

A Dissertation on

**A STUDY ON VARIOUS POSTERIOR SEGMENT
MANIFESTATIONS FOLLOWING OCULAR
TRAUMA IN TERTIARY CARE CENTRE.**

Submitted to

**THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY
CHENNAI**



*With partial fulfillment of the regulations
for the award of the degree of*

M.S. (OPHTHALMOLOGY) BRANCH – III

**MADRAS MEDICAL COLLEGE AND RESEARCH
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MAY - 2020

CERTIFICATE

This is to certify that **Dr.V.THEERTHANA**, with **Registration Number – 221713012** Post Graduate student in M.S Ophthalmology, at Regional Institute of Ophthalmology and Government Ophthalmic hospital attached to Madras Medical College, Chennai, carried out this dissertation on **“ A STUDY ON VARIOUS POSTERIOR SEGMENT MANIFESTATIONS FOLLOWING OCULAR TRAUMA IN TERTIARY CARE CENTRE”** under our direct guidance and supervision during the academic years from 2017 to 2020.

This dissertation is submitted to the TamilNadu Dr.MGR Medical University, Chennai for the fulfillment of award of M.S. Degree in Ophthalmology in Branch III.

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CERTIFICATE FROM GUIDE

This is to certify that this dissertation entitled, “ **A STUDY ON VARIOUS POSTERIOR SEGMENT MANIFESTATIONS FOLLOWING OCULAR TRAUMA IN TERTIARY CARE CENTRE**” is a bonafide record of research work done by **Dr.V.THEERTHANA**, with **Registration Number – 221713012** Post Graduate Resident (May 2017 to May 2020) in Department of Ophthalmology, Madras Medical College, Chennai. This dissertation is submitted to the Tamil Nadu Dr. MGR Medical University, Chennai for the fulfillment of award of M.S. Degree in Ophthalmology in Branch III.

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DECLARATION

I, **Dr.V.THEERTHANA**, solemnly declare that the dissertation titled **“A STUDY ON VARIOUS POSTERIOR SEGMENT MANIFESTATIONS FOLLOWING OCULAR TRAUMA IN TERTIARY CARE CENTRE”** has been prepared by me. This is submitted to The Tamil Nadu Dr.M.G.R. Medical University, Chennai, in partial fulfillment of the requirement for the award of M.S. Ophthalmology, degree Examination to be held in May 2020.

Signature of the candidate,

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CERTIFICATE – II

This is to certify that this dissertation work titled **A STUDY ON VARIOUS POSTERIOR SEGMENT MANIFESTATIONS FOLLOWING OCULAR TRAUMA IN TERTIARY CARE CENTRE** ” of the candidate **DR.V.THEERTHANA** with Registration Number **221713012** for the award of **M.S.,DEGREE BRANCH – III (OPHTHALMOLOGY)**.I personally verified the urkund.com website for the purpose of plagiarism check. I found that the uploaded thesis file contains from introduction to conclusion pages and result shows **2 % (two)** percentage of plagiarism in the dissertation.

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INTRODUCTION

The word “TRAUMA” which derived from Greek word – meaning “WOUND”. Ocular injuries are the major cause of visual impairment.

Eye injuries are the major cause of preventable blindness and visual impairment leads to economical, psychological , social problems to the patient.

In adults, the incidence of ocular injuries has increased with occupational related injuries, road traffic accidents, sports injuries , agricultural vegetable matter injuries, household chemicals can also causes ocular injuries.

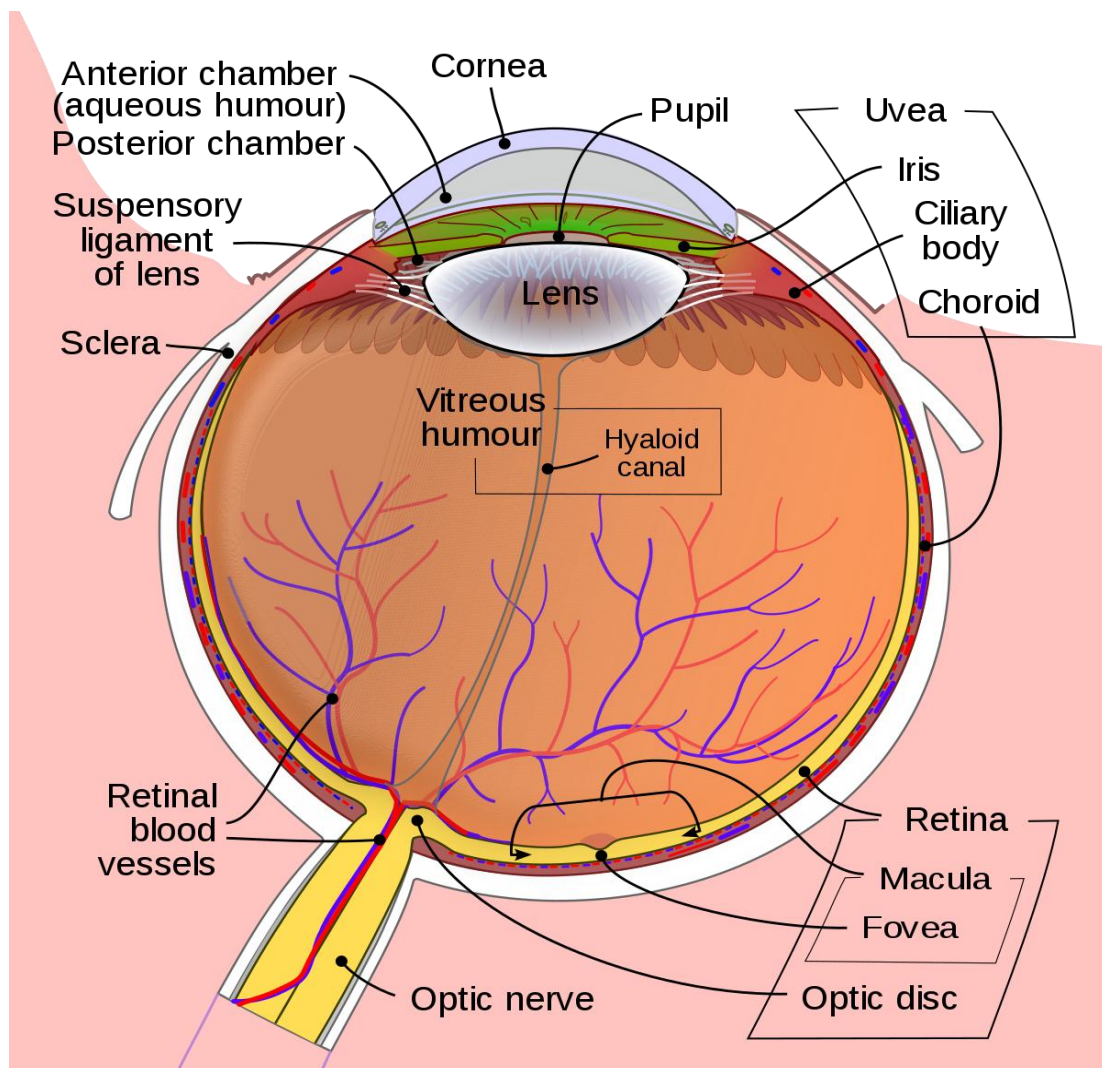
According to Birmingham Eye Trauma Terminology System (BETTS), practicing ophthalmologists documenting ocular trauma cases in a standardized manner, which provides simple, unique , comprehensive system to describe the mechanical injuries to the globe.

Open globe injuries showed good prognosis due to the timely intervention and various newer microsurgical instrumentation techniques.

REVIEW OF LITERATURE

- Martina M. Oiticica -Barbosa et al, (2015) a prospective observational study, conducted in children investigating the causes of ocular trauma and assessing the prognostic value of OTS .
- Kalla A.Gervasio et al ,(2015) a retrospective cohort study,they found that review was conducted on 25 patients. Study concluded that ocular trauma score in patients with combined facial fractures.
- Demirean, Nihal MD et al (2005) study conducted regarding Pars plana vitrectomy in ocular injury with Intra ocular foreignbody ,out of 70 patients ,after PPV vision improved in 39 (53.7%) and didn't change in 19 (27.2%) cases.
- Internal limiting membrane removal for traumatic macular hole (2001) conducted by Ferenc Kuhn ,MD,et al .the hole closed in 100 % of eyes. vision improved more than 2 snellen lines in 16 eyes (94%)the macula showed additional trauma related damage in 10 eyes(59%).No permanent complication is seen Among 4440 eyes with contusion trauma in United States Eye Injury Registry . the risk of macular hole formation is 9 times higher in eyes closed than open globe injury (1.4 % versus 0.15 %).¹⁰

ANATOMY



Posterior Segment

It includes anterior hyaloid membrane, vitreous humour, retina, choroid and optic nerve.

VITREOUS

Vitreous gel made up of water ,collagen fibrils separated by hyaluronic acid. 80% volume of the eye occupied by vitreous body consists of central and cortical vitreous.

Cortical Vitreous

It consists of anterior hyaloid membrane attached with posterior capsule of lens. posterior hyaloid membrane is loosely attached to the internal limiting membrane of the retina.

Potential space between anterior cortical gel and lens called Berger space. It was bordered by wieger ligament.

Vitreous base ; A 4mm wide zone which straddles the ora serrata where the attachment is strongest. Other firm attachments, optic nerve,macula, lens capsule and retinal vessels.

RETINA

Thin delicate layer of nervous tissue. extends from optic disc to ora serrata..

LANDMARKS:

- 1.OPTIC DISC
- 2.AREA CENTRALIS.
- 3.PERIPHERAL RETINA
- 4.RETINAL BLOOD VESSEL.

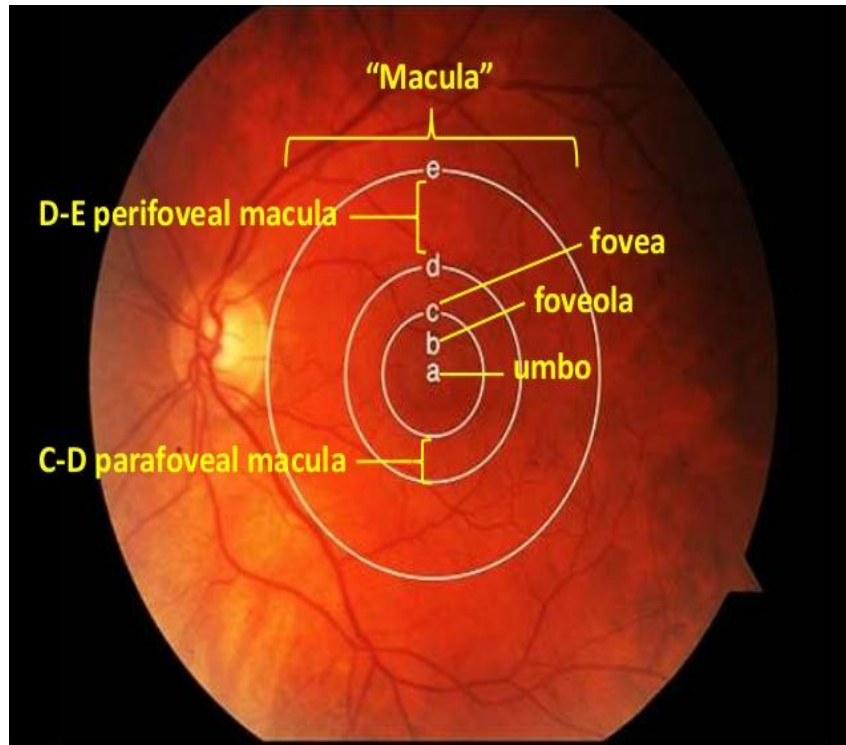
OPTIC DISC:

Pale pink in colour.

Well defined circular area with diameter 1.5mm.

Nerve fibre layer alone passing through lamina cribrosa.

MACULA(AREA CENTRALIS):



Most sensitive part of retina .Area between vascular arcades 5.5mm in diameter centered 3.0mm temporal and 0.8mm inferior to the optic disc center.

PERIFOVEA:

A 1.5mm zone surrounding the parafovea.

PARAFOVEA:

A 0.5mm zone surrounding the fovea, where the ganglion cell layer,inner nuclear layer and henle layer are thickest.

FOVEA:

A 1.5mm concave depression ,mainly useful for high spatial acuity and colour vision.

FOVEOLA:

A 0.35mm in diameter ,where the inner nuclear layer and ganglion cell layer laterally displaced and densely packed cones.

UMBO:

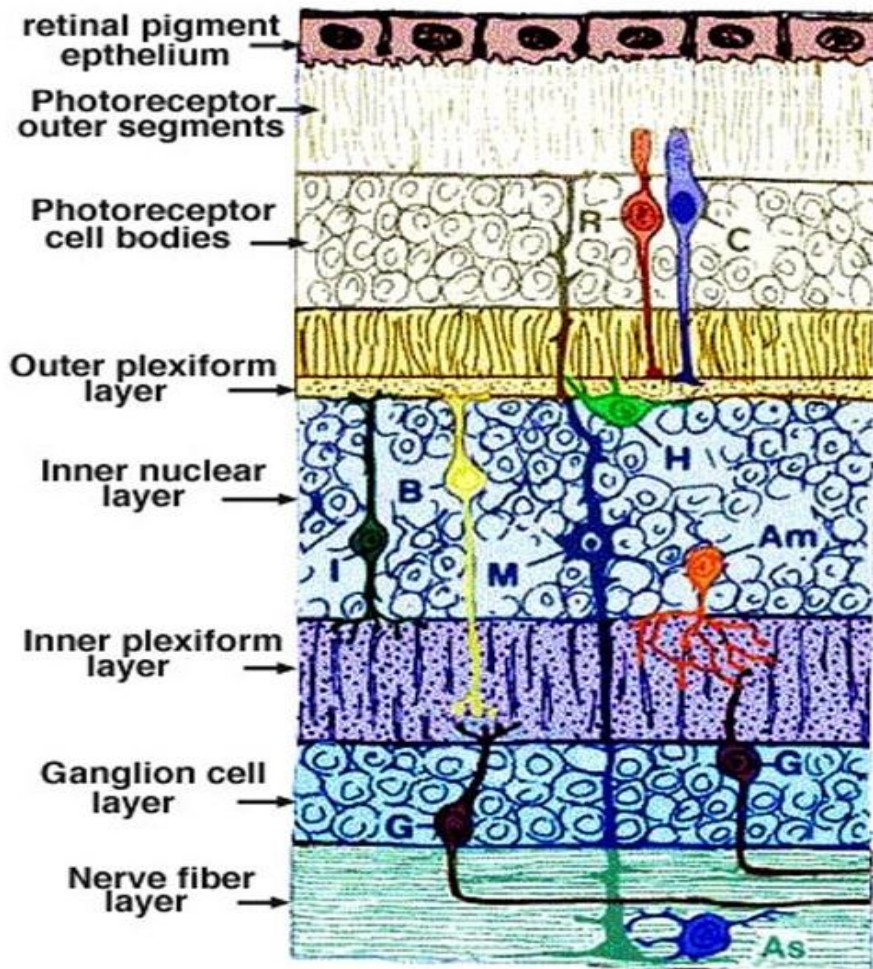
A 150 to 200µm center of the foveola,where the normal light reflex can be observed.

PERIPHERAL RETINA:

NEAR PERIPHERY	1.5mm from the macula.
MID PERIPHERY	3mm from the near periphery.
FAR PERIPHERY	9 - 10 mm from the temporal side of the optic disc.
EQUATOR	24 mm from centre of the optic disc

LAYERS OF RETINA :

There are totally 10 layers as follows, Histologically from inner to outer ,



1. INTERNAL LIMITING MEMBRANE.

2. NERVE FIBER LAYER.

3. GANGLION CELL LAYER.

4. INNER PLEXIFORM LAYER.

5. INNER NUCLEAR LAYER.

6. OUTER PLEXIFORM LAYER.

7. OUTER NUCLEAR LAYER.

8. EXTERNAL LIMITING MEMBRANE.

9. PHOTO RECEPTOR LAYER.

10. RETINAL PIGMENTARY EPITHELIUM.

CHOROID:

- Highly pigmented, vascular loose connective tissue
- Rich in melanocytes gives characteristic dark colour
- Situated between sclera & retina
- Extends from optic nerve to ciliary body
- Nourishment for adjacent retina
- Block light entering through sclera, retina light entering through pupil.

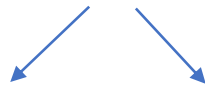
SCLERA:

It composed of irregularly arranged collagen and few elastic fibres, terminates at the histological limbus. Sclera thickest just posterior to the limbus, thinnest immediately behind the muscle insertion.

CLASSIFICATION OF OCULAR TRAUMA:

1). BETTS CLASSIFICATION:

OCULAR TRAUMA



OPEN GLOBE

CLOSED GLOBE

- OPEN GLOBE divided into ,
 - a) Rupture
 - b) Laceration , further divides into,

Penetrating laceration injury.

Intra ocular laceration injury.

Foreign body laceration.

- CLOSED GLOBE divided into,
 - a) Contusion.
 - b) Lamellar lacerating injury.

OCULAR TRAUMA SCORE (OTS)

OTS used to predicting the visual outcome of the open globe trauma, accuracy is around 80%.

METHODS FOR CALCULATING OTS

TABLE 1:

INITIAL VISUAL FACTOR	RAW POINTS
A. Initial visual acuity	NLP = 60 LP to HM = 70 1/200 to 19/200 = 80 20/200 to 20/50 = 90 ≥20/40 = 100
B. Globe rupture	- 23
C. Endophthalmitis	- 17
D. Perforating injury	- 14
E. Retinal detachment	- 11
F. Afferent pupillary defect	- 10

Probability of visual outcome

PROBABILITY OF VISUAL OUTCOME:

Raw score sum	OTS – Score category	NLP(%)	LP/HM (%)	1/200-19/200(%)	20/200-20/50 (%)	≥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
91-100	5	0	1	2	5	92

CLASSIFICATION

OPEN GLOBE INJURIES	CLOSED GLOBE INJURIES
Cornea scleral laceration.	Berlins edema
Intra ocular foreignbody	Traumatic macular hole
Chorio retinal tear	Posterior dislocation of lens.
Intra ocular haemorrhage	Intra ocular haemorrhage
Retinal detachment	Retinitis sclopeteria
	Purtscher retinopathy
	Traumatic retinal detachment
	Optic nerve avulsion
	Traumatic optic neuropathy
	Choroidal rupture

POSTERIOR SEGMENT MANIFESTATIONS:

Vitreous	Pigments in anterior vitreous (tobacco dusting) Dislocated lens into the vitreous. Vitreous haemorrhage. Posterior vitreous detachment. Intra ocular foreign body
Choroid	Choroidal tear Choroidal detachment Choroidal neovascular membrane.
Optic nerve	Disc haemorrhage. Avulsion of optic nerve head Traumatic optic neuritis.

Retina	Retinal edema Intra ocular foreign body. Macular hole. Retinal break . Retinal hole. Retinal detachment. Dialysis
--------	---

BLUNT TRAUMA

- It causes rupture of the eye wall without penetration.
- Mechanical tearing of tissues of eyeball
- Damage to the tissue cells causing damage to the physiological activity.
- Vascular damage leading to ischemia, oedema and haemorrhages.
- Trophic changes due to disturbances of nerve supply.

TRAUMATIC VITREOUS HEMORRHAGE



- It occurs due to rupture of blood vessels of the iris, ciliary body, retina, choroid.
- Very hazy view of fundus, ultrasound examination is needed to detect choroidal detachment, retinal detachment and posterior vitreous detachment.

Example : Ultrasound examination showed entrapment of vitreous strands into the rupture site, indicates occult scleral rupture.

- Mild to moderate VH- Mobile opacities.
- Marked VH- Dense echoes.
- Positional shifting of haemorrhage differentiates from RD.

- Mobility of PVD is more than RD.
- The spike of RD is more than PVD.
- PVD becomes more prominent in higher gain settings.

MANAGEMENT:

a) Closed globe injury with VH, no RD/break

- Bed rest, head elevation.
- Avoid heavy weight lifting /straining/coughing.
- Tablet vitamin C and topical NSAID.
- Re-examination within 2 weeks.

b) Non resolving VH- Persisting for 2-3 months- **vitrectomy**

COMPLICATIONS:

- Secondary open angle glaucoma.
- Haemosiderosis.
- Proliferative vitreo retinopathy.
- Tractional retinal detachment.
- Synchysis.

BERLIN'S EDEMA:

- The term berlins edema caused by shock waves which traverse the eye causing damage to the outer retinal layers.
- Most common retinal manifestations of contusive injury causing acute loss of vision.
- Retinal opacification due to disruption of photoreceptor outer segments, glial swelling involving the posterior pole and mid periphery.
- No effective treatment.



CHOROIDAL RUPTURE:



- Break in the choroid ,bruch s membrane and RPE.
- Most commonly seen in closed globe injuries.
- Classically, a linear tear close to the optic nerve .
- Vision loss due to serous detachment, haemorrhage and retinal edema.
- Macular choroidal tear can cause CNVM.
- MANAGEMNT:
 - a)Frequent follow up to detect CNVM.
 - b) For CNVM – Anti VEGF.

SUPRACHOROIDAL HAEMORRHAGE:

- Accumulation of blood in the supra choroidal space between choroid and sclera.
- Bleeding from the ruptured long and short posterior ciliary arteries .
- Mainly seen in penetrating ocular injuries
- PRESENTATION:
- Incidence of SCH during cataract surgery 0.03% to 0.1 %.
- Intra operative anterior chamber shallowing.
- Loss of red reflex.
- Elevated intra ocular pressure.
- Posterior capsule showed wrinkling and bulging.
- Intra ocular contents extrusion.
- Incidence of SCH during glaucoma surgery 0.15%.

Signs and symptoms,

Increased IOP.

Vitreous prolapse into the anterior chamber.

Decreased visual acuity.

Shallow AC.

Loss of red reflex.

Choroidal elevation.

Severe headache,

Nausea and vomiting.

- Incidence in vitreo retinal surgeries,ranging from 0.17 to 1.9 %.

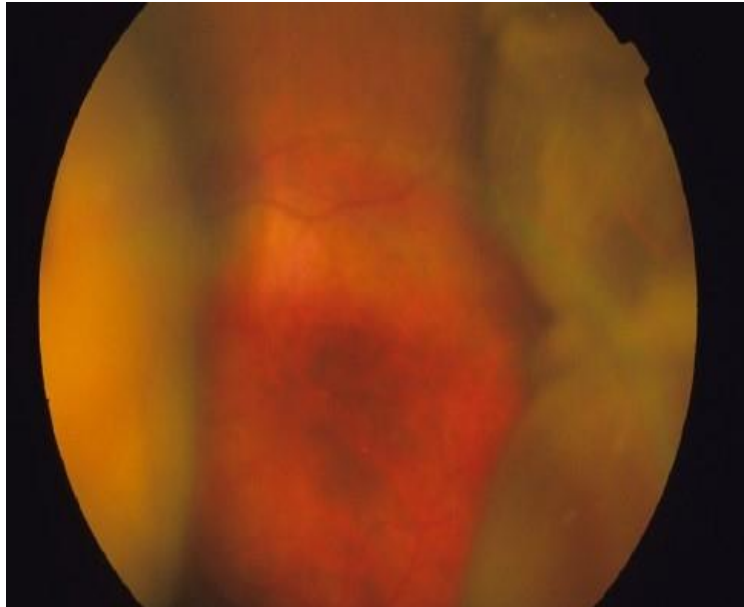
How to prevent and treat?

- Control of IOP
- With holding antiplatlets and anticoagulants.
- Peribulbar anaesthesia with ocular massage.
- Early detection and wound closure.
- Surgical drainage by creating posterior draining sclerotomy.

Picture showed,

a) FUNDUS: dark in appearance .

b) elevation of retina,choroid. apex towards posterior pole.



TRAUMATIC RETINAL DETACHMENT

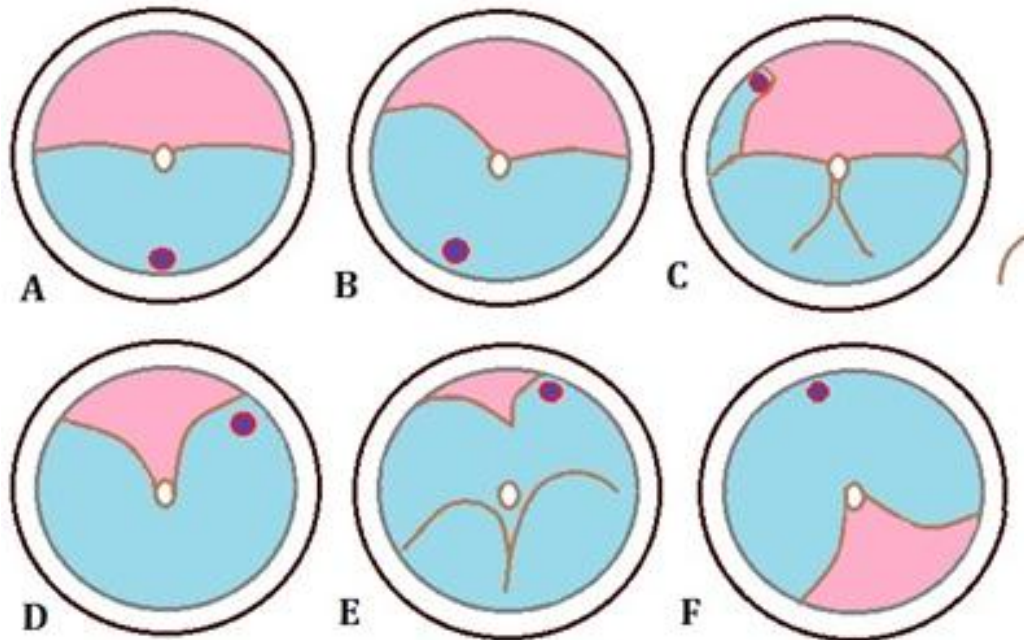
- Blunt trauma causes 70- 80 % of all traumatic RD mainly in young age males, acute RD rarely develops in the age group because vitreous fluid has yet undergone syneresis so it provides an internal tamponade to the retinal layers.
- 90 -95 % of rhegmatogenous retinal detachment having a definite retinal break, with the help of lincoff rules.

LINCOFF RULES

1. A 6'o clock primary break will cause inferior RD with equal fluid levels.
2. A shallow inferior RD in this SRF is spreading slightly higher on the temporal side which states that primary break on that same side.
3. In inferior bullous RD points to the primary break usually lies above the horizontal meridian.
4. For upper nasal quadrant break SRF will revolve around the optic disc, rise on the temporal side until it is level with the location of primary break.
5. For a subtotal RD ,a superior wedge of attached retina points to primary break seen in the periphery nearest its highest border.
6. If the SRF crosses the vertical midline , the primary break is near to 12 o clock, lower edge of RD corresponding to the side of the break.

SYMPTOMS:

- Flashes
- Floaters
- Field defect
- Failing of vision



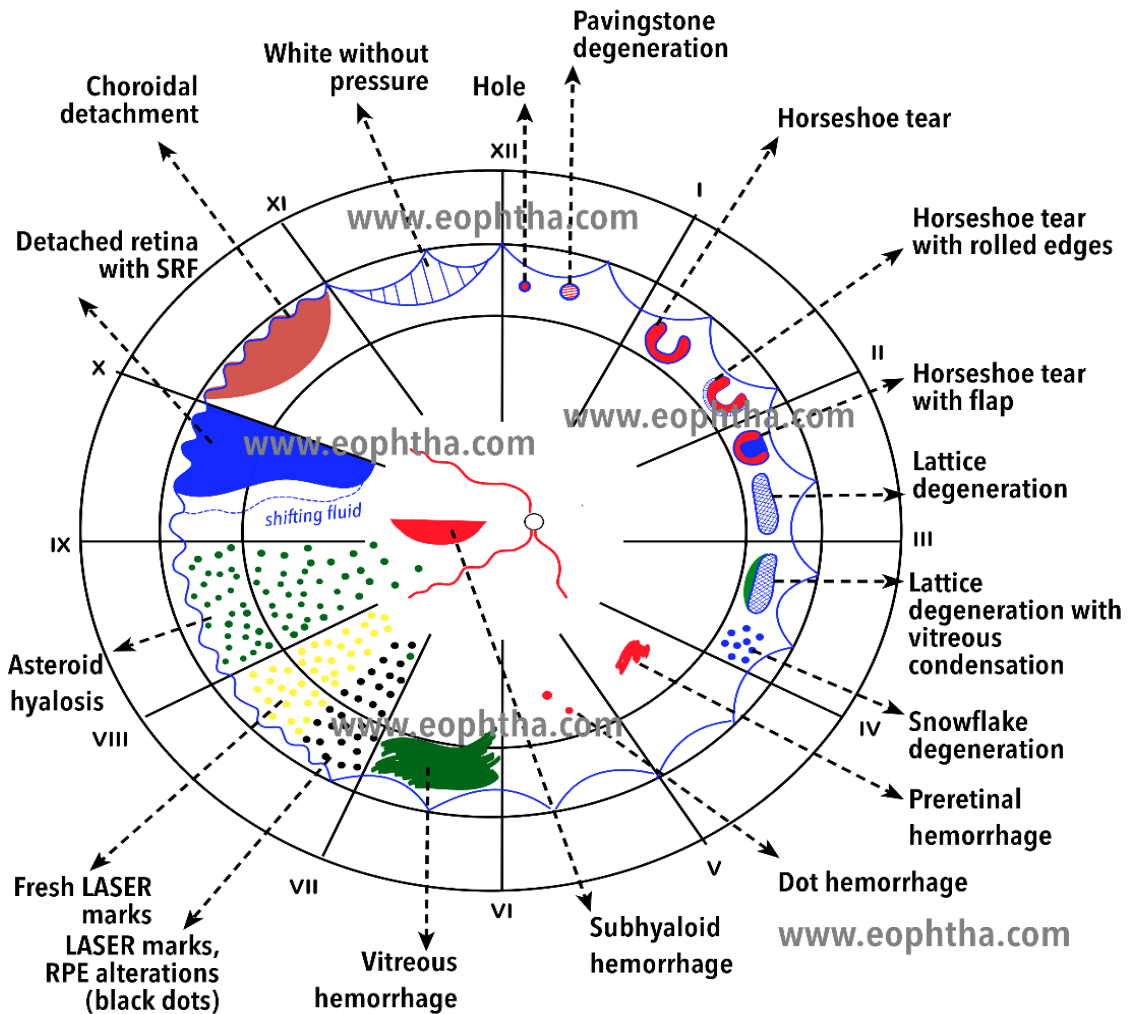
SIGNS:

- Vision- depends on the macular status
- Field of vision- relative scotoma.
- Grey light reflex of the pupil.
- Pupil – normal /RAPD.
- Mild anterior uveitis.
- IOP – mostly decreased.

SCHWARTZ syndrome- obstruction of the trabecular meshwork by the pigmentary granules, photoreceptor segment, inflammatory cells.

- Detached retina is convex, corrugated grey with undulating movements.
Dark and tortuous retinal vessels.
- **Shafer's sign** (tobacco dusting): Pigment cells in anterior vitreous seen in rhegmatogenous RD.
- Posterior vitreous detachment (Weis reflex) can be observed.

RETINAL DIAGRAM



SIGNS OF OLD RD:

- Demarcation line. it takes 3 months to develop.
- Secondary intra retinal cyst. It takes one year to develop.

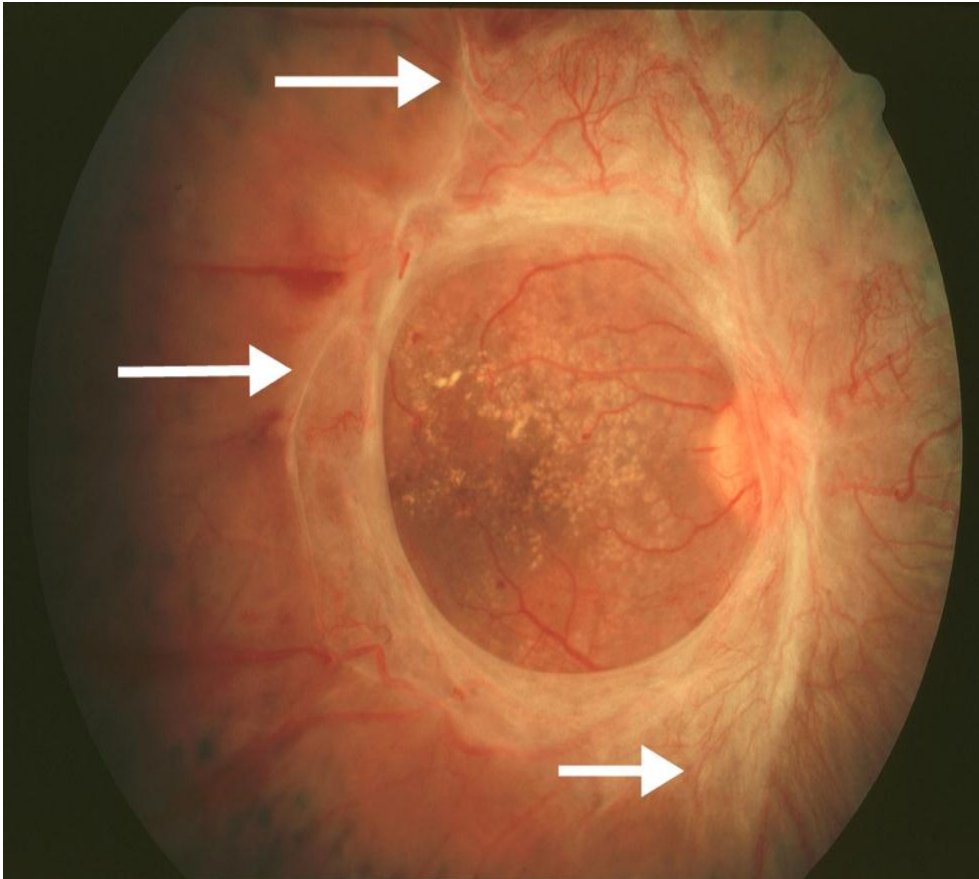
MANAGEMENT:

Aim: To reattach the retina quickly, which follows the GONIN RULE.

- To see the hole
- Seal the hole
- Approximate the retina (SRF drainage)
- Maintain the approximation (scleral buckling)

RD Surgery it can be internal (PPV) or External procedure, which depends on the position of tear.

TRAUMATIC TRACTIONAL RETINAL DETACHMENT:



- Vitreous incarceration, presence of blood in the vitreous acts as a stimulus to fibroblastic proliferation, causing epi retinal membrane.
- ERM leads to contraction and shortening from the vitreous base, causing RD.
- MANAGEMENT: Pars plana vitrectomy.

COMPLICATIONS OF RD SURGERY:

- **INTRAOPERATIVE COMPLICATIONS:**
 1. Vitreous haemorrhage.
 2. Sub retinal haemorrhage
 3. Choroidal haemorrhage
 4. Scleral buckle displacement.

- **POST OPERATIVE COMPLICATIONS:**
 1. Raised IOP
 2. Re-detachment
 3. PVR with vitreous haemorrhage with new breaks.
 4. ERM
 5. Residual SRF
 6. Diplopia.

RETINAL DIALYSIS:

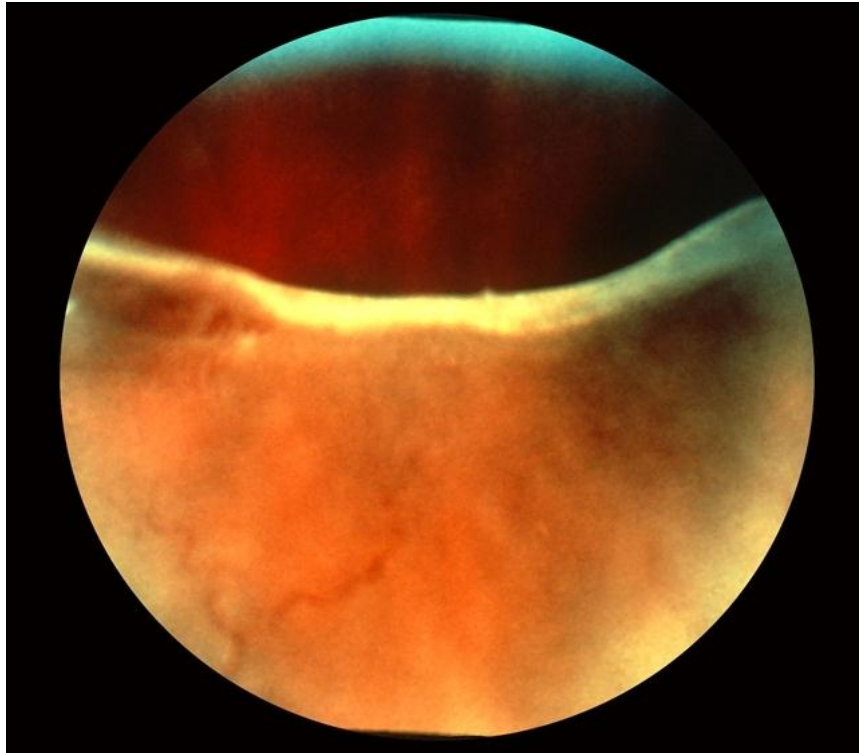
- Retinal disinsertion at ora from non pigmented pars plana epithelium.

- Posterior margin of dialysis attached to vitreous

- Retina remains attached to vitreous base.

- Most common location inferotemporal quadrant,

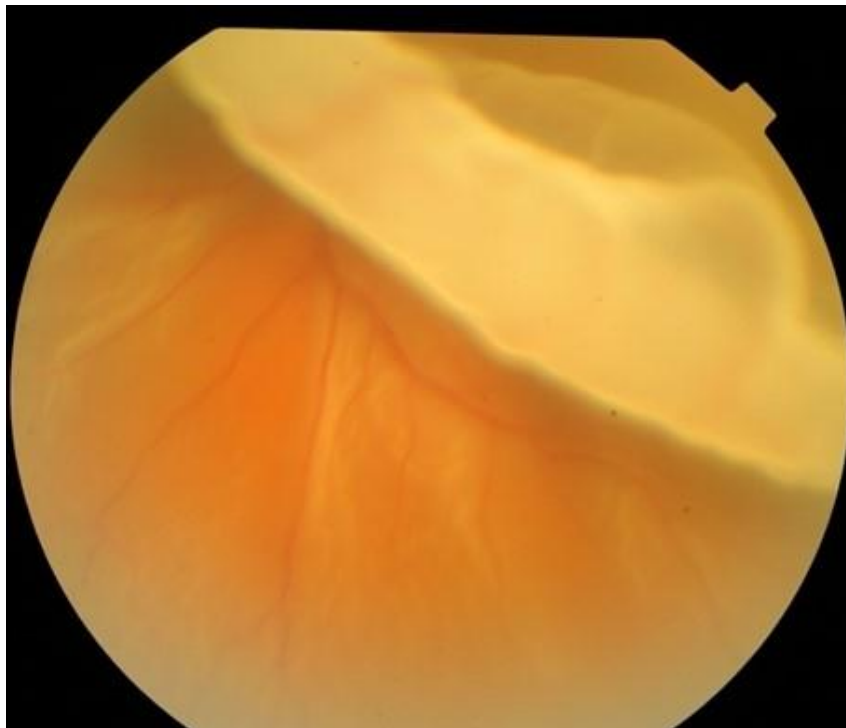
- In traumatic retinal dialysis - superonasal quadrant is a most common location.



- Asymptomatic, due to minimal symptoms.
- Retinal dialysis can be associated with rhegmatogenous retinal detachment.
- Pathognomonic for ocular contusion injury – avulsion of vitreous from the base.
- Management: minimal SRF – Photocoagulation / cryopexy.
- Associated with RD – Scleral buckling can be done.

GIANT RETINAL TEAR:

- It involves 90 degree or more of the circumference of the globe.
- Full thickness circumferential tear.
- Anterior margin of tear attached to vitreous
- Most common location – posterior ora. inferotemporal and superonasal quadrant.
- Associated with posterior vitreous detachment.



- **MANAGEMENT:**

Pars plana vitrectomy, with PFCL stabilization, silicon oil implantation.

HORSESHOE TEAR:



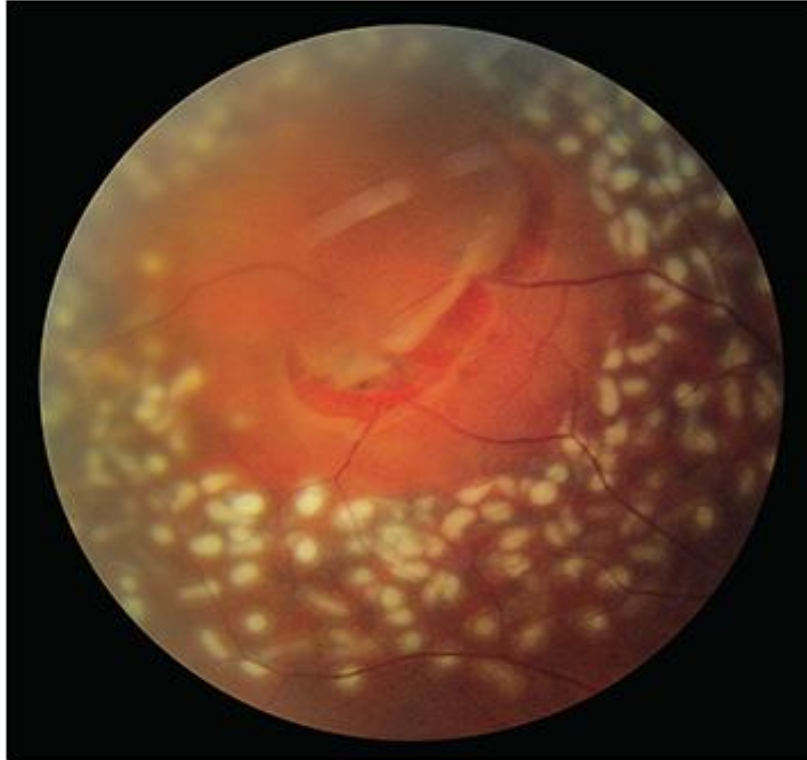
- A full thickness retinal break, areas of strong vitreo retinal adhesion creates a traction.
- Sub retinal fluid enters through the break causing further detachment.
- **MANAGEMENT:**

360 degree scleral buckling followed by sub retinal fluid drainage and cryo laser.

OR

Parsplana vitrectomy, AFE(air fluid exchange), drainage of SRF and endolaser.

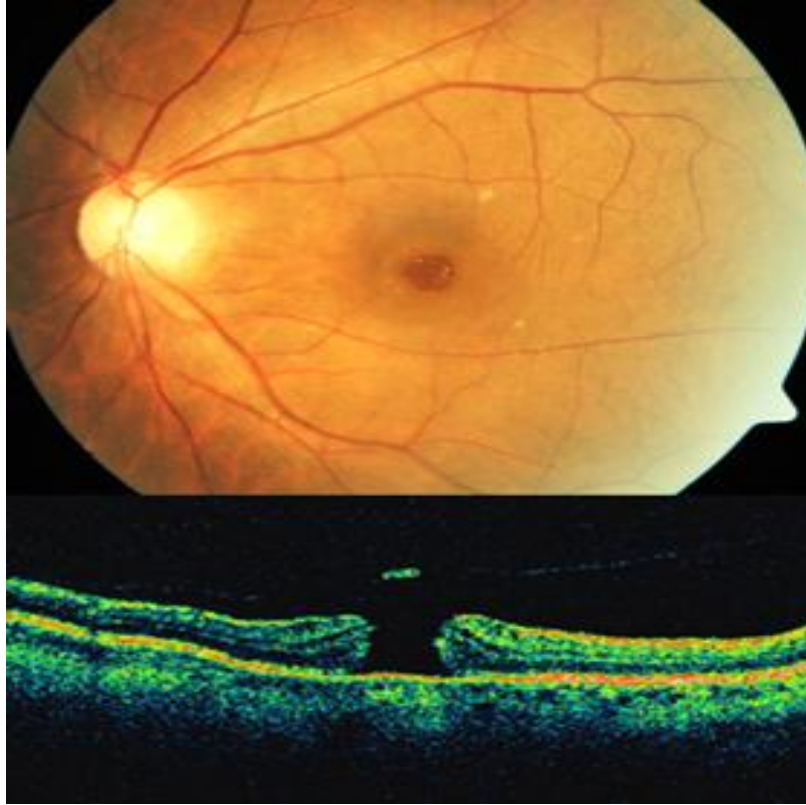
IMAGE SHOWING BARRAGED RETINAL BREAK:



VITREOUS BASE AVULSION:

- Incidence: mostly followed by blunt trauma.
- Pathognomonic for ocular contusion injury.

POST TRAUMATIC MACULAR HOLE:



- Blunt trauma causes full thickness macular hole
- Mechanisms are contusion necrosis and vitreous traction.
- Initially it can be undetected due to submacular haemorrhage.

MANAGEMENT:

Vitrectomy with ILM peeling and intra ocular gas tamponade.

- Prognosis; spontaneous closure / good surgical outcome.
- Visual recovery may be poor in holes larger than 600 μ , coexisting macular RPE atrophy, optic nerve / choroidal injury.

PURTSCHER RETINOPATHY:

- Acute compression injuries to head and thorax initiates endothelial damage and complement mediated leuko embolization, which causes granulocyte aggregation. .
- Complications ; arterial occlusion and extravasation.
- Fundus :
 - Large cotton wool spots, hemorrhages , retinal edema mainly surrounding the optic disc.

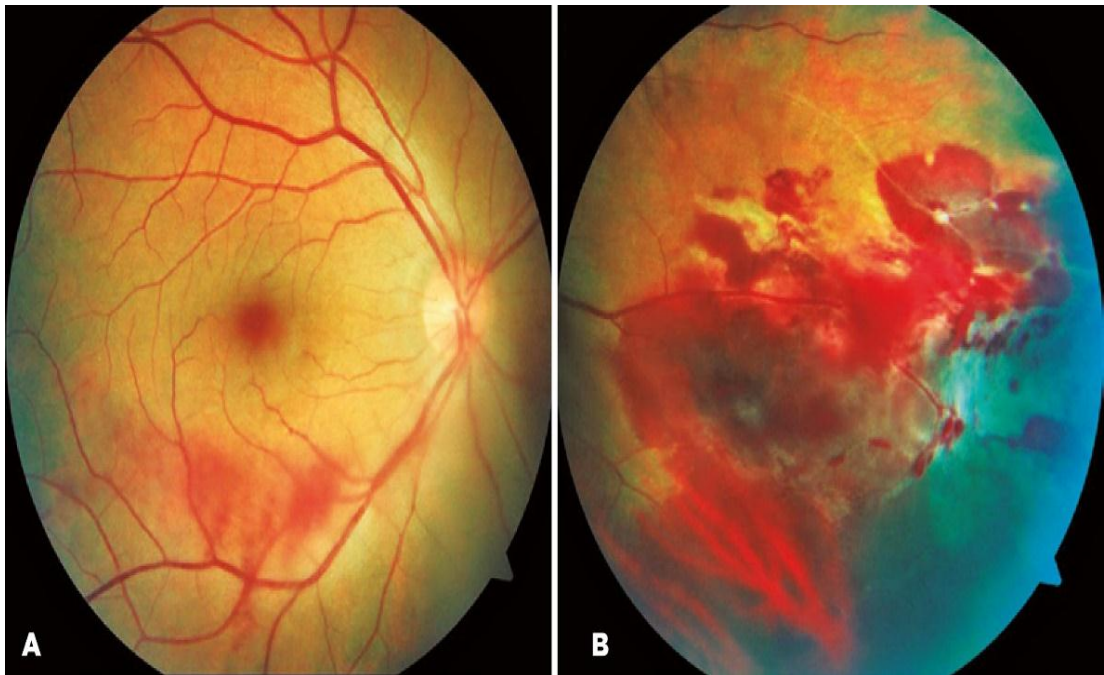


TERSON SYNDROME :

- Trauma causing acute intra cranial haemorrhage leads to acute rise in intra ocular venous pressure,resulting in rupture of peripapillary and retinal vessels.
- Patient can have intra cranial haemorrhage and intraocular haemorrhage.

CHORIO RETINITIS SCLOPETARIA:

- Injury can be caused by shockwaves from a high velocity missile (ballistic bullet)passing through the orbit without direct globe contact.
- Multiple chorioretinal rupture with intact sclera and intra ocular haemorrhage.
- Blood resolves and replaced by fibrous tissue.



- **MANAGEMENT:** Observation.

TRAUMATIC OPTIC NEUROPATHY:

- TON is suspected where profound vision loss and RAPD following trauma.
- Most common site of injury is intra canalicular part followed by intracranial portion.
- Force transmitted through the optic nerve to optic canal
- Direct TON seen in penetrating injuries causing optic nerve impingement.
- Indirect TON seen in deceleration injury, disc pallor can be seen.

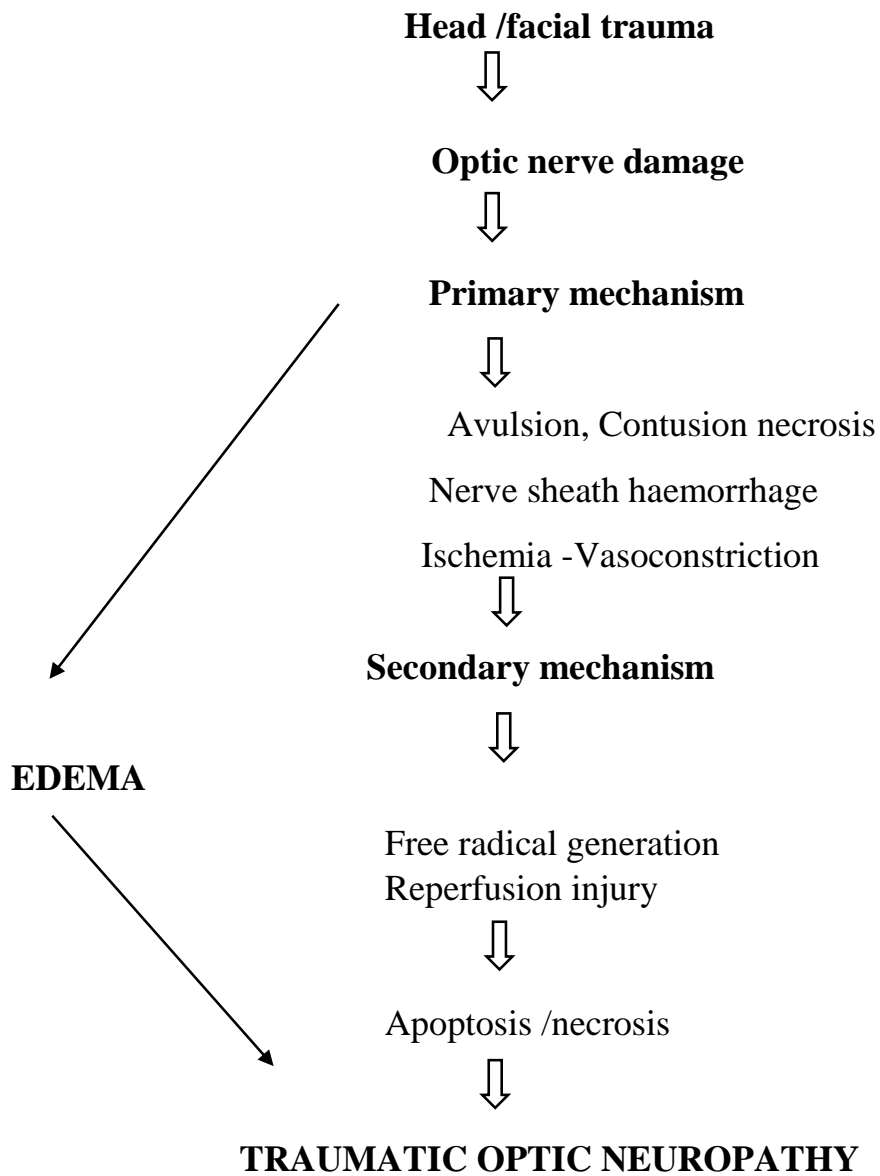


- Treatment :

Intra venous methylprednisolone pulse steroid therapy can be given.

- Surgical approaches :

Optic canal decompression.



PENETRATING INJURY:

- Laceration of the eyeball at a single entry site.
- If more posterior rupture is suspected, gentle 360-degree peritomy and scleral exploration should be performed.
- If the rupture is very posterior repair without expression of intraocular content, then it can be left to heal without suturing.
- Delayed complications:
 - Tractional RD, Cyclitic membrane, Phthisis bulbi.
- Depending upon the conditions vitrectomy may be postponed to 2-14 days.

Primary wound closure should not be delayed.

PERFORATING INJURY:

- Various objects like knives and needles can cause injury, which has both entrance and exit wounds.
- It can initiate fibrous proliferation along the scaffold of damaged vitreous.
- Vitrectomy can be performed.

Indications ,

Non-resolving vitreous haemorrhage, vitreous traction.

INTRAOCULAR FOREIGN BODY:

- **FB in posterior segment:** may enter through sclera and anterior segment of eye and traverse the vitreous and reaching the posterior wall .

EFFECT OF RETAINED FOREIGN BODIES:

The reaction depends upon the composition of the particles.

- Retained IOFB are associated with endophthalmitis nearly 7 to 13 % of cases.
- Management:

Appropriate surgical removal of intra ocular foreign body with intravitreal antibiotics.



CT IMAGE :



INERT SUBSTANCES:

- In the posterior chamber, substances like gold, silver, lead may cause liquefaction, vitreous gel opacification.

MERCURY:

- Purulent inflammation.

COPPER:

- Retinal degeneration,
- Papillitis
- Phthisis bulbi.
- Secondary glaucoma
- Highly refractive deposit on the surface of retina.

IRON:

- Iron particle undergo electrolytic dissociation by the current of rest and its ions are disseminated throughout eye.
- Usually occurs 2 months to 2 years of the injury.
- Siderosis deposition of iron on the ocular tissues.
- Epithelial structures of the eye are most affected.

VEGETABLE MATERIAL:

Among the various vegetable material, Wood is the commonest IOFB.

Manifestations: endophthalmitis

panophthalmitis.

HOW TO LOCATE?

- B scan.
- CT (radio opaque FB)
- MRI is contraindicated for the metallic FB

Which causes the migration of FB from the original site.

- Management: pars plana vitrectomy.

POST TRAUMATIC ENDOPHTHALMITIS:

- Incidence: 2 – 7 % of penetrating injuries.
- Which involves infection of anterior and posterior segments of the eye after penetrating injuries.
- It can be reduced by proper wound closure and early removal of FB.
- Most of them due to bacterial, gram positive organisms like enterococcus, streptococcus, staphylococcus, and bacillus .
- Bacillus cereus accounts for 25% of cases, sensitive to vancomycin.
- Fortified topical vancomycin (50 mg/ml) along with ceftazidime (100 mg/ml) every hour.



SYMPATHETIC OPHTHALMIA:

- Bilateral diffuse granulomatous pan uveitis that occurs after penetrating injury.
- The injured eye is known as exciting eye and the fellow eye developing inflammation days to years later is the sympathizing eye.
- Presentation in trauma induced cases in between 2 weeks to 3 months after initial injury in 65%
- Incidence – 0.2-0.5% after injury.
- 0.01 % following intra ocular surgery.

Symptoms:

Sympathizing eye develops,

- Irritation,
- Blurred vision,
- Retrolental flare,
- Photophobia,
- Loss of accommodation.

Signs:

- Mild to moderate granulomatous anterior uveitis.

Fundus:

Exudative retinal detachment.

Vasculitis, optic disc swelling.

Multifocal choroidal infiltrates develop in the midperiphery with sub RPE infiltrates corresponding to Dalen – Fuchs nodules.

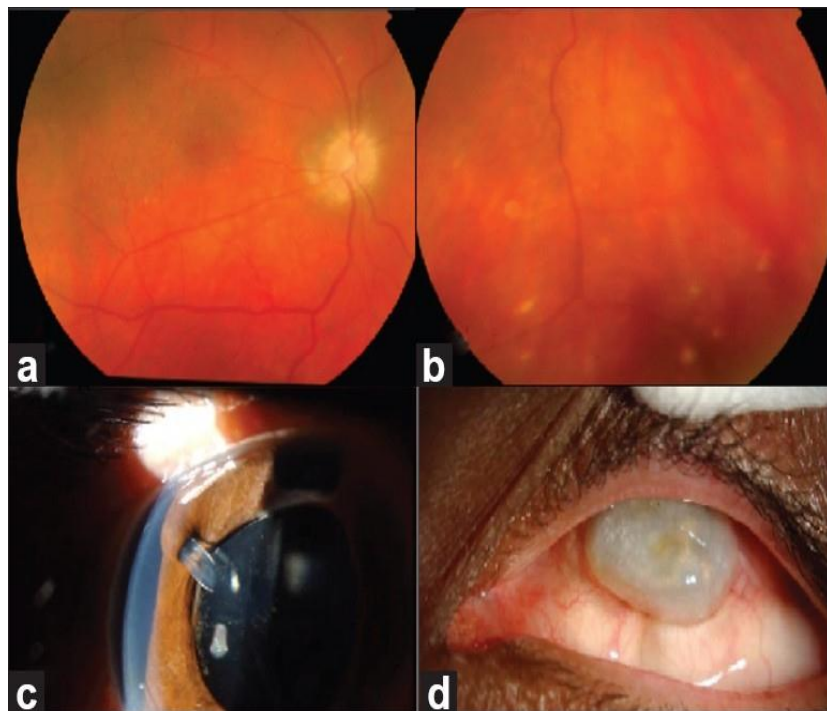
After inflammation settles, residual chorioretinal scarring causes a sunset glow appearance similar to VKH.

Investigations :

B scan – choroidal thickening.

Fundus fluorescein angiography:

Multiple foci of leakage at the level of the RPE, with subretinal pooling in the presence of ERD.



Treatment :

Steroids.

Immunosuppressant - azathioprine, cyclosporine, methotrexate.

Enucleation

MANAGEMENT:

STEP 1: ASSESSMENT OF PATIENT STABILITY.

ABCDE: airway, breathing, circulation, disability, exposure.

- In the case of chemical injury, copious irrigation with saline should come first.
- Shield the eye. Don't proceed any ocular examination until the patient is stable.
- Never remove infraorbital foreign body prior to full examination.

STEP 2: HISTORY.

- Nature of injury, past surgical/ medical treatment

STEP 3: EXAMINATION AND RECOGNITION OF THE PROBLEM:

- Examine the both eye if needed imaging can be done.

STEP 4: TREATMENT OF UNDERLYING PROBLEM:

- Tetanus prophylaxis
- Globe repair is within 24 hours of injury.

STEP 5: CLOSE FOLLOW-UP

- Note if any secondary sequelae :(angle recession glaucoma, RD, traumatic iritis)

STEP 6: PREVENTION

- Protective eyewear (polycarbonate lenses).
- Workplace modifications should be made.

AIM AND OBJECTIVE

To evaluate the posterior segment manifestations and visual outcome

PRIMARY OBJECTIVE

To analyse the age and sex incidence, mode of injury, various clinical presentation, the severity of injuries, mode of treatment and the visual outcome of Ocular Trauma.

SECONDARY OBJECTIVE:

To assess the best corrected visual acuity and posterior segment status following treatment.

MATERIALS AND METHODS

This Prospective study will be conducted at Vitreoretina department, RIOGOH, Egmore, Chennai for a period of 12 months.

METHODOLOGY:

Ocular trauma cases presenting to vitreo retinal services will be registered , evaluated and followed during the study period of 2018 – 2019.

A complete history of the patient, mode of injury, Slit lamp anterior segment examination, and dilated fundus 90 D and indirect ophthalmoscopic examination will be done. If needed radiological imaging can be done. They can be managed according to their mode of injury and presentation by either medical or surgical treatment. Incidence, mode of injury, place of injury, presenting vision follow up vision and complications will be analysed in this study.

INCLUSION CRITERIA:

All ocular trauma cases

Age >3 yrs<75yrs

EXCLUSION CRITERIA:

1. Ventilator patients.
2. Age <3yrs>75 yrs
3. Old h/o Ocular trauma.

SCREENING PROCEDURES/ VISITS:

Complete history of presenting injury, mode of injury

Visual acuity (Snellen's acuity chart)

Extra ocular movements.

Intra ocular pressure using Goldmann Applanation tonometer.

Slit lamp anterior segment examination.

Visual fields.

Colour vision.

Direct ophthalmoscopy.

Slit lamp 90 D examination .

Indirect ophthalmoscopic examination.

Radiological imaging

X ray orbit (AP and LATERAL view)

Posterior segment (B SCAN)ultrasonography

CT/MRI (if needed)

OCT Macula (whenever required)

Follow up visit

ASSESSMENTS OF PARAMETERS:

Visual acuity status (Improved / reduced / maintained)

Various posterior segment manifestations.

OBSERVATION AND RESULTS

TABLE 1: AGE DISTRIBUTION

AGE GROUP	FREQUENCY	PERCENT
Up to 20 Years	8	16.0
21-30 Years	14	28.0
31-40 Years	7	14.0
41-50 Years	6	12.0
Above 50 Years	15	30.0
Total	50	100.0

In this study of 50 patients, below 20 Years were recorded in 16% and 21-40 Years age group people 28% & 14% of the patients. Remaining 41 – 50 Years showing that 12%. Finally maximum percentage of 30% shown in the age group of above 50 yrs.

FIGURE 1

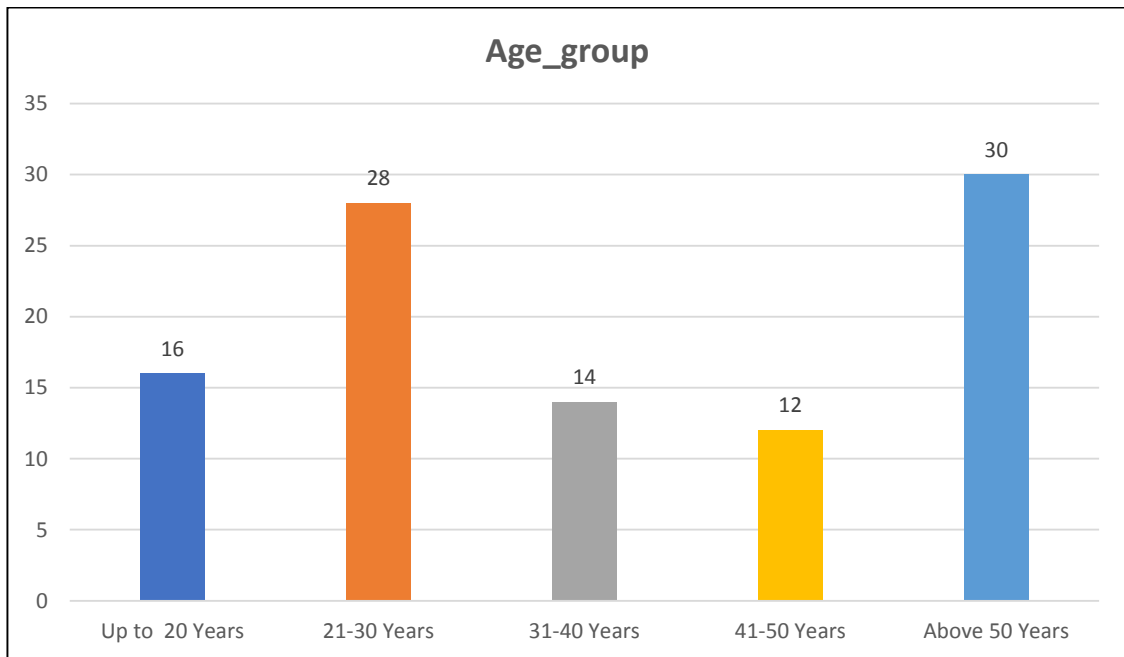


TABLE 2 : SEX RATIO

SEX	FREQUENCY	PERCENT
Male	39	78.0
Female	11	22.0
Total	50	100.0

Above the table representing male and female ratio out of 50 patients. Female patients recorded 22%. Maximum percentage of male patients are 78%. It showing that male patients coming under trauma are high when compare to female.

FIGURE 2:

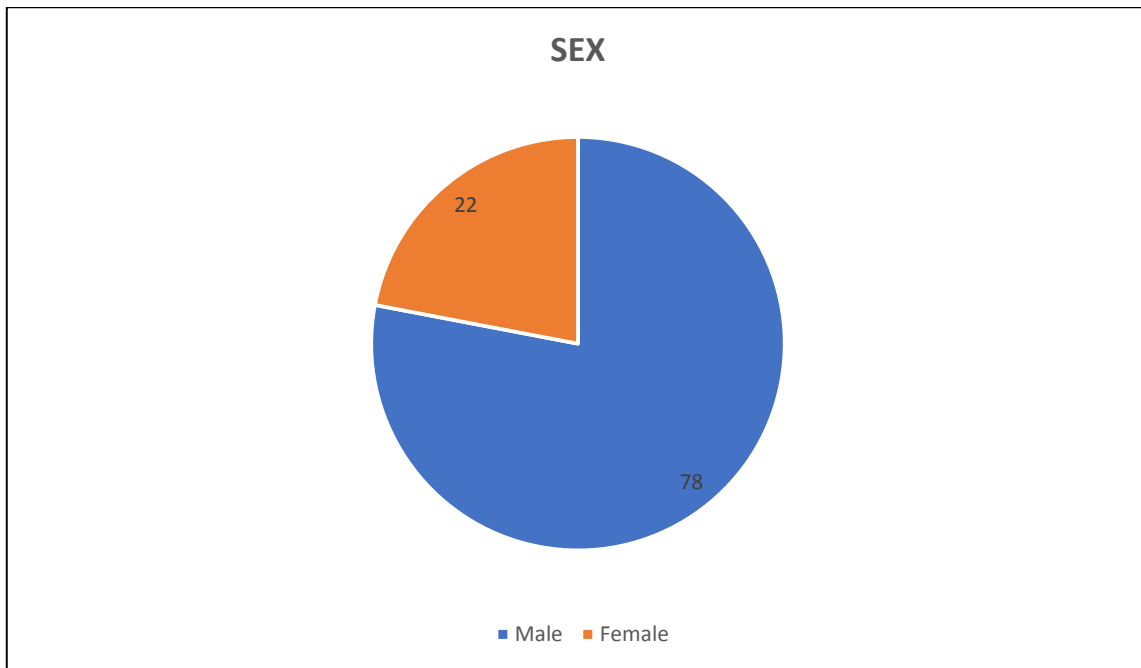


TABLE 3 : PLACE

PLACE	FREQUENCY	PERCENT
RTA (2 WHEELER)	9	18.0
RTA (4 WHEELER)	5	10.0
SELF	19	38.0
SPORTS	4	8.0
WORK PLACE	13	26.0
Total	50	100.0

Above the table we noticed that mode (place) of trauma cases. As per the data of 50 patients low priority goes to sports injury 8%. Remaining mode of injury like two and four wheeler comes around 10%-18%.medium priority to work place injury ranging 26%. Higher priority to self injury 38%.

FIGURE 3:

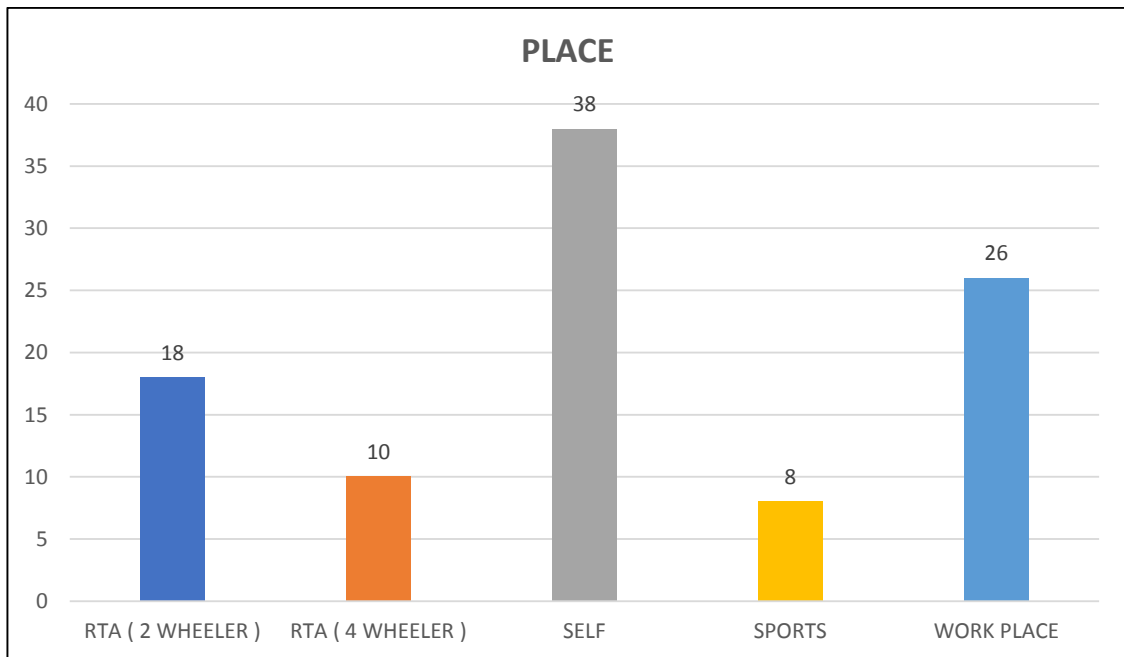


TABLE 4 : TYPE OF INJURY

TYPE OF INJURY	FREQUENCY	PERCENT
CLOSED	38	76.0
OPEN	12	24.0
Total	50	100.0

In this study of 50 patients analysis based on open and closed injury. This table clearly showing that 76% was closed type. Remaining 24% was coming under open type injury.

FIGURE 4:

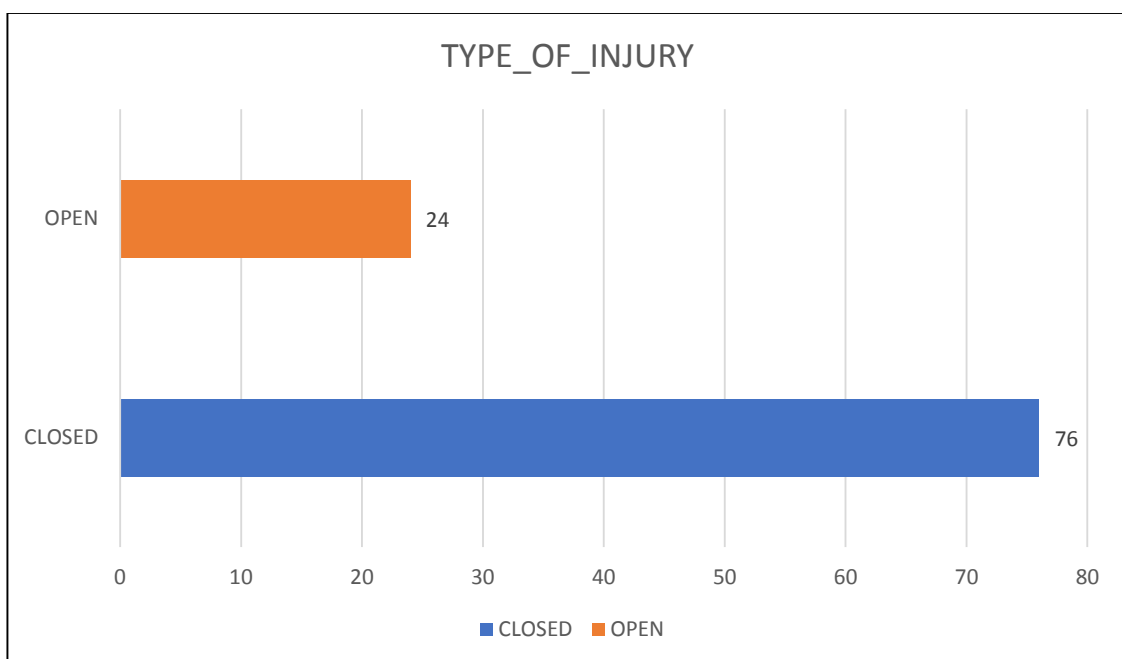


TABLE 5 : EYE INVOLVEMENT

EYE_INVOLVED	FREQUENCY	PERCENT
BE	2	4.0
LE	20	40.0
RE	28	56.0
Total	50	100.0

Above that table representing the eye involvement during trauma injury. Most of the injury percentage were observed in right eye 56%. Probably left eye also caused injury with 40% respectively.

FIGURE 5

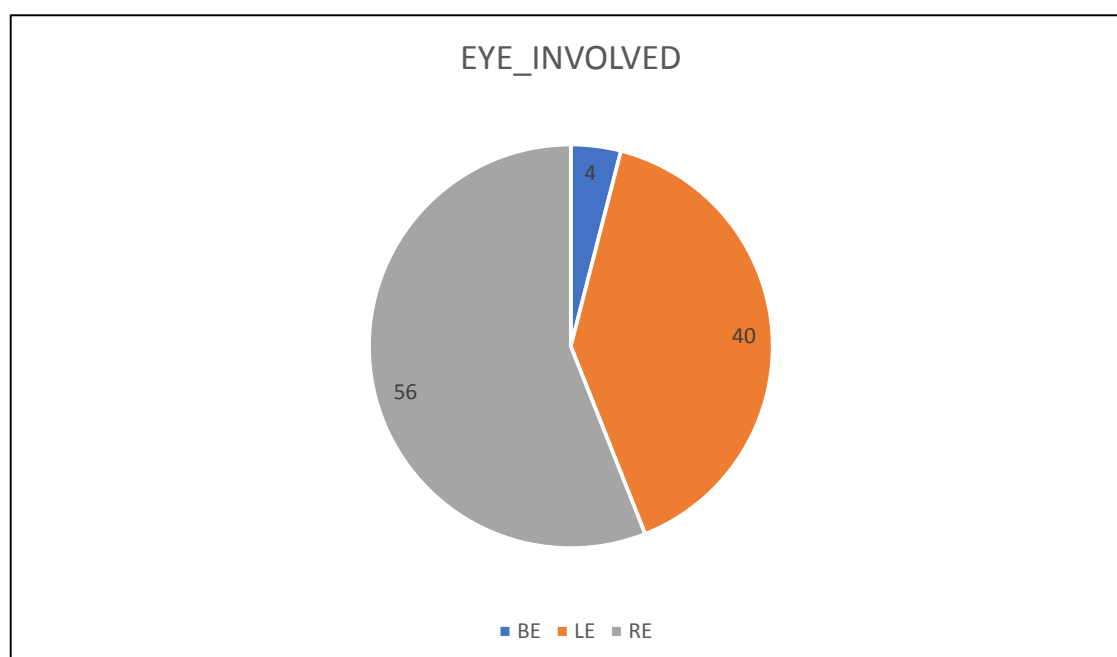


TABLE 6 : ONSET

ONSET	FREQUENCY	PERCENT
IMMEDIATE	28	56.0
1-3 DAYS	8	16.0
3-7 DAYS	4	8.0
LESS THAN TWO WEEK	3	6.0
ABOVE TWOWEEK	7	14.0
Total	50	100.0

As per the analysis out of 50 patients, this table showing patient percentage of reaching hospital after they got injury. Most of the cases were reached with immediate, that percentage was 56%. Remaining cases onset with 16%. Other than that some case are 6%-8% .

FIGURE 6:

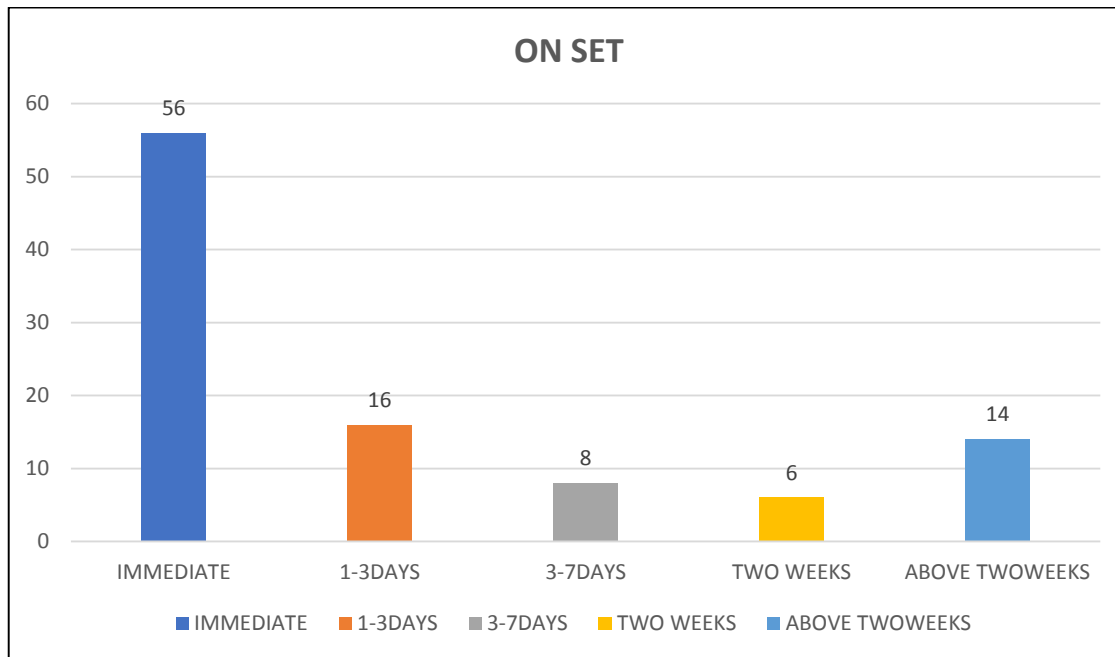


TABLE 7 : VITREOUS INVOLVEMENT

VITREOUS	FREQUENCY	PERCENT
IOL DROP IN VITREOUS	2	10%
LENS DISLOCATION	2	10%
POSTERIOR VITREOUS DETACHMENT	1	5 %
SUBHYALOD HAEMORRHAGE	3	14%
VITREOUS HAEMORRHAGE	13	62 %
Total	21	100.0

Most common presentation in this table found that vitreous haemorrhage 62 %
 Less commonly lens/ IOL dislocation into the vitreous.

FIGURE 7:

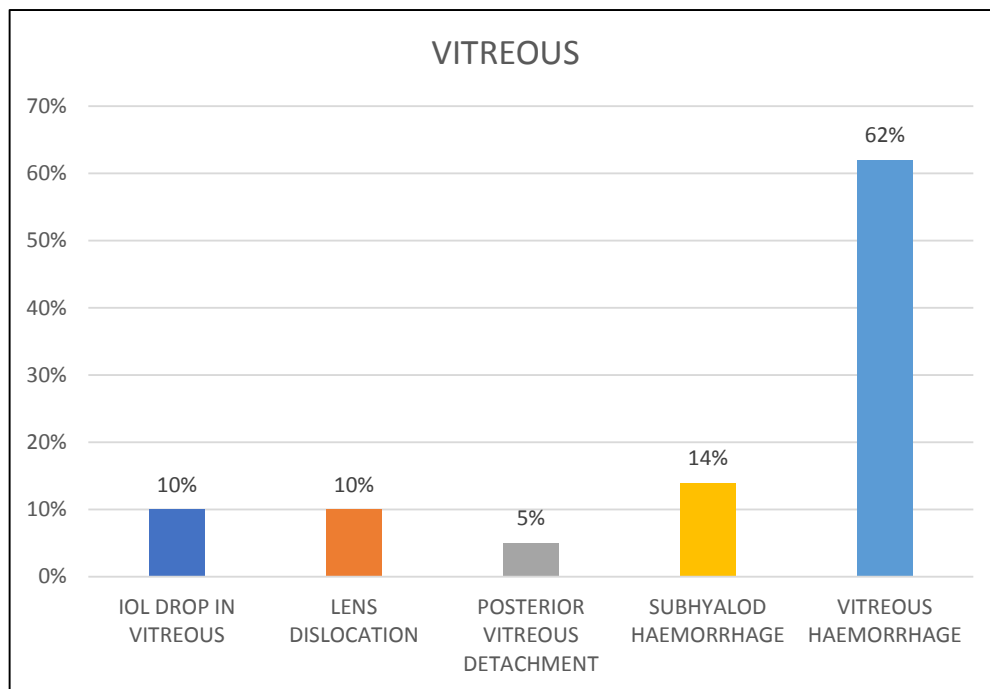


TABLE 8: RETINA

RETINA	Frequency	Percent
RETINAL DETACHMENT	13	54.17%
PURTSCHER 'S RETINOPATHY	2	8.33%
RETINAL DIALYSIS	1	4.17%
RETINAL EDEMA	5	20.83%
SEROUS DETACHMENT	1	4.17%
SUB RETINAL HAEMORRHAGE	2	8.33%
TOTAL	24	100.0

Retinal detachment are the most common in this showed 54.17 %. Some of the percentage goes with other injuries.

FIGURE 8:

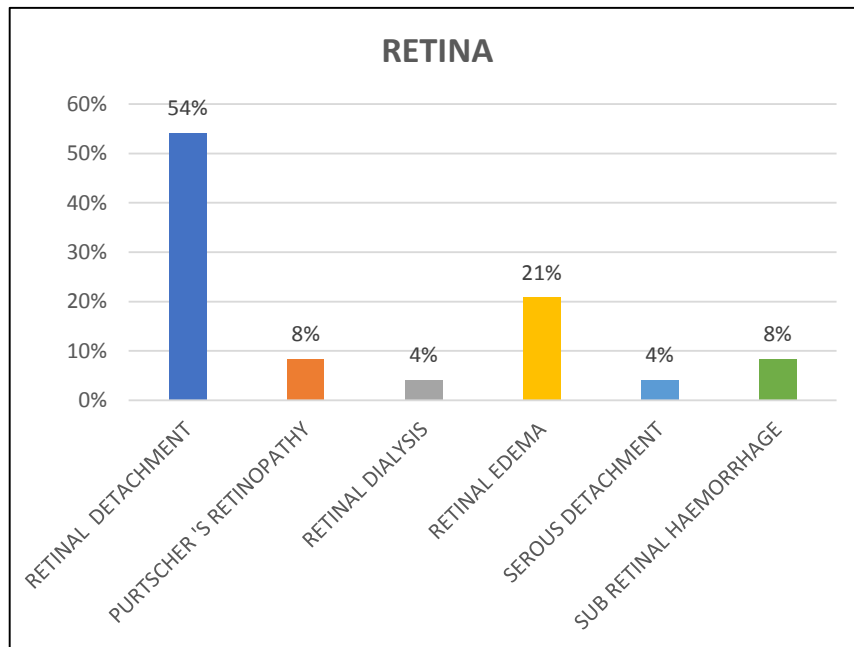


TABLE 9: MACULA

MACULA	Frequency	Percent
EDEMA	12	80.0
MACULER HOLE WITH EDEMA	3	20.0
Total	15	100.0

Above this table macular edema having 12 cases out of 50. macular hole with edema showed only 3 cases.

FIGURE 9:

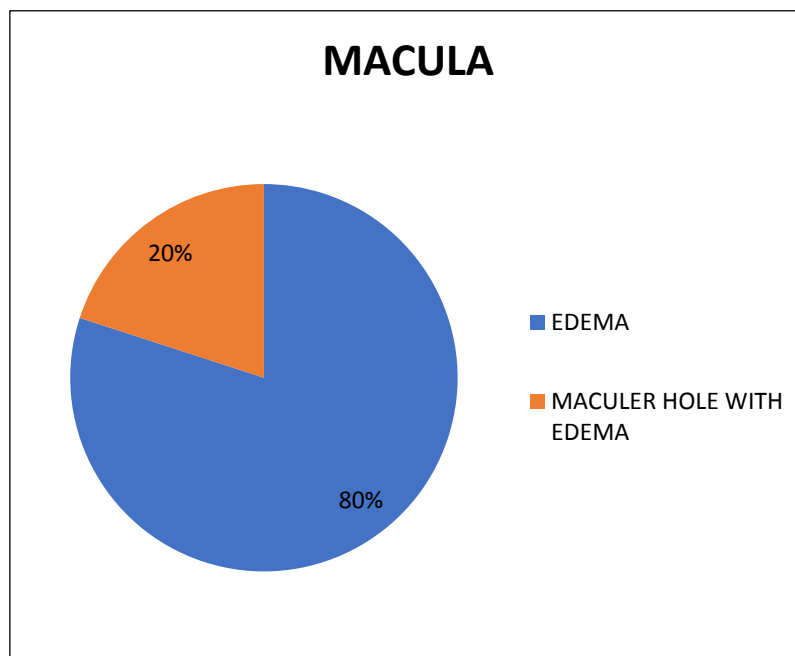


TABLE 10: CHOROID:

CHOROID	Frequency	Percent
CHOROIDAL DETACHMENT	3	60.0
CHOROIDAL TEAR	2	40.0
Total	5	100.0

In the choroid 60 % of cases showed choroidal detachment ,40 % showed choroidal tear.

FIGURE 10:

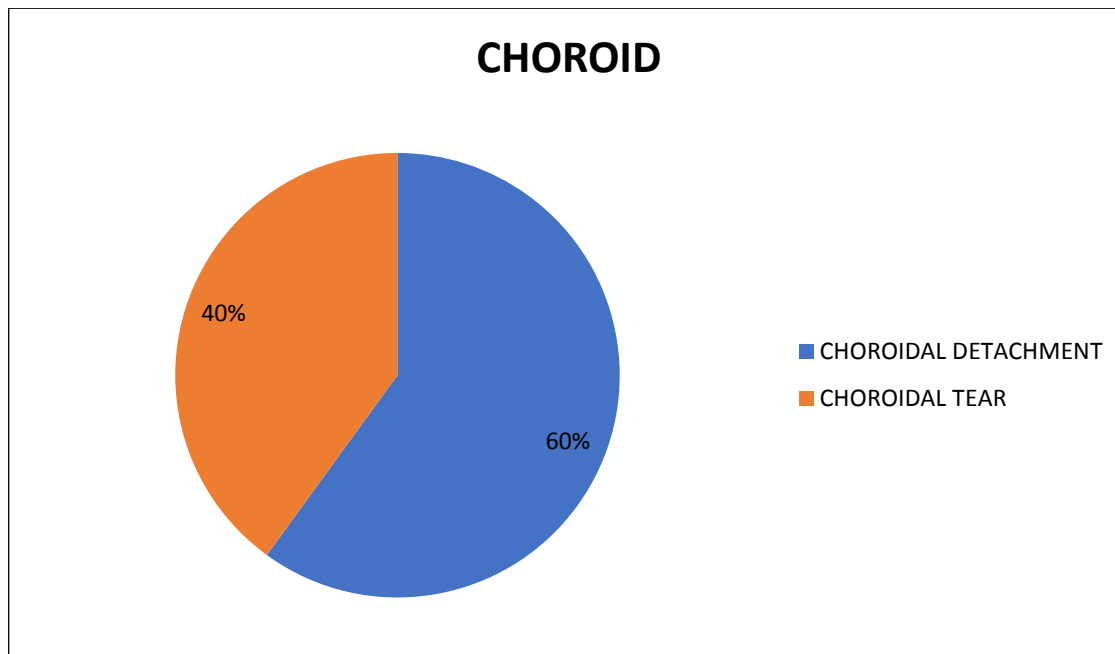


TABLE 11 : OPTIC NERVE

OPTIC NERVE	Frequency	Percent
N	46	92.0
TEMPORAL PALLOR/ TRAUMATIC OPTIC NEUROPATHY	4	8.0
Total	50	100.0

Out of 50 cases , 4 cases (8%) showed traumatic optic neuropathy.

FIGURE 11

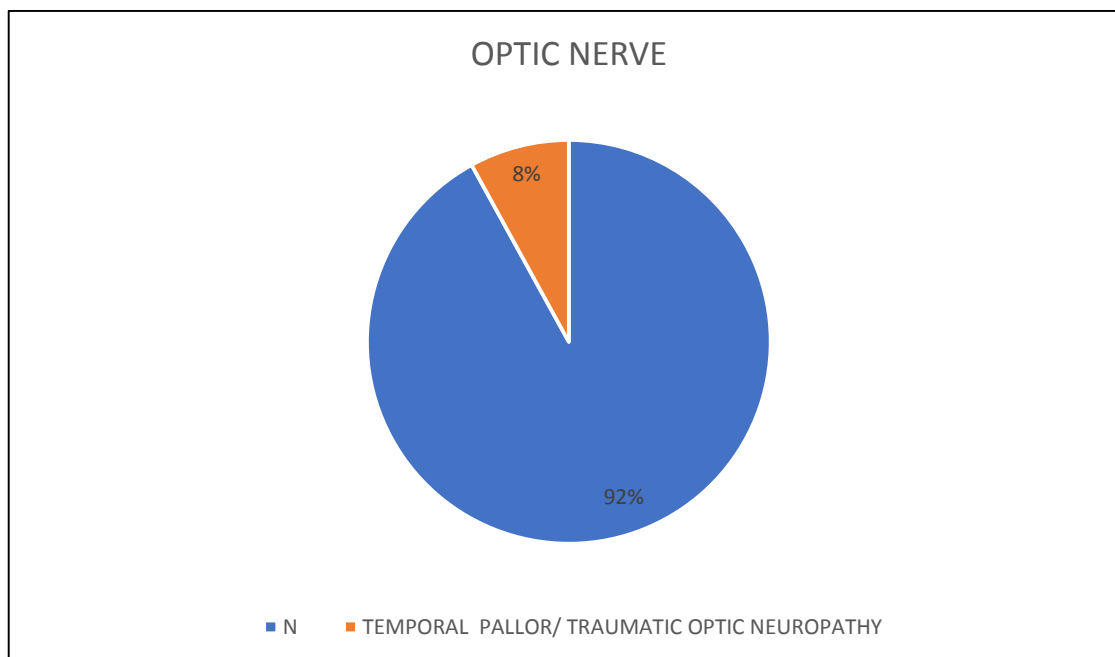


TABLE 12 : OTHERS

OTHERS	FREQUENCY	PERCENT
N	49	98.0
ENDOPHTHALMITIS	1	2.0
Total	50	100.0

In this study 2% of cases belongs to traumatic endophthalmitis.

FIGURE 12:

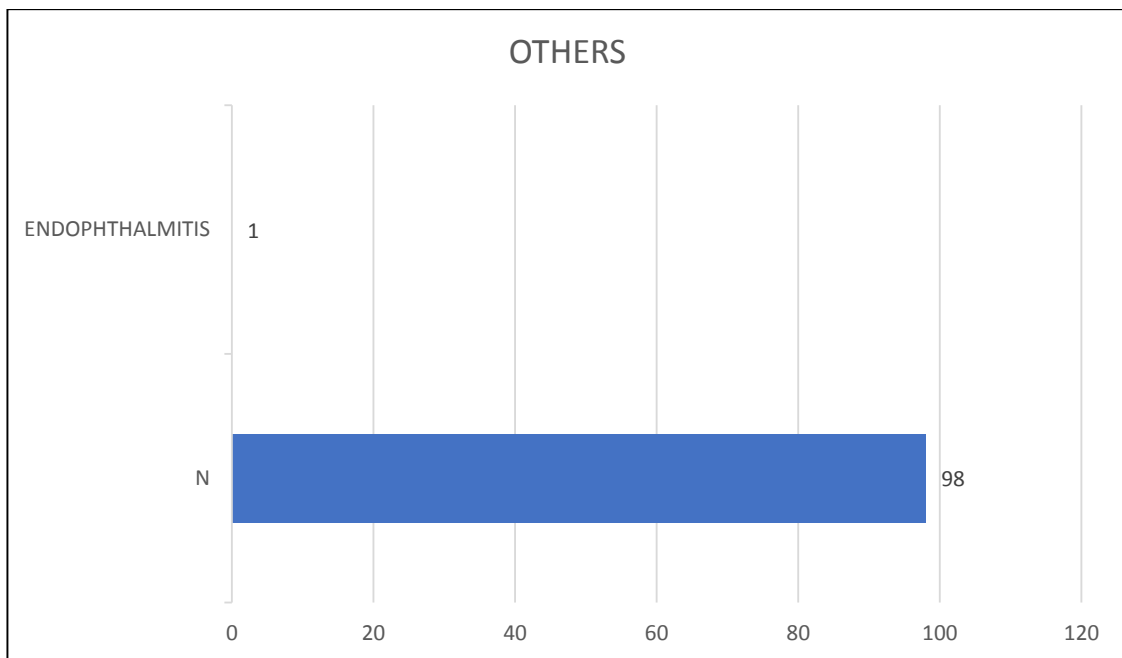


TABLE 13: TREATMENT

TREATMENT	FREQUENCY	PERCENT
LASER	3	6.0
MEDICAL	28	56.0
SURGICAL	19	38.0
Total	50	100.0

Out of 50 cases, 56% cases managed medically, 38 % managed by surgery. Laser does remaining 6%.

FIGURE 13:

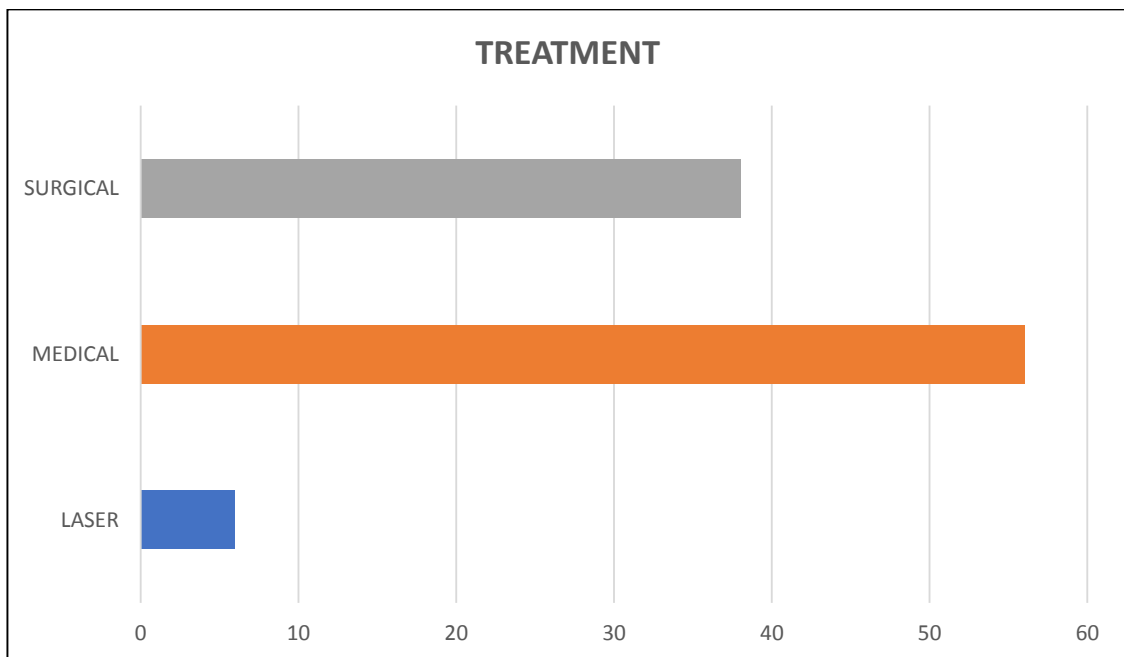


TABLE 14 : FINAL OUTCOME.

Final Outcome	Frequency	Percent
IMPROVED	27	54.0
MAINTAINED	14	28.0
REDUCED	9	18.0
Total	50	100.0

Out of 50 cases 27 cases showed improvement in visual status.14 % maintained their vision during the follow up period also.

FIGURE 15:

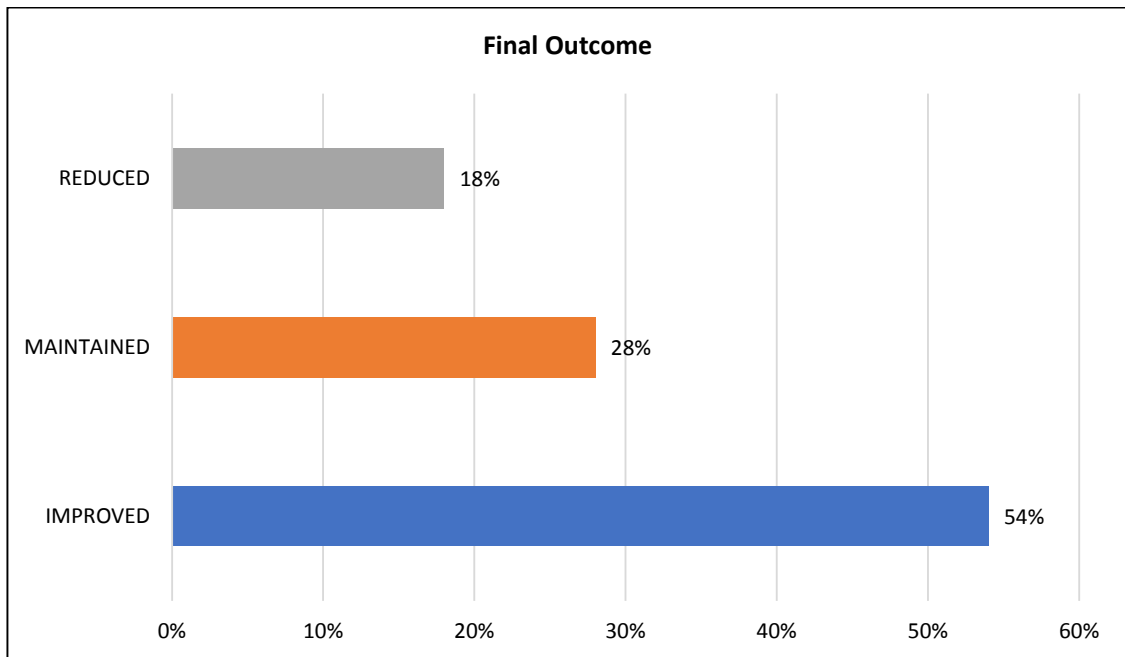


TABLE 16: COMPARISON BETWEEN AGE GROUP AND VISUAL OUTCOME

Crosstable

			Final_Outcome			Total
			IMPROVED	MAINTAINED	REDUCED	
age_group	Up to 20 Years	Count	5	2	1	8
		% within final_Outcome	18.5%	14.3%	11.1%	16.0%
	21-30 Years	Count	5	5	4	14
		% within final_Outcome	18.5%	35.7%	44.4%	28.0%
	31-40 Years	Count	3	4	0	7
		% within final_Outcome	11.1%	28.6%	0.0%	14.0%
	41-50 Years	Count	4	1	1	6
		% within final_Outcome	14.8%	7.1%	11.1%	12.0%
	Above 50 Years	Count	10	2	3	15
		% within final_Outcome	37.0%	14.3%	33.3%	30.0%
	Total	Count	27	14	9	50
		% within final_Outcome	100.0%	100.0%	100.0%	100.0%

Pearson Chi-Square=7.936 p=0.440

In this table showed that above 50 years of cases showed good improvement in follow up vision about 37.0 %,since most common presentation seen in this age group.

FIGURE 16:

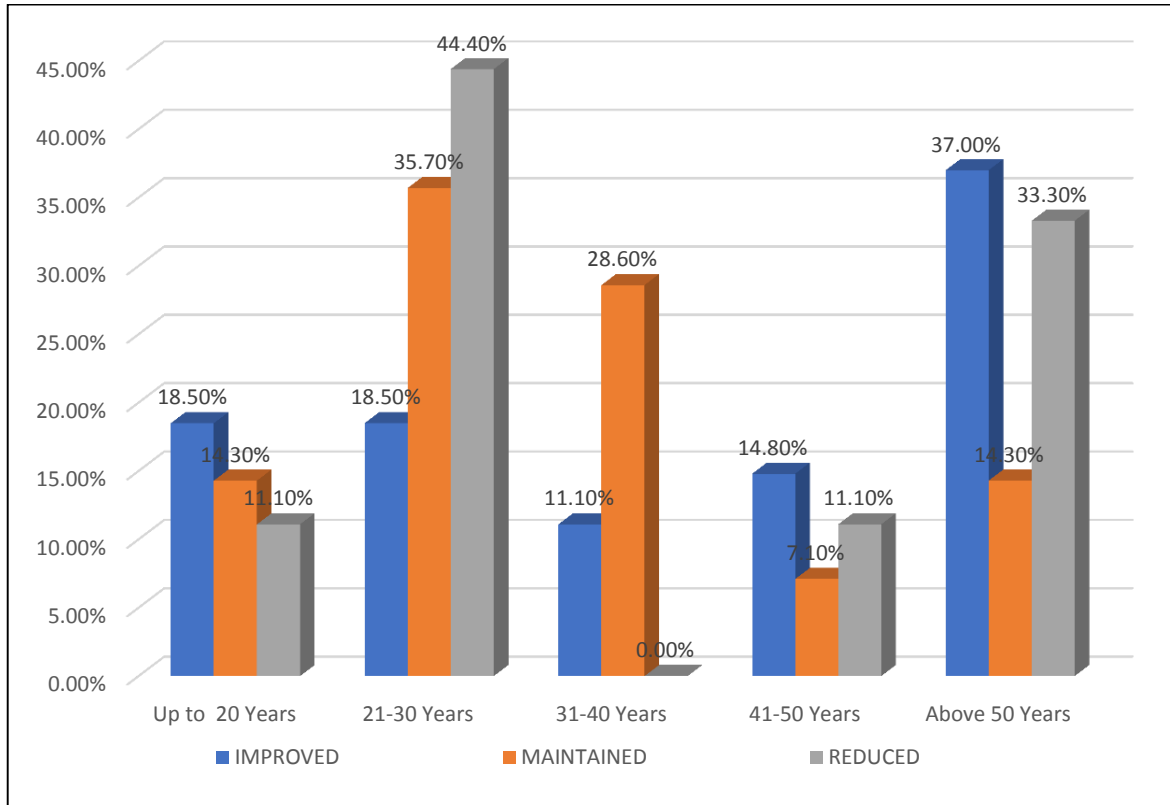


TABLE 17: COMPARISON BETWEEN SEX AND VISUAL OUTCOME

Crosstab

		final_Outcome			Total	
		IMPROVED	MAINTAINED	REDUCED		
SEX	Male	Count	20	13	6	39
		% within final Outcome	74.1%	92.9%	66.7%	78.0%
	Female	Count	7	1	3	11
		% within final Outcome	25.9%	7.1%	33.3%	22.0%
Total		Count	27	14	9	50
		% within final Outcome	100.0%	100.0%	100.0%	100.0%

Pearson Chi-Square=2.717 p=0.257.

In this table, male patient showed improvement in final visual outcome 74.1%, than females. it was not statistically significant.

FIGURE 17:

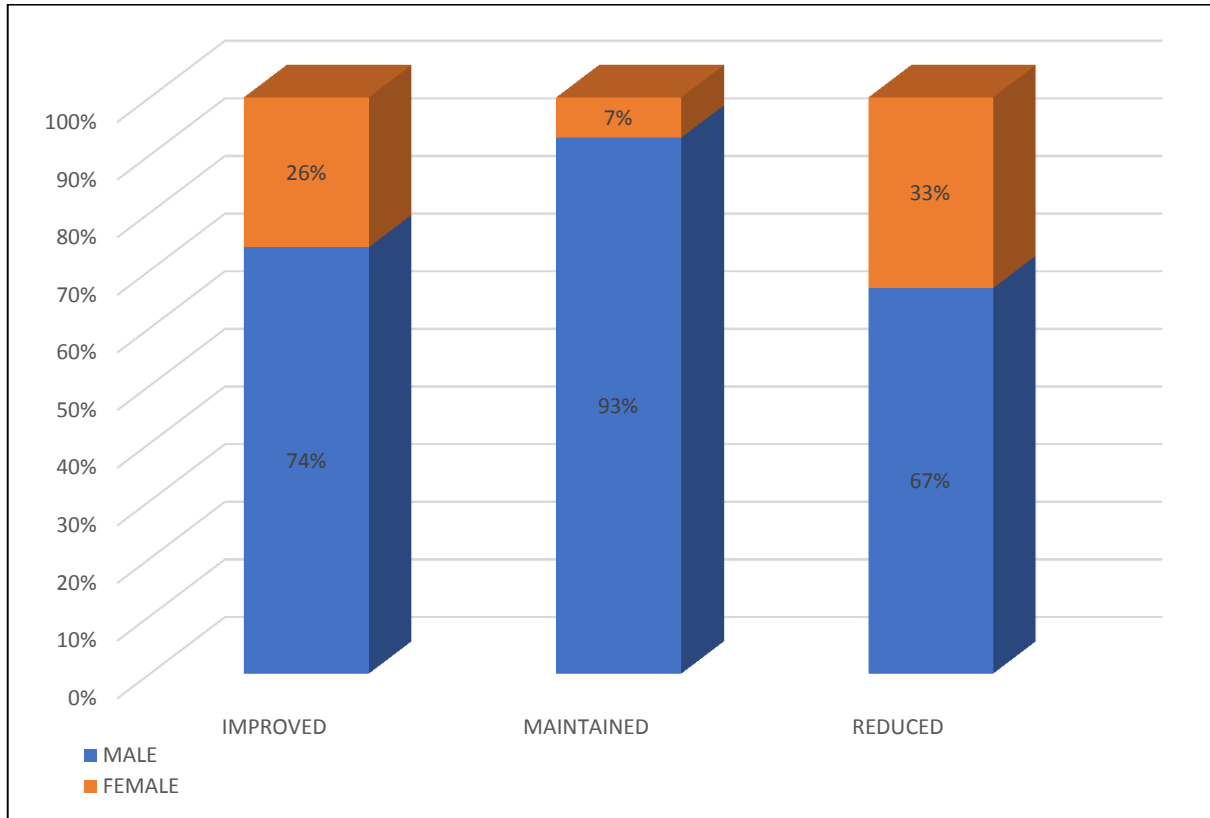


TABLE 18:**TYPE OF INJURY AND VISUAL OUTCOME**

		Final Outcome			Total
		IMPROVED	MAINTAINED	REDUCED	
TYPE OF INJURY	Count	23	9	6	38
	CLOSED % within final Outcome	85.2%	64.3%	66.7%	76.0%
	Count	4	5	3	12
	OPEN % within final Outcome	14.8%	35.7%	33.3%	24.0%
Total	Count	27	14	9	50
	% within final Outcome	100.0%	100.0%	100.0%	100.0%

Pearson Chi-Square=2.732 p=0.255

Here, closed globe injuries showed 85.2 % improvement in final visual outcome than others.

FIGURE 18:

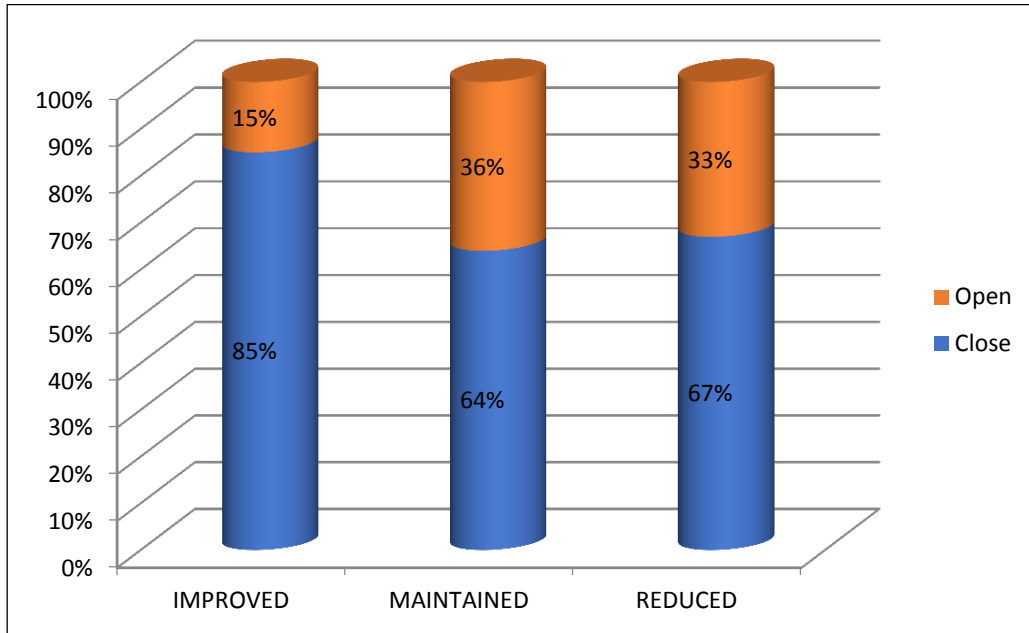


TABLE 19:**COMPARISON BETWEEN LATERALITY AND OUTCOME**

		final_Outcome			Total
		IMPROVED	MAINTAINED	REDUCED	
EYE INVOLVED	Count	2	0	0	2
	BE % within final Outcome	7.4%	0.0%	0.0%	4.0%
	Count	10	6	4	20
	LE % within final Outcome	37.0%	42.9%	44.4%	40.0%
	Count	15	8	5	28
	RE % within final Outcome	55.6%	57.1%	55.6%	56.0%
Total	Count	27	14	9	50
	% within final Outcome	100.0%	100.0%	100.0%	100.0%

Pearson Chi-Square=1.841 p=0.765

In this table , Right eye showed 55.6% of final visual outcome than others, since Involvement of right eye is more in our study.

FIGURE 19:

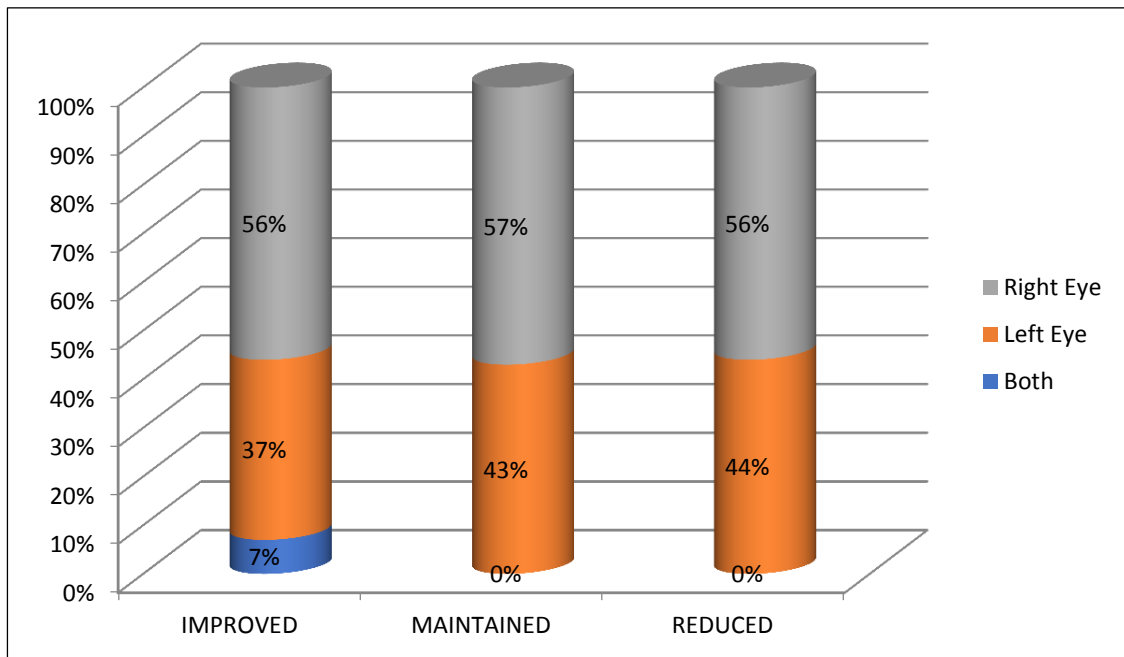


TABLE 20:**COMPARISON BETWEEN THE TIME OF PRESENTATION AND FINAL VISUAL OUTCOME****Crosstab**

		Final Outcome			Total
		IMPROVED	MAINTAINED	REDUCED	
Immediate	Count	15	9	4	28
	% within final Outcome	55.6%	64.3%	44.4%	56.0%
1-3DAYS	Count	6	1	1	8
	% within final Outcome	22.2%	7.1%	11.1%	16.0%
ONSET 4-7Days	Count	3	0	1	4
	% within final Outcome	11.1%	0.0%	11.1%	8.0%
8-15 Days	Count	1	1	1	3
	% within final Outcome	3.7%	7.1%	11.1%	6.0%
Above 15Days	Count	2	3	2	7
	% within final Outcome	7.4%	21.4%	22.2%	14.0%
Total	Count	27	14	9	50
	% within final Outcome	100.0%	100.0%	100.0%	100.0%

Pearson Chi-Square=5.901 p=0.04

In this study , patients when presented immediate after the trauma, showed improvement in outcome in 55.6% which is statistically significant.

FIGURE 20:

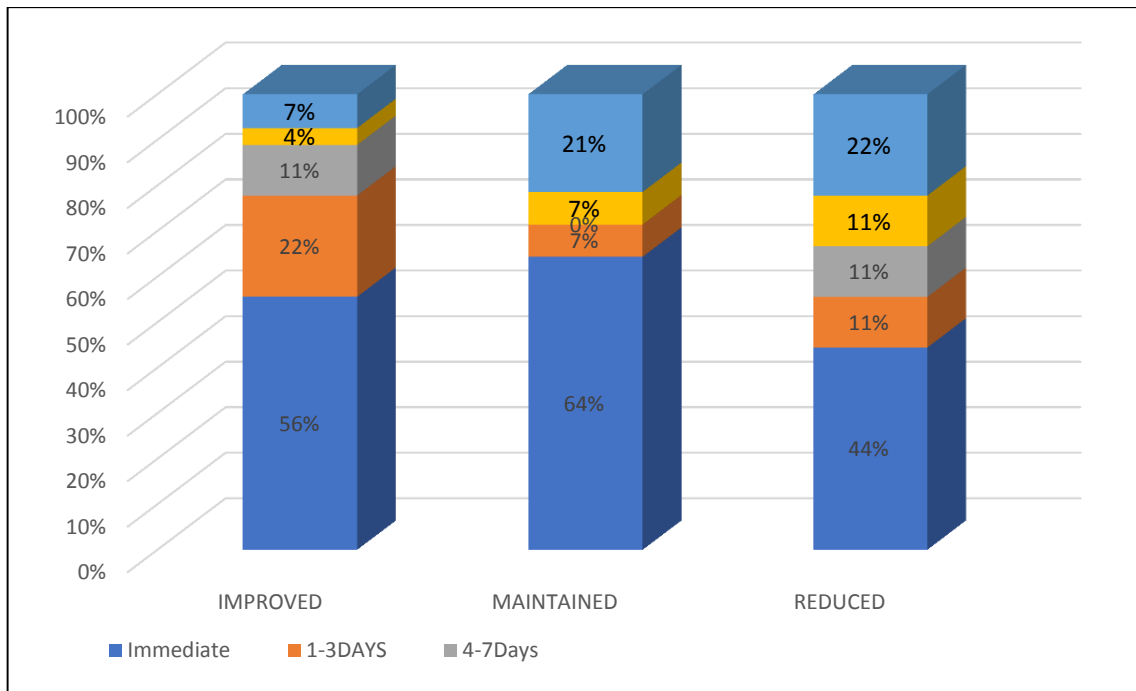


TABLE 21:**COMPARISON AMONG VITREOUS MANIFESTATIONS AND FINAL VISUAL OUTCOME**

Crosstab						
			final Outcome			Total
			IMPROVED	MAINTAINED	REDUCED	
	IOL drop in vitreous	Count	1	0	1	2
		%	50.00%	0.00%	50.00%	100.00%
	Lens dislocation	Count	2	0	0	2
		%	100.00%	0.00%	0.00%	100.00%
	Posterior vitreous detachment	Count	0	0	1	1
		%	0.00%	0.00%	100.00%	100.00%
	Subhyalod haemorrhage	Count	3	0	0	3
		%	100.00%	0.00%	0.00%	100.00%
	Vitreous haemorrhage	Count	6	3	4	13
		%	46.15%	23.08%	30.77%	100.00%
	Total	Count	12	3	6	21
		% within final Outcome	57.14%	14.29%	28.57%	100.00%

Pearson Chi-Square=14.893 p=0.459

In this table , vitreous haemorrhage showed 46.15 % improvement in visual outcome .

FIGURE 21:



TABLE 22:

COMPARISON AMONG MACULAR MANIFESTATIONS AND VISUAL OUTCOME

			final Outcome			Total
			IMPROVED	MAINTAINED	REDUCED	
MACULAR EDEMA	Count	7	2	3	12	
	% within final Outcome	58.33%	16.67%	25.00%	100.00%	
MACULER HOLE WITH EDEMA	Count	0	1	2	3	
	% within final Outcome	0.00%	33.33%	67.67%	100.00%	
Total	Count	7	3	5	15	
	% within final Outcome	46.67%	20.00%	33.33%	100.00%	

Pearson Chi-Square=0.6771 p=0.712

In this table improvement of visual acuity among macular edema cases 58.33% showed improvement in final vision outcome.

FIGURE 22:

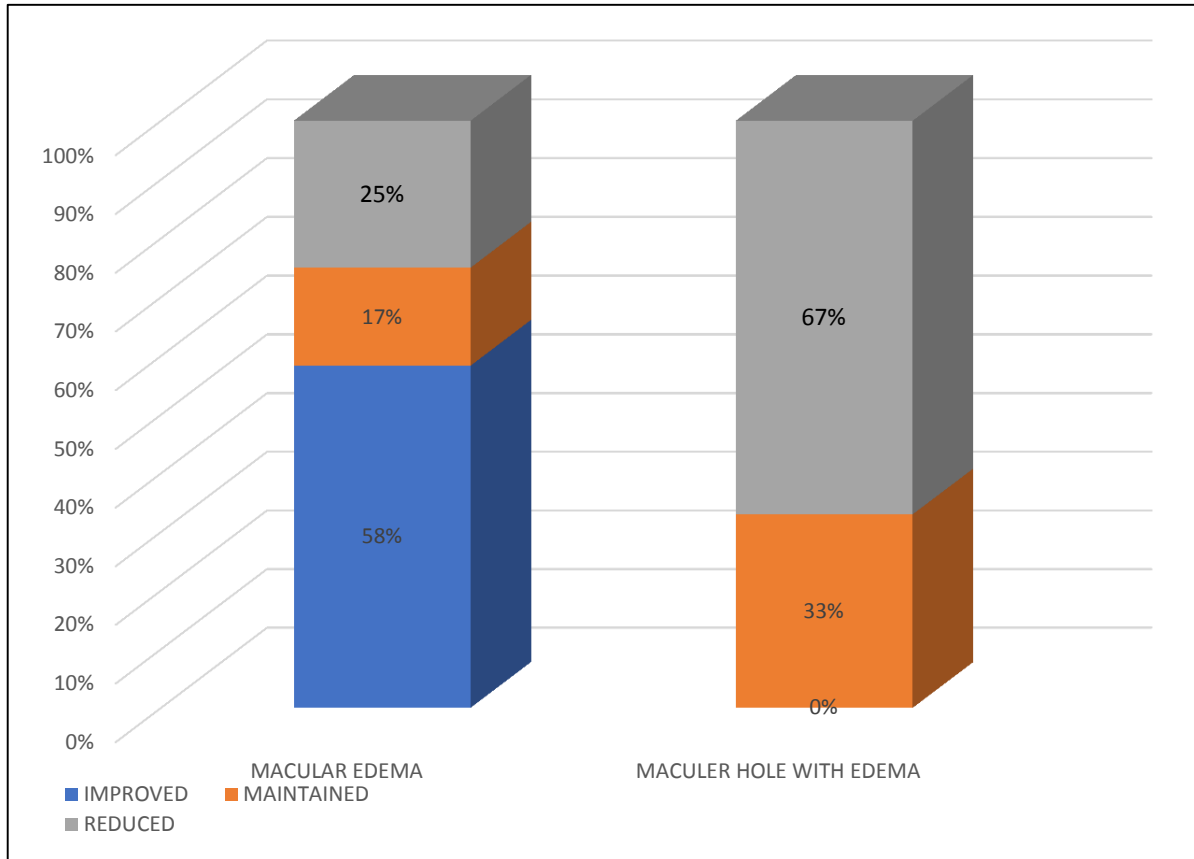


TABLE ; 23

COMPARISON BETWEEN CHOROIDDAL INVOLVEMENT AND FINAL VISUAL OUTCOME.

		MAINTAINED	REDUCED	Total
CHOROIDDAL DETACHMENT	Count	2	1	3
	% within final Outcome	67%	33%	60.0%
CHOROIDDAL TEAR	Count	1	1	2
	% within final Outcome	50%	50%	40.0%
Total	Count	14	9	5
	% within final Outcome	100.0%	100.0%	100.0%

Choroid detachment showed maintained final visual outcome about 67%,

Choroidal tear showed 50 %

FIGURE 23:

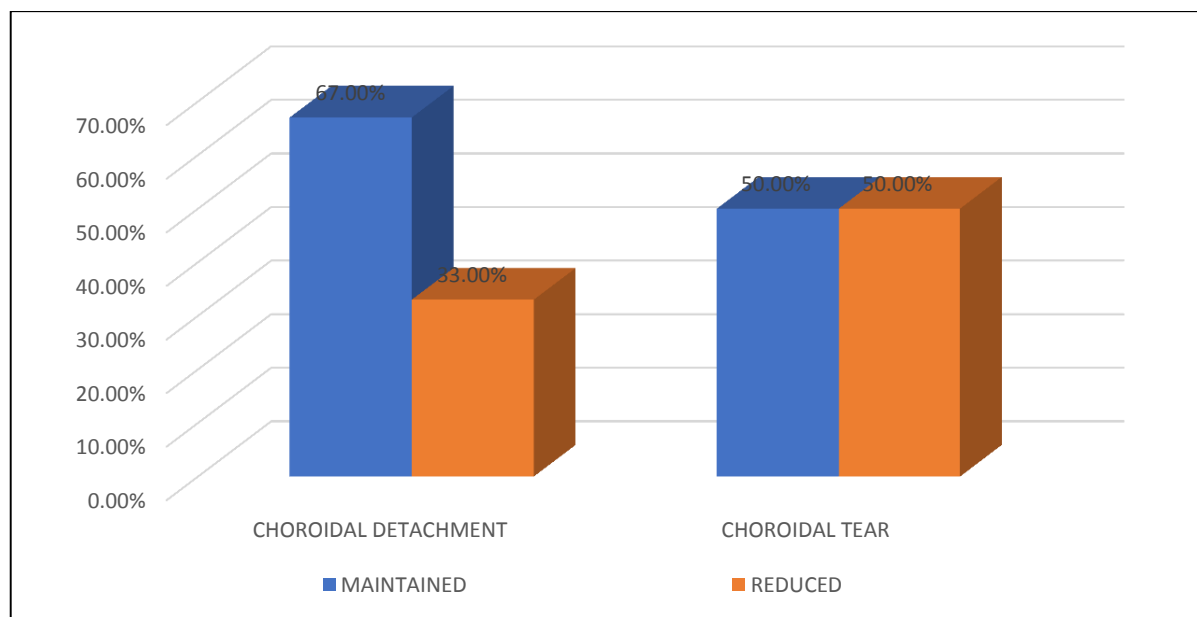


TABLE 24:

TREATMENT * FINAL_OUTCOME CROSSTABULATION

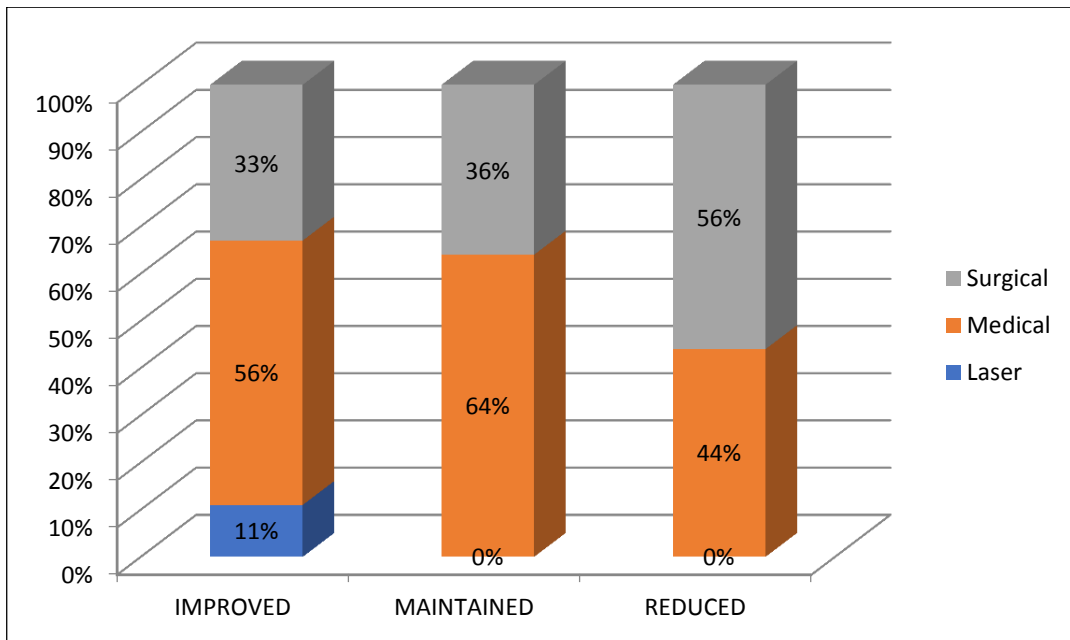
			Final Outcome			Total
			IMPROVED	MAINTAINED	REDUCED	
TREATMENT	LASER	Count	3	0	0	3
		% within final Outcome	11.1%	0.0%	0.0%	6.0%
	MEDICAL	Count	15	9	4	28
		% within final Outcome	55.6%	64.3%	44.4%	56.0%
	SURGICAL	Count	9	5	5	19
		% within final Outcome	33.3%	35.7%	55.6%	38.0%
Total	Count	27	14	9	50	
	% within final Outcome	100.0%	100.0%	100.0%	100.0%	

Pearson Chi-Square=3.847 p=0.427

Here ,laser group showed 11.1 % improvement of vision during follow up.

Medical management group showed 55.6 % of improvement vision during follow up, where as surgical group showed 33.3 %.

FIGURE 24:



TRAUMA CASES;

EXAMPLE 1 : MR.MUNIRATHNAM 45/M –BLUNT INJURY

RE- MACULAR EDEMA (5/60 NIGNIP)

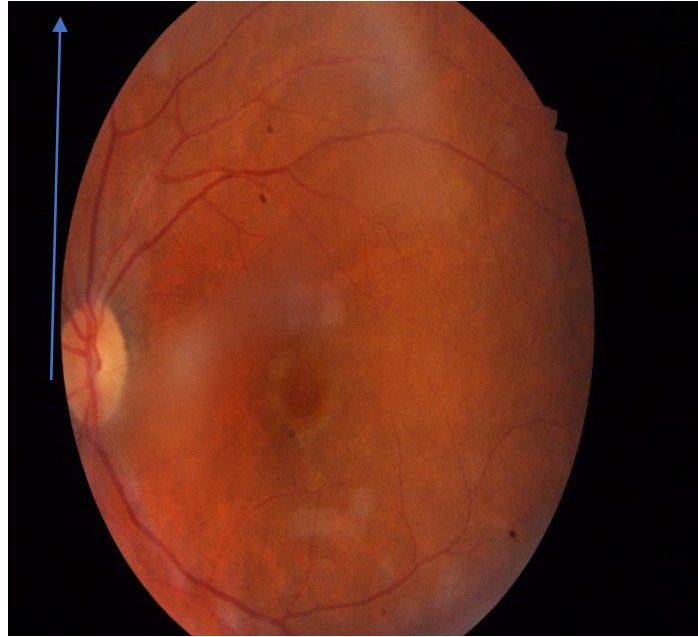


**EXAMPLE 2 : SUBASREE
14M/F- SCISSOR INJURY**

RE- VITREOUS
HAEMORRHAGE –HAND
MOVEMENTS VISION.

EXAMPLE 3 : PRABHAKARAN 18/M – RUBBER TUBE INJURY

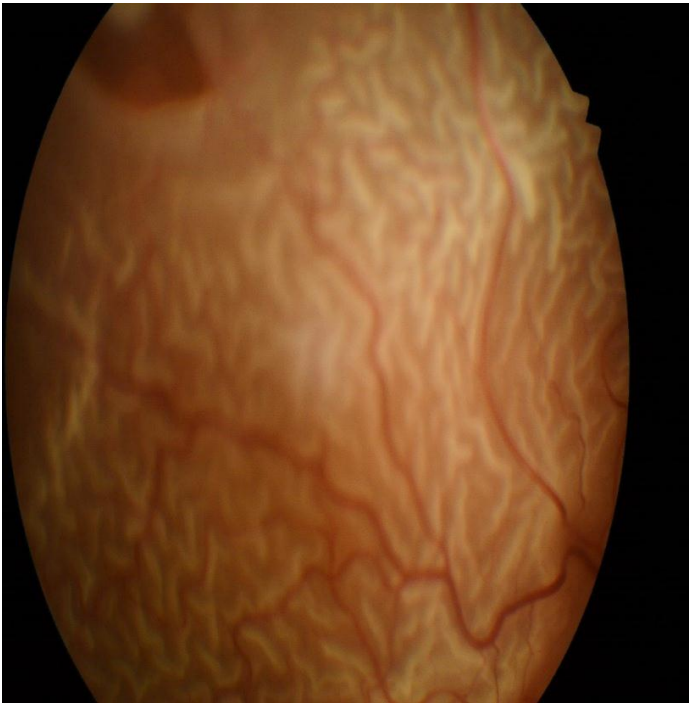
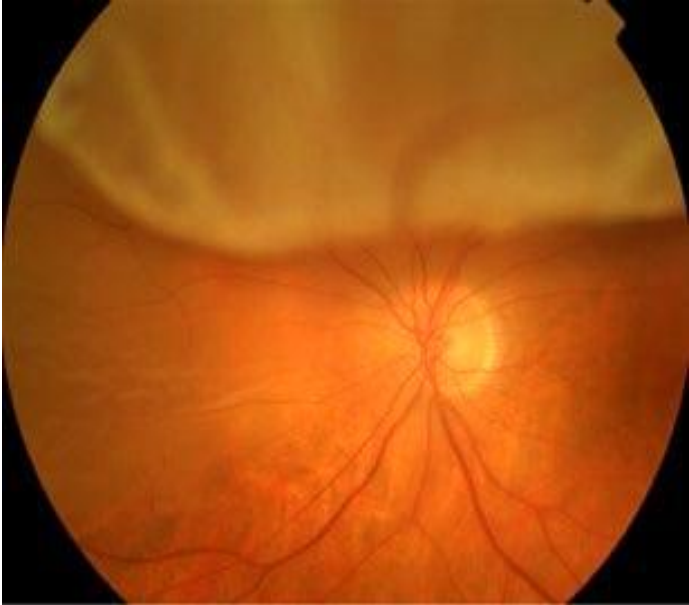
LE - MACULAR HOLE



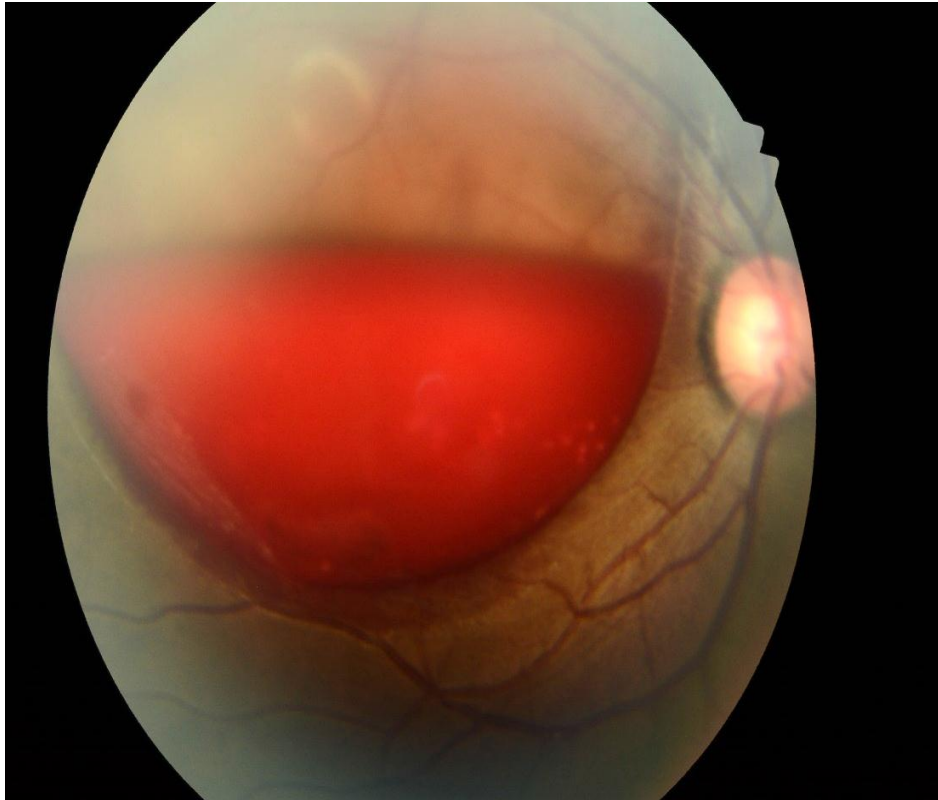
EXAMPLE 4 : RAJPATHI –RTA –PURTSCHER S RETINOPATHY



EXAMPLE 5 : SENTHAMARAI -RETINAL DETACHMENT



EXAMPLE 6 : RAJAN 52/M -SUBHYALOID HAEMORRHAGE



EXAMPLE 7 :JAWAHARLAL 25 /M – RE -TRUMATIC OPTIC NEURITIS .



DISCUSSION

In this study, we discussed about 50 patients of ocular posterior segment trauma cases.

In our study, we included that 39 patients are boys (78%) and 11 cases were girls (22%). Whereas study done by Kindie Desta Alem et al, also concluded that ocular trauma was higher percentage in males.¹⁷ Rajendra P. Maurya et al (2019) who studied that out of the 166 patients, 117 cases (70.48%) were male, 49 cases (29.52 %) were females, this compares well with this study.²⁶

In this study, the more than 50 years of patients had maximum incidence 30%, between the age group of 21 to 30 years showed second most common involvement. previous similar studies also showed the incidence of ocular trauma being more common in the age group more than 40 years.

In our study showed the incidence of self-accidental injuries were 38 %. Similarly Rajendra P. Maurya et al 2019, they showed most common involvement of non-occupational injuries²⁶. S Vats, et al who concluded that out of 6704 participants a significant association was noted in ocular trauma related to work

place(Chi- square = 43.80,P<0.001),but in our study showed that self-accidental injuries were more common than work place injuries.²⁸

Out of 50 cases 38 cases (76 %) were due to closed globe injuries. Kindie Desta Alem et al 2014 who investigated that most common involvement of closed globe injuries,¹⁷ Praveen K Nirmalan et al (2004) also describes the same. He also describes the rate of ocular trauma and visual outcome.²⁴

In this study ,56 % of cases were presented immediately to the hospital .similarly Kindie Desta Alem et al (2014) explained 98 % of cases were presented within 6 hours of trauma.¹⁷ Ashok Kumar Meena et al also reported that out of 177 patients 148 (83.6 %) cases presented within 24 hours of injury.¹²

Similarly in this study , patients when presented immediate after the trauma, showed improvement in outcome in 55.6% which is statistically significant study.¹²

and 17

Similar posterior segment involvement of ocular trauma study conducted by WILLIAMS DAVID F.MD et al (1990).he studied various retinal manifestations in trauma.¹⁴

Out of 50 cases 3 cases showed traumatic macular hole in our study. Greg Budoff et al studied in traumatic macular hole and management, finally reported that pars plana vitrectomy surgery improving the anatomical success rate upto 100%.¹⁸ W.Liu et al, found that current newer techniques for the management of traumatic macular holes.²⁶

In this study ,out of 50 cases on follow up 52 % showed improvement in vision 28 % maintained the vision during follow up.18% of cases were reduced due to irregular follow up. Ashok Kumar Meena et al (2017) investigated the visual outcome in ocular trauma¹² Lalit Dandona et al ,(2008) who reported a study to assessing the prevalence of injury and vision loss following ocular trauma.¹⁹

Khun et al ,(1996) study provides prognostic importance of visual acuity and classification of mechanical injury.

In our study 26% of cases showed traumatic retinal detachment 62 % showed vitreous haemorrhage out of 50 cases. K.Nowomiejska et al,investigated in traumatic retinal detachment and vitrectomy surgical outcome. In our study 38 % of cases managed surgically.

Bhartendu Shukla et al reported that most common posterior segment injury was due to retina (43.3 %).then choroid (11.9%).in our study also retina showed higher incidence among others.¹⁶

Agarwal R , et al 2011 who evaluated the factors affecting final visual status after repair of open globe injuries. Thakker MM ,et al 2006 who reported that vision limiting complications in open globe injuries¹¹ .in our study shows incidence of open globe injuries were 24 %.¹¹

Post traumatic endophthalmitis risk factors and incidence were reported by Ali Reza Dehghani,Leila Rezaei,Hasan Salam et al(2014) ,among 1042 patients of open globe injuries the frequency showed 2.1 % .IOFB cases were 139 ,among 139 cases 5 % showed post traumatic endophthalmitis.²³

In our study vitreous haemorrhage showed 62 % of presentation than other vitreous pathologies but retinal involvement is most common than others similarly, Dana MR et al (1993) who reported that cause for vitreous haemorrhage ,in this proliferative diabetic retinopathy showed 35.2 % among 253 patients. Trauma showed 18.3 % cases of vitreous haemorrhage ,²⁹

SUMMARY

- In our study of 50 cases maximum percentage of 30% shown in the age group of above 50 yrs.
- Males are most commonly affected in this study about 78% in our study.
- Self accidental injuries has showed 38 % among RTA and work place injuries.
- 76 % of cases were reported as closed globe injuries in our study.
- Right eye involvement is about 56% left eye showed 40 %
- Time interval between the injury and presentation to the hospital was studied, which showed immediate presentation (56%) is most common .
- Among the posterior segment injuries retina is most commonly involved.
- In this study showed involvement of 62 % vitreous haemorrhage is more common than other vitreous changes.
- Among the traumatic retinal manifestations retinal detachment showed 54.17% than other retinal changes.
- In this study reported that in the choroid , risk of developing detachment about 60%.choroidal tear showed 40%.
- In the optic nerve out of 50 cases 4 cases 8% showed traumatic optic neuropathy.

- Among 50 cases of ocular trauma 1 patient showed post traumatic endophthalmitis.
- Out of 50 cases macular edema showed 24 cases and 3 cases of macular holes.
- In our study medical management itself showed better visual outcome than surgical treatment. Here 56% of cases were medically managed.38 % surgically managed.
- On follow up period 52 % showed improvement in vision .28 % were maintained the same vision in the follow up period also, remaining 18 % showed reduced visual out come due to irregular follow up interval ,cataract lens changes .
- In this study showed that above 50 years of cases showed good improvement in follow up vision about 37.0 %,since most common presentation seen in this age group.
- In this study,male patient showed improvement in final visual outcome 74.1%,than females.it was not statistically significant.(P- 0.257)
- In this study , Right eye showed 55.6% of final visual outcome than others, since
- Involvement of right eye is more in our study.here there is no statistically significant comparison between the laterality and visual outcome.

CONCLUSION

- Ocular trauma is a most common cause of preventable blindness in the worldwide population.
- Complete history of injury, mode of injury, presenting time to the hospital, previous history of ocular trauma, and other ocular comorbidities can alter the final visual outcome.
- Management of ocular injuries should form a part of general trauma care for restoring potential visual acuity. Because of the newer micro surgical techniques nowadays it's possible to regain the vision.
- Creating ocular awareness regarding the prevention and safety measurement to prevent injury in schoolchildren and industrial workers.
- Importance of early intervention should be made awareness to the people, who lived in remote areas.
- Delayed presentation from the onset of injury and failure of timely intervention may lead to visual impairment .
- Males being the breadwinners of the family in our society. Earlier presentation, timely intervention , regular follow up can improve the visual prognosis of the patient.

- Creating various eye care programmes and providing the education about the protective goggles and propaganda about the work place safety can create awareness among the population and significantly reduce the incidence of work place injuries, thereby reducing visual morbidity.

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PROFORMA

Name:

Age/sex:

Op/ip no:

Occupation:

Chief complaints:

Mode of injury:

Past history:

Treatment history:

Family history:

General examination:

Ocular examination:

presenting visual acuity

re

le

Intra ocular pressure:

Extra ocular movements:

Slit lamp anterior segment examination:

Lids :

Conjunctiva :

Cornea :

Anterior chamber :

Iris:

Pupil:

Lens:

Anterior vitreous:

Fundus examination :

Slit lamp 90 d examination:

Direct ophthalmoscopy:

Indirect ophthalmoscopy:

Diagnosis:

Investigations:

X ray orbit

B scan ultrasonography:

CT/MRI (if needed)

OCT macula (if needed)

Management:

Medical

Surgical

Follow up:

KEY TO MASTER CHART

RE – RIGHT EYE

LE – LEFT EYE

RTA-ROAD TRAFFIC ACCIDENTS.

SELF- SELF ACCIDENTAL INJURIES.

VH- VITREOUS HAEMORRHAGE.

SHH- SUB HYALOID HAEMORRHAGE.

PVD- POSTERIOR VITREOUS DETACHMENT.

PL- PERCEPTION OF LIGHT.

HM- HAND MOVEMENTS.

CD- CHOROIDAL DETACHMENT.

CT- CHOROIDAL TEAR.

RD- RETINAL DETACHMENT.

RRD- RHEGMATOGENOUS RETINAL DETACHMENT.

GRT- GIANT RETINAL TEAR

IOL- INTRA OCULAR LENS.

PR-PURTSCHER S RETINOPATHY.

SR- SEROUS DETACHMENT.

Urkund Analysis Result

Analysed Document: A STUDY ON VARIOUS POSTERIOR SEGMENT MANIFESTATIONS FOLLOWING OCULAR TRAUMA IN TERTIARY CARE CENTRE.docx (D57560311)
Submitted: 10/24/2019 4:32:00 AM
Submitted By: theerthana2649@gmail.com
Significance: 2 %

Sources included in the report:

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<https://4thyearmbbs.files.wordpress.com/2014/12/faqs-in-ophthalmology-venkatesh-prajna-n.pdf>

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**INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI 600 003**

EC Reg.No.ECR/270/Inst./TN/2013
Telephone No.044 25305301
Fax: 011 25363970

CERTIFICATE OF APPROVAL

To
Dr.V.Theerthana
I Year Post Graduate in MS Ophthalmology
Regional Institute of Ophthalmology & GOH/
Madras Medical College
Chennai

Dear Dr.V.Theerthana,

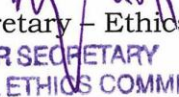
The Institutional Ethics Committee has considered your request and approved your study titled **"A STUDY ON VARIOUS POSTERIOR SEGMENT MANIFESTATIONS FOLLOWING OCULAR TRAUMA INTERTIARY CARE CENTRE "** - **NO.05012018**

The following members of Ethics Committee were present in the meeting hold on **09.01.2018** conducted at Madras Medical College, Chennai 3

- | | |
|--|----------------------|
| 1. Prof.P.V.Jayashankar | :Chairperson |
| 2. Prof.R.Narayana Babu,MD.,DCH., Dean,MMC,Ch-3 | : Deputy Chairperson |
| 3. Prof.Sudha Seshayyan,MD., Vice Principal,MMC,Ch-3 | : Member Secretary |
| 4. Prof.N.Gopalakrishnan,MD,Director,Inst.of Nephrology,MMC,Ch | : Member |
| 5. Prof.S.Mayilvahanan,MD,Director,Inst. of Int.Med,MMC, Ch-3 | : Member |
| 6. Prof.A.Pandiya Raj,Director, Inst. of Gen.Surgery,MMC | : Member |
| 7. Prof.Shanthy Gunasingh, Director, Inst.of Social Obstetrics,KGH | : Member |
| 8. Prof.Remam Chandramohan,Prof.of Paediatrics,ICH,Chennai | : Member |
| 9. Prof. Susila, Director, Inst. of Pharmacology,MMC,Ch-3 | : Member |
| 10.Prof.K.Ramadevi,MD., Director, Inst. of Bio-Chemistry,MMC,Ch-3 | : Member |
| 11.Prof.Bharathi Vidya Jayanthi,Director, Inst. of Pathology,MMC,Ch-3: | Member |
| 12.Thiru S.Govindasamy, BA.,BL,High Court,Chennai | : Lawyer |
| 13.Tmt.Arnold Saulina, MA.,MSW., | :Social Scientist |
| 14.Thiru K.Ranjith, Ch- 91 | : Lay Person |

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.


Member Secretary - Ethics Committee
MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE
CHENNAI-600 003

S/NO	NAME	AGE	SEX	MODE OF INJURY	PLACE	TYPE OF LEVEL	ONSET OF PRESEN	PRESENTING VIS	VITREOUS	RETINA	MACULA	CHOROID	OPTIC NERVE	OTHERS	TREATMENT	FINAL STATUS		
1	ROOATHUNJAR	13 MALE	IRON ROD	SELF	CLOSED	RIGHT	IMMEDIATE	CFCE		SD	MACULAR EDEMA				MEDICAL	6/36P	6/60 NISNIP	REDUCED
2	GNAAMANI	27 MALE	CRICKET BAT	SPORTS	CLOSED	RE	2 MONTHS AFTER	6/60P		SHH					MEDICAL	6/18P	5/60 NISNIP	IMPROVED
3	SATHISH	7 MALE	GLASS	WORK PLACE	OPEN	LE	IMMEDIATE					CH-TEAR	TON/TEM PALLOK		MEDICAL	5/60 NISNIP	RETINA ATTACHED 6/9 P	MAINTAINED
4	SATHISH	9 MALE	STONE	SELF	CLOSED	RE	3 DAYS BACK	HMI		VH	EDEMA				MEDICAL	6/80 P	6/24 NISNIP	IMPROVED
5	BATHRI	18 MALE	RUBBER TUBE	WORK PLACE	CLOSED	LE	IMMEDIATE	CFCE			HOLE WITH EDEMA				MEDICAL	1/60 NISNIP	1/60 NISNIP	MAINTAINED
6	PRABHAKARAN	72 MALE	DRUMSTICK	SELF	CLOSED	RE	IMMEDIATE	6/60P		VH	MACULAR EDEMA				MEDICAL	6/24P	6/18 NISNIP	IMPROVED
7	GANESAN	14 FEMALE	HAND	SELF	CLOSED	LE	IMMEDIATE	6/24P			MACULAR EDEMA				MEDICAL	6/6P	6/6P	MAINTAINED
8	DHARASEGAR	25 MALE	RTA HEAD INJURY	RTA (2 WHEELER)	CLOSED	RE	15 DAYS LATER	NO PL			MACULAR EDEMA		TON		MEDICAL	NO PL	NO PL	MAINTAINED
9	JAYAHARAL	21 MALE	SELF FALL	SPORTS	CLOSED	LE	IMMEDIATE	HMI		VH	RETINAL EDEMA				MEDICAL	6/6P	6/24 NISNIP	MAINTAINED
10	PONNENSELVAM	22 MALE	CRICKET BALL	SPORTS	CLOSED	RE	IMMEDIATE	HMI		VH	RETINAL DETACHMENT				MEDICAL	6/24 NISNIP	RETINA ATTACHED 6/9 P	IMPROVED
11	MOHANI RAJ	26 MALE	GRICKET BALL	SPORTS	CLOSED	RE	IMMEDIATE	6/60P			MACULAR EDEMA				MEDICAL	6/9P	6/6P	IMPROVED
12	CHINNAIDARAJ	26 MALE	FLOWER POT	WORK PLACE	CLOSED	LE	IMMEDIATE	6/28P			MACULAR EDEMA				MEDICAL	6/8P	6/18 NISNIP	MAINTAINED
13	PURUSHOTHAMAN	52 MALE	SELF FALL	SELF	CLOSED	LE	IMMEDIATE	6/28P		SHH	RETINAL EDEMA				MEDICAL	6/6P	6/18 NISNIP	MAINTAINED
14	MANIKANDAN	69 MALE	BOREWELL ROD	RTA (2 WHEELER)	OPEN	LE	IMMEDIATE	HMI		VH	EDEMA				MEDICAL	6/18P	6/6P	IMPROVED
15	MANNKANDAN	27 FEMALE	STICK	SPORTS	CLOSED	RE	1 MON LATER	1/60 NISNIP			MACULAR HOLE				MEDICAL	6/60 NISNIP	4/60 NISNIP	REDUCED
16	SATHISH	30 MALE	FOOT BALL	SPORTS	CLOSED	LE	15 DAYS	1/60 NISNIP			MACULAR HOLE				MEDICAL	1/60 NISNIP	1/60 NISNIP	REDUCED
17	RAJAN	50 MALE	RTA HEAD INJURY	RTA (4 WHEELER)	CLOSED	RE	2 DAYS LATER	HMI		VH					MEDICAL	1/60 NISNIP	6/60 NISNIP	IMPROVED
18	VIGNESH	28 MALE	HAND	SELF	CLOSED	RE	1 WEEK LATER	4/60 NISNIP		VH	MACULAR EDMA		CD		MEDICAL	6/6P	6/9 NISNIP	REDUCED
19	IVARAN	42 FEMALE	COMB	WORK PLACE	CLOSED	RE	1 WEEK LATER	2/60 NISNIP		SHH					MEDICAL	3/60 NISNIP	3/60 NISNIP	IMPROVED
20	SVAGANVA	39 MALE	IRON PIECE	WORK PLACE	CLOSED	RE	1 DAY LATER	HMI			MACULAR EDEMA				MEDICAL	6/24 NISNIP	6/18 NISNIP	IMPROVED
21	MUNIRATHNAM	28 MALE	RTA HEAD INJURY	RTA (2 WHEELER)	CLOSED	RE	1 MON LATER	HMI			GRT WITH RD				MEDICAL	6/36P	RE DETACHMENT 1/60 NISNIP	MAINTAINED
22	RAPATHI	40 MALE	HAND	WORK PLACE	CLOSED	RE	2 MONTHS AFTER	HMI			MACULAR HOLE				MEDICAL	6/36P	RE DETACHMENT 6/12 NI	IMPROVED
23	SENIDHAMMAI	26 MALE	IRON PIECE	WORK PLACE	CLOSED	RE	15 DAYS	6/24P			MACULAR EDEMA				MEDICAL	6/24P	6/24 NISNIP	IMPROVED
24	KAMALAKRMAN	26 MALE	HAND	SELF	CLOSED	RE	1 MON LATER	HMI			MACULAR EDEMA				MEDICAL	6/6P	6/6P	IMPROVED
25	MAGRADAN	28 MALE	IRON PIECE	WORK PLACE	CLOSED	RE	1 MON LATER	HMI			MACULAR EDEMA				MEDICAL	6/6P	6/6P	IMPROVED
26	SHANKAR	27 MALE	FOOT BALL	SPORTS	CLOSED	LE	15 DAYS	1/60 NISNIP			MACULAR HOLE				MEDICAL	1/60 NISNIP	1/60 NISNIP	REDUCED
27	INDRA	30 MALE	STICK	SPORTS	CLOSED	RE	1 MON LATER	HMI		VH					MEDICAL	1/60 NISNIP	6/60 NISNIP	IMPROVED
28	SAVAKUMAR	50 MALE	RTA HEAD INJURY	RTA (4 WHEELER)	CLOSED	RE	2 DAYS LATER	4/60 NISNIP		VH	MACULAR EDMA		CD		MEDICAL	2/60 NISNIP	6/6 NISNIP	REDUCED
29	ABUN PRAKASH	28 MALE	HAND	SELF	CLOSED	RE	1 WEEK LATER	2/60 NISNIP			MACULAR EDMA				MEDICAL	6/6P	6/9 NISNIP	REDUCED
30	DURAIARAJ	42 FEMALE	IRON PIECE	WORK PLACE	CLOSED	RE	1 WEEK LATER	3/60 NISNIP			MACULAR EDEMA				MEDICAL	6/6P	6/18 NISNIP	IMPROVED
31	KATHIRAVAN	39 MALE	IRON PIECE	WORK PLACE	CLOSED	RE	1 DAY LATER	HMI			MACULAR EDEMA				MEDICAL	6/24 NISNIP	6/18 NISNIP	IMPROVED
32	SATHYA	35 MALE	SELF FALL	SELF	CLOSED	LE	2 DAYS LATER	HMI		VH					MEDICAL	NO PL	NO PL	MAINTAINED
33	RANI	67 MALE	GAS CYLINDER BLAST	WORK PLACE	OPEN	RE	IMMEDIATE	HMI		VH					MEDICAL	NO PL	NO PL	MAINTAINED
34	GORU	47 MALE	IRON PARTICLE	WORK PLACE	CLOSED	LE	IMMEDIATE	HMI		VH					MEDICAL	5/60 NISNIP	RETINA ATTACHED 6/24 NI	IMPROVED
35	GORU	54 MALE	HANDE BAR	WORK PLACE	CLOSED	RE	IMMEDIATE	5/60 NISNIP			MACULAR EDEMA				MEDICAL	6/24 NISNIP	6/24 NISNIP	IMPROVED
36	KALAIANI	55 FEMALE	OIL SPLASH	WORK PLACE	CLOSED	RE	NEXT DAY	1/60 NISNIP			MACULAR EDEMA				MEDICAL	6/24 NISNIP	6/24 NISNIP	IMPROVED
37	ELUDUVALI	70 MALE	BUCKET HANDLE	SELF	CLOSED	LE	IMMEDIATE	HMI			MACULAR EDEMA				MEDICAL	6/6P	6/24 NISNIP	MAINTAINED
38	ARUNAVI MARY	45 FEMALE	SELF FALL	RTA (2 WHEELER)	CLOSED	RE	IMMEDIATE	1/60 NISNIP		SHH	MACULAR EDEMA		TON		MEDICAL	6/9 NISNIP	6/6 NISNIP	IMPROVED
39	DILIP KUMAR	67 MALE	METAL VESSEL	WORK PLACE	CLOSED	LE	1 WEEK LATER	1/60 NISNIP			MACULAR EDEMA				MEDICAL	5/60 NISNIP	RETINA ATTACHED 6/18 NISNIP	IMPROVED
40	ASHOK KUMAR	55 FEMALE	CUTTING MACHINE	WORK PLACE	CLOSED	LE	2 MONTHS AFTER	1/60 NISNIP		SHH	MACULAR HOLE				MEDICAL	2/60 NISNIP	1/60 NISNIP	REDUCED
41	DINAKARAN	68 FEMALE	CUTTING MACHINE	WORK PLACE	CLOSED	RE	IMMEDIATE	1/60 NISNIP			MACULAR HOLE				MEDICAL	1/60 NISNIP	1/60 NISNIP	REDUCED
42	KASTHURI	30 MALE	RTA (4 WHEELER)	RTA (4 WHEELER)	OPEN	RE	IMMEDIATE	PL		VH	EDEMA		CD		MEDICAL	PL	HMI	MAINTAINED
43	RAMAN	40 MALE	RTA (4 WHEELER)	RTA (4 WHEELER)	OPEN	RE	IMMEDIATE	PL		VH	EDEMA		CD		MEDICAL	PL	HMI	MAINTAINED
44	SHYAMALA	40 MALE	RTA (4 WHEELER)	RTA (4 WHEELER)	OPEN	RE	IMMEDIATE	PL		VH	EDEMA		CD		MEDICAL	PL	HMI	MAINTAINED
45	MANNYANNAN	45 FEMALE	RTA (4 WHEELER)	RTA (4 WHEELER)	CLOSED	RE	IMMEDIATE	1/60 NISNIP			MACULAR EDEMA				MEDICAL	6/24 NISNIP	6/24 NISNIP	IMPROVED
46	MOHAMMED	52 MALE	RTA (2 WHEELER)	RTA (2 WHEELER)	CLOSED	LE	1 WEEK LATER	1/60 NISNIP			MACULAR EDEMA				MEDICAL	6/9 NISNIP	6/6 NISNIP	IMPROVED
47	ABDHI LAKSHMI	67 MALE	RTA (2 WHEELER)	RTA (2 WHEELER)	CLOSED	LE	1 WEEK LATER	1/60 NISNIP			MACULAR EDEMA				MEDICAL	5/60 NISNIP	6/60 NISNIP	IMPROVED
48	PONNAMMAL	68 FEMALE	SELF FALL	SELF	CLOSED	LE	2 MONTHS AFTER	1/60 NISNIP			MACULAR HOLE				MEDICAL	2/60 NISNIP	1/60 NISNIP	REDUCED
49	HARI HARAN	30 MALE	CUTTING MACHINE	WORK PLACE	CLOSED	RE	IMMEDIATE	1/60 NISNIP			MACULAR HOLE				MEDICAL	1/60 NISNIP	1/60 NISNIP	REDUCED
50	SATHYA	40 MALE	RTA (4 WHEELER)	RTA (4 WHEELER)	OPEN	RE	IMMEDIATE	PL		VH	EDEMA		CD		MEDICAL	PL	HMI	MAINTAINED