



COMPARISON OF 1-SITE AND 2-SITE PHACOTRABECULECTOMY IN EYES WITH CONCOMITANT GLAUCOMA AND CATARACT

Mithun Thulasidas

Junior resident, Department of Ophthalmology K.S Hegde Charitable Hospital Nithyanandanagar, Deralakatte Mangalore- 575018

Dr. Hrishikesh Amin*

Professor, Department of Ophthalmology Junior resident, Department of Ophthalmology K.S Hegde Charitable Hospital Nithyanandanagar, Deralakatte Mangalore- 575018 *Corresponding Author

ABSTRACT

Purpose: The purpose of this study is to compare the efficacy of one-site and two-site combined phacotrabeculectomy in eyes with concomitant glaucoma and cataract

Methodology: 22 Patients with concomitant glaucoma and cataract (36 eyes) over a period of 1 year were randomly assigned to undergo either a one-site (19eyes) or a two-site (17eyes) combined procedure.

Results: Mean postoperative intraocular pressure (IOP) significantly decreased in both groups compared to the preoperative level and was 16mmHg in the one-site group and 15mmHg in the two-site group. Best-corrected visual acuity (BCVA) was not different in both groups, postoperative (induced) astigmatism was less in the two-site group.

Conclusion: Both techniques yielded similar results regarding postoperative IOP reduction and final BCVA. However, the two-site group had less induced astigmatism compared to the one-site group.

KEYWORDS : Phacotrabeculectomy, glaucoma, intraocular pressure, cataract

INTRODUCTION

The concurrent existence of visually significant cataract and glaucoma is increasingly common in the elderly population. (1) Because of this, the ophthalmologist finds it challenging to decide the best surgical way to simultaneously manage these two conditions. Management includes combined cataract extraction, intraocular lens (IOL) implantation, and trabeculectomy along with intraoperative and postoperative use of antimetabolites such as mitomycin C and 5-fluorouracil (5-FU). (2,3,4)

Phacotrabeculectomy (phacoemulsification and trabeculectomy) is performed either through the same incision (1-site) or through separate incisions (2-site). (1) Although outcomes in terms of visual acuity (VA) have been similar, (6-9) there is a debate concerning which technique offers better IOP control and reduction in glaucoma medication requirements. (10-11)

It has been argued that the phacoemulsification incision separate from the trabeculectomy incision reduces postoperative scarring of the scleral flap and conjunctiva and improves the results of the filtration surgery. (12)

This study was undertaken to compare the efficacy of one-site and two-site combined phacotrabeculectomy in eyes with concomitant glaucoma and cataract.

MATERIALS AND METHODS

Preoperative clinical evaluation included best corrected visual acuity (BCVA), slit-lamp examination, type and density of cataract, applanation tonometry, fundus examination in all cases.

After clearance from Institutional Ethical Committee in accordance with the guidelines of the Declaration of Helsinki and obtaining informed consent,

22 Patients with concomitant glaucoma and cataract (36 eyes) over a period of 1 year were randomly assigned to undergo either a one-site (19eyes) or a two-site (17eyes) combined procedure. One-site approach consisted of a standard superior phacotrabeculectomy with a fornix-based conjunctival flap, while two-site approach consisted of a clear cornea temporal phacoemulsification and a separate superior trabeculectomy with a limbus-based conjunctival flap.

Exclusion criteria included lens subluxation, secondary glaucoma, advanced visual field loss and any history of previous intraocular surgery.

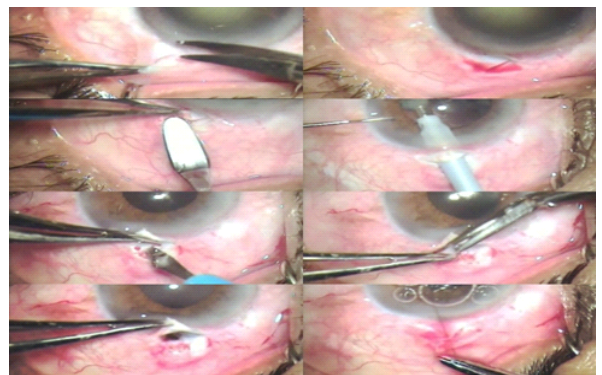


Fig. 1: showing one-site phacotrabeculectomy with a fornix approach

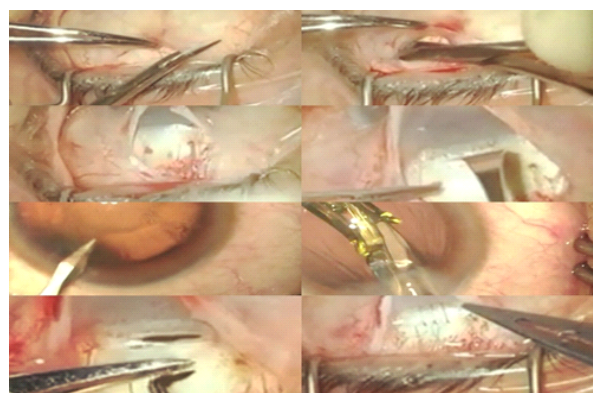


Fig.2 : showing two-site phacotrabeculectomy with a limbal approach

All patients were started on antibiotic steroid drops postoperatively tapered gradually over a month. Two patients (one of each group) were not on any glaucoma medications preoperatively.

BCVA was measured in Snellen charts and converted to log MAR scale for statistical purposes. BCVA was measured at 1 month, 3 month and 6 months postoperatively. IOP measurements were made postoperatively 24 hours after surgery, on the third day, 1 month, 3 months and 6 months. If IOP > 22 mmHg during follow-up, an

antiglaucoma medication was added if necessary. Mean follow-up period was 6 months.

Descriptive statistics applied. SPSS version 17.0 was used for the statistical analysis and p value less than 0.05 was considered as statistically significant.

RESULTS

The mean age of patients was 61.6 (range of 45 to 77 years) which included 12 women and 10 men.

Mean preoperative IOP in one-site group was 29.3 ± 1.89 mmHg and in the two-site group was 29.1 ± 1.83 mmHg (p > 0.05). There was no significant difference in the preoperative intraocular pressure in both groups.

Mean postoperative IOP was 16 ± 1.16 mmHg in the one-site group and 15 ± 1.25 mmHg in the two-site group (p > 0.05).

Table 1: showing pre-operative and post-operative mean IOP

	Pre-operative	Day 1	Day 3	1 month	3 months	6 months
One-site (19 eyes)	29.3±1.89	19.63±1.6	17.84±1.68	16.68±1.49	16.36±1.26	16 ± 1.16
Two-site (17 eyes)	29.1±1.83	19.52±2.49	17.23±1.64	16±1.58	15.52±1.33	15 ± 1.25

Only 2 patients were on anti-glaucoma medications in the two-site category at the end of 6 months compared to 4 patients in the one-site category.

Table 2. showing number of eyes on anti-glaucoma medications

	Pre-operative	1 month	3 months	6 months
One-site	18	8	4	4
Two-site	16	5	2	2

BCVA in one-site and two-site groups has improved from 0.68 ± 0.10 and 0.69 ± 0.10 preoperatively to 0.27 ± 0.50 and 0.27 ± 0.52 respectively at the end of 6 months (p > 0.05).

Table 3. showing pre-operative and post-operative BCVA

	Pre-operative	1 month	3 months	6 months
One-site	0.68 ± 0.10	0.36 ± 0.86	0.27 ± 0.50	0.27 ± 0.50
Two-site	0.69 ± 0.10	0.35 ± 0.85	0.27 ± 0.52	0.27 ± 0.52

The amount of induced astigmatism was 0.3D (0.38 SD) in the two-site group and 0.5D(0.29 SD) in the one-site group at the end of 3 months (p > 0.05).

In the early postoperative period, fibrinous uveitis was noticed as main complication. The fibrinous uveitis had developed in four eyes from the first group-operated by one-site approach and in two eyes from the second group two-site approach.

DISCUSSION

Our study focused on the effect of one-site versus two-site phacotrabeculectomy without the use of antimetabolites intraoperatively in two groups of glaucoma patients.

Cataract and glaucoma are frequently coexisting ocular conditions in the elderly population. Literature suggests that cataract surgery alone may be appropriate for some patients, although combining a trabeculectomy with the cataract extraction significantly increases the IOP-lowering effect (10).

Previous studies suggested that there was no statistically significant difference in postoperative IOP between one- and two-site phacotrabeculectomy (1,13) although a recent meta-analysis of randomized controlled trials supported that the two-site phacotrabeculectomy is better than one-site phacotrabeculectomy in reducing IOP (14). In our study, both techniques are effective in lowering the IOP, and at the end of the follow-up period, there was no

significant difference between the two groups, although the mean IOP of the two-site group was lower (P>0.05). After surgery, the two-site group had consistently lower IOP during each follow up, though not statistically significant.

The patients from the two-site approach group needed less medications postoperatively than patients from one-site approach group, which can be attributed to increased manipulation of the conjunctival and scleral flaps, and therefore, increased fibrosis (15). Moschos et al, in his study (2015), stated that the topical increase in temperature at the trabeculectomy site and at the scleral flap caused by the production of heat by the phacoemulsification probe is another possible factor contributing to decreased efficacy of the 1-site technique(16).

No significant difference in final visual outcome between the two techniques was observed, which could be due to the facts that no patient had a preoperative ocular pathology and no major complications occurred with either technique.

We only encountered one postoperative complication that is fibrinous uveitis in 4 eyes in the 1-site group and 2 eyes in the 2-site group.

In a prospective randomized study of one-site versus two-site phacotrabeculectomy, Borggreffe et al found a 24% increase in postoperative fibrinous uveitis (5). According to Allan and Barrett, the incidence of postoperative uveitis increases to 33%.

We found that the amount of induced astigmatism was lower in the two-site group, where we performed a clear corneal incision in a temporal location. Cagini C et al, (2003) have concluded that an incision at the 12 o'clock position induces more astigmatism compared to a temporal incision (17).

CONCLUSION

Both techniques yielded similar results regarding postoperative IOP reduction and final BCVA. However, the two-site group had less induced astigmatism compared to the one-site group.

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