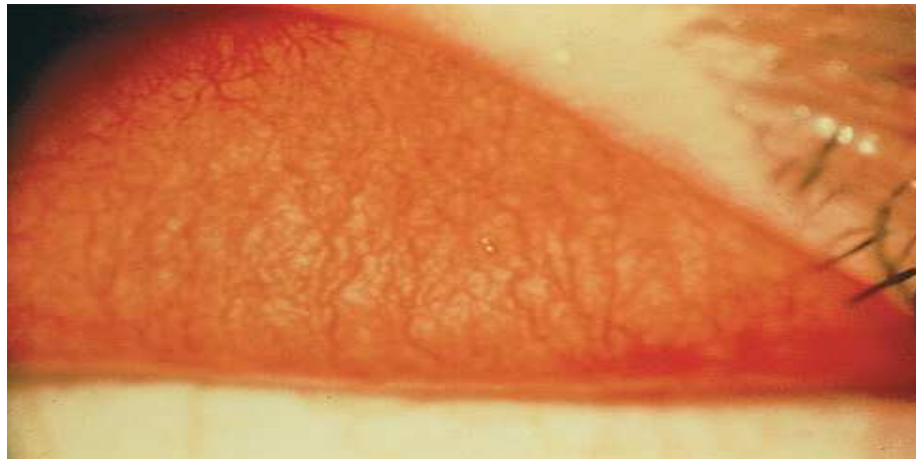


Figure 17 : Conjunctival Congestion

5.Lacerations

Lacerations might be very small wounds or a sign of more significant harm. To rule out the likelihood of an open globe injury, every patient who appears with a conjunctival laceration requires a comprehensive examination, including a dilated fundus check. The only sign of true IOFBs may be a practically unnoticeable conjunctival lesion.

6.Emphysema

Free air that is trapped beneath or inside the conjunctiva causes emphysema (Fig. 13-6). The source of the air might be either internal (endogenous) or external (exogenous). Endogenous emphysema is much more common after an orbital fracture because it provides direct access from the paranasal sinuses to the orbit. Forced exhalation, such as when blowing one's nose or coughing, forces air into the orbit, where it may then dissect anteriorly beneath and into the conjunctiva. This may cause conjunctival emphysema, which manifests as extreme and rapid exophthalmos. Exogenous emphysema is most often caused by explosions, which occur seven times each year on average.



Figure 18 : Orbital Emphysema

CORNEA: ^{65,66}

A retinal injury is common in cases involving the face and eyes. It is crucial to detect and treat corneal injuries in order to maintain clear vision, as the cornea is responsible for producing most of the eye's refractive power. Even minor changes in the cornea's structure can have profound effects on its ability to perform its normal functions.

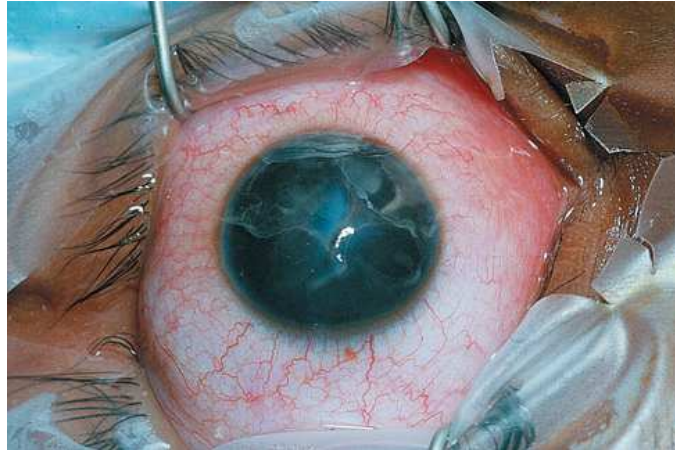


Figure 19 : Corneal laceration

When it comes to youngsters, corneal trauma is particularly prevalent. Secondary or primary corneal damage are possible.

Table 10: Types of corneal damage

PRIMARY	Corneal epithelium damage, corneal laceration, corneal tear
SECONDARY	Edema, blood staining, Descemet's membrane folds

a) Corneal abrasion:

Small injuries are often readily apparent. It's associated with a great deal of distress and sensitivity to light. It stains with fluorescein and has typically crisp margins. It normally takes 24 hours for them to recover.

b) Recurrent epithelial erosion:

Corneal abrasions can disrupt epithelium-basement membrane complexes, resulting in recurring epithelial abnormalities. Sudden discomfort, sensitivity to light, and watery eyes are all connected to it.

c) Non penetrating corneal lacerations:

When the epithelial barriers are broken, the stroma becomes exposed to tears and aqueous fluid, causing it to enlarge and eventually self-seal. This occurs in the case of small, non-perforating corneal lesions. The Siedel test is an assessment for very small leaks.

d) Full thickness corneal laceration:

It's a critical injury that has to be treated right once to avoid vision loss. It can cause discomfort, photophobia, lacrimation, and blurred vision. It's possible that aqueous humor will seep out of the anterior chamber. Iris prolapse, lens disruption, vitreous and uveal prolapse are all possible causes of full thickness corneal tears.

e) Blood staining of cornea:

It usually happens after a period of extended hyphema and high intraocular pressure. Cornea has a reddish brown color to it. Hemosiderin, which gets entrenched in the corneal stroma, causes the opacification. Clearing generally begins on the outside and moves within.

ANTERIOR CHAMBER(AC):^{67,68}

a) Hyphaema:

The anterior chamber has become clogged with blood. Ocular trauma may cause damage to the iris's major artery circle. It's important to note that the volume of blood that enters the anterior chamber is proportional to the extent of the vascular lesion. It may raise intraocular pressure by blocking drainage of the eye, as in the case of a blood clot or inflammatory debris.

Grading of hyphaema:

Table 11: Grades of Hyphaema

Grade 1	Hyphaema less than 1/3 rd of AC
Grade 2	Hyphaema between 1/3 to 1/2 of AC
Grade 3	More than 1/2 of AC but less than complete filling of AC
Grade 4	Total hyphaema

b) Angle recession:

Acute ocular damage causes the separation of circular and longitudinal ciliary muscle fibers, which is known as ciliary dystrophy. Because of hyphaema's presence, it is commonly hidden at first. Glaucoma is rare in those who have less than 180 degrees of recession in their eyes. Those who have a 180-degree recession or greater, on the other hand, will acquire late glaucoma.

IRIS AND CILIARY BODY ^{69,70}

a) Iridodialysis:

The place at which the iris breaks out from the ciliary body is called the iris root. The pupil is frequently arranged in a D shape. Iridodialysis on the margin of the anterior chamber might look as a little black spot. Large dialysis can sometimes induce substantial iris architectural disruption.

b) Traumatic iritis

The blood vessels' permeability increases as a result of eye trauma. Iritis develops as a result of the leakage of protein and fibrin into the anterior chamber. Slit-lamp examination may reveal cells and flare in the anterior chamber, along with pain, redness, and photophobia.

Inflammation of the ciliary body reduces aqueous production, leading to lower intraocular pressure. Another potential complication of traumatic iritis is an increase in intraocular pressure. Corticosteroids and cycloplegics were used to treat the patient.

c) Traumatic aniridia:

If the harm is bad enough, the iris can detach from the ciliary body and fall to the floor of the anterior chamber.

d) Cyclodialysis:

Once the ciliary body has detached from the scleral spur, interstitial fluid can freely enter the suprachoroidal space. Severe hypotony is a hallmark of this condition. The negative effects of cyclodialysis might include peaked pupils, shallow anterior chambers, and ocular edema.

PUPIL: ^{71,72}

a) Traumatic miosis and mydriasis:

Miosis is far rarer than mydriasis due to trauma. Miosis is linked to iris sphincter tears, while mydriasis is linked to anterior chamber inflammation.

b) Sphincter tear:

Following an iris sphincter tear, the pupil edge may seem serrated or uneven.

The pupil is normally in the middle of its dilation range.

LENS: ^{73,74}

When eyes are subjected to severe stress, lens damage are prevalent. There are numerous kinds of lens injuries. Those are

Subluxation and dislocation:

It's conceivable that a weak zonule lens will move about when the patient changes position. The surviving zonules pull the lens away from the site of zonule rupture if zonular dehiscence is partial. The anterior chamber will be deep in this situation. The lens may be extruded through the incision if the patient has had previous procedures such as ECCE or penetrating keratoplasty. Since the individual becomes aphakic, posterior lens displacement causes significant vision loss. Withdrawal of the lens and its displacement into the anterior chamber is yet another possibility.

a) Vossius ring:

It involves the iris pigment being deposited over the anterior lens capsule, which may be fully or partially formed. Significant damage is caused when the pigmented posterior iris epithelial cells crash into the clear anterior lens capsule.

b) Traumatic cataract:

It might happen right away or years later following a physical trauma. Cataracts and opacity form after trauma because aqueous humor enters the lens where it normally wouldn't be able to. Different kinds of traumatic cataract include

- Rosette cataract
- Cataract zonulatum traumaticum
- Diffuse concussion cataract
- Subepithelial opacities
- Glaucoma caused by traumatic lens loss

VITREOUS ^{75,76}

Blunt damage to the vitreous might cause opacification or disinsertion injuries.

a) Vitreous disinsertion:

The vitreous base, optic nerve, retinal veins, fovea, and chorioretinal scars are all potential sites of disinsertion. The avulsed vitreous base looks like a ribbon hanging down loosely in the vitreous space.

b) Vitreous opacification:

This illness is brought on by bleeding from ciliary, choroidal, or retinal body vessels that are injured. Pigments released from iris and retinal pigment epithelium cells may also contribute to vitreous opacification. A retinal tear or dialysis is present if there is pigment in the vitreous.

Vitreous hemorrhage:

The patient reports blurred vision and the sudden arrival of floaters. Vitreous hemorrhage is a common complication of eye trauma, with posterior vitreous separation, retinal rupture, and retinal detachment being the most common underlying causes. Red, sharp borders characterize acute bleeding. The blood begins

to spread throughout the vitreous a week after the initial hemorrhage. Hemorrhaging occurs when blood cells are ingested and hemoglobin is degraded.

It begins to turn golden brown after just 10 days. Glaucoma, hemosiderosis, and proliferative vitreoretinopathy are further effects of a non-clearing vitreous hemorrhage.

Table 12: Grades of Vitreous Hemorrhage

Grading of resolving vitreous hemorrhage:

Grade 1	Opaque vitreous
Grade 2	Only red reflex seen, other details not Visible
Grade 3	Patches of fundus seen in between Opacities
Grade 4	Central vitreous is clear
Grade 5	Clear vitreous

a) Vitreous loss:

An open globe injury causes this condition.

b) Vitreous detachment:

The cortical vitreous separates from the retina at any point behind the vitreous base. Causes include vitreous hemorrhage, retinal hemorrhage, and retinal dialysis.

RETINA: ^{77,78,79}

a) Commotio retinae:

b) It's also known as Berlin's edema. This retinal sign of a contusive ocular injury is the most common. The retina appears white or gray, and choroidal or retinal pigment epithelial detachments or intraretinal hemorrhages may also be present. As an alternative, it might be at the retina's extreme margins, at the rear of the eye. It is quite clear when the macula is affected. The growth of retinal pigment epithelial irregularity and migration into the retina may occur after removal of the retinal edema, leading to the beginning of the degenerative eye condition known as retinal pigmentosa. Commotio Retina is now incurable.

c) Contusion of retinal pigment epithelium:

d) Eyes are easily damaged by blunt force, which can damage the retinal pigment epithelium. Edema of the retinal pigment epithelial cells is one possible cause, as is serous retinal detachment. Currently, there is no effective treatment.

e) Traumatic retinal vascular occlusion:

The central retinal artery or vein may become constricted or occluded after severe trauma. Possible causes include global arteriospasm due to physical trauma, central retinal artery shearing in the optic nerve, and substantial traumatic rotation of the globe.

a) Traumatic macular hole:

Unfortunately, the inner layers of the retina do not provide the fovea with a blood supply or structural support, therefore it is avascular. Depending on how hard the blow was, a full thickness macular hole might form in the eye in a

matter of a few seconds. During trauma, surface traction at the vitreoretinal contact causes hole development.

b) Retinal dialysis:

The retinal dividing line with the nonpigmented pars plana epithelium is located at the ora serrata. Nonetheless, it still has ties to the vitreous body. In 7% of instances, detachment of the retina occurs. Typically, it shows up in the inferotemporal area.

c) Retinal tears:

During traumatic or spontaneous vitreous detachment, areas of severe vitreoretinal adhesion induce retinal fractures. A significant retinal tear is one that is longer than three hours or stretches beyond 90 degrees.

d) Necrotic retinal breaks:

At the point of impact, direct contusive trauma can produce retinal necrosis or ischemia. Within 24 hours, detachment associated with a necrotic retinal crack develops.

f) Traumatic retinal detachment:

Blunt trauma is the most frequent cause of separation after trauma. The severity of wounds is in part influenced by the power of the hit. High myopes are more likely to suffer from eye problems. As a rule, the macula is completely detached after a traumatic event involving the retina.

It might happen right after an injury or after the organized vitreous hemorrhage has contracted..

CHOROID: ^{80,81,82}

a) Choroidal hemorrhage:

In the event of traumatic choroidal hemorrhage, a blood clot will form between the choroid and the sclera. This bleeding is caused by a rupture of the long and short posterior ciliary arteries and veins. It is typically observed near the disc's equator.

b) Choroidal detachment:

Blood accumulating between the choroid and the sclera causes detachments, which are similar to choroidal hemorrhage. Due to the close relationship between the choroid and the vortex veins, choroidal detachments tend to take on a dome shape. Typically seen in the head's temporal area.

c) Choroidal rupture:

There was a traumatic dislocation of the retinal pigment epithelium, bruch's membrane, and underlying choroid. Their tips are pointed and create a crescent shape.

Table 13: Types of Choroidal rupture

Direct choroidal rupture	<ul style="list-style-type: none">• Occurs at the site of impact• Large and irregular in shape
Indirect rupture	<ul style="list-style-type: none">• Away from the site of injury• Present within posterior pole

SCLERA:⁸³

a) Scleral rupture:

At the point of collision, there is a direct rupture. At the point of scleral weakness, an indirect rupture develops. The majority of scleral ruptures are single, however in extreme situations, numerous ruptures may occur. Scleral ruptured eyes are more likely to acquire intraocular bacterial contamination.

INTRAOCULAR PRESSURE:^{84,85,86}

If there is known open globe damage, IOP measurements should be postponed until the damage has been repaired. Intraocular pressure might be too high or too low.

Table 14: IOP and its variations

CAUSES OF HIGH IOP	CAUSES OF LOW IOP
Hyphema	Wound leak
Hemolytic glaucoma	Retinal detachment
Angle recession glaucoma	Ciliochoroidal detachment
Anterior chamber inflammation	Ciliary body ischemia
Epithelial downgrowth	
Retrobulbar hemorrhage	

OPTIC NERVE INJURY:^{87,88}

- (i) Hemorrhage and disc swelling at the periphery of the injured disc are symptoms of a prelaminar injury. Eventually, it causes optic atrophy and complete blindness.

- (ii) Traumatic lamellar damage results from abrupt rise of intraocular pressure after physical force to the eye, causing lamina cribrosa to rupture and optic nerve avulsion. Loss of sight has devastating long-term effects.
- (iii) A swollen optic disc and signs of orbital or ocular trauma indicate that the patient has suffered a lamellar damage.

OTHER CRANIAL NERVES

a) Oculomotor nerve:

Oculomotor nerve injuries caused by trauma often occur at the level of the posterior clinoid ligament.

b) Trochlear nerve:

Diplopia while gazing down or to the other side may indicate trochlear nerve involvement.

c) Abducent nerve:

Causes of isolated abducent nerve palsy include skull fractures, increased intracranial pressure, and head trauma.

d) Facial nerve:

The majority of these incidents involve blows to the head. The patient is complaining of a complete paralysis of one side of their face, including their lids.

ORBITAL TRAUMA ^{89,90}

Children who experience head and facial trauma in RTA frequently exhibit it. Children's orbits are more elastic than adult orbits. A fracture of the orbit is categorized as

Table 15: Fractures of Orbit

TYPE I	Fracture of orbital rim
TYPE II	Fracture of orbital wall with no functional impairment
TYPE IIIa	Fracture of orbital wall with diplopia (adults)
TYPE IIIb	Fracture of orbital wall with diplopia (children)
TYPE IV	Fracture with open wound or penetrating injury
TYPE V	Compression of the globe, fracture of the orbital apex, or ischemia of the optic nerve

Type I and II diabetes may be prevented with treatment since they are not life-threatening. Type III children need to start therapy as soon as possible. If you have type IV, you should get treatment within 24 hours, but if you have type V, you need to get treatment immediately away.

Percentage impairment in terms of visual acuity post trauma

Table 16: Percentages of impairment of visual acuity

CATEGORY	BETTER EYE	WORSE EYE	PERCENTAGE IMPAIRMENT
0	6/9 – 6/18	6/24 – 6/36	20
1	< 6/18 – 6/36	6/60 – Nil	40
2	<6/60-4/60 or field of vision 10°-20°	3/60 to nil	75
3	<3/60-1/60 or field of vision 10°	FC at 1 feet to nil	100
4	FC* at 1 feet to nil or field of vision 10°	FC at 1 feet to nil	100
One-eye blind	20/20	FC at 1 feet to nil	30

Concessions offered by the Government of India:

A individual must be at least 40 percent disabled in order to qualify for the GOI discount. The GOI provides concession on various fronts such as travel, telecommunication, customs, conveyance, education, income tax, employment, and economic assistance.

Other Studies on Ocular trauma:

Ocular trauma is the most avoidable cause of unilateral blindness. Accidental eye injuries are common among children under the age of 12, especially during unstructured play with other children. Despite the significance of ocular trauma to

public health, there is a lack of population-based research examining its frequency and risk factors, especially those in developing countries.

Despite the fact that numerous ophthalmologists have produced enough literature on ocular trauma, just a handful are listed here.

Through careful analysis, Rudolf Berlin was the first to recognize the significance of clinical observation. The "Berlins Oedema," the drastic changes in the retina that happen after an injury, bears his name in perpetuity. In order to account for the globe's sudden antero-posterior compression, Ogilvie presented a comprehensive explanation, involving circumferential lateral distention. According to Pizzarello, vision loss is "probably the top or second cause of monocular blindness in the world," and it has far-reaching consequences for the individual, their loved ones, and the community at large. Because "almost 90 percent of this blindness may be averted by very inexpensive therapies," blindness due to eye damage is extremely uncommon.¹¹

The world's population lose an estimated 1.6 million eyesight due to eye injuries, 2.3 million have visual impairment, and 19 million are totally blind.¹⁰ According to Pizzarello (1998), 90% of eye injuries may be avoided if "proper eye safety procedures were made accessible and effectively executed." The authors agree with this estimate. In 2002, Thompson, Kumar, Billson, and Martin came at the same conclusion.¹¹

Rodriguez, Lavina, and Agarwal (2003)⁹¹ report that over 40,000 eye injuries were sustained in the United States as a consequence of sports and recreational activities, with 30% of these injuries occurring in youngsters.⁹¹ A Scottish study of children under the age of 14 hospitalized due to ocular damage was

given by MacEwan, Baines, and Desai. In the sample of 93 kids, 70% of the kids were boys and 30% of the kids were girls. 84% of the kids were between the ages of 5 and 14. In 60% of the children, hyphaemas (60%) and blunt trauma (65%) were the most frequent injuries, followed by penetrating injuries without retained foreign objects (24%), and blunt trauma (65%). Eye injuries were most frequently sustained at home, where "more than half of all accidents" occurred.⁹²

During a 12-month period, Fong found that 25% of hospitalizations for catastrophic injuries such burst globes and hyphaemas included children under the age of 15 years.⁹³

265 of the 586 kids consulted throughout the research period, according to Mayouego Kouam J et al, had eye injuries (45.22 percent). Males outnumbered females by a ratio of 1.6:1. The most frequent places where injuries occurred were at home (64.15 percent) and at school (18.11 percent). The most frequent wounds were scratches on the fingernails (12.45 percent). In less than six hours, 157 individuals were observed (59.19 percent). The cornea was the most frequently hurt body part (44.40 percent). 75% of the cases involved mechanical eye damage. It was discovered that 6.41 percent of the time involved chemical burns to the eyes. Eyelid and orbital injuries were discovered in 22, 26 and 2, 26 percent of patients, respectively. 6.79 percent of the cases required surgery. 3.02 percent of people were hospitalized, and the average stay was three days. There were four youngsters who developed issues, including two cataracts and two corneal scarring. There were no recorded incidences of blindness.⁹⁴

Workers who suffer eye injuries on the job can face long-term consequences to their health and quality of life. It is a health problem that might be prevented. It

affects the working population, impeding the social and economic development of a nation. It may put a burden on the nation's finances and healthcare system. A person's quality of life and future earning potential might be negatively impacted by blindness.

According to the World Health Organization (WHO), 80% of cases of visual impairment are avoidable or treatable. Therefore, it is important for both the public and the government to adopt measures to lessen the prevalence of ocular damage, especially in the workplace.

Injury is the term for physical harm to human tissues brought on by an accident or exposure to outside pressures. Since they can impair one's quality of life, productivity, morbidity, and even mortality, eye injuries are extremely important.⁹⁵

Any situation that could, either alone or in conjunction with other variables, result in a fatality, an injury, property damage, or other losses at work is considered an occupational hazard. Risks of harm are simply occupational hazards. A workplace hazard is a risk associated with a certain job requirement or working conditions. Workers in this field have a greater than average risk of sickness because to variables including exposure to toxic chemicals and the possibility of being injured in mining accidents. Occupation-related injuries include but are not limited to cuts, fractures, sprains, and amputations. Blindness from ocular damage is preventable. This is a worldwide epidemic that threatens people's health. To this day, ocular trauma remains a major contributor to global ophthalmic morbidity and is a primary cause of permanent blindness in one eye.

It has been shown that a loss of eyesight due to a work-related ocular injury may lower quality of life, lead to emotional and financial difficulties, and negatively impact social interactions. The World Health Organization estimates that each year there are 55 million eye injuries that prevent people from doing their normal daily activities for more than a day and need hospitalization in 750,000 cases, including 200,000 open globe injuries. There are 1.6 million individuals who are blind as a consequence of accidents, in addition to 2.3 million people who have bilateral poor vision as a result of ocular trauma, and another 19 million people who are blind or visually impaired on one side alone. ⁹⁵

In a bimodal age distribution, ocular trauma is more common among younger individuals than older persons. Across the globe, the male-to-female population ratio is 4 to 1. Researchers in Malaysia examined the causes of 220 cases of open globe injuries and found that the majority (51%) were caused by non-work related incidents while 23% were caused by work-related incidents (20). Seventy-six percent of eyes had an initial visual acuity of less than 3/60, however in more than half of these patients, the acuity improved. It was shown that the occurrence of hyphaema (0.001), the length of the wound (0.001), the initial visual acuity (0.005), and the presence of vitreous prolapse (0.001) were all substantially connected with the visual result (0.005). Sharp injuries were the most common, followed by those caused by intraocular foreign bodies, blunt trauma, and blasts. The majority of persons who had an ocular foreign body retained (IOFB) also had an eye laceration, according to the research. Seventeen of the twenty patients who had a foreign body removed from their eye had a positive outcome. Initial visual acuities were below 3/60 in 77% of the examined eyes. Loss of income due to blindness has a significant negative effect on standard of life. ⁹⁶

Welding light exposure was shown to be the leading cause of occupational eye injury in a research conducted in western Turkey (26.9 percent). The second most frequent reason for ocular injuries was drilling or cutting (21.1%), followed by chemical or other substance-related injuries (15.2 percent). In this condition, foreign bodies in the eye were the most often reported sighting (30.7 percent). These patients had all sustained work-related eye injuries brought on by splinters or objects lodged in the eye while they were employed in the metal and equipment sectors. In the same decreasing order of frequency, burns/radiation (26.8%), eyeball penetration/laceration (15.3%), and other eye injuries were noted. In comparison to the left eye, which was hurt in 6.0 percent of patients (n = 421), the right eye was hurt in 51.6 percent of cases. The most frequent cause of injury that led in permanent vision loss was drilling or cutting (82.8 percent) (7.8 percent). Ocular penetration caused corneal and/or scleral involvement in the vast majority of individuals in this group. Lack of safety precautions may be related to the leading factor in occupational eye injuries (18.7%). (goggles and the like). Despite the availability of safety gear in the workplace, including gloves and goggles, 172 patients reported not using it when they were injured (21.1 percent). Men, especially those between the ages of 25 and 34, were more likely than women to sustain work-related eye injuries. The results suggest that regardless of age or gender, occupational eye safety programs may be created to target certain occupations or types of work with a high risk of ocular harm.

13

33 Twenty percent (M:F - 10:1) of the 165 patients with visual impairment who completed a retrospective analysis at a tertiary hospital in the Kumaon area of the Indian state of Uttarakhand were determined to have occupational risks. Vehicle accidents accounted for a third of all occurrences (n = 54; 33.7%), followed by those

occurring during sports, games, and other recreational activities (n = 42; 25.5%). Domestic violence and trauma related to violence are other indicators that have been identified. Wooden sticks were the most frequent source of trauma, found in 27 (16.7%) of the patients. Stones were found in 18 (10.9%), followed by fingernail injury, falling from a height, and playing with a ball in 6 cases each.⁹⁷

Researchers in Dehradun discovered that 37% of ocular trauma was caused by road traffic accidents and 33% was caused by occupational injuries after studying 88 individuals (and 103 eyes) who presented with ocular trauma to the Ophthalmology OPD and emergency services over the course of a year. Workplace mechanics and welders accounted for 23.86 percent of the incidents, while construction workers and farmers accounted for 15.9 percent. The staff consisted of not only manual workers, but also mechanics and welders. It was concerning because none of them claimed to have worn any safety gear while working.⁹⁸

Studies carried out in Korea and Nigeria identified the absence of protective eyewear as a significant risk factor.^{99,100}

Patients in China who had suffered ocular chemical burns were given a 25-item version of the National Eye Institute Visual function Questionnaire and followed for five months for an in-depth analysis of their visual quality of life. The effects of ocular chemical burns on eyesight and quality of life were shown to be substantial and far-reaching. The research found that individuals with binocular visual impairment had a worse quality of life (QOL) as a result of their impaired vision.¹⁰¹

According to a study of 98 adults in Iran who had lacerations to their eyelids, males are more likely to get such wounds. Men in their thirties were the most

vulnerable. There were 27 occurrences at residences, 40 on the streets, and 17 at workplaces. The vast majority of them were working as wage earners or as factory or workshop workers.¹⁰²

Only 22.4% of patients in a prospective cross-sectional study conducted at CMC, Vellore between July 2004 and January 2005 who presented with a history of ocular trauma or a foreign body in either eye within two weeks of the date of presentation had experienced work-related trauma, and 10.4% had vegetative matter. The most often employed insulting weapon was the stick. In the clinical profile, open globe injuries were observed to be frequent (19.3 percent). In rural India, farming was the most frequent kind of work, and firewood was the most popular type of cooking fuel. The results showed a high risk of eye injury brought on by sticks and other vegetative elements.¹⁰³

Blindness caused by damage to any eye was reported at 0.8% in "The Aravind Comprehensive Eye Survey" of a rural South Indian population; men, labourers, and the less educated were at higher risk of injury. It was shown in this research that the lifetime prevalence of ocular trauma is greater than that of glaucoma, age-related macular degeneration, or diabetic retinopathy in the South Indian population, suggesting that this condition deserves more attention. The prevalence of this preventable kind of vision loss might be considerably reduced with the use of very simple measures, such as education regarding the correct use of protective eyewear.¹⁰⁴

At a tertiary eye centre, Singh D. V. and colleagues conducted research to identify the characteristics of ocular trauma. The majority of the 523 eyes that were registered were male (88%) and literate (25 years old, 67%). (77 percent). Students

made up 38% of the population, with rural dwellers making up 44%. The bulk of open globe injuries occurred in Zone 1. (50.8 percent). More than a week after the injury, 75% of people showed up. Retinal detachment and intraocular foreign bodies happened 17.4% and 11.3% of the time, respectively. It was found that 20.5% of open globe injuries resulted in post-traumatic endophthalmitis. Younger age, living in a rural region, illiteracy, foreign object in the eye, and disturbance of the lens have all been associated to endophthalmitis. ¹⁰⁵

Domestic accidents and assault each accounted for over one-third of the injuries in a two-year prospective study conducted at Wilmer Ophthalmological Institute. ¹⁰⁶

Kyle J Alliman et al investigated ocular injuries and visual outcome as a result of paintball projectiles and discovered that the average age of trauma was 21 years old, that 86 percent of the victims were males, and that hyphema was the most prevalent ocular finding. 81 percent of the eyes required surgery, while 22 percent required enucleation. They discovered that 97 percent of people were not wearing eye protection when they were injured. ¹⁰⁷

Among 325 patients with ocular injuries treated at the L V Prasad Eye Institute in Hyderabad, males made up 86.8 percent, women 13.2 percent, and children under the age of 16 made up 46.2 percent. It was shown that 51.1% of patients were impacted by anterior segment involvement, 8.9% by posterior segment involvement, and 31.4% by both. Factors including low baseline visual acuity, whole-chamber hyphaema, retinal detachment, and vitreous haemorrhage were linked to severe visual impairment (VA 6/18).¹⁰⁸

Fasina Oluyemi looked at the penetrating ocular injury epidemiology in Ibadan. The cohort had 135 occurrences. After an average of 24.6 weeks, patients were re-evaluated. The house was the most common location for an injury to occur (58 percent). Projectile missiles were the most common source of eye damage. Victims' ages varied from 9-months-old to 70-years-old. The incidence of penetrating ocular damage was greatest in those aged 20–29 (31.9%), followed by those aged 0–9 (11.9%). Only 31.1% A greater number of males participated than women (ratio 4:1). 14.8% of patients had final acuity of 6/18 or greater, whereas 59.3% had final acuity of 3/60 or worse.¹⁰⁹

Research by Khodam Rostomian et al. on 50 children who had open globe injuries indicated that boys were less likely to be affected (71 percent). Patients in their research were, on average, 5 years old. Most of the injuries were caused by blades (92 percent). The cornea was damaged in 92 percent of the patients, and 32 eyes only needed primary restoration. Five eyes had enucleation procedures. In 45% of the patients, visual acuity of 20/40 or higher was achieved. RAPD, vitreous haemorrhage, hyphema, retinal detachment, and other disorders were linked to a poor visual prognosis. Due to the underlying eye injury and the prevalence of more aggressive organisms like MRSA, endophthalmitis following penetrating eye injuries has a bad prognosis. Risk factors for infection include the presence of a retained intraocular foreign body, the location of the injury (particularly in rural areas), a delay in early wound healing, disturbance of the crystalline lens, and a delay in initial wound healing.¹¹⁰

Imtiaz A, Choudhry et al evaluated the visual result of endophthalmitis related with IOFB and discovered that delaying IOFB removal after trauma greatly

increased the risk of endophthalmitis Thompson et al identified an elevated relative risk of infection in eyes with rupture of the crystalline lens in a retrospective investigation of 258 instances of penetrating ocular trauma at Bascom Palmer Eye Institute. Endophthalmitis due to coagulase-negative staphylococci had the best visual outcome, with 7 (64%) of 11 patients obtaining visual acuity of 20/400 or greater.¹¹¹

At the Vision Research Foundation in Madras, T Sharma, P Agarwal, L Gopal, S S Badrinath, and R Murugesan evaluated 100 children with penetrating injuries using broomstick bows and arrows. In 85 percent of the eyes, they were able to successfully recreate the globe with connected retina. Sixty-two percent of eyes improved by at least two Snellen lines in visual acuity, and all eyes with pre-operative acuity of PL or HM improved to at least 6/9 or better. Anatomical failure was predicted by the presence of anterior and/or posterior segment injuries, endophthalmitis, and/or retinal detachment.¹¹²

Sternberg and colleagues looked at children's penetrating ocular injuries. 49 percent of the injuries were caused by sharp objects, 35 percent by missiles, and 14 percent by blunt trauma. Of the 159 patients who were followed for at least six months, 110 (69%) achieved final vision of 5/200 or better, and 77 (48%) achieved 20/50 or higher. The prognosis of a penetrating injury is significantly determined by the type of the injury and the degree of early damage. Initial preoperative visual acuity of less than 5/200; blunt trauma injuries; sclera wounds; double piercing injuries; thick vitreous bleeding; and wounds coupled with an intraocular "BB" pellet were shown to be related with a poor visual prognosis.¹¹³

MATERIALS AND METHODS:

Materials and Methods :

Study Center : KLES Dr. Prabhakar Kore Hospital and Medical Research Center in Belagavi has a specialised ophthalmology department.

Study Design: Prospective Study, Cross Sectional, Hospital based study.

Study Duration : 1st January 2021 to 31st December 2021

Subjects : Patients with eye injuries who visit the emergency room or the Ophthalmology Out Patient department at the KLES Dr. Prabhakar Kore Hospital and Medical Research Center in Belagavi.

Sample size :

Considering the Overall prevalence of Ocular Injuries from Assault to be at 10.2%, with 5% Margin of error and at 95% confidence interval using the below mentioned formula the estimated sample size was 141 but for the ease of calculation the sample size taken will be 150.

Formula used for sample size calculation is

$$n = \frac{p(100 - p)Z^2}{E^2}$$

Number of samples (n), frequency (p), largest possible sampling error (E), and level of confidence (Z) are all variables that must be determined.

Prevalence of ocular injuries from assaults observed was 10.2% ¹¹⁴. With percentage of maximum error as 5% at 95% confidence level sample size is given by,

Where

$$Z = 1.96 \text{ (95\% CI)}$$

P = prevalence

E = Margin of error (5%)

$$n = \frac{10.2 \times (100 - 10.2) \times (1.96)^2}{5^2}$$

$$n = 140.75 \approx 141$$

Sampling Technique : Non Probability Purposive Sampling

Inclusion Criteria :

1. Patients with ocular trauma irrespective of their age and gender.
2. Conscious and hemodynamically stable patients with polytrauma with ocular injury.

Exclusion Criteria :

1. Patients who are hemodynamically unstable.
2. Comatose patients.
3. Patients who are admitted in ICU.
4. Patients who have not consented for inclusion in the study and not fit or willing for examination.

Data Collection :

Age, sex, and the injury's signs and symptoms were entered into a proforma for each patient who had experienced ocular damage. All patients underwent thorough ophthalmological examinations and histories. In closed globe injuries, visual acuity testing, anterior and posterior eye examinations, intraocular pressure measurements, and gonioscopy were performed.

All aspects of the patient's eyes were checked, including their initial visual acuity, the presence or absence of conjunctival tears or subconjunctival haemorrhages, the presence or absence of foreign bodies, abrasions, lacerations, or perforations in the cornea, the presence or absence of scleral tears or lacerations, the absence of hyphaema, iris injuries, or an afferent papillary defect, and so on. An evaluation of the back of the eye was performed to look for signs of vitreous haemorrhage, retinal detachment, retinal break or tear, choroidal rupture, choroidal haemorrhage, or subretinal haemorrhage.

Patients were looked in on after two days, a week, and then at regular intervals after that. Classification will be based on the Birmingham Eye Trauma Technology Scale (BETTS).

Birmingham Eye Trauma Terminology (BETT)^{53, 54}

In 1996, Kuhn et al. created the Basic Emergency Treatment and Management (BETT) to define injuries in a single, clear phrase and classify them in a comprehensive hierarchy. Improvements to the BETT system have been proposed, but none have been widely implemented.

Terms in the BETT

Sclera and cornea were injured, however there was no full thickness damage to the eyewall.

Injury to the whole thickness of the open globe

Globe subgroups are closed.

No complete thickness damage with a contusion (generally a blunt injury)
Lamellar laceration: Damage to the eye wall's partial thickness (generally a sharp injury) globular open groups Eyewall rupture: Injury to the whole thickness of a surface caused by a blunt object.

The word "laceration" is used to describe full-thickness injury to the eyewall caused by a sharp object. categories of laceration

When there is just one laceration of the eye wall, there is a penetrating injury. If there are several entry wounds, each one must be caused by a distinct agent.

Entrance wounds caused by retained foreign objects in the intraocular space A perforating injury consists of two full-thickness lacerations that create an entrance and exit wound.

Radiological Intervention:

1. X Ray orbit (Wherever necessary)
2. B-Scan (Wherever necessary)
3. MRI (Wherever necessary)
4. CT Scan (Wherever necessary)

Ophthalmologist Intervention:

1. Slit-lamp testing of the anterior segment.
2. Direct or indirect ophthalmoscopy utilising a 20D lens to examine the posterior segment.
3. Gonioscopy.
4. IOP measurement.

Data will be collected and stored in Microsoft Excel. Data will be analyzed using statistical software R and Microsoft Excel. Continuous variables will be given in mean \pm SD/median (range). Categorical variables will be represented by frequency.

METHODS:

Microsoft Excel and the statistical program R software, version 4.1.2, are used to analyze the data. Frequency tables are used to present categorical variables. The form of continuous variables is Mean SD. Statistical significance is assumed when the P-value is less than 0.05.

RESULTS:

There were 201 subjects in the study. Below table gives the summary of age over group. In the study minimum age and maximum age observed was 1 day and 96 years respectively. Mean age observed was 37.08 ± 19.81 years. Below table and plot summarises the age distribution.

Table 17: Distribution of age.

Age distribution (in years)	Number of subjects (%)
< 10	15 (7.46%)
10-11	33 (16.42%)
21-30	37 (18.41%)
31-40	34 (16.92%)
41-50	28 (13.93%)
51-60	28 (13.93%)
61-70	16 (7.96%)
71-80	7 (3.48%)
81-90	2 (1%)
91-100	1 (0.5%)
Age (in years)	37.08±19.81

Graph 1: Distributions of subject by Age.

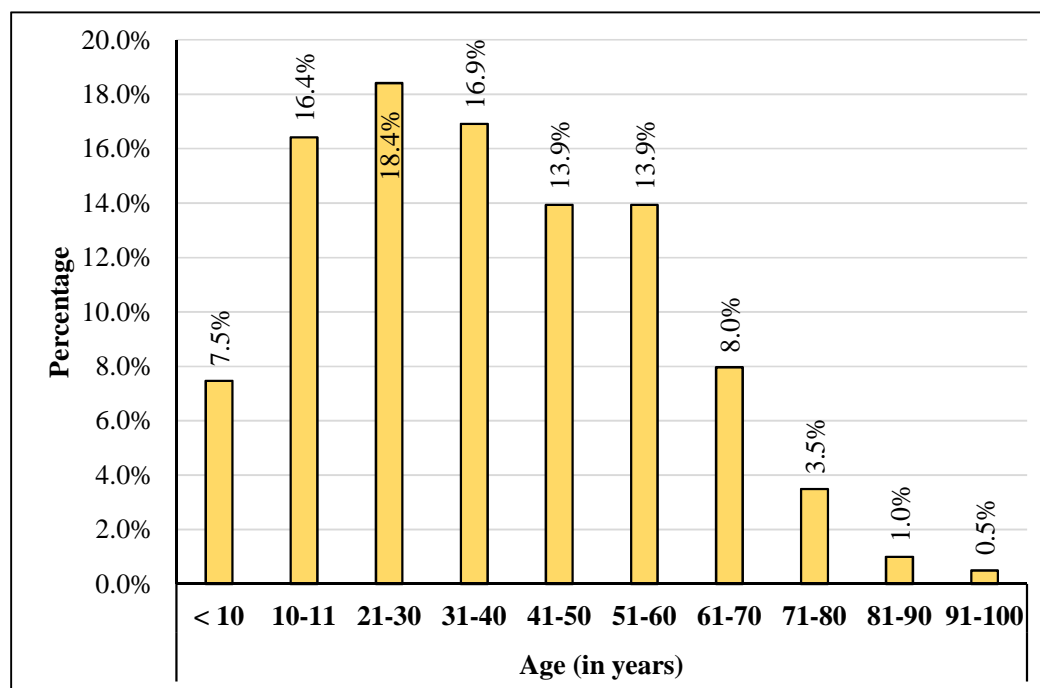


Table 17: Distribution of gender.

Gender	Number of subjects (%)
Female	27 (13.43%)
Male	174 (86.57%)

There were only 27 (13.43%) females in the study and 86.57% were males.

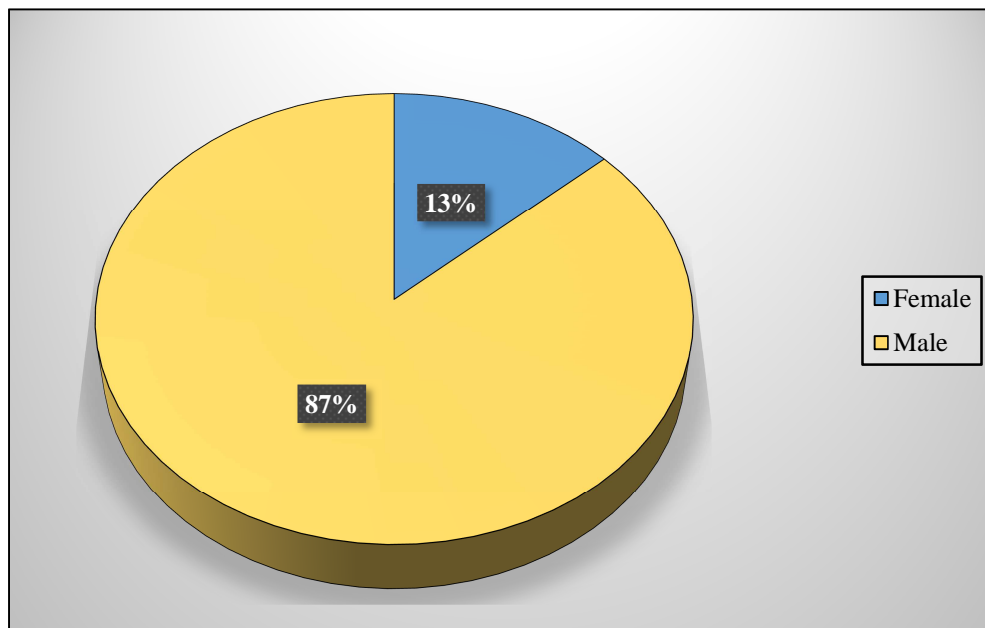
Graph 2: Distribution of subjects by gender.

Table 19: Distribution of subjects by admission time after injury.

Admission time after injury	Number of subjects (%)
< 2 hours	9 (4.48%)
2-6 hours	1 (0.5%)
6-12 hours	1 (0.5%)
12-24 hours	3 (1.49%)
1-2 day	114 (56.72%)
2- 6 days	13 (6.47%)
≥ 7 days	60 (29.85%)

Majority of the subjects (56.72%) got admitted between 1-2 days after injury.

The next common duration was ≥ 7 days (29.85%).

Graph 3: Distribution of subjects by admission time after injury.

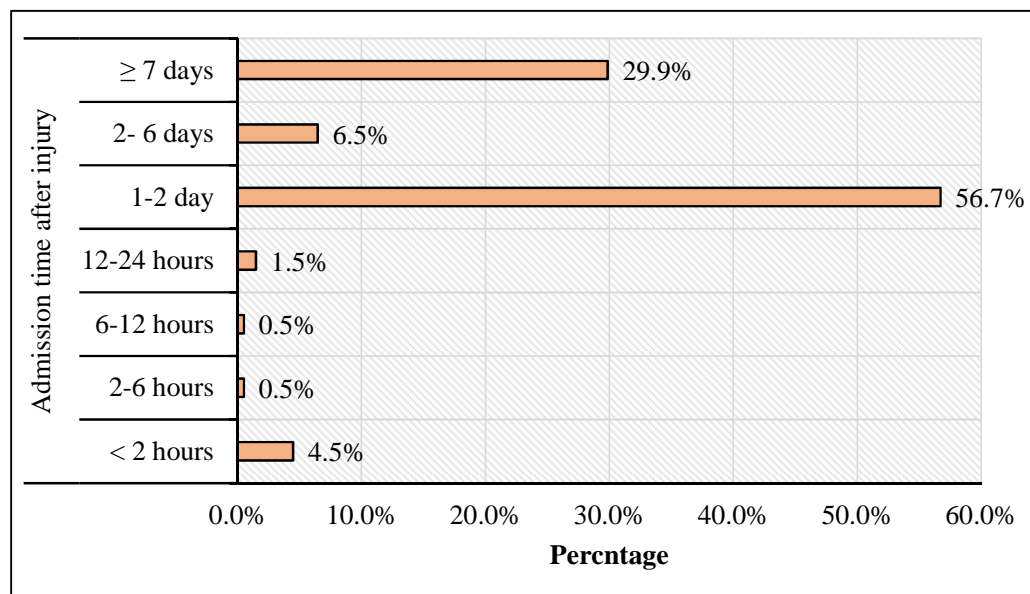


Table 20: Distribution of subjects by mode of injury.

Mode of Injury	Number of subjects (%)
Assault	19 (9.45%)
Blade	1 (0.5%)
Bullock Cart	2 (1%)
Burns	2 (1%)
Cow Horn	1 (0.5%)
Cricket Ball	4 (1.99%)
Electric Shock	1 (0.5%)
Fall	16 (7.96%)
Fire Cracker	3 (1.49%)
Forceps	1 (0.5%)
Glass Piece	2 (1%)
Goat Horn	1 (0.5%)
Insecticide	1 (0.5%)
Iron Nail	7 (3.48%)
Iron Particle	2 (1%)
Iron Rod	4 (1.99%)
Metal Rod	4 (1.99%)

Metallic Particle	5 (2.49%)
Road Traffic Accident	94 (46.77%)
Stone	2 (1%)
Sugarcane	2 (1%)
Vegetative Material	2 (1%)
Vegetative Matter	1 (0.5%)
Welding	1 (0.5%)
Wooden Log	1 (0.5%)
Wooden Stick	22 (10.95%)

In the present study mode of injury were found from various items and mode of injury among those majority of injury was observed by RTA, followed by wooden stick injury in significant numbers.

Table 21: Distribution of subjects by object causing injury.

Object causing injury	Number of subjects (%)
Blunt	113 (56.22%)
Burns	5 (2.49%)
Sharp	83 (41.29%)

In the study, blunt object (56.22%) caused the injury for majority of subjects, followed by sharp object in 41.29% and 2.49% had burns injury.

Graph 4: Distribution of subjects by object causing injury.

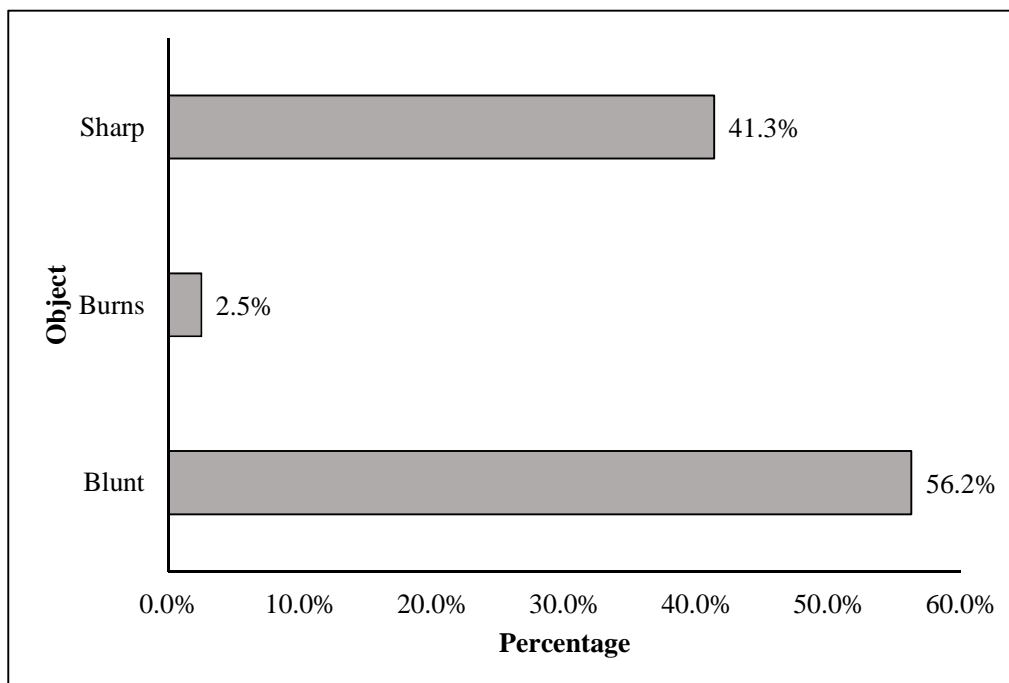


Table 22: Distribution of subjects by occupational injury.

Occupational injury	Number of subjects (%)
No	164 (81.59%)
Yes	37 (18.41%)

Non occupational injuries (81.59%) was observed in the study.

Graph 5: Distribution of subjects by status of occupational injury.

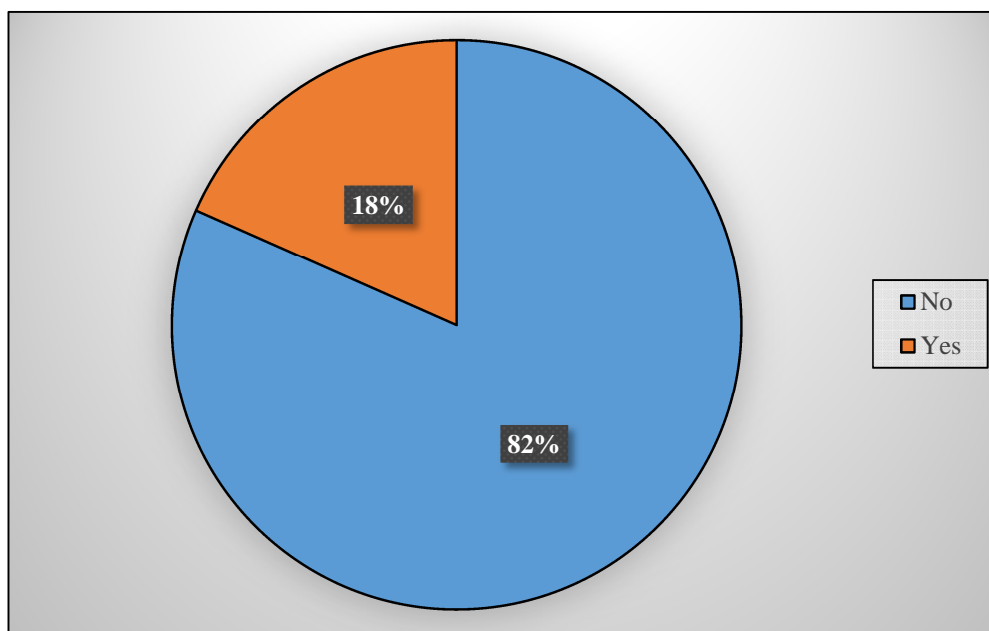


Table 23: Distribution of subjects by use of safety.

Use of Safety	Number of subjects (%)
No	77 (38.54%)
Yes	17 (8.46%)
Cannot be assessed	107 (53.23%)

In the study, use of safety could not be assessed in majority (53.23%). Among the remaining, only 8.46% had used the safety precautions still sustained the injuries.

Graph 6: Distribution of subjects by status of use of safety.

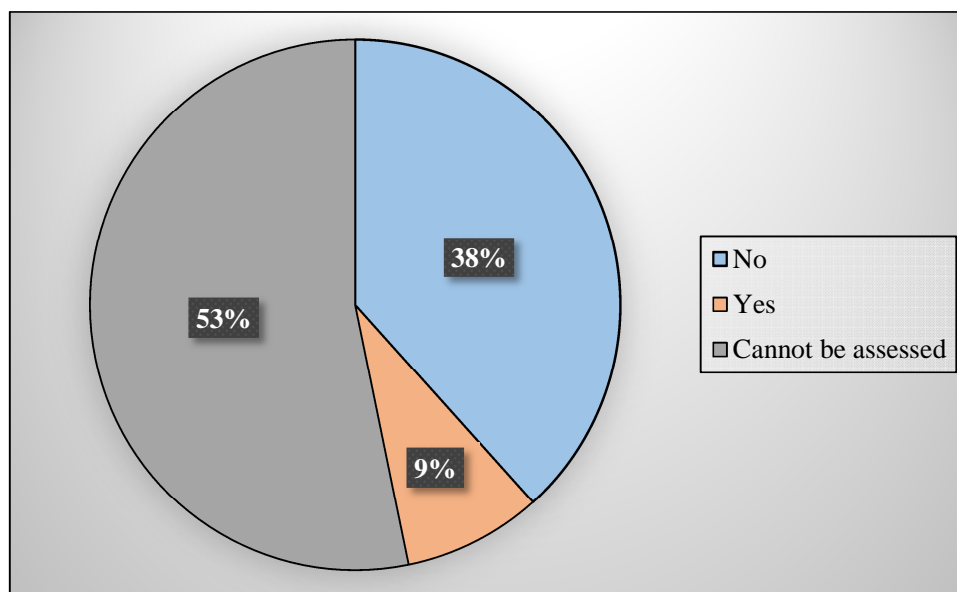


Table 24: Distribution of subjects by H/O of substance abuse.

H/O of Substance Abuse	Number of subjects (%)
No	162 (80.6%)
Yes	39 (19.4%)

Majority in the study (80.6%) were not having any history of substance abuse.

Graph 7: Distribution of subjects by H/O of Substance Abuse.

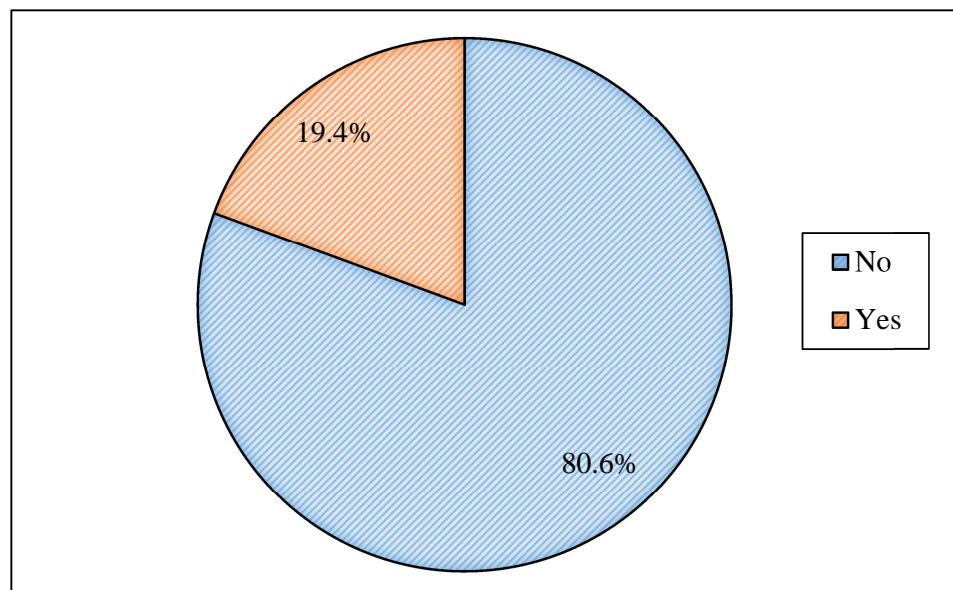


Table 25: Distribution of subjects by General Physical Condition.

General Physical Condition	Number of subjects (%)
Conscious	170 (84.58%)
Altered Sensorium	31 (15.42%)

Above table gives the summary of General Physical Condition in the study. Majority (84.58%) were conscious, while remaining 15.42% were having altered sensorium.

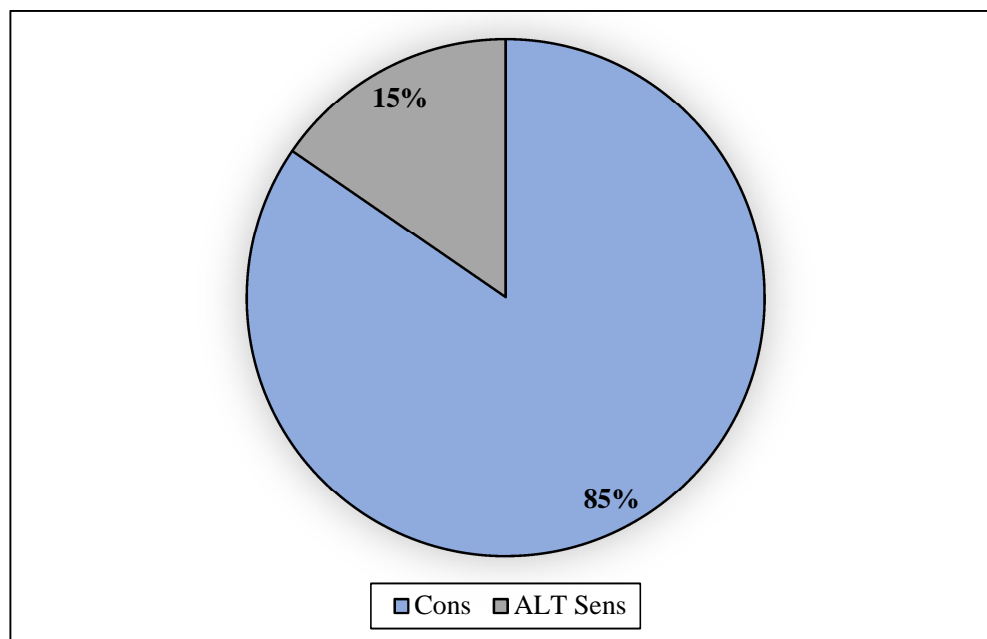
Graph 8: Distribution of subjects by general physical condition.

Table 26: Distribution of subjects by type of injury.

Type of Injury		Number of subjects (%)
	None	10 (4.98%)
Closed Globe	Contusion	104 (51.74%)
	Laceration	31 (15.42%)
Open Globe	Rupture	12 (5.97%)
	Penetrating	30 (14.93%)
	Perforating	4 (1.99%)
	IOFB	10 (4.98%)

Most common type of injury observed was contusion (51.74%) followed by laceration in 15.42% and penetrating injury in 14.93% .

Closed Globe injuries (67.16%) were observed more than Open Globe Injuries (27.87)

Graph 9: Distribution of subjects by type of injury.

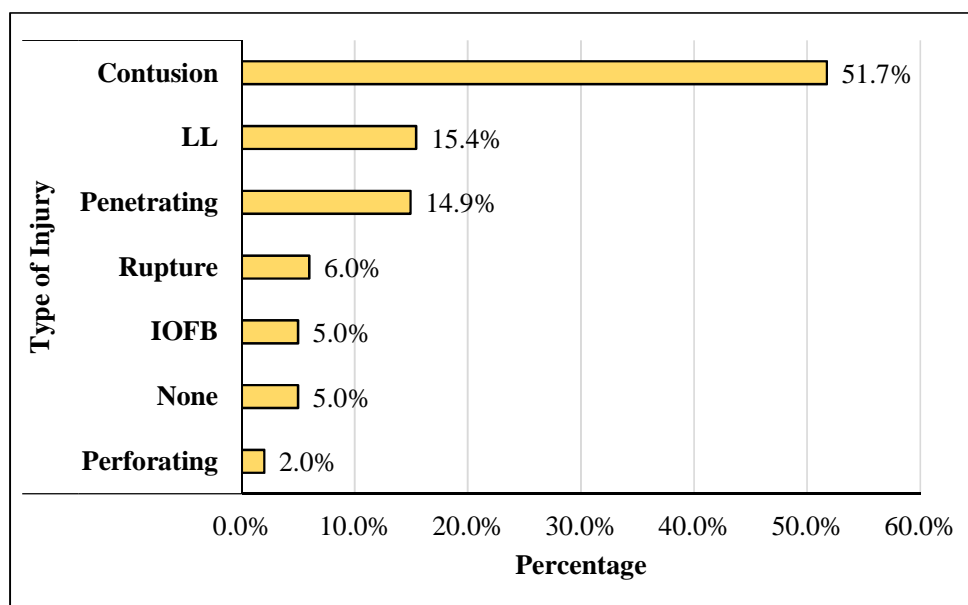


Table 27: Distribution of subjects by head posture.

Head Posture	Number of subjects (%)
Abnormal	23 (11.44%)
Normal	178 (88.56%)

Head posture observed normal for 88.56% of the subjects. Below plot visualises the same.

Graph 10: Distribution of subjects by head posture.

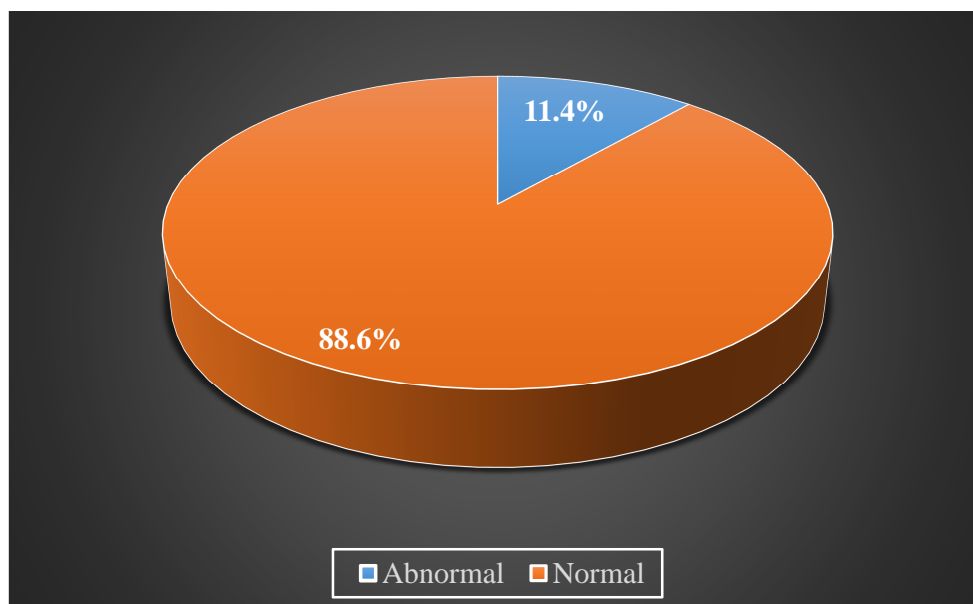


Table 28: Distribution of subjects by Facial Symmetry

Facial Symmetry	Number of subjects (%)
Asymmetrical	92 (45.77%)
Symmetrical	109 (54.23%)

Above table and below plot gives the distribution of facial symmetry. 54.23% of the subjects had symmetrical face.

Graph 11: Distribution of subjects by facial symmetry.

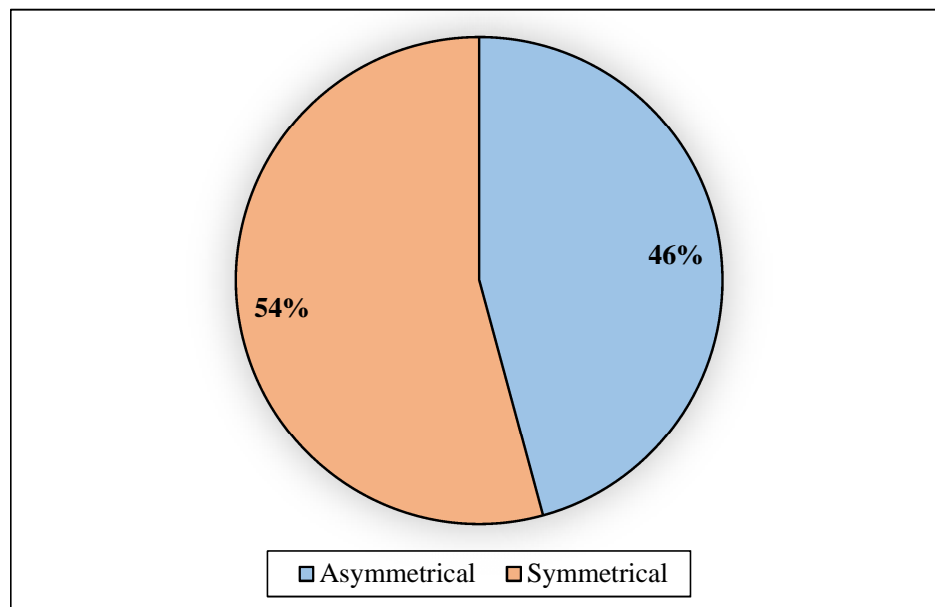


Table 29: Distribution of subjects by visual axes.

Visual axes	Number of subjects (%)
Cannot be assessed	3 (1.49%)
Non parallel	46 (22.89%)
Parallel	152 (75.62%)

Parallel visual axes were observed for 75.62% subjects and 22.89% had non parallel visual axis.

Graph 12: Distribution of subjects by visual axes.

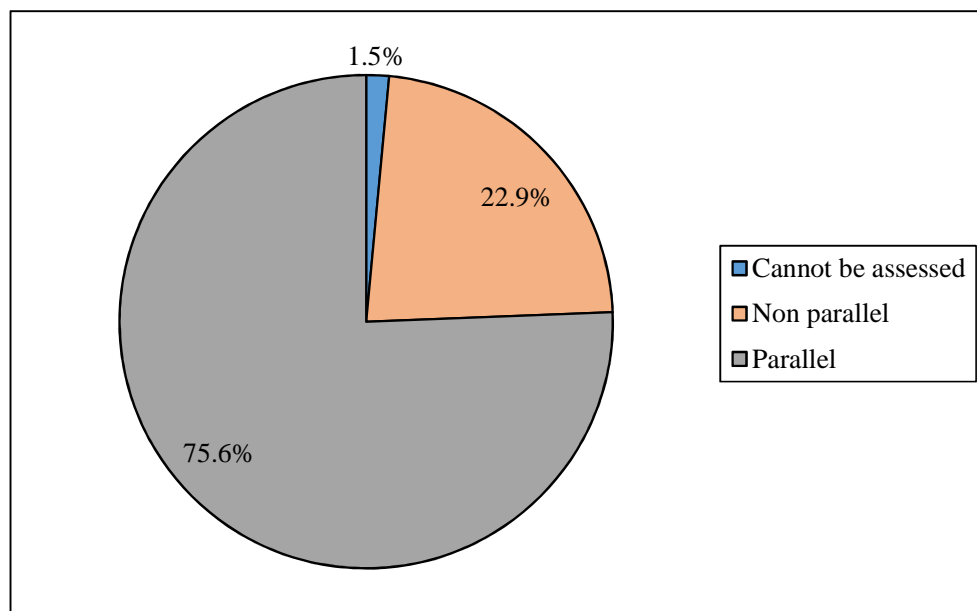


Table 30: Distribution of subjects by eye.

Injured Eye	Number of subjects (%)
Both Eyes	9 (4.48%)
Left Eye	91 (45.27%)
Right Eye	101 (50.25%)

In the study, more than half of the sample had injury in right eye. Only 9 subjects (4.48%) had injury in both eyes.

Graph 13: Distribution of subjects by eye.

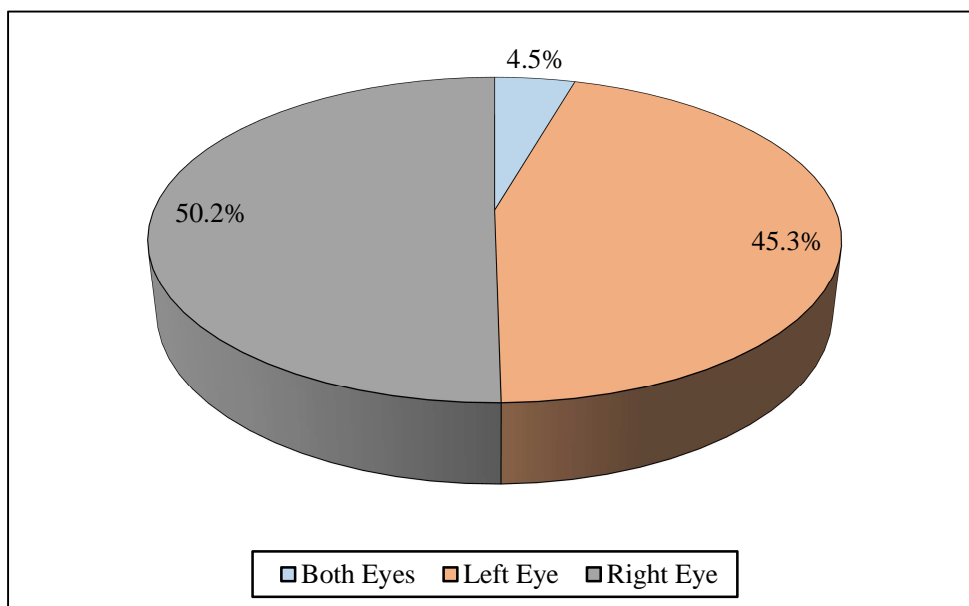


Table 14: Distribution of subjects by distant vision.

Distant Vision	Number of subjects (%)
6\6	14 (6.97%)
6\9	15 (7.46%)
6\12	9 (4.48%)
6\18	3 (1.49%)
6\24	18 (8.96%)
6\36	11 (5.47%)
6\60	6 (2.99%)
PL-	19 (9.45%)
CF	26 (12.94%)
PL+, PR acc	40 (19.9%)
PL+, PR inacc	21 (10.45%)
Cannot be assessed	19 (9.45%)

In the study, 6/6 distant vision was appreciated in only 6.97% cases. PL+ and PR acc was observed in 19.90% cases.

Table 15: Distribution of subjects by near vision.

Near Vision	Number of subjects (%)
N6	27 (13.43%)
N8	4 (1.99%)
N10	9 (4.48%)
N12	14 (6.97%)
N18	11 (5.47%)
N36	5 (2.49%)
<N36	93 (46.27%)
PL-	19 (9.45%)
Cannot be assessed	19 (9.45%)

In the study, N6 near vision was appreciated in around 13.43% cases. <N36 was observed in 46.27% cases.

Table 33: Distribution of subjects by near vision.

Color Vision	Number of subjects (%)
Cannot be Assessed	131 (65.17%)
Color Blindness	5 (2.49%)
Normal	65 (32.34%)

Color blindness was observed for 5 subjects (2.49%) and 65(32.34%) of the subjects had normal vision in our study . Out of 202 ocular trauma patients 5 (2.49%) Patients color vision was found to be affected.

Graph 16: Distribution of subjects by color vision.

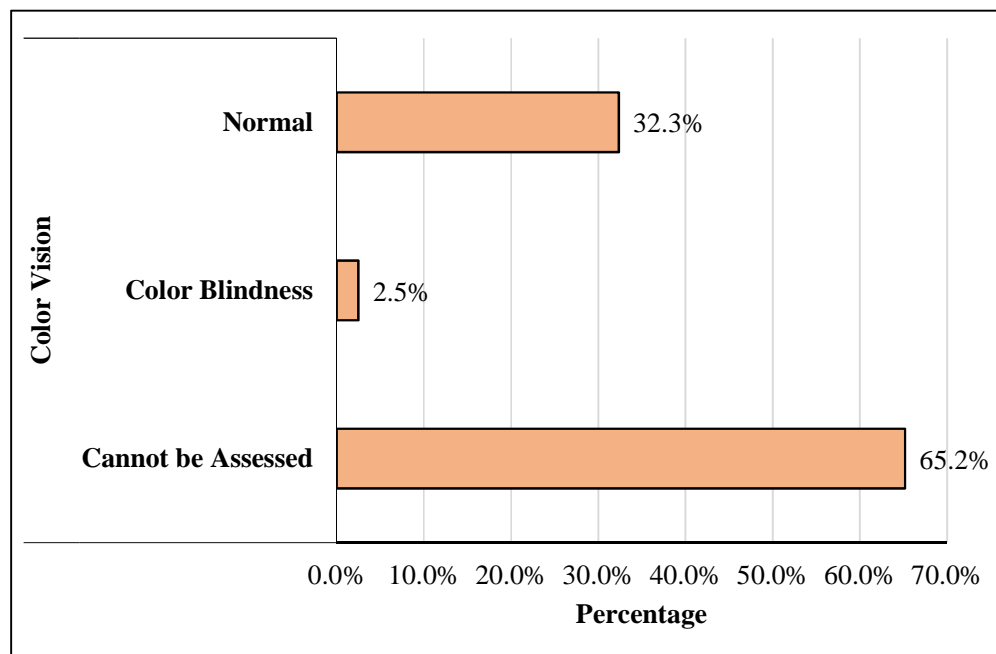


Table 34: Distribution of subjects by orbit.

Orbit	Number of subjects (%)
Fracture	25 (12.44%)
Normal	176 (87.56%)

In the present study 87.56% of the subjects had normal orbit.

Graph 17: Distribution of subjects by orbit.

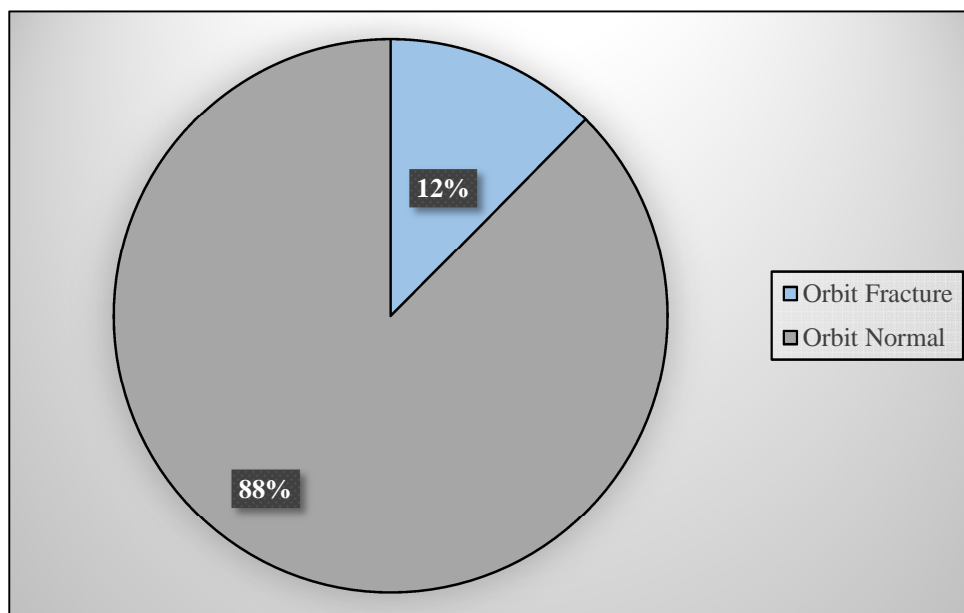


Table 35: Distribution of subjects by adnexa.

Adnexa	Number of subjects (%)
Abrasion	3 (1.49%)
Edematous	27 (13.43%)
Emphysema	4 (1.99%)
Eschar	5 (2.49%)
Laceration	27 (13.43%)
Normal	135 (67.16%)

In the study, the adnexa was normal in majority (67.16%). The next common presentation was edema (13.43%) and laceration (13.43%). Out of 202 ocular trauma patients 66 (32.84%) patients adnexa was found to be affected.

Table 36: Distribution of subjects by Lacrimal apparatus.

Lacrimal Apparatus	Number of subjects (%)
Canalicular Laceration	19 (9.45%)
Normal	182 (90.55%)

In the present study 90.05% of the subjects had normal lacrimal apparatus. Only 19 (9.45%) presented with canalicular laceration.

Graph 18: Distribution of subjects by Lacrimal apparatus.

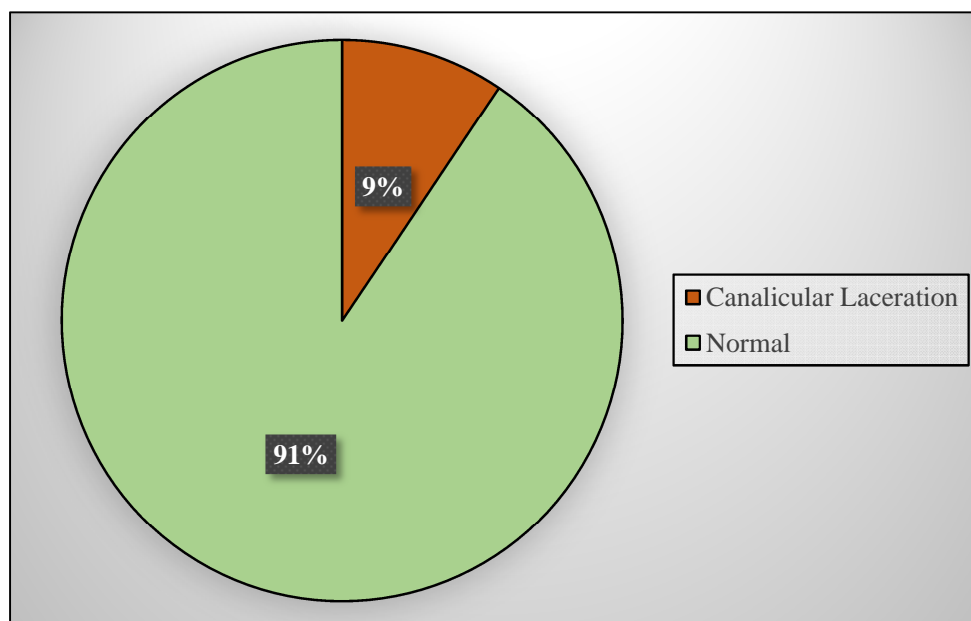


Table 37: Distribution of subjects by eyelid.

Eyelid	Number of subjects (%)
Echymosis	58 (28.86%)
Edema	47 (23.38%)
Laceration	19 (9.45%)
Normal	70 (34.83%)
Ptosis	6 (2.99%)
Superior Lid Disinsertion	1 (0.5%)

The eyelids in the present study 34.83% of them were normal . Among the remaining, ecchymosis (28.86%) was commonly seen followed by 23.38% of them had edema . Out of 202 ocular trauma patients 131 (65.17%) patients eyelids was found to be affected.

Table 38: Distribution of subjects by Sclera.

Sclera	Number of subjects (%)
Anterior Staphyloma	1 (0.5%)
Entry Wound	2 (1%)
Laceration	9 (4.48%)
Normal	171 (85.07%)
Perforation	10 (4.98%)
Rupture	8 (3.98%)

The sclera was found to be normal in majority (85.07%) of the subjects . Among the remaining, perforation (4.98%) was commonly seen. Out of 202 ocular trauma patients 30 (14.93%) patients sclera was found to be affected.

Table 39: Distribution of subjects by Conjunctiva.

Conjunctiva	Number of subjects (%)
Chemosis	8 (3.98%)
Congestion	78 (38.81%)
Cystic Swelling	1 (0.5%)
Laceration	10 (4.98%)
Metallic Fb	1 (0.5%)
Normal	54 (26.87%)
Sub Conjunctival Hemorrhage	46 (22.89%)
Symblepharon	3 (1.49%)

The conjunctiva was normal in 26.87% of the subjects. The common presentation was congestion (38.81%). Out of 202 ocular trauma patients 147 (73.13%) patients conjunctiva was found to be affected.

Table 40: Distribution of subjects by Cornea.

Cornea	Number of subjects (%)
Abrasion	20 (9.95%)
Adherent Leucoma	7 (3.48%)
Anterior Staphyloma	2 (1%)
Clear	121 (60.2%)
Corneal Abscess	1 (0.5%)
Foreign Body	6 (2.99%)
Hazy	17 (8.46%)
Laceration	16 (7.96%)
Opacity	1 (0.5%)
Perforation	6 (2.99%)
Ulcer	4 (1.99%)

The cornea was clear in majority (60.2%) of the subjects . Among the remaining, abrasion (9.95%) , Hazy cornea (8.46%), laceration (7.96%) was seen among the study subjects.

Out of 202 ocular trauma patients 80 (39.80%) patients cornea was found to be affected.

Table 41: Distribution of subjects by AC.

AC	Number of subjects (%)
Deep	4 (1.99%)
Hyphaema	7 (3.48%)
Hypopyon	6 (2.99%)
Lens in AC	2 (1%)
Normal Depth	116 (57.71%)
Shallow	47 (23.38%)
Shallow, Hyphaema	19 (9.45%)

The anterior chamber was normal in majority (57.71%). Among the remaining, it was shallow in 23.38% of the subjects. Out of 202 ocular trauma patients 84 (42.29%) patients anterior chamber was found to be affected.

Table 42: Distribution of subjects by Iris.

Iris	Number of subjects (%)
Angle Structure Tear	5 (2.49%)
Details Not Made Out	20 (9.95%)
Iridodilysis	12 (5.97%)
Iridodonesis	3 (1.49%)
Muddy Iris	2 (1%)
Normal Color Pattern	147 (73.13%)
Posterior Synaechiae	2 (1%)

The iris was normal in majority (73.13%). Among the remaining, Iridodilysis (5.97%) was commonly seen. Out of 202 ocular trauma patients 54 (26.87%) patients iris was found to be affected.

Table 43: Distribution of subjects by pupil.

Pupil	Number of subjects (%)
D Shaped	9 (4.48%)
Details Not Made Out	24 (11.94%)
Irregular	19 (9.45%)
Non Reactive	17 (8.46%)
RAPD	20 (9.95%)
Round,Regular,Reactive	77 (38.31%)
Sluggish	35 (17.41%)

The pupil was normal (RRR) in majority (38.31%). Among the remaining, pupil was sluggishly reacting in 17.41% of the subjects. Out of 202 ocular trauma patients 124 (61.69%) patients pupil was found to be affected.

Table 44: Distribution of subjects by lens.

Lens	Number of subjects (%)
Aphakia	1 (0.5%)
Traumatic Cataract	21 (10.45%)
Displaced in AC	3 (1.49%)
Displaced Under Conjunctiva	1 (0.5%)
Details Not Made Out	23 (11.44%)
Normal	146 (72.64%)
PCIOL in AC	1 (0.5%)
Posterior Dislocation Of IOL	1 (0.5%)
Subluxation	4 (1.99%)

The lens were normal in majority (72.64%). Among the remaining, Traumatic Cataract (10.45%) was commonly seen. Out of 202 ocular trauma patients 55(27.36%) patients lens was found to be affected.

Table 45: Distribution of subjects by EOM.

EOM	Number of subjects (%)
Normal	151 (75.12%)
Painful	4 (1.99%)
Restricted	46 (22.89%)

The extraocular movement was normal in majority (75.12%). 46 patients had restricted eye movements. Only 4 subjects complained of painful movements.

Table 46: Distribution of subjects by Gonioscopy.

Gonioscopy	Number of subjects (%)
Closed	43 (21.39%)
Details Not Made Out	57 (28.36%)
Open	101 (50.25%)

On gonioscopy, majority (50.25%) showed open drainage angle. Around 21.39% showed signs of glaucoma, as the angle was closed.

Table 47: Distribution of subjects by Vitreous.

Vitreous	Number of subjects (%)
Dislocated Lens +	1 (0.5%)
Details Not Made Out	41 (20.4%)
Hemorrhage	23 (11.44%)
IOFB	7 (3.48%)
Normal	126 (62.69%)
PVD	1 (0.5%)
Vitritis	2 (1%)

The vitreous was normal in majority (62.69%). Among the remaining, Vitreous hemorrhage (11.44%) was commonly seen.

Table 48: Distribution of subjects by Retina.

Retina	Number of subjects (%)
Berlins Edema	4 (1.99%)
CRAO	1 (0.5%)
Details Not Made Out	48 (23.88%)
Macular Hole	1 (0.5%)
Normal	135 (67.16%)
Retinal Dialysis	9 (4.48%)
Retinal Scar	1 (0.5%)
Retinal Tear	2 (1%)

The retina was normal in majority (67.16%). Among the remaining, Retinal Dialysis (4.48%) was commonly seen.

Table 49: Distribution of subjects by Optic nerve.

Optic Nerve	Number of subjects (%)
Details Not Made Out	48 (23.88%)
Normal	131 (65.17%)
Pale	19 (9.45%)
Papilledema	3 (1.49%)

The optic nerve was normal in majority (65.17%). Among the remaining, Optic Atrophy/Pale Disc (9.45%) was commonly seen.

Table 50: Distribution of subjects by Investigations

Investigations	Number of subjects (%)
B Scan	139 (69.15%)
CT Orbit	43 (21.39%)
Microbiological Investigations	3 (1.49%)
MRI	12 (5.97%)
X Ray Orbit	4 (1.99%)

In the study, majority (69.15%) was subjected to B-Scan. CT Orbit was done in 21.39% cases, while MRI was required in 5.97% cases.

Table 51: Distribution of subjects by Treatment.

Treatment	Number of subjects (%)
Conservative/Medical	73 (36.32%)
Surgical	128 (63.68%)

Majority of the subjects were managed by surgical procedure (63.68%) in the study.

Table 52: Distribution of subjects by mode of injury over month.

Month	Mode of Injury	
	RTA	Non RTA
January	8 (8.51%)	20 (18.69%)
February	3 (3.19%)	4 (3.74%)
March	6 (6.38%)	9 (8.41%)
April	2 (2.13%)	12 (11.21%)
May	10 (10.64%)	7 (6.54%)
June	7 (7.45%)	2 (1.87%)
July	8 (8.51%)	12 (11.21%)
August	6 (6.38%)	9 (8.41%)
September	18 (19.15%)	13 (12.15%)
October	10 (10.64%)	7 (6.54%)
November	2 (2.13%)	9 (8.41%)
December	14 (14.89%)	3 (2.8%)

Accordingly, RTA was the common mode of injury in the month of September (19.15%). On the contrary, non RTA was the common mode of injury in the month of January (18.69%)

DISCUSSION:

The current research was conducted at the KLE Dr. Prabhakar Kore Hospital in Belgaum between January 1 and December 31, 2021, in the ophthalmology department.

In the current study, ocular trauma was assessed in a total of 201 participants. Ocular injury, a major problem in terms of public health, is a leading cause of unilateral vision impairment. Each year, 55 million eye injuries are recorded worldwide, and 1.6 million people are left legally blind as a consequence.⁹⁵

According to estimates, 1 in 125 Indians suffer an eye injury that results in vision loss. Both rural and urban slums contribute significantly to the scale of the problem in a country like India, where a sizable portion of the labour force is engaged in an unregulated, unskilled sector. Ocular trauma prevalence rates are recorded from metropolitan areas at 3.97%, rural areas at 7.5%, and urban slums at 2.4%.¹¹⁵

Wong et al. (2000) found that the cumulative lifetime prevalence of ocular trauma was close to 20%, which means that around 1 in 5 persons would have an eye injury at some point in their lives.¹¹⁶

Desai et al.⁹² found that annually, 8.14 out of every 100,000 persons have ocular injuries severe enough to need hospitalization.

The average person spends a significant portion of their waking hours (and sometimes their sleeping hours) at their job. The rising need for massive outputs in a short amount of time drives industries to run around the clock, requiring individuals to operate machines or do work shifts. Consequently, the most frequent location for eye

injuries is the workplace. Around 50% of eye injuries, according to several studies, happen at work.

These accidents often occur in both organized and unorganized enterprises, hospitals, agriculture, etc. In both wealthy and developing nations, the situation is comparable. Welders, agricultural labourers, carpenters, stone quarry workers, surgeons, and dentists have all been listed as high risk vocations. The danger of eye injuries is greater when doing tasks like hammering, grinding, welding, sanding, soldering, and smelting. Additionally, more work-related injuries have been recorded to include intraocular foreign substances.¹³

Some other common tasks that pose a serious threat to the eyes include working with chemicals, arc welding, and being exposed to UV rays, radiation, and lasers. The damage to the eyes might be minor and have no lasting effects on the individual, or it could be serious enough to cause permanent sight. If first aid is not administered immediately and the injury is not managed properly, minor injuries have also known to have catastrophic repercussions.¹³

More than 90% of job-related eye injuries may be prevented by simply utilizing PPE and implementing safe work practices, according to a series of studies. Even though the majority of work-related accidents are avoidable, failure to wear personal protective equipment (PPE) or its improper application continues to be a significant risk factor.¹¹⁷

Low PPE compliance has been found in several investigations. Even though PPE's advantages are well recognized, compliance is poor in regions where it is readily available. Even though people are aware of their susceptibility and the risks

associated with their behaviors, they may nevertheless decide not to wear PPE. According to several surveys, very few people constantly wear PPE.^{13,117}

However, the bulk of these research are carried out in industrialized nations where PPE is easily accessible. It has been shown that vision impairment due to work-related trauma reduces quality of life and leads to social and economic difficulties. The incidence of occupational trauma has been demonstrated to reduce when protective equipment are used, although several studies have indicated that protective eyewear is underutilized and that many people are unaware of its benefits.

In the present study the age distribution of the ocular trauma was seen between 10 to 100 years of age with mean age of 37.08 ± 19.81 years of age . Among the various studies done on ocular trauma Juan C¹¹⁸ et al and Ellen Strahlman et al¹¹⁹ focused on ocular trauma among school going children , Hi Cao et al¹²⁰ focused on ocular trauma among children aged less than 12 years. Singh D V et al¹⁰⁵ also found that 67% of the cases were among those aged less than 25 years and Gothwal B et al¹⁰⁸ nearly 46.8% of the subjects with ocular injuries were aged less than 16 years . Similar and comparable results were obtained between our research and that of Mohanthy L et al.⁽¹²¹⁾, which revealed that the age range of 21 to 30 years, and that of Titiyal et al.⁽⁹⁷⁾, which similarly documented 66 percent of injuries among those aged 21 to 30.

The gender distribution was found to be more among the male(86.5%) than females . The incidence of ocular injuries more among males can be attributed to work place injuries and even road traffic accidents and chances of ocular injuries for female is said to me more by domestic violence and injuries occurring in the home during cooking . Mohanthy L et al.¹²¹ and Raiturcar et al.¹²² found a gender

distribution pattern that was quite similar to our own. In a research by Karve et al.,¹²³ injuries occurred 3.7 times more often in men than in women. Misra et al.¹²⁴ and Wong et al.¹¹⁶ reported results that were very similar.

Majority of the study subjects presented to the hospital for the treatment of ocular injuries before 48 hours after the injury . Nearly 56.7% of them presented after 24 hours and before 48 hours in our study . This pattern of presentation may be due to delay in the reference from the casualty after reporting the injury assuming other injuries being treated initially and patient being unconscious on reporting to hospital. Hence once the patient stabilizes they will be referred for the Ophthalmology reference causing delay in reporting for ocular trauma. In few instances the symptoms of the ocular injury gradually appears and then the subjects comes for treatment of the injuries further causing delay .

Nearly 44% of those who reported their injuries in the study by Mohanthy J et al¹²¹ did so within 6 hours, and more than 50% did so between 1 and 3 days after the accident. Alem et al.¹²⁵ reported that three days or longer after injury, 74.51% of patients presented. This discrepancy may have its roots in the fact that the aforementioned research was performed at a very isolated referral facility, whereas this study was conducted at a tertiary care facility situated near a major road and a heavily populated area. That may also be attributed to a greater understanding of ocular trauma in the region. According to Mishra et al,¹²⁴ the majority of people who suffered from ocular injuries presented to the hospital within 6 hours in Raiturcar et al's¹²² study, and roughly 83.6% of those people did so within 24 hours of their injuries.

When it came to how the research participants were harmed, car accidents were the most common cause, followed by assaults with a wooden stick, iron rods, and other sharp items. Another significant factor in ocular injuries was falls. Similar to our study results, Raiturcae et al.¹²² discovered that 62.4% of them had sustained injuries as a result of RTA. Mohanty L. et al.¹²¹ similarly observed that RTA was the primary cause of ocular injuries. In their study, Dhasmana R et al.⁹⁸ found that 33% of eye injuries occurred at work whereas 37.86% of eye injuries occurred in RTAs. According to Karve et al.¹²³ the most frequent agent was a blunt item in 25.75% of cases. Additionally, Nirmalan et al.¹⁰⁴ noted that blunt items were the primary source of injury in 54.9% of their cases. According to Abraham et al.¹²⁶, a wooden stick was the causative factor in 21% of cases of eye damage. According to Vats et al.¹⁶, 2.5% of injuries involved sharp items. Similar to this, several investigations have shown eye injuries caused by a variety of different items and sources. However, reckless driving, driving while intoxicated, or driving without using safety equipment like seat belts or helmets can result in traffic accidents. Other domestic injuries resulted from wounds from wooden sticks or other plant material, which were frequently experienced by women.

Almost 18.4 percent of the study population experienced ocular injuries due to occupation-related causes; this is significantly lower than the 33 percent of eye injuries that were work-related in the study by Mohanty L et al.¹²¹ and the 23 percent of injuries that occurred at a work-related place in the study by karve et al. According to research by Krishnaiah et al.¹¹⁵, 55.9% of all eye injuries happened on the job (21.7 percent).

In the current investigation, we were unable to identify whether the wounded were utilizing safety equipment in roughly 53.2% of the participants, and just 8.46% of the remaining individuals were. Welders in a Vellore research by Alexander et al.¹²⁷ used PPE ineffectively. None of the welders wore the proper clothes or their own personal protection equipment. They mostly used their handless labor. According to the research, the welders' employers did not supply protective eyewear for them, and they were apparently unable to purchase it. According to a Serinkens et al.¹³ survey of Turkish industrial employees, the most common workplace-related cause of eye injuries was the absence of eye protection (goggles, etc.). (18.7%, n = 207) . According to a study of 172 patients, he found that 21.1% of those who reported not wearing protective gear (such as goggles, gloves, etc.) at the time of the accident worked in industries where such items were readily available.

The history of substance abuse was resulting in the ocular injury was seen in nearly 19.4% of the study subjects. Based on their findings, Mishra et al.¹²⁴ concluded that more over half of their patients were intoxicated. Alcohol was involved in 10.2 percent of ocular assault injuries, as reported by Raiturchar et al.¹²².

In the present study nearly more than 51.7% of them had contusions injury and 15.4% of them had laceration ,14.9% had penetrating injury, 5.9%% had rupture of eye injury and 4.9% had foreign bodies in eye cavity. The injuries of the various components of the eye cavity involving sclera, conjunctiva, eye lids, Cornea, Anterior Chamber, Posterior chambers and lens are explained in detail in results sections.

Ecchymosis, corneal abrasions, sealed perforations, subconjunctival hemorrhage, and hyphema were all examples of blunt traumas. Globe ruptures and corneal or sclera rips were examples of penetrating wounds. In their investigation,

Raiturcar et al. 122 450 individuals (90%) had closed globe injuries, 26 (5.2%) had open globe injuries, and the remaining 24 (4.8%) had diverse wounds, such as burns and chemical wounds. Researchers Shukla et al.¹²⁸ found that closed globe injuries accounted for 66.7% of the sample, whereas open globe injuries accounted for just 26.7%. Mishra et al.¹²⁴ and Karve and Kolte et al.¹²³ also came to similar conclusions in their study.

According to research by Syal et al.¹²⁹, closed globe injuries are much more common, accounting for 60.5% of all cases. Oum et al.⁹⁹ found that closed globe injuries were six times more prevalent than open globe fractures in Korea.

In the study by Raiturcar et al.,⁹⁶ 4% of patients had isolated anterior segment injuries, 1.4% had isolated posterior segment injuries, and 2.2% had mixed anterior and posterior segment injuries. Shukla et al.¹²⁸ study .s found that 86% of patients had anterior segment involvement and 14% had posterior segment injuries, compared to Karve et al.¹²³ study, .s which found that 82.75% of patients had anterior segment injuries, 7.2% had posterior segment injuries, and 4% had injuries to both the anterior and posterior segments. In our investigation, the anterior segment was more frequently implicated (82.75%), whereas the posterior segment was only engaged in 7.25% of cases by Karve et al.¹²³

The cornea was the structure that sustained injuries the most frequently (26.5%), probably as a result of its anterior location and exposure to the environment, which renders it particularly prone to harm. Most often, the anterior part was at fault. 10% of the patients had isolated posterior segment injury, which manifested as retinal haemorrhages, Purtscher's retinopathy, optic nerve involvement, and Berlin's edema.

Combination adnexa and globe injuries were found in 30 instances, highlighting the wide range of ocular trauma symptoms and the demand for interdisciplinary care.

Raiturcar et al.¹²² found that ecchymosis and lid lacerations accounted for 86.8 percent of anterior segment injuries. Conjunctival injuries, such as subconjunctival bleeding, chemosis, and conjunctival tears, were seen in 46.4% of patients with anterior segment injuries. Corneal injuries constituted 23%. Majority of corneal injuries were corneal abrasions, followed by corneal tears and foreign bodies. Iris and pupil injuries such as iridodialysis and traumatic mydriasis were 10.2%. Anterior chamber pathologies such as hyphema were 9%. Injuries to the lens comprised 5% of all ocular injuries, which included traumatic cataracts, subluxated, and dislocated lens. Our values are low compared to studies by Jain and Sony⁷² who reported 11.3% lens injuries in their study population and Shukla et al.¹²⁸ who found 27.4% of patients to have lens injuries. Out of patients with posterior segment injuries, 1.8% had injuries to the retina including retinal detachment/tear, 1.6% had optic nerve injuries including traumatic optic neuropathy or avulsion, and 0.4% had vitreous hemorrhage. The findings of our study are low compared to 14% posterior segment injuries found by Shukla et al.¹²⁸ in their study.

The final visual acuity differed according to the kind and extent of the injury, the time that passed before the patient was admitted to the hospital, the treatment that was administered, and the presence of any ocular comorbidities. Overall, 87.4 percent of patients had final visual acuity of 6/12 or better, whereas only 8.2 percent had final visual acuity of 6/18 or better. Most of these people have experienced closed globe trauma. Those whose eyesight is unmatched

CONCLUSION

This research was conducted at the Ophthalmology Outpatient Department (OPD) and the casualty at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre in Belagavi on 202 patients who had sustained ocular damage between January 1, 2020 and December 31, 2020. According to the results of this survey, people in the working class between the ages of 25 and 55 were the most frequently afflicted demographic. Any severe injury could negatively impact a person's employment chances and tip the family's financial balance.

Although most of the injuries were aesthetic in nature, some patients' physical and mental health were adversely affected because they damaged the ocular adnexa and conjunctiva. A poor prognosis was expected for injuries to the cornea or sclera, and the worst prognosis was expected for injuries including visual neuropathy owing to retinal involvement.

The majority of them presented within 24 to 48 hours of the injury, indicating that the severity of the harm and reduced vision encouraged them to seek eye treatment as soon as possible..

Combined zone of injury 1+2+3 was the commonest and both the segments were involved for most of the patients.

Injuries in Zone 1 had a more favourable outcome. A poor visual result was seen when the posterior portion was damaged.

Road traffic accidents (RTAs) were shown to be the leading cause of eye damage, especially among men aged 25–40. Evidence from this research shows that RTAs disproportionately affect the most economically and socially productive members of society, leading to both visible scarring and significant personal financial hardship. The higher incidence of injuries among males is likely due to a combination of factors, including overexposure, drug misuse, and a failure to properly implement safety measures on the job.

Several human and environmental risk factors, such as driving under the influence of alcohol and failing to employ safety measures, were shown to enhance the likelihood of RTA. Mortality and morbidity may be reduced if the underlying causes are addressed.

Recommendations for the prevention of ocular injuries in RTA

- Seat belt use must be mandated for all motorists and passengers in 4-wheel vehicles.
- All road vehicles must have laminated glass windscreens.
- Younger children should not be permitted to ride in the front passenger seat on their parents' laps.
- Helmet laws for motorcyclists and bicyclists.
- Enforcement of traffic laws; Sanctions against aggressive driving and risky passing;
- Drinking and driving carries severe penalties.
- Workers using industrial and construction machinery should be strongly urged to wear protective eyewear.

- The lines painted on the road to direct traffic and motorists should be repainted more often.
- The use of firecrackers requires the supervision of an adult.
- Use of firecrackers to be done under strict guidelines

Hence with the data of this study, preventive and management strategies can be formulated to manage ocular trauma in a better way.

Adequate follow-up and awareness about need for timely surgical intervention is a must for better visual outcome.

Since blunt injury eye leads to severe visual impairment its prevention is better. Creating awareness among school children regarding eye protection during sports activity is also important.

With meticulous management and prevention measures, the cause for blindness due to trauma can be limited .

SUMMARY

- The Department of Ophthalmology at KLES DR. Prabhakar Kore Hospital and Medical Research Center, Belagavi, India, carried out the current cross sectional investigation.
- The study duration was 1st January 2021 to 31st December 2021
- The research comprised a total of 201 instances of ocular injuries that were reported to the ER or the Department of Ophthalmology.
- The age of presentation of ocular trauma ranged from 1 day to 96 years of age
- The 1 day newborn had sustained eye injury during the time of forceps delivery
- The mean age of presentation of ocular injuries was 37.08±19.81 years
- Among the subjects 174(86.5%) of them were Male and 27(13.4%) were females
- Nearly 56.7% of them presented to the hospital after 24 hours and before 48 hours after the occurrence of injury
- In the present study 94 (46.7%) of them had occurred injury by Road Traffic Accidents followed by wooden stick injuries in 22(10.9%)
- Blunt injuries were seen in nearly 113(56.2%) of cases and 83(41.2%) had occurred injuries by sharp object
- Occupational injuries was seen in nearly 37(18.4%) of the study subjects
- Safety equipment's was used by only 17(8.46%) of the study subjects in the present study .
- Ocular injuries caused due to substance abuse was seen in nearly 39(19.4%) of the study subjects.

- 31(15.4%) of the subjects presented with altered sensorium
- Contusion (51.7 percent) was the most prevalent form of injury found in our research followed by Laceration in 15.4 percent
- Only 23(11.4%) of the cases had abnormal head posture
- Facial Symmetry was lost in nearly 92(45.7%) of the study subjects
- Visual Axes was found to be parallel in nearly 152(75.6%) of the study subjects
- Right Eye was the most common side involved with ocular injuries in nearly 101(50.2%) of the cases
- In the study, 6/6 distant vision was appreciated in only 6.97% cases. PL+ and PR acc was observed in 19.90% cases.
- In the study, N6 near vision was appreciated in around 13.43% cases. <N36 was observed in 46.27% cases.
- Colour blindness was seen in only 5(2.49%) of the study subjects
- Orbit fracture was seen in nearly 25(12.4%) of the cases
- Laceration and edematous Adnexa were the most common presentation involving the adnexa structure in 27(13.4%) of the cases
- Canalicular Laceration of the Lacrimal Apparatus was seen in nearly 19(9.45%) of the study subjects
- Nearly 58(28.8 percent) of the patients presented with ecchymosis in the eyelid, and 6(2.9 percent) presented with ptosis.
- Perforation of Sclera was seen in nearly 10(4.98%) of the study subjects
- Conjunctival congestion was the major manifestation of conjunctival injury in nearly 78(38.8%) of the cases .

- Corneal Abrasion was seen in nearly 20(9.9%) of the cases and the most common presentation of corneal injury
- Shallow Anterior chamber was the commonest presentation of ocular injury involving anterior chamber in 47(23.3%) of the cases
- In the study, N6 near vision was appreciated in around 13.43% cases. <N36 was observed in 46.27% cases
- The pupil was normal (RRR) in majority (38.31%). Among the remaining, pupil was sluggish in 17.41% of the subjects
- The lens were normal in majority (72.64%). Among the remaining, Traumatic Cataract (10.45%) was commonly seen.
- The extraocular movement was normal in majority (75.12%). 46 patients had restricted eye movements. Only 4 subjects complained of painful movements.
- On gonioscopy, majority (50.25%) showed open drainage angle. Around 21.39% showed signs of glaucoma, as the angle was closed.
- The vitreous was normal in majority (62.69%). Among the remaining, Vitreous haemorrhage (11.44%) was commonly seen.
- The retina was normal in majority (67.16%). Among the remaining, Retinal Dialysis (4.48%) was commonly seen.
- The optic nerve was normal in majority (65.17%). Among the remaining, Optic Atrophy/Pale Disc (9.45%) was commonly seen.
- Majority of the subjects were managed by surgical procedure (63.68%) in the study.
- Consequently, RTA was the most frequent kind of injury in September (19.15 percent).In contrast, non-motor vehicle collisions were the leading cause of injury in January (18.69 percent)

ANNEXURES I - ETHICAL CLEARANCE



K.L.E. ACADEMY OF HIGHER EDUCATION AND RESEARCH
(Deemed - to- be- University)

Accredited 'A' Grade by NAAC (2nd Cycle)

Placed in Category 'A' by MHRD (GoI)

JAWAHARLAL NEHRU MEDICAL COLLEGE,
NEHRU NAGAR, BELAGAVI-590010 (KARNATAKA-INDIA)

Website: <http://www.jnmc.edu>
E-Mail : dome@jnmc.edu

Phone: (+ 91-(0)831 Office : 2472550
Principal: 2471701
Fax No. +91 (0)831 - 2470759

Ref: MDC/DOME/ 0)

Date: 25/01/2021

To,

REG NO: BK0120001

PG student in Ophthalmology,
J.N.Medical College,
BELAGAVI.

Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled
**"A ONE YEAR CROSS SECTIONAL STUDY TO ASSESS THE CLINICAL PROFILE
OF PATIENTS PRESENTING WITH OCULAR TRAUMA TO KLES DR. PRABHAKAR
KORE HOSPITAL AND MEDICAL RESEARCH CENTRE, BELAGAVI"**, is ethical and
justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics
Committee on Human Subjects Research.

(Dr. Smita Sonoli)
Member Secretary
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

(Dr. Harsha Hegde)
Chairman,
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

ANNEXURE II – CONSENT FORM

INFORMED CONSENT

Title of Research:

**A ONE YEAR CROSS SECTIONAL STUDY TO ASSESS THE CLINICAL
PROFILE OF PATIENTS PRESENTING WITH OCULAR TRAUMA TO KLES
DR. PRABHAKAR KORE HOSPITAL AND MEDICAL RESEARCH CENTRE,
BELAGAVI**

Principal Investigator:

Post Graduate Student,
Department Of Ophthalmology,
Jawaharlal Nehru Medical College,
KAHER, Belagavi – 590010

Guide:

Department Of Ophthalmology,
Jawaharlal Nehru Medical College,
KAHER, Belagavi - 590010

Introduction and Purpose

This study is designed to determine the causes of ocular trauma and to classify them on basis of BETTS classification system in north Karnataka in a study in KLES DR. PRABHAKAR KORE HOSPITAL AND MEDICAL RESEARCH CENTRE, BELAGAVI

Procedure

If, you agree to be part of the research study, you will be asked the relevant history and will be subjected to relevant clinical examination and investigations.

BENEFITS

This study will help us to classify the ocular trauma and know its main causes which will further help us to take necessary precautions and steps to decrease its incidence in the state of Karnataka.

Risk

NIL

Alternatives

Taking part in this study is voluntary. You may choose not to take part in this study.

If you decide to take part, you can later change your mind and withdraw from the study. Your decision will not change the present or future health care or other services that you receive. The study doctor or sponsor may stop your participation in this study at any time. If you choose not to take part in the study, you will receive the standard treatment for patients with your condition.

Privacy and Confidentiality

All the information collected about you during the course of this study will be kept confidential to the extent permitted by law. The code numbers will identify you in this research record. Information from this study may be published but your identity will be confidential in any publication.

Institution / Sponsor's policy

Does not apply to this research

Financial incentives for participation

You will not be paid / offered any gifts /incentives for participating in the study.

Authorization to publish the results

The results of the study would be forwarded to the KAHER, Belgaum as part of requirement towards the completion of MS degree, review and publishing.

In case of the queries during study or in future you may contact following persons,

1. Dr. Harsha Hegde Chairperson, J.N.M.C., IEC and Scientist D, ICMR, National Institute of Traditional Medicine, Belagavi-09480422500

CONSENT FORM

I voluntarily agree to take part in this study by signing below. I may withdraw at any time. I am not giving up any of my legal rights by signing this form. My signature below indicates that I have read this consent form, or it has been read to me, and I have had all the questions answered. The study and the consent form have been explained to me in my language.

Participant's Name:

.....

Name of the Legally Authorized Representative / Guardian:

.....

Signature / Left Thumb print of the Participant or Legally Authorized Representative

Witness' Name:

Investigator's Name and Signature:

Signature / Left thumb Impression

Signature / Left thumb Impression

DATE:

PLACE:

Statement of consent

I hereby voluntarily agree for my child's participation in this study. I understand that even if I choose to allow my child to take part in this study I have the liberty to withdraw at any time. My signature below indicates that I have read or have been told about this entire consent form including the risks and benefits and have had all my questions answered. I will be given a copy of this consent form.

Signature of the authorized representative/ parent: _____

Date: _____

Name: _____

Relation to the Subject: _____

Signature of the witness: _____

Date: _____

Name: _____

Signature of investigator: _____

Date: _____

Name: _____

Assent (<18 years)

I have read the information in this form. After understanding all details about the study, I agree to give assent to be included as a volunteer in the study titled “A One Year Cross Sectional Study To Assess The Clinical Profile Of Patients Presenting With Ocular Trauma To KLES Dr. Prabhakar Kore Hospital And Medical Research Centre, Belagavi”

Name of the Participant

Signature of the participant
or Left-Hand Thumb impression

name of the parent

Signature of the parent

Name of Investigator

Signature of investigator

Name of Witness

Signature of Witness

Date: _____

Place: _____

ANNEXURE-III

PROFORMA

DATE: / /

Hospital ID: _____ Study ID: _____

NAME: _____

AGE: _____ Years

GENDER: MALE FEMALE

ADDRESS: _____

OCCUPATION: _____

CONTACT NUMBER:

DATE OF EXAMINATION: / /

IS THE PATIENT ELIGIBLE FOR STUDY? YES NO

HAS INFORMED CONSENT BEEN GIVEN? YES NO

CHIEF COMPLAINTS:

TRAUMA : _____ . EYE

INVOLVED: _____

DATE AND TIME OF INJURY/PRESENTATION: _____

TYPE ON INJURY: _____

NATURE OF OBJECT CAUSING INJURY: _____

OCUPATIONAL INJURY: _____

INJURY: 1- ACCIDENTAL, 2- ASSAULT, 3- SELF INFLICTED, 4 - UNKNOWN

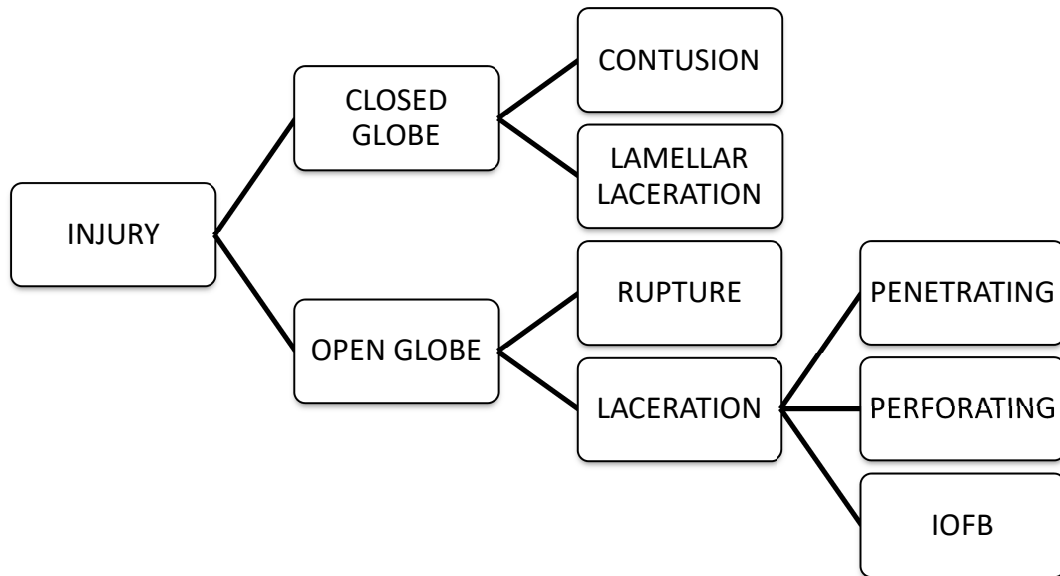
ROAD TRAFFIC ACCIDENT: YES; NO

IF YES THEN WEARING SEAT BELT/HELMET: YES; NO

INTOXICATION: YES; NO

ASSOCIATED

COMPLAINTS: _____



PAST HISTORY:

HISTORY OF PREVIOUS TRAUMA: _____

HISTORY OF PREVIOUS SURGERY: _____

HISTORY OF SPECTACLE USE: _____

EXAMINATION

1. GENERAL PHYSICAL EXAMINATION

GENERAL CONDITION:

TEMPERATURE:

PULSE:

RESPIRATORY RATE:

BLOOD PRESSURE:

2. OCULAR EXAMINATION

HEAD POSTURE

FACIAL SYMMETRY

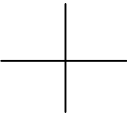
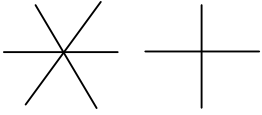
OCCULAR SYMMETRY

VISUAL AXIS

ORBIT

A. ANTERIOR SEGMENT EXAMINATION

	RIGHT EYE	LEFT EYE
1. VISUAL ACUITY i. DISTANT ii. NEAR iii. COLOUR		
2. ADNEXA		
3. LACRIMAL APPARATUS		
4. LIDS		
5. SCLERA		
6. CONJUNCTIVA		
7. CORNEA		
8. ANTERIOR CHAMBER		

9. IRIS			
10. PUPIL			
11. LENS			
12. EXTRA OCULAR MOVEMENT	OD 	OU	OS 
13. INTRA OCULAR PRESSURE SCHIOTZ (MM HG)			
14. GONIOSCOPY			

OTHER FINDINGS:

B. POSTERIOR SEGMENT EXAMINATION

FUNDUS	RIGHT EYE	LEFT EYE
GLOW		
MEDIA		
DISC		
CUP:DISC RATIO		
BLOOD VESSELS		
BACKGROUND		
MACULA		

INVESTIGATIONS:

DIAGNOSIS:

MANAGEMENT IN BRIEF:

NAME OF THE INVESTIGATOR :

SIGNATURE : _____

NAME OF THE GUIDE :

SIGNATURE : _____

ANNEXURE IV – PHOTOGRAPHS



Photograph 1. Canalicular Laceration



Photograph 2. Ecchymosis



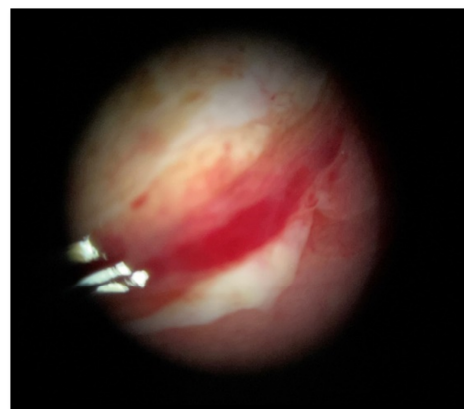
Photograph 3. Lid Laceration



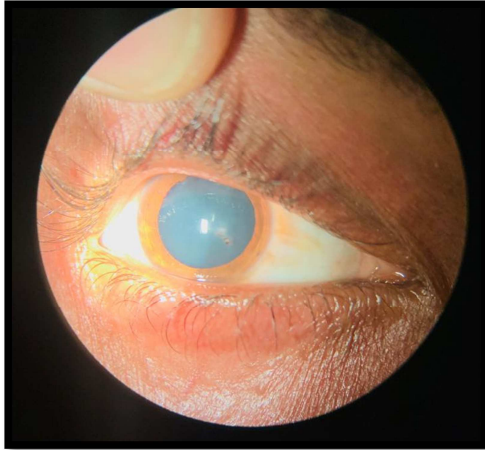
Photograph 4. Lid Laceration



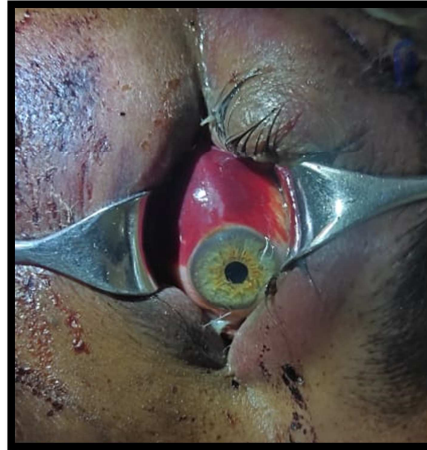
Photograph 5. Lid Avulsion



Photograph 6. Conjunctival Laceration



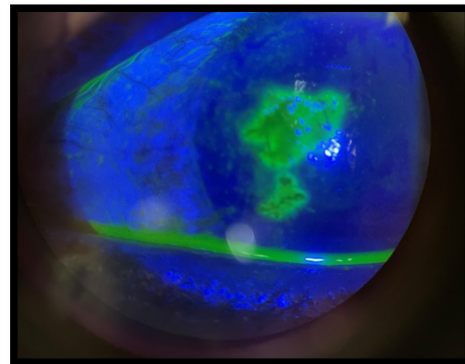
Photograph 7. Corneal Foreign Body



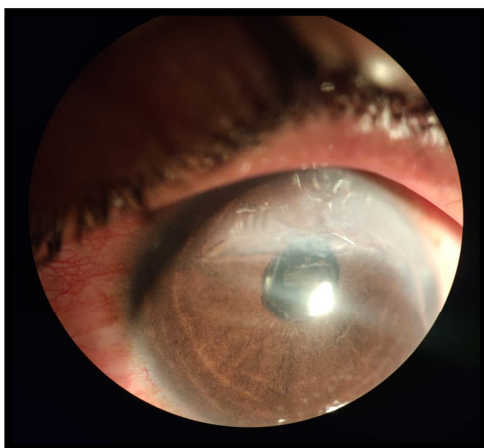
**Photograph 8. Sub
Conjunctival Hemorrhage**



**Photograph 9. Conjunctival
chemosis in CCF**



**Photograph 10. Corneal
abrasion**



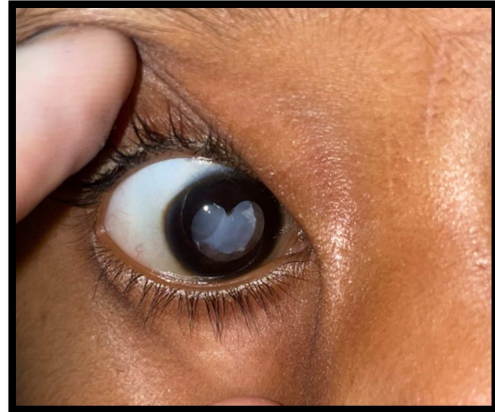
**Photograph 11. Corneal
Laceration**



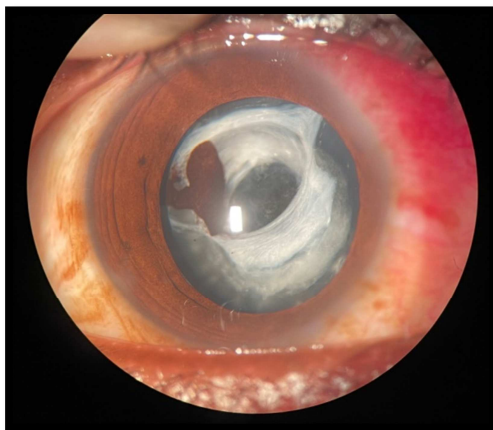
**Photograph 12. Corneal
perforation**



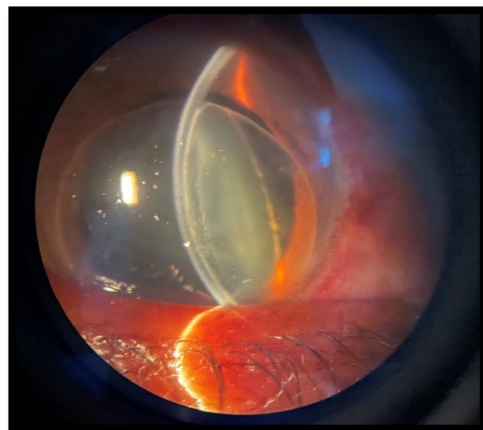
Photograph 13. Scleral perforation



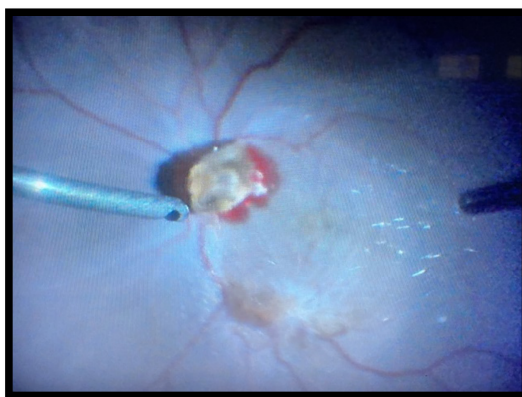
**Photograph 14. Traumatic
Cataract with posterior synechiae**



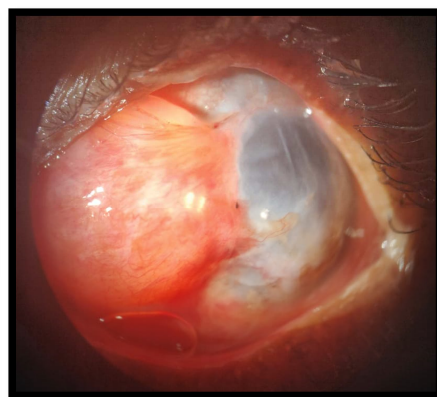
**Photograph 15.
Traumatic Cataract**



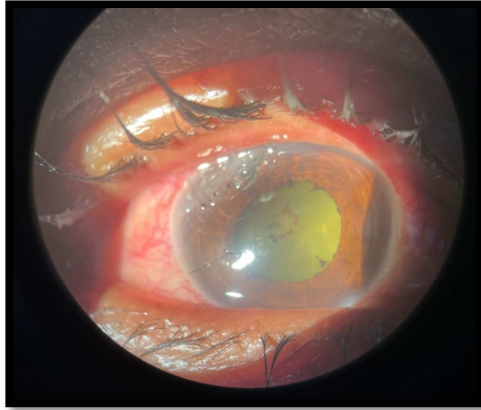
**Photograph 16.
Lens Dislocated in AC**



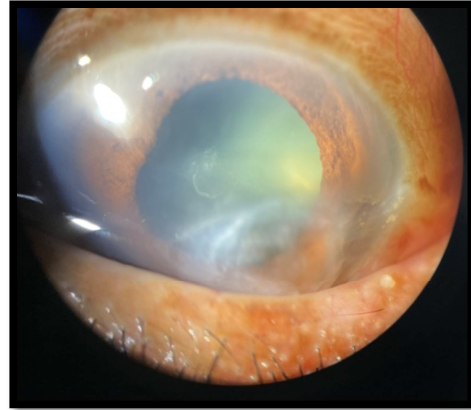
**Photograph 17.
Lens Displaced in Vitreous**



**Photograph 18.
Lens in Subconjunctival space**



Photograph 19.
Sutured Corneal laceration



Photograph 20. Traumatic
impending perforation



Photograph 21.
Vitreous hemorrhage



Photograph 22.
Globe perforation



Photograph 23.
Globe Perforation



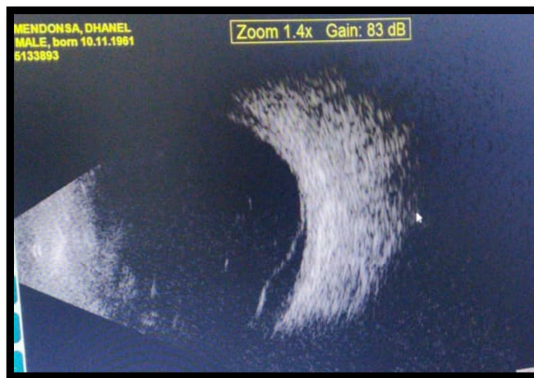
Photograph 24.
Orbital Foreign Body



Photograph 25.
Post Traumatic Ocular Myiasis



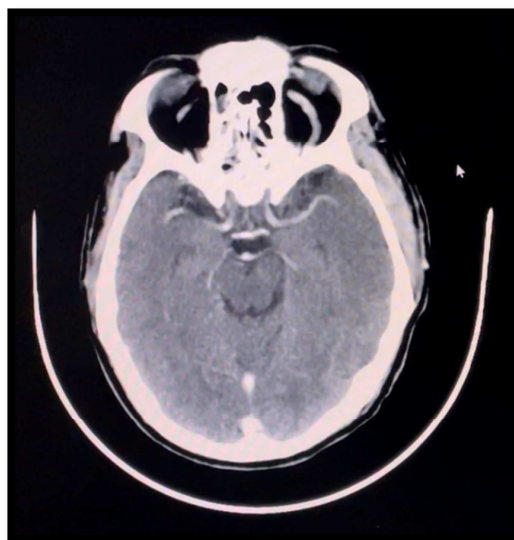
Photograph 26. Traumatic
Expulsive hemorrhage



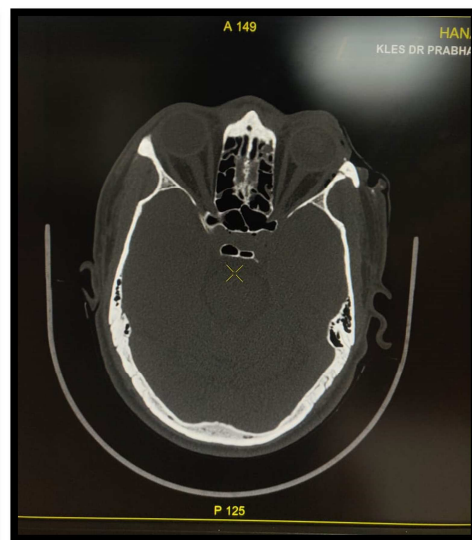
Photograph 27. B Scan - Retinal
Detachment



Photograph 28. CT Sub
periosteal hematoma



Photograph 29.
CT - Dilated SOV in CCF



Photograph 30.
CT - Lateral Wall Fracture



Photograph 31. CT - Orbital roof fracture



Photograph 32. CT - Sub Periosteal hematoma

ANNEXURE-V

KEY TO MASTER CHART

RTA	:	Road traffic accident
Y	:	Yes
N	:	No
CONS	:	Conscious
ALT SENS	:	Altered sensorium
LL	:	Lamellar laceration
IOFB	:	Intra ocular foreign body
N	:	Normal
ABN	:	Abnormal
S	:	Symmetrical
P	:	Parallel
NP	:	Non parallel
RE	:	Right eye
LE	:	Left eye
BE	:	Both eyes
CF	:	Counting fingers
PL	:	Perception of light
PR	:	Projection of rays
INACC	:	Inaccurate
CB	:	Color blind
#	:	Fracture
SCH	:	Sub conjunctival hemorrhage

ND	:	Normal depth
AC	:	Anterior chamber
NCP	:	Normal color pattern
DNMO	:	Details not made out
RRR	:	Round regular reactive
NR	:	Non reactive
R	:	Restricted
H'age	:	Hemorrhage
MRI	:	Magnetic Resonance Imaging
CT	:	Computed Tomography
PVD	:	Posterior vitreous detachment
CCF	:	Carotid cavernous fistula
S	:	Surgical
M	:	Medical
ON	:	Optic neuritis

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5 no.	Age	Gender(M/F)	TIME OF INJURY	TIME OF PRESENTATION	Mode of Injury	Object causing injury	Occupational Injury (Y/N)	Use of Safety measure(RTA-H/V/N)	H/o Substance abuse(Y/N)	General physical condition(1. CONS.2.ALT SENS)	Type of Injury(0.None,1.Comusion,2.LL,3.Rupture,4.Penetrating,5.P erforating,6.IOFB)	Head Posture	Facial Symmetry	Visual axes(PARALLEL, NON PARALLEL)	Eye	Vision (Distant)	Vision (Near)	Color Vision	Orbit	Adnexa	Lacrimal Apparatus	Eyelid	Sclera	Conjunctiva	Cornea	AC	Iris	Pupils	Lens	EOM	IOP	GONOMOSCOPY	Vitreous	Retina	Optic Nerve	Inv.	INV. Findings	Diagnosis	Treatment(MED/SURG)					
1	18	M	10AM	11AM	RTA	SHARP	N	N	N	1	2	N	S	P	LE	6/9	N6	N	N	N	N	N	LACERATION	CLEAR	ND	NCP	RRR	N	N	16,18	OPEN	N	N	N	N	X RAY ORBIT	N	LACERATION	S					
2	27	M	9PM	10PM	RTA	BLUNT	N	Y	N	1	1	N	S	P	RE	6/6	N6	N	N	EMPHYSEMA	N	N	ECHYMOSIS	N	CONGESTION	CLEAR	ND	NCP	RRR	N	N	19,16	OPEN	N	N	N	N	CT ORBIT	N	ECHYMOSIS	M			
3	52	M	9AM	10AM	RTA	BLUNT	N	Y	N	1	1	N	ASYMMETRICAL	P	RE	6/9	N6	N	#	LACERATION	N	N	N	SCH	CLEAR	ND	NCP	RRR	N	R	22,24	OPEN	N	N	N	N	CT ORBIT	FRACTURE ORBIT	FRACTURE ORBIT	S				
4	32	M	1PM	2PM	RTA	BLUNT	N	N	N	1	1	N	ASYMMETRICAL	P	RE	PL-	PL-	-	N	LACERATION	CANALICULAR LACERATION	ECHYMOSIS	N	SCH	HAZY	SHALLOW, HYPHAEMA	DNMO	NR	DISPLACED IN AC	R	50,18	CLOSED	DNMO	DNMO	DNMO	N	N	N	N	B SCAN	VIT H'AGE	TRAUMATIC DISPLACEMENT OF LENS, TRAUMATIC ON, VIT H'AGE	S	
5	32	M	7AM	8AM	RTA	SHARP	N	N	N	1	2	N	ASYMMETRICAL	NP	RE	CF	<N36	-	N	LACERATION	CANALICULAR LACERATION	LACERATION	N	SCH	ABRASION	ND	NCP	RRR	N	N	24,18	OPEN	N	N	N	N	CT ORBIT	N	CORNEAL ABRASION , EYELID AVULSION	S				
6	58	M	7AM	8AM	RTA	BLUNT	N	Y	N	1	1	N	ASYMMETRICAL	P	RE	6/60	N12	N	N	LACERATION	N	N	ECHYMOSIS	N	CONGESTION	CLEAR	ND	NCP	RRR	N	N	19,20	OPEN	N	N	N	N	X RAY ORBIT	N	ECHYMOSIS	M			
7	24	M	10AM	11AM	RTA	BLUNT	N	N	Y	1	1	N	ASYMMETRICAL	P	RE	6/6	N8	N	N	N	N	N	ECHYMOSIS	N	SCH	CLEAR	ND	NCP	RRR	N	N	19,18	OPEN	N	N	N	N	CT ORBIT	N	ECHYMOSIS	M			
8	5	M	2AM	3AM	WOODEN STICK	SHARP	N	.	N	1	4	N	S	NP	RE	PL+,Pracc	<N36	-	N	N	N	N	EDEMA	N	CONGESTION	LACERATION	SHALLOW	NCP	SLUGGISH	CATARACT	N	30,18	CLOSED	N	N	N	N	B SCAN	N	TRAUMATIC CATARACT + CORNEAL LACERATION	S			
9	74	M	7PM	8PM	FALL	BLUNT	N	.	Y	2	1	N	ASYMMETRICAL	P	LE	-	-	-	N	N	N	N	ECHYMOSIS	N	SCH	CLEAR	ND	NCP	RRR	N	N	19,22	OPEN	N	N	N	N	X RAY ORBIT	N	ECHYMOSIS	M			
10	48	M	3 DAYS AGO	6AM	RTA	BLUNT	N	N	N	1	1	N	S	P	LE	PL-	PL-	-	N	LACERATION	N	N	N	SCH	CLEAR	ND	NCP	RRR	N	N	16,20	OPEN	N	N	N	PALE	B SCAN	N	TRAUMATIC ON	M				
11	25	M	6AM	9AM	RTA	BLUNT	Y	Y	Y	1	1	N	ASYMMETRICAL	P	LE	6/36	N12	N	N	N	N	N	PTOSIS	N	CONGESTION	CLEAR	ND	NCP	RRR	N	N	13,13	OPEN	N	N	N	N	B SCAN	N	ECHYMOSIS, MECHANICAL PTOSIS	M			
12	49	M	4PM	6PM	RTA	BLUNT	N	Y	N	1/	1	N	ASYMMETRICAL	P	LE	6/9	N6	N	N	N	N	N	ECHYMOSIS	N	N	CLEAR	SHALLOW	NCP	SLUGGISH	N	N	14,13	CLOSED	N	N	N	N	B SCAN	N	ECHYMOSIS + ANGLE RECESSON	M			
13	40	M	4AM	6AM	RTA	SHARP	N	N	Y	2	2	N	ASYMMETRICAL	P	RE	-	-	-	#	N	N	N	EDEMA	N	SCH	CLEAR	ND	NCP	SLUGGISH	N	N	17,18	OPEN	N	N	N	N	X RAY ORBIT	FRACTURE ORBIT	FRACTURE ORBIT	M			
14	22	M	1PM	10PM	RTA	SHARP	N	N	Y	2	2	N	ASYMMETRICAL	P	LE	-	-	-	N	N	N	N	ECHYMOSIS	N	CONGESTION	ABRASION	ND	NCP	RAPD	N	N	15,21	OPEN	H'AGE	N	PALE	B SCAN	VIT H'AGE	VIT H'AGE + TRAUMATIC ON	M				
15	45	M	10PM	12AM	FALL	SHARP	N	.	Y	2	2	N	ASYMMETRICAL	P	LE	-	-	-	N	LACERATION	N	N	EDEMA	N	SCH	CLEAR	ND	NCP	RRR	N	N	21,21	OPEN	N	N	N	N	MRI	N	SCH	M			
16	65	M	6AM	10AM	COW HORN	SHARP	Y	.	N	1	3	N	S	P	LE	PL+,Pracc	<N36	-	N	N	N	N	EDEMA	LACERATION	SCH	HAZY	SHALLOW, HYPHAEMA	DNMO	DNMO	DISPLACED UNDER CONJUNCTIVA	N	15,6	DNMO	DNMO	DNMO	DNMO	N	N	N	N	B SCAN	VIT H'AGE	GLOBE RUPTURE + TRAUMATIC DISPLACEMENT OF LENS	S
17	51	M	7AM	9AM	ASSAULT	SHARP	N	.	Y	2	2	N	S	NP	RE	CF	<N36	-	N	LACERATION	N	N	PTOSIS	N	SCH	CLEAR	ND	NCP	RRR	N	N	17,17	OPEN	N	N	N	N	CT ORBIT	N	SCH + PTOSIS	M			
18	20	M	8AM	11AM	IRON NAIL	SHARP	Y	.	N	1	4	N	S	P	LE	PL+,Pracc	<N36	-	N	N	N	N	N	CONGESTION	LACERATION	SHALLOW, HYPHAEMA	IRIDODILYSIS	IRREGULAR	CATARACT	N	15,2	CLOSED	DNMO	DNMO	DNMO	N	N	N	N	B SCAN	VIT H'AGE	TRAUMATIC IRIDODILYSIS, CATARACT, CORNEAL LACERATION, VIT H'AGE	S	
19	60	F	12AM	2PM	RTA	BLUNT	N	Y	N	1	1	N	ASYMMETRICAL	P	RE	PL-	PL-	-	N	N	N	N	EDEMA	N	CHEMOSIS	CLEAR	ND	NCP	NR	N	R	40,13	CLOSED	N	N	N	N	MRI	CCF	PROPTOSIS SECONDARY TO CCF	S			
20	19	M	1 DAY AGO	9AM	ASSAULT	BLUNT	N	.	Y	1	1	N	S	P	RE	6/6	N6	N	N	N	N	N	N	SCH	CLEAR	SHALLOW	NCP	SLUGGISH	N	N	30,17	CLOSED	N	N	N	N	B SCAN	N	ANGLE RECESSON	M				
21	29	M	2 DAYS AGO	3PM	RTA	SHARP	Y	N	N	1	2	N	ASYMMETRICAL	P	LE	CF	<N36	N	N	LACERATION	CANALICULAR LACERATION	EDEMA	N	SCH	HAZY	SHALLOW	NCP	RAPD	N	R	13,34	CLOSED	H'AGE	N	N	N	N	B SCAN	VIT H'AGE	TRAUMATIC OPTIC NEUROPATHY + VIT H'AGE	M			
22	39	M	3 DAYS AGO	8PM	RTA	BLUNT	Y	Y	N	2	1	N	ASYMMETRICAL	P	LE	PL+,PR inacc	<N36	-	#	ABRASION	N	N	N	SCH	CLEAR	SHALLOW	NCP	RAPD	N	R	48,16	CLOSED	H'AGE	RD	N	N	N	CT ORBIT	FRACTURE ORBIT	RD + VIT H'AGE + MUSCLE ENTRAPMENT	S			
23	20	M	1 MONTH AGO	11AM	GOAT HORN	SHARP	Y	.	N	1	5	N	ASYMMETRICAL	NP	RE	PL+,Pracc	<N36	-	N	N	N	N	N	ANTERIOR STAPHYLOMA	CYSTIC SWELLING	HAZY	SHALLOW, HYPHAEMA	IRIDODILYSIS	D SHAPED	PCIOI IN AC	R	5,11	DNMO	DNMO	DNMO	DNMO	N	N	N	N	B SCAN	ANTERIOR DISLOCATION OF LENS , ANTERIOR STAPHYLOMA	ANTERIOR DISLOCATION OF LENS + ANTERIOR STAPHYLOMA	S
24	27	F	1 DAY AGO	5AM	RTA	BLUNT	N	N	N	1	1	N	ASYMMETRICAL	P	RE	6/36	N12	CB	N	N	N	N	N	ECHYMOSIS	N	SCH	CLEAR	ND	NCP	RRR	N	N	10,11	OPEN	N	N	N	N	B SCAN	PVD	TRAUMATIC PVD	M		
25	6	M	1PM	3PM	METAL ROD	SHARP	N	.	N	1	5	N	S	P	RE	PL+,PR inacc	<N36	-	N	EDEMATOUS	CANALICULAR LACERATION	EDEMA	ENTRY WOUND +	CONGESTION	PERFORATION	SHALLOW, HYPHAEMA	IRIDODILYSIS	DNMO	DNMO	R	0,9	DNMO	DNMO	DNMO	DNMO	N	N	N	N	B SCAN	VIT H'AGE, RD	GLOBE PERFORATION	S	
26	25	M	1 DAY AGO	3AM	RTA	SHARP	Y	N	Y	1	6	N	ASYMMETRICAL	NP	LE	PL-	PL-	-	#	LACERATION	CANALICULAR LACERATION	LACERATION	LACERATION	LACERATION	LACERATION	LACERATION	SHALLOW	DNMO	DNMO	DNMO	R	10,0	DNMO	DNMO	DNMO	DNMO	N	N	N	N	CT ORBIT	IOFB	IOFB	S
27	22	M	8PM	10PM	CRICKET BALL	BLUNT	N	.	N	1	1	N	S	P	RE	6/24	N8	N	N	N	N	N	EDEMA	N	CONGESTION	CLEAR	ND	NCP	NR	N	PAINFULL	24,8	OPEN	N	N	N	N	CT ORBIT	N	TRAUMIC MYDRIASIS	M			
28	15	M	6AM	4PM	FALL	BLUNT	N	.	N	2	1	N	ASYMMETRICAL	P	BE	-	-	-	N	EDEMATOUS	N	N	EDEMA	N	SCH	CLEAR	ND	NCP	SLUGGISH	N	N	8,8	OPEN	N	N	N	PALE	MRI	DIFFUSE AXONAL INJURY	TRAUMATIC ON	M			
29	27	M	9PM	10PM	GLASS PIECE	SHARP	Y	.	N	1	4	N	S	P	LE	CF	<N36	-	N	EDEMATOUS	N	N	EDEMA	LACERATION	CONGESTION	LACERATION	SHALLOW, HYPHAEMA	NCP	SLUGGISH	CATARACT	PAINFULL	20,2	DNMO	N	N	N	N	CT ORBIT	N	SCLERAL + CORNEAL TEAR	S			
30	4	M	5PM	6PM	IRON NAIL	SHARP	N	.	N	1	4	N	S	P	RE	PL+,Pracc	<N36	-	N	N	N	N	EDEMA	N	CONGESTION	LACERATION	SHALLOW, HYPHAEMA	PROLAPSE	DNMO	DNMO	N	4,20	DNMO	H'AGE	N	N	N	N	B SCAN	ANTERIOR DISLOCATION OF LENS , VIT H'AGE	CORNEAL TEAR + VIT H'AGE	S		
31	30	F	6PM	11PM	RTA	BLUNT	N	N	N	1	0	ABN	ASYMMETRICAL	NP	RE	6/36	N12	N	N	N	N	N	PTOSIS	N	N	CLEAR	ND	NCP	NR	N	R	9,10	OPEN	N	N	N	N	B SCAN	N	PUPIL INVOLVING 3RD NERVE PALSY	M			
32	11	M	7PM	9PM	FALL	BLUNT	N	.	N	1	1	N	ASYMMETRICAL	P	RE	6/24	N12	CB	#	LACERATION	N	N	ECHYMOSIS	N	N	CLEAR	ND	NCP	SLUGGISH	N	R	15,8	OPEN	N	N	N	PALE	CT ORBIT	FRACTURE ORBIT	# OF ROOF OF ORBIT AND TRAUMATIC ON	S			
33	36	M	11AM	3PM	RTA	BLUNT	Y	N	Y	2	1	ABN	ASYMMETRICAL	NP	LE	PL+,Pracc	<N36	-	#	EDEMATOUS	N	N	PTOSIS	N	CHEMOSIS	CLEAR	ND	NCP	NR	N	R	18,12	OPEN	N	N	N	PALE	MRI	EDH	3RD NERVE PALSY + TRAUMATIC ON	M			
34	38	M	6AM	3PM	WOODEN STICK	SHARP	N	.	N	1	6	N	S	P	RE	CF	<N36	-	N	N	N	N	N	ENTRY WOUND +	LACERATION	CLEAR	SHALLOW	NCP	SLUGGISH	CATARACT	R	4,28	CLOSED	IOFB	RD	N	N	N	N	B SCAN	IOFB, VIT H'AGE, RD	IOFB, VIT H'AGE, RD	S	
35	18	M	3AM	10PM	CRICKET BALL	BLUNT	N	.	N	1	3	ABN	ASYMMETRICAL	NP	LE	PL+,PR inacc	<N36	-	N	N	N	N	EDEMA	N	CONGESTION	HAZY	HYPHAEMA	DNMO	DNMO	DNMO	R	10,-	DNMO	DNMO	DNMO	DNMO	N	N	N	N	B SCAN	GLOBE RUPTURE	GLOBE RUPTURE	S
36	20	M	5 DAYS AGO	9AM	IRON NAIL	SHARP	Y	.	N	1	2	N	S	P	LE	6/9	N8	N	N	N	N	N	EDEMA	N	LACERATION	ABRASION	ND	NCP	RRR	N	N	14,15	OPEN	N	N	N	N	B SCAN	PVD	CONJUNCTIVAL LACERATION + CORNEAL ABRASION	M			
37	29	M	1AM	2AM	RTA	SHARP	N	N	Y	2	2	ABN	ASYMMETRICAL	NP	BE	-	-	-	#	LACERATION	CANALICULAR LACERATION	ECHYMOSIS	N	CONGESTION	CLEAR	ND	NCP	RAPD	N	R	-	OPEN	N	N	N	N								

101	60	M	1 DAY AGO	3AM	RTA	BLUNT	N	N	N	1	1	N	ASYMMETRICAL	NP	RE	CF	<N36	-	N	N	N	EDEMA	N	CHEMOSIS	ABRASION	ND	NCP	RRR	N	R	34,18	OPEN	N	N	N	CT ORBIT	SUPRA ORBITAL SUBPERIOSTEAL HEMATOMA OF RIGHT EYE	SUPRA ORBITAL SUBPERIOSTEAL HEMATOMA OF RIGHT EYE	S		
102	60	M	1 DAY AGO	2AM	RTA	BLUNT	N	N	Y	2	1	ABN	ASYMMETRICAL	P	LE	-	-	-	#	LACERATION	N	ECHYMOSIS	N	CONGESTION	CLEAR	SHALLOW	IRIDODILYSIS	IRREGULAR	N	R	16,30	CLOSED	N	N	N	CT ORBIT	FRACTURE ORBIT	IRIDODILYSIS AND # ORBIT	S		
103	9	M	1 WEEK AGO	8AM	VEGETATIVE MATERIAL	BLUNT	N	.	N	1	2	N	ASYMMETRICAL	P	RE	CF	<N36	-	N	N	N	LACERATION	N	CHEMOSIS	ABRASION	ND	NCP	SLUGGISH	N	N	24,8	OPEN	N	N	N	CT ORBIT	ORBITAL CELLULITIS	ORBITAL CELLULITIS	M		
104	49	M	1 WEEK AGO	6AM	WOODEN STICK	BLUNT	N	.	N	1	1	N	S	P	LE	PL+,PR inacc	<N36	-	N	N	N	N	N	N	CLEAR	ND	NCP	RAPD	CATARACT	N	12,18	OPEN	N	N	N	B SCAN	PVD AND RD	RETINAL DETACHMENT, PVD AND TRAUMATIC CATARACT	S		
105	70	M	6PM	7PM	RTA	SHARP	N	N	N	2	4	N	ASYMMETRICAL	NP	LE	PL-	PL-	-	N	LACERATION	N	N	PERFORATION	CONGESTION	HAZY	SHALLOW	DNMO	DNMO	DNMO	N	-	DNMO	DNMO	DNMO	DNMO	CT ORBIT	GLOBE RUPTURE	GLOBE RUPTURE	S		
106	54	M	10AM	11AM	IRON PARTICLE	SHARP	Y	.	N	1	2	N	S	P	LE	6\18	N10	N	N	N	N	N	N	N	FOREIGN BODY	ND	NCP	RRR	N	N	13,17	OPEN	N	N	N	B SCAN	NORMAL	CORNEAL FB	S		
107	38	F	2 DAYS AGO	11:00 AM	FALL	BLUNT	N	.	N	1	1	N	S	P	RE	6\6	N6	N	N	N	N	N	N	N	CLEAR	SHALLOW	NCP	RRR	N	N	24,8	CLOSED	N	N	N	B SCAN	NORMAL	CYCLODIALYSIS CLEFT	M		
108	2	M	1 DAY AGO	11:00 AM	FALL	SHARP	N	.	N	1	1	N	S	P	LE	6\6	N6	-	N	N	CANALICULAR LACERATION	LACERATION	N	N	CLEAR	ND	NCP	RRR	N	N	11,16	DNMO	N	N	N	B SCAN	NORMAL	CANALICULAR LACERATION + LID LACERATION	S		
109	3	M	1 WEEK AGO	11:00 AM	WOODEN STICK	SHARP	N	.	N	1	2	N	S	P	LE	-	-	-	N	N	N	N	N	CONGESTION	CORNEAL ABSCESS	ND	NCP	RRR	N	N	-	DNMO	N	N	N	B SCAN	NORMAL	CORNEAL ABSCESS	S		
110	34	M	1 DAY AGO	10:00 AM	RTA	BLUNT	Y	Y	Y	1	1	N	S	P	RE	6\12	N10	N	N	LACERATION	N	ECHYMOSIS	N	N	CLEAR	ND	ANGLE STRUCTURE TEAR	IRREGULAR	SUBLUXATION	N	17,19	OPEN	N	N	N	B SCAN	NORMAL	IRIS SPHINCTER RADIAL TEAR WITH SUBLUXATION OF LENS	S		
111	67	M	1 DAY AGO	9:00 AM	RTA	BLUNT	N	N	N	2	1	N	ASYMMETRICAL	NP	LE	CF	<N36	-	N	EDEMATOUS	N	EDEMA	N	CHEMOSIS	CLEAR	ND	NCP	SLUGGISH	N	R	12,34	OPEN	N	N	N	CT ORBIT	CCF	CCF	S		
112	45	M	1 DAY AGO	9:00 AM	FALL	BLUNT	N	.	Y	1	1	N	ASYMMETRICAL	P	LE	PL+,Pracc	<N36	-	N	N	N	N	ECHYMOSIS	N	N	CLEAR	ND	NCP	RAPD	N	R	12,19	OPEN	N	N	RETINAL DIALYSIS	N	B SCAN	RETINAL DIALYSIS	RETINAL DIALYSIS	M
113	20	M	9AM	11AM	METALLIC PARTICLE	SHARP	N	.	N	1	0	N	S	P	RE	6\6	N6	N	N	N	N	N	N	CONGESTION	ABRASION	ND	NCP	RRR	N	N	13,17	OPEN	N	N	N	B SCAN	NORMAL	FOREIGN BODY IMPACTION ON UPPER LID	M		
114	40	M	1 DAY AGO	10AM	RTA	BLUNT	N	N	N	2	1	ABN	ASYMMETRICAL	NP	RE	PL-	PL-	-	#	LACERATION	N	ECHYMOSIS	N	CONGESTION	CLEAR	ND	NCP	NR	N	R	18,17	OPEN	N	N	PALE	CT ORBIT	FRACTURE ORBIT	FRACTURE ORBIT, OPTIC NERVE TRANSECTION	S		
115	41	M	1 WEEK AGO	9AM	RTA	BLUNT	Y	Y	N	1	1	N	S	P	RE	6\24	N12	N	N	N	N	N	N	ECHYMOSIS	N	N	ABRASION	SHALLOW	NCP	SLUGGISH	N	N	22,10	CLOSED	N	N	N	B SCAN	NORMAL	CORNEAL ABRASION , ANGLE RECESSION	M
116	25	M	1 DAY AGO	12AM	RTA	SHARP	N	N	N	1	6	ABN	ASYMMETRICAL	NP	BE	PL-, PL-	PL-, PL-	-	N	LACERATION	N	ECHYMOSIS	RUPTURE	LACERATION	LACERATION	SHALLOW	DNMO	DNMO	DNMO	R	-	DNMO	IOFB	DNMO	DNMO	CT ORBIT	GLOBE PERFORATION + VIT H'AGE + MULTIPLE IOFB + AIR POCKETS IN VITEROUS	GLOBE PERFORATION + VIT H'AGE + MULTIPLE IOFB + AIR POCKETS IN VITEROUS	S		
117	5	M	10PM	12AM	GLASS PIECE	SHARP	N	.	N	1	6	N	S	P	LE	6\36	<N36	-	N	N	N	N	EDEMA	N	CONGESTION	LACERATION	SHALLOW	PROLAPSE	DNMO	DNMO	N	20,6	DNMO	N	N	N	B SCAN	IRIS PROLAPSE	CORNEAL PERFORATION + IRIS PROLAPSE	S	
118	58	M	7PM	9PM	RTA	SHARP	N	N	N	1	4	N	S	P	RE	6\18	N10	N	N	LACERATION	N	LACERATION	LACERATION	LACERATION	CLEAR	ND	NCP	RRR	N	N	12,12	OPEN	N	N	N	B SCAN	NORMAL	SCLERAL TEAR	S		
119	60	M	5PM	6PM	METALLIC PARTICLE	SHARP	N	.	N	1	0	N	S	P	RE	6\9	N10	N	N	N	N	N	N	CONGESTION	FOREIGN BODY	ND	NCP	RRR	N	N	13,18	OPEN	N	N	N	B SCAN	NORMAL	CORNEAL FB	S		
120	45	M	2PM	9PM	RTA	BLUNT	N	N	N	1	1	N	S	P	RE	PL+,Pracc	<N36	-	N	LACERATION	N	ECHYMOSIS	N	CONGESTION	CLEAR	SHALLOW, HYPHAEMA	DNMO	DNMO	DNMO	N	18,32	DNMO	DNMO	DNMO	DNMO	B SCAN	RETINAL DETACHMENT+HYPHAEMA	RETINAL DETACHMENT+HYPHAEMA	S		
121	27	M	1 MONTH AGO	8AM	ASSAULT	BLUNT	N	.	Y	2	1	N	S	P	RE	PL+,Pracc	<N36	-	N	N	N	N	N	N	CLEAR	ND	NCP	RRR	CATARACT	N	18,17	OPEN	DNMO	DNMO	DNMO	B SCAN	CATARACTOUS CHANGE IN LENS	TRAUMATIC CATARACT	S		
122	19	M	12PM	2PM	RTA	BLUNT	N	Y	Y	1	3	N	S	P	RE	PL+,PR inacc	<N36	-	N	N	N	N	ECHYMOSIS	N	N	CLEAR	SHALLOW	NCP	SLUGGISH	N	N	4,20	CLOSED	H'AGE	N	N	B SCAN	CHOROIDDAL RUPTURE+VIT H'AGE	CHOROIDDAL RUPTURE+VIT H'AGE	S	
123	62	M	1PM	2PM	RTA	BLUNT	Y	Y	N	1	1	N	S	P	LE	6\24	N12	N	N	N	N	N	N	LACERATION	N	N	CLEAR	ND	NCP	RRR	N	N	16,18	CLOSED	N	N	N	B SCAN	NORMAL	ANGLE RECESSION	M
124	60	M	1 DAY AGO	5PM	RTA	BLUNT	N	N	N	1	1	N	S	P	RE	6\24	N18	CB	N	EDEMATOUS	N	ECHYMOSIS	N	N	CLEAR	SHALLOW	IRIDODONOSIS	RRR	SUBLUXATION	N	12,12	CLOSED	N	N	N	B SCAN	SUBLUXATION OF LENS+CATARACT	SUBLUXATION OF LENS+CATARACT	S		
125	53	M	1 MONTH AGO	12PM	RTA	BLUNT	N	N	N	1	1	N	S	P	LE	6\60	N36	N	N	N	N	N	N	N	CLEAR	DEEP	IRIDODONOSIS	RRR	SUBLUXATION	N	12,12	OPEN	N	N	N	B SCAN	SUBLUXATION OF LENS+CATARACT	SUBLUXATION OF LENS+CATARACT	S		
126	53	M	1 DAY AGO	12PM	RTA	BLUNT	N	N	N	1	1	N	S	P	LE	CF	<N36	-	N	N	N	N	N	N	CLEAR	ND	NCP	NR	N	N	12,12	OPEN	N	N	BERLINS EDEMA	N	B SCAN	NORMAL	BERLINS EDEMA	M	
127	42	F	1 DAY AGO	12PM	RTA	BLUNT	N	N	N	1	1	N	S	P	RE	CF	<N36	-	N	N	N	N	N	N	CLEAR	SHALLOW	IRIDODILYSIS	D SHAPED	N	N	12,14	OPEN	N	N	N	B SCAN	NORMAL	IRIDODIALYSIS	M		
128	19	M	1 DAY AGO	12PM	METAL ROD	SHARP	Y	.	N	1	4	N	S	P	RE	CF	<N36	-	N	N	N	N	N	LACERATION	CONGESTION	LACERATION	SHALLOW, HYPHAEMA	PROLAPSE	IRREGULAR	N	N	2,20	DNMO	N	N	N	B SCAN	NORMAL	SCLERAL TEAR+CORNEAL TEAR+IRIS PROLAPSE	S	
129	19	M	1 DAY AGO	12PM	METAL ROD	SHARP	Y	.	N	1	4	N	S	P	RE	PL+,PR inacc	<N36	-	N	N	N	N	LACERATION	LACERATION	CONGESTION	CLEAR	SHALLOW, HYPHAEMA	NCP	SLUGGISH	N	N	4,22	DNMO	H'AGE	DNMO	DNMO	B SCAN	VIT H'AGE + SCLERAL PERFORATION	VIT H'AGE + SCLERAL PERFORATION	S	
130	42	F	1 WEEK AGO	12PM	METAL ROD	BLUNT	N	.	N	1	1	N	S	P	RE	PL+,Pracc	<N36	-	N	N	N	N	N	N	CLEAR	ND	NCP	RRR	CATARACT	N	18,17	OPEN	DNMO	DNMO	DNMO	B SCAN	CATARACTOUS CHANGE IN LENS	TRAUMATIC CATARACT	S		
131	73	M	1 MONTH AGO	12PM	WOODEN STICK	SHARP	N	.	N	1	4	N	S	P	RE	6\36	N18	N	N	N	N	N	N	CONGESTION	ADHERANT LEUCOMA	SHALLOW	NCP	IRREGULAR	N	N	14,18	OPEN	H'AGE	N	N	B SCAN	VIT H'AGE	TRAUMTIC ADHERENT LEUCOMA+ VIT H'AGE	S		
132	12	M	1 DAY AGO	12PM	WOODEN STICK	BLUNT	N	.	N	1	3	N	S	P	RE	6\24	N36	-	N	N	N	N	N	N	CONGESTION	ABRASION	ND	NCP	RRR	N	N	-	DNMO	N	N	N	B SCAN	NORMAL	CORNEAL ABRASION	M	
133	49	M	11AM	11AM	IRON NAIL	SHARP	Y	.	N	1	4	N	S	NP	RE	PL+,Pracc	<N36	-	N	N	N	N	N	LACERATION	CONGESTION	LACERATION	SHALLOW, HYPHAEMA	NCP	IRREGULAR	N	N	8,12	DNMO	N	N	N	B SCAN	GLOBE RUPTURE	SCLERAL TEAR	S	
134	19	M	1 MONTH AGO	12PM	WOODEN STICK	SHARP	Y	.	N	1	6	N	S	P	LE	PL+,PR inacc	<N36	-	N	N	N	N	EDEMA	N	CONGESTION	HAZY	HYPOPYON	NCP	RAPD	N	N	10,22	DNMO	IOFB	N	N	B SCAN	EXUDATES IN AC + VITRITIS + IOFB	ENDOPHTHALMITIS	S	
135	11	M	1 WEEK AGO	12PM	WOODEN STICK	BLUNT	N	.	N	1	1	N	S	P	LE	PL+,Pracc	<N36	-	N	N	N	N	N	CONGESTION	ULCER	HYPOPYON	NCP	RRR	N	N	-	DNMO	DNMO	DNMO	DNMO	MICROBIOLOGICAL INV	FUNGAL ELEMENTS +	FUNGAL CORNEAL ULCER	M		
136	40	M	1 MONTH AGO	12PM	IRON ROD	BLUNT	Y	.	N	1	1	N	S	P	RE	6\12	N10	CB	N	N	N	N	N	N	CLEAR	ND	NCP	RRR	N	N	12,12	DNMO	N	N	RETINAL SCAR	PALE	B SCAN	NORMAL	RETINAL SCAR+TRAUMATIC OPTIC NEUROPATHY	M	
137	32	M	1 DAY AGO	12PM	FALL	BLUNT	N	.	Y	2	1	N	S	P	RE	-	-	-	N	N	N	N	ECHYMOSIS	N	CONGESTION	ABRASION	ND	NCP	RAPD	N	N	14,16	OPEN	N	N	PALE	B SCAN	NORMAL	CORNEAL ABRASION + TRAUMATIC OPTIC NEUROPATHY	M	
138	81	M	1 DAY AGO	12PM	FALL	BLUNT	N	.	N	1	1	N	S	P	RE	6\18	N12	N	#	N	N	N	N	ECHYMOSIS	N	N	CLEAR	ND	NCP	RRR	N	R	12,14	OPEN	N	N	N	CT ORBIT	FRACTURE ORBIT	FRACTURE ORBIT	S
139	58	M	1 WEEK AGO	12PM	FALL	BLUNT	N	.	N	1	1	N	S	NP	LE	6\12	N10	N	N	N	N	N	N	N	CLEAR	ND	NCP	RRR	N	R	13,17	OPEN	N	N	N	MRI	EDH	TRAUMATIC 3,4,6 NERVE PALSY	M		
140	20	M	1 DAY AGO	10AM	RTA	BLUNT	N	N	N	1	1	N	ASYMMETRICAL	P	LE	-	-	-	N	N	N	N	ECHYMOSIS	N	CONGESTION	CLEAR	ND	NCP	RAPD	N	R	-	OPEN	N	N	PALE	MRI	SDH	TRAUMATIC ON	M	
141	73	M	1 WEEK AGO	11AM	WOODEN STICK	SHARP	N	.	N	1	4	N	S	P	LE	6\60	<N36	-	N	N	N	N	N	N	CONGESTION	ADHERANT LEUCOMA	SHALLOW	NCP	IRREGULAR	N	N	14,15	CLOSED	N	N	N	B SCAN	NORMAL	ADHERENT LEUCOMA	S	
142	26	F	1 DAY AGO	11AM	FALL	BLUNT	N	.	N	1	1	N	S	P	RE	PL+,PR inacc	<N36	-	N	N	N	N	N	N	N	CLEAR	ND	NCP	RAPD	N	N	14,16	OPEN	N	N	PAPILLE DEMA	N	B SCAN	OPTIC NERVE SWELLING	RETROBULBAR NEURITIS	M
143	24	M	1 WEEK AGO	11AM	WOODEN STICK	BLUNT	N	.	N	1	1	N	S	P	LE	PL+,PR inacc	<N36	-	N	N	N	N	N	N	N	CLEAR	ND	NCP	NR	CATARACT	N	18,20	OPEN	DNMO	DNMO	DNMO	B SCAN	PVD AND RD	TRAUMATIC CATARACT+PVD+RD	S	
144	5	M	1 DAY AGO	10AM	WOODEN STICK	SHARP	N	.	N	1	4	N	S	P	RE	PL+,Pracc	<N36	-	N	N	N	N	N	CONGESTION	LACERATION	SHALLOW, HYPHAEMA	PROLAPSE	RAPD	N	N	8,18	CLOSED	DNMO	DNMO	DNMO	B SCAN	CORNEAL PERFORATION + IRIS PROLAPSE	CORNEAL PERFORATION + IRIS PROLAPSE	S		
145	21	M	1 DAY AGO	10AM	RTA	BLUNT	N	N	N	1	1	ABN	ASYMMETRICAL	NP	LE	PL+,PR inacc	<N36	-	N	N	N	N	ECHYMOSIS	N	SCH	CLEAR	ND	NCP	SLUGGISH	N	N	12,12	OPEN	N	N	RETINAL DIALYSIS	PALE	B SCAN	RETINAL DIALYSIS	RETINAL DIALYSIS+TRAUMATIC OPTIC NEUROPATHY	M
146	34	M	1 DAY AGO	10AM	RTA	BLUNT	N	N	Y	1	1	N	ASYMMETRICAL	P	LE	PL+,Pracc	<N36	-																							

156	34	M	12PM	1AM	RTA	SHARP	N	N	N	1	2	ABN	ASYMMETRICAL	P	RE	6\24	N12	N	N	EDEMATOUS	N	LACERATION	N	SCH	CLEAR	ND	NCP	SLUGGISH	N	N	18,20	CLOSED	N	RETINAL DIALYSIS	N	B SCAN	RETINAL DIALYSIS	RETINAL DIALYSIS+SCH	M	
157	20	F	6PM	2AM	RTA	BLUNT	N	N	N	1	1	N	S	P	RE	6\60	<N36	-	N	EDEMATOUS	N	ECHYMOSIS	N	SCH	CLEAR	ND	NCP	SLUGGISH	N	N	24,24	CLOSED	H'AGE	DNMO	DNMO	B SCAN	VITRITIS+RETINAL DETACHMENT	VITRITIS+RETINAL DETACHMENT	S	
158	15	M	6PM	9PM	ASSAULT	SHARP	N	.	N	1	4	N	ASYMMETRICAL	P	RE	6\6	N6	N	N	CANALICULAR LACERATION	N	N	N	CLEAR	ND	NCP	RRR	N	N	12,14	OPEN	N	N	N	CT ORBIT	NORMAL	CANALICULAR LACERATION	S		
159	26	M	8PM	12AM	ASSAULT	BLUNT	N	.	Y	2	1	ABN	ASYMMETRICAL	P	RE	CF	<N36	-	N	EDEMATOUS	N	ECHYMOSIS	N	SCH	CLEAR	ND	NCP	RAPD	N	N	26,24	OPEN	N	N	PALE	B SCAN	NORMAL	TRAUMATIC ON	M	
160	65	M	12PM	1AM	FIRECRACKER	BLUNT	N	.	N	1	1	N	ASYMMETRICAL	P	LE	6\60	<N36	-	N	N	N	N	SCH	CLEAR	SHALLOW	IRIDODILYSIS	D SHAPED	N	N	12,24	OPEN	N	N	N	CT ORBIT	NORMAL	IRIDODILYSIS	S		
161	14	M	1 DAY AGO	12PM	FIRECRACKER	BLUNT	N	.	N	1	1	N	S	P	RE	PL+,Pracc	<N36	-	N	N	N	N	N	CLEAR	ND	POSTERIOR SYNAECHIAE	IRREGULAR	CATARACT	N	12,12	CLOSED	DNMO	DNMO	DNMO	B SCAN	CATARACTOUS CHANGE IN LENS+VIT H'AGE	CATARACTOUS CHANGE IN LENS+VIT H'AGE	S		
162	35	M	1 DAY AGO	12PM	ASSAULT	BLUNT	N	.	N	1	3	N	ASYMMETRICAL	-	RE	PL-	PL-	-	N	EDEMATOUS	N	ECHYMOSIS	RUPTURE	CONGESTION	PERFORATION	SHALLOW	DNMO	DNMO	DNMO	N	-	DNMO	DNMO	DNMO	MRI	PROPTOSIS+ORBITAL COMPARTMENT SYNDROME	PROPTOSIS+ORBITAL COMPARTMENT SYNDROME	S		
163	55	F	1 DAY AGO	12PM	FIRECRACKER	BLUNT	N	.	N	1	3	N	ASYMMETRICAL	NP	LE	PL-	PL-	-	N	EDEMATOUS	N	ECHYMOSIS	RUPTURE	CONGESTION	HAZY	HYPHAEMA	DNMO	DNMO	DNMO	N	-	DNMO	DNMO	DNMO	B SCAN	GLOBE RUPTURE + VIT H'AGE+RETINAL DETACHMENT	GLOBE RUPTURE + VIT H'AGE+RETINAL DETACHMENT	S		
164	50	M	1 DAY AGO	11PM	RTA	BLUNT	N	N	N	1	1	N	ASYMMETRICAL	P	RE	6\24	N12	N	N	EDEMATOUS	N	ECHYMOSIS	N	SCH	CLEAR	ND	NCP	RRR	N	N	14,16	OPEN	N	N	N	B SCAN	NORMAL	SCH+ECHYMOSIS	M	
165	65	M	12PM	1AM	ASSAULT	BLUNT	N	.	N	1	1	N	S	P	RE	6\60	<N36	-	N	N	N	N	N	SCH	CLEAR	LENS IN AC	NCP	IRREGULAR	DISPLACED IN AC	N	28,12	DNMO	N	N	N	B SCAN	ANTERIOR DISLOCATION OF LENS	ANTERIOR DISLOCATION OF LENS	S	
166	38	M	12PM	1AM	RTA	SHARP	N	N	N	1	2	N	ASYMMETRICAL	P	RE	6\12	N6	N	N	CANALICULAR LACERATION	LACERATION	N	N	CLEAR	ND	NCP	RRR	N	N	12,12	OPEN	N	N	N	B SCAN	NORMAL	CANALICULAR LACERATION + LID LACERATION	S		
167	48	F	1 DAY AGO	12PM	BULLOCK CART	BLUNT	Y	.	N	1	1	N	S	P	RE	6\24	N18	N	N	N	N	N	SCH	CLEAR	ND	NCP	RRR	N	N	14,16	OPEN	PVD	N	N	B SCAN	PVD	PVD	M		
168	56	M	10AM	12PM	RTA	BLUNT	N	N	N	1	1	N	S	P	LE	6\36	N18	N	N	N	N	N	SCH	CLEAR	SHALLOW	NCP	SLUGGISH	N	N	16,18	CLOSED	N	N	N	B SCAN	NORMAL	TM TEAR/DISINSERTION	S		
169	40	M	1 MONTH AGO	12PM	RTA	BLUNT	N	N	N	1	1	N	S	P	RE	PL-	PL-	-	N	N	N	N	N	N	ANTERIOR STAPHYLOMA	DEEP	DNMO	DNMO	DNMO	N	-	DNMO	DNMO	DNMO	B SCAN	ANTERIOR STAPHYLOMA+DISORGANISATION OF TISSUE	ANTERIOR STAPHYLOMA+EXPULSIVE HEMORRHAGE	S		
170	36	M	1 MONTH AGO	12PM	RTA	BLUNT	N	N	N	1	1	N	S	P	LE	PL+,Pracc	<N36	-	N	N	N	N	N	N	CLEAR	ND	NCP	RRR	CATARACT	N	12,14	OPEN	DNMO	DNMO	DNMO	B SCAN	CATARACTOUS CHANGE IN LENS	TRAUMATIC CATARACT	S	
171	38	M	1 DAY AGO	2PM	ASSAULT	SHARP	N	.	N	1	2	N	S	P	RE	6\9	N6	N	N	N	N	ECHYMOSIS	N	LACERATION	CLEAR	ND	NCP	RRR	N	N	12,17	OPEN	N	N	N	B SCAN	NORMAL	CONJUNCTIVAL LACERATION	S	
172	32	M	1 DAY AGO	4PM	ASSAULT	BLUNT	N	.	Y	1	1	N	S	P	RE	CF	<N36	-	N	N	N	N	N	CLEAR	ND	NCP	RAPD	N	N	20,20	OPEN	N	BERLINS EDEMA	N	B SCAN	NORMAL	BERLINS EDEMA	M		
173	57	M	1 DAY AGO	5PM	RTA	BLUNT	N	N	N	1	1	ABN	ASYMMETRICAL	NP	BE	PL-, PL-	PL-, PL-	-	N	N	N	N	ECHYMOSIS	N	SCH	CLEAR	SHALLOW	NCP	NR	N	N	40,40	CLOSED	H'AGE	RD	PALE	B SCAN	VITRITIS+RETINAL DETACHMENT	TRAUMATIC ON +VIT H'AGE+RD	M
174	30	M	1 DAY AGO	12PM	RTA	BLUNT	N	Y	N	1	1	ABN	ASYMMETRICAL	P	RE	PL+,Pracc	<N36	-	N	N	N	N	LACERATION	N	SCH	CLEAR	ND	NCP	SLUGGISH	N	N	20,20	CLOSED	H'AGE	N	PALE	B SCAN	VITRITIS+RETINAL DETACHMENT	TRAUMATIC ON +VIT H'AGE+RD	S
175	54	F	1 WEEK AGO	12PM	ASSAULT	BLUNT	N	.	N	1	1	N	ASYMMETRICAL	P	LE	PL+,Pracc	<N36	-	N	N	N	N	N	CONGESTION	ANTERIOR STAPHYLOMA	SHALLOW, HYPHAEMA	DNMO	DNMO	DNMO	N	-	DNMO	DNMO	DNMO	B SCAN	VIT H'AGE+HTPHAEMA	CORNEAL BULLAE+VIT H'AGE	S		
176	16	F	1 DAY AGO	12PM	WOODEN STICK	SHARP	N	.	N	1	4	N	ASYMMETRICAL	NP	LE	PL+,Pracc	<N36	-	N	N	N	EDEMA	N	CONGESTION	LACERATION	SHALLOW, HYPHAEMA	DNMO	DNMO	DNMO	N	-	DNMO	DNMO	DNMO	B SCAN	GLOBE RUPTURE	CORNEAL PERFORATION +HYPHAEME	S		
177	36	M	1 WEEK AGO	12PM	IRON NAIL	SHARP	N	.	N	1	4	N	S	P	LE	PL+,Pracc	<N36	-	N	N	N	N	EDEMA	N	SCH	ADHERANT LEUCOMA	SHALLOW	NCP	IRREGULAR	N	N	24,8	CLOSED	H'AGE	DNMO	DNMO	B SCAN	VIT H'AGE	ADHERANT LEUCOMA+VIT H'AGE	S
178	18	M	1 DAY AGO	4PM	IRON ROD	SHARP	N	.	N	1	2	N	S	P	LE	6\6	N6	N	N	CANALICULAR LACERATION	LACERATION	N	SCH	CLEAR	ND	NCP	RRR	N	N	14,16	OPEN	N	N	N	B SCAN	NORMAL	CANALICULAR LACERATION + LID LACERATION	S		
179	60	F	12PM	1AM	RTA	BLUNT	N	N	N	1	1	N	S	P	RE	6\9	N6	N	N	EDEMATOUS	N	LACERATION	N	SCH	CLEAR	ND	NCP	RRR	N	N	14,15	OPEN	N	N	N	CT ORBIT	NORMAL	LID LACERATION	S	
180	12	F	2 DAYS AGO	1PM	METALLIC PARTICLE	SHARP	N	.	N	1	0	N	S	P	RE	6\9	N6	N	N	N	N	N	SCH	FOREIGN BODY	ND	NCP	RRR	N	N	16,18	OPEN	N	N	N	B SCAN	NORMAL	CORNEAL FB	S		
181	32	M	1 MONTH AGO	1PM	IRON ROD	BLUNT	N	.	N	1	0	N	S	P	BE	CF	<N36	-	N	N	N	N	N	CLEAR	ND	NCP	RRR	N	N	18,20	OPEN	H'AGE	N	N	CT ORBIT	SAH	VIT H'AGE SECONDARY TO TERSON SYNDROME	S		
182	35	M	1 DAY AGO	1PM	BURNS	BURNS	N	.	N	1	0	N	S	NP	BE	CF	<N36	-	N	ESCHAR	N	ECHYMOSIS	N	SYMBLEPHARON	ABRASION	ND	NCP	RRR	N	N	-	DNMO	N	N	N	B SCAN	NORMAL	CORNEAL EPITHELIAL DEFECT	M	
183	22	M	1 WEEK AGO	1PM	RTA	BLUNT	N	N	Y	1	1	N	S	NP	LE	CF	<N36	-	N	N	N	N	ECHYMOSIS	N	N	CLEAR	ND	NCP	RAPD	N	N	12,12	OPEN	N	CRAO	PAPILLE DEMA	B SCAN	NORMAL	CRAO SECONDARY TO BLUNT TRAUMA	M
184	19	M	1 DAY AGO	10PM	RTA	SHARP	N	N	N	1	4	N	S	P	LE	CF	<N36	-	N	N	N	N	ECHYMOSIS	N	CONGESTION	LACERATION	SHALLOW	NCP	SLUGGISH	N	N	4,12	DNMO	N	N	N	B SCAN	NORMAL	CORNEAL PERFORATION	S
185	63	M	1 DAY AGO	10PM	RTA	BLUNT	N	N	N	1	1	N	S	P	LE	CF	<N36	-	N	N	N	N	N	CONGESTION	ABRASION	ND	NCP	RRR	N	N	14,16	OPEN	N	N	N	B SCAN	NORMAL	CORNEAL ABRASION	M	
186	25	M	1 DAY AGO	4PM	RTA	SHARP	N	N	Y	2	2	N	S	NP	LE	-	-	-	#	N	CANALICULAR LACERATION	LACERATION	N	CONGESTION	CLEAR	ND	NCP	RRR	N	N	15,16	OPEN	N	N	N	B SCAN	NORMAL	CANALICULAR LACERATION + LID LACERATION	S	
187	94	M	1 DAY AGO	12AM	FALL	BLUNT	N	.	N	1	3	N	ASYMMETRICAL	-	RE	PL-	PL-	-	N	N	N	N	RUPTURE	CONGESTION	PERFORATION	SHALLOW	DNMO	DNMO	DNMO	N	-	DNMO	DNMO	DNMO	MRI	EXPULSION OF INTRAOCULAR CONTENTS	EXPULSIVE HEMORRHAGE+GLOBE RUPTURE	S		
188	51	M	1 DAY AGO	12AM	ASSAULT	BURNS	N	.	Y	2	1	N	S	P	LE	6\9	N6	N	N	ESCHAR	N	EDEMA	N	SYMBLEPHARON	ABRASION	ND	NCP	RRR	N	N	-	DNMO	N	N	N	B SCAN	NORMAL	EPITHELIAL DEFECT+ESCHAR SECONDARY TO ACID	M	
189	65	F	2AM	12PM	RTA	SHARP	N	N	N	1	4	N	S	P	LE	6\24	N18	N	N	N	N	N	CONGESTION	ADHERANT LEUCOMA	SHALLOW	NCP	IRREGULAR	N	N	16,18	CLOSED	N	N	N	B SCAN	NORMAL	CORNEAL PERFORATION + ADHERANT LEUCOMA	S		
190	64	F	1 MONTH AGO	12PM	RTA	SHARP	N	N	N	1	5	N	S	P	LE	PL-	PL-	-	N	N	N	N	EDEMA	N	CONGESTION	HAZY	SHALLOW	DNMO	DNMO	DNMO	N	16,44	DNMO	DNMO	DNMO	DNMO	B SCAN	CATARACTOUS CHANGE IN LENS+ENDOPHTHALMITIS	ENDOPHTHALMITIS+TRAUMATIC CATARACT	S
191	38	M	1 DAY AGO	12PM	RTA	BLUNT	Y	Y	N	1	3	N	ASYMMETRICAL	P	LE	PL+,Pracc	<N36	-	N	N	N	N	EDEMA	RUPTURE	CONGESTION	HAZY	HYPHAEMA	DNMO	DNMO	DNMO	N	-	DNMO	DNMO	DNMO	B SCAN	GLOBE RUPTURE	GLOBE RUPTURE	S	
192	32	F	12PM	1AM	RTA	SHARP	N	N	N	1	2	N	ASYMMETRICAL	P	RE	6\9	N6	N	N	LACERATION	CANALICULAR LACERATION	LACERATION	N	N	CLEAR	ND	NCP	RRR	N	N	12,12	OPEN	N	N	N	CT ORBIT	NORMAL	CANALICULAR LACERATION + LID LACERATION	S	
193	22	M	10AM	12PM	FALL	BLUNT	N	.	Y	2	1	N	S	P	LE	6\36	N36	CB	N	N	N	N	ECHYMOSIS	N	SCH	CLEAR	ND	NCP	RAPD	N	N	14,16	OPEN	N	N	N	B SCAN	NORMAL	TRAUMATIC ON +ECHYMOSIS	M
194	21	M	12PM	1AM	RTA	BLUNT	N	N	Y	2	1	ABN	ASYMMETRICAL	P	BE	6\9	N10	N	N	N	N	ECHYMOSIS	N	N	CLEAR	ND	NCP	RRR	N	N	16,18	OPEN	N	N	N	CT ORBIT	NORMAL	ECHYMOSIS	M	
195	53	F	1 DAY AGO	12PM	RTA	BLUNT	N	Y	N	2	1	ABN	ASYMMETRICAL	NP	BE	PL+,Pracc	<N36	-	N	EDEMATOUS	N	ECHYMOSIS	N	SCH	CLEAR	ND	NCP	NR	N	N	24,24	OPEN	N	N	PALE	CT ORBIT	NORMAL	TRAUMATIC ON	M	
196	62	M	1 WEEK AGO	12PM	RTA	SHARP	N	Y	Y	1	4	N	ASYMMETRICAL	P	RE	PL+,Pracc	<N36	-	N	N	N	N	ECHYMOSIS	N	CONGESTION	ADHERANT LEUCOMA	SHALLOW	NCP	SLUGGISH	CATARACT	N	12,18	DNMO	N	N	N	B SCAN	NORMAL	ADHERANT LEUCOMA+TRAUMATIC CATARACT	S
197	25	M	1 DAY AGO	12PM	RTA	BLUNT	N	N	Y	1	1	N	S	P	LE	PL+,Pracc	<N36	-	N	EDEMATOUS	N	ECHYMOSIS	N	SCH	CLEAR	ND	NCP	RAPD	N	N	12,20	CLOSED	H'AGE	DNMO	DNMO	B SCAN	VITRITIS+RETINAL DETACHMENT	VITRITIS+RETINAL DETACHMENT	S	
198	60	M	1 DAY AGO	12PM	IRON NAIL	SHARP	Y	.	Y	1	6	N	ASYMMETRICAL	P	RE	PL+,Pracc	<N36	-	N	N	N	N	EDEMA	PERFORATION	CONGESTION	CLEAR	ND	NCP	SLUGGISH	N	N	4,20	CLOSED	IOFB	N	N	B SCAN	IOFB, VIT H'AGE	IOFB, VIT H'AGE	S
199	55	M	1 WEEK AGO	12PM	BURNS	BURNS	Y	.	N	1	0	N	S	P	RE	6\6	N10	N	N	ESCHAR	N	EDEMA	N	CONGESTION	ABRASION	ND	NCP	RRR	N	N	12,14	OPEN	N	N	N	B SCAN	NORMAL	EPITHELIAL DEFECT+ESCHAR SECONDARY TO BURNS	M	
200	5	M	12PM	1AM	RTA	BLUNT	N	N	N	1	1	N	S	P	RE	6\9	N10	N	N	EDEMATOUS	N	ECHYMOSIS	N	SCH	CLEAR	ND	NCP	RRR	N	N	12,12	OPEN	N	N	N	B SCAN	NORMAL	SCH+ECHYMOSIS	M	
201	14	M	1 DAY AGO	12PM	RTA	BLUNT	N	N	N	1	1	N	ASYMMETRICAL	NP	RE	CF	<N36	-	N	N	N	N	ECHYMOSIS	N	CONGESTION	CLEAR	SHALLOW	NCP	SLUGGISH	N	N	26,12	OPEN	N	N	N	MRI	SUPRA ORBITAL SUBPERIOSTEAL HEMATOMA OF RIGHT EYE	PROPTOSIS DUE TO SUPRA ORBITAL SUBPERIOSTEAL HEMATOMA OF	