

Intraocular Lens Implantation in Phacomorphic Glaucoma

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Objective: To study the outcome of intraocular lens implantation in patients presenting with acute phacomorphic glaucoma.

Method: Cataract surgery was performed after controlling the intraocular pressure in patients presenting with acute phacomorphic glaucoma. Intraocular lenses were inserted in the bag after conventional extracapsular cataract extraction. Patients with minimum follow up of one year were analyzed for the study. Corrected visual acuity, intraocular pressure and any complications of surgery were recorded.

Results: Analysis of 41 cases of acute phacomorphic glaucoma who were treated by cataract removal and lens implantation revealed that 25 (61%) patients recovered vision of 6/12 or better. In 37 cases (90%) the intraocular pressure remained below 21 mm Hg. The incidence of postoperative inflammatory reaction seen in 13 (31.7%) cases was more than normally seen in cataract surgery. However, the incidence of serious complications was low.

Conclusions: Lens implant surgery in acute phacomorphic glaucoma gave satisfying outcome in this study. Placement of intraocular lenses in inflamed eyes was found to be safe.

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Gifford and Von Reuss independent of each other, described lens induced glaucoma as a separate entity for the first time in 1900¹. While the former described it in association with hypermature cataract, the latter described it associated with spontaneous absorption of the cortex through the intact capsule. Since then, glaucoma secondary to crystalline lens has been described under various clinical terms but these have all now been combined under one broad category of lens induced glaucoma (LIG). In great majority of cases, essentially two mechanisms operate to produce LIG². In the first instance the crystalline lens blocks the forward flow of aqueous humor through the pupil resulting in rise of intraocular pressure (IOP). This classically occurs in large intumescent cataract and is known as phacomorphic glaucoma. In the second category glaucoma develops as a result of blockage of the trabecular meshwork by lens proteins, material or debris and includes phacolytic, lens particle and phacoanaphylactic glaucoma.

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Lens induced glaucoma is a preventable and curable disease³. It is rare in developed countries but unfortunately it still continues to be prevalent in this part of the world. Definitive treatment of this condition most often involves removal of the cataractous lens alone or combined with filtration surgery, once the high intraocular pressure is satisfactorily controlled. In recent years, attempts have been made to implant intraocular lenses in such inflamed eyes but large case studies have been rarely reported^{4,5}. In this report we present our experience of implanting intraocular lens in patients presenting with acute phacomorphic glaucoma.

METHODS

Cases included in this study were operated for acute lens induced glaucoma secondary to intumescent cataract between July 1990 and June 2000. Phacomorphic glaucoma was established by the presence of pain and redness of the affected eye associated with the presence of corneal oedema, shallow anterior chamber, dilated pupil, intumescent cataractous lens and intraocular pressure above 21 mm Hg. Intraocular pressure was controlled with topical betablockers, intravenous and oral acetazolamide, or intravenous mannitol. In resistant cases YAG iridotomy was also performed. Topical steroids were instilled four times daily to control the inflammatory component. Two percent (2%) pilocarpine was sparingly instilled sometimes to pull the iris from the angle but its intensive use was largely avoided. Once the intraocular pressure was reduced to a safe level and the corneal haze had subsided, a standard extracapsular cataract extraction was performed after deepening the anterior chamber with viscoelastic material. Manual nuclear delivery followed by manual cortex aspiration was performed. It was combined with trabeculectomy without the use of antimetabolites, in those cases where preoperative intraocular pressure could not be controlled with topical medication alone and duration of attack was more than seven days. Posterior chamber intraocular lens was implanted in the bag. Miochol was injected to constrict the pupil. The viscoelastic was removed and replaced with balanced salt solution. Wound was closed with interrupted 10X0 nylon sutures. Topical steroids/ antibiotic combination six times a day and short acting cycloplegic as necessary was used postoperatively. Topical diclofenic (Naclof) and systemic Brufen 400mg twice daily were also used in patients with severe exudative reaction. Cases were periodically followed up with record of visual acuity, refraction, slit lamp biomicroscopy, Goldman applanation tonometry and indirect ophthalmoscopy. Patients with minimum follow up of one year were included in the final analysis.

RESULTS

A total of 41 cases were available for this study. 40 patients received conventional polymethyl methacrylate (PMMA) two-loop posterior chamber intraocular implant and in one case flexible anterior chamber lens was implanted. In 7 cases cataract surgery was combined with trabeculectomy. Six patients had received YAG iridotomy for control of raised intraocular pressure.

There were 17 males and 24 females. Their ages ranged from 49 to 77 years with a mean of 64.5 years. The youngest patient was 49 years old female and the oldest 77 years male. The females outnumbered the males in a ratio of 4:3 (Table 1).

Table 1. Age and sex distribution

Age	Male		Female		Total	
	No	%	No	%	No	%
41-50	0	0	1	2.43	1	2.43
51-60	4	9.75	9	21.95	13	31.7
61-70	6	14.6	11	26.8	17	41.4
71-80	7	17.0	3	7.3	10	24.3
Total	17	41.46	24	58.53	41	100.0

Six cases (16%) presented to the hospital within 48 hours of onset of the disease. Twenty four patients (58.5%) came to the hospital between 3rd and 5th day. In seven patients (17%) the disease had been present for more than a week before any treatment was sought (Table 2).

Table 2. Duration of symptoms

Days	No	%
1	2	4.8
2	4	9.75
3	9	21.95
4	8	19.5
5	7	17
6	4	9.75
7	4	9.75
8-10	2	4.8
11-14	1	2.4

The visual acuity was markedly reduced in all cases due to cataract as well as due to loss of corneal transparency secondary to sudden rise of intraocular pressure. Thirty seven patients had only light perception vision and in two cases even perception of light was doubtful. The mean preoperative intraocular pressure was 44 mm Hg (range 24-68). In 25 (61%) patients the intraocular pressure could be reduced to less than 30 mm Hg by hypotensive medications. Six patients required YAG laser iridotomy to control the intraocular pressure.

Final corrected visual recovery is shown in table 3. It can be seen that 61% of the patients recovered very good vision (6/12 or better) after surgery. Poor visual recovery (less than 6/60) occurred in 3 (7.3%) cases (Table 3).

Table 3. Corrected visual acuity at last follow up

Vision	No	%
6/6-6/12	25	61
6/18-6/60	13	31.7
< 6/60	3	7.3

The intraocular pressure was controlled in 37 (90%) patients (21 mm Hg or less) without any postoperative antiglaucoma medication and the mean postoperative intraocular pressure at last follow up was 15.5 mm Hg (Fig.1).

Figure No 1. Control of intraocular pressure (IOP) following cataract surgery.

Intraoperative and postoperative complications encountered in this study are shown in Table 4. While performing the surgery, 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 patients complete removal of the cortical material could not be achieved. Post-operative uveitis was seen in 13 (31.7%) patients, inflammatory deposits on the lens implant surface were present in 8 (19.5%) and striate keratopathy in 5 (12.19%) cases. The rate of other complications are shown in Table 4.

Table 4. **Complications**

Intraoperative		
- Shallow Anterior Chamber due to Vitreous Pressure	9	21.9%
- Posterior capsule rupture and vitreous loss	1	2.43 %
- Cortical remnants	3	7.3%
Post-operative		
- Hyphaema	3	7.3%
- Anterior uveitis	13	31.7%
- Pupillary block glaucoma	1	2.43%
- Striate keratopathy	5	12.19%
- Implant deposits	8	19.5%
- Iris Implant adhesions	3	7.3%

DISCUSSION

Pathophysiology of elevated intraocular pressure caused by the crystalline lens takes many different paths and therefore lens related glaucoma has been described under a variety of categories⁶. Phacomorphic glaucoma is the most prominent form and is more often encountered in clinical practice⁷. It presents as a classical pupil block glaucoma with acute onset of pain, redness and watering of the affected eye and can be associated with nausea and vomiting. The vision is often poor due to cataract prior to the onset of acute attack. It is likely to be confused with primary angle closure glaucoma, neovascular glaucoma and uveitic glaucoma. However, careful identification of the subtle signs in the affected eye and examination of the fellow eye helps to differentiate these categories. Although acute in onset and violent in its course, phacomorphic glaucoma is clinically recognizable, easily treatable and also preventable.

In the present study the disease was relatively more common in the females and occurred at a younger age. Similar observations were made by Pradhan et al in a large series of lens-induced glaucoma⁸. Acute onset of pain and redness in an already poorly seeing eye were common symptoms and a majority of the patients presented after 5 days of onset of the disease. Two patients in this study had very doubtful light perception and had the symptoms almost for 10 days prior to seeking treatment. Late presentation for the relief of symptoms is surprising in spite of easily available eye care facilities in Bahrain. Poor geriatric care, lower socioeconomic status, cost of surgery and fear of operation has been reported as the main cause of late presentation in such patients⁹. Good percentage (61%) of our patients recovered excellent vision after lens implant surgery of phacomorphic glaucoma. Only 7.3% recovered vision less than 6/60 as compared to 21% reported recently⁸. The reasons for poor visual recovery were identified as corneal or posterior segment disease. Late presentation for treatment is a factor, which adversely affected the visual outcome in our patients. Similar observations were made by Dhar et al⁴. Striate keratopathy, uveitis, inflammatory deposits on the implant surface and iris implant adhesions were the major complications in our study.

Implantation of posterior chamber intraocular lenses poses specific problems to the surgeon¹⁰. Corneal oedema hampers proper estimation of implant power and operating on an inflamed eye increases chances of operative and postoperative complications. Control of intraocular pressure and inflammation preoperatively is very essential in such cases. Use of topical steroids and non-steroidal anti-inflammatory drugs have been very useful in our patients. Performing YAG laser iridotomy for better and quick control of the IOP has been recommended¹¹. Placement of lens implant in the bag is desirable and removal of viscoelastic should be thorough in order to avoid rise of intraocular pressure in the immediate postoperative period.

Increasing improvements in intraocular lens implant techniques have increased the scope of implant insertion in eyes with associated ocular pathology. Lens implantation in eyes with acute angle closure glaucoma and cataract has given good results¹². Encouraging results obtained in this study have suggested that patients presenting with acute phacomorphic glaucoma can be safely managed with in- the- bag placement of intraocular lenses.

CONCLUSIONS

The present analysis of 41 cases of lens induced glaucoma who received intraocular lens implants have shown that visual recovery and control of IOP following surgery was very satisfactory. Good medical control of intraocular pressure assisted by YAG iridotomy and suppression of inflammation by topical steroids prior to surgery is important for better outcome. Patients presenting with acute lens induced glaucoma due to intumescent cataract can be safely managed by lens implant in the capsular bag.

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