

# Intraocular Pressure Control in Post Trabeculectomy Patients with Pseudoexfoliation Syndrome: A Prospective Study

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## Abstract

**Introduction:** Eyes with pseudoexfoliation syndrome have a greater frequency of glaucoma. There are high frequency and severity of optic nerve damage at the time of presentation, poor response to medical treatment, worse field damage, and the more frequent necessity for surgical intervention.

**Purpose:** The prime aim was to study the analysis of the effectiveness of trabeculectomy in controlling intraocular pressure (IOP) (defined as an IOP <21 mmHg) in patients of exfoliative glaucoma and comparison of success rate of trabeculectomy in controlling IOP with or without additional post-operative medication in patients of exfoliative glaucoma.

**Materials and Methods:** The prospective study was conducted in the postgraduate, Department of Ophthalmology, Government Medical College Srinagar. About 50 cases of exfoliative glaucoma underwent primary trabeculectomy. Patients with a history of trauma, uveitis, and previous ocular surgery were excluded from the study. Post-operative follow-up was done on 1<sup>st</sup>, 2<sup>nd</sup>, and 4<sup>th</sup> week and then at 2, 6, and 12 months in terms of visual acuity, IOP, slit-lamp examination (for bleb status), visual field, and fundus examination.

**Result:** The study showed that average post-operative fall of IOP from initial level was 14.14 mmHg at 6 months (49.15%) ( $P < 0.000$ ) in comparison to pre-operative mean IOP of 28.26 mmHg. The percentage of patients with controlled IOP without additional medical therapy at 6 months was 92% and percentage of patients requiring post-operative medical therapy (only one drug) for IOP control was 6% making an overall percentage of patients with controlled IOP (with or without additional treatment as 98%).

**Conclusion:** Our study concludes that trabeculectomy is an effective modality for controlling IOP in patients with pseudoexfoliative glaucoma.

**Key words:** Glaucoma, Intraocular pressure, Pseudoexfoliation, Trabeculectomy

## INTRODUCTION

Glaucoma is a leading cause of irreversible blindness throughout the world and refers to a group of diseases

that have a common characteristics of optic neuropathy with associated field loss for which elevated intraocular pressure (IOP) may be one of the risk factors.<sup>1</sup> Glaucoma based on initial event is classified as an open angle, angle closure, developmental, or associated with other ocular and systematic disorders.<sup>2</sup> Pseudoexfoliation syndrome (XFS) belongs to the last group and eyes with XFS have a greater frequency of glaucoma.<sup>3</sup> There is high frequency and severity of optic nerve damage at the time of diagnosis, worse field damage, poorer response, more severe clinical course, and more frequent necessity for surgical intervention.<sup>4</sup> XFS usually effects one eye, or one

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eye in advance and usually involves age more than 50 years. Deposits of white material (exfoliation) can be seen on lens (three zones), iris, cornea (Sampaolesi's line), ciliary processes, zonules, and above all trabecular meshwork.<sup>5</sup> Exfoliation glaucoma has to be treated even in absence of field damage, if left untreated can lead to it. Glaucoma in XFS is to be treated on same lines as primary open angle (POAG) but it responds less than POAG but it responds well to filtering surgery (trabeculectomy) than POAG.<sup>6</sup>

## MATERIALS AND METHODS

This study was conducted in 50 diagnosed cases of exfoliative glaucoma who were operated with primary trabeculectomy and followed up for 6 months to 1 year (in some cases). Indications for trabeculectomy were uncontrolled IOP despite maximum tolerated medication and disease progression. Criteria for inclusion was patients with exfoliation, 6 months F/U minimum, if both eyes were involved first eye was taken and no surgery being done before trabeculectomy. Pre-operative assessment included visual acuity, slit-lamp examination (SLE), gonioscopy, fundus examination, and visual field assessment. Patients were operated by the senior staff of the Department of Ophthalmology for trabeculectomy. Post-operative F/U was done on 1<sup>st</sup>, 2<sup>nd</sup>, and 4<sup>th</sup> week and then after 3<sup>rd</sup>, 6<sup>th</sup> and if possible 12 months postoperatively in terms of visual acuity, IOP, SLE (for status of bleb), fundus and field of vision.

## OBSERVATIONS

The study revealed demographic data about age in years -  $60.26 \pm 7.38$  and about gender male:female (32:18). The observations that were made from the study as shown in Tables 1-7.

Post-operative cup disc ratio remained same in 84% of cases, whereas it deteriorated in 16% of cases and improved in none.

Post-operative visual field status at 6 months when compared with pre-operative visual field showed same status in 84% of cases, improvement in 2% and deterioration in 14%.

## DISCUSSION

Trabeculectomy has proved itself a safe and simple filtering procedure.<sup>7</sup> As per our study, its pressure reducing effect in exfoliative glaucoma is striking (92% without medication) and 98% with medication, as far as can be judged (6 months mainly). The results are close to results published by Jerndal and Kriisa (96%).<sup>8</sup> The mean IOP of all cases in our study

**Table 1: Pre-operative visual acuity (Snellen chart)**

Visual acuity (Snellen chart)	Number of cases (%)
6/12 or better	7 (14)
6/18 to 6/36	19 (38)
6/60 or less	24 (50)
Total	50 (100)

**Table 2: Pre-operative IOP (applanation tonometry)**

IOP (mmHg)	Number of cases (%)
>15-20	12 (24)
21-30	20 (40)
31-40	14 (28)
41-50	3 (6)
51-60	1 (2)
Total	50 (100)

**Table 3: Distribution of cases according to post-operative IOP**

IOP (mmHg)	Number of cases			
	1 <sup>st</sup> week	1 <sup>st</sup> month	3 months	6 months
>21	2 (4)	1 (2)	3 (6)	1 (2)
10-20	44 (88)	48 (96)	46 (92)	49 (98)
<10	4 (8)	1 (2)	1 (2)	0 (0)
Total	50 (100)	50 (100)	50 (100)	50 (100)

IOP: Intraocular pressure

**Table 4: Success of trabeculectomy in relations to post-operative IOP at 6 months**

Post-operative IOP	Number of cases (%)
Control without treatment	46 (92)
Control with additional treatment	3 (6)
Total controlled with and without additional treatment	49 (98)
Failure (IOP not controlled)	1 (2)

IOP controlled=IOP<21 mmHg at 6 months, IOP: Intraocular pressure

**Table 5: Changes in mean IOP from pre-operative level at different follow-up of all cases**

Mean pre-operative IOP	Mean post-operative IOP			
	1 <sup>st</sup> week	1 <sup>st</sup> month	3 months	6 months
28.26±8.72	14.10±3.59	13.68±3.11	13.95±3.52	14.12±3.19

IOP: Intraocular pressure

was  $14.12 \pm 3.19$  mmHg at 6 months which is close to results given by Popovic and Sjöstrand in whose study the mean post-operative IOP at last F/U visit (46.2 months) was 15.3 (5.1) in exfoliation glaucoma.<sup>6</sup> Our mean pre-operative IOP was  $28.26 \pm 8.72$  mmHg which is in accordance with study conducted by Popovic and Sjöstrand were mean IOP at operation was 28.2 mmHg in exfoliation glaucoma.<sup>6</sup> The mean age of the patients in our study is 60.26 years for both males and females, and this coincides with the mean

**Table 6: Changes in mean IOP from pre-operative levels at different follow ups along with their significance level**

A				
Pre-operative IOP (mean±SD)	Post IOP at 1 <sup>st</sup> week (mean±SD)	Change in IOP (mmHg)	t value	Significance (2-tailed)
28.26±8.72	14.10±3.59	14.16	12.097	0.000
B				
Pre-operative IOP (mean±SD)	Post IOP at 1 <sup>st</sup> month (mean±SD)	Change in IOP (mmHg)	t value	Significance (2-tailed)
28.26±8.72	13.68±3.11	14.58	11.858	0.000
C				
Pre-operative IOP (mean±SD)	Post IOP at 3 months (mean±SD)	Change in IOP (mmHg)	t value	Significance (2-tailed)
28.26±8.72	13.95±3.52	14.31	11.434	0.000
D				
Pre-operative IOP (mean±SD)	Post IOP at 6 months (mean±SD)	Change in IOP (mmHg)	t value	Significance (2-tailed)
28.26±8.72	14.12±3.19	14.14	11.426	0.000

IOP: Intraocular pressure, SD: Standard deviation

**Table 7: Distribution of cases according to post-operative visual acuity at 6 months**

Visual acuity	Number of cases (%)
Improved	2 (4)
Remained same	32 (64)
Deteriorated	16 (32)

age of 52 years in study by Jerndal and Kriisa.<sup>8</sup> Our study also showed increased susceptibility of males to exfoliative glaucoma (64% vs. 36%) as by Konstas *et al.*<sup>9</sup> Post-operative visual acuity in our study remained same at 6 months in about 64% of cases, however, it deteriorated in 32% of cases which is higher as by Jerndal and Kriisa, cause being our patients have advanced cupping and low vision so less chances of improvement.

In our study, 42 cases, no changes in visual field at 6 months, 7 cases showed deterioration while 1 case showed improvement. Similarly, in 52 cases by Jerndal and Krussu, 42 were same at 2 years, 9 deteriorated, and 1 showed improvement.

## CONCLUSION

Our study conclusively proves that trabeculectomy is a very effective modality in controlling IOP in pseudoexfoliative

glaucoma cases. This assumes a more significance given that XFS glaucoma is associated with the early field loss, poorer response to medical therapy, advanced cupping at presentation and aggressive nature of the disease as compared to other types of glaucoma. A lasting control of IOP is obtained by primary trabeculectomy and thus preserving the vision the patients and improving the quality of life of these patients.

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