Early Postoperative Intraocular Pressure as a Prognostic Factor in Glaucoma Surgery

Pressão Intraocular Pós-Operatória Precoce como Fator de Prognóstico na Cirurgia do Glaucoma

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ABSTRACT

INTRODUCTION: The relationship between early and late postoperative intraocular pressure (IOP) after glaucoma surgery remains unclarified. Few published studies have investigated the long-term effects of early IOP after trabeculectomy and nonpenetrating deep sclerectomy, and the existing ones have differing results. This study aims to evaluate the effects of early postoperative IOP after these two procedures on long-term surgical success rate.

METHODS: We retrospectively studied the patients with open-angle glaucoma who underwent primary trabeculectomy (86 eyes of 72 patients) or primary nonpenetrating deep sclerectomy (137 eyes of 117 patients) between January 2010 and July 2020 that were followed for at least 24 months postoperatively. For each procedure, the study population was divided into three groups according to the IOP registered in the early postoperative time: IOP <6 mmHg, IOP 6-18 mmHg and IOP >18 mmHg. The postoperative IOP, the number of IOP-lowering medications and best corrected visual acuity were compared among the groups. Surgical success was defined as presenting postoperative IOP ≤18 mmHg during medium- and long-term follow-up period. Success probability analysis was performed using a Kaplan-Meier survival curve.

RESULTS: Patients with an early IOP >18 mmHg had significantly worse IOP control and success rate in long-term follow-up for both trabeculectomy and nonpenetrating deep sclerectomy. Patients with early transient hypotony after trabeculectomy had a tendency for better long-term surgical outcome.

CONCLUSION: The early postoperative IOP state influences the long-term prognosis after glaucoma surgery.

KEYWORDS: Glaucoma/surgery; Intraocular Pressure; Postoperative Period; Prognosis; Trabeculectomy.

RESUMO

INTRODUÇÃO: A relação entre a pressão intraocular (PIO) no período pós-operatório precoce e a PIO a longo-prazo após uma cirurgia de glaucoma continua por esclarecer. Poucos estudos investigaram os efeitos a longo-prazo da PIO inicial após trabeculectomia ou esclerectomia

profunda não penetrante, apresentando resultados contraditórios. Este estudo tem como objetivo avaliar os efeitos da PIO pós-operatória precoce na taxa de sucesso cirúrgico a longo-prazo após as duas técnicas cirúrgicas referidas.

MÉTODOS: Estudo retrospetivo dos doentes com diagnóstico de glaucoma de ângulo aberto submetidos a trabeculectomia (86 olhos de 72 doentes) ou esclerectomia profunda não-penetrante (137 olhos de 117 doentes) como procedimento primário entre Janeiro de 2010 e Julho de 2020, que foram seguidos pelo menos 24 meses após a cirurgia. Para cada um dos procedimentos, a amostra foi dividida em três grupos de acordo com a PIO registada no período pós-operatório precoce: PIO <6 mmHg, PIO 6-18 mmHg e PIO >18 mmHg. A PIO, o número de fármacos antiglaucomatosos e a melhor acuidade visual corrigida pós-operatórios foram comparados entre grupos. Sucesso cirúrgico foi definido como PIO pós-operatória ≤18 mmHg ao longo do seguimento a médio e longo-prazo. A análise da probabilidade de sucesso cirúrgico foi realizada através da curva de sobrevivência de Kaplan-Meier.

RESULTADOS: Doentes com PIO precoce >18 mmHg após trabeculectomia e esclerectomia profunda não-penetrante apresentaram um controlo da PIO e taxa de sucesso cirúrgico significativamente piores a longo-prazo. Doentes com hipotonia transitória precoce após trabeculectomia apresentaram uma tendência para resultados cirúrgicos mais favoráveis a longo-prazo.

CONCLUSÃO: A PIO pós-operatória inicial influencia o prognóstico a longo-prazo após cirurgia de glaucoma.

PALAVRAS-CHAVE: Glaucoma/cirurgia; Período Pós-Operatório; Pressão Intraocular; Prognóstico; Trabeculectomia.

INTRODUCTION

Trabeculectomy is still considered the gold standard for many types of glaucoma and the most widely used surgical procedure in glaucoma. It has been associated with a high number of short- and long-term complications,[1] however, several modifications to the original trabeculectomy techniques have been developed to improve success rates and reduce the complication rates of this procedure.[2] Trabeculectomy results depend mainly on the wound healing response, in such a way that scarring is the most common cause of trabeculectomy failure.[3] Known risk factors for surgical failure include young age, African ancestry, inflammatory eye disease, long-term use of multiple topical medical therapy, aphakia, complicated cataract surgery, recent intraocular surgery, conjunctival incisional surgery, failed glaucoma filtration surgery and neovascular glaucoma.[4]

Nonpenetrating deep sclerectomy was popularized as an alternative to trabeculectomy due to its increased safety profile, as it avoids full-thickness penetration and the potential for sudden hypotony.[1] However, pressure lowering is reportedly less than with incisional procedures[4] and, after long-term follow-up, surgery can fail to maintain a low intraocular pressure (IOP).[5]

Immediate postoperative IOP is variable after these procedures. The relationship between early and late postoperative IOP was not clarified until now.[6] There is limited information regarding the long-term prognosis of trabeculectomy and nonpenetrating deep sclerectomy according to the early postoperative IOP, and published studies have differing conclusions on the matter.[6-12] Therefore, the aim of this study was to evaluate the effects of early postoperative IOP after trabeculectomy and nonpenetrating deep sclerectomy on surgical prognosis after 2 years.

MATERIAL AND METHODS

The present study was conducted in accordance with the tenets of the Declaration of Helsinki. This was a retrospective study based on the clinical records of patients with open-angle glaucoma who underwent primary trabeculectomy or primary nonpenetrating deep sclerectomy at the Ophthalmology Department of Hospital Pedro Hispano, Portugal, between January 2010 and July 2020. Only patients that were followed for at least 24 months after the procedure were included. Glaucoma surgery was indicated in case of poor IOP control or progressive visual field damage despite maximal medical therapy and in case of intolerance or non-compliance to pharmacological therapy.

The trabeculectomy was carried out using a fornix-based conjunctival flap. A 4.0x4.0 mm scleral flap with one-half scleral thickness was dissected. Sponge pieces soaked in a 0.02% mitomycin C solution were placed under the conjunctiva for 2-3 minutes. After the removal of the sponge pieces, the site was rinsed with 100 mL of balanced salt solution. Following the resection of a 1.0x2.0 mm sclerocorneal block, a peripheral iridectomy was performed. The scleral flap and conjunctiva were closed with 10-0 nylon sutures. Regarding nonpenetrating deep sclerectomy, a 5.0×5.0 mm scleral flap was dissected with one-third of scleral thickness. A deeper scleral flap measuring 3.0×4.0 mm was then dissected just above the choroid level and

advanced anteriorly. Schlemm's canal was bisected and deroofed, and the deep scleral flap was excised leaving in place the remaining trabeculo-Descemet's membrane. A collagen or hydroxyethyl methacrylate implant was placed on the suprachoroidal space and fixed with a single 10-0 nylon suture. The superficial scleral flap was sutured with two loose single 10-0 nylon sutures. In eyes submitted to combined surgery for cataract and glaucoma, phacoemulsification was performed first.

Baseline data included age at the time of the surgery, gender, eye laterality, type of glaucoma and surgical intervention. IOP was evaluated preoperatively and throughout the postoperative follow-up period (1 week, 1 month, 6 months, 12 months and 24 months after the surgery, approximately). The study population was divided into three groups according to the IOP registered within the first 1-2 weeks (early postoperative time): Group I included the patients with hypotony, defined as an early postoperative IOP <6 mmHg; Group II included the patients with an early IOP 6-18 mmHg; Group III included the patients with an early IOP >18 mmHg. The main outcome measure was surgical success, defined as a consistent postoperative IOP ≤18 mmHg throughout medium- and long-term follow-up period. Surgical failure occurred when the postoperative IOP exceeded the success range in two consecutive visits during medium- and long-term follow-up period (from 1 month postoperatively). Eyes requiring further glaucoma surgery were also considered failures. Secondary parameters included best corrected visual acuity (BCVA) and the number of IOP-lowering medications, which were registered preoperatively and at 24 months. BCVA was assessed using the decimal scale chart and converted to the logarithm of the minimum angle of resolution (logMAR) for statistical analysis.

All statistical analysis was performed using SPSS software version 26.0 (SPSS Inc., Chicago, Illinois, USA), and *p*-values <0.05 were considered statistically significant. Continuous variables were described through mean (M) ± standard deviation (SD) and categorical variables through absolute (n) and relative (%) frequencies. Parametric tests were applied after the normality of the sample was confirmed by the Kolmogorov-Smirnov test. A one-way between-groups analysis of variance was conducted to explore the differences in BCVA, IOP and the number of medications between groups, followed by post-hoc comparisons. A paired samples t-test was conducted to evaluate the differences in these variables over time. Surgical success probability analysis was performed using a Kaplan-Meier survival curve.

Table 1. Baseline characteristics and overall outcomes of patients submitted to trabeculectomy.

Variables	
Number of patients, N	72
Number of eyes, N	86
Age (years), M±SD (range)	71.9 ± 9.3 (47-92)
Gender, N (%)	
Male	44 (51.2%)
Female	42 (48.8%)
Laterality, N (%)	
Right eye	39 (45.3%)
Left eye	47 (54.7%)
Surgery, N (%)	
Trabeculectomy alone	17 (19.8%)
Combined phacoemulsification-trabeculectomy	69 (80.2%)
Diagnosis	
POAG	48 (55.8%)
Pseudoexfoliative glaucoma	36 (41.9%)
Pigmentary glaucoma	2 (2.3%)
IOP (mmHg), M±SD (range)	
Preoperative	25.2 ± 9.9 (11-60)
1 week	9.5 ± 4.9 (1-25)
1 month	13.1 ± 4.2 (5-26)
6 months	12.9 ± 3.9 (5-27)
12 months	13.7 ± 4.1 (5-31)
24 months	14.9 ± 5.4 (6-54)
BCVA (logMAR), M±SD (range)	
Preoperative	0.3 ± 0.3 (0.0-1.3)
24 months	0.2 ± 0.4 (0.0-2.0)
Number of medications, M±SD (range)	
Preoperative	2.5 ± 1.1 (0-4)
24 months	0.5 ± 1.0 (0-4)
Number of eyes that needed medications, N (%)	23 (27.4%)
Number of eyes with surgical success, N (%)	64 (75.3%)
Number of eyes with postoperative complications, N (%)	16 (20.9%)

BCVA, best corrected visual acuity; IOP, intraocular pressure; logMAR, logarithm of the minimum angle of resolution; M, mean; N, absolute frequencies; POAG, primary open angle glaucoma; SD, standard deviation; %, relative frequencies.

RESULTS

TRABECULECTOMY

The records of 86 eyes of 72 patients who underwent primary trabeculectomy were examined. The mean age was 71.9 ± 9.3 years and the mean follow-up time was 36.2 ± 0.9 months. Baseline characteristics and outcomes are summarized in Table 1. Preoperative IOP was 25.2 ± 9.9 mmHg and it significantly decreased to 14.9 ± 5.4 mmHg at 24 months (p<0.001). BCVA did not significantly change after the surgery (preoperative BCVA 0.3 ± 0.3 logMAR; final BCVA 0.2 ± 0.4 logMAR; p=0.241). The number of needed IOP-lowering medications significantly decreased from an average of 2.5 ± 1.1 medications preoperatively to 0.5 ± 1.0 medications at 24 months (p<0.001).

The sample was divided into three different groups according to early postoperative IOP as explained before. The postoperative outcomes were compared between groups (Table 2). Eyes with an early IOP >18 mmHg (group III) presented a significantly worse controlled IOP at 6 months (group I-group III, p=0.006; group II-group III, p=0.047) and a higher final number

Table 2. Comparison of baseline characteristics and postoperative outcomes of eyes submitted to trabeculectomy (N=86), divided according to the early postoperative IOP (Group I, IOP <6 mmHg; Group II, IOP 6-18 mmHg; Group III, IOP >18 mmHg).

Variables	Group I	Group II	Group III	*p*-value
Number of patients	13	53	5	
Number of eyes	15	65	5	
Age (years), M±SD (range)	69.40 ± 8.50 (56-85)	72.17 ± 9.63 (47-92)	73.40 ± 7.40 (62-80)	0.542
Surgery, N (%)				
Trabeculectomy alone	6 (40%)	11 (16.92%)	0 (0%)	0.068
Combined phacoemulsification-trabeculectomy	9 (60%)	54 (83.08%)	5 (100%)	
IOP (mmHg), M±SD (range)				
Preoperative	26.0 ± 11.2 (16-60)	24.6 ± 9.5 (11-55)	32.8 ± 10.8 (22-48)	0.197
1 week	3.5 ± 1.6 (1-6)	10.1 ± 3.5 (6-18)	19.4 ± 5.9 (10-25)	0.000*
1 month	13.2 ± 3.1 (7-19)	12.8 ± 4.1 (5-26)	16.4 ± 7.1 (8-24)	0.193
6 months	11.1 ± 3.4 (5-18)	13.0 ± 3.8 (6-27)	17.2 ± 4.2 (12-22)	0.008*
12 months	12.0 ± 4.1 (5-21)	13.8 ± 3.9 (6-31)	16.8 ± 4.7 (9-21)	0.062
24 months	12.9 ± 2.7 (8-17)	15.2 ± 5.8 (6-54)	16.6 ± 4.4 (11-23)	0.254
BCVA (logMAR), M±SD (range)				
Preoperative	0.2 ± 0.2 (0.0-0.7)	0.3 ± 0.3 (0.0-1.3)	0.4 ± 0.4 (0.0-1.0)	0.291
24 months	0.3 ± 0.1 (0.0-2.0)	0.2 ± 0.1 (0.0-2.0)	0.2 ± 0.1 (0.0-0.4)	0.746
Number of medications, M±SD (range)				
Preoperative	3.1 ± 1.0 (1-4)	2.4 ± 1.1 (0-4)	2.2 ± 0.8 (1-3)	0.106
24 months	0.2 ± 0.4 (0-1)	0.5 ± 0.9 (0-3)	1.8 ± 1.8 (0-4)	0.008*
Number of eyes that needed medications, N (%)	3 (20%)	17 (27%)	3 (60%)	
Number of eyes with surgical success, N (%)	13 (86,7%)	49 (75.4%)	2 (40%)	

BCVA, best corrected visual acuity; IOP, intraocular pressure; M, mean; N, absolute frequencies; SD, standard deviation; %, relative frequencies; *, statistical significance.

of IOP-lowering medications (group I-group III, p=0.006; group II-group III, p=0.016), comparing with the two other groups. Five eyes (5.8%) presented hypotony-related complications (clinical hypotony), namely chorioretinal folds in 1 eye (1.2%), choroidal detachment in 3 eyes (3.5%) and shallow anterior chamber in 1 eye (3.5%). Only one eye with clinical hypotony was from group I; the other four were from group II.

The results of the Kaplan-Meier analysis of the three groups with surgical success defined according to the target IOP ≤18 mmHg are represented in Fig. 1. Surgical success was achieved in 13 eyes (86.7%) from group I, 49 eyes (75.4%) from group II and 2 eyes (40.0%) from group III. Group III showed a significantly worse cumulative success rate compared with group I (p=0.011) and group II (p=0.038). Patients with early hypotony (group I) presented a tendency for a better surgical prognosis than group II, although not statistically significant (p=0.350).

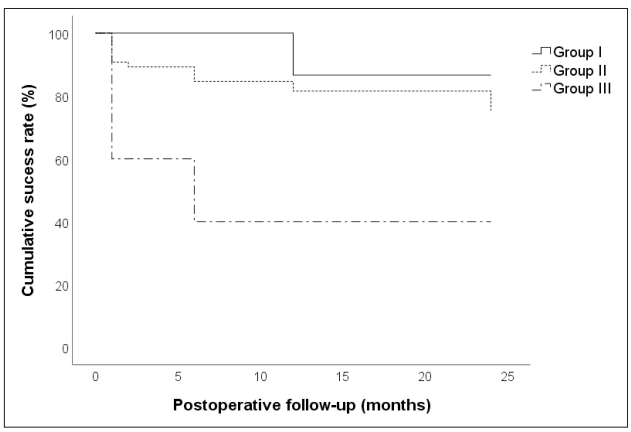

Figure 1. Kaplan-Meier cumulative probability curve of the surgical success rate of trabeculectomy in the groups according to the early postoperative intraocular pressure. Group I, early IOP <6 mmHg; group II, early IOP 6-18 mmHg; group III, early IOP >18 mmHg.

NONPENETRATING DEEP SCLERECTOMY

A total of 137 eyes of 117 patients who underwent primary nonpenetrating deep sclerectomy were included, with a mean age of 71.1 ± 9.4 years and a mean follow-up time of 35.35 ± 11.41 months. Table 3 summarizes the baseline characteristics and overall outcomes. The mean preoperative IOP was 22.1 ± 8.7 mmHg, which significantly decreased to 14.6 ± 3.5 mmHg at 24 months postoperatively (p<0.001). BCVA also showed a significant improvement from 0.3 ± 0.3 logMAR preoperatively to 0.2 ± 0.3 logMAR at 24 months (p<0.001). The number of needed IOP-lowering medications significantly decreased from an average of 2.3 ± 1.2 medications to 0.5 ± 0.9 medications after 24 months (p<0.001).

A total of 38 eyes underwent neodymium: yttrium aluminum garnet (Nd:YAG) laser goniopuncture (LGP) to further lower IOP after nonpenetrating deep sclerectomy, 2 eyes from group I, 33 eyes from group II and 3 eyes from group III. The mean time between the surgery

Table 3. Baseline characteristics and overall outcomes of patients submitted to nonpenetrating deep sclerectomy.

Variables	
Number of patients, N	117
Number of eyes, N	137
Age (years), M±SD (range)	71.1 ± 9.4 (42-95)
Gender, N (%)	
Male	62 (45.3%)
Female	75 (54.7%)
Laterality, N (%)	
Right eye	63 (46.0%)
Left eye	74 (54.0%)
Surgery, N (%)	
Deep sclerectomy alone	25 (18.2%)
Combined phacoemulsification-deep sclerectomy	112 (81.8%)
Diagnosis	
POAG	92 (67.2%)
Pseudoexfoliative glaucoma	42 (30.7%)
Pigmentary glaucoma	2 (1.5%)
Other secondary glaucoma	1 (0.7%)
IOP (mmHg), M±SD (range)	
Preoperative	22.1 ± 8.7 (10-60)
1 week	11.9 ± 6.2 (2-38)
1 month	12.5 ± 4.2 (4-25)
6 months	13.0 ± 3.7 (4-28)
12 months	13.4 ± 3.3 (4-21)
24 months	14.6 ± 3.5 (3-30)
BCVA (logMAR), M±SD (range)	
Preoperative	0.3 ± 0.3 (0,0-2,0)
24 months	0.2 ± 0.3 (0,0-2,0)
Number of medications, M±SD (range)	
Preoperative	2.3 ± 1.2 (0-4)
24 months	0.5 ± 0.9 (0-4)
Number of eyes that needed medications, N (%)	39 (28.5%)
Number of eyes that required Nd:YAG LGP, N (%)	38 (27.7%)
Number of eyes with surgical success, N (%)	107 (78.1%)
Number of eyes with postoperative complications, N (%)	12 (8.8%)

BCVA, best corrected visual acuity; IOP, intraocular pressure; LGP, laser goniopuncture; logMAR, logarithm of the minimum angle of resolution; M, mean; N, absolute frequencies; Nd:YAG, neodymium-doped yttrium aluminum garnet; POAG, primary open angle glaucoma; SD, standard deviation; %, relative frequencies.

and the LGP was 42.0 ± 47.7 weeks and the mean IOP was 21.5 ± 6.5 mmHg before the laser procedure. Surgical success was achieved in 26 eyes (68.4%), in which LGP was performed 49.1 ± 10.6 weeks after surgery with a mean pre-laser IOP of 20.1 ± 0.9 mmHg. Eyes that resulted in surgical failure underwent LGP 26.7 ± 7.6 weeks after surgery with a mean pre-laser IOP of 24.9 ± 2.7 mmHg.

Table 4 describes the postoperative outcomes of the three groups divided according to early postoperative IOP. Patients with early IOP >18 mmHg (group III) presented a significantly worse controlled IOP at 6 months (group I-group III, p=0.022; group II-group III, p=0.038) and at 12 months (group I-group III, p=0.011; group II-group III, p=0.014) than the two other groups. Patients from group III also presented a higher final number of IOP-lowering medications (group I-group III, p=0.004; group II-group III, p=0.001) and a higher proportion of eyes requiring LGP (33.3%). A hypotony-related complication (chorioretinal folds) occurred in 3 eyes, one from each group.

Surgical success was achieved in 11 eyes (78.6%) from group I, 92 eyes (83.6%) from group II and 1 eye (11.1%) from group III. Group III had the lowest success survival rate (p<0.001) according to the Kaplan-Meier analysis (Fig. 2). No differences were detected in the cumulative success rate between group I and group II (p=0.599).

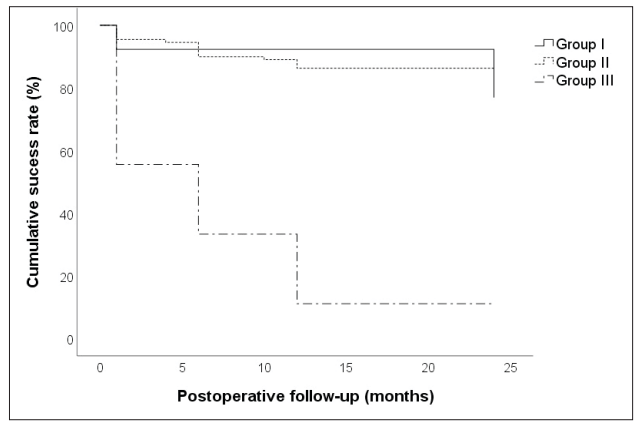

Figure 2. Kaplan-Meier cumulative probability curve of the surgical success rate of nonpenetrating deep sclerectomy in the groups according to the early postoperative intraocular pressure. Group I, early IOP <6 mmHg; group II, early IOP 6-18 mmHg; group III, early IOP >18 mmHg.

DISCUSSION

Lowering IOP remains the principal proven method of treatment for glaucoma.[13] The target IOP for each eye is established according to several factors including the rate of progression, initial glaucoma damage, age and life expectancy. The IOP target must be a compromise between treatment benefits and its consequences.[4] On one hand, glaucoma treatment aims to reduce the IOP low enough to reduce the risk of progressive damage and symptomatic vision loss. On the other hand, treatment adverse effects and complications can be harmful to the patient. Hypotony after glaucoma surgery, for example, can complicate with persistent choroidal detachment and hypotony maculopathy.[14]

Few studies have evaluated the effect of early IOP status after trabeculectomy and nonpenetrating deep sclerectomy on long-term surgical success or failure rates. Therefore,

Table 4. Comparison of baseline characteristics and postoperative outcomes of eyes submitted to nonpenetrating deep sclerectomy (N=137), divided according to the early postoperative IOP (Group I, IOP<6 mmHg; Group II, IOP 6-18 mmHg; Group III, IOP>18 mmHg).

Variables	Group I	Group II	Group III	*p*-value
Number of patients	13	92	9	
Number of eyes	14	111	9	
Age (years), M±SD (range)	70.14 ± 11.21 (52-84)	71.65 ± 9.18 (42-95)	66.67 ± 9.77 (46-77)	0.290
Surgery, N (%)				
Deep sclerectomy alone	4 (28.57%)	18 (16.22%)	3 (33.33%)	0.270
Combined phacoemulsification-deep sclerectomy	10 (71.43%)	93 (83.78%)	6 (66.67%)	
IOP (mmHg), M±SD (range)				
Preoperative	18.93 ± 5.53 (11-30)	22.08 ± 8.39 (10-60)	29.22 ± 13.25 (15.50)	0.069
1 week	4.08 ± 0.95 (2-5)	11.37 ± 3.39 (6-18)	29.33 ± 5.94 (19-38)	<0.001*
1 month	10.23 ± 4.69 (5-20)	12.42 ± 3.67 (4-25)	17,.13 ± 6.73 (4-24)	0.051
6 months	11.85 ± 3.78 (4-17)	12.94 ± 3.51 (4-28)	16,.11 ± 4.57 (10-24)	0.021*
12 months	12.38 ± 3.20 (8-18)	13.25 ± 3.10 (4-20)	16.44 ± 4.04 (8-21)	0.009*
24 months	14.57 ± 4.89 (7-26)	14.35 ± 3.35 (3-30)	16.78 ± 3.35 (10-22)	0.144
BCVA (logMAR), M±SD (range)				
Preoperative	0.08 ± 0.09 (0.00-0.22)	0.32 ± 0.32 (0.00-2.00)	0.38 ± 0.46 (0.00-1.30)	0.093
24 months	0.07 ± 0.10 (0.00-0.30)	0.17 ± 0.32 (0.00-2.00)	0.32 ± 0.45 (0.00-1.30)	0.235
Number of medications, M±SD (range)				
Preoperative	2.79 ± 0.80 (1-4)	2.27 ± 1.17 (0-4)	2.00 ± 1.73 (0-4)	0.121
24 months	0.36 ± 0.84 (0-3)	0.41 ± 0.81 (0-4)	1.56 ± 1.33 (0-3)	0.027*
Number of eyes that needed medications, N (%)	3 (21.4%)	28 (25.2%)	6 (66.7%)	
Number of eyes that required Nd:YAG LGP, N (%)	2 (14.3%)	33 (29.7%)	3 (33.3%)	
Number of eyes with surgical success, N (%)	11 (78.6%)	92 (83.6%)	1 (11.1%)	

BCVA, best corrected visual acuity; IOP, intraocular pressure; LGP, laser goniopuncture; logMAR, logarithm of the minimum angle of resolution; M, mean; N, absolute frequencies; Nd:YAG, neodymium-doped yttrium aluminum garnet; SD, standard deviation; %, relative frequencies; *, statistical significance.

the relationship between early and late IOP after glaucoma surgery remains unclarified.

Polikoff *et al* found a very poor correlation between IOP in the early postoperative period and IOP one year after successful primary or secondary antimetabolite-augmented trabeculectomy or combined cataract extraction and trabeculectomy.[9] Benson *et al* concluded that early post-trabeculectomy hypotony within 1 month is associated with reduced survival time of blebs.[10]

In contrast, several studies found early postoperative hypotony to be associated with better IOP control during follow-up.[6,7,12,15,16] Okimoto *et al* analyzed the long-term success rate of initial trabeculectomy with mitomycin C in patients with primary open-angle glaucoma. An IOP inferior to 8 mmHg at 2 weeks after surgery was associated with better IOP control during follow-up. Younger age was found to be a risk factor for surgical failure.[7] In another study, an IOP of 8 mmHg in the first 9-14 days after surgery was suggested as the optimal target for patients with preoperative multiple medications in whom IOP control to lower normal level was attempted with mitomycin C trabeculectomy. Among the factors studied, only the mean IOP during the first 9-14 days after surgery was significantly correlated with the surgical outcome.[15] A non-randomized prospective trial involving 105 eyes of 105 patients with medically uncontrolled primary and secondary open angle glaucoma who underwent deep sclerectomy concluded that an IOP ≤ 5 mmHg in the first postoperative day was a significant indicator of favorable surgical outcome.[12]

In our study, both trabeculectomy and nonpenetrating deep sclerectomy presented good outcomes, especially with lower initial IOP values. Patients with an early IOP >18 mmHg had significantly worse IOP control at 6 months for both procedures and at 12 months for nonpenetrating deep sclerectomy, a higher final number of IOP-lowering medications, a higher proportion of eyes requiring LGP after nonpenetrating deep sclerectomy" and the lowest success survival rate. Patients with early transient hypotony after trabeculectomy had a tendency for a better long-term surgical outcome, although not statistically significant.

These results suggest that maintaining a lower level of IOP during the immediate postoperative period can be beneficial in long-term. Knowledge of this may be helpful for clinical decisions during postoperative care, for example, in deciding when laser lysis of sutures, LGP or IOP-lowering medication introduction are indicated.

The retrospective nature of this study certainly implies several limitations, including the lack of other crucial information about glaucoma surgery prognosis. There was an asymmetry between the number of patients in the three groups because the majority of patients had an early IOP between 6-18 mmHg. In this study, we included both isolated and combined glaucoma-phacoemulsification procedures, which can influence the results. Patients were followed up

in a regular clinical setting without strict protocols for treatment and follow-up. However, this study tries to reflect our experience in everyday clinical practice. A larger prospective comparative study is needed to confirm these results.

CONCLUSION

The early postoperative IOP state influences the long-term prognosis after glaucoma surgery. Patients with an early IOP >18 mmHg had significantly worse IOP control and success rate in long-term follow-up for both trabeculectomy and nonpenetrating deep sclerectomy. Patients with early transient hypotony after trabeculectomy appear to have a better long-term surgical outcome.

CONTRIBUTORSHIP STATEMENT / DECLARAÇÃO DE CONTRIBUIÇÃO:

ARV: Material preparation, collection, data analysis, conception, study design and manuscript writing.

RB, RCB, AS: Material preparation, collection and data analysis.

RB, CV, RG, PT: Contributed to the conception and design of the study.

All authors reviewed and approved the final manuscript.

RESPONSABILIDADES ÉTICAS

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