

## Comparative Study Between Upper Eye Lid Blepharoplasty With And Without Prophylactic Browpexy

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**Abstract: Background:** Dermatochalasis refers to excess skin in the upper eyelid, lower, or both. Dermatochalasis may also include the presence of excess fat and hypertrophic muscle tissue of the eyelid. Blepharoplasty is a surgical procedure to correct both aspects, functional and cosmetic related to dermatochalasis. The procedure usually associated with great improvement of functional complaints and facial beauty. However some times its effect seems to be limited due to a low or lowered eyebrow position. Internal browpexy is an adjunctive procedure to upper blepharoplasty added to improve the cosmetic and functional results of the upper blepharoplasty. **Objective:** The purpose of the study was to compare the results of upper blepharoplasty alone to upper blepharoplasty combined with prophylactic browpexy in patients with dermatochalasis from the functional and cosmetic aspects. **Patients and Methods:** Twenty patients (fourty eyelids) were included in this study divided into two groups: Group A included twenty eyelids with dermatochalasis managed with upper blepharoplasty. Group B included twenty eyelids with dermatochalasis managed with upper blepharoplasty combined with internal browpexy through the same incision. Both groups followed up for 12 months after surgery. **Results:** MRD1, PFH and upper crease height were increased in both groups, LC / LBE was decreased in group A and increased in group B. The patient satisfaction was higher in group B. **Conclusion:** The combination of internal browpexy with upper blepharoplasty enhancing its functional and cosmetic results through stabilizing the lateral brow leading to acceptable brow position and more patient satisfaction.

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**Key Words:** Dermatochalasis – Upper Blepharoplasty – Internal Browpexy – Browposition – Brow ptosis.

### 1. Introduction

Since the upper face forms the platform for facial recognition, beauty, and age estimation, it is a focus of many patients seeking aesthetic facial surgery. The importance of the upper facial appearance was studied with eye tracking devices to determine which facial regions on a photograph were used by observers to gauge age and tiredness. By far, the periorbital areas were the most scrutinized by observers (**Nguyen HT et al., 2009**).

Dermatochalasis refers to excess skin in the upper eyelid, lower, or both. Although esteatoblepharon describe more specifically the isolated presence of herniated orbital fat, dermatochalasis may also include the presence of excess fat and hypertrophic muscle tissue of the eyelid (**DeAngelis et al., 2002**). Both intrinsic (chronological programmed aging) and extrinsic factors (smoke, UV radiation, gravity, and wind) lead to involuntional facial changes (**LaTeranta and Gregory., 2004**).

Blepharoplasty is a surgical procedure to correct both aspects, functional and cosmetic related to dermatochalasis. Upper eyelid blepharoplasty is performed for various functional or cosmetic indications. The upper eyelids protect the globe, distribute tears on the surface of the eye, and facilitate the drainage of tears through the lacrimal apparatus. If

any of these functions is impaired or significant ptosis of the upper eyelid blocks vision, the physician must determine if a surgical procedure is indicated (**Weissman and Most., 2013**).

Cosmetic upper lid blepharoplasty is an elective procedure performed to improve the appearance of the eyes. This procedure requires alteration of the relationships of the eyebrows, the sub-brow fat, upper lid dermatochalasis, or upper lid steatoblepharon. Often, the patient describes tired-looking or droopy eyes (**Chen and Park., 2013**).

Upper eyelid blepharoplasty is one of the most frequently performed facial plastic surgery with general great improvement of functional complaints and facial beauty. However some times its effect seems to be limited due to a low or lowered eyebrow position. such a low eyebrow position may be present either preoperatively or be due to lowering of the eyebrow position as result of the blepharoplasty procedure itself (**Rohrich et al., 2004**). The latter effect is regarded to be the result of either mechanical depression in the eyebrow with the removal of a large amount of excessive upper eyelid skin or due to a diminished need for elevating the forehead as a compensatory mechanisms to elevate the eyebrows and thereby the eyelids (**Gentile, 2005**).

Thus far the eyebrow position after upper eyelid blepharoplasty has not evaluated in a general population with dermatochalasis and complaint of visual impairment. Only a few studies have addressed this hypothesis in a pure cosmetic population and concluded that upper eye lid blepharoplasty has no influence on postoperative eyebrow position (DeAngelis et al., 2002).

The limitation of these studies is that the patients only have a minimal degree of dermatochalasis with pseudoptosis. Consecutive data analysis of a large cohort with functional complaints to evaluate whether an upper eyelid blepharoplasty causes lowering of the eyebrow is missing. The direct effect of an upper eyelid blepharoplasty on the position of the eyebrows in a population with significant dermatochalasis is a subject of controversy, also the effect of browpexy on the result of the upper eye lid blepharoplasty from both cosmetic and functional aspects needs more studies to clarify (Huijing et al., 2014).

## 2. Patients and Methods

This was a prospective comparative interventional study enrolled twenty patients (fourty eyelids) with dermatochalasis divided into two groups: Group A: included twenty eyelids with dermatochalasis managed with upper blepharoplasty (skin side) alone and Group B: included twenty eyelids with dermatochalasis managed with upper blepharoplasty combined with internal browpexy through the same incision. All cases were operated at the ophthalmology department of Al-Azhar university hospitals.

Inclusion criteria were: Age 40 years or more, significant dermatochalasis (cosmetically or functionally), Patient compliance to participate. Exclusion criteria were: Uncontrolled ocular inflammation, IOP, or other ocular disease, uncontrolled systemic conditions such as diabetes mellitus, hypertension, renal disease or bleeding tendency, eye-lid previous surgery, facial nerve palsy, sever degree brow ptosis {LC/ LBE (distance from the lateral end of the brow to the lateral canthus) less than 10 mm}.

All patients subjected to the following: Full history taking, Complete ophthalmological examination, Upper eye lid evaluation including: (Measurement of palpebral fissure height (PFH), measurement of the upper eye lid crease height, measurement of margin reflex distance (MRD1), testing lid lag on down gaze), Forehead and eye brow evaluation including: (measurement of the distance from the eye brow to the center of the pupil center (BPD) and from the lateral end of the brow to the lateral canthus (LC/LBE), frontalis muscle function assessment), dry eye testing including, corneal

sensation testing, bells phenomenon testing, preoperative photographs.

Selected cases were divided according to consequence of operations into two groups: Group A treated by the conventional transcutaneous upper blepharoplasty and given odd numbers in consequence of operations. And group B: Treated by the conventional transcutaneous upper blepharoplasty combined with internal browpexy and given even numbers in consequence of operations. This study was approved by the Faculty of Medicine, Al – Azhar University Ethics Committee and informed consent was obtained from all the patients.

### Group (A) surgical technique upper blepharoplasty:

Using gentian violet (surgical marker), the normal skin crease is marked and superior incision site also marked while the patient in sitting position taking into consideration the pinch test, Anxious patient was given a sedative anxiolytic, Sterilization of operative field (upper lids, lower lids, eyebrow, forehead, nose and cheek of both sides) with Betadine (povidone - Iodine 5%) solution, Sterile draping covering anterior hair line, posterior part of the temple, ears, mandible and the chin so that the whole face is exposed for proper adjustment of upper eyelid position and contour, 2% lidocaine with 1: 100,000 epinephrine is injected subcutaneously below the marked area of the skin, A 4-0 silk traction suture is placed in the eyelid margin, The skin incision is made with a scalpel (standard no.15 blade), The skin flap is excised using monopolar cutting cautery with Clorado Needle exposing the orbicularis oculi muscle, Hemostasis is achieved with the light application of a bipolar cautery, Orbicularis muscle is tented anteriorly and a cut is made to the posterior orbicular fascial plane. Scissors open this plane medially and laterally along the length of the wound and at its upper limit, Excision of a strip of orbicularis oculi muscle (1-2 mm).

The orbital septal is identified and incised starting medially then laterally allowing for herniation of orbital fat, Identification of nasal fat pad by its paler yellow colure than central (preaponeurotic) pad, Small “windows” in the fat pad capsule created, teasing the fat out of the capsule with forceps and slight pressure on the globe, Excess fat pads (the fat that readily prolapses through the capsule opening) judiciously removed in part by monopolar cautery, Layered closure is achieved with interrupted 6-0 Vicryl sutures for the reapproximating of the orbicularis oculi muscle, Skin is closed with a running 6 -0 vicryl suture, A steroid antibiotic ointment is applied.

### Group (B) surgical technique upper blepharoplasty combined by internal browpexy

**through the same incision:** Steps (A – O) as in group A technique then: Subsequent dissection superiorly, immediately deep to the orbicularis muscle on the surface of the orbital septum until the brow fat is exposed and dissection then continued in the same (sub muscular) plane then in a periosteal plane to expose about 1-2 cm of frontal periosteum. A wide plane is dissected to enable the brow to be lifted smoothly without creating creases or bunching. A 4-0 prolene suture is then placed through the periosteum at 10 mm above orbital rim, The brow fat debulked laterally at this stage in some cases to correct excessive lateral brow fullness, Brow fixation to the periosteum about 1 cm superior to the orbital rim with two or three 4/0 non-absorbable sutures (Prolene) done as follow: The needle passed through the subcutaneous tissue of the brow then through the periosteum at the desired site then the sutures were tied carefully to avoid skin dimpling.

Layered closure is achieved with interrupted 6–0 Vicryl sutures for the reapproximating of the orbicularis oculi muscle, The procedure is completed by a simple skin closure with continuous 6-0 nylon or 6-0 polypropylene suture, or interrupted 6-0 fast-absorbing plain gut or 6-0 vicryle suture, A steroid antibiotic ointment is applied.

Statistical package of Graph pad prism 7 was used for analysis of data, Data was summarized as mean ± SD. Comparison between and in groups was carried out using two-tailed t test, If F values were significant, Tukey-Kramer multiple comparison test was used, Pearson's correlation was also done to examine the correlation between parameters. P-value was considered significant if ≤ 0.05\* at confidence interval 95%.

**3. Results**

The mean age of group A {8 females (80%) & 2 males (20%)} was 54 years ± 7.5 SD, ranged from 43 -

69 years And the mean age of group B {7 females (70%) & 3 males (30%)} was 61 years ± 9.3 SD, ranged from 45 - 72 years.

**Table (1): Pre-operative clinical parameters of group A & B:**

groups		Group A	Group B
Variables	Mean ±SD	10±0.87	9.2±1.2
	Range	9-12	6.5-11
Upper lid crease height (mm)	Mean ±SD	6.7±1.6	6.6±1.3
	Range	4.5-9	4-8.5
MRD <sub>1</sub> (mm)	Mean ±SD	3.8±0.46	3.8±0.50
	Range	3-4.5	3-4.5
BPD (mm)	Mean ±SD	18±2.3	17±2.5
	Range	13-20	14-22
LC/LBE (mm)	Mean ±SD	16±4.7	15±3.2
	Range	8-21	9-20
BUT (second)	Mean ±SD	13±2	11±2.1
	Range	9-15	7-15
Shirmer I (mm)	Mean ±SD	13±2.8	14±1.5
	Range	10-18	12-18
Shirmer II (mm)	Mean ±SD	7.7±1.3	8.9±1.8
	Range	6-10	7-12

**Table (2): Clinical parameters at the end of study:**

Groups		Group A	Group B
Variables	Mean ±SD	10±0.60	10±0.62
	Range	9.5-12	9-11
Upper lid crease height (mm)	Mean ±SD	8.3±0.72	8.2±1.2
	Range	7-9	6-11
MRD <sub>1</sub> (mm)	Mean ±SD	4.2±0.24	4.4±0.24
	Range	4-4.5	4-5
BPD (mm)	Mean ±SD	18±2.3	18±2.1
	Range	13-20	15-22
LC/LBE (mm)	Mean ±SD	14±4.2	21±2
	Range	7-19	17-23

**Table (3): Comparative statistic of group A pre and post-operative:**

Variables	Before	After	Paired test	
			t	p-value
PFH (mm)	10.2±0.87	10±0.60	3.1	0.0058**
Upper lid crease height (mm)	6.7±1.6	8.3±0.72	6.4	<0.0001****
MRD <sub>1</sub> (mm)	3.8±0.46	4.2±0.24	3.9	0.0010***
BPD (mm)	18±2.3	18±2.3	1.5	0.1625
LC/LBE (mm)	16±4.7	14±4.2	9.2	<0.0001****

**Table (4): Comparative statistic of group B pre and post-operative:**

Variables	Before	After	Paired test	
			T	p-value
PFH (mm)	9.2±1.2	10±0.62	4.8	0.0001***
Upper lid crease height (mm)	6.6±1.3	8.2±1.2	8	<0.0001****
MRD <sub>1</sub> (mm)	3.8±0.50	4.4±0.24	6.9	<0.0001****
BPD (mm)	17±2.5	18±2.1	2	0.056
LC/LBE (mm)	15±3.2	21±2	11	<0.0001****

**Table (5): Group A & B t-test Pre-operative:**

Variables	Group A	Group B	Paired test	
			T	p-value
PFH (mm)	0.87±10	1.2±9.2	2.8	0.01*
Upper lid crease height (mm)	1.6±6.7	1.3±6.6	0.48	0.63
MRD <sub>1</sub> (mm)	0.46±3.8	0.50±3.8	0.83	0.42
BPD (mm)	2.3±18	2.5±17	0.53	0.60
LC/LBE (mm)	4.7±16	3.2±15	0.97	0.34

**Table (6): Group A & B t-test Post-operative:**

Variables	Group A	Group B	Paired test	
			T	p-value
PFH (mm)	0.60±10	0.62±10	1.4	0.19
Upper lid crease height (mm)	0.72±8.3	1.2±8.2	0.11	0.91
MRD <sub>1</sub> (mm)	0.24±4.2	0.24±4.4	4.1	0.0007***
BPD (mm)	2.3±18	2.1±18	0.06	0.95
LC/LBE (mm)	4.2±14	2±21	5.5	<0.0001****

**Group A:** Regarding the PFH was significantly increased by 2 % post-operative than pre – operative, Also upper lid crease height was significantly increased by (23.9 %) post- operative than pre – operative, In relation to MRD<sub>1</sub> there was significant increase post-operative by (10.5 %) than that of pre-operative, No significant difference between BPD pre and post-operative. However, there was significant decrease in LC / LBE distance post-operative than pre-operative by (14.2%).

**Group B:** Regarding the PFH there was significant increase between pre and post-operative by (8.7 %), Also upper lid crease height was significantly increased by (24.2 %) post- operative than pre-operative, In relation to MRD<sub>1</sub> there was significant increases post-operative by (15.8 %) than that of pre-operative, No significant difference between BPD pre and post-operative. However, there was significant increase between LC / LBE post-operative than pre-operative by (40%).

**Regarding comparative statistics between group A & group B:** There was significant decrease of PFH in group B than group A by (8%) Pre-operative, No significant difference between upper lid crease height, MRD<sub>1</sub>, BPD, LC / LBE in group A & B pre-operative, There was significant increase in MRD<sub>1</sub> in group B than group A by (4.8%), Also there was significant increase in LC / LBE in group B than group A by (50%), No significant difference between PFH, upper lid crease height, BPD in group A & B post-operative.

#### 4. Discussion

The results of group A agree with (**Pool and van der Lei., 2014**) study which reported a statistically significant increase in palpebral fissure by 0.5 mm and decrease in eyebrow height by 0.6 mm in 365

Caucasian subjects with upper blepharoplasty (UB). However, it is not clear if such a small amount of change (0.6 mm) is clinically significant. Study design and differences between study populations, that is, mainly cosmetic versus more functional, may contribute to the discrepancy in descend of eyebrow after UB.

Also agree with (**Hassanpour and Khajouei Kermani., 2016**) study in which 70 patients (140 eyes) were included who underwent upper eyelid blepharoplasty. There were 58 women and 12 men and the mean age of patients was 49.7 years (48.9 years in females and 53.7 years in males). Distance measurements were used, taking the brow–lid margin distance (BMD), brow-pupil distance (BPD), lid margin- pupil distance (MPD), brow–lateral canthal distance (BLCD), brow–medial canthal distance (BMCD), as anatomical reference points.

In contrary for our study and the previous studies (**Huijing et al., 2014**), in which an evaluation of 140 consecutive patients who underwent an upper eyelid blepharoplasty. Results clearly show that the position of the eyebrow is not lowered significantly after an upper eyelid blepharoplasty performed among a population with dermatochalasis and functional complaints of visual impairment. The difference between this study and our study as regard the brow position may be due to the difference in the follow-up period between the two studies where in our study it was 12 months but in Huijing et al 2014, it was 8 weeks which may be inadequate period to elicit the descend in brow.

The results of group B revealed that the combination of internal browpey with upper blepharoplasty enhancing its functional and cosmetic results through stabilizing the lateral brow leading to acceptable brow position and more patient

satisfaction, also revealed that the internal browpexy through the upper blepharoplasty incision is an effective browlift procedure with advantages of the relative technical ease and efficiency of the procedure.

**Baker et al., 2016** agree completely with our results where UB alone lowers the brow, however, performing quantitated ISB at the time of upper blepharoplasty effectively stabilizes the lateral brow and prevents the brow descent observed in upper blepharoplasty alone patients.

Also agree with (**Tyres, 2006**) who reported that the trans blepharoplasty browlift (the same procedure of our study) was associated with lift acceptable to most of the patients although less than lift achieved with direct browlift, and the sutures causing dimpling of the skin that was encountered in our study but was not a major issue as regard the patient satisfaction and cosmetic appearance.

In our study we reported lesser satisfaction in patients of (group A) specially female gender due to unaccepted cosmetic appearance caused by the lateral hooding of the eyelid brow continuum, which indicate a second surgery in one patient. in contrast to patients of (group B) who were satisfied completely apart from slight skin dimpling annoying one patient to some extent.

## 5. Conclusion

The combination of internal browpexy with upper blepharoplasty enhancing its functional and cosmetic results through stabilizing the lateral brow leading to acceptable brow position and more patient satisfaction. the internal browpexy through the upper blepharoplasty incision is an effective browlift procedure with advantages of the relative technical ease and efficiency of the procedure, addressing other aging problems as dermatochalasis, the lack of an additional external incision, less frequent complications and the similar recovery and downtime to patients undergoing blepharoplasty alone.

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