

Glaucoma Triple Procedure: A One-site vs. a Two-site Approach

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ABSTRACT

The purpose of this study is to describe and evaluate the success rate of combined glaucoma and small cataract surgery by means of a one-site versus two-site approach. Fifty-eight eyes of fifty-five patients undergoing combined surgery were operated: thirty-one eyes underwent two-site approach and twenty-seven eyes underwent one-site approach. Short term and long term mean intraocular pressure (IOP) was similar in both groups. There was no significant difference in postoperative inflammation and complication rates between two groups. There is no significant difference in the postoperative results in those two different approaches to perform combined operations of cataract and glaucoma.

Introduction

A common challenge for ophthalmologist all over the world is the surgical treatment of patients with both cataract and glaucoma. During the period when extracapsular cataract extraction was on the top of popularity the tendency was to avoid combined operation because it tended to be more prone to bleb failure than trabeculectomy alone^{1,2}.

Recently small incision phacoemulsification has become a common technique of cataract extraction. Few years ago the term *phacotrabeculectomy* was first introduced to describe combined operation of cataract by phacoemulsifica-

tion and glaucoma³. The idea of this operation was to produce as small wound as possible-the same size as trabeculectomy alone.

The evaluation of results of two combined techniques for operation of glaucoma and cataract: one-site approach scleral tunnel phacotrabeculectomy versus two-site approach temporal clear cornea incision phacoemulsification and separate trabeculectomy was the tendency of this study.

Patients and methods

Fifty-eight eyes of 55 patients affected by open-angle glaucoma and cataract

have been enrolled in prospective study. Thirty-one eyes underwent two-site approach operation. Data of this group were compared with second group of twenty-seven operated eyes operated by one-site approach.

Patients from both groups were operated in parabolbar anesthesia by one surgeon. In eyes with one-site approach, fornix-based conjunctival flap was dissected. Light cautery was applied to the episcleral vessels. A 3 mm posterior to corneoscleral limbus a 4 mm scleral tunnel was created. A circular capsulorrhexis was performed and incision through the scleral tunnel into the anterior chamber by a 3.2 mm keratome blade was made. Hydrodissection was performed, viscoelastic was injected and phacoemulsification of nucleus was done. Residual cortical material was removed by bimanual irrigation/aspiration. The wound was enlarged to allow insertion of foldable silicon intraocular lens. Before the viscoelastic was aspirated, a Kelly punch was used to create sclerostomy and a basal iridectomy was performed. After the viscoelastic was removed the scleral flap was closed with one 10.0 nylon single stitch.

For the two-site procedure the temporal clear corneal groove was made. Cataract removal was made on the same way as described before. No suture was used to close corneal wound. If aqueous leakage was detected a single nylon 10.0 stitch was applied. After this procedure was completed attention was turned on trabeculectomy at 12 o'clock. A limbal-based conjunctival flap was created. Light cautery was applied when it was necessary. After that scleral flap was created and sclerostomy and peripheral iridectomy performed. The conjunctiva was closed in running fashion with 8.0 Vycril.

All patients were treated with synthetic corticosteroid eye-drops four times for four weeks. This dosage was then gradually tapered.

Patients were examined first postoperative day and weekly for the first month. In this study we have analyzed the results of both group three, six and twelve months after operation. Statistical analysis was performed with Mann-Whitney test. All results are reported as mean SD. Statistical significance was defined as a *P* value less than 0.05.

Results

Fifty-eight eyes of 55 patients were included in the study. Twenty-seven eyes were operated by one side approach technique and 31 eyes were operated by two-site approach.

The mean age of patients was 71.6 (range of 55 to 97 years). There were 22 women and 17 men. All 55 patients were Caucasians and all of them had diagnosis of open-angle glaucoma. All patients were treated by timolol 0.5% two days per day and pilocarpin 2% four or six times per day. This is the mostly and traditionally used therapy in our country because of the low price of these medicaments.

Preoperative intraocular pressure was in one-site group was 26.15 mm Hg 6.2 and in the two-site group 25.3 mm Hg 5.18. There was no significant difference in the preoperative intraocular pressure in both groups ($p > 0.05$).

In the early postoperative period hyphaema and fibrinous uveitis were noticed as complications. Hyphaema was registered in three eyes operated by one-site and in one eye operated by two-site approach. The fibrinous uveitis has developed in five eyes from the first group-operated by one-site approach and in three eyes from the second group-two-site approach.

Three months after operation intraocular pressure was significantly lower in both groups then preoperatively, but there was no significant difference between

TABLE 1
POSTOPERATIVE RESULTS OF INTRAOCULAR PRESSURE IN OPERATED EYES

	preoperative		3 months		6 months		12 months	
one-site (mmHg)	26.15	6.20	17.90	2.44	18.22	2.48	8.78	2.53
two-site (mmHg)	25.30	5.18	17.68	2.31	18.58	2.34	18.65	2.63

TABLE 2
NUMBER OF OPERATED EYES WITH NECESSITY OF GLAUCOMA MEDICATIONS AFTER OPERATION

	one-site (No of eyes)	two-site (No of eyes)
preoperative	27	31
3 months postop	4	2
6 months postop	5	4
12 months postop	7	4

groups in IOT. In one-site approach groups 3 months after operation IOT was 17.9 mm Hg 2.44 and in the two-site approach group IOT was 17.68 mm Hg 2.44. After 6 and 12 months there was also no significant difference in the IOT between both groups ($p > 0.05$). After one year in the first group IOT was 18.78 mm Hg 2.53 and in the second group IOT was 18.65 mm Hg 2.36. The IOT pressure was in both groups significantly lower one year after operation than preoperatively ($p > 0.05$).

Postoperative use of medications was necessary after one year in 7 eyes operated by one-site phacotrabeculectomy and in 4 eyes with two-site phacotrabeculectomy.

Discussion

The advantage of the combined procedure over two steps surgery include the elimination of a separate invasive procedure and a disappointment of patients if only glaucoma surgery has been done

with no intervention on already existing cataract. This may be very important in patients with poor medical condition because they are not good candidates for multiple operations but also we can not ignore the cost of two separate procedures. The combined surgery of glaucoma and cataract has been shown in many studies to lower the IOP and to improve the visual acuity³⁻¹³. The first reports of combined operation arise from the time of extracapsular cataract surgery¹⁴⁻¹⁶. At that time the control of postoperative IOP was poor and the formation of bleb was pitiful. The phacoemulsification has reduced the incision size as well as the postoperative induced inflammation and the results of combined filtering surgery now are better^{3,4,6-8}. In the meantime lot of authors have described their techniques for phacoemulsification and filtering surgery provided in the same time: one-side or two-side approach^{11,17-19}. We have compared in our study two groups of patients who underwent combined surgery but with different approaches.

There was no significant difference between two groups in mean postoperative IOP immediately after the operation and even after one year follow up. The patients from the two-site approach group needed less medications postoperatively than patients from one-site approach group to achieve a good IOP.

The success rates of this study are comparable only with few previous reports until now. Rosetti et al. also found no difference between group of patients operated by standard phacotrabeculecto-

my and those operated by temporal corneal phacoemulsification combined with separate-incision superior trabeculectomy²⁰. Wyse et al also got the same results: the both technique are similar in postoperative results, but the patients from one-site approach group needed more medications to control postoperative IOP²¹.

We also compared the complication rates of the one site and two-site approach of combined glaucoma and cataract surgery and found no significant difference in the frequency of any of complications. Hyphaema and fibrinous iritis as early postoperative complications were noticed in both groups. Iritis is not surprising in those patients, because of preoperative use of pilocarpin and therefore the pupils were not very wide preoperatively and not even during the operations.

In conclusion, there appears to be no difference between this two technique for combined procedure of operation of glaucoma and cataract. Complications rate are similar. The only difference was in the duration of the operation. For the per-

forming the one-site approach the surgeon needed less time than for the two-site approach. The lasting of operation is not always very important factor but in some cases (very old patients or patients with risk factors) it could be of great importance. We have also to think about the late results of this two operations-it is a question how is expected to be the IOP of this two groups of patients 2 years after the operations. This is a prospective study and we also plan to collect future data about them.

The technologic innovations of small incision cataract surgery have changed the outcome of combined procedures. The results in the control of postoperative IOP are better, there are less postoperative complications and there is a prompt visual recovery. The results of one-site phacotrabeulectomy are as well as good of two-site phacotrabeulectomy. There is no significant difference in the postoperative results in those two different approaches to perform combined operations of cataract and glaucoma.

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TROSTRUKA OPERACIJA GLAUKOMA: JEDNOSTRANI NASUPROT DVOSTRANOM PRISTUPU

S A Ž E T A K

Cilj studije je ocijeniti i usporediti uspjeh kombinirane operacije glaukoma i katarakte: jednostanim nasuprot dvostranom pristupu. Pedeset i osam očiju od pedeset i pet bolesnika operirano je kombiniranom operacijom: trideset i jedno oko dvostranim pristupom, a dvadeset i sedam očiju jednostranim pristupom, Intraokularni tlak u postoperativnom razdoblju bio je jednak u obje grupe. Nije bilo signifikantne razlike u postoperativnoj upalnoj reakciji ili komplikacijama kod analiziranih grupa. Također, nije zabilježena signifikantno znatna razlika u postoperativnim rezultatima kod ova dva različita pristupa kombiniranoj istovremenoj operaciji glaukoma i katarakte.