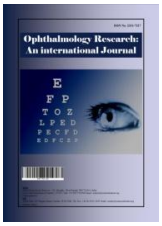

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Visual Outcome after Manual Small Incision Cataract Surgery for Phacolytic Glaucoma

Shams Mohammad Noman[1*] and M. A. Karim[2]

[1]Eye Infirmary and Training Complex, Chittagong, Bangladesh.

Authors' contributions

This work was carried out in collaboration between both authors. Author SMN designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author MAK managed the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

Aim: To evaluate the visual outcome after manual small incision cataract surgery (MSICS) as a treatment of phacolytic glaucoma.
Methods: The study included 43 patients with phacolytic glaucoma treated by manual small incision cataract surgery with intraocular lens implantation. Preoperative and postoperative visual acuity and intraocular pressure have been recorded and compared at the end of six weeks after surgery.
Results: The mean preoperative intraocular pressure was 36.23 (± 10.86) mm of Hg. There were no significant intraoperative complications such as posterior capsular tear or expulsive hemorrhage. Post operative mean intraocular pressure (IOP) was 12.58 (± 3.45) mm Hg. Pre operative visual acuity in all the affected eyes were perception of light with projection of rays in all quadrant. Postoperative best corrected visual acuity was 6/6-6/18 in 27 patients (62.80%), 6/24- 6/36 in 10 patients (23.25%) and ≤ 6/60 in 6 patients (13.95%).
Conclusion: Manual small incision cataract surgery is a safe and effective method of treatment for phacolytic glaucoma and the visual outcome and IOP reduction is satisfactory.

Keywords: Phacolytic; cataract; intraocular pressure.

**Corresponding author: E-mail: drshams_noman@yahoo.com;*

1. INTRODUCTION

Cataract is the most common cause of avoidable blindness in the world. Bangladesh is one of the densely populated developing countries having about 700 thousand people blind. Cataract contributes 80 % of total blindness in Bangladesh [1,2]. Limited health care facility and other socioeconomic factors influence the patients for late presentation, sometimes with complication like phacolytic and phacomorphic glaucoma [3,4].

The definitive treatment for phacolytic glaucoma is cataract extraction [5,6,7]. Surgery in a patient of phacolytic glaucoma has to face some challenges. High intraocular pressure, increases the risk of expulsive haemorrhage, hard nucleus is often associated with zonulolysis which makes surgery technically more difficult. Phacoemulsification is not possible and conventional extracapsular cataract extraction(ECCE) has some limitations in a patient with phacolytic glaucoma. Manual small incision cataract surgery is suitable for such phacolytic glaucoma cases as it is easy to approach and manage [8,9]. The aim of our study is to evaluate the visual outcome and intraocular pressure after manual small incision cataract surgery in the management of phacolytic glaucoma.

2. METHODS

This is a retrospective review of case series and was conducted at the glaucoma clinic of Chittagong Eye Infirmary and Training Complex, Bangladesh and was approved by institutional review board. A total of 43 patients with phacolytic glaucoma were included in this study. The patients with inaccurate perception of light, zonular dialysis and subluxation of lens where intraocular lens implantation was not possible were excluded from the study. Most of the patients in this study group came from remote area with poor socioeconomic background.

All of the patients presented with gradual loss of vision followed by acute onset of pain, redness in the affected eye. The diagnostic features were hypermature cataract with perception of light and raised intraocular pressure. Conjunctival congestion, corneal edema and cortical materials in the anterior chamber with severe inflammation found in all cases. Lenticular changes include capsular calcification, wrinkling, morgagnian change, phacodonesis due to zonular weakness. All patients were treated medically prior surgery to reduce inflammation and intraocular pressure.

All 43 surgeries were done by a single surgeon. Raised intraocular pressure not controlled by topical medications were treated with systemic carbonic anhydrase inhibitor or hyperosmotic agents prior to surgery to soften the eye ball.

Peribulbar block was given in all cases with short and long acting anesthetic agents. Superior rectus briddle suture was placed and superior limbus and adjacent conjunctiva were exposed. Fornix based conjunctival flap was made in the superior part and bleeding blood vessels were cauterized with wet field bipolar cautery. A partial thickness 6mm scleral incision was made 2mm behind the limbus and scleral tunnel was created up to 1mm of the clear cornea. Anterior chamber entry was done with 3.2 mm keratome. Reformation of the anterior chamber was done to create an environment for easy manipulation for the next step. A small perforation was made in the upper part of anterior capsule using a bent 26 G needle attached with a syringe and aspiration of the liquid cortex was done. The capsular bag was then inflated with viscoelastic substance and CCC (continuous curvilinear capsulorrhexis) was done with capsulorrhexis forcep.

The tunnel was enlarged on either side up to 6 mm with the help of crescent knife. The nucleus was prolapsed in the anterior chamber by rotation technique and removed by irrigating vectis. After aspiration of remaining cortex with simco cannula, anterior chamber and capsular bag was reformed with viscoelastic substances. A 6 mm Polymethyl methacrylate (PMMA) lens was then inserted in the capsular bag and proper positioning was done by dialer. Aspiration of viscoelastic material was done and anterior chamber was reformed with ringer lactate solution. Self sealed limbal wound was covered with conjunctival flap.

Post operatively all patients were treated with topical cycloplegic, steroid and antibiotic. Total ophthalmic examination was done on first post operative day and then one week and six weeks after operation. Detailed ophthalmic examination was done in each follow up.

3. RESULTS

The demographic details of the 43 patients are showed in Table 1: Mean age of the patients was 59.65 (± 10.44) years and among them 23 were

male and 20 female. The fellow eyes of the study patients were cataract in 23 cases (53.49 %), pseudophakic in 15 cases (34.88 %) and aphakic in 5 cases (11.63 %). Mean duration of acute symptoms like pain redness and photophobia was 9.18(±3.60SD) days. Among them most of the patients have a duration of 0-10 days. Preoperative visual acuity was perception of light with projection of rays in all quadrants in all affected cases.

Pre-operative and post-operative visual acuity was shown in Table 2: Best corrected visual acuity at six week follow up was ≥ 6/18 in 62.80% cases, between 6/24-6/36 in 23.25% cases and ≤ 6/60 in 13.95% cases. Among the all patients 86% cases had postoperative best corrected visual acuity ≥ 6/36. The mean refractive status at six weeks follow up was +1.50D cylinder (range +0.5 to +2.5 D) and the median axis was 180^0.

The pre operative intraocular pressure ranges from 22-60 mm Hg with the mean of 36.23 (± 10.86) mm Hg. Post operative intraocular pressure ranges from 5-22 mm Hg with the mean of 12.5 (±3.45) mm Hg. (Table 3).

Table 1. Demographic characteristics of the study population

Demographics	Number of Patients (%)
Age (Years)	
Mean (± SD)	59.65 (± 10.44)
Range	40-85
Gender	
Male	23
Female	20
Operated Eye	
Right Eye	20 (46.52 %)
Left Eye	23 (53.48 %)
Status of Fellow Eye	
Cataract	23 (53.49)
Pseudophakia	15 (34.88)
Apahakia	5 (11.63)
Duration of Symptoms (Days)	
Mean (± SD)	9.18 (± 3.60)
0-10 Days	30 (69.8)
11-16 days	11 (25.6)
17-22 days	2 (4.7)
Visual acuity	
Light perception with projection of rays	100%

Table 2. Comparison of pre-operative and postoperative visual acuity

Visual Acuity	Pre-Op Uncorrected	Post-op Best Corrected
6/6-6/18	0 (0.0%)	27 (62.80%)
6/24-6/36	0 (0.0%)	10 (23.25%)
≤ 6/60	43 (100.0%)	6 (13.95%)

Fig. 1. Phacolytic glaucoma- before surgery

Table 3. Comparison of pre-operative and postoperative IOP

IOP mmHg	Preoperative
Mean	36.23 (± 10.86)
Range	22 - 60
20 - 29	11 (25.6 %)
30 - 39	13 (30.2 %)
40 - 49	13 (30.2 %)
50 - 60	6 (14.0 %)
IOP mmHg	**Postoperative**
Mean	12.58 (± 3.45)
Range	5 - 22
5 - 8	6 (14.0%)
9 - 12	18 (41.9%)
13 - 16	16 (37.2%)
17 - 22	3 (7.0%)

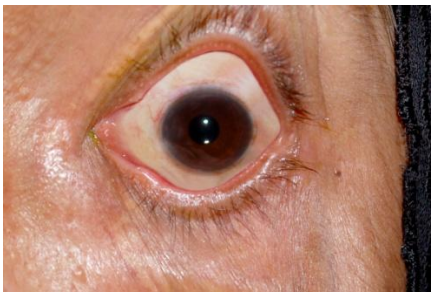

Fig. 2. Phacolytic glaucoma -6 weeks after surgery

4. DISCUSSION

The result of this study showed good visual outcome after manual small incision cataract surgery in patients with phacolytic glaucoma. Phacolytic glaucoma is caused by an obstruction of trabecular meshwork by lens proteins or protein laden macrophages. Extracapsular cataract extraction needs large incision and more surgical manipulation. So there is always a high risk of expulsive hemorrhage and severe post operative inflammation.

Phacoemulsification is not suitable in phacolytic glaucoma, because the nucleus is dense, hard, lens capsule and zonules are compromised in almost all cases. There is also a risk of endothelial damage, zonular dialysis, and posterior capsular tear [10, 11, 12]. But in MSICS causing less stress on the zonules, does not need expensive equipments and anterior chamber is more stable due to shelving scleral wound. In this study MSICS gives satisfactory uncorrected vision as it has a low range of post operative astigmatism.

At six weeks visit, 27 patients (62.80%) had best corrected visual acuity (BCVA) of ≥ 6/18, 10 patients (23.25%) had BCVA between 6/24-6/36 and 6 patients had≤ 6/60. This compares favorably with other series in which ECCE was performed [13,14,3,4]. Post operative visual acuity was not appreciable in 6 patients in comparison to others. The reason behind the poor visual outcome in this group was late presentation of the patient which causes more inflammation and corneal decompensation due to prolong raised pre operative intraocular pressure [15-22]. The mean post operative astigmatism of our patient is comparable to a series where MSICS was performed in 191 eyes where the mean astigmatism was 1.20D [14]. Most of the cases in our study the steep axis was 180^0, whose vision were improved with refraction, possibly due to relaxation caused by the superior scleral incision.

The result of post operative visual acuity in our study group is also similar to the result of Venkatesh et al where they showed the post operative outcomes of 33 patients after MSICS in phacolytic glaucoma cases [23,24]. Post operative IOP in all cases was controlled without the need for long term anti-glaucoma medications. This is similar to other studies

where ECCE performed for phacolytic glaucoma [13,14,3].

5. CONCLUSION

In a developing country like Bangladesh, phacolytic glaucoma is not an uncommon disease due to limited eye care facility, ignorance and also economical barrier. Our study demonstrates that, MSICS is a safe and effective treatment for the patient with phacolytic glaucoma due to satisfactory post operative visual outcome and adequate control of intraocular pressure without anti glaucoma medication.

CONSENT

As per international standard or university standard written participant consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard informed and written ethical permission has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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