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International Journal of Pharmaceutical Research & Allied Sciences, 2016, 5(3): 168-173

Research Article

ISSN : 2277-3657
CODEN(USA) : IJPRPM

Lower lid blepharoplasty: comparing fat reposition with fat removal based on orbital vector in patients referred to Farabi eye hospital in 2013

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ABSTRACT

Treatment of the aging lower eyelid is determined by the anatomic variables noted for each surgical candidate. Lower eyelid blepharoplasty has been a challenging surgery fraught with many potential complications. The prevention of these complications requires a detailed knowledge of lower eyelid anatomy and a focused examination of the factors that may predispose to poor outcome. We compared lower eyelid blepharoplasty outcome and complication in vector negative and vector positive and neuter patients 40 patients who were referred for lower eyelid blepharoplasty were studied. Mean age of the patients were 46.87±2.55. Of the 40 patients included in the study, 82.5% (33) were females and 17.5% (7) were males. 16 (40%) were vector negative and 24 (60%) were vector positive and neuter. Vector negative patients underwent fat repositioning and vector neutr and positive patients underwent fat repositioning and fat removal lower eyelid blepharoplasty. Data were analyzed using SPSS software. P value of postoperative complication and surgeon and patient satisfaction were respectively 0.328, 0.812 and 0.075. According to choosing the appropriate surgical approach in vector negative patients there were statistically insignificant difference between these two groups (vector negative vs. positive and neuter) in outcome and complications. Fat reposition in vector negative patients improves the outcome and decreases postoperative complications in these patients.

Keywords: Blepharoplasty, Lower eyelid, orbital vector, Fat removal, Fat reposition.

INTRODUCTION

The eyes are the most vital component of facial cosmetic emphasis and balance. They play a pivotal role in facial aesthetics. Because of this, aging in this part of the face is easily and emphatically noticed by patients (1). Blepharoplasty plays a vital role in facial rejuvenation, with direct aesthetic relation to the brow and the cheek (2). As the eye ages, there are several functional and anatomical changes that will occur to the eyelid, giving the patient a tired or stern appearance. As the eyelids and the midface begin to age and descend because of gravitational effects and loss of tissue elasticity, the orbit will assume a deeper and wider appearance (1). Therefore, the youthful shorter and fuller lower eyelid is slowly replaced by a longer and volume-deflated eyelid whose junction with the midface is displaced inferiorly (3). The action of gravity on periorbital structures, decreased strength in periorbital muscles, sun damage, and changes in skin composition may cause aesthetically displeasing changes referred to in the vernacular as “droopy eyelids,” “tired eyes,” or “bags under the eyes” (4). Aging of the lower lid and cheek results in bulging of orbital fat and deepening of the orbital rim groove, known as the “tear trough” (5). Blepharoplasty is one of the most popular and common procedures in facial plastic surgery. Initially performed in 1818 for eyelid reconstruction,

blepharoplasty has evolved to become a cosmetic or functional operation. Although the surgical approaches are relatively straightforward, achieving natural and predictable results require precision and judgment (6). Note should be made of the positive or negative vector of orbit. In the lateral view, a line dropped from the supraorbital rim to the infraorbital rim just touches the cornea. If the cornea is posterior to this line it is a positive vector, like an enophthalmos. When the cornea is anterior to it then the eye is prominent and there is poor globe support, this is called negative vector (7). This can occur as a result of relative globe prominence (large eye, shallow orbit, etc.) or midface (bone/soft tissue or both) recession. When the lower lid is tightened in this scenario, it can bowstring the globe, increase or create scleral show (true or pseudo-lid retraction), and make the eye (globe) appear more prominent (8). Lower lid blepharoplasty has potential for significant long-lasting complications and marginal aesthetic outcomes if not performed correctly, or if one disregards the anatomical aspects of the orbicularis oculi muscle. (9). One of the most critical aspects of lower lid blepharoplasty is the appropriate management of orbital fat and lower eyelid volume loss (10). Over the last decade, lower transconjunctival blepharoplasty has become the method of choice used by facial plastic surgeons for the treatment of lower eyelid herniated fat owing to the reduced rate of complications and the hidden incision (11). Transconjunctival lower blephroplasty was first described by Bourguet in 1924, but was not brought into mainstream modern cosmetic surgery until Baylis et al. re-introduced the technique in 1989. With this approach, orbital fat is addressed through an incision on the internal (conjunctival) surface of the eyelid, thereby preserving the integrity of the orbital septum and orbicularis muscle. These are essential steps in preventing lower eyelid malposition, as there is less distortion of anatomy and postoperative cicatrization. For this reason, transconjunctival lower blepharoplasty has gained wide acceptance in cosmetic surgery across all subspecialties (8). The eyelid is principally divided into 3 lamella, with the anterior lamella being composed of skin and the orbicularis oculi muscle. The orbicularis oculi muscle is further divided into a pretarsal, preseptal, and an orbital segment (1). The posterior lamella consists of the tarsus and conjunctiva in the first 5 mm of the eyelid, and the capsulopalpebral fascia (lower eyelid retractors) and conjunctiva below the tarsus. The tarsus is the cartilaginous structure, which gives the lower eyelid support and is 4-5 mm in height, and 30 mm in width. The Meibomian glands lie within the tarsus, producing sebaceous secretions to the outer layer of the tear film, thereby preventing evaporation of tears. The capsulopalpebral fascia originates from the inferior rectus muscle and, as stated above, fuses with the orbital septum before inserting to the inferior edge of the tarsus. This attachment is an important support structure of the lower eyelid. Disruption of this attachment may lead to entropion. Orbital fat is located posterior to the orbital septum and anterior to the lower lid retractors. The lower orbital fat pads consist of three compartments: lateral, central, and medial pockets (8). Traditionally, lower eyelid herniated fat is removed, which may cause a sunken or hollow lid appearance, especially in patients with a tear-trough deformity. Fat preservation in the lower eyelid, which was originally described in 1996, may prevent some of these contour irregularities [5]. Fat repositioning is defined as the subperiosteal repositioning of the medial and central lower lid herniated orbital fat into the nasojugal fold. The lateral orbital fat pad may be repositioned into the lateral inferior orbital region if needed (11). When performing blepharoplasty with fat repositioning, it is essential to be aware of the anatomic location of the inferior oblique in the anterior inferomedial orbit to avoid incarceration of this muscle. (12). The disadvantages of fat repositioning are the steep learning curve and potential complications such as diplopia owing to injury of the inferior oblique muscle, fat granulomas, prolonged edema, and, rarely, soft tissue irregularities. Candidates for fat repositioning include patients with the following: Lower eyelid herniated fat, Presence of a tear-trough deformity, Acceptance of the possible risks and complications, Realistic expectations. Often, this technique is used to soften moderate to- severe tear-trough deformities in patients with minimal to no herniated fat because the fat may be released once the septum is opened. In addition, a lower eyelid skin pinch may be performed in patients with excess skin in the lower lid and adequate lower lid tone (11). In a study entitled “New Insights into Physical Findings Associated with Post blepharoplasty Lower Eyelid Retraction” by Griffin et al (14) post blepharoplasty lower eyelid retraction (PBLER) has been linked to anterior lamellar shortage, unaddressed eyelid laxity, and middle lamellar scarring. The authors believe there are other, less-appreciated physical findings (orbicularis weakness, negative-vector eyelid, and inferior eyelid/ orbit volume deficit) that also influence the development and potentially the management of this complex type of eyelid malposition. Evaluating these factors when planning primary blepharoplasty may reduce the incidence of PBLER. Awareness of these findings when planning revisional procedures may improve surgical outcomes. In a study by Renom et al (15) authors describe their technique combining blepharoplasty and malar fat grafting to reverse the negative vector and conclude that Periorbital rejuvenation is a part of integral facial rejuvenation and is achieved only if, in addition to the blepharoplasty, the negative vector is also corrected. Mack (16) studied Complications in periocular rejuvenation and demonstrate that thorough preoperative evaluation with meticulous surgical planning to achieve facial aesthetic balance between the forehead, eyelids, and midface is imperative to avoid or decrease potential functional and/or cosmetic complications in cosmetic periocular surgery. Before performing surgery, the physician should be aware of the patient's history of dry eyes, previous facial trauma, previous injection of Botox Cosmetic, history of previous laser-assisted in situ keratomileusis, and past facial surgery. On the lower eyelid/cheek examination, special attention should be directed to the diagnosis of underlying negative vector, dry eyes, prominent eyes, lower lid retraction, ectropion, lateral canthal dystopia, lower eyelid laxity, scleral show, and lagophthalmos. Intraoperative

and postoperative medical and surgical management of cosmetic periocular surgery complications focus on decreasing the risk of postoperative ptosis, lagophthalmos, lid retraction, and lid asymmetry, with special attention to limiting the risk of visual loss secondary to orbital hemorrhage. With the availability of a variety of techniques, an individualized approach based on variations in anatomical features is feasible (13). It is important to pay attention to the factors that increase the risk of post operation complications, negative orbital vector is one of the factors that increase post-op complications. In this study, we compare the results and complications of lower eyelid blepharoplasty performed among patients referred to Farabi Hospital in 2014 by orbital vector and operation procedure (fat removal or fat reposition).

MATERIALS AND METHODS

This is a case series study. 40 patients who were referred for lower eyelid blepharoplasty to Farabi Hospital in 2014 and fulfil inclusion criterias were studied. Data were gatherd and analyzed using descriptive statistics (mean, standard deviation, correlation) and inferential statistics (t-test and ANOVA) using SPSS version 16.
Inclusion and exclusion criteria

Inclusion criteria: Patients who are referred for blepharoplasty in Farabi Hospital, no other ophthalmic procedures planned for the patient in study period

Exclusion criteria: Previous eyelid surgery, Other orbital or lacrimal gland disease, Concurrent use of contact lenses, Previous glaucoma surgery, History of dry eye, Facial anomaly, History of facial trauma, History of thyroid disease, History of orbital fx

Preoperative Evaluation and examination:
Preoperative evaluations were performed for all patients. The evaluation included medical history (chronic underlying disease) and ophthalmologic history (vision problems, history of trauma, glaucoma, allergic reactions, dry eye, excessive tearing), eye examination, checking the quality and quantity of the skin in periorbital area, supporting bony structures, evaluation of excess skin and fat herniation in lower eyelids.

According to the study's purpose patients were divided into two groups according to their orbital vector, one group were vector negative patients and the other group were patients with positive and neuter orbital vector. Appropriate surgical technique were chosen according to pre operation evaluation and surgeon's opinion.

Surgery:
After selecting the patients and determine their vector, using transconjunctive approach and cutting conjunctiva and lower eyelid Retractor using applicator, septum was driven to the eyelid and after reaching orbital rim and pick up the periosteum, two fat pads, medial and central separately went under the periosteum and were connected to the skin. Then the conjunctiva were sutured and after doing skin pinch test and removing skin and then suturing the skin if necessary, closed eye lateral canthoplasty were done.

Follow-up after surgery:
All the patients who underwent lower eyelid blepharoplasty were visited after six months and examined for lower eyelid position, skeletonization of inferior orbital rim, lower eyelid ectropion, lower eyelid hollowness and tear trough deformity. Patient and surgeon satisfaction was measured with a scale of 1 to 4 in which 4 represents the highest satisfaction rate and 1 represents the lowest level of satisfaction.

RESULTS

The mean age of patients was 46.8±2.55 years. The youngest patient was 23 years old and the oldest was 88 years old. 33 patients (82.5%) were female and 7 patients (17.5%) were male. All patients were followed 6 months after surgery.

Most patients were in the age group 40-50 years.

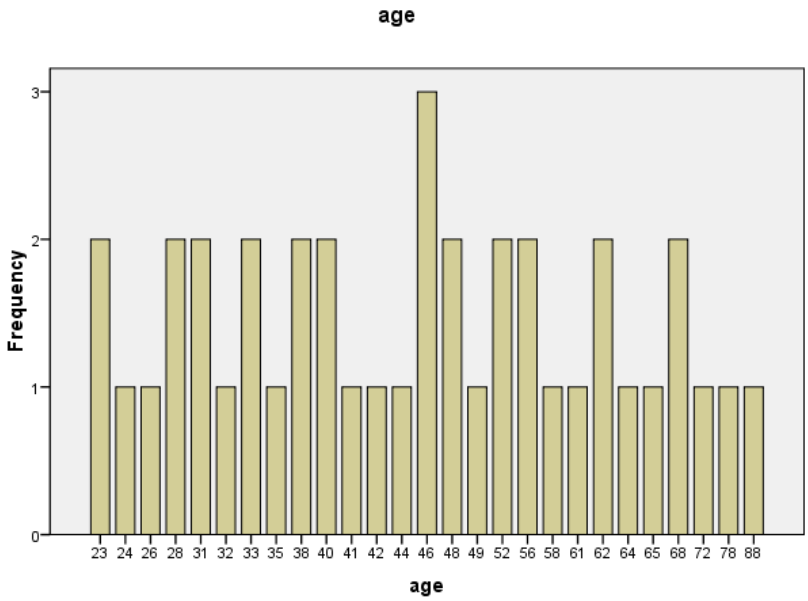

Figure 1. Age Distribution

Table 1. Results after surgery in patients

Outcome	Group		P-value
	Negative Vector	Positive & Neutr Vector	
Tear trough deformity correction	+3.06	+3.5	0.116
Triangular correction	+3.5	+3.5	0.987
Patient Satisfaction	+3.312	+3.708	0.064
Surgeon satisfaction	+3.5	+3.5	0.965
condition Lower eyelid	+0.5	+0.25	0.247
Continuing	+3.187	+3.416	0.328
Lateral Canthus position	0	0	-
Skeletonization of inferior orbital rim	+1.5	+1.416	0.779
Ectropion	0.125	0.041	0.340
Under eye hollowness	0.812	1.208	0.404

Table 2. Continuing after lower eyelid blepharoplasty

Continuing	Vector		P-value
	Negative	Positive and Neuter	
2	1(6.2%)	0(.0%)	0.328
+2	2(12.5%)	4(16.7%)	
+3	6(37.5%)	6(25%)	
+4	7(43.8%)	14(58.3%)	

Table 3. Tear trough deformity correction after lower eyelid blepharoplasty

Tear trough deformity correction	Vector		P-value
	Negative	Positive and Neuter	
+1	2(12.5%)	0(0%)	0.116
+2	1(6.2%)	3(12.5%)	
+3	7(43.8%)	6(25%)	
+4	6(37.5%)	15(62.5%)	

Table 4. Skeletonization of inferior orbital rim after lower eyelid blepharoplasty28

Skeletonization of inferior orbital rim	Vector		P-value
	Negative	Positive and Neuter	
1	11(68.8%)	18(75%)	0.779
2	3(18.8%)	4(16.7%)	
+3	1(6.2%)	1(4.2%)	
+1	1(6.2%)	0(0%)	
+2	0(0%)	1(4.2%)	

DISCUSSION AND CONCLUSION

In this study, we compare the results and complications of lower eyelid blepharoplasty performed among patients referred to Farabi Hospital in 2014 by orbital vector and operation procedure (fat removal or fat reposition). The first signs of aging often appears in the periorbital area, characterized by changes in quality or quantity of skin, by fat herniation or by lengthening of the lower eyelid margin (17). Complications in blepharoplasty are uncommon and, when they occur, they are usually mild and transient, such as hematomas and chemosis. However, sometimes they can be severe, such as blindness, or they might require surgical correction, such as ectropion .Complication prevention or even their forecast starts with a careful preoperative assessment. It must include a detailed clinical history (comorbidities, use of medication, ophthalmic past, personal and family members), and careful physical exam. The surgical technique to be used is based on the anatomical changes found and the patient's complaints, always taking into account patient expectation and the real surgical possibilities for cosmetic improvement (18). As mentioned before different factors predict outcome of lower eyelid blepharoplasty. One of the important factors is orbital vector. Usually there are more post operation complications in patients with negative orbital vector and prominent eye ball than other patients. The other important factor is how to deal with fat pads, choosing the right way helps to improve the final outcome. In this study the operation procedure were chosen according to patients' orbital vector. Patients with negative orbital vector underwent lower eyelid blepharoplasty with fat reposition. Patients with positive and neuter orbital vector underwent lower eyelid blepharoplasty with fat removal and fat reposition at the same time. After 6 months results and complications were compared in these two groups of patients.

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