

VISCO AND PHACOVISCOCANALOSTOMY: SHORT TERM RESULTS

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SUMMARY – PURPOSE: In this study we evaluated a nonfiltering glaucoma technique viscocanalostomy alone or in combination with small incision phacoemulsification and intraocular lens (IOL) implantation. **MATERIAL AND METHODS:** From January 1999 to February 2001 we performed viscocanalostomy in 18 patients with medically uncontrolled primary open angle glaucoma. In 10 patients with cataract and primary open angle glaucoma we performed a combined operation of phacoemulsification and viscocanalostomy. **RESULTS:** The mean IOP reduction remained statistically significant after 6 months in both groups ($P < 0,01$). There was also a significant decrease in the antiglaucoma medications in both groups postoperatively. **CONCLUSION:** We achieved good hypotensive effect and had very low complications rate. Such a low complication rate makes this operation particularly attractive to surgeons who perform an increasing number of operations in outpatient's bases.

Key words: *Glaucoma. Open-Angle, Phacoemulsification*

Introduction

New surgical techniques have been advocated for lowering intraocular pressure (IOP) in patients with open angle glaucoma, and the decision on how to manage concurrent glaucoma and cataract has evolved.^{1,2,3}

This continuing search stems from dissatisfaction with the spectrum of undesirable early postoperative complications of trabeculectomy.³

Recently, a new technique of nonpenetrating glaucoma surgery viscocanalostomy has been described, designed to increase trabecular outflow. This procedure evolved from earlier techniques described by Krasnov called sinusotomy, and Stegman developed similar technique, the so-called viscocanalostomy.¹

In this study we evaluated a nonfiltering glaucoma technique viscocanalostomy alone or in combination with

small incision phacoemulsification and intraocular lens (IOL) implantation.

Patients and methods

From January 1999 to February 2001 at the Department of Ophthalmology University Hospital Sestre milosrdnice 10 patients (10 eyes) with cataract and primary open angle glaucoma underwent a combined operation (phacoemulsification, implantation of intraocular lens combined with viscocanalostomy). In 18 Patients (18 eyes) with medically uncontrolled primary open angle glaucoma viscocanalostomy alone was performed. One surgeon performed all surgical procedures.

Patients were included in the study if they had uncontrolled glaucoma (IOP > 22mmHg) despite maximally tolerated medications. There were 28 patients included in the study, 16 men and 12 women. Mean age of the patients was 72,9 years. Patients with previous ocular surgery or laser treatment, patients younger than 40 years of age as well as the patients with significant posterior segment

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disease were excluded. The eyes which needed extremely low target pressure were also excluded from the study. The patients were enrolled consecutively. Informed consent was obtained from all the patients before the procedure.

Full preoperative baseline data were obtained for each patient which included age, sex, ocular history, visual acuity, applanation tonometry, slit lamp examination and ophthalmoscopy.

Surgical procedure

In all cases a 6,0 superior peripheral corneal traction silk suture was used and fornix-based conjunctival flap was dissected superiorly and sclera was exposed. A 4x4 mm scleral flap was dissected to approximately one-third scleral thickness, anteriorly into clear cornea using a NO 69 Beaver blade (Alcon surgical, Fort worth, Sx). A second deeper flap is prepared to provide access to Schlemm's canal leaving only a thin layer of deep sclera over the chorioid.

Anteriorly, the dissection was made down to remove Schlemm's canal and juxtacanalicular trabeculum. Excision of the corneal stroma was performed more anteriorly down to Descemet's membrane. This allowed aqueous humour to percolate through the thin trabeculo-Descemet's membrane. Sodium hyaluronat 1,4% (Healon GV) was injected into the open ends of Schlemm's canal using a very fine Grieshaber cannula.

Contrary to other techniques we tried to perform fistulation below conjunctiva and that is why the upper flap was fastened with only 2-3 single sutures. Healon GV was placed under the external flap before it was securely sutured with running 10.0 polyester (Mersilen).

In cases of combination procedure with cataract and glaucoma the surgery was performed through a shared scleral incision, the deep inner flap was left in place and the outer flap incisions extend into the anterior chamber as for typical scleral tunnel incision.

After the cataract was removed and the anterior chamber reformed the intraocular lens was implanted. At the end of the operation deep scleral flap was excised and conjunctiva was sutured with two 10,0 sutures. Perforation of trabeculo Descemet's membrane occurred in two eyes with POAG and the procedure was completed as trabeculectomy, and those patients were excluded from the study.

Patients were examined on the first, third and 7th postoperative day and after 1. 3 and 6 months.

Anterior segment of the eye was evaluated on the slit lamp (hyphaema, fibrin, sinechiae and cataract). Visual

acuity was measured and intraocular pressure was estimated with Goldmann applanation tonometry. Fundus was examined in midriasis.

In statistical analysis we used Wilcoxon signed rank test, Friedman test and Mann-Whitney test. Statistical significance was defined as a P value less than 0,05.

Results

Preoperative and postoperative IOPs are shown in Table 1. There was a significant IOP reduction after surgery in both groups through the all follow-up period ($P < 0,001$). The mean reduction in first group (viscocanalostomy) on the first postoperative day was 11,05 mmHg, and in the second group (phaco viscocanalostomy) it was 13,6 mmHg. It remained statistically significant after 6 months: 7,05 mmHg in the first and 7 mmHg in the second group ($P < 0,01$). There was no statistically significant difference between two groups at the end of follow-up.

Table 1. Mean preoperative and postoperative intraocular pressures (in mmHg)

	Visco	Phaco-visco
Preoperative	23,83	23,7
1 day	12,78	10,1
3 days	12,95	10,6
7days	12,78	11,1
1 month	14,67	14,3
3 months	14,61	15,1
6 months	16,78	16,7

A significant decrease in the antiglaucoma medications occurred in both groups postoperatively ($P < 0,001$), from mean of 2,2 before operation to 0,6 medications 6 months postoperatively. There was no statistically significant difference between two groups.

We had low rate of complications: seven microperforations, hyphaema in one patient, ocular hypertension in 3 eyes and hypotony in one. There were no uveitis, flat anterior chambers or cataract development after surgery.

Discussion

Nonpenetrating filtration surgery was first proposed by Zimmerman et al. 1984.^{4,5} Others described different techniques with encouraging results like Fyodorov et al. and Kozlov et al.b.

Further studies reported better surgical outcome when a collagen drainage implant was used during that procedure.^{2,7}

Nonpenetrating sclerectomy allows aqueous filtration from the anterior chamber to the subconjunctival space through a thin trabeculo-Descemet's membrane. This membrane avoids the sudden IOP drop.

Encouraging results with viscocanalostomy in black patients, that are known to be at high risk for fibrotic failure of filtration surgery, have been reported by Stegman *et al.*¹ Their 82% success rate without medications (IOP below 22 mmHg) contrasts with our success rate (less than 60%). If medications are considered, the success rate increases to 89% in Stegman *et al.* study.¹ We had only 78% success rate.

Our observed rate of successful viscocanalostomias at 6 months postoperatively was not similar also to that reported by Carassa *et al.* who described a success rate of 86,2% after the follow up of 12 months.⁸

Viscocanalostomy according to Stegman and co-authors relies on creating an intrascleral lake of aqueous in the residual cavern, inner deep scleral lamella has been resected. From there drainage may occur into the canal, in which cut ostia are encouraged to maintain their patency after dilatation.¹

Our group of patients started with mean of 2,2 medications preoperatively and required 0,6 antiglaucoma agents six months after the surgery, which is statistically a significant reduction.

When complications are concerned, we had microperforations in seven and hyphaema in one patient. We had also ocular hypertension in 3 eyes and hypotony in one. There were no uveitis, flat anterior chambers or cataract development after the surgery. The major advantage of the procedure is that it precludes sudden postoperative hypotony by creating progressive filtration of huxnour aqueous from the anterior chamber without perforating the eye. The incidence of immediate postoperative complications such as anterior chamber inflammation, hyphaema, hypotony with flat anterior chamber was therefore much lower. Others⁹⁻¹³ also described a low rate of postoperative complications. Three of our patients showed evidence of subconjunctival drainage at the surgical site. This indicates that an amount of drainage takes place by mechanisms similar to those in trabeculectomy.

In the past 5 years there have been strong debates among the ophthalmic surgeons who deal with surgical management of glaucoma whether nonpenetrating filtering surgical procedures have real merits as compared with

trabeculectomy. In reality there is no need for that, because there are indications a contraindications for both procedures and both of them work.

Conclusion

Despite the fact that we do not know long term effects and mechanism of act of this procedure, we achieved good hypotensive effect and had a very low rate of complications. At the end we can also say that this procedure is targeting the exact place of glaucoma disease-trabecular meshwork and by doing that, it has perspective in surgical treatment of glaucoma.

Such a low complication rate makes this operation particularly attractive to surgeons who perform an increasing number of operations in outpatient's bases.

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Sažetak

VISKO I FAKOVISKOKANALOSTOMIJA: KRATKOROČNI REZULTATI

Z. Mandić, R. Iveković, D. Šarić and I. Petrić

CILJ: U ovoj studiji željeli smo prikazati uspješnost nepenetrirajuće antiglaukomske operacije-viskokanalostomije primijenjene kao samostalni zahvat, odnosno u kombinaciji s fakoemulzifikacijom s ugradnjom intraokularne leće.

BOLESNICI I METODE: Od siječnja 1999. godine do veljače 2001. godine učinili smo viskokanalostomiju kod 18 bolesnika s nekontroliranim glaukomom otvorenog kuta. U istom vremenskom razdoblju učinili smo i 10 kombiniranih operacija fakoemulzifikacije s viskokanalostomijom kod bolesnika s kataraktom i glaukomom otvorenog kuta.

REZULTATI: 6 mjeseci postoperativno intraokularni tlak ostao je značajno niži od preoperativnih vrijednosti. Postignuto je također statistički značajno smanjenje upotrebe antiglaukomskih lijekova.

ZAKLJUČAK: Postigli smo zadovoljavajući hipotenzivni učinak uz nizak broj komplikacija. Tako malen broj komplikacija čini ovu vrstu zahvata aktualnom obzirom na sve veću potrebu ambulantnog izvođenja operacija.

Ključne riječi: *glaukom otvorenog kuta, fakoemulzifikacija*