

Trabeculectomy: A Follow-up Study of 120 Cases in Terms of Intraocular Pressure

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Abstract

The aim of the study was to access the efficacy of conventional trabeculectomy in lowering the intraocular pressure (IOP) in various types of glaucoma.

A clinical evaluation of trabeculectomy was done in 120 cases of different types of glaucoma. 60 were primary open-angle glaucoma, 13 were primary angle closure glaucoma, 42 were exfoliation glaucoma, and five were steroid-induced glaucoma.

Patients were operated by conventional trabeculectomy and followed up for 6 months.

Statistically there was highly significant reduction from mean pre operative level (36.12 ± 10.84) to last postoperative IOP (14.7 ± 3.17). Average postoperative IOP fall at 06 months from initial value was 21.42 mm Hg (59.3%).

The complications were seen in 29.16% cases. Main complications were shallow AC 16.6% followed by hypahema 10 % and progression of lenticular changes 10 % cases. The study concludes the conventional trabeculectomy is equally effective in controlling IOP in all four types of Glaucoma with few complications and is still gold standard for management of glaucoma.

Trabeculectomy was successful in controlling IOP to <21 mmHg in 92% of cases and visual activity improved or was maintained in 80% of cases.

Key words: Glaucoma, Intraocular pressure, Trabeculectomy

INTRODUCTION

The term glaucoma refers to a group of disorders that have in common characteristic optic neuropathy with associated failure loss for which the elevated intraocular pressure is one of the primary risk factor.

Glaucoma is a leading cause of irreversible blindness throughout the world. Although the condition more commonly affects the elderly, it occurs in all segments of society with significant health and economic consequences

Glaucoma can be classified into developmental, primary and secondary. Primary open angle glaucoma is clearly the most common single form of glaucoma.

Once the blindness of glaucoma has occurred, there is no known treatment that will restore the lost vision. However in nearly all the cases, blindness from glaucoma is preventable. This prevention requires early detection and proper treatment.

In spite of introduction of so many new drugs medical treatment many a times fails either due to patient non compliance with the regimen or the prescribed regimen may be incapable of effectively controlling the disease.

When non surgical means of reducing pressure fail, surgical method are justified.

The basic aim of most of the surgical procedures is to establish a fistula between anterior chamber and subconjunctival space

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so that aqueous should drain from the eye with the least resistance. They differ primarily according to the method of creating the fistula with the two main variations:

1. Full thickness fistula
2. Guarded fistula beneath a partial thickness scleral flap.

Full thickness fistula is associated with high complication rate. One attempt to minimize complications has been to place partial thickness scleral flap over the fistula. This concept was suggested by Sugar (1961) but was popularized by 1986 report of Cairnes. Both authors referred the technique as trabeculectomy. The intention is to excise a short length of Schlemm’s canal, with its trabecular adnexia, thus leaving two cut ends, opening directly into aqueous humour with no trabecular tissue remaining as a barrier at that point and restoring the integrity of corneoscleral coat over the area of excision.

PATIENTS AND METHODS

The study was conducted in the Department of Ophthalmology, District Hospital Baramulla. In the study, 120 diagnosed cases of different types of glaucoma were operated between January 1, 2015, and December 31,

Table 1: Types of glaucoma and their mean pre-operative IOP⁽¹⁾

Types of glaucoma	Mean pre-operative IOP
POAG	35.87±9.1
PACG	40.77±12.4
Exfoliation glaucoma	32.73±5.5
Steroid-induced glaucoma	42±11.40

IOP: Intraocular pressure, POAG: Open-angle glaucoma, PACG: Primary angle closure glaucoma

Table 2: Distribution of cases according to post-operative IOP (mmHg) ^[2,3]

Types of glaucoma	1 st week	1 st month	3 rd month	6 th month
POAG	13.6±3.61	14.54±4.55	14.54±4.3	15.32±3.95
PACG	12.92±3.7	14.46±4.33	13.85±2.23	14.0±2.31
Exfoliation glaucoma	12.86±3.1	13.73±4.2	14.0±4.19	13.9±3.57
Steroid-induced glaucoma	12.0±2.83	12.4±2.19	12.8±2.7	13.2±2.28

IOP: Intraocular pressure, POAG: Open-angle glaucoma, PACG: Primary angle closure glaucoma

Table 3: Pre-operative and post-operative IOP according to glaucoma type seen was ^[4,5,6]

Types of glaucoma	Pre-operative IOP	Last post-operative IOP (6 months)	Change in IOP in mmHg (%)	Significance level P value based on student’s t-test
POAG	35.87	15.32	20.55 (57.29)	<0.001
PACG	40.77	14.0	26.77 (65.66)	<0.001
Exfoliation glaucoma	32.73	13.9	18.83 (57.53)	<0.001
Steroid-induced glaucoma	42	13.2	28.8 (68.57)	<0.001

IOP: Intraocular pressure, POAG: Open-angle glaucoma, PACG: Primary angle closure glaucoma

2017. Indication for trabeculectomy was uncontrolled intraocular pressure (IOP) despite maximum tolerated medical therapy and disease progression. All patients were admitted 1 day before surgery and given antiglaucoma treatment for lowering raised IOP. (Timolol 0.5 % e.d., oral acetazolamide, oral Glycerol or mannitol IV depending on level of IOP) Patients were operated under local (peribulbar) anesthesia. A fornix-based conjunctival flap^[18] was made at 12 O’ clock position. Trabeculectomy was performed with borders of superficial sclera flap triangular (4 mm × 4 mm) outlined to two-thirds of sclera thickness. Deep sclerotomy involved corneoscleral block of 1.5 mm × 3 mm. Peripheral iridectomy was performed. The superficial triangular flap was sutured with 10-0 nylon, with one suture at apex. Conjunctiva was closed with two sutures by 10-0 nylon at two corners of the flap. Anterior chamber was formed by injecting fluid through paracentesis made at 9 O’clock position and bleb was formed on table. Bandage was removed after 24 h and particular attention was paid to condition of filtering bleb, cornea, anterior chamber for depth and contents, pupil, and lens postoperatively. After 24 h, patients were put on antibiotic steroid e.d., 2 h and cyclopentolate 1% e.d., QID for 1 week. Steroids QID were continued for 1 month IOP that was measured by Goldmann applanation tonometry using 2% fluorescein strips in immediate post-operative period. Post-operative follow-up was done on 1st, 2nd, and 4th weeks, and 3rd and 6th months.

Observation

The patient ranged in age from 16 to 80 years with mean age of patients being 58.41 ± 13.6 years. The primary open-angle glaucoma (POAG) constituted 60 cases, primary angle closure glaucoma (PACG) 13 cases, exfoliation glaucoma 42 cases, and steroid-induced glaucoma five cases. Preoperatively, majority of cases were in >21–30 mmHg IOP range with mean IOP being 36.12 ± 9.31 mmHg (Table 1).

Pre-operative visual acuity was 6/12 or better in 15% of cases, 6/18–16/36 in 39% of cases, and 6/60 or less in 46% of cases.

Statistically, there was highly significant reduction from mean pre-operative level (36.12 ± 10.84) to the last post-operative IOP (14.7 ± 3.17). Average post-operative IOP fall at 6 months from initial value was 21.42 mmHg (59.3%) (Table 2).

Table 4: The various complications encountered with percentage of occurrence was [7,8,9]

Complication	Number of cases	Age (%)
Hyphema	12	10
Shallow AC	20	16.6
Flat AC	2	1.66
Conjunctival leak	6	5
Iritis	1	0.83
Striate keratitis	3	2.5
Iris prolapsed	1	0.83
Hypotony (transitory)	2	1.66
Choroidal effusion	2	1.66
Blebitis	1	0.83
Encapsulated bleb	2	1.66
Cataract progression	12	10
Total cases	35	29.16

Trabeculectomy was considered to be successful if post-operative IOP was <21 mmHg at 6 months without medication or with single addition medication. Trabeculectomy was successful in 92% of cases at 6 months. 90% of cases were controlled without treatment. Failure was seen in 7%. When post-operative status of vision at 6 months was compared with pre-operative vision, it was found that vision deteriorated >1 line in 20% of cases. Vision improved in 7% and remained same in 73% of cases.

The total number of complication exceeds as more than one complication occurred in some cases.

Conjunctival resuturing was done in 6 cases (5%), cataract extraction was done in 12 cases (10%).

DISCUSSION

Our success rate of 90% without medication is close to success rate published by Watson and Greirson (86%)^[10] and Anand *et al.* (85%)^[11] but higher than as reported by Schwartz and Anderson (56%)^[12] and Freesom *et al.* (57%)^[13].

Our success rate of 92% with or without additional treatment is similar to as reported by Fridgway *et al.* (92%)^[14] and Jerndal and Lundstorm. (92%)^[12] but higher than as reported by Schwartz and Anderson^[13] and Freesom *et al.* (84%)^[16] and is lower than as reported by Watson and Barnet (95%)^[7] and Al Smarai (95.5%)^[17].

Our success regarding improvement or no change in visual acuity (80%) is similar to as reported by Fridgway *et al.* (80%) and Mills (84.8%)^[18].

Our incidence of post-operative shallow anterior chamber (16.6%) is higher than as reported by Watson and Barnet (22.2%)^[16].

Our incident of hyphema (10%) is close to as reported by Anand *et al.* (12.7%)^[11] but lower than as reported by Fridgway *et al.* (15%)^[14].

Our incident of cataract progression (10%) is lower than as reported by Watson and Barnet (15.5%)^[16] and Mills (35.4%)^[18] but higher than as reported by Anand *et al.* (2.8%)^[11].

Our incidents of choroidal effusion are in accordance with as reported by Watson and Greirson (2%)^[10] and Mills (5.3%)^[18] 2% of patients developed encapsulated bleb.

CONCLUSION

A clinical evaluation of trabeculectomy was done in 120 cases of different types of glaucoma. 60 were POAG, 13 were PACG, 42 were exfoliation glaucoma, and five were steroid-induced glaucoma. Patients were operated by conventional trabeculectomy and followed up for 6 months. Preoperatively, mean IOP was 36.12 mmHg. Post-operative IOP remained comparatively low up to 1 week (mean 13.23 mmHg). It showed that a rising tendency is subsequent follow-ups with mean IOP at 6 months being 14.6 mmHg. Average post-operative fall of IOP from initial level was 21.42 mmHg at 6 months (Table 3). The fall in IOP was statistically significant ($P < 0.0001$) mmHg in 92% of cases and visual acuity improved or was maintained in 80% of cases. The complications were seen in 29.16% of cases. Main complications were shallow AC 16.6% followed by hyphema 10% and progression of lenticular changes 10% of cases (Table 4). The study concluded that the conventional trabeculectomy is equally effective in controlling IOP in all four types of glaucomas with few complications and is still the gold standard for the management of glaucoma.

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