

Visual Outcomes of Glaucomatous Patients after Phacoemulsification

Mohamed Salah Hamed Mohamed^{1*}, Amr Mounir Mohamed¹,

Mahmoud Mohamed Farouk¹, Ahmad Mostafa Ahmad¹

¹Department of Ophthalmology Department, Faculty of Medicine, Sohag University, Sohag, Egypt

*Corresponding Author: Mohamed Salah Hamed Mohamed

Email: Mohsalah513@gmail.com, Mobile: (+20) 01005473113

ABSTRACT

Background: Angle closure glaucoma represent one of main causes of irreversible visual loss due to optic atrophy caused by too high intra ocular pressure.

Objectives: The current study aimed to assess visual outcomes of glaucomatous patients after phacoemulsification.

Patients and methods: Twenty individuals with primary angle closure glaucoma (PACG) and cataract grade II or higher were included in this investigation. Every participant had a thorough eye examination and had their visual acuity measured either before or after surgery. Uncorrected visual acuity (UCVA) and best corrected visual acuity (BCVA), presented as a logarithm of the minimum angle of resolution (logMAR), were the primary research outcome measurements.

Results: Regarding mean baseline and follow up values of UCVA of the phaco group, the mean baseline was (1.03 ± 0.187), at 1 week was (0.66 ± 0.187), at 1 month was (0.63 ± 0.192), at 3 months and 6 months was (0.60 ± 0.145). Regarding mean baseline and follow up values of BCVA of the phaco group, the mean baseline was (0.86 ± 0.252), at 1 week was (0.50 ± 0.182), at 1 month was (0.46 ± 0.154), at 3 months and 6 months was (0.45 ± 0.147).

Conclusions: Phacoemulsification in cases with primary angle closure glaucoma is connected to improved UCVA and BCVA up to 6 months follow-up.

Keywords: UCVA, BCVA, glaucoma, Phacoemulsification

INTRODUCTION

Angle closure glaucoma represent one of main causes of irreversible visual loss due to optic atrophy caused by too high intra ocular pressure^(1,2).

In its current form, cataract extraction has been a safe and successful procedure for many years. Numerous studies have shown that the removal of cataracts may potentially have a clinically important role in the management of glaucoma. The only known effective way to manage the risk factor for glaucoma is to lower intraocular pressure, which is achieved by lens extraction⁽³⁾.

Surgery for glaucoma may hasten the evolution of cataracts, and combining the two procedures may raise the incidence of structural alterations and problems after surgery⁽⁴⁾. It might be difficult to decide whether to get cataract surgery alone or combine glaucoma with surgery^(4,5). Pentacam may be used for safe, noncontact glaucoma screening, except for eyes with plateau iris configurations. Postoperative corneal biomechanics results may be affected by variations in surgical method^(6,7).

Pentacam offers both qualitative and quantitative evaluation of anterior segment structures relevant to the pathophysiology and structural variations of glaucoma, as well as the effectiveness of various therapeutic strategies⁽⁸⁾.

The purpose of the present research was to assess glaucomatous patients' visual results after phacoemulsification.

PATIENTS AND METHODS

This study included a total of 20 cases with primary angle closure glaucoma and cataract grade II or higher, attending at Department of Ophthalmology, Sohag University Hospital, during the period from January

2021 and December 2022. A single surgeon (M.S.) carried out every surgery.

Exclusion criteria included patients with previous glaucoma and cataract surgery, ocular or intraocular inflammations, corneal pathology, intraocular pathology, patients who lost follow-up, and patients with advanced glaucoma (30-2 Humphery visual field analysis yields a mean deviation score >12 on the visual field score).

Every research participant had a thorough eye examination and had their visual acuity measured either before or after surgery.

Uncorrected visual acuity (UCVA) and BCVA, presented as logMAR, were the primary research outcome measurements.

Ethical Considerations: This study was ethically approved by Department of Ophthalmology, Sohag University, and the Faculty of Medicine's Institutional Review Board (IRB) and registered in The Pan African Clinical Trial Registry (PACTR202108689834812). Written informed consent of all the participants was obtained. The study protocol conformed to the Helsinki Declaration, the ethical norm of the World Medical Association for human testing.

Statistical analysis

STATA version 17.0 (Stata Statistical Software: Release 17.0 College Station, TX: StataCorp LP.) was utilized to analyze the data. The terms mean, standard deviation, median, and range were utilized to describe quantitative data. Student t-test data analysis was utilized to compare the means of the two groups. The Mann-Whitney test was used to compare both groups

when the data did not fit together naturally. The 6-month data collected after surgery was compared to the preoperative data utilizing the Wilcoxon matched-paired signed rank test if the information was not normally distributed, or the paired t test if it was. The STATA or Excel programs were utilized to create the graphs. If the P value was less than 0.05, it was deemed significant.

RESULTS

Baseline characteristics (age and gender) of the studies patients are shown in table 1.

Table 1: Initial features of the patients under study

Phaco group (n= 20)		
Age		60.15 ± 2.739
Gender	Males	7 (35.0%)
	Females	13 (65.0%)
Data reported as a percentage and frequency or as mean and standard deviation.		

Regarding mean baseline and follow up values of UCVA of the phaco group, the mean baseline was (1.03 ± 0.187), at 1 week was (0.66 ± 0.187), at 1 month was (0.63 ± 0.192), at 3 months and 6 months was (0.60 ± 0.145). (Table 2).

Table 2: UCVA (LOG MAR) follow-up of Phaco group

Phaco group (n= 20)	Mean and SD	Median	Range
Baseline UCVA	1.03 ± 0.187	1	0.6, 1.3
1 week	0.66 ± 0.187	0.7	0.4, 0.9
1 month	0.63 ± 0.192	0.6	0.4, 0.9
3 months	0.6 ± 0.145	0.6	0.4, 0.8
6 months	0.6 ± 0.145	0.6	0.4, 0.8

Regarding mean baseline and follow up values of BCVA of the phaco group, the median baseline was (0.86 ± 0.252), at 1 week was (0.50 ± 0.182), at 1 month was (0.46 ± 0.154), at 3 months and 6 months was (0.45 ± 0.147). (Table 3)

Table 3: BCVA follow-up of Phaco group

Phaco group (n= 20)	Mean and SD	Median	Range
Baseline BCVA	0.86 ± 0.252	1.00	0.30, 1.30
1 week	0.50 ± 0.182	0.50	0.20, 0.80
1 month	0.46 ± 0.154	0.50	0.20, 0.70
3 months	0.45 ± 0.147	0.50	0.20, 0.70
6 months	0.45 ± 0.147	0.50	0.20, 0.70

DISCUSSION

Reduction of intraocular pressure (IOP) and opening of the angle are the primary goals of surgical therapy for PACG; however, trabeculectomy may not enlarge the narrow angle or prevent the onset of progressive peripheral anterior synechia (PAS), and in some situations, it may worsen both. Peripheral iridectomy in trabeculectomy may not enlarge the angle since gonioscopic residual angle closure occurs in over 80% of individuals with narrow angles after LI. Furthermore, a trabeculectomy by itself may cause the lens to move anteriorly, aggravating the angle narrowing. In individuals with primary angle-closure illness, cataract (or clear-lens) extraction is an alternate surgical approach that expands the angle while simultaneously lowering intraocular pressure (9).

Pentacam is used in many different clinical settings, including as corneal evaluation for refractive surgery, lens density measurement, pachymetry, posterior capsule opacification quantification, intraocular lens (IOL) computation, and glaucoma screening (10).

Regarding mean baseline and follow up values of UCVA of the phaco group, the mean baseline was (1.03 ± 0.187), at 1 week was (0.66 ± 0.187), at 1 month was (0.63 ± 0.192), at 3 months and 6 months was (0.60 ± 0.145). Regarding mean baseline and follow up values of BCVA of the phaco group in this study, the mean baseline was (0.86 ± 0.252), at 1 week was (0.50 ± 0.182), at 1 month was (0.46 ± 0.154), at 3 months and 6 months was (0.45 ± 0.147).

In line with the present research, Wang *et al.* (11) showed that UCVA decreased significantly postoperatively and for 3 months follow-up.

In similarity to our study, Hansapinyo *et al.* (12) showed that The median Log MAR BCVA +/- 1 SD in the phacoemulsification group was 0.78 ± 0.51 (range, 0.40 to 3.00) before to operation, and it increased to 0.74 ± 0.77 (range, 0.10 to 3.00) at the 5th year (p = 0.92).

Also, El Sayed *et al.* (13) observed that at the final follow-up, the BCVA in the phacoemulsification group increased from 0.29 ± 0.3 preoperatively (range, 0.005 to 1.0) to 0.35 ± 0.31 (range, 0.005 to 1.0). BCVA did not significantly vary between the two groups either before surgery or at the end of follow-up (13).

The relatively small sample size (n= 20 eyes) and the short-term follow-up period (6 follow-up months) were our 2 major limitations. Therefore, we recommend further additional future multicenter studies with larger sample sizes and long-term follow-up durations to investigate and evaluate the effect of different surgical techniques.

CONCLUSIONS

Phacoemulsification in cases with primary angle closure glaucoma is connected to improved UCVA and BCVA up to 6 months follow-up.

DECLARATIONS

- **Consent for publication:** I confirm that the agreement of each author to submit the work has been obtained.
- **Availability of data and material:** Available
- **Competing interests:** None
- **Funding:** No fund
- **Conflicts of interest:** no conflicts of interest.

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