

## Skin Only Versus Skin and Orbicularis Oculi Muscle Resection in Upper Blepharoplasty

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### ABSTRACT

**Background:** The actual benefit of resecting of the orbicularis oculi muscle (OOM) in standard blepharoplasty has been questioned in several studies. A significant concern about strip resection of OOM is the addition of more morbidity to the patient's recovery period with potentially equivalent aesthetic outcomes.

**Objective:** The current study aimed to identify patients need upper eyelid blepharoplasty, determine the procedure of choice for patients with changes in periocular region, demonstrate the technique of skin excision only versus skin and OOM excision in blepharoplasty and compare between two techniques as procedures for facial aesthetic surgery.

**Patients and methods:** A randomized controlled clinical trial was conducted at the Plastic and Reconstructive Surgery Department in Zagazig University Hospitals. During the study period (6 months) a total of 24 cases were subjected to upper blepharoplasty. Participants were divided into 2 groups; skin excision only (12 cases) versus skin and OOM excision (12 cases). **Results:** Edema, hematoma, itching, and pain scores were significantly higher among skin and OOM group compared to skin group. There was a significant difference between the two studied groups regarding 7 days postoperative VAS. Moreover, there were no significant differences regarding 3 months and 6-months postoperatively.

**Conclusion:** Patients who undergone OOM excision had higher satisfaction, less surgical adverse effects, higher VAS score and higher postoperative symptoms than patients who undergone skin only excision.

**Keywords:** Blepharoplasty, Periocular region, Facial aesthetic, Clinical trial, Zagazig University.

### INTRODUCTION

The human face is composed of small functional and cosmetic units, of which the eyes and periocular region constitute the main point of focus in routine face-to-face interactions. This dynamic region plays a pivotal role in the expression of mood, emotion, and character, thus making it the most relevant component of the facial esthetic and functional unit<sup>(1)</sup>.

Any change in the periocular unit leads to facial imbalance and functional disharmony, leading both the young and the elderly to seek consultation, thus making blepharoplasty the surgical procedure of choice for both cosmetic and functional amelioration<sup>(1)</sup>.

Blepharoplasty is a surgical procedure in which the eyelid skin, orbicularis oculi muscle, and orbital fat are excised, redraped, or sculpted to rejuvenate the esthetic look of the patient along with correction of any functional abnormality<sup>(2)</sup>.

The word "blepharon" means eyelids and "plastikos" means to mold. In general, the upper eyelid blepharoplasty (UEB) is done for both esthetic and functional indications while the lower eyelid blepharoplasty is commonly performed for esthetic rationales<sup>(3)</sup>.

Arabian surgeons, Avicenna and Ibn Rashid, described the significance of excess skin folds in impairing eyesight way back in the 10th and 11th century. They excised this skin to improve vision, thus giving the first example of a surgical approach toward the management of dermatochalasis. In 1818, Karl Ferdinand Von Graefe

(father of Albrecht von Graefe, Ophthalmologist) first coined the term "blepharoplasty" while reporting an eyelid reconstruction<sup>(4)</sup>. Since then, blepharoplasty has evolved and becomes the most commonly performed facial esthetic surgery. Besides being performed for esthetic concern, UEB is considered to be the procedure of choice for correcting dermatochalasis for functional indication<sup>(1)</sup>.

The current study aimed to identify patients need upper eyelid blepharoplasty, determine the procedure of choice for patients with changes in periocular region, demonstrate the technique of skin excision only versus skin and OOM excision in blepharoplasty and compare between two techniques as procedures for facial aesthetic surgery.

### PATIENTS AND METHODS

A randomized controlled clinical trial was conducted at the Plastic and Reconstructive Surgery Department in Zagazig University Hospitals. During the study period (6 months; 4 cases/ month) a total of 24 cases were subjected to upper blepharoplasty. Participants were divided into 2 groups; skin excision only (12 cases) versus skin and OOM excision (12 cases).

**Inclusion criteria:** Confirmed diagnosis with periocular changes or disharmony as dermatochalasis, Age  $\geq 18$  years, intention for surgery at admission, patients with adequate physiological function to undergo anesthesia

and surgery, and patients ready to continue 6 months follow up.

**Exclusion criteria:** Age <18 years, patient can't undergo surgery or anesthesia, and patients who can't continue 6 months follow up.

**Method:** All patients were subjected to complete history taking (personal history, complaint and its duration, present history, past medical history and past surgical history), physical examinations (general and local examination) and investigational studies.

**Surgical technique:** The surgical procedure was standardized before the study. The patients underwent either the removal of upper eyelid skin only procedure or the additional removal of a strip of orbicularis oculi muscle. The surgical landmarks and planned skin excisions were marked on the upright positioned patient's eyes. Approximately 1.7 ml of ultracaine DS Forte (40 mg articaine, 10 µg epinephrine per ml) local anesthetic was injected subcutaneously per eye. After the skin incision with a scalpel, the marked excess skin was removed. Participants underwent subsequent removal of an additional strip of the underlying orbicularis oculi muscle (3– 4 mm). The orbital septum was coagulated, and the muscle edges were approximated with bipolar coagulation. The skin was sutured with ethilon 6-0 (Ethicon, Cornelia, Georgia, USA) intracutaneously in a running fashion, and adhesive suture strips were placed. When a significant amount of protruding medial fat was present, this protruding medial fat was removed after minimally opening the orbital septum.

**Ethical Consideration:**

This study was ethically approved by the Institutional Review Board [IRB] of the Faculty of Medicine, Zagazig University. Written informed consent was obtained from all participants. This study was executed according to the code of ethics of the World Medical Association (Declaration of Helsinki) for studies on humans.

**Statistical Analysis**

The data was analyzed using IBM SPSS Statistics version 23.0 (IBM Corp., Armonk, NY, USA). Qualitative data were defined as numbers and percentages. Chi-Square test and Fisher's exact test were used for comparison between categorical variables as appropriate. Quantitative data were tested for normality by Shapiro-Wilk test, Kolmogorov-Smirnov test and graphical interpretation of Q–Q plots. Normal distribution of variables was described as mean and standard deviation (SD), and independent sample t-test was used for

comparison between groups. P value ≤0.05 was considered to be statistically significant.

**RESULTS**

**Table 1** showed no significant difference between the studied groups regarding age, BMI, and sex.

**Table (1):** Demographic data of the two studied groups.

Variable	Skin (n=12)	Skin & OOM (n=12)	t / $\chi^2$	P value
Age (years) Mean ± SD	51.68 ± 9.53	52.47 ± 8.4	0.175	0.863
BMI (kg/m <sup>2</sup> ) Mean ± SD	25.82 ± 2.77	26.37 ± 2.89	0.476	0.639
<b>Sex</b>				
Male	3 (25%)	2 (16.7%)	0.253	0.615
Female	9 (75%)	10 (83.3%)		

There was no significant difference between the two studied groups regarding dermatochalasis severity (**Table 2**).

**Table (2):** Dermatochalasis severity distribution between the two studied groups.

Variable	Skin (n=12 eyes)	Skin & OOM (n=12 eyes)	$\chi^2$	P value
Mild	9 (37.5%)	11 (45.8%)	0.573	0.751
Moderate	13 (54.2%)	12 (50%)		
Severe	2 (8.3%)	1 (4.2%)		

There is a significant difference between the studied groups regarding operative time (**Table 3**).

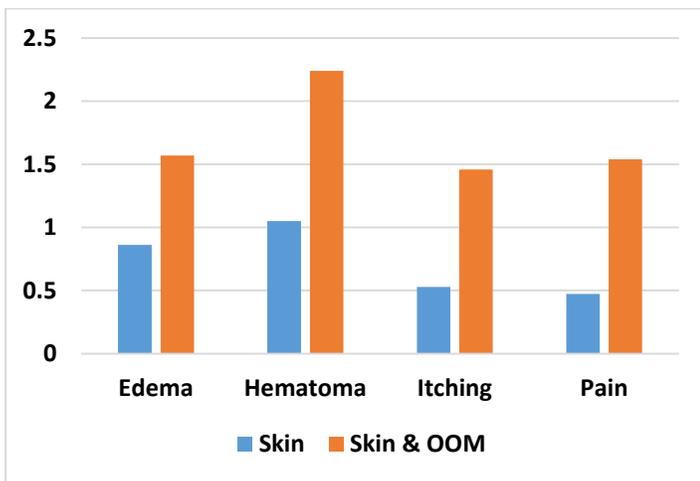
**Table (3):** Operative characteristics between the two studied groups.

Variable	Skin (n=12)	Skin & OOM (n=12)	T test	P value
Operative time (min) Mean± SD	64.82 ± 9.43	78.36 ± 12.67	2.97	0.007
Estimated blood loss (cc) Mean± SD	184.2 ± 32.4	197.3 ± 38.5	.902	0.377

Edema, hematoma, itching, and pain scores were significantly higher among skin & OOM group compared to skin group (**Table 4 and Figure 1**).

**Table (4):** Postoperative symptoms scoring between the two studied groups.

Variable	Skin (n=12)	Skin & OOM (n=12)	T test	P value
<b>Edema</b> (Mean ± SD)	0.862 ± 0.223	1.57 ± 0.418	<b>5.18</b>	<b>&lt;0.001</b>
<b>Hematoma</b> (Mean ± SD)	1.05 ± 0.257	2.24 ± 0.473	<b>7.66</b>	<b>&lt;0.001</b>
<b>Itching</b> (Mean ± SD)	0.528 ± 0.219	1.46 ± 0.426	<b>6.74</b>	<b>&lt;0.001</b>
<b>Pain</b> (Mean ± SD)	0.473 ± 0.162	1.54 ± 0.321	<b>9.7</b>	<b>&lt;0.001</b>



**Figure 1:** Summary of postoperative symptoms scoring of the two studied groups.

There was a significant difference between the two studied groups regarding 7 days postoperative VAS. Moreover, there were no significant differences regarding 3 months and 6-months postoperatively (**Table 5**).

**Table (5):** VAS distribution between the two studied groups.

Postoperatively follow up	Skin (n=12)	Skin & OOM (n=12)	T test	P value
<b>7 days</b> (Mean ± SD)	4.28 ± 0.838	5.86 ± 1.65	<b>2.96</b>	<b>0.007</b>
<b>3 months</b> (Mean ± SD)	6.94 ± 1.47	7.34 ± 1.85	0.586	0.564
<b>6-months</b> (Mean ± SD)	8.23 ± 2.18	8.72 ± 2.43	0.520	0.608

There was no significant difference between the groups regarding adverse effects (**Table 6**).

**Table (6):** Adverse effects distribution between the two studied groups.

Variable	Skin (n=12)	Skin & OOM (n=12)	χ <sup>2</sup>	P value
<b>Difficulty in closing eyes</b>	0	2 (16.7%)	2.18	0.139
<b>Eye dryness</b>	3 (25%)	3 (25%)	--	1
<b>Excessive tearing</b>	5 (41.7%)	3 (25%)	0.750	0.387
<b>Eyelid scar</b>	2 (16.7%)	1 (8.3%)	0.381	0.537

**DISCUSSION**

Dermatochalasis is a skin excess in the upper eyelid which may be associated with orbital fat prolapse, lacrimal gland prolapse, and involuntional blepharoptosis. Upper blepharoplasty is the gold standard procedure for correction of dermatochalasis <sup>(5)</sup>.

In our study regarding demographic data of the two studied groups, we found that there was no significant difference between the two studied groups regarding age, BMI, and sex.

As regard to comorbidities distribution between the two studied groups we found that there was no significant difference between the two studied groups.

Our results showed that there was no significant difference between the two studied groups regarding dermatochalasis severity.

In agreement with our study **Hollander et al.** <sup>(6)</sup> who aimed to assess the effect of blepharoplasty with or without the removal of a strip of orbicularis oculi muscle on tear film dynamics and dry eye symptoms. The study reported that there was no statistically significant difference between with and without OOM excision (P>0.05).

Our results showed that edema, hematoma, itching, and pain scores were significantly higher among skin & OOM group compared to skin group.

Our study was consistent with **Scarano et al.** <sup>(7)</sup> who aimed to study upper eyelid blepharoplasty with voltaic arc dermabrasion. Skin resurfacing with voltaic arc dermabrasion induced a slightly lid retraction and elevated the upper lid in majority of patients, but increased scleral show top, providing further cosmetic advantage. There were no complications. Scarring, ectropion, or pigmentary changes were not seen. Cosmetic improvement appeared as soon as 1 week. The upper eyelid skin dermis appears as a pale, erythematous, dull surface. Bleeding is not seen unless excessive abrading occurs with the saline-moistened gauze. Average time to postoperative photo was 3.6 months (1–10 months). During the first postoperative week, 24 patients’ areas exhibited edema, while edema was present

in 10 patients of treated areas at the day 30 follow-up examination. The results were evaluated 1 month after the treatment. The mean patient satisfaction score was 5.20, while the mean surgeon satisfaction score was 5.24. No hyperpigmentation, hypopigmentation, erythema, ecchymosis, pain, itching, outbreaks of herpes, infectious processes, or scarring were observed.

**Lelli et al.** <sup>(8)</sup> who aimed to study blepharoplasty complications demonstrated that complications within the first postoperative week include corneal abrasions and vision-threatening retrobulbar hemorrhage; the intermediate period (weeks 1 through 6) addresses upper and lower eyelid malpositions, strabismus, corneal exposure, and epiphora; and late complications (>6 weeks) include changes in eyelid height and contour along with asymmetries, scarring, and persistent edema.

Concerning VAS distribution between the two studied groups we found that there was a significant difference between the two studied groups as regard 7 days postoperative VAS. Moreover, there is no significant difference regarding 3 months and 6-months postoperatively.

In agreement with our study **Damasceno et al.** <sup>(5)</sup> who aimed to study upper blepharoplasty With or without resection of the OOM: A randomized double-blind left-right study. The study reported that there was a statistically significant difference between group with resection of the preseptal OOM and the group without resection of the preseptal OOM at 7 and 30 days postoperatively ( $P < 0.05$ ). There was no statistically significant difference between the 2 groups at 90 days postoperatively ( $P > 0.05$ ).

As regard to adverse effects distribution between the two studied groups we found that there is no significant difference between the groups.

In agreement with our study **Kiang et al.** <sup>(9)</sup> who aimed to study Muscle-Sparing Blepharoplasty: A prospective left-right comparative study. Two patients undergoing upper blepharoplasty procedure requiring greater than 5 mm of skin resection and with no history of ophthalmologic disease, dry eye, or previous eyelid surgery were selected. Upper blepharoplasty was performed with skin-only removal on one side, and combined skin-muscle removal on the other side. There were comparable aesthetic outcomes in both eyelids. The incidence of sluggish eyelid closure, lagophthalmos and dry eye syndrome were significantly higher in eyelids where wide segments of muscle had been resected.

A study by **Yang et al.** <sup>(10)</sup> demonstrated that as with any procedure, complications may occur despite careful planning and meticulous surgical technique. Prior to discharge, warnings signs of bleeding, vision loss, compartment syndrome, and infection are reviewed. Patients should be given appropriate discharge paperwork with instructions and contact information during and after office hours to mitigate postoperative complications. In this section, we review several potential complications of blepharoplasty and how to minimize them.

## CONCLUSION

Patients who undergone OOM excision had higher satisfaction, less surgical adverse effects, higher VAS score and higher postoperative symptoms than patients who undergone skin only excision.

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