



Comparison of Phacotrabeculectomy and Phacotrabeculectomy with Subconjunctival 5-Fluorouracil

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ABSTRACT

Introduction: Glaucoma is the second leading cause of blindness worldwide. Phacotrabeculectomy is a technique in which glaucoma and cataract surgery performed.

Methods: Prospective study was carried out in the department of glaucoma at Lumbini Eye Institute, Bhairahawa. 100 patients who underwent phacotrabeculectomy within a period of two years. Patients were divided into two groups those who received 5FU (n=47) and no antifibrotic agent (n= 53)

Results: The age range was from 38 to 80 years; mean age of 62.97±9.14 SD. 55% were male and 45% were female. The postoperative IOP reduction in last follow-up group A was mean=13.08±1.57SD and mean=13.23±1.73SD in group B. This was statically significant with P <0.001. Bleb survival was almost similar in two groups 3.17(78.31%) in group A and 3.20 (78.93%) in group B. 85% visual acuity was improved in both groups.

Conclusions: Phacotrabeculectomy and phacotrabeculectomy with inj. 5FU, both were equally effective surgical techniques in terms of visual acuity, IOP control and bleb survival. There was no significant statistical difference vis-à-vis the success of Phacotrabeculectomy using of either these two techniques.

Keywords: glaucoma; 5FU; intraocular pressure; phacotrabeculectomy.

INTRODUCTION

Glaucoma is the second leading cause of irreversible blindness worldwide. There are at least 60.5 million people with open angle glaucoma (OAG) and angle closure glaucoma (ACG) in 2010, increasing to 79.6 million by 2020. Asians will represent 47%. Bilateral blindness will be present in 4.5 million people with OAG and 3.9 million people with ACG in 2010, rising to 5.9 to 5.3 million people in 2020. Elevated intraocular pressure (IOP) is the most important risk factor in the development of the diseases. Phacotrabeculectomy is the most commonly performed operation for combined glaucoma surgery.⁹

METHODS

This study was carried out in the department of glaucoma at Lumbini Eye Institute, Bhairahawa, Nepal. All subjects were randomly selected. A verbal/written informed consent was obtained from the patients enrolled in the study. **Primary open angle glaucoma with significant cataract within a period of two years (August**

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2012-August 2014) was included. Patients diagnosed with acute angle closure glaucoma, uveitis glaucoma, secondary glaucoma, Lens induced glaucoma, failed trabeculectomy, postpterygium surgery and any intraocular surgery were excluded from the study. Data analysis was performed using the statistical software SPSS 16 version. Comparisons between two groups were analyzed by the chi-square and paired t tests.

Preoperative assessment:

Demographic assessment like name, age, gender, address and occupation were evaluated. A brief personal history, medical history, anti-glaucoma drug history and family history were also taken. All patients underwent full ophthalmological examination, including best corrected visual acuity, slit lamp bio-microscopy, anterior chamber depth, Goldmann applanation, central corneal thickness, gonioscopy, Humphrey field analyser 24-2 and 10-2, disc photograph and OCT. Fundus examination was performed with both direct and indirect methods. Cataract was graded by using of Lens opacities classification system (LOCS) with the standard photograph.¹

Indication for combined surgery:

a) Glaucoma under borderline control, despite maximum tolerable medical therapy. b) Adequate IOP control, but significant drug-induced side effect. c) Adequate IOP on well-tolerated medical therapy, but advanced glaucomatous optic atrophy. d) Uncontrolled glaucoma, but urgent need to restore vision.¹¹

Operative procedure:

All surgeries were performed under peribulbar anaesthesia by a single surgeon in the Lumbini Eye Institute, Bhairahawa, Nepal. Phacotrabeculectomy were performed 53 patients in group A and phacotrabeculectomy with 5-Fluorouracil (5FU) 47 patients in group B were evaluated. One-port phacotrabeculectomy surgery was performed with the surgeon sitting superiorly. A fornix-based 4mm conjunctival flap was created with tinotomy scissors. Bipolar cautery was used as needed. A square 2x2.0mm partial thickness scleral flap was created towards the limbus with crescent.¹² Paracentesis was made into the clear cornea with a 15° blade. The keratome was used to enter the anterior chamber through the scleral flap than phacoemulsification was carried out. Phacoemulsification was performed in the usual manner. Foldable PC IOL was implanted all cases. Trabeculectomy was done with Kelly's punch followed by Peripheral iridectomy was done for all cases. The scleral flap was closed with 2 interrupted 10.0 nylon sutures at the apices of the square and conjunctiva and

tenon's capsule were reposed with 10.0 nylon sutures in the both groups. Following surgery, inj.cefuroxime 1mg was injected intracamerally. Inj. 5FU 5mg was injected 180° (6'O'clock) position subconjunctivally in group B cases at the end of surgery.

Postoperative follow-up:

Post operatively, all patients treated with 1% prednisolone acetate 2 hourly for 2 weeks then tapered according to the anterior chamber inflammatory reaction up to 45 days and 0.3% ofloxacin eye drop 4 times a day. Patients were evaluated on the first postoperative day, after 14 days, 1 month, 3 months and every 6 months. Surgical Outcome were defined as IOP < 21mmHg without medication, best corrected visual acuity, fundus examination and bleb grading. Bleb scoring was done according to Moorfield Grading System (MBGS).⁷

RESULTS

The age ranged from 38 to 80 years; mean age of 62.97 ± 9.14 SD. 55% were male and 45% were female. All two groups had statistically significant lower intraocular pressure at 1st day, 1-month follow-up, 3-month follow-up, 6-month follow-up and 12-month follow-up compared to preoperative intraocular pressure levels at all times intervals measured ($p < 0.001$). Intraocular pressures were slightly higher in both groups in 14-day follow-up 15.1 ± 2.87 SD in group A and 15.23 ± 2.45 SD in group B. Bleb survival was almost similar in both groups 3.17 (78.31%) in group A and 3.20 (78.93%) in group B. 85% visual acuity was improved in both groups.

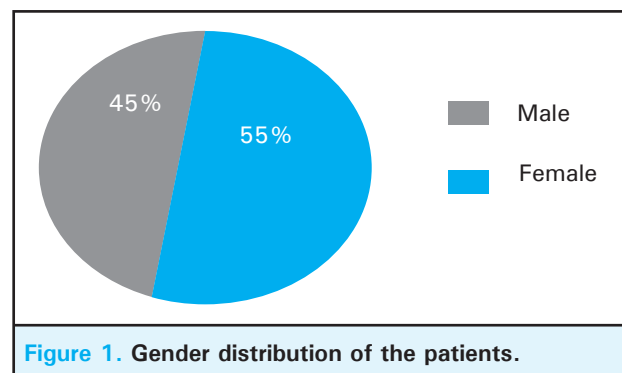


Figure 1. Gender distribution of the patients.

Postoperative final visual acuity was improved 84.91% in group A and 85.11% in group B.

visual acuity	Preoperative visual acuity		Postoperative visual acuity		Total
	Group A	Group B	Group A	Group B	
6/6-6/18	0	0	45	40	85
< 6/18-6/60	22	27	8	7	15
< 6/60-3/60	13	7	0	0	0
< 3/60	18	13	0	0	0
Total	53	47	53	47	100

Table 1. Comparison of preoperative and postoperative visual acuity in group A and group B.

There was no significant difference in intraocular pressure between group A and group B on preoperative and other follow ups. But when compared to preoperative intraocular pressure, all other follow up intraocular pressure were significantly lower ($p < 0.001$) in both groups. All two groups had statistically significant lower intraocular pressure at 1st day, 1-month follow up, 3-month follow-up, 6-month follow-ups and 12-month

follow-up compared to preoperative intraocular pressure levels at all times intervals measured ($p < 0.001$). Intraocular pressures were slightly higher in both groups in 14-day follow-up 15.1 ± 2.87 SD in group A and 15.23 ± 2.45 SD in group B.

IOP mmHg	Group A		Group B		P value
	N = 53		N = 47		
	Mean	SD	Mean	SD	
Preoperative	25.86	9.91	25.04	8.32	0.660
1 st day follow -up	14.98	3.35	14.89	3.32	0.969
14 days follow -up	15.1	2.87	15.23	2.45	0.692
1 month follow -up	14.57	2.56	14.94	2.34	0.387
3 months follow -up	14.04	1.83	14.43	2.02	0.290
6 months follow -up	13.51	1.74	13.53	1.9	0.789
12 months follow- up	13.08	1.57	13.23	1.73	0.517

Table 2. Comparison of intraocular pressure in group A and group B.

Table 3. Bleb survival was almost similar in both groups mean 3.17(78.31%) in group A and mean 3.20 (78.93%) in group B according to Moorfield Bleb Grading System (MBGS).

Parameters	Group A N=53	Group BN= 47
Area	4.15	4.23
Height	3.2	3.23
Vascularity	2.15	2.14
Mean	3.17	3.20
Percentage (%)	78.31%	78.93

DISCUSSION

In a study done by Chang et al 2006, there were 92 patients in follow- up 12 months, preoperative IOP was 23.4 ± 4.56 and Postoperative IOP was 16.1 ± 8.2 .⁵ In our study, total number of patients was 100 in a follow-up period 12 months, Preoperative IOP was 25.47 ± 9.1 , postoperative IOP was 14.25 ± 2.69 and $p 0.607$.

Budenz DI et al did a comparative study of phacotrabeculectomy with 5-fluorouracil, mitomycin c and without antifibrotic agents in 1999.³ All 3 groups had statistically significant lower intraocular pressures (IOP) on fewer antiglaucomatous medications at 6-month, 12-month, and last follow-up compared to preoperative levels ($P < .05$). No differences in final visual acuity or complications were found between groups.

In a study of Augustinus CJ, Zeyent T entitled as the effect of phacoemulsification and combined phacoglaucoma procedures on the intraocular pressure in open-angle glaucoma² the success rate was defined as IOP < 21mmHg without medication, visual acuity and complication were evaluated. Patients were used one or more type of medication before the surgery and after the surgery only 5% needed medication to maintain an IOP below 21mmHg. The most common cause of failure in glaucoma filtering surgery was scar of the filtering bleb.

A study done by Buys YM, Chipman ML, Zack B et al in 2008, there were no significant differences between the groups preoperatively. Mean IOPs were 17.6 versus 17.6, 12.6 versus 12.5, 13.1 versus 11.7, 13.1 versus 12.7, and 12.5 versus 12.9 mmHg for one- versus two-site at baseline and 3, 6, 12, and 24 months. There was a significant lowering of IOP compared with baseline at all time points ($P < 0.05$). There was no significant difference in mean IOP between the groups at any time.⁴

A study done by Rotchford AP, Vernon SA in 2007, it was found that the mean final IOPs were 13.4 and

13.5 mmHg on a mean of 0.6 and 0.8 glaucoma drops in the PMT and MT groups, respectively. In the PMT final visual acuity improved by at least one Snellen line in 81.1% and was worse in a single eye. It was concluded that IOP control following combined surgery by PMT is as good as following MT alone.¹⁰ In our study, postoperative final visual acuity was improved 84.91% in group A and 85.11% in group B, preoperative mean IOP and the final follow-up IOP values were significantly different between group A and group B and bleb survival was almost similar in the two groups in 12 months follow-up.

CONCLUSIONS

Phacotrabeculectomy and phacotrabeculectomy with inj. 5-FU, both were equally effective surgical techniques in terms of visual acuity, IOP control and bleb survival. There was no significant statistical difference vis-à-vis the success of Phacotrabeculectomy using of either these two techniques.

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