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Is It Really Safe to Discontinue Anticoagulant Treatment Before Ptosis Surgery From Serious Bleeding?

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Abstract

The study aimed to evaluate the surgical effect of discontinuing anticoagulants preoperatively in patients with blepharoptosis. Patients were classified into two groups depending on anticoagulant treatment or otherwise. All patients taking anticoagulant discontinued with the treatment one week prior to surgery in accordance with our clinical guidelines. Preoperative and postoperative marginal reflex distance 1(MRD1) and ecchymosis grade were compared.

Group 1 (anticoagulant treatment cessation) included 93 eyelids, and group 2 (control) included 98 eyelids. The preoperative MRD1 showed no significant difference between groups. Group 1 showed a significantly higher rate of severe ecchymosis (41.8 vs. 22.4%, p = 0.004) at 1 week of surgery as well as 'persistent ecchymosis (58.8 vs. 7.3%, p=0.000) postoperatively at 1 month. Postoperative MRD1 was significantly lower in group 1 at 1 week (p=0.019). However, the MRD1 and degree of improvement in lid height was not significantly different between the two groups (p = 0.499, p = 0.058) at 1 month postoperatively.

The Key Messages

Contrary to our expectations, discontinue anticoagulant treatment before ptosis surgery would cause significant ecchymosis after surgery. We should take care this ecchymosis which can affect the initial surgical outcomes.

Introduction

Blepharoptosis is a clinical condition characterized by drooping of one or both eyelids, which affects both the function and appearance of the eyes.[1, 2]The surgical correction of blepharoptosis is difficult in that both functional and cosmetic aspects need to be considered. In addition, complications such as ecchymosis and edema, which may appear after ptosis surgery, are not easily predictable, which is a serious clinical concern. Also, ecchymosis and edema complicate the evaluation of potential over- or under-correction after surgery. Therefore, clinicians try to avoid ecchymosis and edema as much as possible, but studies investigating ecchymosis and edema after surgery are scarce.

Along with increased life expectancy and interest in cardiovascular disease, the use of anticoagulants has increased more than ever. Anticoagulant treatment, especially before surgery, increases the risk of bleeding during surgery.[3, 4] Therefore, clinicians recommend discontinuing the use of anticoagulants based on cardiologist consultation before surgery. However, whether discontinuing the use of anticoagulants has a positive effect on postoperative complications and the outcome of surgery has yet to be investigated. Therefore, our clinical study evaluated the surgical effects of discontinuing anticoagulants preoperatively in patients with blepharoptosis to identify factors associated with outcomes.

Results

The study analyzed 144 patients finally after excluding 8 patients. Group 1 (discontinuing anticoagulants) included 47 patients with 93 eyelids, and group 2 (control) included 51 patients with 98 eyelids. Demographics of enrolled patients are shown in Table 1. The prevalence of hypertension was significantly higher in group 1 ($p = 0.024$). The mean duration of anticoagulant therapy (DOT) in each group was similar. No major bleeding events such as retrobulbar hemorrhage occurred in either group. Table 2 shows the intergroup comparison of pre- and postoperative MRD1 and the degree of ecchymosis. Preoperative MRD1 showed no significant difference between the groups.

Group 1 (41.8%) manifested a significantly higher rate of severe ecchymosis than group 2 (22.4%) at 1 week post-surgery ($p = 0.004$). Neither group had ecchymosis of grade 2 or higher at 1 month postoperatively. However, Group 1 (58.8%) had a higher rate of 'persistent ecchymosis' than group 2 (7.3%, $p = 0.000$). Postoperative MRD1 was significantly lower in group 1 during the week 1 ($p = 0.019$). However, the MRD1 and the degree of improvement in lid height (postoperative MRD1–preoperative MRD1) was not significantly different between the two groups ($p = 0.499$, $p = 0.058$) at postoperative 1 month. In both groups, under-correction was confirmed one month after surgery in 2 patients with 4 eyelids.

Discussion

Oculoplastic surgeons face a dilemma whether or not to discontinue anticoagulants before ptosis surgery. Based on consultation with a cardiologist, most oculoplastic clinicians recommend discontinuing anticoagulants prior to ptosis surgery, but the effect on postoperative outcomes is still unknown.

Previous studies investigated the risk of anticoagulant treatment on ophthalmic surgery, but a majority of them analyzed cataract or retinal surgery, with limited focus on oculoplastic surgery. Furthermore, the effect of anticoagulants on oculoplastic procedures is still controversial, and there is no valid guideline.

Recent studies [5–8] revealed that anticoagulant treatment has no significant effect in most oculoplastic surgery. Bartley [8] reported no major bleeding complication in patients treated with anticoagulants who underwent oculoplastic procedures, including blepharoplasty and dacryocystorhinostomy (DCR). The American College of Chest Physicians (ACCP) classified eye surgery including oculoplastic procedure as ‘low risk’, which is defined by a probability of 0 to 2% of major bleeding events occurring within 2 days of surgery and recommended continuing treatment with anticoagulants perioperatively.[9] Similarly, our previous study [10] revealed that the use of intraoperative ketorolac, known as blood thinner, in oculoplastic surgery does not increase postoperative bleeding risk. Other studies also revealed the low incidence of severe complications in patients undergoing anticoagulant therapy and non-significant differences compared with control group. Philip et al [6] analyzed the intraoperative and postoperative complications in patients undergoing oculoplastic procedure, and reported that the proportion of major

complications affecting the surgical outcome was only 0.4% and found no statistically significant difference among patients with and without taking anticoagulants. As new anticoagulants, including direct oral anticoagulant (DOAC), previously known as new oral anticoagulants (NOAC), are routinely recommended, several studies have investigated the half-lives of DOACs. A study published in the *European Heart Journal* showed that DOACs have comparable half-lives and suggested that their residual anticoagulant effects do not differ or persist upon treatment interruption.[11]

However, our results were inconsistent with their results, and confirmed the effect of anticoagulants. Interestingly, our study showed significant ecchymosis and edema after surgery despite adequate discontinuation of anticoagulants. The degree of postoperative ecchymosis was severe in the group that discontinued with anticoagulants before surgery at postoperative one week and one month despite proper discontinuation. In addition, postoperative MRD1 was significantly lower in group 1 at one week.

Similarly, traditionally even if anticoagulants are discontinued appropriately prior to oculoplastic surgery, the risk of severe complications such as retrobulbar hemorrhage may still remain. In addition, according to questionnaire surveys conducted by Esparaz et al [12], the majority of oculoplastic surgeons experienced various intraoperative or postoperative complications in patients with a history of anticoagulant usage. Parkin et al argued the risks of taking anticoagulants prior to blepharoplasty, indicating that the incidence of ocular hemorrhage was high in patients who took anticoagulants.[13]

While these contrasting studies have focused on intraoperative and postoperative complications in patients taking anticoagulants, the effects of such complications on surgical outcomes were unclear. Furthermore, especially in patients undergoing blepharoplasty, it is necessary to focus on more common complications such as postoperative ecchymosis, edema or under-correction rather than major complications such as retrobulbar hemorrhage. Therefore, the aim of our study was to determine the effect of discontinue anticoagulant use before surgery on the degree of ecchymosis after surgery and the effect on the surgical outcome.

The possible mechanisms supporting our findings are as follows. First, irreversible hematologic or microvascular changes may have occurred due to hypertension and long-term use of anticoagulants. Gregory et al [14] showed that hypertension was associated with abnormal hemostasis/fibrinolytic function. Wall et al [15] reported that hypertension was a predictor of permanent vascular change. In our study, the prevalence of hypertension was significantly higher in the group exposed to anticoagulants, which may have altered the postoperative outcome. Second, the anticoagulant action would have persisted even when the anticoagulant was discontinued. Two studies [16, 17] reported residual serum concentrations of anticoagulants in patients who underwent elective invasive procedures. Anne et al [16] confirmed persistent anticoagulant effects in most patients even after discontinuing for 3 times the half-life of the known anticoagulant. Another possible hypothesis is that delayed bleeding occurred due to re-administration of anticoagulant after surgery. In fact, the challenge of delayed bleeding after endoscopy-like procedures in patients taking anticoagulants is being debated worldwide. Hideomi et al. [18] argued the possible risk of delayed bleeding in patients taking anticoagulants. Harada et al. [19] also reported a

9% higher rate of delayed bleeding. Similarly, our study confirmed that the clinical application of the currently known half-lives of anticoagulants in periprocedural management is unstable. Therefore, in line with the emergence of new anticoagulants and their increased use, further active studies investigating periprocedural management are needed.

Unfortunately, our study has some limitations that have yet to be clearly addressed. First, this study was retrospective with a relatively small sample size, which may limit the statistical power. Second, no objective indicators were available to quantitatively evaluate the degree of bleeding experienced by patients. Lastly, the ecchymosis grade and persistence can be proxy and subjective despite evaluation by 4 masked graders to minimize bias.

Otherwise, it is important to balance the risk of potential intraoperative bleeding and postoperative ecchymosis against the risk of systemic thromboembolic events. Therefore, the oculoplastic surgeon must establish proper guidelines for patients taking and discontinuing anticoagulants by evaluating the possible complications and surgical outcomes. Also, the possible complications after surgery need to be borne in mind, even if the drugs are discontinued properly. Fortunately, the patients should be reassured and monitored during the intervention and subsequently. Even if such ecchymoses and edema occur, there may be no significant effects on the surgical outcome.

In conclusion, postoperative ecchymoses were more severe in group 1 by one month after ptosis surgery even though after discontinuing with anticoagulants. Surgeons should be careful about this before operation.

Method

This is a retrospective study of patients with acquired blepharoptosis who underwent surgical correction at the Department of Ophthalmology of Dongguk University Ilsan Hospital from January 2014 to January 2020. The study was approved by the Institutional Review Board of Dongguk University, Ilsan Hospital, Goyang, South Korea (Approval number, DUIH 2020-09-009), and adhered to the tenets of the Declaration of Helsinki. The informed consent required was waived because of the retrospective nature and the minimal risk of this study by the Institutional Review Board of Dongguk University, Ilsan Hospital, Goyang, South Korea.

In addition to reviewing medical records, the study included 152 patients who were diagnosed with blepharoptosis and underwent surgical correction. All patients received ophthalmologic evaluation for preoperative marginal reflex distance1 (MRD1) and laboratory evaluation to exclude abnormal hematological findings.

Patients who were diagnosed with blepharoptosis involving one or both eyelids and with no hematological abnormalities were included in this study. Patients who were treated with anticoagulants were included only if their discontinuation was recommended by a cardiologist. Patients who failed to

discontinue with anticoagulants due to the risk of thromboembolic events, or who did not voluntarily discontinue were excluded.

Surgical correction of blepharoptosis was performed by one surgeon (M.C.). Preoperative and postoperative MRD1 at one week and one month were calculated automatically using FIJI software (an expanded version of ImageJ version 1.51a, available at fiji.sc, free of charge). MRD1 was evaluated in primary gaze with fixed frontalis muscle and without any extra pressure, and was recorded objectively with 8mm diameter stickers on the patient's forehead in all photographs as a reference point. The degree of postoperative ecchymosis was evaluated according to Chang M. et al. classification. Ecchymosis grades 0 and 1 were classified as 'mild ecchymosis, and grades 2 and 3 were categorized under 'severe ecchymosis'. 'Persistent ecchymosis' was defined by the presence of ecchymosis 1 month after surgery regardless of grade. We compared the rate of 'severe ecchymosis' between the two groups at 1 week and 1 month postoperatively, and the rate of 'persistent ecchymosis' depending on the presence or absence of ecchymosis.

All statistical analysis was performed using IBM SPSS version 21.0 for Windows (SPSS Inc., Chicago. IL, USA).

Independent two-sample t-tests were used to compare normally distributed variables to determine the effect of discontinuing anticoagulant treatment on the degree of ecchymosis and surgical outcomes. Chi $\chi 2$ tests were used to analyze categorical variables. A value of $p < 0.05$ was considered as statistically significant difference.

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Tables

Table 1
Demographics of patients discontinuing anticoagulants vs. control group.

Characteristics	Group 1 (n = 47)	Control (n = 51)	*p*-value
Number of eyelids	93 (48.7%)	98 (51.3%)	
Age, years	69.9 ± 8.2	68.8 ± 8.8	0.528
Male, n (%)	18 (38.3%)	23(45.1%)	0.495
Duration of treatment (DOT), months	88	90	
Baseline comorbidities			
Hypertension	31 (66.0%)	22 (43.1%)	0.024
Diabetes	19 (40.4%)	13 (25.5%)	0.115
P values were calculated with t-test, chi square test			

Table 2
Comparison of subjects' preoperative and postoperative outcomes.

Characteristics	Group 1 (n = 47, 93 eyelids)	Control (n = 51, 98 eyelids)	*p*-value
MRD1			
Preoperative	0.84 ± 1.10	1.30 ± 1.30	0.066
One week	2.56 ± 0.85	2.84 ± 0.79	0.019
One month	2.98 ± 0.93	3.07 ± 0.84	0.499
Ecchymosis grade			
Severe ecchymosis (1 week, %)	41.8%	22.4%	0.004
Persistent ecchymosis (1 month, %)	58.8%	7.3%	0.000
Improvement in lid height (mm)			
One week	1.71	1.56	0.371
One month	2.14	1.78	0.058
Under-correction at one month	2 (4 eyelids)	2 (4 eyelids)	

MRD1 = marginal reflex distance 1

P values were calculated with t-test, chi square test