

# A Clinical Study on Traumatic Hyphaema with Special Reference to Its Management

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**Place of Study:** Assam Medical College & Hospital, Dibrugarh

**Period of Study:** July '2013 to June '2014.

**University:** Srimanta Sankaradeva University of Health Sciences, Guwahati (Assam), India

## 1. Introduction

- Hyphema is the presence of blood into the anterior chamber
- Blunt trauma is the most common cause of a hyphema
- Traumatic hyphema is usually common in children
- Complications resulting from secondary hemorrhage such as glaucoma, corneal blood staining or optic atrophy, can lead to permanent impairment of vision, especially if the hyphema is prolonged in association with elevated intraocular pressure (IOP)<sub>1</sub>.
- Spontaneous hyphema, commonly confused with a traumatic hyphema is usually secondary to neovascularisation.

Hyphema, associated complications, and concomitant injuries to ocular structures represent frequent and vision – threatening sequelae of blunt or penetrating trauma. The extent of hyphema is typically graded by the volume of the anterior chamber filled with blood after layering of the blood cells, as follows:

- Microhyphema – suspended RBC's in the anterior chamber
- Grade I - less than 1/3<sup>rd</sup> of the anterior chamber
- Grade II - 1/3<sup>rd</sup> to 1/2th of the anterior chamber
- Grade III - 1/2th to nearly total
- Grade IV – Total ('eight ball') hyphema

- Albert Jakobiec's (2008): 3<sup>rd</sup> edition – 5095.

Hyphaema appears as bright red mass usually with a fluid level. It may be stratified due to recurrent bleeding in which lower portion appear reddish black. When the whole of the anterior chamber is filled up with blood it is called 'total hyphaema'. When this blood in the anterior chamber has clotted & taken on a black or purple colour, it is called 'eight ball' or 'black ball' hyphaema.

## 2. Aetiology of Hyphema

Aetiologically hyphema may be divided into following categories:

### (1) Traumatic Hyphema:

This is the most common type of hyphema which results due to trauma to the eyeballs. It is further subdivided into –

- (i) Non Surgical: Due to ocular trauma.
    - (a) Blunt: Rupture of iris and ciliary body blood vessels.
    - (b) Penetrating: direct severing of blood vessels.
  - (ii) Surgical:
    - (a) Intraoperative bleeding:
      - Ciliary body or iris injury during cataract extraction, peripheral iridectomy etc.
      - (b) Early postoperative bleeding:
        - Conjunctival bleeding that enters the anterior chamber through corneo-scleral wound.
        - (c) Late postoperative bleeding:
          - Reopening of uveal wound.
          - Disruption of new vessels growing across the corneoscleral wound.
- (2) Non traumatic hyphema/ Spontaneous hyphema:
  - (i) Neovascularisation of Iris:
    - (a) Retinal detachment
    - (b) Proliferative diabetic retinopathy
    - (c) Central retinal artery occlusion
    - (d) Central retinal vein occlusion
  - (ii) Intraocular tumours:
    - (a) Retinoblastoma
    - (b) Malignant melanoma
    - (c) Juvenile Xanthogranuloma
    - (d) Metastatic tumour
  - (iii) Clotting disorders:
    - (a) Leukemia
    - (b) Hemophilia
    - (c) Anemia
    - (d) NSAID

## 3. Classification

Hyphema is graded according to the amount of blood present in the anterior chamber.

Hyphema is graded according to the amount of blood in the AC. Grade	Hyphema size
I	< 1/3
II	1/3 – 1/2
III	1/2 - near total
IV	Total
Microscopic	Circulating RBC's only; no gross collection of blood

The management of hyphaema is controversial. Both medical & Surgical management have been advised. The medical management include – bed rest, elevation of head end, binocular or monocular patching, use of mydriatic, use of steroid, carbonic anhydrase inhibitors and hyperosmotic agent. Recently drugs like - aminocaproic acid, tranexamic acid and tissue plasminogen activator have been used.

Surgical intervention is made when medical management fails. The various procedures are –

- Paracentesis and anterior chamber washout with balance salt solution for unclotted blood.
- Manual expression of clot with McPherson forceps or Colibri forceps.
- Automated vitrectomy instrument.

#### 4. Aims and Objectives

The present study has been conducted with the following objectives –

- To study the occurrence of hyphema following trauma
- To study the clinical course & visual outcome on treatment.

#### 5. Materials and Methods

- PLACE OF STUDY

Department of Ophthalmology, Assam Medical College & Hospital, Dibrugarh

- DURATION OF STUDY: One year
- TYPE OF STUDY: Prospective clinical study
- PERIOD OF STUDY: July'2013 – June'2014

#### Study Group:

- All patients who presented to the Department of Ophthalmology, Assam Medical College & Hospital, Dibrugarh having clinically suspected or, diagnosed as 'traumatic hyphema'.

#### Selection of Cases –

#### Inclusion Criteria:

- Post-traumatic hyphema.

- Patients of all age group and both sexes will be included.

#### Exclusion Criteria:

- Hyphema due to intraocular diseases
- Hyphema resulting due to Systemic diseases
- Post-surgical hyphema.

#### 6. Methodology

- After obtaining the informed consent, patients will be enrolled in the Study,
- Detailed evaluation of the patient including the detailed history and general physical examination, systemic & ocular examination (visual acuity, intraocular pressure, anterior segment examination with slit lamp biomicroscopy, fundus examination with direct and/ indirect ophthalmoscopy, USG B-scan, Gonioscopy, etc.) will be carried out.
- Documentation of relevant findings will be made in the form of external photography as well as slit lamp fundus photography.
- Systemic evaluation and relevant investigations to find out if any associated systemic diseases.

#### 7. Outcome Measures

- Time taken for resolution of the hyphema from the onset.
- Best corrected visual acuity (BCVA) 6 weeks after enrollment.

#### Proforma

- Case No.:
- Hospital No.:
- M.R.D. No:
- Name:
- Age: yrs,
- Sex:
- Address:
- Religion:
- Occupation:
- Date and Time of Injury:
- Date and Time of Examination:
- Date and Time of Admission:
- Date and Time of Discharge:

#### History:

- Chief Complaint:
- History of Present Illness:
- History of Past Illness:
- Personal History:
- Socio-economic History:
- History of Allergy

#### Physical Examination:

- General Appearance:

- Built:
- Nutrition:
- Pallor:
- Icterus:
- Oedema:
- Cyanosis:
- Clubbing:
- Teeth & Gums:
- Lymph Gland:
- Temperature:
- Pulse:
- Blood Pressure:

**Systemic Examination:**

- Cardiovascular System:
- Central Nervous System:
- Respiratory System:
- Gastrointestinal System:

**Ocular Examination:**

Right eye Left eye

- Visual Acuity: Distant

Near

- Head Posture:
- Facial symmetry:
- Position of the eyebrow:
- Left eye Right eye
- Orbit: Local tenderness

Swelling

Irregularities

Crepitus

- Eyeball: Position

Size

Ocular movement

Alignment

- Palpebral aperture: Size

Shape

- Eyelid: Position

Movement

Appearance

Lid margin

Alignment

Right eye Left eye

- Nasolacrimal Passage: Puncta

Canaliculi

Lacrimal sac

Nasolacrimal duct

- Conjunctiva:

- Cornea: Size

Shape

Surface

Transparency

Sensation

Vascularisation

- Sclera: Discoloration

Inflammation

Staphyloma

Perforation

Right eye Left eye

- Anterior Chamber: Depth

Any abnormal content

Angle of ant. Chamber

- Iris:

- Pupil: Location

Size

Shape

Colour

Reaction to light: Direct

Consensual

- Lens: Position

Shape

Colour

Transparency

Right eye Left eye

- Intraocular tension: Digital Tonometry

Applanation tonometry

- Direct Ophthalmoscopy:

- Indirect Ophthalmoscopy:

- Gonioscopy:

- Slit lamp biomicroscopy:

- Local examination of the wound:

- Other associated injuries:

**Investigations:**

- Blood for: TLC/DLC/ESR/Hb %/platelet count/PT/aPTT

- B.T, C.T, ABO grouping

- Urine for sugar:

- Blood sugar profile: FBS, PPBS, HbA1c

- Chest X-ray:

- ECG:

- B-scan Ultrasonography:

- X-ray orbit:

- C T scan:

- MANAGEMENT:

**1.) Conservative treatment:**

The medical management of hyphema is controversial. The effect of bed rest is not established. So is the use of unilateral or bilateral pads. Some workers advise mydriatic or miotic or neither. There is also lack of general agreement regarding the use of local steroids. The present study is carried out with the following standard conservative management:

- Bed rest
- Elevation of head end of the bed approximately to 30-35°.
- Pad and bandage to the injured eye.
- Topical antibiotic in the form of drops and ointments.
- Whenever complications arise they were treated accordingly.

**2.) Surgical treatment:**

The indication for surgical management is as follows –

- Hyphema with three quarter to total or eight-ball hyphema.
- Cases not improving despite medical therapy.

General anaesthesia was used to perform surgery for cases below 15 years of age. The adult cases were performed under local anaesthesia.

The various types of surgical procedures adopted are as follows:

- Paracentesis
- Aspiration and Irrigation with Balanced Salt Solution

**Paracentesis:**

In this procedure about 3 mm length incision is made at the temporal quadrant over the cornea near the limbus with a blade, breaker knife or with a keratome after steadying the eye with a fixation forceps. A broad paracentesis needle was employed through the incision to enter into the anterior chamber and withdrawn carefully to avoid iris prolapse. With the iris repository the peripheral lip of the wound was slightly depressed so that fluid hyphema escapes slowly with a minimum of disturbance. The incision was left unstitched.

**Aspiration and Irrigation with Balanced Salt Solution:**

In this technique a limbus based conjunctival flap was made and an ab-externo incision of 120° approximately made with a blade breaker knife and corneo-scleral scissors. A two way cannula was used for aspiration and irrigation with one end connected to syringe and the other end connected to an irrigating fluid bottle. The anterior chamber was irrigated with balanced salt solution for cleaning the blood from the anterior chamber. The incision was closed with 8-0 silk suture.

Patients with raised intraocular pressure were operated after intravenous mannitol and controlling the intraocular pressure to the normal range.

**3) Postoperative treatment & advice:****4) Follow-up period:****5) Condition of the wound in case of any surgery performed:****Eye Examination:**

	Day 1	1 week	1½ month
Best corrected visual acuity			
Slit lamp examination			
Intraocular pressure			
Direct ophthalmoscopy			
Indirect ophthalmoscopy			
USG-B scan			
X-ray orbit			
CT scan			

**8. Results and Observations**

In this present study, a total of 53 patients of traumatic hyphema were studied.

During the one year period of study a total 15,714 patients attended the Out-patient Department, Department of Ophthalmology, Assam Medical College & Hospital, Dibrugarh with various ailments of the eye. Out of these, 417 patients had ocular injury.

All the patients in the present study were recorded as details as per proforma shown in chapter materials and methods. Following are the results and observations of the study.

**1) Incidence of Traumatic Hyphaema:**

Period of Study	Total Number of Cases with Ocular Trauma	Total Number of Cases with Traumatic Hyphema	INCIDENCE (%)
One Year	417	53	12.71%

In the present study, 417 patients of ocular trauma were found, out of which 53 patients had traumatic hyphema. The annual incidence rate of traumatic hyphema out of total injury patient is 12.71%.

**2) Age Distribution of Patients:**

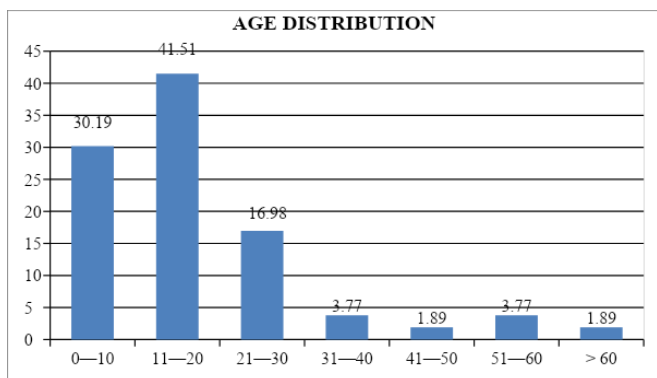
In the present study, the youngest patient was of 3 years old and oldest patient 65 years. The incidence of hyphema was found to be more in the age group between (11- 20) years i.e., 30.19% followed by the age group between (0-10) years i.e., 28.30%.

AGE (in years)	NUMBER OF CASES	AGE (in years)	NUMBER OF CASES	AGE (in years)	NUMBER OF CASES
3	2	12	2	23	3
4	2	13	6	24	1
5	2	14	2	25	1
6	2	15	3	31	1
7	3	16	2	40	1
8	1	19	1	50	1
9	1	20	1	54	1
10	3	21	2	60	1
11	5	22	2	61	1

Age Distribution in 53 Patients of Traumatic Hyphema

AGE GROUP (in years)	NUMBER (n)	PERCENTAGE (%)
0—10	16	30.19
11—20	22	41.51
21—30	9	16.98
31—40	2	3.77
41—50	1	1.89
51—60	2	3.77
> 60	1	1.89
TOTAL	53	100

The incidence of hyphema was mostly in the young age group. In the present study 41.51 % patients were found in the age group 11-20 years and 30.19% patients were found in the age group 0-10 years. In the present study 71.7 % patients were found in the age group below 20 years.



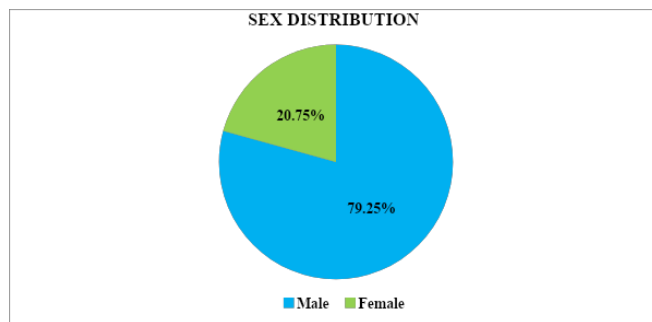
### 3) Sex Distribution

In the present study male patients were more than female patients. Table-5.4 shows the distribution of sex in 53 patients of hyphema.

Sex Distribution in 53 Patients of Traumatic Hyphema

SEX	NUMBER (n)	PERCENTAGE (%)
Male	42	79.25
Female	11	20.75
TOTAL	53	100

In the above table the sex distribution among 53 patients of traumatic hyphema was showed. 79.25% patients were male and 20.75% patients were female.



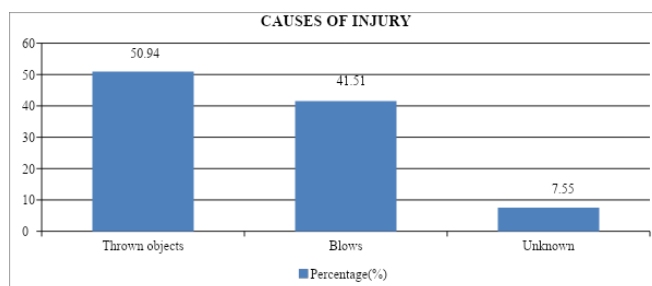
### 4) Causes of Injury

Out of the 53 patients of hyphema, thrown objects accounted for 27 patients; blows accounted for 22 patients and in 4 patients causes of injury was unknown.

Causes of Injury in 53 Patients of Traumatic Hyphema

CAUSES OF INJURY	Number of cases (n)	Percentage (%)
Thrown Objects (e.g. Stones, Balls, etc.)	27	50.94
Blows (e.g. with Fists, Sticks, etc.)	22	41.51
Unknown	4	7.55
TOTAL	53	100

The above table shows the mode and cause of injury was mostly due to thrown objects (50.94%) followed by blows (41.51%). In 7.55% patients the cause was unknown.



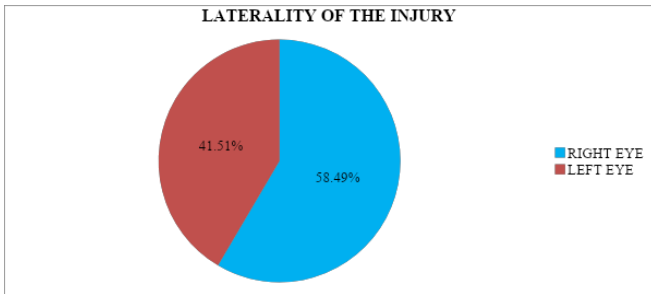
### 5) Laterality of Injury

In the present study right eye was involved in 31 patients. Bilateral involvement was not recorded. It has been observed that there is no predilection to only particular eye involvement.

Laterality of the Injury among 53 Patients of Traumatic Hyphema

EYE	NUMBER (n)	PERCENTAGE (%)
RIGHT EYE	31	58.49
LEFT EYE	22	41.51
TOTAL	53	100

The above table shows 58.49% of patients had right eye involvement and 41.51% patients had left eye involvement. Bilateral involvement was not encountered.

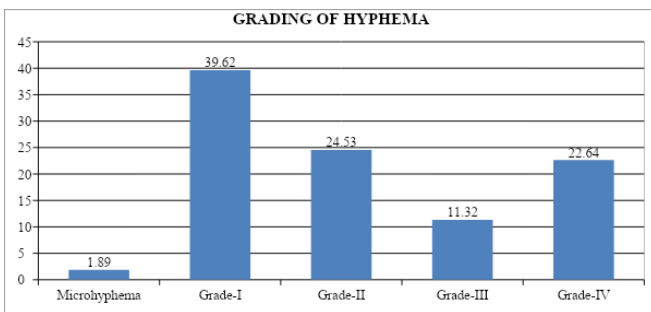


**6) Grading of Hyphaema:**

In the present study Grade I hyphema is seen in 21 patients and microhyphema is seen in only 1 patient. Table-5.7 showing the distribution of various grading of hyphema.

Table-Grading	Number of Cases	Percentage (%)
Microhyphema	1	1.89
Grade-I	21	39.62
Grade-II	13	24.53
Grade-III	6	11.32
Grade-IV	12	22.64
TOTAL	100	100

The above table shows Grade I hyphema consists of maximum patients i.e. 39.62% followed by Grade II hyphema which consists of 24.53% of patients. Microhyphema consist of 1.89% of patients.



**7) Visual Acuity of Patients at Time of Presentation**

**Clinical Presentation:**

Most of the patients presented with pain, redness and blurred vision of their affected eyes, nausea, vomiting and sudden transient obscuring of vision.

These patients were presented with following features:

- Eyelids: 29 patients presented with swollen lids due to injury.
- Conjunctiva: Conjunctival congestion was found in 33 patients, 9 patients were having ciliary congestion. Subconjunctival hemorrhage is found in 11 cases.
- Cornea and Sclera: Corneal oedema was found in 14 patients, corneal laceration was noted in 5 patients, corneal staining in 2 patients and corneal abrasion in 1 patient. Scleral rupture was seen in 2 patients.
- Limbus: Limbus was found to be normal in all patients.
- Anterior Chamber: The anterior chamber was filled with variable amount of blood. In most of the patient's

blood filled up less than half of the anterior chamber and was fluid in nature. In 12 patients anterior chamber was full of blood.

- Iris, Pupil and Lens: Iris, pupil and lens were not visible in 21 patients due to hazy media. Other patients were within normal limits.
- Visual Acuity and Intraocular pressure at the time of presentation:

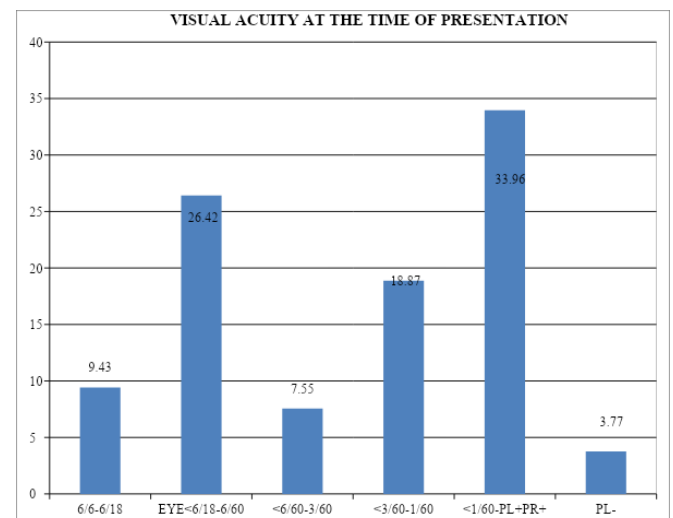
Visual acuity was reduced in all patients during the time of examination. It ranged from 6/12 to no perception of light. 2 patients had no perception of light, 6 patients had perception of light, 12 patients had hand movement, 9 patients had finger counting at 1 metre, 1 patient had finger counting at 2 metre and 4 patients had finger counting at 3 metre. 10 patients with 6/60 vision, 3 patients with 6/36 vision, 1 with 6/24 vision, 2 with 6/18 vision and 3 having 6/12 vision.

The intraocular pressure was normal in 41 patients. In 12 patients intraocular pressure was raised probably related to the amount of blood in the anterior chamber. Among these 12 patients, 7 patients had full chamber hyphema.

VISUAL ACUITY	NUMBER (n)	VISUAL ACUITY	NUMBER (n)
PL-	2	6/60	10
PL+	6	6/36	3
HM+	12	6/24	1
1/60	9	6/18	2
2/60	1	6/12	3
3/60	4		

**Visual Acuity at the Time of Presentation in 53 Patients of Traumatic Hyphema**

VISUAL ACUITY	NUMBER (n)	PERCENTAGE (%)
6/6-6/18	5	9.43
EYE<6/18-6/60	14	26.42
<6/60-3/60	4	7.55
<3/60-1/60	10	18.87
<1/60-PL+PR+	18	33.96
PL-	2	3.77
TOTAL	53	100





**8) Complications**

Following are the complications seen in the present study:

Secondary glaucoma, Secondary hemorrhage and Corneal blood staining.

- Secondary Glaucoma:

Secondary glaucoma was reported in 8 patients. In 6 patients the amount of blood in the anterior chamber was more than half of the anterior chamber. In 4 patients the anterior chamber was completely full of blood. The incidence of secondary glaucoma in the present study is 15.09%.

- Secondary Hemorrhage:

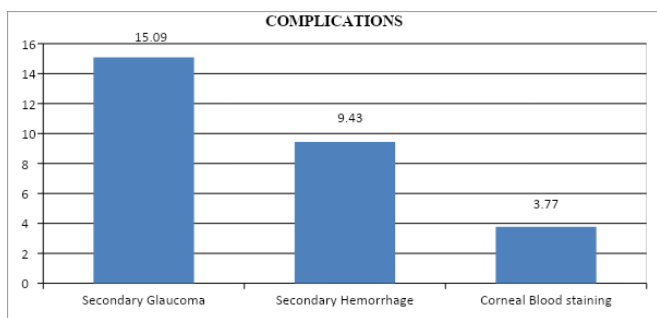
The total number of patients with secondary hemorrhage was 5. The incidence of secondary hemorrhage was 9.43%. Secondary hemorrhage occurred on 2<sup>nd</sup> day in 1 patient. In 2 patients it occurred on 3<sup>rd</sup> day and in other 2 patients it occurred on 4<sup>th</sup> day.

- Corneal Blood Staining:

Corneal blood staining was reported in 2 patients. In both the patients the anterior chamber was full of blood and the intraocular pressure was raised. The incidence of corneal blood staining in the present study was 3.77%.

Complications in 53 Patients of Traumatic Hyphema

COMPLICATION	NUMBER OF CASES	PERCENTAGE (%)
Secondary Glaucoma	8	15.09
Secondary Hemorrhage	5	9.43
Corneal Blood staining	2	3.77



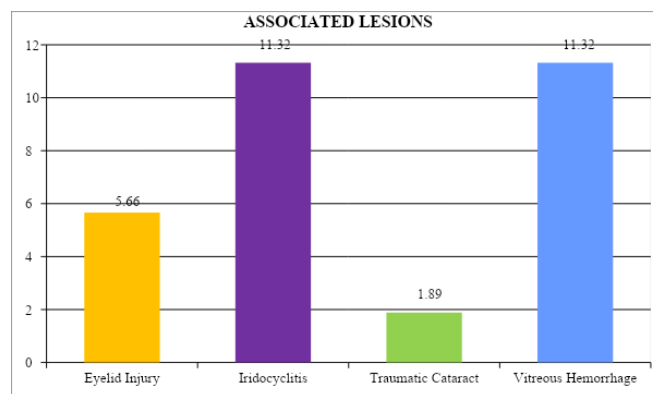
**Associated Complications:**

Besides the complications due to hyphema there are other complications that are due to original trauma which are shown in the Table below.

Associated Lesions	Number of Cases	Percentage (%)
Eyelid Injury	3	5.66
Iridocyclitis	6	11.32
Traumatic Cataract	1	1.89
Vitreous Hemorrhage	6	11.32

The above table shows vitreous hemorrhage and

iridocyclitis to be the most common complication associated with traumatic hyphema both consisting of 11.32% of total cases of traumatic hyphema. Traumatic cataract is the least commonly associated complication consisting of only 1.89% of the total cases of traumatic hyphema.

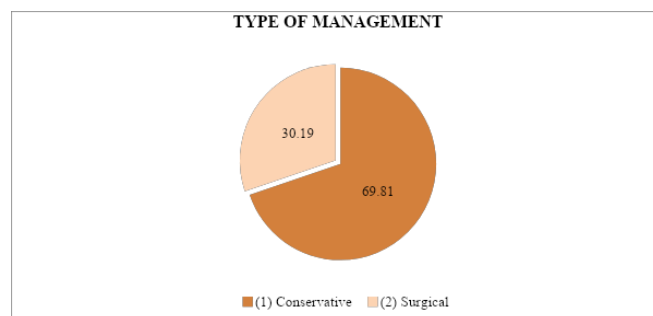


**9) Management**

Initially all the 50 patients were given conservative treatment. Most of the patients were cured with conservative management alone. 16 patients needed surgical intervention.

Management in 53 Cases of Traumatic Hyphema

TYPE OF MANAGEMENT	NUMBER	PERCENTAGE (%)
(1) Conservative	37	69.81
(2) Surgical	16	30.19



**Conservative Management:**

All the 50 patients of the present study were at first given conservative treatment as follows:

- Bed rest
- Elevation of the head end of the bed.
- Pad and bandage to the affected eye.
- Topical antibiotics in the form of drops and ointments (Ciprofloxacin 0.3%).

However, 7 patients of iridocyclitis that were encountered in the present study were treated with Topical Mydriatics (E/D Atropine sulfate 1%) and subconjunctival injection of gentamycin and decadron. The results obtained weresatisfactory.

The following parameters were used to assess the 50 patients of traumatic hyphema in the present study –

- The speed of absorption of blood from the anterior chamber.
- The incidence of secondary hemorrhage.
- Complications.
- Visual acuity better than 6/18 at time of discharge.
- Visual acuity better than 6/18 after 6 weeks.

Based on these parameters the results and observations of the present study are given in the Table below.

PARAMETERS	NUMBER OF CASES	PERCENTAGE (%)
Absorption within one week	39	73.58
Incidence of Secondary Hemorrhage	5	9.43
Complications	12	22.64
Final Visual Acuity better than 6/18	42	79.25

**Surgical Management:**

Surgical management was done with the following procedures –

- Paracentesis
- Irrigation and Aspiration with Balanced Salt Solution.
- Large Incision Technique.

Sixteen (16) patients out of the total 53 patients were managed surgically. Of these, 8 patients underwent irrigation and aspiration with balanced salt solution and the rest 7 patients underwent paracentesis and 1 patient underwent large incision technique.

**Paracentesis:**

Seven (7) patients were subjected to paracentesis. Following paracentesis 5 patients showed absorption of blood from the anterior chamber within one (1) week while other 2 patients showed absorption on the 8<sup>th</sup> and 10<sup>th</sup> day respectively. In the initial 5 patients the blood was unclotted. Visual acuity improved to 6/12 in two patients, one patient had 6/18 visual acuity, one patient had 6/24 visual acuity, one patient had 6/36 visual acuity and two patients had 6/60 visual acuity.

**Irrigation and Aspiration with Balanced Salt Solution:**

In the present series 8 patients underwent irrigation and aspiration with balanced salt solution. In 6 patients blood in the anterior chamber was clotted and in 2 patients it was unclotted. Following irrigation and aspiration with balanced salt solution blood absorbed from the anterior chamber within one week in 5 patients and in the rest 3 patients it took a few more days. Visual acuity improved up to 6/12 in two patients, one patient had visual acuity of 6/18, two patients had visual acuity of 6/60, one patient had visual acuity had visual acuity of 3/60 and two patients had visual acuity of 1/60.

**Large Incision Technique:**

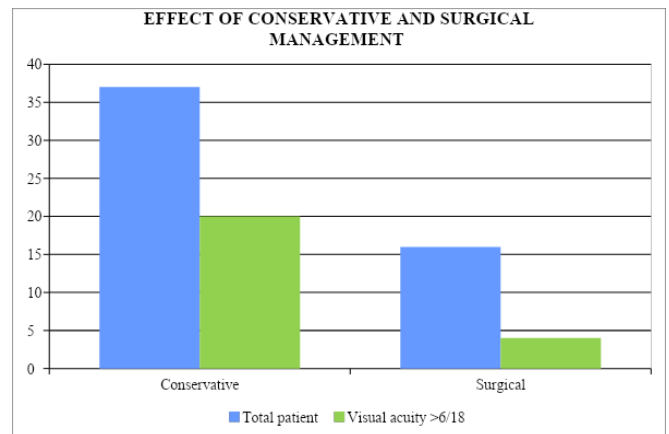
In the present series one patient had undergone this technique. Here a clear corneal incision is made in the area adjacent to the clot. A McPherson or a colibri forceps is used to remove the clot manually. His visual acuity improved to 1/60 after 1 week and to 6/18 after 6 weeks.

**The Effect of Conservative and Surgical Management:**

In the present study 37 patients were treated conservatively and 16 patients treated surgically. Table below shows the effect of conservative and surgical management.

TYPE OF MANAGEMENT	TOTAL		NUMBER OF PATIENT WITH VISUAL ACUITY BETTER THAN 6/18	
	NO.	(%)	NO.	(%)
Conservative	37	69.81	20	37.75
Surgical	16	30.19	4	7.55

The above table shows 37 patients were treated purely conservatively and 16 patients were treated surgically. The final visual acuity better than 6/18 was found in 20 patients i.e. 37.75% in the group treated conservatively whereas only 4 patients i.e. 7.55% were found in the group treated surgically.



**9. Conclusion**

The present study was carried out in the Department of Ophthalmology, Assam Medical College and Hospital, Dibrugarh, Assam. The duration of the study was one year which started from July ‘2013 to June ‘2014. The title of the study was “A Clinical Study on Traumatic Hyphema with Special Reference to Its Management”. The entire study has been summarized in the following paragraphs:

- Traumatic Hyphema patients both attending the Ophthalmology Out-patient Department and from the Indoor have been studied. During this study period a total of 53 patients of traumatic hyphema were encountered.
- During this one year period of study a total of 16, 718 patients attended the Out-patient Department of Ophthalmology, Assam Medical College and Hospital,



Dibrugarh, Assam with various ailments of the eye. Out of these 417 patients had ocular injury. The total numbers of traumatic hyphema patients were 53. So the incidence of traumatic hyphema was 12.71%.

- The present study gives stress more on traumatic hyphema due to its increased incidence among other types of hyphema. Moreover the complications following traumatic hyphema are often disastrous.
- The method of patient study included a detailed history and examination followed by routine examination of blood, urine, bleeding time, clotting time and prothrombin time. Special investigations like fasting blood sugar, Montoux test, Chest X-ray etc. were done wherever needed.
- In the present study the youngest patient was of 3 years old and the oldest patient 61 years. The incidence of hyphema was found to be more in the young age group below 20 years.
- The sex distribution was more towards the male group with 42 patients i.e. 79.25% while the female group had 11 patients i.e. 20.75%.
- In the present study the cause of injury was by thrown objects which included 27 patients and by blows to 22 patients. In 4 patients cause could not be ascertained.
- In the present study the most common form of hyphema is Grade I i.e. 39.62% followed by grade II which consist of 24.53% of cases. Microscopic hyphema consist of 1.89%.
- The patients presented with pain, redness and blurred vision of their affected eye. The eyelids were swollen with the conjunctiva congested. The anterior chamber was filled with variable amount of blood. Visual acuity was reduced in all patients.
- Major complications of hyphema that were encountered in this study included the following: (i) Secondary Glaucoma, (ii) Secondary Hemorrhage and (iii) Corneal Blood Staining.
- Secondary glaucoma occurred in 8 patients. In 6 patients the amount of blood in the anterior chamber was more than half of the anterior chamber. In 4 patients the anterior chamber was completely full of blood. The incidence of secondary glaucoma in the present study is 15.09%.
- The total number of patients with secondary haemorrhage was 5. The incidence of secondary hemorrhage was 9.43%. In all these patients secondary haemorrhage occurred between 2<sup>nd</sup> and 4<sup>th</sup> day.
- Only 2 patients suffered from corneal blood staining. In both the patients the anterior chamber was full of blood and the intraocular pressure rose.
- Out of 53 patients of traumatic hyphema, 16 patients had associated lesions. Eyelid injury was present in 3 patients, iridocyclitis in 6 patients, traumatic cataract in 1 patient and vitreous haemorrhage in 6 patients.
- The visual recovery was not satisfactory with these patients with complications. In the present study all the patients were initially treated with conservative management. But 16 patients needed surgical management due to the failure of conservative management or due to the impending complications. Paracentesis and Irrigation and aspiration with balanced salt solution, large incision technique were the surgical

procedures executed. Out of these 16 patients, 7 patients were subjected to paracentesis, 8 patients to irrigation and aspiration with balanced salt solution and 1 patient underwent clear corneal incision.