

Vertical Midface Lifting with Periorbital Anchoring in the Management of Lower Eyelid Retraction: A 10-Year Clinical Retrospective Study

Michele Pascali, M.D., Ph.D.

Chiara Botti, M.D.

Valerio Cervelli, M.D.

Giovanni Botti, M.D.

Rome and Salò, Italy



Background: Lower eyelid retraction can be the unfortunate result of aesthetic surgery, trauma, disease, or the aging processes. The purpose of this article is to assess whether midface lifting based on purely vertical repositioning constitutes an effective procedure for its correction.

Methods: A retrospective study was carried out on 199 patients (311 eyelids) operated on between January of 2004 and January of 2014. The various causes of eyelid retraction in this population included cosmetic blepharoplasty (56.8 percent), involutional ectropion (23.1 percent), tumor resection (9.5 percent), facial nerve paralysis (8.5 percent), and trauma and related surgery (2 percent). The study was restricted exclusively to cases of moderate and severe lower eyelid retraction addressed by means of midface lifting. The mean follow-up time was 16.8 months. All of the patients were subjected to midface lifting with strengthening of the lateral canthus. A spacer graft was also used in 37.7 percent of the cases.

Results: One hundred ninety-five patients (97.9 percent) displayed objective improvement of the eyelid retraction and a marked degree of improvement both in aesthetic terms and as regards the functional disorders reported. Only four patients (2 percent) presented complications such as needing another operation.

Conclusion: Midface lifting based on purely vertical repositioning makes it possible to recruit a considerable amount of “new” skin at the lower eyelid, thus ensuring a decrease in vertical distraction and correct recovery of the height of the external lamellar plane. (*Plast. Reconstr. Surg.* 140: 33, 2017.)

CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, IV.

Lower eyelid retraction, which can be defined as inferior displacement of the lower eyelid margin without eyelid eversion,¹ is both aesthetically unappealing and functionally problematic.² Various causes can be involved in its pathogenesis. Although the problem lies solely in weakening of the lateral canthus in a limited number of cases, where the malposition of the eyelid margin can be easily remedied by means of a simple canthoplasty or canthopexy,³ the causes must often be sought elsewhere. Among these, one situation frequently found is unquestionably excessive shortening of the anterior lamella (skin and

orbicularis muscle),⁴ which can be caused directly by downward pull on the eyelid because of the descent of the tissues of the entire midface area as a result of the aging processes,^{1,2,5-7} loss of tissue as a result of trauma or oncologic resection,^{8,9} or excessive removal of skin during blepharoplasty.^{4,10}

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From the Department of Plastic and Reconstructive Surgery, University of “Tor Vergata”; and Villa Bella Clinic.

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It should be borne in mind that although cosmetic blepharoplasty remains one of the surgical procedures most requested,¹¹ malposition of the lower eyelid is the most frequent complication.^{1,12-14} Further causes of eyelid retraction include isolated defects of the posterior lamella (capsulopalpebral fascia and conjunctiva), in which case the retraction is nearly always of a posttraumatic scar nature² or connected with medical abnormalities (thyroid disease). Cicatricial “magma” of a postsurgical or traumatic nature developed at the intermediate lamella (the orbital septum) can also involve the capsulopalpebral fascia and retractor muscle posteriorly and/or the orbicularis muscle and the skin anteriorly, thus leading to eyelid retraction.^{1,3} Although the use of spacer grafts is now standard practice in the treatment of retraction or isolated defects of the posterior lamella,¹⁵⁻¹⁸ the approach to defects of the anterior lamella has undergone changes in recent years. Protocols well known in the literature include the use of full-thickness skin grafts^{4,19} or local flaps²⁰ to replace the missing skin, but a valid alternative adopted by various authors

is midface lifting.^{1-3,5-7,21} The lifting of cheeks and the entire midface area is an easy and effective way to recruit “new” skin at the lower eyelid. Although unquestionably more complex than the use of a simple graft or a flap rotated from the upper eyelid, this solution is also far more elegant in surgical terms and also makes it possible to address the problem by means of subciliary access alone,³ with no additional scars (Fig. 1).

The purpose of this article is to report on the authors’ treatment of 199 patients for eyelid retraction by means of midface lifting. In all these cases, where the major problem was to restore the position of the anterior lamella, the technique of midface lifting used involved purely vertical elevation and transorbital anchoring (belt-like suture).³

PATIENTS AND METHODS

A retrospective study was carried out on 199 patients (311 eyelids) operated on between January of 2004 and January of 2014. These were selected by means of a search of a database

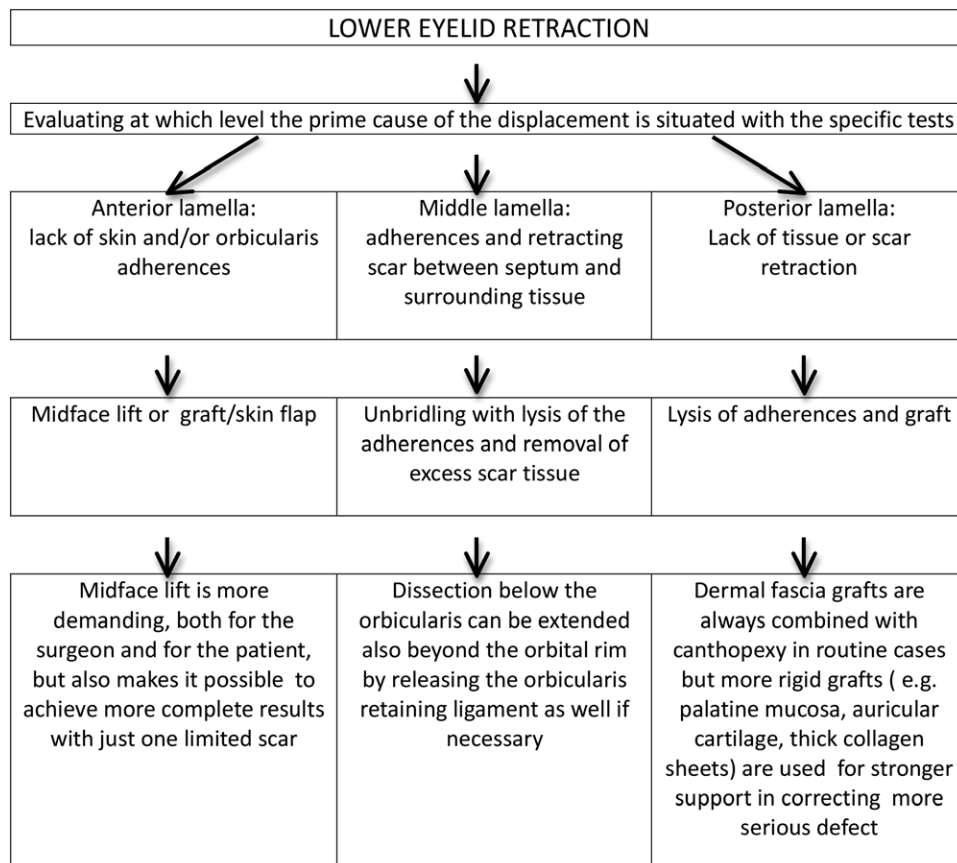


Fig. 1. In a clinical situation, different combinations of techniques are nearly always required to solve problems of this kind. The authors make use in most cases of canthopexy and midface lifting, with the release of deep adhesences, and grafts in the posterior lamella when necessary. Fat grafts can often help to provide stronger support for the eyelid.

containing information on patient demographics, preoperative analysis, operating techniques, postoperative results, and complications. One hundred eight of the patients were women and 91 were men. Patient ages ranged from 29 to 78 years, with a mean of 51.8 years. Table 1 lists the causes of eyelid retraction. Although transconjunctival blepharoplasty does not appear among lower blepharoplasty procedures reported as leading to eyelid retraction, it should be noted that information on this point was unfortunately not available for all of the cases. No significant differences could be detected as regards eyelid retraction between procedures involving the use of separate flaps, first skin then muscle, or skin/muscle flaps. The degree of eyelid retraction, estimated on the basis of the distance in millimeters between the palpebral rim and the lower limbus during forward gaze, was classified as mild (<1 mm), moderate (2 to 3 mm), or severe (>3 mm). Selection criteria were applied to take into consideration solely cases of moderate and severe retraction of the lower eyelid addressed exclusively by means of midface lifting. The postoperative follow-up ranged from 9 to 26 months, with a mean of 16.8 months. Standard photographic documentation was obtained from all of the patients before and after surgery looking straight forward in the sitting position. The position, facial expression, focal distance, and camera settings were all standardized.

Use was made of an objective method and a subjective method in the analysis of results. The former was based on observation of the degree of improvement in eyelid retraction as assessed through examination of the preoperative and postoperative photographs. The latter involved

analysis of the answers to a questionnaire sent to the patients with a letter of explanation and completed by them both before and after surgery at intervals of 2 months and 1 year (Table 2).

Preoperative Evaluation

Identification of the lamella actually involved in the pathogenesis of eyelid retraction is the major priority of the preoperative clinical appraisal of the patient.²² To this end, after the usual snap test to obtain important information on palpebral tone, particular importance is attached to the vertical traction test, which involves pushing the lower eyelid up over the cornea with the examiner’s finger. In conditions of normality, the eyelid should completely cover the upper limbus (cephalic margin of the iris). If the cause of eyelid retraction lies at the lateral canthus, it will be possible to push the eyelid upward as far as the upper limbus without encountering any resistance. If instead the eyelid does not cover the upper limbus, or if even just a certain degree of difficulty is perceived in pushing it cranially, this indicates the existence of a defect in the anterior and/or posterior lamella and an area of cicatricial adhesion at the intermediate lamella. To determine whether the obstacle is primarily posterior or anterior, it is necessary to ascertain whether the palpebral skin is sufficiently abundant and mobile. If it tends, on being pushed up, to slide over the ciliary margin, which instead remains in its position, it can be deduced that the anterior lamella is not defective and the problem lies deeper. If instead the skin does not move upward at all or moves only minimally, this means that this cutaneous deficit is responsible at least in part for the lid retraction.³

Table 1. Types of Retraction, Severity, and Surgical Strategies

Cause	No. of Patients	Degree of Scleral Show				MPA	Surgical Strategies					
		Lids		Mod	Sev		GS*				LCT	
		B	U				1	2	3	4	T Sling	T Strip
Blepharoplasty	113 (56.8%)	87 (64.3%)	26	81	32	113 (100%)	21	13 (51.3%)	0	24	56 (100%)	57
Involution	46 (23.1%)	25 (22.8%)	21	14	32	46 (100%)	0	0 (0%)	0	0	0 (100%)	46
Tumor	19 (9.5%)	0 (6.1%)	19	4	15	19 (100%)	0	0 (0%)	0	0	6 (100%)	13
Facial nerve paralysis	17 (8.5%)	0 (5.5%)	17	3	14	17 (100%)	5	8 (100%)	4	0	10 (100%)	7
Trauma	4 (2%)	0 (1.3%)	4	2	2	4 (100%)	0	0 (0%)	0	0	0 (100%)	4
Total	199	311		104	95	199	26	21	4	24	72	127

B, bilateral; U, unilateral; Mod, moderate (2–3 mm); Sev, severe (>3 mm); MPA, midface with periorbital anchoring; GS, graft spacer; LCT, lateral canthal tightening; T, tarsal.

*1, Permacol MT: porcine dermal collagen; 2, hard palate/mucosal graft; 3, auricular cartilage; 4, suprapubic dermal graft.

Table 2. Subjective Evaluation*

Symptoms	Before Surgery (%)	2 Mo after Surgery (%)	12 Mo after Surgery (%)
Ocular discomfort	199 (100)	111 (55.8)	4 (2)
Redness	147 (73.9)	105 (52.8)	4 (2)
Burning	199 (100)	135 (67.8)	4 (2)
Excessive tearing	199 (100)	60 (30.2)	0 (0)
Photophobia	161 (80.9)	96 (48.2)	6 (3)
Blurred vision	75 (37.7)	32 (16.1)	0 (0)
Aesthetic satisfaction†	3.3 ± 1.2	8.3 ± 1.0	8.5 ± 1.1

*Results of the self-assessment questionnaire sent to all patients with an explanatory letter for evaluation of the ocular symptoms and the degree of aesthetic satisfaction.

†Values are the mean of patient scores (from 0–10). Data are expressed as mean ± SD. It should be noted that the associated ocular symptoms register marked improvement in the space of 2 mo and disappear almost completely after 1 yr. This is probably connected with the initial presence of a certain degree of edema and tissue inflammation, which clears up in the space of a few months.

Finally, the presence of laxity of the lateral canthal tendon is clinically assessed by pulling down on the lateral canthus to see whether the entire lateral canthal angle is mobile. Medial movement of the lateral canthus greater than 2 mm indicates laxity in the suspension system of the canthal ligament/tendon complex.

Surgical Technique

The authors' philosophy as regards midface lifting is stated in an article published in 2015,²³ to which readers are referred for details of the technique. [See **Video, Supplemental Digital Content 1**, which demonstrates the midface lifting and

lateral canthal tendon tightening with tarsal sling and anchoring of the lateral end of the tarsus directly to the orbital frame through two osseous holes (patient shown in Fig. 9), available in the "Related Videos" section of the full-text article on PRSJJournal.com or, for Ovid users available at <http://links.lww.com/PRS/C192>.] The type of midface lifting used for the correction of eyelid retraction is that of purely vertical repositioning of the midface flap with a belt-like suture (Figs. 2 and 3). Briefly stated, the standard access of inferior blepharoplasty is used to arrive at the orbital frame, the periosteum is incised externally to the bony crest, and the entire midface flap is detached, with care being taken to identify and preserve the infraorbital pedicle. Subperiosteal undermining starts with the use of a 10-mm Obwegeser elevator in the malar area and gradually extends medially, dissecting the area situated laterally and caudally to the infraorbital pedicle as far as the pyriform orifice of the vestibular fornix. It is then completed by means of a 6-mm elevator, dissecting the narrow tunnel between the pedicle and the orbital rim as far as the nasal wall. To detach the midface flap completely and obtain an effective upward vertical movement of the tissues, an incision is made to weaken the periosteum bordering the area of detachment.³ For this purpose, the dissector can be used with its blade turned upside-down or with small movements of the wrist in the "can-opener maneuver," gradually lifting the flap at its base. It is important to ensure that the midface flap can move cranially with no obstructions.



Video. Supplemental Digital Content 1 demonstrates the midface lifting and lateral canthal tendon tightening with tarsal sling and anchoring of the lateral end of the tarsus directly to the orbital frame through two osseous holes (patient shown in Fig. 9), available in the "Related Videos" section of the full-text article on PRSJJournal.com or, for Ovid users available at <http://links.lww.com/PRS/C192>.

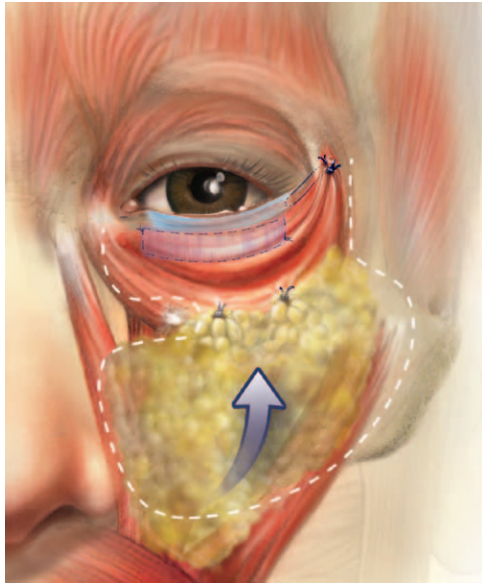


Fig. 2. The *white dotted line* marks the boundary of the periosteal dissection. Note the points where the midface flap is secured to the orbital rim. The spacer graft placed on the posterior lamella to support the eyelid margin is shown in *purple*.

Two or three holes along the inferior orbital rim (Fig. 4) and two on the superolateral margin can then be made. As the lateral canthus should be

positioned approximately 2 mm above the medial canthus in a Caucasian face, the lower hole in the superolateral orbital rim should ideally be made 2 mm above a horizontal line passing through the medial canthus and the upper hole should ideally be made approximately 3 mm above. The holes are made with a drill mounted on a micromotor once the periosteum has been undermined along the inside of the orbital rim.

A cutaneous incision of at least 1.5 to 2 cm at the level of the upper eyelid is usually sufficient for easy access to the region of the lateral orbital rim. The next step is to create a vertical tunnel laterally to the external canthus between the orbicularis muscle and the periosteum (or behind the periosteum), joining the upper eyelid incision to the midface area. The midface flap is then secured. A suture (2-0 Vicryl; Ethicon, Inc., Somerville, N.J.) pierces the flap at the level of the infraorbital pedicle and passes through the most medial hole following a superomedial vector with no knotting (Fig. 5, *left*). When the most lateral sutures have also been positioned (Fig. 5, *right*), all of them are from the most medial to the lateral.

At this point, a small muscle flap created in the lateral portion of the lower eyelid orbicularis is passed through the paracanthal tunnel and

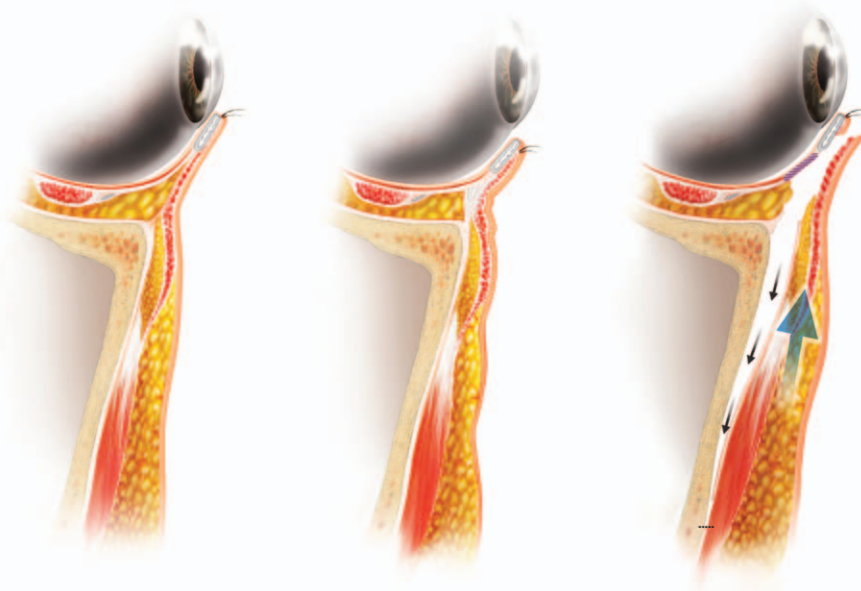


Fig. 3. (*Left*) Normal eyelid anatomy. (*Center*) Lower eyelid retraction. Note the scarring and fusion between the orbital septum and capsulopalpebral fascia posteriorly and the orbicularis muscle and skin anteriorly. The eyelid is inevitably pulled downward as a result. (*Right*) The undermining of the midface flap is carried out in contact with the bone with a total lift of all the soft tissues. To detach the midface flap completely and obtain an effective upward vertical movement of the tissues, an incision is made to weaken the periosteum at the base of the dissection (*dotted line*).



Fig. 4. Two or three holes (with a 1.2-mm burr) along the inferior orbital rim and two holes on the superoexternal margin are usually made.

anchored with 3-0 Vicryl to a hole in the bone on the upper-lateral orbital rim. Care must be taken to leave an adequately wide base (approximately 12 to 15 mm) to ensure that the flap has sufficient nutrition. This should not, however, allow medial movements of the canthus.

The suspension of the midface flap from the orbital frame makes it possible to obtain a remarkable recruitment of “new” skin at the lower eyelid area and evidently decreases the degree of distraction at the external lamellar plane. The amount of skin gained corresponds exactly to the previous midface soft-tissue elevation, often reaching 10 to 15 mm in height (Fig. 6).

It is often necessary to remove a conservatively estimated amount of skin, from the lateral paracanthal area alone, and sometimes also to trim the orbicularis, again conservatively. It should be

borne in mind that, whereas the deeper tissues are held more firmly in the new position, those closer to the surface (skin, orbicularis, and fat) have a slight tendency to settle over time.²⁴

In cases where preoperative clinical analysis has also detected a deficit of the posterior lamella, the next step is the insertion of a spacer graft. The authors make routine use of many different materials, such as spacers, including porcine dermal collagen (Permacol; Covidien, Dublin, Ireland), hard palate/mucosal grafts, auricular cartilage grafts with a covering of perichondrium and/or skin, and grafts of dermis usually harvested from the suprapubic region. The spacers are usually 4 to 6 mm high and 20 to 25 mm in length, according to need. They can be positioned posteriorly through a transconjunctival incision, in which case the conjunctiva and lower lid retractors (capsulopalpebral fascia) are detached from the inferior border of the tarsus and the spacer is placed into the recessed bed to lengthen the posterior and middle lamella (Fig. 7). A 6-0 Vicryl suture is used to attach the graft to the recipient inferior tarsal edge and the recessed conjunctiva and capsulopalpebral fascia. The suture should be tied on the skin to prevent any corneal injury. Alternatively, the conjunctiva can be left intact, and use can be made of an anterior approach through the cutaneous incision to reach and cut through the plane of the retractors where the spacer is sutured (Fig. 8).

Tightening of the lateral canthal tendon is now carried out by means of two procedures: canthopexy with plication of the canthal ligament (tarsal sling) and canthoplasty with canthotomy and shortening of the palpebral margin (tarsal

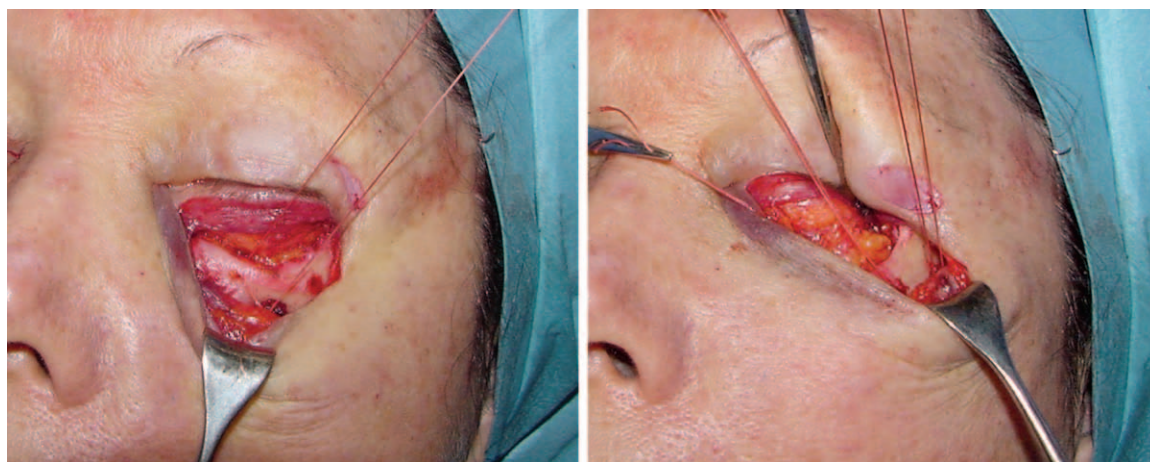


Fig. 5. (Left) A suture pierces the flap at the level of the infraorbital pedicle and passes through the most medial hole following a superomedial vector without being knotted. (Right) When the most lateral sutures have also been positioned, all of them are tied from the most medial to the lateral.



Fig. 6. Midface lifting with transorbital anchoring makes it possible to recruit a considerable amount of new skin in the area of the lower eyelid, which can reach 10 to 15 mm in height. The quantity obtained in this case was indeed so abundant that it even proved necessary to remove a small portion before suturing.

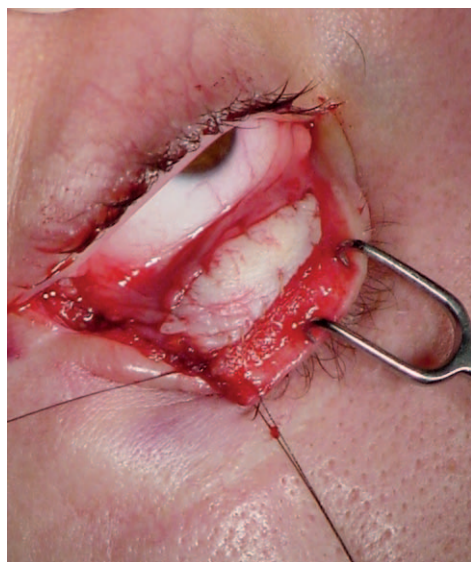


Fig. 7. Hard palate/mucosal graft positioned posteriorly through a transconjunctival incision. The conjunctiva and lower lid retractors (capsulopalpebral fascia) are detached from the inferior border of the tarsus and the spacer is placed into the recessed bed to lengthen the posterior and middle lamella. A 6-0 Vicryl suture is used to attach the graft to the recipient inferior tarsal edge and the recessed conjunctiva and capsulopalpebral fascia. The suture should be tied on the skin to prevent any corneal injury.

strip). In the tarsal sling, the paracanthal portion of the orbital septum (canthal ligament) is secured with a suture (5-0 nylon) to the periosteum of the orbital rim. In cases where the canthal ligament/tendon system is not regarded as

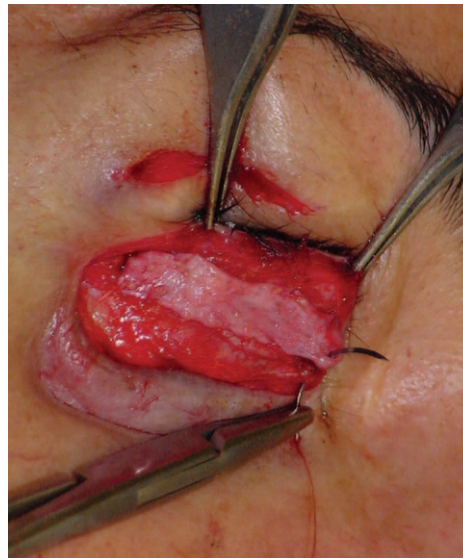


Fig. 8. Dermis graft harvested from the suprapubic region and positioned by means of an anterior approach through the cutaneous incision to reach and perforate the plane of the retractors where the spacer is sutured.

sufficiently thick and reliable but proves weak and slack, it is preferable to secure the lateral end of the tarsus directly to the periosteum of the orbital rim, which ensures more reliable attachment. In this case, it is not necessary to tighten the plication suture all the way; instead, it is sufficient to make sure that the canthus has been correctly repositioned and that adequate palpebral tone has been obtained. If the palpebral margin instead proves to have undergone excessive elongation, sometimes even to the point of assuming an arched shape, it becomes necessary to combine strengthening of the canthal suspension system with effective shortening of the eyelid by means of the well-known tarsal strip technique.

After the execution of canthotomy and subsequent cantholysis, the lower canthal tendon is identified and amputated at the base. The new tendon obtained and stripped of any covering tissue (conjunctiva and skin) can be reattached in its original location after suitable shortening of its lateralmost portion or secured in a more cephalic position.

It should also be noted in this connection that if, in performing the two techniques to strengthen the canthal suspension system (with and without canthotomy), the periosteum at the level of the superolateral orbital rim is considered too thin and fragile to guarantee effective and stable anchoring over time, it is preferable to make two transosseous holes, 3 to 4 mm apart, to anchor the suture. In the authors' opinion, exclusively

periosteal suspension is possible only in rare cases and on condition that the periosteum is thick and robust. They regard direct anchorage to the bone as a better guarantee of success in practically every case, not least because patients of this type have already undergone attempts at correction and the periosteum often proves weak and brittle.

The surgical procedure put forward unquestionably has the drawback of major postoperative edema extending over the entire area of midface and palpebral detachment. To limit morbidity and improve recovery postoperatively, it can prove useful to irrigate the area of dissection with a solution of triamcinolone acetonide (10 mg/ml) and apply a compressive dressing with tapes and 3M Reston foam pads (4 mm) (3M, St. Paul, Minn.) suitably cut to shape. This dressing is removed 4 days later and replaced with a lighter dressing for another 5 to 7 days.

RESULTS

All of the patients examined were subjected to midface lifting with transorbital anchoring and strengthening of the lateral canthus. A spacer graft was inserted in 37.7 percent of the cases. Table 1 shows the types of canthopexy/canthoplasty and spacers used in relation to the different types of eyelid retraction involved. Representative outcomes are shown in Figures 9 through 12. The subjective evaluation carried out through analysis of the questionnaires completed by the patients also showed a high degree of satisfaction with the aesthetic results obtained, together with marked

improvement of the associated ocular symptoms (Table 2). Examination of the results obtained clearly shows that the approach put forward here makes it possible to remedy most of the ocular symptoms presented by patients before the operations. It should be noted that symptoms such as excessive tearing and blurred vision disappeared completely in the space of 1 year, whereas others present before the operation, such as ocular discomfort, redness, burning, and photophobia, were reduced considerably (Table 2). Moreover, the associated midface lifting results in evident aesthetic improvement of the entire region of the eyelid and adjoining midface area. Only four patients reported a persistent sensation of ocular discomfort, which was in any case combined with elimination of some of the functional problems present before the operation.

Complications

Table 3 lists the postoperative complications registered. Despite the application of a Frost suture (tarsorrhaphy) every time a conjunctival edema was noted at the end of the operation, chemosis developed in 26 patients (13.1 percent). This was eliminated in all cases within 3 to 4 weeks through the application of a steroid eye drop four times per day (for a maximum of 2 weeks) and cold compresses. A layer of thick cream was also applied to protect the eye during the night. Four patients (2 percent) experienced corneal irritation from the absorbable sutures of the spacer graft normally left in place, which was remedied

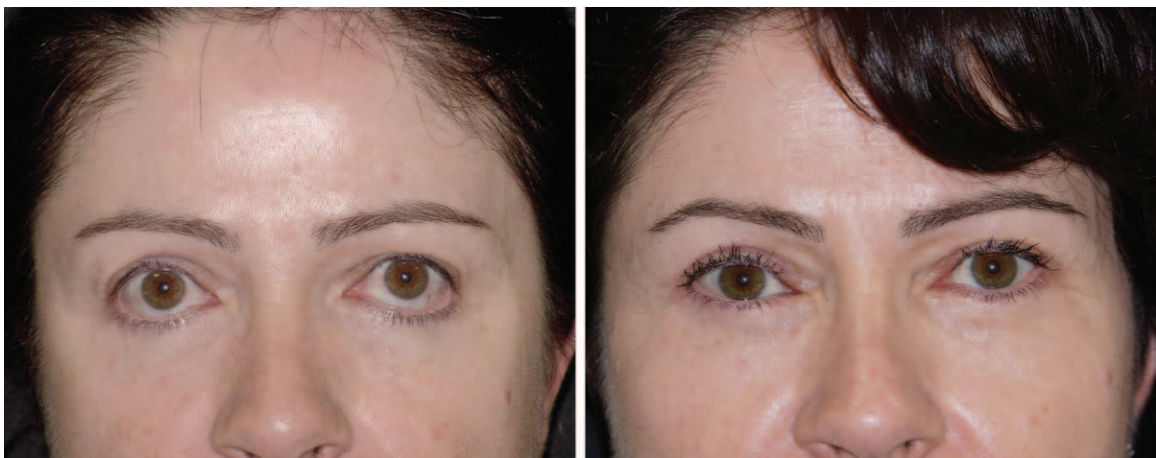


Fig. 9. (Left) Preoperative view of a 48-year-old woman with bilateral lower lid retraction (left greater than right) and canthal dystopia subsequent to cosmetic blepharoplasty. The patient complained of scleral show, a sad-eyed appearance, and ocular irritation. (Right) Twelve-month postoperative view after midface lifting and lateral canthal tendon tightening with tarsal sling and anchoring of the lateral end of the tarsus directly to the orbital frame through two osseous holes. The lower eyelids are satisfactorily repositioned and the scleral show, round lateral canthi, and ocular irritation are all corrected.

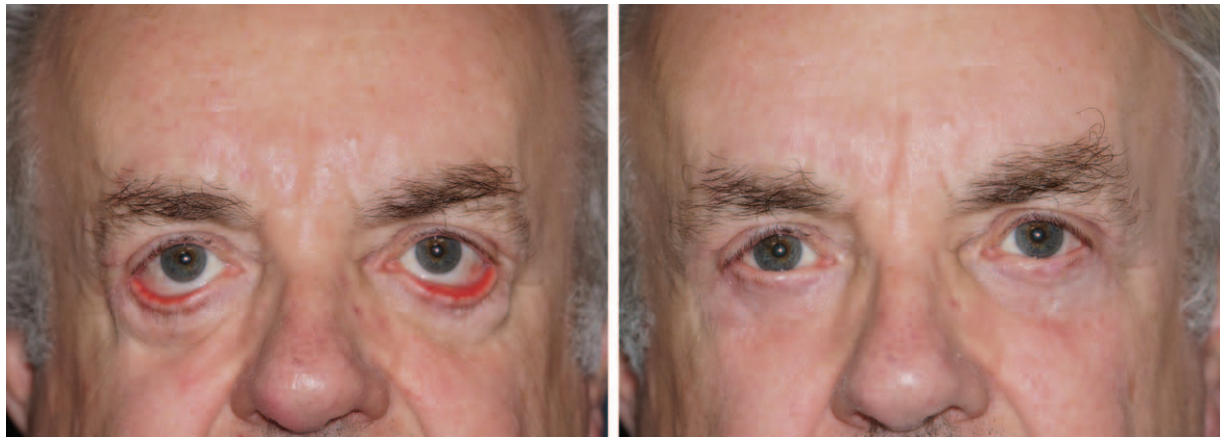


Fig. 10. (Left) Preoperative view of a 62-year-old male patient with bilateral involitional ectropion (left greater than right), ocular irritation, and chronic keratoconjunctivitis. (Right) Eighteen-month postoperative view after midface lifting and lateral canthal tendon tightening with tarsal strip and osseous anchoring to the orbital frame. The results proved satisfactory in cosmetic and functional terms.

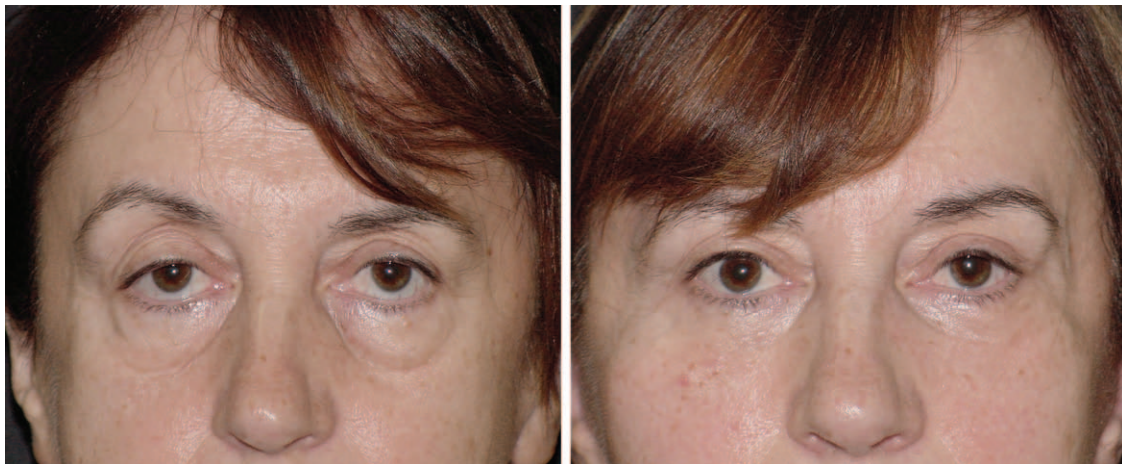


Fig. 11. (Left) Preoperative view of a 54-year-old female patient with bilateral involitional lower lid retraction. Note the particular laxity of the palpebral soft tissues, infraorbital hollowness, and midface descent. (Right) Two-year postoperative view after midface lifting and lateral canthal tendon tightening with tarsal strip and osseous anchoring to the orbital frame. Note the correction of the lower eyelid position and infraorbital hollowness, which has been maintained for 2 years since surgery. The upper eyelid ptosis of senile type evident in the right eye was successfully corrected during the operation by securing the aponeurosis of the elevator to the superoanterior rim of the tarsus.

by their immediate removal. One patient (0.5 percent) had decreased sensation in the distribution of the maxillary division or the trigeminal nerve, which cleared up by itself in the space of 6 months. Four patients (2 percent) manifested major complications such as requiring another operation. One of them developed detachment of the lateral canthus 2 weeks later. A further operation was performed, including a second anchoring, with the tarsal strip directly attached this time to two transosseous holes in the superolateral orbital frame. The other developed unilateral cellulitis of the lower eyelid 3 months after the

operation, resulting in scarring and ectropion. A new operation, including a tarsal strip this time and the insertion of a new spacer graft, was performed 3 months later, once the inflammation had completely disappeared. Finally, failure of the lateralmost portion of the palpebral margin to appose the ocular globe was noted in two patients a few days after the operation, when absorption of the edema was already underway. It proved necessary in both cases to anchor the tendon/ligament complex more internally at the level of the orbital frame. The fact that none of the major complications reported is connected with the recurrent

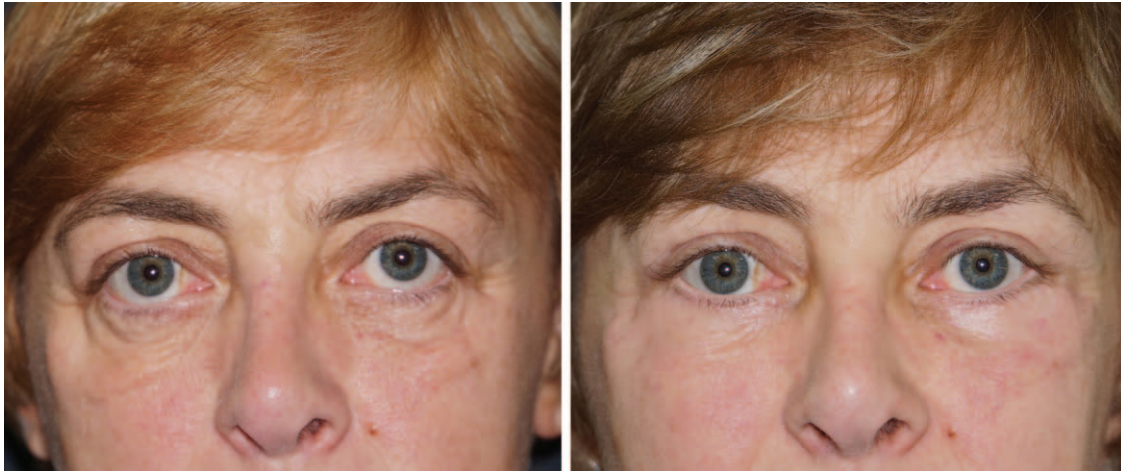


Fig. 12. (Left) Preoperative view of a 55-year-old woman with bilateral lower lid retraction subsequent to cosmetic blepharoplasty. The patient complained of scleral show, a sad-eyed appearance, persistent infraorbital hollowing, and midface descent. (Right) Twelve-month postoperative view after midface lifting, lateral canthal tendon tightening with tarsal strip, and the insertion of Permacol (1-mm) grafts. The lower eyelids and midface are satisfactorily repositioned.

Table 3. Postoperative Complications

Complications	No. of Patients (%)
Minor	
Corneal irritation	4 (2)
Ocular infections	0 (0)
Conjunctival chemosis	26 (13.1)
Paresthesia	1 (0.5)
Scar requiring revision	1 (0.5)
Canthal web revision	1 (0.5)
Excision of granuloma(s)/cyst(s)	1 (0.5)
Major	
Secondary lid malposition	4 (2)

descent of midface soft tissues confirms the effectiveness of midface lifting with a subperiosteal approach and osseous anchorage. The authors believe on the basis of their experience that the correction of eyelid retraction can be regarded as stable and definitive with no risk of relapse after a period of 9 to 12 months.

DISCUSSION

Retraction of the lower eyelid has a whole range of causes^{1,2,5} and constitutes a serious problem for the patient in both aesthetic and functional terms.² Regardless of the cause of the retraction, which can lie in the lateral canthus, the eyelid, or the midface area, the fundamental prerequisite for correct diagnosis and selection of the right treatment is thorough knowledge on the part of the surgeon of the anatomy of the entire region of the middle third of the face.²⁵ Examination of the countless articles in the literature on the changes

undergone by this area during the aging processes clearly shows that the lower eyelid and the midface region are two intimately interconnected structures.^{5-7,21-23,26} Drooping of the malar fat pad pulls on a lateral canthal tendon that is often no longer strong and elastic,⁶ thus leading to descent of the lower eyelid with rounding of the palpebral rim and scleral show. Moreover, these aging processes can be accelerated or amplified by aesthetic surgery on the lower eyelid.¹ Surgical skin removal (not necessarily of an overaggressive character) and the simple manipulation of palpebral fat,^{1,4,19} which are routine maneuvers during cosmetic blepharoplasty, can in fact result in retractive scar formation and fusion of the orbital septum with the capsulopalpebral fascia posteriorly or with the orbicularis muscle and skin anteriorly.³ The eyelid is inevitably pulled downward as a result.

In the authors' opinion, the separation of skin from muscle does not result in a higher incidence of eyelid retraction. The slightly greater retraction of the skin flap occurring when this procedure is used should, however, be taken into account.

As regards the part played by muscle denervation, the authors are not convinced that subciliary incision constitutes a major cause of lid displacement, as also demonstrated in other studies.²⁷ As the nerve endings reach the orbicularis oculi both laterally in its central part and medially, a split in the upper section caused by surgical incision cannot impair its functionality. It is in any case well known that the most common complication after blepharoplasty is lower eyelid displacement (from

scleral show to ectropion), with published rates of 5 to 30 percent.^{11,28–30}

In light of these considerations, it is easy to understand why the role of midface lifting in the treatment of eyelid retraction has been broadly explored over the past 15 years. Patipa^{1,6,25} observes that lower eyelid retraction is usually accompanied by midface descent and claims that subperiosteal midface elevation makes it possible to reposition the midface structures and the lower eyelid in their normal anatomical positions. This results in a considerable recruitment of skin at the lower eyelid and eliminates any need for skin grafts.¹ Patel et al.² also note that more severe retraction of the lower eyelid has basically three causes: laxity of the lateral canthal tendon, scarring of the middle lamella, and midface descent. Their “tripartite approach” involves combined lateral canthoplasty, spacer graft placement, and midface elevation for all their patients.

Although Patel et al. always make use of a spacer on the posterior lamella, in the authors’ experience this proves necessary only in a limited number of cases (37.7 percent). Chung and Yen⁵ take the same view and point out that the midface has an intimate relationship with the anatomy of the lower eyelid. They therefore regard midface lifting as a key additional procedure in the treatment of patients with cicatricial, involucional, and paralytic ectropion. Other authors have reported their own experiences and confirmed the usefulness of midface lifting to correct malposition of the lower eyelid.^{7,21,30–32}

Being already firmly convinced of the effectiveness of midface lifting in the correction of defects of the middle third of the face arising from aging processes,^{3,23} the present authors also confirm its usefulness in the correction of eyelid retraction. The results reported here on a total of 311 eyelids also demonstrate unequivocally that the approach put forward makes it possible to obtain both a high degree of aesthetic improvement and almost complete elimination of the associated ocular symptoms (Table 2). The only alternative is in any case the use of full-thickness skin grafts^{3–5,33} or local flaps such as the skin-muscle pedicle flap from the upper lid.^{34,35}

The advantages of midface lifting are in any case multiple. The skin recruited from the cheek and elevated to the eyelid level has the same texture and color as the missing skin and is thick and robust.³ Grafts of skin harvested from areas at a distance from the eyelid, such as the neck and the retroauricular and supraclavicular regions,²⁰ can instead often differ from it in color and texture

and prove subject to retraction and sometimes to unpleasant discoloring over time, which can make the results unsatisfactory.³ Needless to say, however, if the cutaneous deficit cannot be adequately compensated by elevation of the midface flap because a sufficient amount of skin is not available for some reason, the skin graft remains the only valid alternative capable of ensuring adequate palpebral coverage.^{3,5}

Although there now appears to be general agreement on the usefulness of midface lifting in recruiting skin at the palpebral level, there are differences of opinion as regards the ideal plane of dissection of the midface flap,²³ classically regarded as the subperiosteal^{35–44} or supraperiosteal.^{45–50} The authors have already stated their views in a previous article,²³ where they argue that the subperiosteal approach presents numerous advantages in the rejuvenation of the middle third of the face. For the same reasons, these advantages prove equally valid and effective in the treatment of eyelid retraction. With the subperiosteal approach, all of the structures contained in the midface flap, from the skin to the bone beneath (the orbicularis muscle, the sub-orbicularis oculi fat, the malar fat pad, and the origins of the zygomaticus major and minor muscles and levator labii superioris), are moved upward. The thickness of the repositioned tissues is unquestionably greater than that obtained by means of a supraperiosteal approach, and the periosteum itself functions as a “suspender” to hold all the tissues above it together.

A further point to be made is that suitable detachment of the periosteal insertion at the base of the cheek bone and at the level of the oral vestibule²³ is essential to effective repositioning of the midface flap. This lifting is stronger in the deeper layers than the superficial ones: greatest on the sub-orbicularis oculi fat, slightly less on the orbicularis muscle, less at the level of the subcutaneous fat, and still less on the skin. Moreover, with the subperiosteal approach, once the midface border has been secured at the level of the orbital frame, direct fat grafting is still possible at the subcutaneous level if required. The injection of autologous fat strengthens the supporting base of the eyelid, and provides a valid aid in remedying eyelid retraction.³ This is particularly important in the presence of a negative vector. With the subperiosteal approach, the vascularization of the uppermost layers also remains intact, which is the essential prerequisite for the grafted fat to take as well as possible.

As regards the strengthening of the lateral canthus, midface lifting was combined with

canthopexy/canthoplasty in all cases considered in this study. Weakening of the lateral canthus to a varying degree is in fact a constant feature² and one that may or may not be associated with transversal elongation of the eyelid. Simple plication of the canthal ligament by means of the tarsal sling technique²⁹ is sufficient to restore the tension of the suspension system represented by the tendon/ligament in cases of no more than moderate laxity.^{1,11} If it instead proves necessary to combine strengthening of the canthal suspension system with effective shortening of the eyelid, use is made of the well-known tarsal strip technique.⁵¹

The use of a spacer graft proved appropriate in 37.7 percent of the cases. Preoperative diagnosis obviously plays a crucial role in assessing whether this is required. As regards the characteristics of the graft, this may serve simply as a spacer to lengthen the posterior lamella and replace missing/retracted tissue or also as a “stabilizer,” performing a static and supporting function of the palpebral margin over time. When the function of a palpebral stabilizer is instead also required, grafts of greater thickness and robustness are to be preferred, such as hard palate/mucosal grafts, auricular cartilage grafts, or 1-mm Permacol.

A further question arises at this point, namely, what to do when the problem is one of asymmetry, meaning that the defect is either bilateral but worse on one side or unilateral. Correction in these cases must seek to establish eyelid symmetry with regard to an ideal point of reference, which may also be the eye not in need of treatment. In this ideal position, the rim of the lower lid should run along the corneal limbus or overlap it by approximately 1 mm, and the position of the lateral canthus should be 2 mm above the medial with the eye in central gaze.

When unilateral midface lifting is carried out, the malar eminence can be fuller and projected to a greater degree on the treated side. To avoid an evident and lasting difference, it is important to avoid overly caudal anchorage of the periosteum that stretches the midface flap. This would cause a deep crease in the periosteum and result in greater and lasting projection on that side.²³ More cephalic anchorage makes it possible to avoid this problem, as the settling of tissues eliminates any evident difference between the two sides in a comparatively short period.

CONCLUSIONS

Midface lifting based on the purely vertical repositioning of soft tissue with transorbital

anchoring has proved to be a highly effective procedure in the correction of eyelid retraction. The results obtained with success in the treatment of both aesthetic and functional problems make it possible to state that midface lifting should always be taken into consideration for the correction of eyelid retraction caused primarily by cutaneous deficiency.

Michele Pascali, M.D., Ph.D.

Department of Plastic and Reconstructive Surgery,
University of “Tor Vergata”
Viale Oxford 81
00133 Rome, Italy
mic.pascali@gmail.com

PATIENT CONSENT

Patients provided written consent for the use of patients' images.

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