COMPARATIVE EVALUATION OF TRABECULECTOMY WITH SCLERAL AQUEOUS POOL AND CONVENTIONAL TRABECULECTOMYSanjeev Rohatgi¹**HOW TO CITE THIS ARTICLE:**

Sanjeev Rohatgi. "Comparative Evaluation of Trabeculectomy with Scleral Aqueous Pool and Conventional Trabeculectomy". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 03, January 20; Page: 742-745, DOI:10.14260/jemds/2014/1895

ABSTRACT: The advances in the field of ophthalmology during the past 2 decades have been revolutionary. One of the leading causes of blindness worldwide is Glaucoma. Due to aging of the population, the number of patients of this disease has been rising, with approximately 69 million cases of blindness expected by year 2020 as a result of Glaucoma.

The surgical intervention of choice for glaucoma patients is trabeculectomy but its long term efficacy to maintain normal intraocular pressure has been disappointing. This can be attributed to postoperative progressive scarring of conjunctiva and fibroblastic activity at filtration site. Keeping this in mind, the present study was undertaken for the modification of trabeculectomy surgery by creating a sclera flap so that the sclera aqueous pool will help in reducing the fibroblastic activity. This study further enhances our understanding of glaucoma surgery. The successful outcome by the sclera aqueous pool technique could greatly improve the patient prognosis and can replace conventional trabeculectomy in the future.

INTRODUCTION: Glaucoma is the second leading cause of blindness in USA and fourth in India; it is considered next to cataract in causing visual morbidity.

The association between glaucoma and elevated intraocular pressure (IOP) was suggested almost four decades ago by Richard Banister¹; however, surgical attempts to treat glaucoma came into being only in the 19th century.

Traditional method of reducing IOP is "filtration surgery" of various types, viz., sclerectomy, iridencleisis, filtering bleb sclero-iridectomy and posterior lip sclerotomy. Trabeculectomy was introduced in 1968 and is now the most common operation for the treatment of glaucoma worldwide (Cairns 1968; Watson & Barnett 1975; Watson 1981)^{2,3,4}. The long term successful control intra-ocular pressure in eyes that have undergone primary trabeculectomy has ranged from 48%-98%, depending on follow up time and the criteria used to define successful outcome (D'Ermo et al 1979, Mills 1981 Vesti and Raitta 1997)^{5,6,7}. However, its long-term efficacy in maintaining a normal functional bleb, and hence normal IOP, is disappointing.

Since the original description of trabeculectomy, numerous modifications have been proposed -Posterior location of trabeculectomy, site of surgery (Vesti & Raitta 1992)⁸, limbus versus fornix based conjunctival flap (Shuster et al 1984)⁹, sclera flap size (Starita et al 1984)¹⁰.

The present study has been conducted to attempt a comparison between the results of conventional trabeculectomy and trabeculectomy with creation of scleral aqueous pool.

MATERIAL & METHODS: This study was conducted in the Department of Ophthalmology, Govt. Medical College, Kannauj from July 2009 to June 2011). We have performed the follow-up of

ORIGINAL ARTICLE

patients who had undergone trabeculectomy with scleral aqueous pool (group A) and conventional trabeculectomy (group B).

During postoperative follow-up, particular attention was given to tension, bleb, anterior chamber and cornea. All data were recorded on day 2, day 7, day 21, day 42, three months, 6 months and 1 year postoperatively. Outcome of trabeculectomy was assessed according to an IOP of 16mm of Hg or less, without any complications. An IOP of >21 mm of Hg, with or without other ocular complications, was recorded as failure. Pressure spikes encountered during first 10 postoperative days, whether requiring anti-glaucoma medications or not, were ignored in the determination of surgical outcome.

OBSERVATIONS: Mean age of patients was 54.03 ± 6.52 in group A and 55.02 ± 6.92 in group B. There were 14 males and 18 females in group A and 12 males and 20 females in group B. The two groups were, therefore, matched for age and sex.

Preoperative IOP was 34 ± 7.17 in group A and 34.42 ± 6.48 in group B. Decline in IOP in the two groups at various postoperative intervals was compared, and it was observed that there was no significant decrease in group A on day 2 and day 7. However, the decrease of IOP in group A was significantly more as compared to that in group B at day 21, day 42, three months, 6 months and 1 year (Table-1).

Recording day	Group A	Group B	p-value
Preoperative	34.58 ± 7.17	34.42 ± 6.48	-
Day 2	16.75 ± 3.31	22.48 ± 3.33	>0.05
Day 7	17.19 ± 3.69	21.46 ± 3.32	>0.05
Day 21	16.82 ± 3.23	21.15 ± 3.62	<0.01
Day 42	15.60 ± 2.79	21.04 ± 3.04	<0.01
3 months	15.38 ± 2.80	20.92 ± 2.81	<0.05
6 months	15.18 ± 2.50	20.90 ± 2.60	<0.05
1 year	15.18 ± 2.50	20.89 ± 2.58	<0.05

Table 1: Comparison of decrease of IOP (mm of Hg) in Group A and group B at varying periods after surgery.

Shallow anterior chamber after operation was found in 1 patient and conjunctival bleb failure in 2 patients of group B only. None of the patients in either group suffered from postoperative infections. Scleral flap complication was also encountered in only 1 patient of group B. Overall trabeculectomy success rate was 100% in group A and 96.73% in group B.

DISCUSSION: Trabeculectomy has been the procedure of choice for glaucoma surgery since the last 45 years. It may fail from occlusion of internal sclerotomy, or from external scarring. While the former is largely preventable by proper surgical technique, the latter is almost impossible

ORIGINAL ARTICLE

to prevent. The long-term efficacy of conventional trabeculectomy in maintaining a normal functioning bleb and hence normal IOP is, therefore, disappointing over months or years. A scleral aqueous pool would prevent apposition of flap and hamper the fibroblastic activity, thus preventing scarring at the filtration site.

We found that the improvement in IOP was significantly better in patients who had undergone trabeculectomy with scleral aqueous pool (group A) as compared to patients who were subjected to conventional trabeculectomy (group B), particularly in the period between 3 weeks to 1 year after surgery.

Moreover, shallow anterior chamber, scleral flap complication and conjunctival bleb failure were not encountered in any of the group A patients. Overall success rate in our study was 100% in group A and 96.7% in group B.

Shape of the scleral flap has been a matter of discussion – some authors have recommended a square flap and others have used a triangular flap. Still others have observed that the shape did not matter as far as success rate regarding the IOP is concerned (Kimbroug et al 1982)¹¹. We have recorded good results with a square scleral flap.

On the basis of our findings, we have concluded that scleral aqueous pool trabeculectomy leads to a better long-term control of IOP the conventional trabeculectomy.

CONCLUSION: The present study is a double blind study based on follow up records of patients who had undergone conventional trabeculectomy and trabeculectomy with sclera aqueous pool.

Surgical success was assessed on two criteria i.e. intraocular pressure control and post operative ocular complications. It was found that improvement in IOP was significantly better in patients who were subjected to trabeculectomy with sclera aqueous pool as compared to standard trabeculectomy.

Thus it can be concluded that sclera aqueous pool trabeculectomy has better long term control on IOP as the aqueous pool prevents apposition of flap & thus prevents fibrosis and other post operative complications.

REFERENCES:

1. Richard Banister on Wikipedia http://en.wikipedia.org/wiki/Richard_Banister (accessed 17Nov.2012).
2. Cairns JE. Trabeculectomy preliminary report of a new method. Am J. Ophthalmol 1968; 66:673-679.
3. Watson PG & Barnett F. Effectiveness of trabeculectomy in glaucoma. Am J Ophthalmol 1975; 79:831-845.
4. Watson PG. Trabeculectomy. Dev Ophthalmol, 1981; 1:61-70.
5. D'Ermo F, Bonomi L, Doro D. A critical analysis of long term results of trabeculectomy. Ophthalmology 1993;100:599-612.
6. Mills KB. Trabeculectomy, a retrospective long term follow-up of 444 cases. Br J Ophthalmol 1981;65: 790-795.
7. Vesti E, Raitta C. A review of the outcome of trabeculectomy in open angle glaucoma. Ophthalmic Surg Lasers 1997;28:128-132.
8. Vesti E, Raitta C. Trabeculectomy at the inferior limbus. Acta Ophthalmol 1992;70.

ORIGINAL ARTICLE

9. Starita RJ, Fellman RL, Spaeth GL. Effect of varying size of scleral flap and corneal block on trabeculectomy. Ophthalmic surgery 1991;22: 23-26.
10. Shuster JN, Krupin T, Kolkar AE. Limbus verses fornix based conjunctival flap in trabeculectomy, A long term randomized study. Arch Ophthalmol 1984;102: 361-362.
11. Kimbrough RL, Stewart RH, Decker WL, Praeger TC. Trabeculectomy, square or triangular scleral flap? Ophthalmic surgery 1982;13:753.

AUTHORS:

1. Sanjeev Rohatgi

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Ophthalmology, Government Medical College, Kannauj.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Sanjeev Rohatgi,
10/503B, Allenganj,
Khalasi Line, Kanpur.
Email- snjvrohatgi@gmail.com

Date of Submission: 23/12/2013.
Date of Peer Review: 24/12/2013.
Date of Acceptance: 02/01/2014.
Date of Publishing: 17/01/2014