

## Clinical Study of 100 Cases of Traumatic Cataract

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**Abstract :** Ocular Trauma is common in an agricultural & industrial area like Kancheepuram. One of the most common presentation of ocular trauma is traumatic cataract . It remains a significant cause of visual disability in the productive age group. **Aim:** To analyse the incidence of traumatic cataract in various age groups, the nature and characteristics of trauma in traumatic cataract, the operative and post operative complications, and to assess the visual prognosis of traumatic cataract

**Materials and Methods:** A retrospective study was carried on 100 patients who had traumatic cataract and diminished vision. Complete anterior and posterior segment examination was done. X-ray orbit to rule out orbital fractures, ocular foreign body, B Scan to detect posterior segment pathology and intactness of posterior capsule of the lens and Biometry for IOL power calculation were done. For uncomplicated traumatic cataract, SICS or phacoemulsification with PCIOL implantation was done as primary procedure. For complicated traumatic cataract, with corneal (or) corneoscleral tear with shallow anterior chamber, emergency suturing was done.

**Results:** Out of the 100 patients taken for the study, incidence of ocular trauma was more in the age group of 16 to 30 years. 86% of affected patients were younger than 45 years. 69% were males. Involvement of the right eye was slightly more (52%). Farmers were mainly affected with sticks (33%) and thorns (21%). The type of injury being 40% blunt injury, 59% penetrating injury, 1% electric injury. Visual acuity in 48% of patients was HM (or) worse and 18% had PL only. The associated corneal injury being 59%, iris injury 21%, lens subluxation 10% and secondary glaucoma 12%. Visual acuity during the early post operative period (on 3rd day) was less than 6/36 in 77 cases due to early post operative complications like iritis (16%) and striate keratopathy (13%). Visual acuity at the end of 6 weeks of surgery was less than 6/36 in 28 cases mainly due to pre-existing corneal opacity and posterior segment complications. Visual acuity of better than 6/18 was seen in 72% of cases.

**Conclusion:** Traumatic cataract is a dreadful complication. Most of the injuries are occupation related so protective goggles in the workplace is mandatory where workers are prone for ocular injuries. Early ophthalmic assessment and treatment can prevent visual loss due to post traumatic cataract.

**Key Word:** Cataract, Trauma, Phacoemulsification, Subluxation.

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### I. Introduction

Cataract is by far the commonest complication causing loss of vision following any type of ocular injury mechanical injuries (blunt and penetrating) or non-mechanical injuries (Electric, thermal, radiational and chemical injuries)<sup>1,2</sup>. Extent of associated damage to anterior and posterior segment at the time of presentation, operative and postoperative complications, determine the ultimate prognosis.

### II. Materials and Methods

This is a retrospective study of 100 patients who presented with cataract after trauma at Kancheepuram District Headquarters Hospital & DNB Training Institute from January 2014 to January 2020 for a period of 6 years. All patients presenting to out patient department with history of trauma and diminished vision due to cataract were included in the study. Patients with history of any pre-existing posterior segment pathology and macular diseases<sup>3</sup> were excluded. History regarding the diminished vision, mode of onset and duration, nature of trauma, associated ocular damage<sup>4</sup>, time lapse between occurrence of trauma and treatment taken were recorded. Ophthalmological evaluation included visual acuity, anterior segment examination by Slit lamp biomicroscopy<sup>5</sup>, patency of nasolacrimal duct, IOP measurement by applanation tonometry, angle study by gonioscopy, posterior segment evaluation by direct and indirect ophthalmoscopy<sup>6</sup>. X-ray orbit to rule out orbital fractures and IOFB, B-Scan to find out the posterior segment pathology and Biometry for IOL power calculation were done. For uncomplicated traumatic cataract, SICS or phacoemulsification with PCIOL implantation was done as a primary

procedure. Patients with corneal (or) corneoscleral tear with shallow anterior chamber, were taken up for emergency suturing (Fig 1.). After 6 weeks, patients were taken up for cataract surgery. Patient was reviewed daily for first 4 days and every week for 6 weeks. Spectacle correction was given at the end of 6 weeks for residual refractive error.

### III. Results

Incidence of ocular trauma was more in the age group of 16 to 30 years (41%). Incidence was more in the right eye (52%). Occupation history varied from farmers, manual labourers, industrial workers and students. Farmers and industrial workers form the core group of affected persons.

**Table No. 1:** Age distribution of Traumatic cataract

Age (in years)	No. of cases	Percentage
0 – 15	17	17%
16 – 30	41	41%
31 – 45	28	28%
46 – 60	11	11%
61 – 75	2	2%
76 – 90	1	1%

Farmers were mainly involved because they were more exposed to sticks and thorns situated in the proximity of fields and in the fences. None of the industrial workers were wearing safety glasses when they were injured. In our study, 40 cases had blunt injury, 59 cases had penetrating injury and 1 case had electric injury<sup>8</sup>. The objects causing trauma were stick (33%) , thorn (21%), metal piece(12%), stone(11%), fist(4%),ball(4%), pencil(4%), glass piece(4%),bag(4%) and plastic material(3%). Since this study was conducted in the general population and most of the patients belong to low socioeconomic status, the most common type of objects were stick and thorn<sup>7</sup>.

**Table No. 2:** Ocular Injuries and Types of Cataract

Associated ocular injuries <sup>2</sup>	No of cases(n= 100)	Types of cataract	No of cases(n= 100)
Corneal / corneoscleral injury	59	Intumescent cataract	31
Iris injury	21	Lacerated cataract	23
Subluxated lens	10	Rosette cataract	18
Anterior dislocation of lens	1	Localized cataract	5
Posterior dislocation of lens	1	Diffuse concussion cataract	12
Subconjunctival dislocation of lens	1	Zonular cataract	5
Secondary Glaucoma	12	Electric cataract	1
Posterior synechiae	6	Post traumatic partially absorbed lens	3
Vitreous hemorrhage	2	Post cortical cataract	2
Retinal detachment	2		

**Fig. No. 1:** Traumatic cataract with posterior synechiae

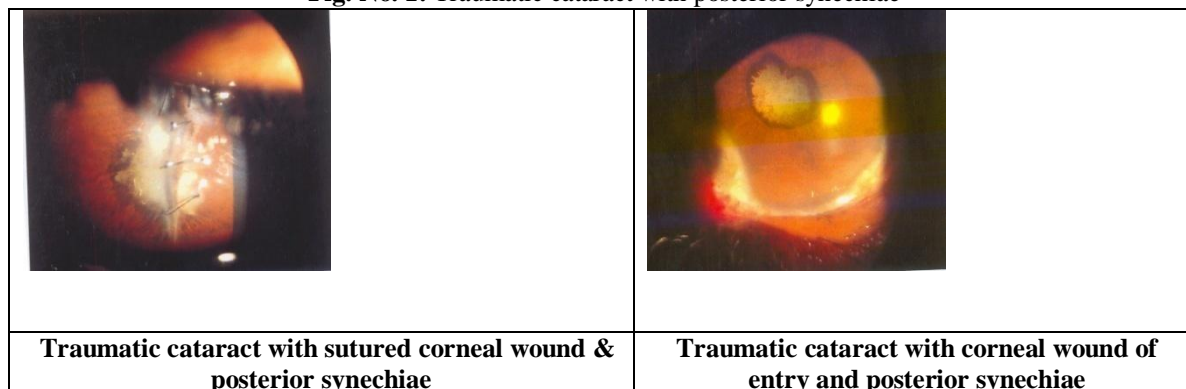


Fig. No.: 2 Intumescent cataract

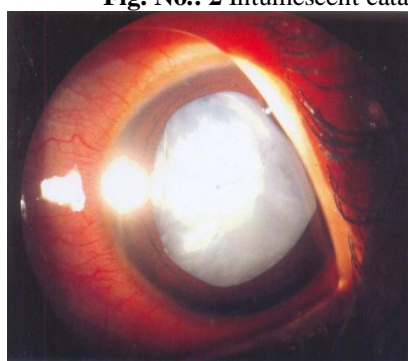
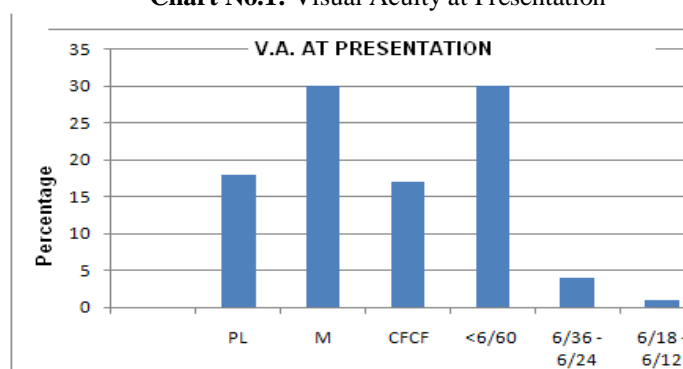


Chart No.1: Visual Acuity at Presentation



Out of 18 cases who had perception of light, 2 cases had defective projection of rays because of associated retinal detachment. Intraocular pressure was raised in 12 patients in the traumatized eye<sup>8</sup>. The raised tension may be due to perforating injury with intumescent cataract, cortical matter in anterior chamber or iritis. These patients were treated medically with beta blockers and azetazolamide and later taken up for surgery<sup>3</sup>.

35% of patients had B scan abnormalities like PVD, PC rupture, lens subluxation, retinal detachment, vitreous haemorrhage<sup>9</sup>. In all other cases, ultrasound B-scan showed normal posterior segment. Almost 79% of patients underwent cataract surgery within 6 months of trauma.

In our study, 59 patients had penetrating injury in which 13 had corneal or corneoscleral tear for which emergency corneal tear suturing with reformation of anterior chamber was done<sup>10</sup>.

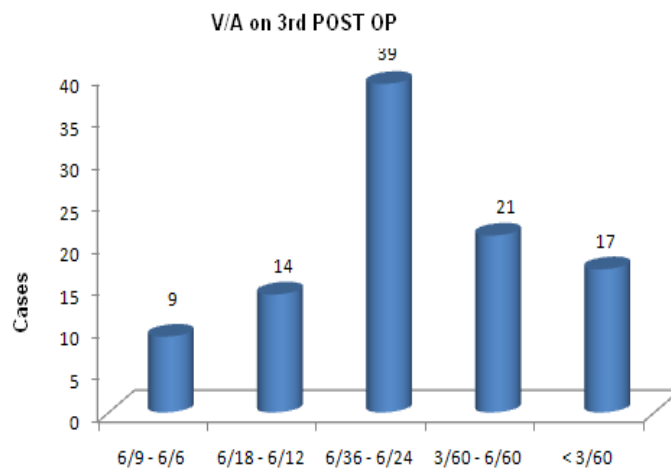
Table No.2: Early and Late Post Operative Complications

S.NO	Early post operative complications	No.of patients	Late post operative complications	No of cases
1	Iritis	16	PCO	14
2	Striate keratitis	13	Pupillary capture	4
3	Shallow AC	2	Cystoid macular edema	3
4	Retained cortex	4	IOL decentration	3
5	Hyphaema	3	Pigment dispersion	8
6	Pigment dispersion over IOL	9	Vitreous haze	1
7	Vitritis	2	Retinal detachment	4
8	Raised IOP	2		

In our study, PCIOL was placed in 64% of cases<sup>10</sup>, scleral fixation IOL in 16% of cases, sulcus fixation IOL was placed in 9%, PCIOL with CTR was placed 6% of cases, ACIOL in 2% of cases and 3% of cases were left aphakic<sup>11</sup>. In this study, the most common intraoperative complications were PC rupture (20%) (pre existing-11% and intraoperative - 9%) and vitreous disturbances(20%). Anterior vitrectomy was done in these patients with or without IOL implantation<sup>12</sup>. 2 patients had nucleus drop for which pars plana vitrectomy<sup>11</sup> and lensectomy was done and the patients were left aphakic. In this study, the most common early postoperative complications include the following(in descending order of frequency); Iritis (16%), striate keratitis (13%), pigment dispersion over IOL( 9%), retained cortex (4%), hyphaema (3%) and shallow AC( 2%)<sup>13</sup>.

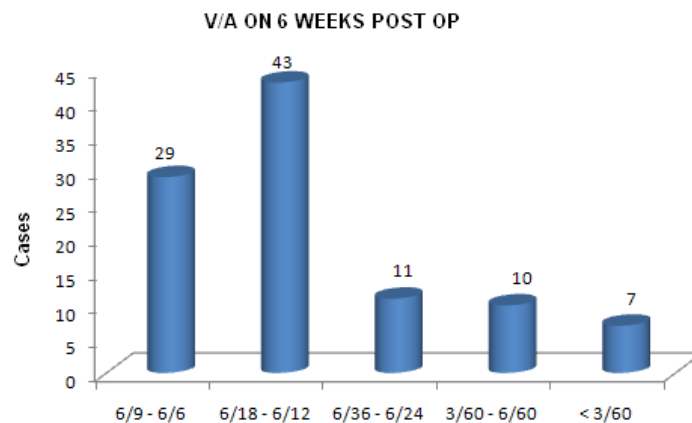
Posterior capsular opacification (14%) and pigment dispersion (8%) were the most common late postoperative complications. After 3 days of surgery,38% of patients had vision of <6/60, 39% of patients had vision of 6/24 - 6/36 and 23% had vision >6/18. Visual acuity during the early post operative period was less than 6/24 in 77 due to early post operative complications like iritis(16%) and striate keratopathy(13%).

**Chart No.: 3** Visual Acuity on 3<sup>rd</sup> Post Operative Day



Post operatively at the end of 6 weeks, 17% of patients had <6/60, 11% of patients had 6/36 - 6/24, 43% of patients had 6/18-6/12 and 29% of patients had 6/9-6/6. Among 17 cases with poor vision, 12 cases had sutured corneal wound or corneal opacity in the visual axis, 2 cases had vitreous haze, 2 cases had retinal detachment, 1 case had thick posterior capsular opacification which did not improve even after YAG capsulotomy.

**Chart No. 3.** Visual acuity after 6 weeks of post operative period



#### IV. Discussion

Incidence of ocular trauma was more in the age group of 16-30 years (41%) which reflects the fact that people in the active age group are more prone to sustain injuries. Increased incidence seen in males (60%) indicate relatively more involvement in outdoor activities and their nature of work should also be taken into account. This is supported by the study by Gnanajothi C<sup>14</sup> et al in 2018 where males (80%) in age group of (11-20 years) (38%) were affected.

There was no significant difference between the eyes involved. Right eye 52%; left eye 48%. Mainly farmers and industrial workers were involved due to the fact that they work outdoors in the fields. They were mostly exposed to stick and thorn. Trauma at industrial site occurs due to non wearing of protective glasses. None of the industrial workers were wearing safety glasses at the time of accident. Penetrating injury (59%) was more common than blunt injury (40%). One patient had Electric injury.

The corneal tear was self sealing in 21% of cases and hence did not require suturing at the time of examination. 25% cases had pre-existing corneal opacity with traumatic cataract. 13% cases needed emergency corneal tear suturing and these cases were taken up later for lens removal with IOL implantation. Patients with raised intraocular pressure (12%) and iritis (19%) were given medical treatment and then taken for surgery. Almost 79% of patients underwent cataract surgery within 6 months of trauma.

The pre-operative visual acuity was grossly reduced in 65% of cases. This was due to the total cataract in majority of cases and corneal opacity in the visual axis. Patients without any corneal tear or any other major complications underwent primary procedure (87%). The type of surgery differs depending upon the intactness of

the posterior capsule and the degree of zonular dehiscence. PCIOL was placed in 64% cases, sclera fixation IOL in 16% cases, PCIOL with CTR in 6% cases. ACIOL in 2% cases, 3% cases were left aphakic.

The most common intraoperative difficulties encountered were posterior capsular rupture (pre-existing - 11%, intra-operative-9%), vitreous loss (20%) and inadequate pupillary dilatation (7%) due to posterior synechiae. Visual acuity during the early post operative period (on 3rd day) was less than 6/36 in 77 cases due to early post operative complications like iritis (16%) and striate keratopathy (13%). Visual acuity at the end of 6 weeks of surgery was better than 6/18 in 72% and less than 6/24 in 28 cases mainly due to pre-existing corneal opacity and posterior capsular opacification. This is consistent with study by Pavlovic S<sup>15</sup>, Weinand F et al who achieved final visual acuity of better than 6/18 in 72.7%. The study by Akshay J Bhandari<sup>16</sup> et al showed that poor visual acuity was mainly due to corneal opacity & posterior capsular opacification.

Posterior capsular opacification (14%) and pigment dispersion (8%) were the most common late postoperative complications. Patients with PCO underwent YAG capsulotomy and the average visual acuity was 6/24 after the procedure. Pigment dispersion over the IOL did not affect the final visual outcome. Although only 23% of patients had > 6/18 vision on the 3<sup>rd</sup> post operative day, 72% of patients had better than 6/18 vision at 6 weeks.

## V. Conclusion

In our study males were predominantly affected by traumatic cataract keeping in view their nature of work and outdoor occupation. People in productive age group of 16 to 30 years age group were mainly involved. Perforating injuries were mostly due to sticks and thorns. PCIOL implantation was the most common type of surgery done in our study. PCIOL with capsular tension rings and SFIOL were done in complicated cases. The final visual outcome depends upon early diagnosis, timely management and the extent of corneal injury and posterior segment involvement. However more emphasis should be laid on preventive strategies like educating the people on ocular trauma and using protective goggles at work places.

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