International Journal of Innovative Research in Medical Science (IJIRMS)
Volume 03 Issue 04 April 2018, ISSN No. - 2455-8737
Available online at - www.ijirms.in

Open Access Journal | Research Article | DOI: 10.23958/ijirms/vol03-i04/02

Study of Comparing Combined Viscocanalostomy - Trabeculectomy to Trabeculectomy for the Management of Glaucoma

Dr. Anand Verma[*1] M.S., Dr. Pratibha Kaushal[2]
[1]Professor, Department of Ophthalmology, Rama Medical College and Hospital, Hapur, U.P., India
[2]Ex Senior Resident Department of Anaesthesiology

Abstract

Purpose: *To compare combined viscocanalostomy - trabeculectomy to trabeculectomy in Primary Open angle glaucoma.* ***Material and Methods:*** *A total of 20 patients (40 eyes) of bilateral Primary Open Angle Glaucoma (POAG) were included in this study. They were randomly divided into two groups. Twenty eyes underwent combined viscocanalostomy - trabeculectomy and other twenty eyes underwent trabeculectomy with releasable suture. Combined viscocanalostomy - trabeculectomy constituted lamellar sclera flap, deep sclera flap dissection, excision of deep sclera flap, deroofing of sclemn's canal, viscodilatation of sclemn's canal, trabeculectomy and tight flap closure. Success criteria included intraocular pressure < 14 mmHg or more than 30% reduction of IOP.* ***Result:*** *Although in both the groups IOP was decreased, there was more lowering of IOP in combined viscocanalostomy -trabeculectomy than trabeculectomy. Target IOP was achieved in 95 % in viscocanalostomy - trabeculectomy group compared to 85% in trabeculectomy group.*

Keywords: ***Intra Ocular Pressure, Trabeculectomy, Combined Viscocanalostomy - Trabeculectomy, Primary open angle glaucoma.***

Introduction

The surgical treatment of choice for uncontrolled glaucoma is trabeculectomy, which was introduced by Cairns in 1968,[1] but this procedure is associated with both early and late postoperative complications. Early complications includshyphaema, fibrinous uveitis, shallow anterior chamber and hypotony. Late complications include bleb-related problems such as delayed leaks and endophthalmitis and cataract formation,[2] to reduce complications, non-penetrating filtering procedures have been developed in which peripheral iridectomy is not performed, thus minimizing risk of hyphaema and postoperative inflammation.

To lower intraocular pressure, two major variations are deep sclerectomy (DS) and viscocanalostomy. Viscocanalostomy, as shown by Stegmann is reported to lower intraocular pressure.[3]

To preserve the residual visual function, the severely compromised optic nerve requires low and stable intraocular pressure (IOP) in advanced glaucoma.[4] High incidence of hypotony-related complications are seen or associated with the Trabeculectomy (TRAB) with mitomycin C (MMC) and complications related to tight flap closure or early suture removal are also seen.[5,6] During nonpenetrating glaucoma surgery, macroperforation of trabeculo - Descemet's membrane results in hypotony in most of the cases.[7,8]

Combined viscocanalostomy - trabeculectomy consist of dissection of the deep scleral flap, viscodilation of Schlemm's canal (SC), and intended macroperforation called as penetrating sclerokeratectomy. This technique is modified to control hypotony by enhancing internal flow via Schlemm's canal and a scleral lake and limiting external filtration with tight suturing of the scleral flap.[9]

Materials and Methods

This is prospective study for which ethics committee approval was obtained. The patients were recruited from outpatient department of Ophthalmology of Rama Medical College and Hospital, Hapur and admitted in Rama Medical College and Hospital, Hapur.

A total of 20 patients (40 eyes) of bilateral Primary Open Angle Glaucoma (POAG) were included in this study. All patients gave full informed consent. They were randomly divided into two group.

Group A: Trabeculectomy with single releasable suture in one eye.
Group B: Combined Viscocanalostomy - Trabeculectomy with single releasable suture in other eye.

Inclusion Criteria: Patients of diagnosed Primary Open Angle Glaucoma(POAG) with clinical indication of surgery, patients of POAG not responding to medical multi drug therapy, intolerance of drugs, poor compliance and patients who could not afford anti glaucoma medication.

Exclusion Criteria: Patients with prior ocular surgeries, patients with Angle closure glaucoma, Neovascular glaucoma, Low tension glaucoma, congenital glaucoma, Secondary glaucoma, and patients with any other corneal pathology.

All selected patients underwent full ophthalmic and systemic examination. Visual assessment, applanation tonometery, fundus examination, gonioscopy and visual field analysis were done.

Surgical Technique

Group A: Trabeculectomy with single releasable suture in one eye.
20 eyes of twenty patients underwent trabeculectomy with single releasable suture in one eye. Fornix based conjuctival flap was fashioned. Bipolar wet field cautery was done to achieve heamostasis. A 4 mm by 4 mm rectangular sclera flap of two third thickness was made with help of cresent knife. A paracentesis was done 90 degree away from trabeculectomy site and full thickness 2 mm by 3 mm sclerectomy was performed. Peripheral iridectomy was made. Scleral flap was sutured with 10-0 nylon suture, one releasable suture and variable numbers of interrupted sutures were given depending upon the status of flow through the flap.

Group B: Combined Viscocanalostomy-Trabeculectomy with single releasable suture in other eye
Fornix based conjuctival flap was fashioned. Heamostasis was achieved using bipolar cautery. A 5 mm by 5 mm rectangular sclera flap of one third thickness was dissected within 1 mm of clear cornea with help of crescent knife.Other near full thickness deeper scleral flap was dissected 0.5 mm inside the border of first flap and it was carried up to 2 mm of clear cornea. Deeper scleral flap was excised, de roofing the sclemn's canal. Balanced salt solution was injected in sclemn's canal to confirm its position. Both the cut ends of schlemn's canal were dilated with canula and then sodium hyaluronate was injected. A paracentesis was done and floor of schelmn's canal was incised along with 2 mm by 3 mm trabeculer meshwork ia also excised. Peripheral iridectomy was done. The outer scleral flap was sutured with 10-0 nylon, one releasable suture and variable number of interrupted sutures was given depending upon the status of flow through the flap.

Both A and B group: Subconjuctival injection of gentamycin 0.3 ml and dexamethasone 0.3 ml were given in inferior fornix. Moxifloxacin 0.3% eye drop and Predacetate 1% eye drop were advised to put 6 times par day and later on tapered. All the patients were examined post operatively on day 1, day 7, and then 1 month, 2 month and 3 month. On every visit unaided visual acuity and with pin hole visual acuity was recorded. Every patient was examined under slit lamp, for presence and absence of any complications, condition of filtering bleb, anterior chamber depth and any sign of inflammation. Applanation tonometery and fundoscopy was done.

Observation:

Table 1: Distribution of patients, according to age and sex

Age Group in Years	Male	Female
40-49	1	0
50-59	1	2
60-69	4	2
70 and above	6	4
Total	12	8

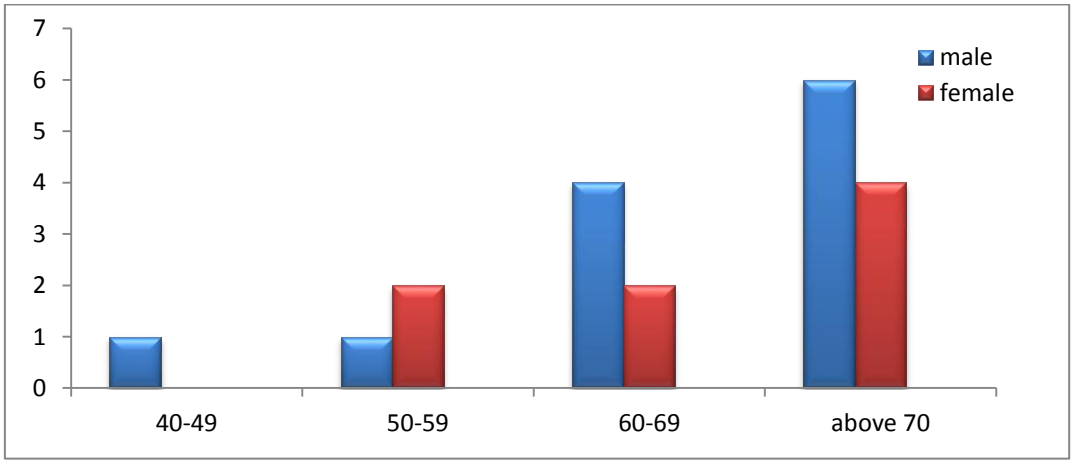

Table 2: Mean Preoperative and Post operative Intra Ocular Pressure

Time	Group A Trab Mean IOP (SD)	Group B Combined Visco-Trab Mean IOP(SD)
Pre operative	31.9(3.276)	31.4(3.61)
Post operative		
1st day	14.8(2.09)	12.3(2.54)
Around 7th day	15.4(2.06)	13.8(2.33)
Around 1st month	14.3(2.27)	13.4(1.73)
Around 2nd month	14(2.05)	12.1(1.77)
Around 3rd month	13.3(2.36)	11.9(1.65)

Table 3: Percent of IOP reduction in both group

Time	Group A Trab % of IOP reduction	Group B Combined Visco-Trab % of IOP reduction
Pre operative	0	0
Post operative		
1st day	53.6%	60.82%
Around 7th day	51.72%	56.05%
Around 1st month	55.17%	57.32%
Around 2nd month	56.11%	61.46%
Around 3rd month	58.30%	62.10%

Table 4: Success rate by IOP control at 3months

	Group A Trab (n=20)	Group B Combined Visco-Trab(n=20)
Complete success (IOP<14 mmHg without medication)	19 (95%)	17 (85%)
Partial Success (IOP<14 mmHg with medication)	1	2
Failure (IOP>14 mmHg with medication)	0	1

Table 4: Intraoperative complications

Intraoperative Complications	Group A Trabeculectomy	Group B Combined Viscocanalostomy-Trabeculectomy
Repositioning of scleral flap	1	O
Descemet membrane tear	1	0
Hyphema	1	2

Table 5: Early postoperative complications

Postoperative Complications	Group A Trabeculectomy	Group B Combined Viscocanalostomy-Trabeculectomy
Hypotony	0	0
Wound Leak	2	1
Shallow AC	1	0
Fibrinous AC	1	2
Hyphema	0	0
Choroidal Maculopathy	0	0
Choroidal detachment	0	0

Discussion

Glaucoma is one of the most common causes of legal blindness in the world. It is group of disorder which affects optic nerve causing vision loss. There are many glaucoma surgeries, and variations or combinations of their surgeries that facilitate the escape of excess aqueous humor from the eye to lower intraocular pressure.[1]

In our study we compared the outcomes in form of efficacy and complications of both the types of surgeries. A total of 20 patients (40 eyes) of bilateral Primary Open Angle Glaucoma (POAG) were selected in this study. 40 eyes were divided into two groups. Group A (20 eyes) underwent conventional standard Trabeculectomy with releasable suture surgery and group B underwent combined Viscocanalostoomy - Trabeculectomy surgery with releasable suture.[2,3] All patients were operated by single surgeon to avoid any surgical variability which can give any variable results. All the patients were followed up for 3 months

In our study total 20 patients were included out of which 12 were males and 8 were females. The male to female ratio is 1.5:1 .The mean age was 66.35 and most of the patients were in age group of 70 and above. The number of anti glaucoma drugs used preoperatively and postoperatively was same.

The mean preoperative IOP was 31.9 ± 3.276 mmHg in group A and 31.4 ± 3.61 mmHg in group B. The mean preoperative IOP was slightly higher in group A than in group B but the mean preoperative IOP in both the groups were not statically significant.

On first postoperative day the mean IOP was 14.8 ± 2.09 mmHg in group A (Trab) and 12.3 ± 2.54 mmHg in group B (Visco-Trab), a reduction in IOP by 53.6% in group A and 60.82% in group B. IOP was reduced in both the groups but reduction was higher in group B as compared to in group A. On seventh postoperative day the mean IOP was 15.4 ± 2.06 mmHg in group A (Trab) and 13.8 ± 2.33 mmHg in group B (Visco-Trab).Reduction in IOP was seen in group A and group B at 1 month 14.3 ± 2.27 (by 55.17%) and 13.4 ± 1.73 (by 57.32%) respectively ; at 2nd month 14 ± 2.05 mmHg in group A (reduction by 56.11%), 12.1 ± 1.77 mmHg in group B (reduction by 61.46 %); and at 3 month 13.3 ± 2.36 mmHg in group A (reduction by 58.30%), 11.9 ± 1.65 mmHg in group B (reduction by 62.10%). The mean IOP was reduced in both the group but reduction was higher in group B in our study. The mean IOP postoperatively after 3 months was found a reduction of 58.3% in TRAB (group A) and reduction of 62.10% in VISCO -TRAB (group B). While in study done by by Eid et al study.[4] who found 43% reduction of IOP in TRAB group and reduction of 52.5% in VISCO -TRAB and study done by Shashidhar Harvyasi et al study,[5] 40.63% reduction of IOP in TRAB group and reduction of 54.41% in VISCO -TRAB. Viscocanalostomy increases the aqueous outflow not only by dilating Schelmn canal but also by disrupting the internal and external walls of Schelmn canal, thus increasing the trabecular out flow facility1.

Intra operative complications were found in both the groups. One case of repositioning of scleral flap, one case of descemet membrane tear and one case of hyphema were found in TRAB (group A) and two cases of hyphema were reported in VISCO - TRAB (group B). Early post operative complications were also seen. Two cases of wound leak, one case of shallow AC and one case of fibrinious AC were reported in TRAB (group A) and one case of wound leak and two cases of fibrinous AC were reported in VISCO - TRAB (group B). Late postoperative complications were not found in any group while late postoperative complication like lentiular changes is found in O'Brart DP study.[6] In terms of its less invasive nature viscocanalostomy offers some theoretical advantages, and possible reduced reliance on subconjunctival drainage, intraocular pressure control appears to be far superior with trabeculectomy and it continues to be the filtering procedure of choice for the glaucoma management. Generally Viscocanalostomy is associated with fewer postoperative complications, especially cataract formation, but significant problems permanently impairing vision did not occur with either technique.

Conclusion

On the basis of our study we found that in both the groups IOP was decreased but there was more lowering of IOP in combined viscocanalostomy - trabeculectomy than trabeculectomy alone for the management of primary open angle glaucoma. Also incidence of complications was lower in combined viscocanalostomy - trabeculectomy as compared to that of trabeculectomy.

Conflict of Interest: is nil.

Source of Funding: The study was carried in Rama Medical College, Hapur and no extra financial support was required.

Ethical Clearance: Ethics committee approval was obtained before study.

References

[1] Cairns JE. Trabeculectomy. Preliminary report of a new method. Am J Ophthalmol 1968; 66(4): 673–679

[2] Simsek T, Citirik M, Batman A, Mutevelli S, Zilelioglu O. Efficacy and complications of releasable suture trabeculectomy and standard

trabeculectomy. Int Ophthalmol2005; 26(1–2): 9–14.

[3] Stegmann R, Pienaar A, Miller D. Viscocanalostomy for open-angle glaucoma in black African patients. J Cataract Refract Surg 1999; 25(3): 316–322.

[4] Kolker AE. Visual prognosis in advanced glaucoma: a comparison of medical and surgical therapy for retention of vision in 101 eyes with advanced glaucoma. Trans Am Ophthalmol Soc. 1977; 75():539-55.

[5] Scott IU, Greenfield DS, Schiffman J, Nicolela MT, Rueda JC, Tsai JC, Palmberg PF . Outcomes of primary trabeculectomy with the use of adjunctive mitomycin. Arch Ophthalmol. 1998 Mar; 116(3):286-91.

[6] Bardak Y, Cuypers MH, Tilanus MA, Eggink CA. Ocularhypotony after laser suture lysis following trabeculectomy with mitomycin C. Int Ophthalmol. 1997-1998; 21(6):325-30.

[7] Rebolleda G, Muñoz-Negrete FJ. Comparison between phaco-deep sclerectomy converted into phaco-trabeculectomy and uneventful phaco-deep sclerectomy.Eur J Ophthalmol. 2005 May-Jun; 15(3):343-6.

[8] Sanchez E, Schnyder CC, Mermoud A. Comparative results of deep sclerectomy transformed to trabeculectomy and classical trabeculectomy. Klin Monbl Augenheilkd. 1997 May; 210(5):261-4.

[9] Eid TM. Combined viscocanalostomy-trabeculectomy for management of far-advanced glaucoma: evaluation of the early postoperative course. Ophthalmic Surg Lasers Imaging. 2008 Sep-Oct; 39(5):358-66.

[10] Carassa RG, Bettin P, Fiori M, Brancato R. Viscocanalostomy versus trabeculectomy in white adults affected by open-angle glaucoma: a 2-year randomized, controlled trial. Ophthalmology 2003; 110(5): 882–887.

[11] Mermoud, Schnyder CC, Sickenberg M, et al. Comparison of deep sclerectomy with collagen implant and trabeculectomy in open angle glaucoma. J Cataract Refract Surg 1999; 25:323–31.

[12] El Sayyad F, Helal M, El-Kholify H, et al. Non-penetrating deep sclerectomy versus trabeculectomy in bilateral primary open angle glaucoma. Ophthalmology 2000; 107:1671–74.

[13] Eid TM, Tantawy WA. Combined Viscocanalostomy - Trabeculectomy for management of Advanced Glaucoma - A Comparative Study of the Contralateral Eye: A Pilot Study. Middle East Afr J Ophthalmol 2011 Oct; 18(4):292-7.

[14] Harvyasi Shashidhar et al, Surgical Management of Glaucoma: Newer Concept. Del J Ophthalmol - Vol 27 No: 1 July –Sept 2016.

[15] O'Brart DP, Shiew M, Edmunds B. A randomised, prospective study comparing trabeculectomy with viscocanalostomy with adjunctive antimetabolite usage for the management of open angle glaucoma uncontrolled by medical therapy. Br J Ophthalmol 2004; 88(8): 1012–1017.

Corresponding Address:

Dr. Anand Verma,
Tower No- 6, Flat No - A/3- 601,
Silver City 2, Sector Pi - 2,
Greater Noida - 201308
Email: *dr_anand74verma@rediffmail.com.*

