
*Original Article***ONE SITE AND TWO SITES PHACOTRABECULECTOMY: A COMPARATIVE STUDY**

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Abstract

Purpose: To compare the results of one-site versus two-site combined glaucoma filtration and phacoemulsification surgery with respect to visual acuity (VA) and intraocular pressure (IOP) control. **Methodology:** A prospective study was conducted on 40 patients with glaucoma and cataract. Cases will be divided into two random groups: Group A: 20 eyes were subjected to one site Phacotrabeculectomy. Group B: 20 eyes were subjected to two-site Phacotrabeculectomy. The results were compared within one week, one month, three months and six months post-operative as regards VA and IOP. **Results:** There was a statistically significant difference in VA and IOP in pre-operative and post-operative conditions in the whole patients. There was no statistically significant difference in VA and IOP post-operatively between the two groups. **Conclusion:** The similar and excellent results achieved in the 2 groups imply that either technique might be used to handle the problem of concurrent cataract and glaucoma in many patients.

Keywords: *Cataract, Glaucoma, Phacotrab*

1. Introduction

The association of cataract with glaucoma has become more frequent because of aging populations and the increased risk of cataract development in the patient with glaucoma. There is an increased risk of cataract in some forms of glaucoma, as pseudoexfoliative glaucoma. In addition, glaucoma surgery increases the risk for the development of cataract [1,2]. Traditionally, the management of coincident cataract and glaucoma generally involved sequential surgery, that is, initial glaucoma surgery followed by cataract extraction months later when the intraocular pressure was controlled

and the bleb had matured. With current techniques for combined cataract and glaucoma surgery, most patients will require just one procedure [3]. Several studies have reported reduced complications from and increased efficacy of Phacotrabeculectomy compared with manual extracapsular extraction combined with trabeculectomy [4]. Debate continues on whether a single-site or two-site approach is best. A single-site approach may be less time consuming, but a two-site approach allows the surgeon to use the familiar clear corneal approach with better visibility associated with avoidance

of a superior scleral tunnel [5]. The objective of this study is to compare the results of one-site versus two-site combined

glaucoma filtration and phacoemulsification surgery with respect to visual acuity, intraocular pressure control.

2. Patients and Surgical Procedures

2.1. Patients

A prospective study was done on 40 patients with glaucoma and cataract attending the outpatient clinic of Ophthalmology department Al-Azhar Assiut University Hospital in period from April 2016 to October 2017. All patients will be subjected to the following:

- 1- Ethical considerations: explanation of the aims and research steps to all participants before beginning in the research. Getting informed written consent from whole participants before beginning in the research. Guarantee of the privacy of the data.
- 2- Preoperative evaluation: includes: History taking to inquire about: age, history and duration of visual impairment, anti glaucoma medication, previous ocular surgery. Ophthalmological

2.2. Surgical procedures

2.2.1. One-site procedure

The one site procedure was performed as follows: The patient was brought to the preoperative area, and a peribulbar anesthesia to the globe were done. Using a fornix-based conjunctival flap a scleral groove incision was made superiorly, and a partial-thickness flap was mobilized. The eye was entered underneath the scleral tunnel with a

examination: Assessment of best corrected visual acuity, slit lamp examination of the anterior segment, intraocular pressure measurement, fundus examination and B-scan ultrasonography if retinal details are obscured.

- 3- Cases were divided into two random groups: Group A: 20 eyes were subjected to one site phaco-trabeculectomy. Group B: 20 eyes were subjected to two-site phaco-trabeculectomy. Inclusion criteria were that the patient had immature cataract and primary glaucoma either open angle or closed angle. Exclusion criteria were that previous ocular surgery, retinal pathology other than glaucoma, corneal opacities.

keratome. Phacoemulsification was performed and the foldable posterior chamber IOL was implanted in the capsular bag, fig. (1). A posterior lip sclerectomy was performed underneath the scleral flap and a peripheral iridectomy was performed Followed by closure of the scleral and conjunctival flaps respectively, fig. (2).

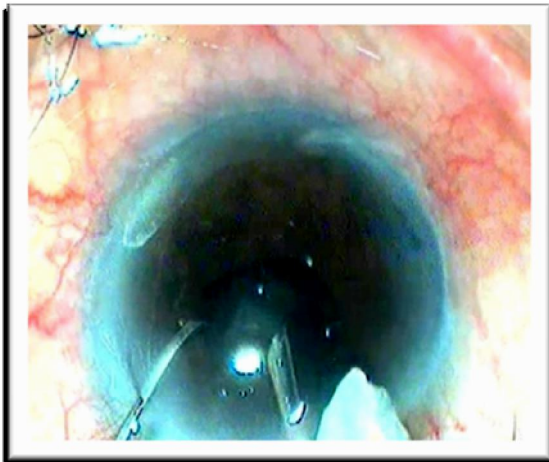


Figure (1) Phacoemulsification was performed through scleral tunnel.

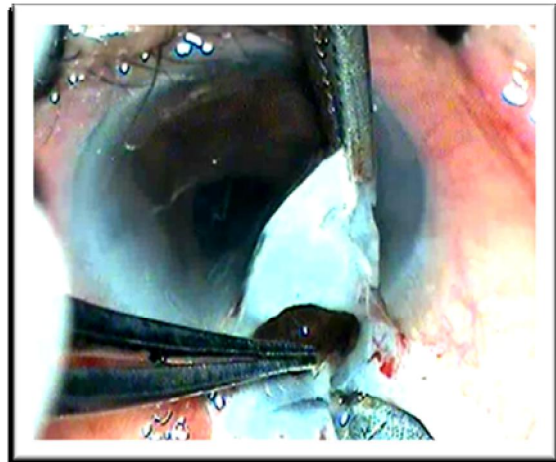


Figure (2) sclerotomy was performed underneath the scleral flap.

2.2.2. Two- site procedure

The two-site procedure was performed as follows: The steps like one site except that the surgeon first mobilized triangular partial-thickness scleral flap superiorly. At this time, the surgeon shifted temporally and Phacoemulsification of the nucleus and impl-

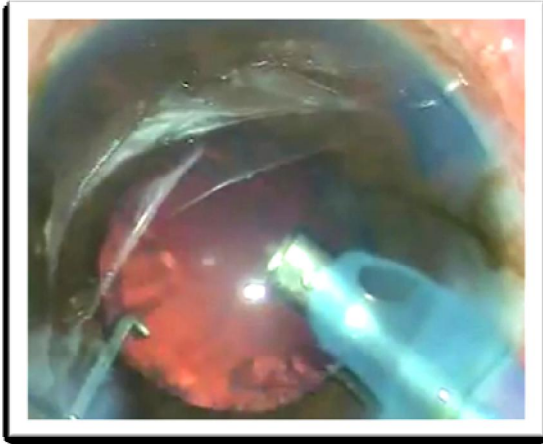


Figure (3) Phacoemulsification of the nucleus temporally.

2.3. Postoperative treatment

In both groups, at the end of the procedure, a patch and a plastic shield were placed over the eye. Postoperatively, topical antibiotic

2.4. Complications

* There were no intra-operative complications in either group. * Postoperative complications in the 2-site group included 9 patients (14%) who required a neodymium: YAG (Nd:YAG) capsulotomy at 6months postoperatively. Six patients (9%) had a bleb leak. One patient had a small hemorrhage from

2.5. Post-operative assessment

Postoperative measures for the purpose of this study included VA and IOP. Patients were followed up the morning after surgery, as well as 1 week, 1 month, 3 months and 6months postoperatively. The best-corrected VA was measured with a Snellen chart and

2.6. Statistical analysis

All patients had a minimum follow-up period of six months. All visual acuity measurements were made using a projected Snellen chart and were converted to logMAR equivalence using the method described by Holladay.

antification of the nucleus and implantation of a foldable posterior chamber IOL were performed, fig. (3). Again, the surgeon shifted superiorly and the filtration surgery was completed, fig. (4).



Figure (4) Filtration surgery was completed superiorly through separate site..

(ciprofloxacin), 1% atropine, and corticosteroid eye drops were used and gradually discontinued over 6 weeks.

the trabeculectomy site at the first-day postoperative visit that cleared spontaneously. Postoperative complications in the 1-site group included 5 patients (15%) that required an Nd:YA Gcapsulotomy at 6 months postop-eratively. Five patients (15%) had a bleb leak.

the figures were converted in logMAR notation. IOP was measured applying applanation tonometry. The cataract density was graded clinically on a 1-4 scale (1: mild; 2: moderate; 3: severe; 4: white or brown).

Counting fingers, hand motion, and light perception visual acuity were standardized to a Snellen equivalent of 20/600, 20/800, and 20/1000, respectively. All IOP measurements were recorded. The preoperative visual acuity

(logMAR equivalent) and IOP (mm Hg) were recorded in both the 1-site and 2-site groups. The mean values were compared with the postsurgical visual acuity and IOP in each group over a 6 months follow-up period. The

2 postsurgical groups were also compared with each other, and change over time was analyzed. Probability values were determined using a 2-tailed Student t test and calculated using SPSS software.

3. Results

Over 18 month's period, 40 patients were included in this study with an age range from 51 to 68 years with a mean of 61 years. As regards gender distribution, they were 15 males (37.5%) and 25 females (62.5%). There was no statistically significant difference in VA and IOP between the 2

groups. In our study there was a statistically significant difference in VA pre-operative and during all stages of post-operative follow-up in both groups. As regards IOP it was improved post-operatively in a statically significant manner.

Table (1) Comparison of the pre-operative parameters of the two groups

Group Parameter	G I (n=20)		G II (n= 20)		P value	
	Mean	SD	Mean	SD	Value	Comment
VA(log MAR)	1.12	0.25	1.13	0.24	0.908	Not significant
IOP (mmHg)	29.12	3.61	29.16	3.50	0.968	Not significant

Table (2) Comparison of the post-operative VA of the two groups

Group VA (log MAR)	G I (n=20)		G II (n= 20)		P value	
	Mean	SD	Mean	SD	Value	Comment
VA 1 w post operative	0.57	0.197	0.56	0.17	0.89	Not significant
VA 1 m post operative	0.47	0.21	0.47	0.198	0.91	Not significant
VA 3 m post operative	0.39	0.19	0.39	0.16	1.000	Not significant
VA 6 m post operative	0.394	0.187	0.394	0.162	1.000	Not significant

There was no statistically significant difference in VA between both groups

Table (3) Comparison of the post-operative IOP of the two groups

Group VA (log MAR)	G I (n=20)		G II (n= 20)		P value	
	Mean	SD	Mean	SD	Value	Comment
VA 1 w post operative	16.38	2.83	17.04	1.65	0.37	Not significant
VA 1 m post operative	17.55	2.63	17.48	1.95	0.92	Not significant
VA 3 m post operative	17.96	2.50	18.48	2.37	0.50	Not significant
VA 6 m post operative	18	2.39	18.48	2.37	0.504	Not significant

There was no statistically significant difference in IOP between both groups.

4. Discussion

Surgical options for coexisting cataract and glaucoma could be by various methods like only cataract surgery

followed by postoperative anti-glaucoma medication or combined Phacotrabeculectomy from one site or

two separate sites procedure or finally it could be by two sequential surgeries of trabeculectomy and cataract separately. In this study the mean age for group I and group II were 60.7 and 61.1 respectively, tab. (1). This was agreeing with [6] who used age-specific prevalence data from the Framingham Eye Study to estimate 5-year incidence rates for lens opacities and cataract. The 5-year incidence estimates for ages were 66 above the age of 60. As regards the gender distribution in this study, the female percentage was higher than males. There is evidence from epidemiologic data that cataract is more common in women than men. It has been hypothesized that the decrease in estrogen at menopause cause increased risk of cataract in women, i.e. not strictly the concentration of estrogen, but more the withdrawal effect [7] in this randomized controlled clinical trial, the results of 1-site versus 2-site phacotrabeculectomies, as regards visual acuity (log MAR) and IOP (mmHg) were compared. As regards VA (log MAR), there was improvement in post-operative results than pre-operative results in both one site and two sites groups. However, there was no statistically significant difference in post-operative data between both groups, tab (2). This was agreeing with study by Shingleton et al., 2003, [8] who used the VA log MAR to evaluate the VA pre and post operative in one site and two sites groups. The VA log MAR was 0.78 and 0.79 in the 2 groups respectively. Post-operative VA was 0.23 and 0.32 without statistically significant difference [9]. Compared one site phacotrabeculectomy with two sites phacotrabeculectomy in 76 eyes. In their study, they used Snellen's notation to compare VA pre and post operative instead of log MAR. They found an improvement in post-operative data over period of one year in both groups. However, there were no statistically significant differences in postoperative results

between the two groups [10]. Compared one site and two sites phacotrabeculectomy in 33 eyes. They reported a mean preoperative best-corrected VA (decimel) of 0.30 for the one site group and 0.28 for the two site group. In post-operative follow-up, the best corrected VA had improved significantly among all patients without statistical significance between the two groups (mean in one site group versus two sites group were 0.63 and 0.64 respectively). In our study the mean IOP in the two groups preoperatively was 29.12 and 29.16 respectively with no statistically significant differences between them. There was significant improvement in IOP in both groups in the follow-up observations. However, this improvement is not statistically significant differ between the two groups, tab (2). This agree with a study done by Cotran P et al. [11] who compared one site and two sites phacotrabeculectomy over three years and found no significant differences in the mean outcome of IOP. This is agree also with study by Shingleton B et al, [8] who compared 71 eyes with one site phacotrabeculectomy versus 64 eyes with two sites phacotrabeculectomy. The reported improvement in IOP in the two sites group than one site group over the first week postoperative period, however this difference is not present in follow up data beyond the first week post-operatively. This is also confirmed by Buys Y et al. [12] who compared 1-site phacotrabeculectomy versus 2-site procedures in 2-groups of patients according to the indication for phacotrabeculectomy either medically uncontrolled glaucoma with a visually significant cataract or a visually significant cataract in a patient on maximal medical therapy. They found no statistically significant difference between groups. In contrast [10] found a lower mean IOP in the 2-site eyes (13.3 VS 15.3) but, perhaps because of the small sample size, this difference was not statistically significant.

5. Conclusion

The similar results achieved in our two groups imply that either technique might be used to handle the problem of concurrent cataract and glaucoma in many patients.

6. Recommendations

Our study recommends that in patients with combined cataract and glaucoma, the combined surgery is more favorable than doing separate cataract and glaucoma surgery. To perform one-site procedure as it is easier in performance with no statistically significant difference to the two-site procedure

7. References

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