THE EFFECT OF ORBICULARIS OCULI SLING ON LATERAL CANTHUS AND LOWER LID IN UPPER BLEPHAROPLASTY

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ABSTRACT

Background

Upper lid blepharoplasty is one of the most commonly performed procedures in aesthetic plastic surgery, which directly affects facial rejuvenation. The periocular region is the main point of focus in routine face-to-face interaction. Understanding the periorbital surgical anatomy, facial analysis, and specific change in the skin, muscle and fat with preoperative workup and a thoughtfully conceived surgical plan targeted according to the difference gives a successful outcome.

Objectives

This dynamic region has both functional and aesthetic influence on the face; unfortunately, this area develops ageing sooner than other regions of the face.

Patient and Methods

A total of 30 patients underwent upper lid blepharoplasty. In the most lateral part, the orbicularis oculi muscle was divided horizontally. The lower part was suspended to the periosteum of the orbital rim with a single stitch of the long-standing absorbable suture. The upper part overlapped over the lower part of the muscle and fixed them by a single stitch in a single stitch pant over vest fashion.

Results

This technique provides more youthfulness to the eye, especially at the region of lateral canthus, as it lifts the tissue superolateral. It has minimal effect on lateral canthus laxity but shows marked improvement in lateral lower lid and crowfeet; it also shows valuable improvement of lateral hooding.

Conclusion

The orbicularis oculi muscle suspension procedure is a good technique that reliably corrects and reshapes the outer portion of both upper and lower eyelids. It is an easy technique, and it would be helpful as an adjunctive procedure with blepharoplasty in selected cases.

Keywords: *Blepharoplasty, Orbicularis muscle, Crow's feet, Lateral hooding, Lateral canthus.*

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INTRODUCTION

The ageing process affects the entire facial skin, including the periorbital area, involving all layers and structures of the face.

The periocular region is the main focus point in routine face-to-face interaction; there is an increased demand for periorbital rejuvenation. Nowadays, upper lid blepharoplasty is one of the most common periorbital surgical enhancement procedures, and plastic surgeons perform it to optimize rejuvenation, directly affecting facial rejuvenation [1,2] .

Blepharoplasty can be performed for both cosmetic and functional indications or asymmetry. This surgery aims to restore and rejuvenate the periorbital area, so it is advisable to have an approach to be effective longer with minimizing postoperative recovery time and complications [3,4].

Different structures such as skin, muscle, and fat require individual and specific surgical treatments according to their particular demands during blepharoplasty [1].

Orbicularis oculi muscle will become lax, excess and attenuate with ageing, so some form of muscle manipulation is performed during a blepharoplasty as resection and tightening [2].

Orbicularis oculi muscle suspension was described in lower blepharoplasty, and its effect is quite clear, as mentioned in much literature. However, here we suspend the lateral portion of the orbicularis muscle to the superolateral part of the orbital rim by using a single stitch that provides more youthful and reliably correct changes, especially on the lateral one-third of both upper and lower eyelids.

Orbicularis muscle suspension can be performed in blepharoptosis or asymmetry.

This prospective study aims to know the efficacy of the orbicularis oculi muscle suspension to the periosteum of the superior lateral orbital rim in upper lid blepharoplasty.

PATIENT AND METHODS

This study was prospectively performed on 30 female patients ranging from 26 to 59 years old with a mean age of 36 during standard primary upper lid blepharoplasty. In addition, ten patients underwent concurrent lower lid blepharoplasty.

This procedure was performed for those patients who requested surgical treatment of excess upper lid skin in As Sulaymaniyah burn, plastic and reconstructive surgery hospital between November 2018 to November 2020.

All the patients underwent a local physical examination preoperatively, including any abnormality in the periorbital area, excess skin, and brow position.

We included young-middle aged patients without any periorbital disease and previous periorbital scars, and the only exclusion criteria were those who had previous periorbital surgery.

Patients were followed up for six months with photo documentations taken preoperatively, three months and six months postoperatively.

Surgical technique

After assessing the upper lid with pinch test, the incision dimensions were marked, and upper lid blepharoplasty was done under local anaesthesia. After skin excision, hemostasis was performed with excision or redistribution of upper lid fat compartments accordingly.

At the most lateral part, the orbicularis muscle is divided horizontally at the midpoint into upper and lower parts by electrocautery (as shown in Figures 1 and 2). Then dissecting is performed beneath the upper part to reach the lateral orbital rim (Fig.3), with a single stitch of long-lasting absorbable suture [polydiaxone (PDS) 5/0]. Finally, the lower part of the muscle at the level of the lateral canthus was suspended to the periosteum in a horizontal mattress suturing fashion and avoiding excessive tension (as shown in Fig.4).

To Alleviate any irregularities, depression or dead space formation caused by the suspension and give more natural smoothness, we do overlap the upper part over the lower part and fix them by a single stitch of short absorbable suture (vicryl 6/0)

After that, the skin was sutured in a subcuticular fashion using polypropylene 6/0 thread. Then, the same dressing was applied to all the patients.

RESULTS

The mean age of the patients was 36 years; we performed this procedure for female patients with a mean operative time of 45 minutes.

A preoperative lower lid distraction test was performed. The test was re-performed after six months to know the efficacy of the lateral canthus; this procedure reinforced the lateral canthus and provided a mild degree of canthal tilt with minimal effect on canthal laxity.

This technique provides more youthfulness to the eye, especially at the region of the lateral canthus. It lifts the tissue superolateral, decreases lateral fullness and hooding, prevents postoperative round eye appearance, and reduces tension on the closure of the skin.

Especially on the scar laterally, as we have previously seen, some patients request revision blepharoplasty for wide scars. It has a beneficial effect on the crowfeet and lateral lower eyelid wrinkles, too (as shown in Fig.5 and 6). However, it has no significant impact on lateral canthus itself, but it may reinforce it.

This procedure showed a remarkable effect in cases with concurrent lower lid blepharoplasty as it will prevent round eye appearance due to lower lid canthopexy or lower lid orbicularis suspension.

Fig.1. Marking the site of Orbicularis muscle split.

Fig. 2. Orbicularis Oculi muscle split at its outermost part horizontally.

Fig.3. Dissection under the upper part done to reach the orbital rim.

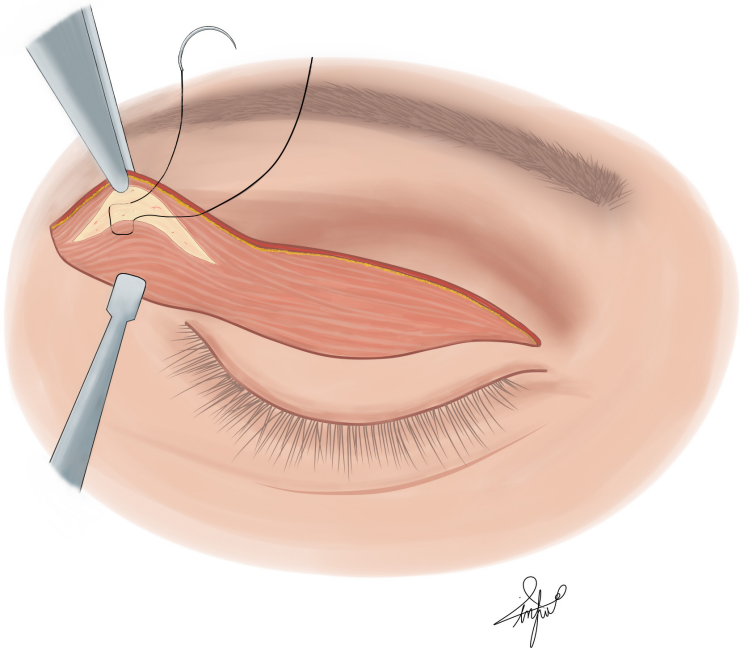

Fig.4. Mattress suture fashion of orbicularis muscle suspension to superolateral orbital periosteum.

Fig.5 Anterolateral view (Above- preoperative, Below- postoperative) 38 years old female 6 months after upper blepharoplasty with orbicularis muscle suspension: no round eye appearance, smoothness of lateral lower lid and decrease the appearance of crow feet, no lateral fullness.

Fig.6. Front view (Above-preoperative, Below- postoperative) 57 years old female 1 year after upper blepharoplasty with orbicularis suspension show marked decrease in crowfeet and improvement of lower lid wrinkles at lateral part with the improvement of lateral hooding.

DISCUSSION

The periorbital ageing process involves layered structures including the skin, muscle, fat and bone. It affects the skin quality that becomes inelastic and wrinkled; the orbicularis muscle also loses tone and extends vertically, becoming ptotic. The orbital fat herniates, and the suspension ligament becomes relaxed, changing the contour of the eye[1].

Optimizing the rejuvenation of these different structures during blepharoplasty requires individual and specific surgical treatment according to their particular demands[1].

The skin should be smoothened and eventually reduced. The muscle must be reinforced, re-tensioned, and lifted. The fat must be conservatively removed, whereas the suspension structure must be re-tensioned.

This procedure has been used in transcutaneous lower lid blepharoplasty before, and there are studies on that subject, but according to one study; orbicularis oculi suspension in lower lid blepharoplasty may give unnatural round eye appearance while using this procedure in upper lid blepharoplasty will decrease round eye appearance as we came up within our study [1,4].

Many techniques have been used to decrease the appearance of periorbital wrinkles, like botulinum toxin injection or lateral temporal brow lift. In addition, concurrent orbicularis suspension during blepharoplasty will reduce the crowfeet and lateral part of the lower eyelid.

About ten patients in this study underwent lower lid blepharoplasty too, and we did orbicularis suspension in both upper and lower lid blepharoplasty. It was quite preventive for postoperative round eye appearance as a complication of blepharoplasty.

We avoided excessive tension of our procedure as it can cause floppy eye at the lateral portion of the upper lid, which was fixed intraoperatively by removing the suture and reinserting the suspension suture. Also, to avoid skin depression as a complication of this procedure, the upper part of orbicularis over the lower part.

In those cases with positive canthal tilt, the tension was minimal as this procedure provided some degree of lifting of the lateral canthus.

Orbicularis muscle flap sling was used in one study; orbicularis muscle was dissected from medial to lateral. This flap was anchored to the lateral orbital rim periosteum, but no strip of orbicularis was excised. Instead, they made it a laterally based flap that was anchored to the periosteum. However, in our procedure, a strip of orbicularis was excised, and sutures hold the lower edge of the upper orbicularis directly; we think the flap may give extra bulk to the lateral portion, especially in cases of lateral hooding. Flaps might not be so reliable in atonic orbicularis for elevation. A long muscle flap based on a narrow pedicle might have potency for necrosis, especially at the distal part, which was anchored, then efficacy will not long stand [3].

Orbicularis oculi muscle manipulations are used in some surgical procedures to manage sunken eye, high eyelid fold, undercorrected blepharoptosis post frontalis sling or levator advancement [5-8].

Some studies show no significant change in eyebrow dropping post blepharoplasty. However, as it will decrease tension on the lateral side, this procedure may decrease the chance of lateral eyebrow dropping [9].

Modifications and approaches during upper lid blepharoplasty continue through supratarsal incision of blepharoplasty as contouring of retro-orbicularis oculi fat and transpalpebral myotomy to correct the glabellar and frown lines [10].

Many procedures have been performed for the management of lateral hooding, such as lateral subcutaneous brow lift, forehead lift, an extension of the upper lid incision to the tail of the eyebrow with excessive skin excision on the lateral side.

However, there will be visibility of the scar. Our technique is simple without too much effort and, in our hands, added about 5 to 7 minutes extra time for the whole surgical procedure [11].

More extensive skin-only excision on the lateral side for correction of hooding might have tension on the scar postoperatively, but this procedure decreases tension on the lateral closure site.

CONCLUSION

The orbicularis muscle suspension procedure is a good technique that reliably corrects and reshapes the outer lateral portion of both the upper and lower eyelid.

It is an easy technique, and it would be useful as an adjunctive procedure with blepharoplasty in selected cases for the more youthful periorbital region as it improves upper lid lateral hooding, decreasing tension on skin closure at the lateral side and improvement of crow's feet and lower eyelid fine wrinkles at the superolateral region and decrease round eye appearances.

Conflicts of interest: none

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