

Outcome of Phacoemulsification Cataract Surgery in Complicated Cataract Due to Uveitis

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Abstract

Background: Surgical removal of cataractous lens is the only of treatment of cataract irrespective of etiology. Phacoemulsification is a modern cataract surgery in which the eyes internal lens is emulsified with an ultrasonic hand-piece and aspirated from the eye. Complicated cataract due to anterior uveitis has difference in morphology and outcome from that of age-related cataract variety.

Aim of the study: The purpose of this study was to evaluate the outcome of phacoemulsification in complicated cataract due to uveitis.

Methods: This prospective observational cross-sectional study conducted in cataract clinic of National Institute of Ophthalmology & Hospital, Dhaka, Bangladesh, from September 2018 to March 2019. Sample was selected by purposive sampling technique. Total 50 patients suffering from complicated cataract due to uveitis were included according to selection criteria. Data were gathered from the informant and recorded in a structured case report format. Clinical examination and relevant investigation were done meticulously. All acquired data was entered into a Microsoft Excel Work Sheet and analyzed using descriptive statistics in SPSS 24.0.

Results: In this study, the maximum number of patients 18(36.0%) were 51-60 years age group, mean age of the patient was 52.7±6.37 years. Male to female ratio was 1:1.17. Postoperative best corrected visual acuity (BCVA) was better progressively and reached significance difference ($P < 0.05$). Astigmatism was measured in different follow up time. There was significant difference ($P < 0.05$) present in all post-operative days. In time wise comparison revealed, there was also significant difference in between 1st postoperative day and 30th postoperative day but no significance was present between 30th postoperative day and 180th postoperative day ($P = 0.161$). In this study postoperative complications included posterior capsule opacification (55.5%), posterior synechiae (11.1%), cystoid macular edema (22.2%) & glaucoma (11.1%).

Conclusion: Present study concluded that phacoemulsification is safer for the uveitic cataract as less inflammation is induced than that by a manual extracapsular cataract extraction. In order to optimize the postoperative outcome of uveitic cataract surgery, it is necessary to be meticulous and thorough.

Keywords: Cataract, Phacoemulsification, Uveitis, Glaucoma.

I. INTRODUCTION

Cataract is one of the most frequent consequence of uveitis, reported in 40% of the patients. In general, uveitis patients are younger and have a greater prevalence of comorbidities than the general cataract population; however, the rates of inflammatory sequelae varied significantly between uveitic entities [1]. Uveitis causes anatomic and functional damage and complications in anterior and posterior segment structures due to underlying inflammatory processes [2, 3]. As a result, the prevention and repair of structural damage become critical. Cataract surgery in uveitis patients presents a significant challenge due to pre-existing ocular comorbidities that may limit the visual outcome and complicate the surgical procedure; the need for preoperative inflammation control; and the efficacy of postoperative management to avoid immediate and late ocular complications [4]. Successful cataract management has been reported in previous studies that have documented favorable anatomical and functional success rates with phacoemulsification and intraocular lens (IOL) implantation [5, 6]. However, cataract surgery in eyes with uveitis presents a number of intraoperative and postoperative problems, including miotic pupil, synechiae, anterior segment hemorrhage, iris atrophy, severe inflammation, high intraocular pressure

(IOP), and cystoid macular edema (CME) [7-9]. The complication rate after phacoemulsification and IOL implantation can be lowered in the short term by careful preoperative medication, professional surgery, and attentive postoperative monitoring. However, the long-term effects of this surgical procedure may vary under different circumstances. Long-term outcomes of phacoemulsification and IOL implantation in eyes with uveitis have varied greatly in prior research, with variations arising due to differences in etiologic variables, phacoemulsification systems, surgical experience, and IOL type. Most patients with uveitis now prefer tiny clear corneal incision phacoemulsification surgery to extracapsular cataract extraction (ECCE) and lensectomy [5, 6]. Because cataract surgery in these individuals is usually complicated by corneal opacification, iris synechiae, pupillary and cyclitic membranes, and other factors, the surgical procedure should be minimally invasive, utilizing precise and sensitive operations. In most of those patients, eyes present some aspects that can produce either difficulties and complications during surgery, or short or long-term complications. Retinal problems, such as macular oedema, retinal scarring, and vitreoretinal interface pathology, can develop before or after cataract surgery. All those factors can determine poor visual outcome after cataract surgery in these patients⁶. Surgical management of complicated cataract after anterior uveitis needs additional actions, especially for achieving and maintaining a good mydriasis [10] or for a good stabilization of the intraocular lens. Posterior capsule opacification is the most common problem in these patients. Cystoid macular edema occurs after surgery in the patients who suffered posterior capsule rupture (accidentally or by Nd-YAG laser capsulotomy); some authors state that perioperative systemic therapy is protective against those complications [11, 12]. Prolonged eye inflammation after surgery is relatively rare, especially if heparin-surface-modified intraocular lenses are implanted. Postoperative rising of intraocular pressure can occur frequently in these patients. Good preoperative and postoperative control of inflammation plays an important role in achieving favorable visual outcomes [13, 14]. Visual outcome is generally good, but poorer than in non-uveitis eyes [15]. Previous study reported that surgery of complicated cataract after anterior uveitis offers good visual outcome in 72.9% of the cases (visual acuity of more than 0.8). Iris hooks or perfect pupil rings are very frequently required in these patients (37.83%). Posterior capsule opacification and cystoid macular edema are more frequent than in senile (non-uveitic) cataract. After surgery, elevated intraocular pressure and prolonged ocular inflammation can occur [6].

II. METHODOLOGY

This is a prospective observational cross sectional study conducted in cataract clinic, National Institute of Ophthalmology & Hospital, Dhaka, Bangladesh, from September 2018 to March 2019. Sample was selected by purposive sampling technique. Total 50 patients suffering from complicated cataract due to uveitis were included according to selection criteria. Data were gathered from the informant and recorded in a structured case report format. The clinical examination and necessary investigations were carried out meticulously. All data collected was entered into a Microsoft Excel Work Sheet and evaluated with descriptive statistics in SPSS 24.0. Qualitative data is expressed as frequency and percentage, while quantitative data is expressed as mean and standard deviation. Tabulation and graphical display were used for comparison, including tables, pie charts, graphs, bar diagrams, histograms, and charts. P-values < 0.05 were considered significant across all analyses.

III. RESULT

Table-1 illustrates the age and gender distribution of the study participants. Out of 50 patients 11 patients belongs to 31-40 years age group, 15 patients were in 41-50 years age group, 18 patients were 51-60 years age group and 6 patients were 60 years or more. Out of 50 patients, 23 (46%) were male and 27 (54%) were female. Table-2 reveals that Postoperative best corrected visual acuity (BCVA) was better progressively and reached significance difference ($P < 0.05$). Findings of the study shows that there was significant difference ($p < 0.05$) present in all post-operative days. In time wise comparison revealed, there was also significant difference in between 1st postoperative day and 30th post-operative day but no significance was present between 30th postoperative day and 180th postoperative day ($P = 0.161$). So, moving from 1st post-operative day to 30th post-operative day, the astigmatism decreased significantly but moving from 30th post-operative day to 180th postoperative day it became statistically insignificant [Table-3]. In this study the lowest IOP in the affected eye was 29.4 mm Hg and the highest recorded was 48.2 mmHg at the time of presentation. Mean intraocular pressure 1 week later was 25.3, 1 month later was 19.5 mmHg and 6 month later 20.1 mmHg. The intraocular pressure was much better after treatment [Table-4]. Out of 50 cases, 41 (82.0%) of cases recovered without sequelae [Table-5]. Table-6 shows that the postoperative complications included posterior capsule opacification (55.5%), posterior synechiae (11.1%), cystoid macular edema (22.2%) & glaucoma (11.1%).

Table -1: Age and gender distribution of the studied patients (N=50)

Age (in years)	Frequency	Percentage	Mean ± SD
31-40	11	22.0	52.7±6.37
41-50	15	30.0	
51-60	18	36.0	
>60	6	12.0	
Total	50	100	
Gender			
Male	23	46.0	
Female	27	54.0	
Total	50	100	

Table-2: Assessment of best corrected visual acuity (BCVA) (N=50)

BCVA	Follow up time					P-value
	Baseline	1 st POD	7 th POD	30 th POD	180 th POD	
6/12 or better	0	8	15	12	5	0.0052
Less than 6/12 to 6/18	4	18	23	26	26	
Less than 6/18 to 6/60	12	24	12	12	19	
Less than 6/60	34	0	0	0	0	
Mean±SD	0.14±0.19	0.32±0.19	0.38±0.19	0.37±0.19	0.42±0.19	

Table-3: Evaluation of astigmatism (N=50)

Variables	Mean ±SD	P-value
Baseline	0.70 ±0.38	<.0001
1 st POD	0.62 ± 0.30	
7 th POD	0.54 ± 0.25	
30 th POD	0.51 ± 0.24	
180 th POD	0.50± 0.23	

Table-4: Distribution of mean intraocular pressure in mmHg at the different period (N=50)

Period	Mean IOP in mmHg
Baseline or preoperative	43.7
1 week after	25.3
p-value (before vs 1 week after)	0.276 ^{ns}
30 th POD	19.5
p-value (before vs 1 month after)	0.001 ^s
180 th POD	20.1
p-value (before vs 3 month after)	0.001 ^s

Table-5: Overall outcome of treatment (N=50)

Outcome	Number of patients	Percentage (%)
Recovered without sequelae	41	82.0
Complications	9	18.0

Table-6: Complications after treatment (N=9)

Complications	Number of patients	Percentage (%)
Posterior capsule opacification	5	55.5
Posterior synechiae	1	11.1
Cystoid macular edema	2	22.2
Glaucoma	1	11.1

IV. DISCUSSION

This prospective observational study was conducted in Cataract clinic, National Institute of Ophthalmology & Hospital, Dhaka, over a period of six months to evaluate the outcome of phacoemulsification cataract Surgery in complicated cataract due to uveitis. In this study, the maximum number of patients 18(36.0%) were 51-60 years age group, mean age of the patient was 52.7±6.37 years. Male to female ratio was 1:1.17. In a retrospective study on 37 patients, who underwent phacoemulsification (37 eyes) surgery during the period 2009–2014 for complicated cataract after anterior uveitis, revealed that 21 patients were males (56,75%), 16 females (43,25%) [6]. In this study postoperative best corrected visual acuity (BCVA) was better progressively and reached significance difference ($P<0.05$). Astigmatism was measured in different follow up time. There was significant difference ($p< 0.05$) present in all post-operative days. In time wise comparison revealed, there was also significant difference in between 1st postoperative day and 30th post-operative day but no significance was present between 30th postoperative day and 180th postoperative day ($P= 0.161$). In this study the lowest IOP in the affected eye was 29.4 mm hg and the highest recorded was 48.2 mmhg at the time of presentation. Mean intraocular pressure 1 week later was 25.3, 1 month later was 19.5 and 6 month later 20.1 mmHg. The intraocular pressure was much better after treatment. Various outcomes have been reported in previous reports regarding VA after phacoemulsification and IOL implantation in patients with uveitis [9, 16]. Kosker et al. reported a BCVA value of 0.3 logMAR or better in 94.5% of eyes at the end of a follow-up period of 6 months [16]. Estafanous et al. noted that BCVA increased in 95% of eyes at the end of a follow-up period of 20 months, and that CME, glaucoma, and optic atrophy were the main reasons for low BCVA [9]. In another study, BCVA improved one line or more in 87.7% of eyes at the first month postoperatively. At the end of our follow-up period of a mean of 35.2 ± 22.2 months, the BCVA value was 0.3 logMAR or better in 61.3% of the eyes [5]. Similarly, Elgohary et al. and Ram et al. reported macular scarring and optic atrophy as independent risk factors for low visual acuity after phacoemulsification [17]. ERM and CME were also recognized as factors associated with a poor prognosis regarding postoperative visual acuity [18]. The lower BCVA outcomes in our study were considered to be associated with the longer follow-up period as compared with similar reports as well as the referral pattern of our specialized eye hospital, and high frequency of uveitis causing irreversible retinal damage. In another study, 8.5% of all eyes required additional antiglaucoma treatment due to the elevated IOP after phacoemulsification. Previously reported postoperative elevated IOP rates vary between 4.6 and 28.9% [19, 20]. IOP control may be difficult to maintain in eyes with uveitis after phacoemulsification [7]. Postoperatively increased IOP may be related to release of inflammatory mediators, residual viscoelastic device, pigment dispersion, and retained lens material [21]. Beside surgical factors, ongoing inflammatory processes and corticosteroid treatment may also occlude drainage ways and increase IOP in patients with uveitis [22, 23]. Our study revealed that postoperative glaucoma development was directly correlated with postoperative high IOP values. Eyes with a higher postoperative IOP were found to be 5.4-fold more prone to developing glaucoma. In this study postoperative complications included posterior capsule opacification (55.5%), posterior synechiae (11.1%), cystoid macular edema (22.2%) & glaucoma (11.1%). After surgery, transient rising of intraocular pressure was noticed in 4 eyes (10.81%) more frequent than in non-uveitic patients, estimated at 0.5% [24]. Prolonged postoperative inflammation (more than 14 days) was present in 3 eyes. Posterior capsule opacification was the most frequent issue in the first 6 months after surgery (9 eyes – 24.32%). Cystoid macular oedema was reported in 2 eyes (5.4%) at 4 and 6 months after surgery, more frequent than in senile (non-uveitic) patients, being estimated at 4% [25].

Limitation of the study:

This study was a single-center study with a small sample size and a short duration of follow-up, so these findings may not reflect the actual scenario.

V. CONCLUSION & RECOMMENDATION

Our study showed that phacoemulsification in patients with uveitis yield desirable visual outcomes. Worse BCVA outcomes were associated with complications of uveitis itself rather than with cataract surgery and its complications. Proper evaluation, control of inflammation mandatory for better outcome of phacoemulsification cataract surgery in complicated cataract due to uveitis.

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