

Original Research Article

Management and final visual outcome of various types of the lens induced glaucoma's attending to Narayana Medical College Hospital

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Abstract

Objectives: A clinical study of visual outcome and intraocular pressure control after cataract surgery in Lens Induced Glaucoma.

Material and methods: A minimum of 50 cases of lens induced glaucoma were selected based on simple random sampling, who attended the department of Narayana Medical College Hospital and were diagnosed to be having Lens Induced Glaucoma. Appropriate medical management was given followed by surgical intervention. Patients were followed up on the 1st week, 4th week and 6th week postoperatively.

Results: Finally after the analysis of the data, it was demonstrated that the longer the duration of symptoms and higher intraocular pressure (IOP) at presentation, the poorer the visual prognosis. It was also noticed that the intra-operative and postoperative complication were more in cases of LIG as compared to normal population. It was also noticed that after cataract extraction surgery few cases had post-operative IOP above borderline. These cases can be controlled by anti-glaucoma medication and regular follow-up of these cases. If necessary, trabeculectomy may be done in future to control the IOP.

Conclusion: The incidence of postoperative uveitis was more in LIG when compared to the normal population and more so if associated with intra-operative complications. The visual recovery was fairly good in all those cases that have undergone treatment quite early. Also the higher the IOP pre-operatively, the prognosis for good vision following surgery is poor. A sustained rise of pressure for a

long time was a bad prognostic factor for post-operative development of good vision. It is to be stressed upon, imparting health education and creating awareness regarding cataract and its implications among the rural community, ophthalmic assistants and peripheral health workers.

Key words

Cataract, Lens induced Glaucoma, Intraocular pressure.

Introduction

Lens Induced Glaucoma (LIG) is a common condition seen in patients with senile cataracts and it is one of commonest cause of secondary glaucoma that requires an immediate attention and management to prevent blindness. Lens induced glaucoma's are a common occurrence in India, hardly surprising in a situation where the incident of cataract cases far exceeds the total number of surgeries performed currently. Though these are clinically distinct entities, they have certain common factors in that they are lens induced; they compromise the function of the optic nerve due to rise of intraocular pressure, cataract surgery is definitive treatment in these cases, and finally they uniformly share a guarded prognosis [1].

Pre-operative and post-operative morbidity is more in an eye with lens induced glaucoma than that with a simple uncomplicated cataract. Prognosis and visual outcome are also affected to some extent. Hence timely intervention is important in achieving good results. Each case depending on the mechanism by which glaucoma occurs, has to be managed in a different way. In general, after controlling the intraocular pressure, cataract extraction with IOL implantation should be performed preferably. Pre-operative and post-operative morbidity is more in an eye with lens induced glaucoma than that with a simple uncomplicated cataract. Each case depending on the mechanism by which glaucoma occurs, has to be managed in a different way. In general, after controlling the intraocular pressure, cataract extraction with IOL implantation should be performed preferably.

Trauma is the most common cause of a displaced lens [2]. Jarrett WH in a series of 166 cases

reported that injury accounted for 53% of the total group [3]. Medical therapy with topical β -blockers, systemic carbonic anhydrase inhibitors, and hyperosmotic agents is useful for reducing intraocular pressure in preparation for surgery. Intracapsular cataract extraction has been advocated in the past because of concerns that lens material remaining after extracapsular surgery could allow perpetuation or exacerbation of the condition [4, 5]. Reports of cures of phacolytic glaucoma with extracapsular cataract extraction with or without posterior chamber intraocular lens implantation suggest that this may be useful alternative to intracapsular surgery [5, 6].

Material and methods

A minimum of 50 cases of lens induced glaucoma were selected based on simple random sampling. Age and sex were not criteria in selecting cases. The study was made on patients diagnosed with lens induced glaucoma and admitted to the ophthalmic ward Narayana Medical College Hospital, Nellore during the period of January 2013 to January 2014. All the 50 patients after clinical diagnosis were admitted and a detailed history and examination were done.

Clinical examination of all cases were done which consist of general examination, detailed study of globe, lacrimal sac, adnexa anterior segment and posterior segment by USG. Lens was examined with respect to its size. Shape, transparency and position, whether in situ or displaced condition of lens capsule was also noted. Retinal function was determined by testing for Perception of Light and Projection of Rays appropriately to the corresponding quadrants of visual field. Fundus examination

was done after dilatation of pupil. The IOP was measured with schiottz tonometer average of three reading were taken. Gonioscopy was done to rule out the details of angle whether open/closed or any extensive peripheral anterior synechiae involving 2/3or > 2/3rd of the angle of anterior chamber. Sac syringing was done for lacrimal sac surgery. Detailed examination of both eyes was done. All routine investigations including BP, urine sugar albumin, blood sugar etc were done.

Management

The management of the cases included relief from pain and bringing down the raised IOP. Apart from these, subsidence of the uveal inflammation was also a priority. These were achieved through both medical and surgical measures. Medical management consisted of analgesics, mydriatics depending upon whether the glaucoma was due to pupil block, topical steroids, anti glaucoma medication and drugs for reducing associated features. Following control of IOP patient was operated for lens extraction. The preferred surgery was Manual Small Incision Cataract Surgery with PCIOL implantation under local (peribulbar) anaesthesia. Eye pad was removed next day. Detailed slit lamp evaluation was done and looked for any post-operative complications. Vision with pin hole was tested on the first day. Patients were followed up after 1st post-operative day, 1, 4 and 6 weeks and at each visit a detailed slit lamp examination, IOP measure with Non-contact tonometer in first two follow up and 4th and 6th weeks with Applanation tonometer and BCVA were recorded.

Data recorded in proforma and was analyzed statistically using the Chi-Square method and the Probability value. The statistical analysis was done using the SPSS ver.16.0.

Results

In this study, age range was 52 to 81 years with a mean age of 59.57±7.96 years.

Preoperative IOP in various LIG

A total of 3 cases (6%) presented with IOP less than 30 mm Hg, 20 cases (40%) with IOP between 30-40 mm Hg. Rest of the cases presented with IOP more than 40 mm Hg (54%). The highest pressure recorded during the study was 78.00 mm Hg. (**Figure - 1**)

PCR with VL

Out of the 50 cases operated, intra-operative complication was noted in 6 cases (12%) in the form of PCR with Vitreous Loss. The incidence of PCR with VL in phacomorphic glaucoma in this study was 06% whereas in phacolytic glaucoma it was noticed to be around 4%. (**Table - 1**)

Table – 1: PCR with VL.

PCR with VL	No. of cases	%
Phacomorphic	03	06
Phacolytic	02	04
Lens particle	01	02
Phacoanaphylactic	-	-
Subluxation/ dislocation	-	-
Total	06	12

Post-operative AC reaction

On the first post-operative day, AC reaction in the form of flare, cells, exudative membrane or hypopyon was found in 11 cases (22%) out of the 50 cases operated. 6 of these cases (54.54%) were of phacolytic glaucoma. 3 cases (27.27%) were of Phacomorphic glaucoma and 2 cases (18.18%) were of lens particle glaucoma.

Duration of symptoms and final BCVA

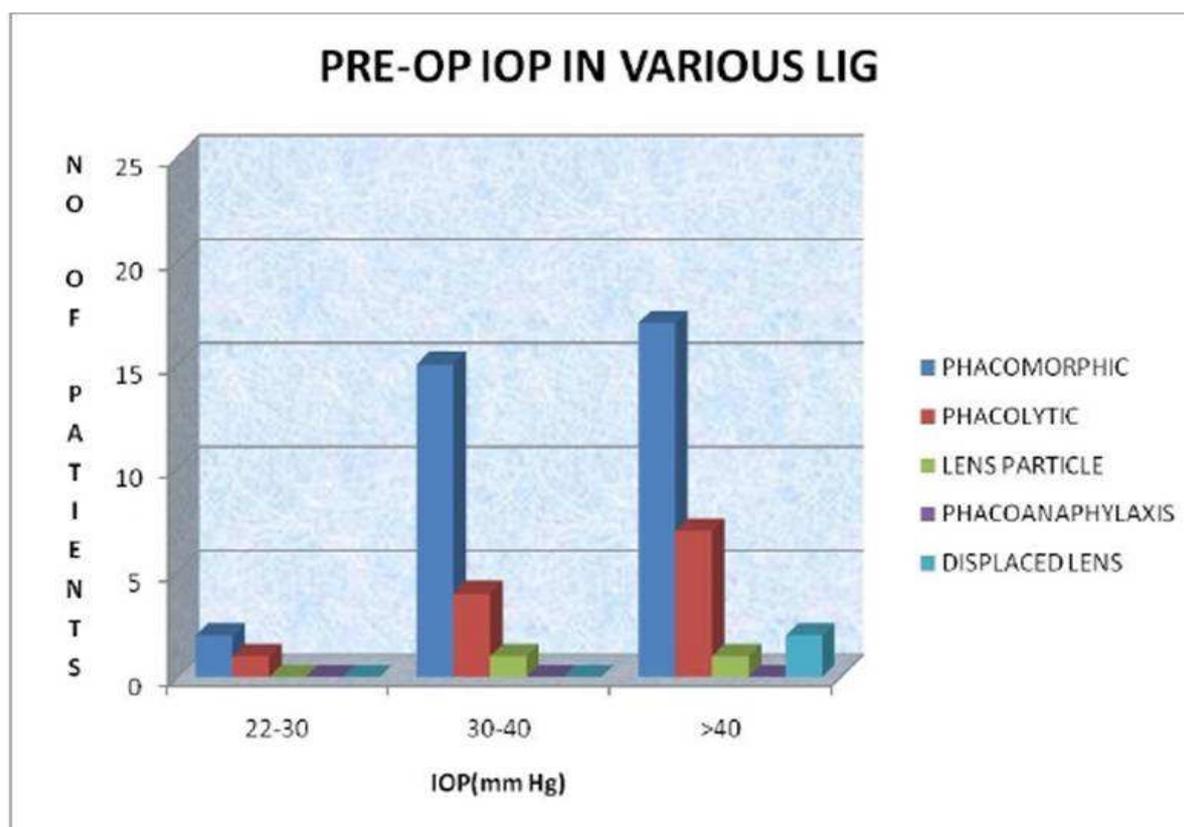
Out of 29 cases (58%) who presented within 1 week, 18 cases (62.06%) had good BCVA while 7 cases (24.13%) had useful vision and remaining 4 cases (13.79%) had poor vision. 11 cases (22%) presented between 1-2 weeks in which 4 cases (36.36%) had good BCVA, 5 cases (45.45%) had useful vision while 5 cases (45.45%) had poor vision. In 10 cases (20%) who presented later than 2 weeks, 5 cases (50%) had useful vision and 5 cases (50%) had poor vision. (**Table - 2**)

Table – 2: Duration of symptoms and final BCVA.

	6/6-6/12 (%)	6/18-6/60 (%)	>6/60 (%)
<1week	18(36)	07(14)	04(08)
1- 2weeks	04(08)	05(10)	02(04)
>2 weeks	00	05(10)	05(10)
TOTAL	22(44)	17(34)	11(22)

Chi square = 19.533 and 'p'= 0.001

Figure - 1: Preoperative IOP in various LIG.



Preoperative IOP and final BCVA

Out of 3 cases who presented with IOP less than 30 mm Hg, 2 cases (66.66%) had a good BCVA at the end of 6 weeks; remaining 1 case (33.33%) had poor vision. In 20 cases that presented with IOP between 30- 40 mm Hg, 10 cases (50%) had good visual acuity while 6 cases (30%) had fairly useful vision and 4 cases (20%) had poor vision.

Out of the 27 cases that presented with IOP more than 40 mm Hg, 10 cases (37.03%) had good vision, 11 cases (40.74%) had fairly useful vision and remaining 06 cases (22.22%) cases had poor vision. (Table - 3)

Comparison between pre-operative and post-operative IOP

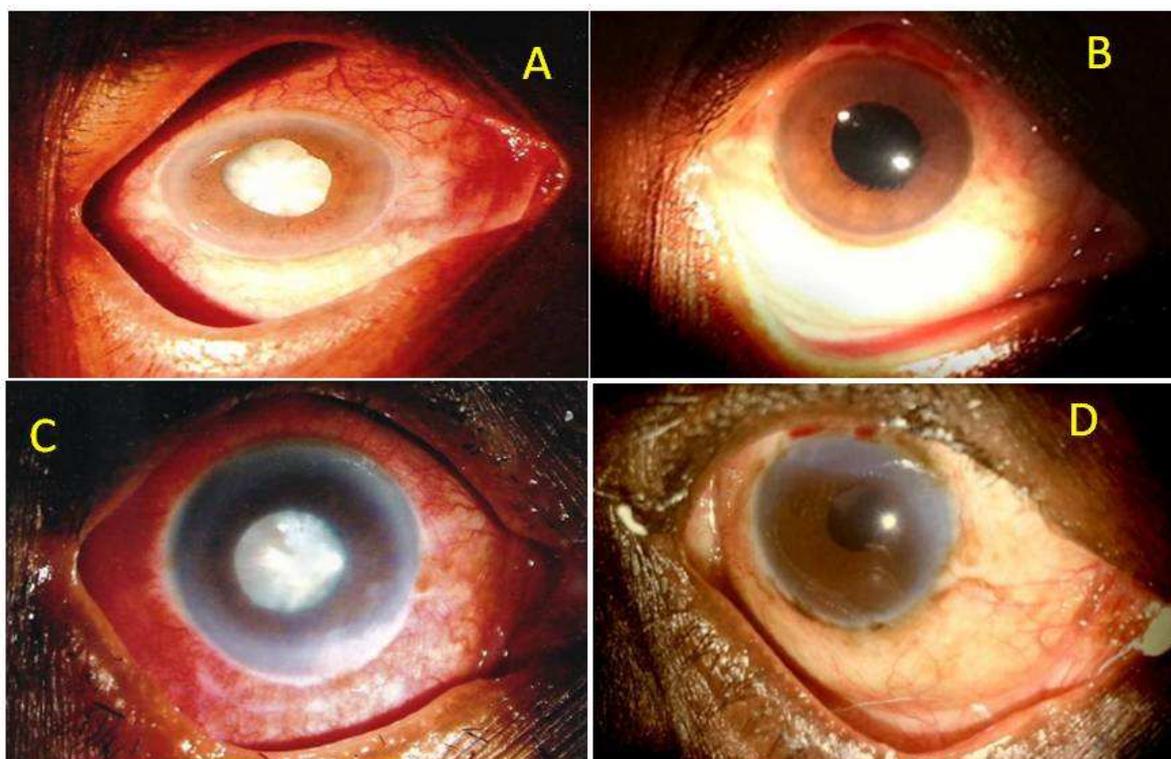
Out of 50 pre-operative cases, there were no cases that had IOP between 0-10 and 11-20 mm of Hg. 3 (6%) cases between 21-30 mm of Hg, 20 (40%) cases between 31-40 mm of Hg and 27 (54%) cases had more than 40 mm of Hg. However, out of 50 post-operative cases, 3 (6%) cases had IOP between 0-10 mm of Hg, 44 (88%) had IOP between 11-20 mm of Hg and 3 (6%) had IOP between 21-30 mm of Hg. No post-operative case had IOP 31- 40 and >40 mm of Hg. (Table - 4) (Figure - 2)

Table – 3: Preoperative IOP and final BCVA.

IOP (in mm Hg)	6/6- 6/12 (%)	6/18- 6/60 (%)	>6/60 (%)	Total
22- 30	02(4)	0	01(2)	03(6)
30- 40	10(20)	06(12)	04(8)	20(40)
> 40	10(20)	11 (22)	06(12)	27(54)

Chi square = 17.956 and 'p'= 0.04

Figure – 2: A) Phacolytic glaucoma Pre-operative right eye. B) Phacolytic glaucoma Post-operative right eye. C) Phacomorphic glaucoma Pre-operative right eye. D) Phacomorphic glaucoma Post-operative right eye.



Discussion

Here (Chi^2) = 9.632, p-value= 0.278 showed that no significant association existed between the age group of patients and the disease under study. There were 18 males and 32 females. Their age ranged from 56 to 81 years with a mean of 68.84 years. The youngest patient was a 56-year- old female and the oldest an 81 years old male.

In this study and including all above studies females seemed to have significant increased risk of having this glaucoma's. Out of 50 pre-operative cases, there were no cases that had IOP between 0-10 and 11-20 mm of Hg. 3 (6%) cases

between 21-30 mm of Hg, 20 (40%) cases between 31-40 mm of Hg and 27 (54%) cases had more than 40 mm of Hg.

Table – 4: Comparison between pre-operative and post-operative IOP.

IOP (mm of Hg)	Pre-op IOP	Post-op IOP
0-10	0	3
11-20	0	44
21-30	3	3
31-40	20	0
>40	27	0
Total	50	50

However, out of 50 post-operative cases, 3 (6%) cases had IOP between 0-10 mm of Hg, 44 (88%) had IOP between 11-20 mm of Hg and 3 (6%) had IOP between 21-30 mm of Hg. No post-operative case had IOP 31- 40 and >40 mm of Hg.

Out of the 50 post-operative cases of cataract extraction to control IOP, 3 cases (6%) had IOP more than 21 mm of Hg which above borderline. IOP in these cases can be controlled by anti-glaucoma medication and regular follow-up of these cases. If necessary, trabeculectomy may be done in future to control the IOP.

All the cases were treated surgically with small incision cataract surgery with posterior chamber IOL implantation except in 2 cases with traumatic posterior subluxation of lens where scleral fixated IOL was placed.

Out of the 50 cases operated, intra-operative complication was noted in 6 cases (12%) in the form of PCR with Vitreous Loss. PCR with VL occurred in 06 cases out of which, 3 cases (50%) were phacomorphic glaucoma while 2 cases (33.33%) were phacolytic glaucoma and 1 case (16.66%) was phacotoxic glaucoma. 5 cases were managed with placing PCIOL in sulcus, 1 case was managed by placing ACIOL. (χ^2) = 7.053 and p -value= 0.1, indicating that the incidence of PCR with VL was clinically significant but not statistically in the patients with lens-induced glaucoma as compared to normal population.

According to Lim, Cheu and Jen the incidence of PCR during cataract surgery was around 6-10%. The above data shows the incidence to be 12% in cases of lens induced glaucoma. In study of Mohinder Singh [7], Intraocular Lens Implantation in Phacomorphic Glaucoma, found intra-operative complications encountered in this study shallow anterior chamber due to posterior vitreous pressure was seen in nine patients. Posterior capsular tear resulting in loss of the vitreous occurred in one patient and in three patient's complete removal of the cortical

material could not be achieved. In present study and study of Mohinder Singh Posterior capsular tear resulting in loss of the vitreous is common intra-operative complications encountered.

On the 1st post-operative day AC reaction in the form of flare, cells, exudative membrane or hypopyon was noticed in 11 cases (22%) out of 50 cases that were operated. Out of the 11 cases, 6 cases (54.54%) were of phacolytic glaucoma, 3 cases (27.27%) were of phacomorphic glaucoma and 2 cases (18.18%) of lens particle glaucoma. (χ^2)=55.811 and p -value=0.1 indicating the incidence of AC reaction was clinically significant but not statistically significant in the study population than normal.

AC chamber reaction was treated with topical steroids (stronger topical agents—1 % prednisolone, 0.1% dexamethasone, 0.1% Betamethasone and difluprednate 0.05%, —are indicated for severe and acute inflammation), cycloplegic (cyclopentolate 1%, atropine 1%, homatropine) and systemic steroids (Prednisolone is given 1-2 mg/kg, starting with low dose and then slowly taper before stopping). Majority of the patients recovered within 1 week with the treatment and all the 11 cases did not show any AC reaction at the end of 2 weeks follow-up period.

In study of Mohinder Singh [7], postoperative complications encountered is Post-operative uveitis, inflammatory deposits on the lens implant surface were present, striate keratopathy. Other complications are Hyphaema, Iris Implant adhesions, Pupillary block glaucoma. In present study and study of Mohinder Singh A.C reaction is correlating post-operative complication.

Delayed reporting for treatment leads to serious complications like lens induced glaucoma causing irreversible visual loss. LIG is a condition to reckon with in our ophthalmic patients, especially ours being a rural area. In spite of availability of surgical facilities still many people are becoming blind due to lack of awareness about significance of early

management. Illiterate, older, and rural population are the worst affected.

Conclusion

Medical line of management had to be initiated before taking the patients to surgery to reduce the IOP and to relieve the symptoms. However medical line of management was temporary and surgery in the form of lens extraction was the definitive treatment. The incidence of intra-operative PCR with VL was more as compared to normal population. The incidence of postoperative uveitis was more in LIG when compared to the normal population and more so if associated with intra-operative complications. The visual recovery was fairly good in all those cases that have undergone treatment quite early. Also the higher the IOP pre-operatively, the prognosis for good vision following surgery is poor. A sustained rise of pressure for a long time was a bad prognostic factor for post-operative development of good vision. It is to be stressed upon, imparting health education and creating awareness regarding cataract and its implications among the rural community, ophthalmic assistants and peripheral health workers.

References

1. Fletcher A, Thulasiraj RD, et al. Low uptake of eye services in rural India: A challenge for programs of blindness prevention. *Arch Ophthalmol.*, 1999; 117: 1393-1399.
2. Chandler PA. Choice of treatment in dislocation of the lens. *Arch Ophthalmol.*, 1964; 74: 765.
3. Jarrett WH. Dislocation of the lens: a study of 166 hospitalized cases. *Arch Ophthalmol.*, 1967; 78: 289.
4. Khalil MK, Lorenzetti DW. Lens-induced inflammations. *Can J Ophthalmol.*, 1986; 21: 96.
5. Lane SS, Kopietz LA, Lindquist TD, Leavenworth N. Treatment of phacolytic glaucoma with extracapsular cataract extraction. *Ophthalmology*, 1988; 95: 749.
6. Gross KA, Pearce JL. Phacolytic glaucoma with ECCE and primary IOL implantation. *Cataract*, 1984, 2: 22.
7. Mohinder Singh, Hassan Al-Arrayyed, Revathy Krishnan. Intraocular Lens Implantation in Phacomorphic Glaucoma. *Bahrain Medical Bulletin*, 2002; 24(3): 1-5.