



ORIGINAL RESEARCH PAPER

Ophthalmology

A COMPARATIVE STUDY ON IOP CONTROL, VISUAL OUTCOME AND COMPLICATIONS FOLLOWING PHACOTRABECULECTOMY IN PRIMARY OPEN ANGLE GLAUCOMA (POAG), PRIMARY ANGLE CLOSURE GLAUCOMA (PACG) AND PSEUDO EXFOLIATIVE GLAUCOMA(PXFG)

KEY WORDS: Cataract, glaucoma, phacotrabeculectomy, outcomes

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ABSTRACT

BACKGROUND: Incidence of concurrent Glaucoma and Cataract is increasing. Phacotrabeculectomy can be considered in these cases. Comparison of visual outcome, IOP control and complications of 3 different types of glaucoma undergoing phacotrabeculectomy will be done.
METHODS: In this study, 90 eyes with cataract were divided into three groups, group A- POAG, group B – PACG, group C - PXFG. All underwent phacotrabeculectomy by a single surgeon.
RESULTS: No significant difference was seen in the three groups with respect to IOP control, complications and visual outcome except at 1 month when high IOP was noted in POAG and PACG and underwent laser suturolysis which was statistically significant (p <0.05).
CONCLUSION: Excellent results achieved in all the three groups of glaucoma imply that the phacotrabeculectomy might be a safe and effective surgery for IOP control and early visual rehabilitation in patients having co-existent cataract and glaucoma. Also no significant difference was noted in the rate of intraoperative complications between pseudo-exfoliation glaucoma and other types of glaucoma.

Introduction:

Glaucoma is a progressive optic neuropathy with characteristic structural and pathological changes in the optic nerve head¹. It is irreversible resulting from death of retinal ganglion cells. Prevalence of Glaucoma of any type in rural population of South India has been estimated as 2.6%, POAG -1.2%, PACG 0.5% and PXFG 0.4%.² Concurrent presence of visually significant cataract and glaucoma is increasingly common as elderly population increases. Thus ophthalmologist faces a surgical decision to simultaneously manage these two problems. Effect of cataract on visual function in a patient with glaucoma may include a reduction in visual field scores and visual acuity. Advanced Glaucoma Intervention Study (AGIS) demonstrated that, cataract extraction improves visual field defect scores in addition to improving visual acuity³. Phacoemulsification results in better IOP control post-operatively than extracapsular cataract extraction procedures⁴⁻⁶. For simultaneous surgical management of cataract and glaucoma, phacotrabeculectomy is often the treatment of choice⁷⁻¹¹.

MATERIALS AND METHODS

A prospective, comparative, interventional study was done from November 2008 to October 2009. Patients with POAG, PACG – sub acute and chronic angle closure post peripheral iridectomy and PXFG, with visually significant cataract were included and divided into 3 groups. Group A- POAG, Group B - PACG and Group C - PXFG. Patients with history of previous ocular surgeries, argon laser trabeculoplasty, secondary glaucoma, subluxated lens, mature and hyper mature cataract; corneal opacity, conjunctival inflammation, age-related maculopathy, high myopia, and diabetic maculopathy were excluded. 90 eyes of 90 patients who satisfied above criteria were selected and included in the study. All patients underwent BCVA, Slit lamp examination, Applanation tonometry, Gonioscopy, Fundoscopy, Visual fields (HFA 24-2 SITA STANDARD) and Biometry. After approval of Ethics Committee of Aravind Eye Care System, written, informed consent was taken. All patients underwent phacotrabeculectomy by a single experienced surgeon. The technique of phacotrabeculectomy was similar in all groups. All cases were reviewed and followed up for a period of 6 months with 5 post-operative follow-ups (1day, 1week, 1month, 3month, 6month).

Parameters assessed were BCVA, Slit-lamp biomicroscopy, Applanation tonometry, complications if any and its management, interventions like argon laser suturolysis (ALS), release of sutures, bleb needling, added post-operative anti-glaucoma medications. Statistical percentage, mean and standard deviations were used for analysis wherever necessary. Analysis was performed by the statistical package SPSS (13.0) at 5% level of significance (p=0.05) using ANOVA and test of proportions.

Results:

90 eyes of 90 cases were included. Review of age and gender

showed predominantly females with mean age of 69.1+/-7.3 years in PXFG group. Males and females equally participated in POAG and PACG group with mean age of 68.1+/-7.9 years and 65.3+/-7.4 years respectively. (Table 1)

Table 1: Age distribution

Age groups (Years)	Group A		Group B		Group C	
	N	%	N	%	N	%
40-49	1	3	0	0	0	0
50-59	2	6	8	26	1	3
60-69	12	40	10	33	14	46
70-79	14	46	12	40	13	43
80-89	1	3	0	0	2	6
Total	30	10	30	10	30	10
Mean	68.1		65.3		69.1	
SD	7.9		7.4		7.3	

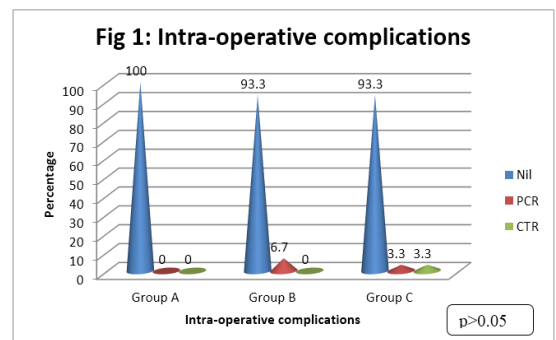
Severity of glaucoma, as revealed by mean cup:disc ratio was 0.76+/-0.04 in POAG, 0.77+/-0.06 in PACG and 0.75+/-0.06 in PXFG and did not differ significantly between the three groups. (Table2)

Table 2: Cup: Disc Ratio

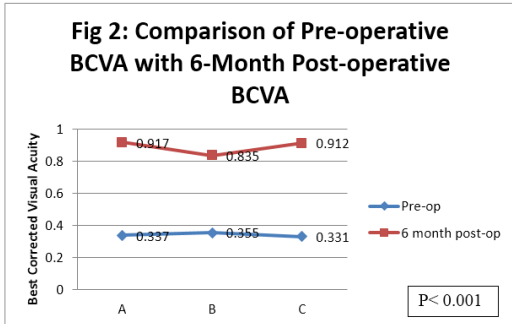
Groups	Mean	S.D
A	0.7633	0.049
B	0.7767	0.062
C	0.7500	0.068

ANOVA-F - F=1.458 d.f=2,87 and p>0.05

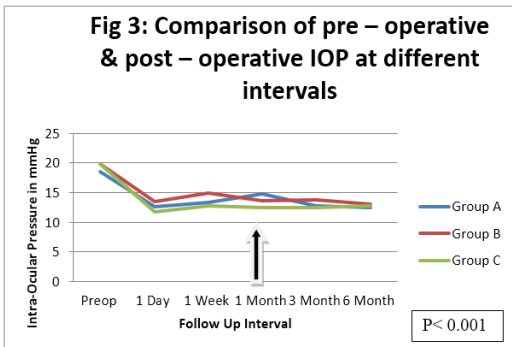
Intra-operative complications were few. 2 eyes with PACG and 1 eye with PXFG had posterior capsular dehiscence, 1 eye in PXFG group had zonular dialysis needing intraoperative capsule tension ring (CTR) placement (Fig 1)



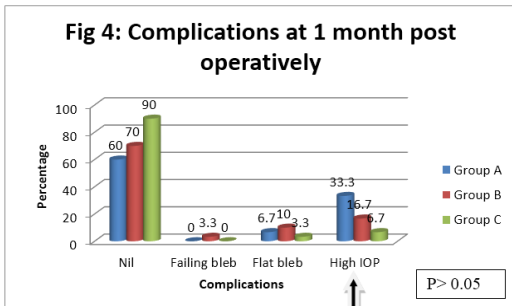
There was significant improvement in visual acuity with BCVA 6/9 or better in 100% eyes each in POAG and PACG and 96.7% PXFG. However there was no statistically significant difference in the BCVA of eyes between three groups at any interval. (Fig2)



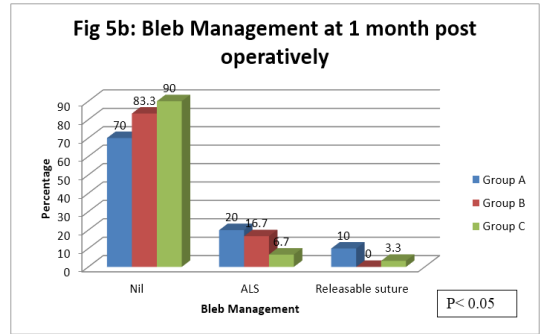
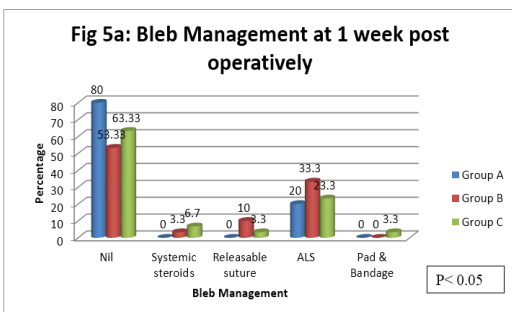
There was significant improvement in IOP control in three groups with fall in pre-operative mean IOP from 18.6+/-3.7mmHg to 12.5+/-2.5 mmHg in the final follow-up in POAG, 19.9+/-4.7mm Hg to 13.0+/-3.1mmHg in PACG and 19.8+/-4.9mmHg to 12.7+/-2.1mmHg in PXFG. There was no statistically significant difference in IOP between three groups during the study interval except during first month follow-up when there was a significant difference between POAG and PXFG (Fig3)



There was no statistically significant difference in anti-glaucoma medication requirements between three groups at any interval. High IOP was noted during first month follow-up in POAG and needed suture lysis for the same. (Fig4)



Laser suturolysis (ALS) was done in 20%, 33.3% and 23.3% at 1 week and 20%, 16.7% and 6.7% at 1-month follow-up in POAG, PACG PXFG respectively and showed statistically significant difference (fig 5a&5b)



Bleb needling with 5-fluorouracil was done in one case of PXFG at 3-month follow-up, and one case of failure due to late bleb fibrosis was noted each in PACG and PXFG.

Discussion:

Our study was aimed at comparing outcomes of phacotrabeculectomy in three different types of glaucoma with cataract. 96% cases had BCVA 6/9 or better in all three groups. Parihar et al¹² observed BCVA better than 6/12 in more than 60% cases, with poor visual outcome of less than 6/36 in 12% attributing to advanced glaucomatous changes. Robert J Casson et al¹³ observed BCVA of 6/12 or better in 78-94% of POAG patients post phacotrabeculectomy at 12 months. 4 (4.44%) patients of PACG and PXFG had intra-operative complications i.e posterior capsule dehiscence and zonular dialysis. Landa G et al¹⁴ did not report any significant difference in the rate of complications between PXFG and non-PXFG, although more frequent transition to ECCE in PXFG group was noted. Jimmy SM et al¹⁵ reported significant reduction in IOP in PACG than in POAG as in our study where good IOP control was noted in PACG. Liza sharmini et al¹⁶ observed a better IOP control in POAG than in PACG in Malaysian population unlike our study. Ramakrishnan R et al¹⁷ observed better reduction in IOP in POAG group than in other glaucoma groups with Small incision cataract surgery-trabeculectomy.

However, G.Venkatraman et al¹⁸ reported good IOP control in all three groups with good success rates. Similar to our study Jimmy SM et al¹⁵, Casson et al¹³ reported a significantly lower number of post-operative anti glaucoma medication requirement in different groups of glaucoma. In our study at 1-week follow-up, 2 eyes (6.7%) in PXFG and 1 eye (3.3%) in PACG group had shallow anterior chamber with choroidal detachment. They were effectively managed with systemic steroids, which resolved in one week. Similarly Namrata D, M Bhaskaran et al¹⁹ reported no significant difference in early complication rate between POAG and PACG. In their study, 3 eyes required reformation of anterior chamber. Choroidal drainage was performed in 1 eye with hemorrhagic choroidal detachment. G Venkatraman et al¹⁸ reported shallow anterior chamber and choroidal detachment as the most common complication. Post-operatively, laser suturolysis was done in 20%, 33.3% and 23.3% at 1 week and 20%, 16.7% and 6.7% at 1-month follow-up in POAG, PACG PXFG respectively and showed statistically significant difference. At 3 month follow up 1 eye (3.3%) in PACG had blocked ostium, which was managed by Nd YAG intervention. 1 eye (3.3%) in PXFG developed tenon's cyst and underwent bleb needling with 5-Fluorouracil. Borgreffe et al²⁰ also reported an overall 6% eyes requiring bleb needling.

Conclusion:

Similar and excellent results achieved in all three groups of glaucoma imply that technique of phacotrabeculectomy might be used to handle concurrent cataract and glaucoma. It is safe and effective surgery for IOP control and early visual rehabilitation. Although complications are expected to be more in PXFG, there has been no significant difference in rate of intra-operative complications between PXFG and other types of glaucoma. Evolution and refinement of small incision technique has made phacotrabeculectomy a procedure of choice for patients with co-existent cataract and glaucoma.

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