

Original Research Article

Visual outcome in cases of lens-induced Glaucomas following Manual Small Incision Cataract Surgery in a tribal district of South India - A prospective study

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Abstract: The aim is to assess the visual outcome and complications following manual small incision cataract surgery in eyes with lens induced glaucomas in a tribal district. All patients who presented with lens induced glaucoma at Department of Ophthalmology, Rajiv Gandhi Institute of Medical Sciences, and Adilabad from June 2008 to Feb 2017 were included in this prospective non-randomized interventional consecutive study. Anterior segment was examined with a slit lamp and intraocular pressure was measured with a schiotz tonometer and gonioscopy was done in the other eye in cases of narrow angle. Manual small incision cataract surgery with staining of the anterior capsule with trypan blue and intraocular lens implantation was done in all cases. At each follow up slit lamp examination was done and best corrected visual acuity was assessed at the end of six weeks. Total numbers of cases included in the study were 128. Preoperative intraocular pressure (IOP) was ranging from 21mm of Hg to 80mm of Hg at the time of presentation and mean IOP at the end of six weeks was 18mm of Hg. The final visual outcome at the end of six weeks was 6/18 or better in 40% of the cases. Intra-operative complications were posterior capsular rupture and zonular dialysis. At the end of six weeks 8 patients (6.25%) had anterior chamber inflammation and 6 patients (4.68%) had corneal edema. A good visual outcome can be achieved with manual small incision cataract surgery in the management of lens induced glaucomas.

Keywords: lens induced glaucoma, manual small incision cataract surgery, and intraocular pressure

INTRODUCTION

The most common cause of bilateral blindness worldwide is cataract [1]. It has been estimated that cataract is responsible for 62.4% of bilateral blindness in India [2]. The incidence of lens induced glaucoma in India is more compared to the developed countries. In our area there is a general misbelief that cataract should be operated only when it becomes mature [3]. Economic factors, old age, other eye having good vision, associated systemic disease and lack of awareness are the other reasons for patients not receiving timely treatment. Manual small incision cataract surgery (MSICS) is popular in our country, being inexpensive requiring same instruments and equipment needed for extracapsular cataract extraction compared to phacoemulsification which needs expensive equipment. Manual small incision cataract surgery allows high volume surgery to be done without compromising the visual outcome resulting in best uncorrected visual acuity [4]. The aim of our study is to

evaluate the visual outcome and complications following MSICS in the treatment of patients with lens induced glaucoma.

MATERIALS AND METHODS

All patients presented with lens induced glaucoma [LIG] at Department of Ophthalmology, Rajiv Gandhi Institute of Medical Sciences, Adilabad, between June 2008 to Feb 2017 were included in this prospective non-randomized interventional consecutive case series study. The diagnosis of lens induced glaucoma was made on the basis of symptoms at presentation i.e., sudden onset of pain in the eye, headache, redness and sometimes nausea and vomiting. Examination showed circumcorneal congestion, corneal edema and shallow anterior chamber in phacomorphic glaucoma, floating cortical material with or without a pseudohypopyon in phacolytic glaucoma, cataractous lens and IOP above 21 mmHg. Slit-lamp examination was done in all cases, Intraocular Pressure (IOP)

measurement was done with a schiottz tonometer and gonioscopy was done in the other eye in cases of suspected narrow angle. All patients diagnosed earlier as open angle glaucoma or narrow angle glaucoma or showing a narrow angle on gonioscopy at presentation were excluded from the study. All patients were treated with topical beta blockers, topical antibiotic steroid drops, oral acetazolamide and intravenous mannitol 20% (1-2gm/kg body wt).

All surgeries were performed by a single surgeon (MIA). All cases were operated under peribulbar anaesthesia. A Side port paracentesis entry was made at 9 o' clock position. Air was injected and trypan blue 0.06% (Rhex ID, Appasamy Ocular Devices, and India) was injected under air. After a few seconds viscoelastic (Appavisc Appasamy Ocular Devices India) was injected to deeper the anterior chamber, to replace the air bubble and to wash out the excess trypan blue. A continuous curvilinear capsulorhexis was done with a 26 G bent cystitome. In difficult cases it was completed with an Utrata capsulorhexis forceps through the main incision. A fornix based conjunctival flap was made. A partial thickness scleral incision 6-7 mm. was made and the tunnel was dissected with a crescent knife up to 1mm in to the clear cornea. Anterior chamber was entered with a sharp keratome. After hyrodissection the nucleus was brought into the A.C with a sinsky hook and delivered out of the eye with visco expression technique. A

thorough cortical cleanup was done with a simcoe cannula and a single piece 6mm diameter optic PMMA lens was implanted into the capsular bag. All the viscoelastic material was aspirated out and the side port entry was hydrated and the main wound was checked for any leak. Sub conjunctival gentamycin and dexamethasone was injected at the end of surgery. Conjunctival flap was opposed with bipolar diathermy.

Post operatively patients were treated with topical betamethasone and neomycin eye drops for 6weeks. Follow up was done at the end of one week and at the end of 6weeks a complete ophthalmic examination was done with slit lamp along with assessment of best corrected visual acuity and measurement of intraocular pressure.

RESULTS

Out of 6678 senile cataracts seen in our OPD of Ophthalmology Department (Rajiv Gandhi Institute of Medical Sciences Adilabad, during June 2008 to Feb 2017 one hundred and twenty eight patients (1.9 %) presented with LIG were admitted for surgery. The age range of patients was between 42 years to 90 Years. The most common age groups affected by Lens induced glaucoma in this group of patients were the 61 to 70 years that included 60.5% of the patients followed by the 71 to 80 years of age group which had 16.4% of cases and 51 to 60 yrs contributed 12.5% of patients and 81 to 90 had 9.3% of cases involved.

Table 1: Showing the age distribution of the patients included in the study

Age in years	Number of patients (n)	percentage
42 – 50	2	1.56
51 – 60	16	12.5
61 – 70	77	60.5
71 – 80	21	16.4
81 – 90	12	9.3
Total	128	100

In the present study 63% of patients were females and males were 37% giving the ratio of Female to male [1.85: 1] figure 1.

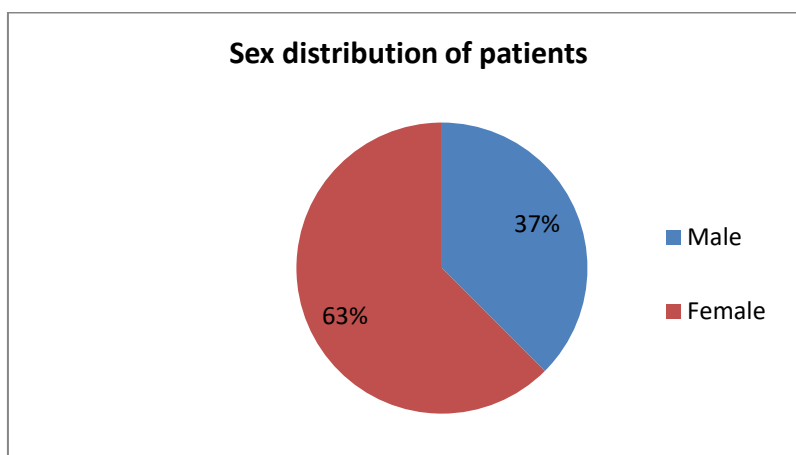


Fig 1: showing sex distribution of the patients

The intraocular pressure measurements were done in all patients prior to surgery and most the patients were having the intraocular pressure ranging

from 41 to 50 mmHg 41.4% of patients the IOP of 31 to 40 mmHg were recorded in 23.4% of patients see table 2.

Table 2: showing the intraocular pressure measurements prior to surgery.

Intraocular Pressure (mmHg)	Number of Patients (n)	Percentage
21 – 30	8	6.52
31 – 40	30	23.4
41 – 50	53	41.4
51 – 60	15	11.7
61 – 70	13	10.1
71 – 80	9	7.03
Total	128	100

Duration of pain was less than 10 days in 116 cases (90.6%) and more than 10 days in 12 (9.3%) of cases. The reasons for late presentation were poor economic condition, lack of escort, other eye having good vision and long distance for travel. All patients had a vision of not greater than hand movements at

presentation. Examination of the fellow eye revealed cataract in 38 cases (29.6 %) of cases, pseudophakia in 87 cases (67.9%) and 3 cases (2.3%) were one eyed. IOP at presentation ranged from 21mm of Hg to 80mm of Hg.

Table 3: Visual acuity outcomes 6 weeks after the surgery

Visual Acuity	Number of Patients (n)	percentage
6/6 – 6/9	23	17.9
6/12 – 6/18	30	23.4
6/24 – 6/36	96	35.9
6/60 – 1/60	18	14
Counting fingers [CF]	4	3.1
Hand Movements [HM]	3	2.3
Perception of Light [PL]	-	-
Non-Perceptive to light [NPL]	4	3.1
Total	128	100

After medical management all cases planned for surgery had an IOP of less than 25mm of Hg. Intra

operative posterior capsule rupture occurred in 2 cases and 4 cases had zonular dialysis. In one case IOL was

implanted with the support of the anterior capsular rim and the rest of cases were made aphakic. No patient had any sight threatening complications like expulsive hemorrhage or post-operative endophthalmitis. The best

corrected visual acuity was 6/18 or better in 53 cases (41.4%) it was between 6/24 to 6/36 in 46 cases (35.9%) and 4 cases (3.1%) had no perception of light (Table-3).

Table 4: causes of poor visual outcomes in the patients

Causes of poor visual outcomes	Number of patients (n)	Percentage
Optic atrophy	6	20.6
Corneal edema	12	41.3
Cystoid macular edema	4	13.71
Optic disc changes	7	24.1
Total	29	100

At discharge all patients had IOP 21mm of Hg or less. Causes of poor visual outcome were (Table -4). The mean postoperative cylinder was +1.25 D range from 0.5 to 2.50. The median axis was 180°.

DISCUSSION

Out of 6678 senile cataracts seen in this study One hundred and twenty eight patients 128 (1.9 %) presented with LIG were admitted for surgery it was similar to one study by Damodar Pradhan *et al.*; where they found 1.5% of LIG cases [5]. Manual Small Incision Cataract Surgery [MSICS] is cost effective as compared to other options for cataract surgery [6]. In our study trypan blue dye staining of the anterior capsule helped to achieve a good capsulorhexis as noted in other studies [7]. Visualization of the capsular rim is better with trypan blue dye staining and a zonular dialysis can be easily detected. It has been reported by Ruit *et al.*; that both phaco and MSICS achieve excellent results with low complication rates in cataract surgery [8]. MSICS may be appropriate surgical procedure for the treatment of advanced cataract in the developing countries like India. Our study demonstrates that MSICS can be performed safely in patients with LIG and produces good visual outcomes. MSICS produces a good visual outcome compared to both phacoemulsification and extracapsular cataract extraction (ECCE). Phacoemulsification may prove difficult in cases of LIG because the nuclei are very dense and hard and the capsule and zonules are often compromised, giving little support. The risk of endothelial damage and posterior capsule rupture may be higher and there is higher risk of endothelial damage, zonular dialysis, and posterior capsule rupture. In Extra capsular Cataract Extraction [ECCE] a large incision is required and a high IOP associated with a shallow anterior chamber in phacomorphic glaucoma increases the risk of sight threatening complications such as expulsive hemorrhage [5]. Surgery may be sometimes more difficult due vitreous up thrust and iris prolapse

leading to either a posterior capsular rupture or endothelial damage. Postoperative astigmatism is higher in ECCE compared to MSICS. In MSICS Anterior chamber is more stable causing less stress on the zonules, postoperative uncorrected visual acuity is better and expensive equipment is not required. It has been shown that MSICS gives better uncorrected vision compared to ECCE due to higher postoperative astigmatism in ECCE [4]. Intense inflammation associated with corneal edema in the immediate postoperative period was seen and it resolved with treatment as noted in the study by Rengaraj Venkatesh *et al.*; [6]

At the end of 6 weeks 40 % of our patients had good visual outcome according to the WHO criteria with best corrected visual acuity of 6/18 or better and 36% of patients had best corrected visual acuity of 6/24 to 6/36. The results were similar with other series of study in which ECCE was performed [9, 10]. The mean postoperative astigmatism of our patients is comparable to a series where MSICS was performed in 191 eyes where the mean astigmatism was 1.20D, SD ± 0.8 [11]. The causes for poor visual outcome were persistent corneal edema due to corneal decompensation, optic disc pallor and age related macular degeneration. In all our cases, the IOP was controlled without the need for long-term anti-glaucoma medications. This is a result similar to other studies on ECCE performed for phacolytic glaucoma [9, 10, 12].

A similar study has not been conducted in this area or the authors are not aware of any previous studies conducted on the safety, efficacy and complications of MSICS in the treatment of eyes with lens induced glaucoma. In a developing country like India, LIG is not an uncommon presentation in the population. In one study by M Sharanabasamma *et al.*; finding visual outcome in patients with lens induced glaucoma in south India found that early diagnosis and treatment

was beneficial in LIG cases [13]. In one similar study by V Rajkumari *et al.*; managing phacomorphic glaucoma with manual small incision cataract surgery in North east India found that the MSICS being inexpensive plays a key role in management of poor outreach program marker like phacomorphic glaucoma effectively controlling IOP and achieving good visual acuity with minimum complications [14]. We have also found similar results in all the treated patients and we achieved good visual acuity with minimum complications with MSICS.

CONCLUSION

Our study demonstrates that MSICS is a safe and effective treatment for patients with lens induced glaucoma producing a good visual outcome. It is clear that a cataract should be treated before it goes into the stage of maturity. There is a need for patients to be educated about the dangers of LIG and poor visual outcome if there is a delay in treatment.

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