Periorbital Rejuvenation

Tips and Techniques

Bahram Eshraghi
Mohsen Pourazizi
Editors

Springer

Periorbital Rejuvenation

Bahram Eshraghi • Mohsen Pourazizi
Editors

Periorbital Rejuvenation

Tips and Techniques

Springer

Editors
Bahram Eshraghi
Department of Ophthalmology
UT Health at San Antonio (University of Texas Health at San Antonio)
San Antonio, TX, USA

Mohsen Pourazizi
Isfahan Eye Research Center
Department of Ophthalmology
Isfahan University of Medical Sciences
Isfahan, Iran

ISBN 978-981-95-9677-5 ISBN 978-981-95-9678-2 (eBook)
https://doi.org/10.1007/978-981-95-9678-2

Surgical and Surface Periorbital Anatomy

1

Matin Irajpour and Mohsen Pourazizi

1.1 Introduction

Thorough knowledge of the complex anatomy of periorbital region is paramount for any surgeries involving this area. Surgical procedures involving eyelids can affect their function as well as their form. Therefore, understanding areas that might be affected as a result of rearrangement or complications is crucial. Furthermore, for a clear understanding of the techniques demonstrated in the following chapters, a solid anatomic foundation is required.

1.2 Orbit and Bony Structures

The orbit cavity houses the globe as well as extraocular muscles, nerves, blood vessels, and fatty tissues. It has a pyramidal shape with curvilinear walls, and seven bones contribute to its formation: frontal, sphenoid, maxillary, zygomatic, palatine, ethmoid, and lacrimal (Fig. 1.1).

The roof of the orbit has a cephalic curvature on its lateral aspect that houses the lacrimal gland. The superior orbital rim is the most projected rim due to expansion of frontal sinuses, especially in adult males. It has a notch on the medial third through which the superior orbital neurovascular bundle runs; this notch can become calcified and form a foramen [1]. This location is an important reference point for avoiding injury to the nerve during brow and forehead surgeries. The portion of superior rim between supraorbital notch and medial canthal ligament appears flatter, from which the supra and infratrochlear nerves as well as dorsal nasal artery emerge.

▶ **Tip** Important bony landmarks in the periorbital region:

- Superior orbital rim: for determining the brow's position.
- Inferior orbital rim: for determining orbit's vector (negative or positive vector).
- Supraorbital notch: for locating the supraorbital neurovascular bundle.

From the medial border to the apex is approximately 45 mm, which is about 10 mm longer than lateral rim to the apex [2]. Average orbital volume is measured at 24.5 ± 3.08 cc, which is slightly larger in males and on the right side [3, 4]. Eyes occupy about 7.2 cc of this space with the average diameter of 24 mm.

M. Irajpour
Isfahan Eye Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

M. Pourazizi (✉)
Isfahan Eye Research Center, Department of Ophthalmology, Isfahan University of Medical Sciences, Isfahan, Iran
e-mail: m.pourazizi@med.mui.ac.ir

B. Eshraghi, M. Pourazizi (eds.), *Periorbital Rejuvenation*,
https://doi.org/10.1007/978-981-95-9678-2_1

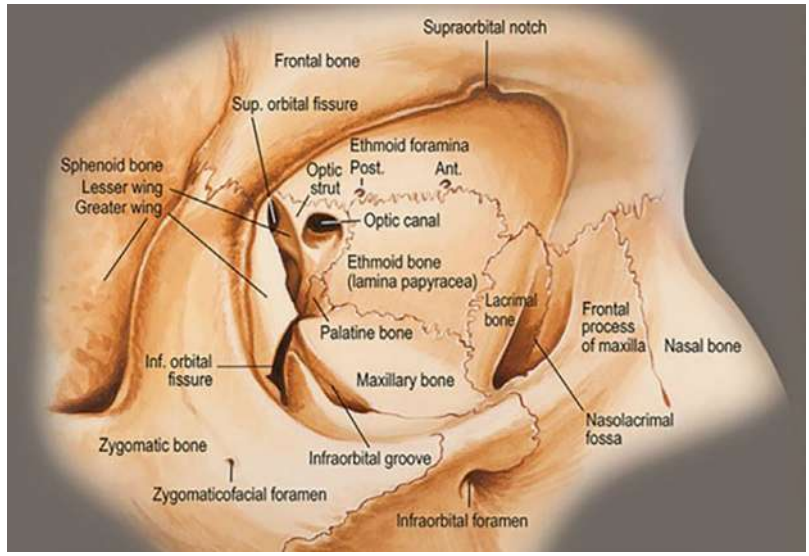

Fig. 1.1 Osteology of the orbit (exactly taken from Bones of the Orbit, In: Atlas of Orbital Imaging, Jack Rootman et al., Springer, License number: 6026070611623)

▶ **Tip** Multiple canthopexy techniques use the upper lateral part of the orbital rim, made by the zygomatic bone, as a suture point for supporting the lower eyelid.

1.3 Muscles

Extraocular muscles: The extraocular muscles are comprised of six muscles that control the movements of the eye and the singular muscle that elevates the eyelid (levator palpebrae). Ophthalmic artery is the main arterial supplier of extraocular muscles. Oculomotor nerve (CN III) innervates all of these muscles except for lateral rectus and superior oblique muscles, which are innervated by abducens (CN VI) and trochlear (CN IV) nerves, respectively (Fig. 1.2).

▶ **Tip** During upper blepharoplasty, carefully avoid damaging the levator muscle aponeurosis, which lies partially behind the septum and retroseptal fat and under the superior part of the pretarsal orbicularis oculi muscle, as injury can lead to ptosis.

▶ **Tip** In lower transconjunctival blepharoplasty, be cautious around the posterior lamella at the inferior border of the capsulopalpebral fascia to avoid damaging the inferior oblique muscle and prevent scarring.

Orbicularis oculi muscle (OOM): Orbicularis oculi muscle's function is to close the eyelid, but it also facilitates the drainage of tears through different structures in the tear drainage system. It is a striated muscle, with fibers running parallel to eyelid margins. It receives motor innervation from frontal and zygomatic branch of the facial nerve (CN VII). OOM is divided in to pretarsal, preseptal, and orbital parts. Pretarsal and preseptal portions are located over the tarsus and septum, respectively. The orbital part extends from the eyelid to superiorly to the forehead, laterally to temple and inferiorly to the cheek. The deep head of pretarsal portion, known as Horner's muscle or pars lacrimalis, is inserted into posterior lacrimal crest. Preseptal fibers also have a deep head, called Jones' muscle, that inserts into the lacrimal fascia (Fig. 1.3).

▶ **Tip** OMM is crucial in blepharoplasty, as its firm attachment to the eyelid skin means any manipulation of the muscle (contraction, dissection) will directly impact the skin's texture and the aesthetic outcome of the periorbital area.

Frontalis: It is a part of the larger occipitofrontalis muscle that inserts directly to the orbi-

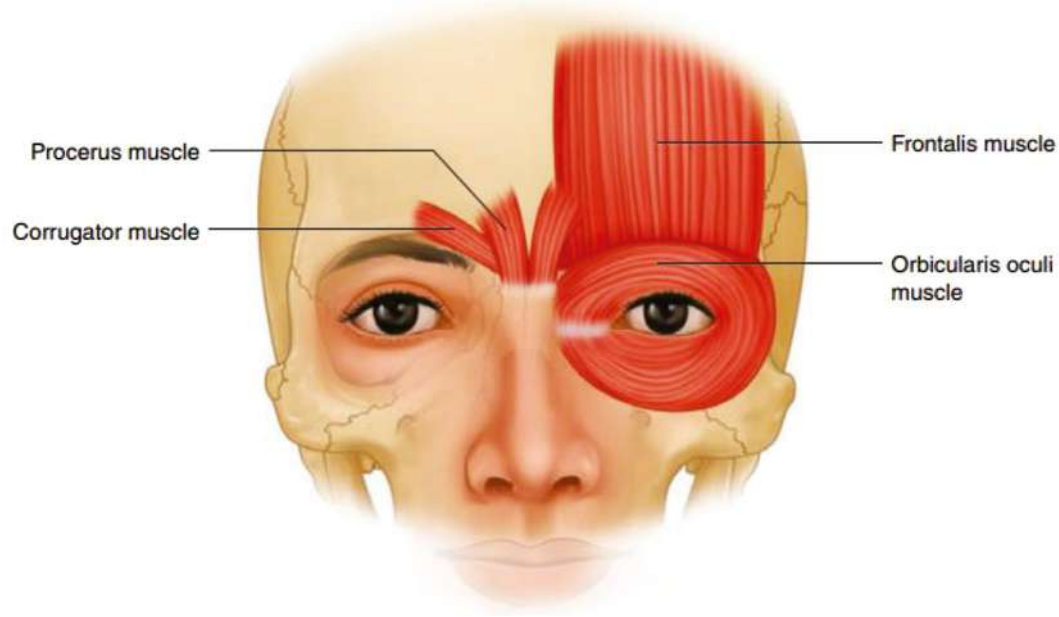

Fig. 1.2 Muscles in the periorbital region (exactly taken from Anatomy of the Periorbital Region. In: Applied Head and Neck Anatomy for the Facial Cosmetic Surgeon, Christine E. Niekrash, Springer, License number: 6018910761665)

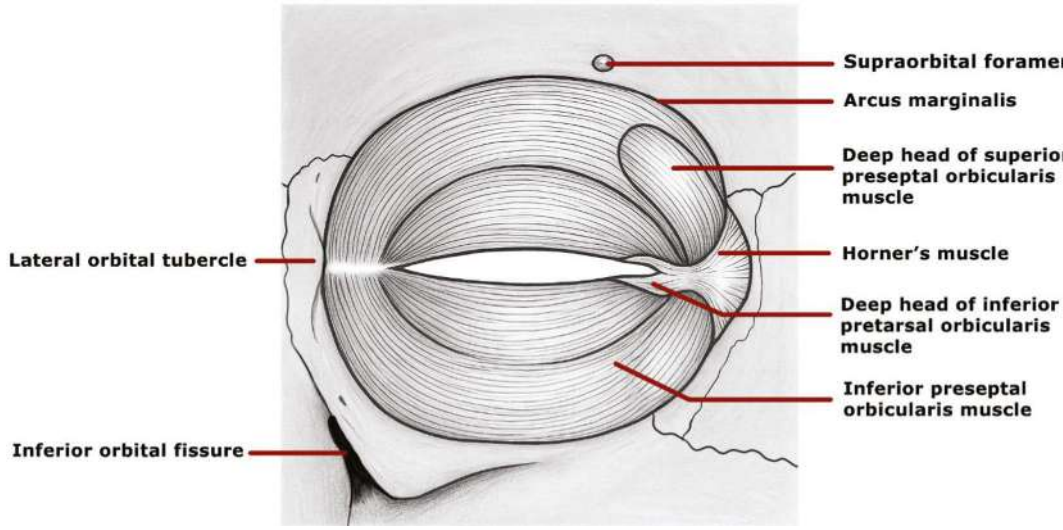

Fig. 1.3 Parts of orbicularis oculi muscle (Illustration made by Matin Irajpour for this book)

cularis oculi muscle. Contraction of frontalis muscle elevates the brow, which makes it a target for neurotoxin injections. This muscle is innervated by frontal branch of facial nerve (CN VII). However, injections near the orbital rim could lead to ptosis due to neurotoxins reaching levator palpebrae.

Procerus: This muscle originates from the nasal bone and inserts to the skin above the glabella; depressing the medial part of brow when contracted, forming the horizontal lines between eyebrows. Procerus can receive motor innervation from the frontal, zygomatic, or buccal branch of facial nerve (CN VII) [5, 6].

Corrugator supercilii: It originates from the nasofrontal suture and inserts into skin above the superciliary arch. On contraction, it pulls the eyebrow medially and inferiorly, creating the vertical lines between eyebrows [7]. Corrugator receives motor innervation from the frontal branch of facial nerve (CN VII).

1.4 Eyebrows

The eyebrows usually span between 5 and 5.5 cm horizontally and 1.3 to 1.5 cm vertically. Medially they start from the supraorbital rim and end on the line that connects the lateral border of nose and lateral canthus. In females, eyebrows are located 0.5 to 1 mm above the superior orbital rim. It also has a slight curvature, with the highest point being between later limbus and lateral canthus and 3 mm above the orbit. In males, eyebrows are typically flatter (Fig. 1.4).

A notable aging change is the flattening of eyebrows. However, in some individuals due to weakness of levator palpebrae muscle, as a compensatory mechanism, the frontalis muscle is chronically contracted, lifting the brow.

Eyebrow ptosis is defined as having less than 10 mm from the brow to the eyelid. Many etiologies have been identified for this condition, but the most common cause is age-related. Majority of blepharoplasty candidates have some degree of eyelid ptosis, which requires eyebrow lift to be performed along with blepharoplasty, because otherwise the ptosis would deteriorate [8]. Measurements for the extent of eyebrow ptosis should be performed while brow and frontalis muscle are relaxed, and eyes are closed [9, 10].

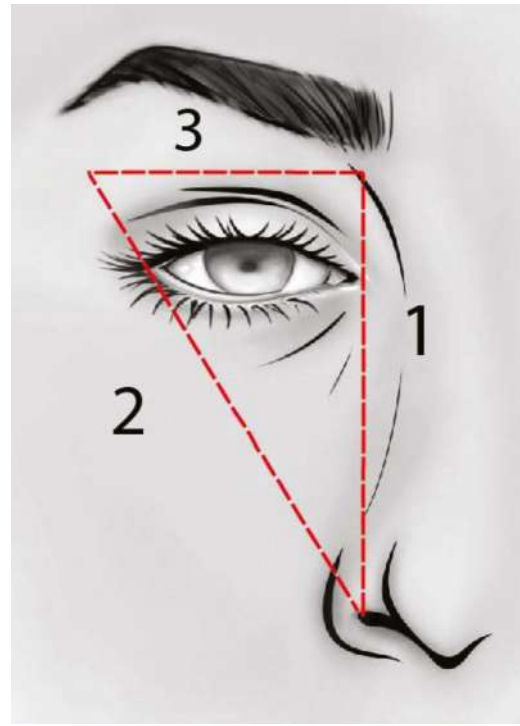

Fig. 1.4 Normal brow in females. Line 1: The medial margin of the brow aligns with a line extending from the medial canthus to the nasal ala. Line 2: The lateral margin of the brow aligns with a line extending from the lateral canthus to the nasal ala. Line 3: Both lines terminate at the same horizontal plane. (Illustration made by Matin Irajpour for this book)

1.5 Eyelids

Eyelids mainly serve a protective function to shield the eye from injury and excessive light. They also contribute to providing nutrients and lubrication of cornea while facilitating drainage of tear in the lacrimal system. Interpalpebral fissure is 30–31 mm wide and 10–11 mm high, which decreases in older patients to about 8–10 mm [11]. On the anterior side, this fissure is covered by a cutaneous epidermis without any subcutaneous fat layer. Posteriorly it is covered by conjunctiva and Meibomian gland orifices. At the edge of the eyelid, there is faint gray line that is made by the Riolan's muscle. This striated muscle may be involved in Meibomian glands discharge and positioning the eyelashes. Medial and lateral extensions of eyelids and tarsus are bounded by medial and lateral canthal (palpebral) tendons [12]. Reforming the upper eyelid crease during blepharoplasty or ptosis surgery is crucial for normal cosmetic appearance [8, 13].

Tarsal plat show (TPS) is referred to the distance between upper eyelid's edge and its crease. Brow fat span (BFS) is the distance between the

lower border of eyebrow and the eyelid crease. Margin reflex distance (MRD) is determined by shining a light at the level of the eye and measuring the distance from the light reflex to eyelid margins. MRD 1 is the distance to the edge of upper eyelid and MRD2 is the distance to the lower eyelid's margin. Normal range of MRD1 is 4 to 5 mm [14]. The width of palpebral fissure is the sum of MRD1 and MRD2. MRD 1 is helpful in grading unilateral ptosis [15, 16] (Figs. 1.5 and 1.6).

▶ **Tip** The upper lid's margin lies slightly lower than the upper limbus (0.5 to 1 mm lower); while lower lid's margin rests on the lower limbus.

▶ **Tip** In Asian ethnicities, brows have a thicker skin while also being located slightly higher. Also, the upper eyelid crease is not present in about 50% of Asians. Additionally the pretarsal and suborbicularis fat pads are more prominent, which leads to a fuller and puffier eyelids in Asians [17].

Orbital Septum: Deep below the OOM muscle, there is a connective tissue layer that is known as the orbital septum, which originates from the orbital periosteum and adheres to the tarsal plates. It is also connected with levator palpebrae's aponeurosis and skin of the eyelid, making the upper eyelid crease. In Asians, these adhesions are lower, located below the superior margin of tars, preventing the insertion of levator muscle to the skin, resulting in absence of the upper eyelid crease.

In the lower eyelid, orbital septum is connected to capsulopalpebral fascia, which is located 5 mm inferior to the tarsal plate. This septum also prevents the spread of preseptal infection into the orbital fossa.

Orbital Fat: There are three main fat pads in the upper eyelid: preaponeurotic, pretarsal, and retro-orbicularis oculi fat (ROOF) pad. The preaponeurotic fat pad is situated behind the orbital septum, which acts as a barrier between it and the pretarsal fat pad. ROOF or upper galea fat pad lies just under the skin, covered by deep galea. This fat pocket is more noticeable laterally, and with advanced age, it typically moves anteriorly and inferiorly. This descent, along with the same for pretarsal fat pad, might lead to increased tension on orbital ligaments and deep galea, eventually causing contracture of frontalis muscle and fullness of temporal part of the eyelids.

In the lower eyelid, there are also three fat pockets: lateral, medial, and central. These pads are separated from the malar fat by the superficial musculoaponeurotic system (SMAS). Suborbicularis oculi fat pad (SOOF) resembles the ROOF and is located between the lower eyelid and cheek [18].

Retractors: Upper lid retractors are located below the orbital fat pads. The main retractor is levator palpebral superioris, which originates from the small wing of sphenoid and is innervated by the oculomotor nerve (CN III). The other lid retractor is Muller's muscle, which is innervated by the sympathetic nerves of autonomic system. It originates just below the Whitnall's ligament and inserts to the superior part of tarsal plate.

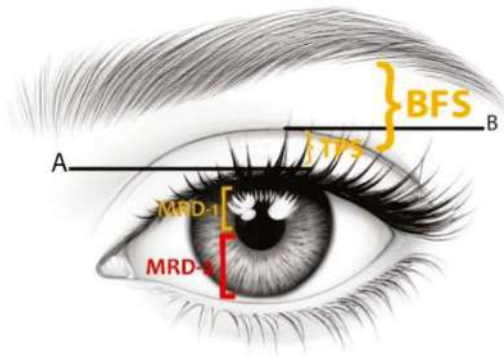

Fig. 1.5 Landmarks of eyebrow and eyelid. BFS (brow fat span): from the lower margin of eyebrow to eyelid crease; TPS (tarsal plat show): from lower border of eyelid (line A) to its upper crease (Line B). MRD1 and 2 (margin to reflex distance): distance from the light reflex from a light source at eye level to upper and lower eyelids respectively (Illustration made by Matin Irajpour for this book)

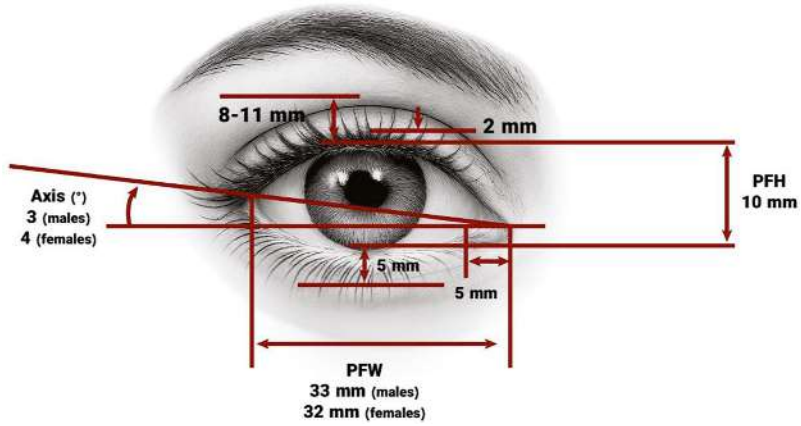

Fig. 1.6 Typical topographic measurements of the periorbital region. (*PFH* palpebral fissure height, *PFW* palpebral fissure width) (Illustration made by Matin Irajpour for this book)

▶ **Tip** To avoid postoperative ptosis, during upper blepharoplasty operations, surgeons should avoid damaging the levator muscle's aponeurosis, which lies posterior to the septum and preseptal fat pad. Also, a part of this aponeurosis is located behind the superior part of pretarsal portion of OOM.

▶ **Tip** In lower transconjunctival blepharoplast, great care must be exercised, to avoid damaging the inferior oblique muscle where the inferior border of capsulopalpebral fascia and retractor system meet.

Tarsus: Tarsal plate, also known as Tarsus, is a fibrous layer that serves as the primary supportive and protective structure of the eyelids. It is approximately 25–30 mm wide and 10–12 mm high in the upper eyelid, and 3–5 mm high in the lower eyelid.

Conjunctiva: It is an epithelial layer that lines the posterior surface of the eyelids. It serves as a physical barrier that also replenishes the tear film layer by its numerous goblet cells [19].

1.6 Blood Supply of Orbit and Periorbital Region

The eye and eyelids have a very rich and intricate blood supply. It is of utmost importance to know the anatomical intricacies of this region to avoid any complications during and after periorbital surgeries.

Arterial blood supply: Both internal and external carotid arteries contribute to blood supply of orbit and periorbital area. The globe and orbital contents are mostly supplied by ophthalmic artery which is derived from internal carotid. The ophthalmic artery also has branches such as, lacrimal artery, posterior and anterior ethmoidal arteries, ciliary artery, and supraorbital artery, and eventually it splits into supratrochlear and dorsal nasal arteries. A branch from the external carotid system, known as anterior facial artery, supplies parts of the eyelids. Infraorbital artery, derived from internal maxillary artery that roots back to external carotid, contributes to the blood supply of eyelids (Fig. 1.7).

Lateral palpebral arteries: Derived from lacrimal artery which is a branch of ophthalmic artery; they supply the lateral portion of the eyelid.

Medial palpebral arteries: Dorsal nasal artery, also known as lateral nasal artery, gives rise to superior and inferior medial palpebral arteries after crossing the medial canthal ligament. These arteries are the main source of blood supply to the medial parts of eyelids. They anastomose with their lateral counterparts to form superior and inferior marginal arcades. These arcades are very susceptible to bleeding during blepharoplasty operations.

Canthoplasty in Aesthetic Patients

16

Behzad Khademi and Mehryar Ray Taban

16.1 Aesthetic Lateral Canthal Suspension

The procedure of aesthetic canthal suspension (CS) frequently poses a complex task, whether it is an independent operation or supplementary to other surgical endeavors within the realm of facial cosmetic surgery. It is a considerable concern that this operation, inclusive of its various forms, does not acquire adequate attention in terms of specifics during surgical instruction, unless one is receiving subspecialty training. There is also a noticeable lack of uniformity in the characterization of canthal anatomy, terminologies used, as well as the respective surgical interventions.

Achieving a harmonious equilibrium, which involves preserving the structural integrity of the canthal architecture while concurrently executing a procedure that provides sufficient support to the lower eyelid, is pivotal. This does not merely imply exerting more tension, but rather focuses on providing support whilst preserving aesthetic appeal and structural coherence. This principle is fundamental to comprehend in order to consistently produce dependable and generally devoid of complications outcomes in aesthetic canthal suspension surgical interventions.

16.2 Anatomy

The anatomy of the lateral canthus is intricate and not as commonly understood. The eyelid experiences a dual directional force at the lateral canthus. The posterior lamella, located internally, inserts into the lateral orbital rim, resulting in the contouring of the lower lid around the globe. Conversely, the anterior lamella is positioned externally and inserts at the periphery of the rim.

The Lateral Canthal Tendon (LCT) has an approximate dimension of 1 mm in thickness, 3 mm in width, and extends to a length of about 7 mm. In the area of the lateral canthus under the skin layer, there are three unique structural components, namely the Lateral Palpebral Raphe (LPR), the Superficial Lateral Palpebral Ligament (SLPL), and the Deep Lateral Palpebral Ligament (DLPL).

At the lateral commissure, the lateral ends of the superior and inferior orbicularis oculi muscles intertwine, giving rise to the Lateral Palpebral Raphe (LPR). The lateral palpebral ligament is bifurcated into the Superficial Lateral Palpebral Ligament (SLPL) and the Deep Lateral Palpebral Ligament (DLPL). The SLPL extends from the lateral extremities of the tarsal plate to the perios-

B. Khademi (✉)
Poostchi Ophthalmology Research Center, Department of Ophthalmology, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

M. R. Taban
Stein Eye Institute, UCLA, Los Angeles, CA, USA
e-mail: doctor@tabanmd.com

B. Eshraghi, M. Pourazizi (eds.), *Periorbital Rejuvenation*,
https://doi.org/10.1007/978-981-95-9678-2_16

teum of the lateral orbital rim. The DLPL, situated deeper than the SLPL, extends from the same lateral terminations of the tarsal plate, coursing deeper to the origin of the SLPL, towards Whitnall's tubercle on the zygomatic bone inside the orbital margin. The DLPL finds its anchorage on the lateral orbital tubercle, also known as Whitnall's tubercle. Whitnall's tubercle is situated approximately 2.9–0.8 mm inside the orbital rim of the zygoma.

The impact of anterior insertion pales in comparison to the posterior attachment, which carries a greater degree of importance in this context.

The location of the lateral canthus is generally about 1–2 mm higher than the medial canthus, and in healthy adults, it is less than 1 cm distant from the lateral orbital rim. When compared to a horizontal baseline, the angle of the lateral canthus is approximately 6 degrees, and it measures roughly 60 degrees in total span.

The lateral canthus is inherently a dynamic structure. This is due to the fact that it has attachments from the lateral horn of the levator aponeurosis, the lower eyelid retractors, and the lateral rectus to the Lateral Canthal Tendon (LCT). Consequently, movements of these anatomical components inherently result in corresponding movements of the canthus.

When planning an aesthetic surgery for this particular anatomical region, two key youthful landmarks ought to be considered. Firstly, the border of the lower eyelid conventionally rests on or just above the inferior limbus, and the lateral canthal angle aligns with the inferior edge of the pupil. The age-related downward shift of the canthus and lower lid is a consistent phenomenon. The second consideration pertains to the fact that under normal circumstances, the lateral scleral triangle is typically larger, broader, and more pointed in comparison to the nasal scleral triangle. By adhering to these two fundamental principles, the aesthetic outcomes post-lateral canthopexy can be significantly enhanced.

16.3 Changes with Age

With the progression of age, the shape of the palpebral aperture undergoes a shift from a predominantly horizontal oval structure to a more circular outline due to the medial relocation of the canthus. This metamorphosis is a result of a confluence of factors such as the compromised structural soundness or slackening of the lateral canthal tendon, diminution of the orbital bone in designated areas, involutional shrinkage of the orbital fat leading to enophthalmos, and potential changes in the structural support of the globe.

This transformation may lead to the lateral bowing of the lower eyelid and may also permit the lower eyelid to migrate medially and downwards with age progression. Gradually, the exerted traction on the lateral canthus could weaken its connective bonds to the lower eyelid, potentially contributing to the laxity frequently observed in the lower eyelids of elderly individuals.

Even in the absence of involutional alterations, when performing a lower eyelid blepharoplasty using either a transcutaneous or transconjunctival approach, the requirement for lower eyelid support is crucial to prevent possible complications. Such complications could encompass phenomena like lower eyelid retraction and ectropion.

16.4 Assessment

To carry out a successful and aesthetically satisfactory canthoplasty, it is essential to consider the other periorbital and facial features. The majority of patients might initially exhibit no symptoms but might face complications following the surgery. Therefore, it is vitally important to recognize patients at elevated risk before surgery. Concentrating on the subsequent examination procedures can assist in identifying such patients and help mitigate the risk of complications and subpar outcomes.

16.5 Assessment of Vertical Vector

Individuals who are susceptible to experiencing eyelid retraction following a blepharoplasty usually present an eye that appears notably prominent in relation to the bony maxilla. For such patients, the protruding eye may instigate an anterior displacement of the lower eyelid. These individuals are characterized as exhibiting negative vertical vectors. A negative vector condition is identified when the globe protrudes forward, beyond the inferior orbital rim (Fig. 16.1).

Under these circumstances, lid tightening and/or skin removal may generate a bowstring impact on the lid beneath the globe, leading to an adverse alteration in the position of the eyelid. Reflection should also be extended to strategies such as canthal suspension and eyelid support, bypassing any attempts to constrict the lateral canthus in these particular patients. This consideration is due to the fact that eyelid tightening could potentially instigate or aggravate lower eyelid retraction.

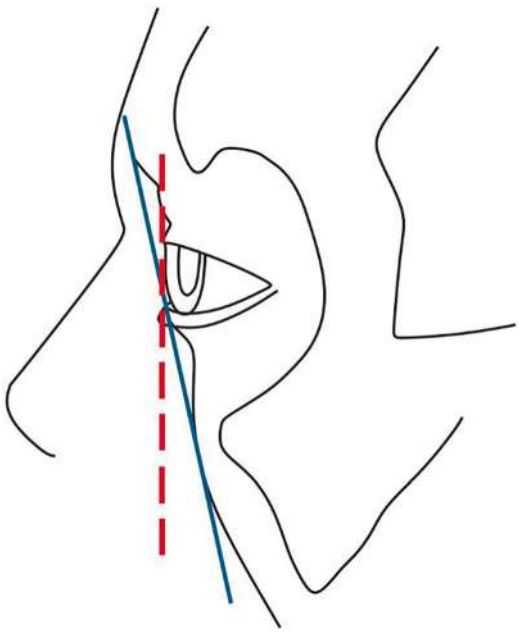

Fig. 16.1 Mid-face Vector; negative vector

The most commonly adopted strategy to manage this situation encompasses the use of the supra-positioning and/or the hanging back method for canthal suspension, and the anterior relocation of orbital rim suspension sutures from the inner orbital rim. The primary objective of these techniques is to reduce strain on the globe, thereby circumventing potential lower lid bowstringing and retraction.

16.6 Assessment of Canthal Laxity

16.6.1 Snapback Test

The evaluation of the lower lid's tensile integrity entails manipulating the lower ocular cover away from the globe by leveraging the index finger. This process serves to examine its intrinsic recuperative capabilities, particularly its ability to swiftly return to its initial position against the eyeball without external support. Upon the cessation of the externally imposed tension, it is anticipated that the lid will expediently regain its anatomically correct placement, categorically before the patient engages in a blinking action. A discernable delay in the execution of this expected response deems the test as positive.

Patients displaying unilateral symptoms indicative of diminished orbicularis muscle tonicity should be subjected to further diagnostic processes to rule out any abnormalities in the facial nerve.

16.6.2 Lid Distraction Test

Should the eyelid exhibit a displacement capacity of 8 millimeters or greater from the globe when manually manipulated, such an outcome is classified as a positive test result. This finding signifies an underlying compromise in the integrity of the canthal tendon.

16.6.3 Medial and Lateral Canthal Laxity

The lateral canthus ought to exhibit rigidity, providing a discernible resistance against any attempts to medially displace the lateral canthal tendon. This technique also offers an avenue for assessing the laxity of the medial canthus. The medial canthal laxity can be further quantified by evaluating the mobility of the inferior punctum; the medial canthal tendon should not permit lateral distraction exceeding 5 millimeters.

Prior to a surgical intervention, the position of the lateral canthus necessitates careful evaluation, since any postoperative modifications to its location will invariably alter the ocular aesthetic. In a normal anatomical setting, the lateral canthus is situated several millimeters superior to the medial canthus.

16.6.4 Lower Lid Forced Duction Test

The patient is requested to direct their gaze upward while the evaluator actively mobilizes the lower eyelid in a superior direction. Under normal physiological conditions, the lower eyelid should effortlessly extend upwards to envelop the entire cornea, thereby effectuating eye closure. If the lower eyelid encounters mechanical resistance that inhibits its upward mobility, the presence of anterior or middle lamellar scarring is postulated.

16.6.5 Mid-Face Assessment

A midface that is deficient in volume, whether in soft tissue or bone structure, culminates in a relative prominence of the globe. For patients presenting with these characteristics, meticulous care is mandated during canthal suspension procedures to circumvent the potential occurrence of the aforementioned bowstringing effect.

16.6.6 Evaluate the Position of the Lower Eyelid in Relation to the Iris

The presentation of inferior scleral show, which may expose laxity in the lower eyelid, could be attributed to the prominence of the eyes or simply represent a normal anatomical variant.

16.6.7 Surgical Technique

In light of the diverse anatomical structures that influence the lateral canthal angle, multiple surgical strategies can be deployed for its rectification and aesthetic enhancement.

Canthoplasty, a surgical procedure involving the modification of the lower lid or lateral canthal tendon (LCT), typically entails an incision, possible shortening, and subsequent securing of the aforementioned structures to the periosteum of the lateral orbital rim. In contrast, canthopexy constitutes a less invasive intervention, featuring a plication suture of the LCT or orbicularis muscle. This procedure abstains from altering these lid structures; instead, the LCT or terminal lateral orbicularis muscle is attached to the lateral orbital rim utilizing a plication suture.

The canthoplasty variant, while possessing superior surgical efficacy, is more complex and associated with a greater potential for complications. Direct canthal surgical approaches offer enhanced access and visualization of critical canthal structures, thereby facilitating precision in lower lid placement. However, this direct access may predispose the patient to canthal deformities and malalignment.

Conversely, indirect canthal surgical procedures, where the surgical entry is via a distant site such as an upper eyelid crease incision or a blepharoplasty incision, potentially restrict anatomical exposure and precision of lid placement due to the remote access point. Nevertheless, this method may result in less conspicuous scarring.

16.6.8 Direct Canthoplasty

Direct canthal suspension (DCS), while being the most potent and aggressive surgical technique, is associated with an extended recovery period and numerous postoperative complaints. This intervention is typically indicated in cases of considerably lower eyelid laxity, where shortening of the lid is typically required.

However, the vast majority of surgeons have largely discontinued the use of this procedure in aesthetic patients due to its invasive nature, specifically, the disruption of the supporting ligaments of the lateral orbit. The surgery is often deemed unnecessary, considering the potential risks and postoperative complications relative to the benefits in an aesthetic context.

16.6.9 Surgical Technique

Following a lateral canthotomy and cantholysis, an infraciliary incision is executed. The eyelid is then judiciously shortened, maintaining an area of lateral redundancy to offer support to the lateral canthus. A tarsal strip is fashioned by the removal of conjunctiva from the posterior tarsus using either a surgical blade or a cautery device and subsequently trimming the lash follicles from the strip at their bases with a Westcott scissors. This tarsal strip is then sutured to the periosteum on the inner side of the lateral orbital wall with 5–0 PDS, and the lateral canthal angle is reshaped using 6–0 absorbable sutures. This technique may lead to a perceived reduction in the horizontal palpebral aperture, a cosmetic outcome that is generally unfavorable due to overcorrection and shortening of the lower eyelid with preservation of the upper eyelid length [1] (Fig. 16.2).

To circumvent these cosmetically undesirable outcomes, an alternative approach to open canthoplasty can be employed.

An alternate, more aesthetically acceptable form of direct canthoplasty retains the integrity of the lateral commissure, thereby resulting in lesser disturbance and more desirable cosmetic outcomes. This variant, known as commissure-sparing canthoplasty, is a modified form of direct canthoplasty. During this procedure, the canthotomy is performed in such a manner that the commissure and canthus are preserved from division for a span of 3 mm. This technique ensures that a segment of the canthal angle remains undisturbed.

The lateral canthal tendon is then subject to a graded cantholysis, contingent upon the clinical indication and the extent of suspension required. A single-armed 5–0 PDS suture attached to an RB-2 needle is passed through the periosteum of the inner orbital rim, then to-and-fro through the internal canthal wound, exiting at the commis-

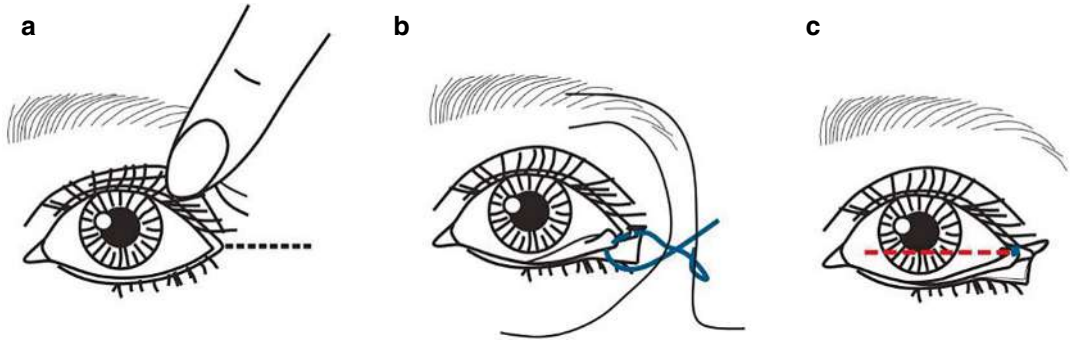

Fig. 16.2 Direct Canthoplasty; (**a**) lateral canthotomy incision and inferior cantholysis. (**b**) A tarsal strip is fashioned and sutured to the periosteum on the inner side of the lateral orbital wall. (**c**) The correct position of lateral canthus is positioned along the inferior border of pupil

Fig. 16.3 Commissure-sparing canthoplasty

sure, and then from the external to the internal side. The suture is subsequently passed a second time through the periosteum and securely fastened [2] (Fig. 16.3).

16.6.10 Indirect Canthoplasty

Indirect canthoplasty represents the least invasive and intense technique, and it is frequently the method of choice among many surgeons, particularly for aesthetic cases. Characteristically, this procedure results in minimal postoperative complaints, facilitates the quickest recovery period, and is, inherently, the most "aesthetic" surgical technique. The clinical indications for opting for indirect canthoplasty usually encompass cases presenting with mild to moderate eyelid laxity.

16.6.11 Surgical Technique

In indirect canthoplasty, a temporal upper eyelid crease incision is marked, typically extending 10 mm in length. In cases where upper blepharoplasty is also being performed, the canthoplasty access is facilitated through the temporal wound. The orbicularis muscle is then dissected, followed by a suborbicularis dissection leading to the periosteum over the superolateral orbital rim and proceeding inferiorly until the LCT (Lateral Canthal Tendon) is identified. The tendon is subsequently stretched and can be strummed and then lysed in a graded fashion, dependent on the desired extent of eyelid support and/or canthus elevation.

The majority of patients undergoing this variant of canthoplasty usually present with mild laxity and consequently require minimal canthal support. In such instances, partial lysis of the canthal tendon is deemed sufficient. As the entire inferior crus is not incised, the canthal position is seldom altered, representing a key advantage and desirability of this technique. Complete release of the LCT is reserved for scenarios requiring enhanced suspension or, on rare occasions, for elevating the canthus.

A double-armed 5–0 PDS suture with an RB-2 needle is passed through the commissure (from the external to the internal wound) using both ends through the same hole, or if greater support is desired, through the terminal tarsus. Both ends are then passed through the exposed periosteum at the inner orbital rim. Given the limited exposure, it can be beneficial to use the wooden end of a cotton-tipped applicator to locate the inner orbital rim periosteum and deflect the lacrimal gland. Closure of the orbicularis muscle can then be achieved using several interrupted buried absorbable sutures, and the skin can be closed with a 6–0 nylon suture [3] (Fig. 16.4).

16.6.12 Direct Canthopexy

There exists a specific group of patients requiring merely mild lower lid support during blepharoplasty procedures. In such instances, it is prudent to adopt a conservative approach when deliberating on the inclusion of lid support, as this strategy helps evade potential complications associated with postoperative lower eyelid malposition. The emphasis on caution aids in the prevention of any unnecessary surgical intervention and the subsequent challenges related to managing postoperative complications.

16.6.13 Surgical Technique

In this procedure, a 4–5-mm canthal incision is made, extending to or through the commissure. A suture (for instance, 5–0 Vicryl, PDS, or a similar type on a half-circle needle) is threaded through

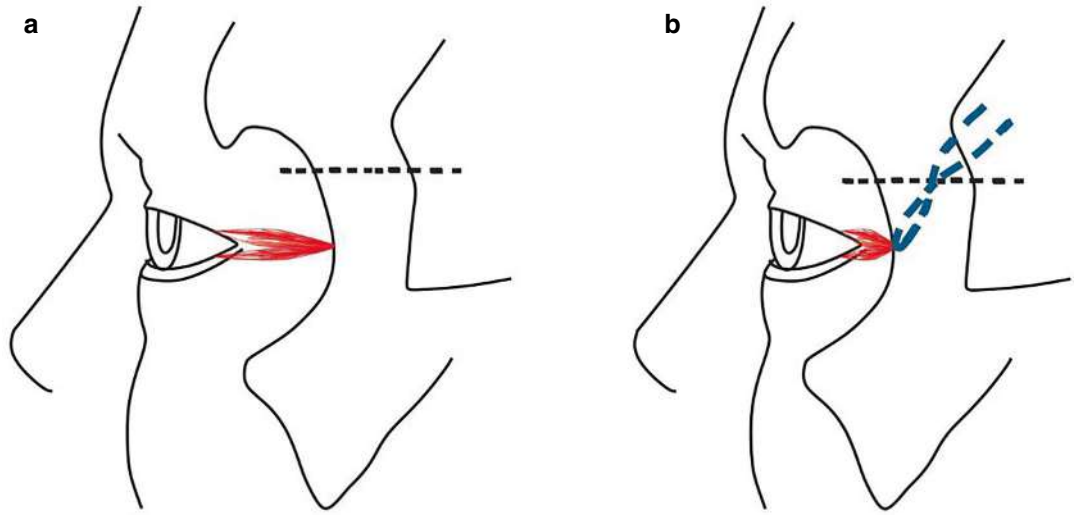

Fig. 16.4 Indirect canthoplasty; (**a**) Temporal upper eyelid crease incision is marked. (**b**) Suture is passed through the commissure and both ends are then passed through the exposed periosteum at the inner orbital rim

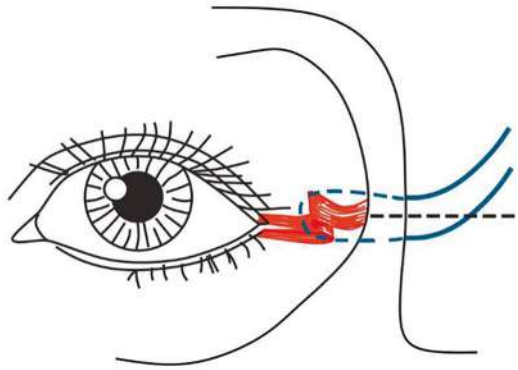

Fig. 16.5 Direct Canthopexy

the LCT (Lateral Canthal Tendon) and is secured to the periosteum of the lateral orbital rim in a horizontal mattress fashion. As an alternative strategy, some surgeons prefer to merely suspend the terminal preseptal orbicularis muscle with a similar suture engagement or to include such suspension in conjunction with the lateral canthal tendon plication [4] (Fig. 16.5).

While the perceived shortening of the horizontal palpebral aperture is generally not a concern with canthopexy-type techniques, eyelid imbrication can be observed if the inferior crus of the lateral canthal tendon is preferentially tightened or supraplaced. This is why careful attention should be paid to ensure a balanced adjustment during the procedure to achieve the most desirable aesthetic outcome.

16.6.14 Indirect Canthopexy

This method is particularly beneficial for the standard aesthetics-focused patient requiring just a slight modification to the suspension of their lower eyelid. The technique's less invasive nature can efficiently cater to the patient's demands, usually ensuring quicker recuperation periods and fewer complications, thereby making it a potentially preferred choice in these scenarios.

16.6.15 Surgical Technique

Through an upper lid crease or an incision made during upper blepharoplasty, dissection is performed to reach the lateral orbital rim. A suborbicularis dissection is executed to access the lateral canthal tendon. Here, the conjoined tendon (that from the upper and lower lids) is firmly grasped with the suture. A double-armed 5/0 absorbable suture is then threaded through the periosteum, a minimum of 4 mm inside the lateral orbital rim, in alignment with the inferior edge of the pupil. This suture is then routed

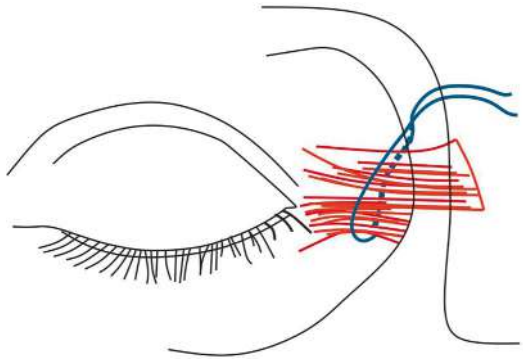

Fig. 16.6 Indirect Canthopexy

around and beneath the lateral canthal tendon and subsequently passed through the periosteum of the lateral orbital rim once more. This procedure effectively provides the desired support to the eyelid structure, ensuring an aesthetically pleasing and functional outcome [4] (Fig. 16.6).

16.6.16 Hangback Canthal Suspension

Adaptations in surgical technique are mandated for negative vector eyelids in order to preclude the "bowstringing" effect on the globe. These modifications can be incorporated using any of the previously detailed techniques, such as a direct or indirect approach in conjunction with a canthopexy or canthoplasty. When the lateral canthal suture is affixed to the lateral orbital rim, it is deliberately left loose or permitted to 'hang back.' The degree of hang back is customized to each case, contingent on the desired pseudo-lid lengthening effect. Furthermore, the suture can be supraplaced along the orbital rim, which provides a more pronounced elevating effect [2] (Fig. 16.7).

In a substantial number of these cases, a pexy without lysis is employed owing to the increased distance between the canthus and the lateral orbital rim. This modification ensures an optimal outcome, minimizes the risk of postoperative complications, and adheres to the principle of individualized patient care in aesthetic surgery.

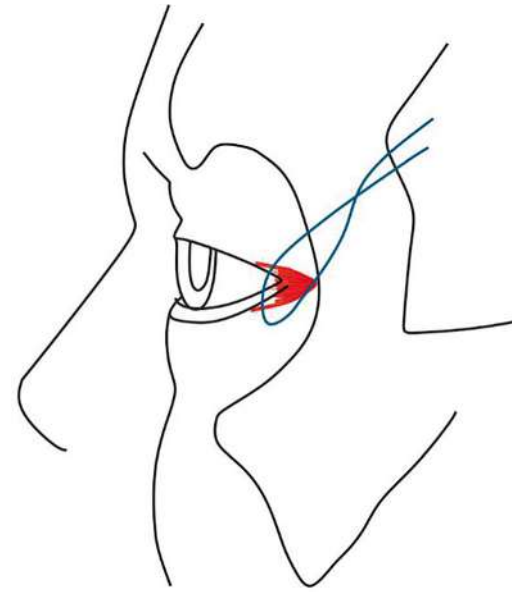

Fig. 16.7 Hang-back Canthal Suspension

16.6.17 Other Modification

There exists a modification of the aforementioned techniques that falls intermediate between canthoplasty and canthopexy.

This adapted canthopexy technique is executed through an incision in the upper eyelid. The superficial lateral palpebral ligament and the lateral palpebral raphe are elevated from the periosteum; however, the deep lateral palpebral ligament is intentionally left attached to Whitnall's tubercle. The dissection is then extended downward under the suborbicularis oculi fat and the lower eyelid orbicularis muscle.

To achieve the resuspension of the lower eyelid, a 5.0 polydioxanone (PDS) suture is threaded through the upper eyelid incision, beneath the orbicularis muscle but anterior to the lateral canthal tendon, and is then externalized through the apex of the lateral canthal angle at the mucocutaneous junction. Subsequently, the suture is passed back through the same hole in the canthal angle created by the forward pass, but this time inferior and posterior to the lateral canthal tendon, and then externalized through the blepharoplasty

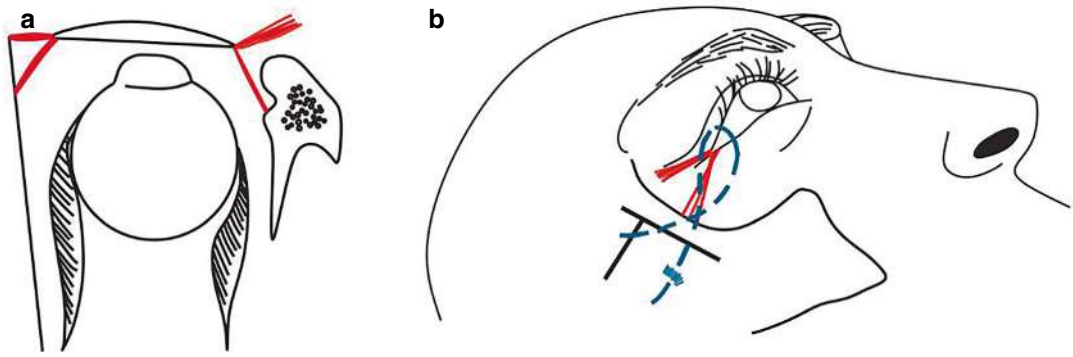

Fig. 16.8 Modified Canthopexy; (**a**) Lateral palpebral raphe is elevated although the deep lateral palpebral ligament is left attached to Whitnall's tubercle. (**b**) Suture was passed inferior and posterior to the lateral canthal tendon, and then externalized through the blepharoplasty incision

incision. The suture is finally secured to the periosteum just inside the lateral orbital rim, slightly above the level of Whitnall's tubercle [5] (Fig. 16.8).

This modified procedure balances the rigidity of canthoplasty with the less invasive approach of canthopexy, offering a nuanced solution to address specific anatomical or clinical needs.

16.6.18 Postoperative Care

Post-operative management instructs patients to employ cold compresses for 20-minute durations every 2 h during waking hours for a period of 3 days. In addition to this, patients are prescribed an erythromycin ophthalmic ointment, which is to be applied specifically to the suture line, be it the canthal or the upper lid crease. The incorporation of eye drops is an added measure, as a majority of the patients have simultaneously undergone a transconjunctival lower blepharoplasty. Following a week of this regimen, the sutures are carefully extracted, marking the cessation of the topical drops and ointment application. This structured approach ensures an effective healing process while minimizing potential postoperative complications.

16.7 Complications

16.7.1 Early Complications

The postoperative complications that can potentially arise encompass chemosis, reactions or infections related to sutures, cyst development, canthal pain or tenderness, and wound dehiscence.

In instances of chemosis, the first-line approach to management is conservative in nature, entailing the use of topical steroids and the implementation of upper eyelid massages. In cases where chemosis continues to persist, temporary lateral tarsorrhaphy and minor conjunctival cauterization can be employed as effective treatment options.

For reactions associated with sutures, it is recommended to carry out a suture cut down and removal. If an infection is concurrently present, an oral antibiotic regimen should be promptly initiated.

Inclusion cysts that are lined with epithelium, though rare, can occur, as with any conjunctival or cutaneous incision. These cysts can be conveniently managed through surgical excision.

Canthal pain and tenderness can pose considerable discomfort to the patient. Fortunately, these issues typically resolve with time and can be alleviated through manual massage.

These interventions ensure the prompt and effective management of complications, thereby enhancing the recovery and postoperative experience of the patients.

16.7.2 Late Complications

The management of postoperative complications such as canthal asymmetries or malalignment (dystopia), webs, and scars can be particularly challenging.

Canthal asymmetries often resolve over time, with or without the use of manual massage techniques. However, if these asymmetries persist, a surgical revision may be necessary. Generally speaking, raising a canthus that is positioned too low tends to be significantly easier and more predictable than lowering a canthus that is too high.

Canthal webs and scars usually require a period of time, massage, and chemomodulation as the first line of therapy. Injecting medications such as Kenalog (5 mg/mL, 0.2 mL) or 5-Fluorouracil (5-FU, 50 mg/mL, 0.2 mL) can be helpful. Many surgeons prefer 5-FU, as it is nonparticulate (thereby preventing rare vascular visual compromise) and less likely to cause skin dyschromia, telangiectasias, and atrophy. These injections can start as early as 2 weeks after surgery, given in 0.2-mL aliquots every few weeks until stability is reached. On average, this treatment requires around 4 injections in total. If webs persist despite these treatments, surgical intervention may be considered as a last resort.

16.7.3 Recommendations

You're absolutely right. Canthopexy techniques, which were initially primarily employed for cosmetic purposes, are increasingly being used for reconstructive surgeries as well, especially in cases with a mild-to-moderate degree of horizontal eyelid laxity.

It's crucial to approach these procedures with the intention of using the least invasive method necessary to achieve the desired outcome. If skin excision is added to a lower blepharoplasty, it's common to also include canthal suspension in the surgical plan.

For patients with lax lower lids, the surgeon should consider performing a canthopexy or canthoplasty that involves shortening of the eyelid along with anchoring of the canthal ligament. In cases with deep-set eyes, the fixation point for canthal anchoring should be adjusted downward and more internally to prevent an upward "clothesline" effect on the lower lid. This modification can help to avoid narrowing of the palpebral fissure, which can create the appearance of a smaller eye.

However, it's crucial to keep in mind that the success of a canthal suspension procedure relies heavily on the absence of excessive tension and intact orbicularis oculi function. No matter how well executed, a canthal suspension won't be effective or sustainable if these conditions aren't met.

Lastly, the importance of careful planning and execution of a blepharoplasty cannot be overstated. No canthal suspension procedure can compensate for a poorly conducted blepharoplasty.

16.7.4 Medial Epicanthoplasty

The epicanthal fold is indeed a skin fold that extends from the upper eyelid and covers the inner corner of the eye (or the lacrimal caruncle). Its presence can influence the overall aesthetic outcome of a blepharoplasty, and this is especially relevant in certain ethnic groups where the epicanthal fold is more prominent, such as in many East Asian populations.

The effects of the epicanthal fold on facial aesthetics can include:

Obscuration of the caruncle and lacrimal lake.

Increased interocular distance.

Lower nasal upper lid contour.

Reduced palpebral fissure height.

Shortened horizontal palpebral fissure length.

In some cases, a procedure known as an epicanthoplasty may be performed alongside a bleph-

aroplasty to modify the appearance of the epicanthal fold and enhance the overall aesthetic results of the surgery. It's always crucial to consider these factors and discuss them with the surgeon when planning eyelid surgery.

Indeed, epicanthoplasty can greatly enhance the aesthetic results of double eyelid surgery in certain circumstances. As you mentioned, these can include:

Reducing a wide inner canthal distance: Epicanthoplasty can be used to effectively decrease the distance between the inner corners of the eyes, thereby improving overall facial symmetry and harmony.

Improving the appearance of a high-lying eyelid crease: In cases where the patient desires a high eyelid crease, an epicanthal fold might interfere with the desired outcome and result in an unnatural semi-circular appearance of the eyelids. Epicanthoplasty can be useful in such instances.

Facilitating an outer-type double eyelid: For those who prefer the eyelid crease to run parallel to the lash line all the way to the inner corner of the eye, an epicanthal fold might cause the crease to split, thereby disrupting the smooth line of the crease. In these cases, performing an epicanthoplasty can prevent this splitting and ensure a more aesthetically pleasing result.

However, it's true that some surgeons may hesitate to perform this procedure due to the risk of creating noticeable or lasting scars in the medial canthal area (the inner corner of the eye). This is a particularly sensitive and visible part of the face, and thus any scarring can significantly impact the aesthetic result of the surgery.

When performed along with double eyelid surgery, epicanthoplasty does serve to extend and reshape the medial corner of the eye opening, which can contribute to a more pleasing and natural-looking outcome. As with all cosmetic procedures, the decision to perform an epicanthoplasty should be made in consultation with a knowledgeable and experienced surgeon, taking into account the patient's individual anatomy, preferences, and the potential risks and benefits of the procedure.

16.7.5 Pathophysiology

The precise anatomical factors contributing to the formation of an epicanthal fold are indeed multifactorial, and our understanding of these influences continues to evolve.

Some research suggests that the insertion of superficial fibers of the medial canthal ligament and preseptal orbicularis oculi muscle fibers running through the fold might play a crucial role in the development of an epicanthal fold.

Further, recent anatomical studies have indeed emphasized the role of the orbicularis oculi muscle in the formation of the epicanthal fold. Specifically, the preseptal portion of the orbicularis oculi muscle fibers run obliquely around the area of the epicanthal fold, aligning with the direction of the fold itself. This muscle contraction might be a significant anatomical factor contributing to the formation of the epicanthal fold.

Other proposed contributing factors include excess skin, the presence of abnormal fibrous tissue, and a lack of medial attachment of the levator aponeurosis. However, it's crucial to note that our understanding of these factors continues to develop, and the importance of each of these elements might vary considerably between individuals.

Given this complexity and the variety of contributing factors, it's unsurprising that multiple surgical techniques have been developed for the correction of the epicanthal fold. The choice of procedure should be tailored to the specific anatomical characteristics and cosmetic goals of each individual patient, taking into account these various etiological factors.

16.7.6 Surgical Techniques

Historically, corrective techniques for the epicanthal fold such as the revised Y-V advancement flap, diverse Z-plasties, V-W plasty, lazy S-plasty, and the Mustarde approach have predominantly prioritized the design of the flap. However, contemporary methodologies have transitioned their emphasis towards alleviating vertical tension

through the myectomy of the orbicularis oculi muscle. This paradigm shift in the surgical approach has been influenced by a greater understanding of the underlying anatomical structures and their contribution to the epicanthal fold.

In recent years, the surgical approach to the correction of the epicanthal fold has evolved, with a particular emphasis on redraping epicanthoplasty and its numerous adaptations. However, no single technique has proven to be universally effective for all manifestations of the epicanthal fold.

Generally speaking, redraping epicanthoplasty serves as an effective method for addressing mild to moderate epicanthal folds, offering the added benefit of minimal scarring. For the treatment of more moderate folds, Z-epicanthoplasty is typically recommended. Alternative techniques are primarily employed in cases of severe epicanthal folds.

One significant disadvantage of these alternative techniques, however, is the potential for significant scarring. This can be cosmetically undesirable and therefore may not be acceptable to patients seeking a more aesthetically pleasing outcome.

16.7.7 Anchor Epicanthoplasty

In our view, the central unifying principle across all proposed redraping surgical methodologies is the removal of the tissue beneath the epicanthal fold, followed by deep tissue anchoring of the epicanthal skin.

16.7.8 Surgical Technique

The initial step involves extending a medial marking to a point (referred to as point A) 5–6 mm medial to the upper punctum. This point represents the intended location for the new medial canthus. Subsequently, a 2-mm strip of pretarsal orbicularis oculi muscle is removed horizontally at the superior tarsal border to reveal the levator aponeurosis. A portion of the medial preaponeurotic fat is then eliminated.

While retracting the skin of the epicanthal fold using skin hooks, a strip of orbicularis oculi muscle is excised along the direction of the supratarsal incision. In the process, the preseptal orbicularis oculi fibers and superficial fibers of the medial canthal tendon, situated beneath the fold, are delicately dissected and removed (Fig. 16.9).

Occasionally, intraoperative probing of the upper canaliculus is conducted to prevent damage to the upper lacrimal canaliculus during the tissue dissection. The procedure is concluded by anchoring the medial skin to the deeper tissue and forming the eyelid crease, employing a 6–0 nylon suture for this purpose [6].

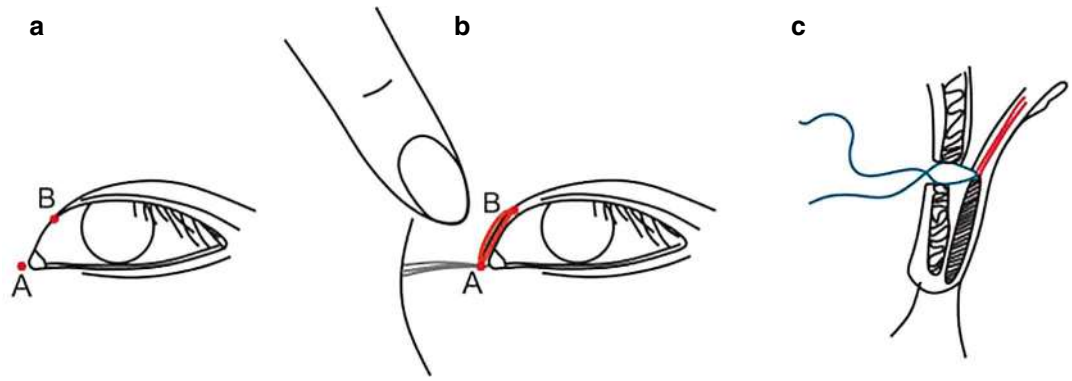

Fig. 16.9 Anchor Epicanthoplasty; (**a**) The intended location for the new medial canthus (point A), the lateral end of epicanthal fold (point B). (**b**) Strip of pretarsal orbicularis oculi muscle is removed horizontally at the superior tarsal border. (**c**) Anchoring the medial skin to the deeper tissue and forming the eyelid crease

16.7.9 Z Epicanthoplasty

Modified Z-epicanthoplasty is a recently developed technique that aims to address various factors contributing to the formation of the epicanthal fold. It appears to be particularly beneficial for correcting more severe grades of epicanthal folds.

The discussion to follow will describe two specific techniques. The first one is more suitable for surgeons at an early stage of their career, while the second is more advanced and requires a higher level of surgical expertise.

16.8 Surgical Technique

16.8.1 First Technique

The initial medial canthus (point A) was marked on the farthest lateral boundary of the medial epicanthus, with point A' signifying the insertion point of the Medial Canthal Ligament (MCL). The central limb AB, which is perpendicular and equal to the horizontal limb AA', typically aligns with the lowest point of the medial epicanthal fold. Point B′ is the terminus of BB', set at a 45-degree angle and equal to the central limb AB in length.

Following incision of the skin and subcutaneous tissue, the underlying pretarsal and preseptal orbicularis oculi muscle fibers may be partially resected, exposing the superficial portions of the medial canthal tendon (MCL). The suturing from point A to point B′ and from point B to A' was performed subcutaneously using a 6/0 vicryl suture. The superficial skin layer was then sutured with a 7/0 nylon suture [7] (Fig. 16.10).

16.8.2 Second Technique

Point A is situated at the center of the epicanthal fold, while Point B is located at the juncture of the epicanthal fold with the lower eyelid skin. Point D is the medial end of the lacrimal lake, and Point C is located medially to Point A, maintaining the same length as DB or AB. Line AC extends obliquely toward the mid-glabellar point and forms a 90-degree angle with the upper tarsal border at the medial canthal area. Point E is located at the medial aspect of the existing supratarsal crease, thus forming line EC, which serves as a continuation of the supratarsal crease.

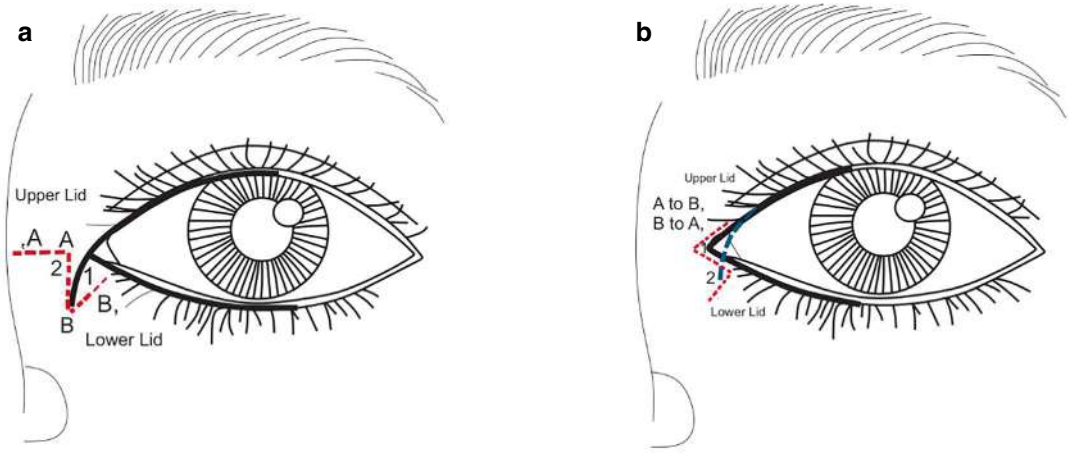

Fig. 16.10 Z Epicanthoplasty; (**a**) Farthest lateral boundary of the medial epicanthus (Point A), insertion point of the Medial Canthal Ligament (Point A'). AB typically aligns with the lowest point of the medial epicanthal fold. Point B′ is the terminus of BB', set at a 45-degree angle and equal to the central limb AB in length. (**b**) Suturing point A to point B′ and point B to A'

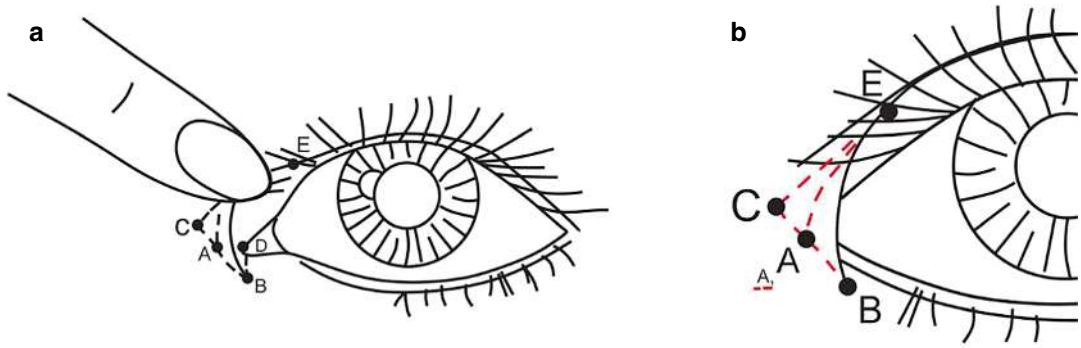

Fig. 16.11 Z Epicanthoplasty: (**a**) Center of the epicanthal fold (Point A), juncture of the epicanthal fold with the lower eyelid skin (Point B). The medial end of the lacrimal lake (Point D) and Point C is located medially to Point A. The medial aspect of the existing supratarsal crease (Point E) and line EC serves as a continuation of the supratarsal crease. (**b**) EAC is excised and the EABD flap is rotated, the line AB overlaps with BD without any tension

EABD constitutes an epicanthal flap, and upon removal of EAC, it's imperative to include the underlying muscle and fatty tissue to prepare the recipient bed for the EABD flap. When the EABD flap is rotated, the line AB overlaps with BD without any tension. Upon releasing the flap, the surgeon can feel a sudden liberation of the flap from the underlying medial canthal ligament. The flap is then trimmed and secured to the deep tissue using a 7/0 nylon suture. A stitch to bring together points A and D is made through the medial canthal ligament [8] (Fig. 16.11).

Regardless of the specific medial epicanthoplasty technique utilized, the plication of the anterior horn of the medial canthal tendon can be executed. This step, which involves folding or pleating the anterior horn of the medial canthal tendon, allows for better structural support and anatomical restoration in the area. This procedure, while important, should be carried out with utmost care to avoid complications or unwanted outcomes.

16.8.3 Complications

Medial epicanthoplasty, although generally a safe and effective procedure, is not without potential complications. These include, but are not limited to, scarring, which can be noticeable and aesthetically displeasing, and undercorrection or overcorrection, which can lead to unsatisfactory cosmetic results or functional impairment. Additionally, injury to the canaliculus, a part of the lacrimal system in the eye, may occur during the surgical process. This can result in tearing and other ophthalmic issues. These complications highlight the need for meticulous surgical technique and thorough preoperative planning.

16.8.3.1 Scar

Scarring tends to be most pronounced at the 6-to 8-week mark postoperatively and then gradually subsides. The extent of scarring can be minimized by strategically placing incisions along the relaxed skin tension lines, thus leveraging the natural contours of the skin. Moreover, it is beneficial to separate the incisions for epicanthoplasty and blepharoplasty, as the movement of the upper eyelid could potentially exert tension on the epicanthoplasty incision if these incisions are contiguous. The aim should always be to avoid tension in the skin flaps and employ the thinnest possible suture (7–0, for instance) for skin closure.

In the event of hypertrophic scars, therapeutic interventions such as injections of diluted triamcinolone and 5 fluorouracil can be employed. Application of scar-reducing ointment like silicon gel and onion extract may also be considered in the management of scarring.

16.8.3.2 Undercorrection and Overcorrection

Adopting a conservative approach towards epicanthoplasty is advisable; undercorrection tends to be less risky than overcorrection, primarily because it is much simpler to revise an undercorrected epicanthal fold compared to an overcorrected one. Revision of an undercorrected outcome can be undertaken within the first week following the initial operation. However, beyond this timeframe, any revisionary procedures should be deferred until at least 6 months have elapsed or until the hypertrophic response has sufficiently subsided. It is, nevertheless, important to maintain a balance and avoid excessive undercorrection during the surgical procedure.

16.8.3.3 Canalicular Injury

Canalicular injuries, while infrequent, can occur during epicanthoplasty. Given its anatomical location, the canaliculus runs parallel to and is situated 1 mm beneath the eyelid margin, positioned 2 mm deep from the skin of the eyelid. This positioning necessitates surgical caution. In the unfortunate event of a canalicular injury, it is mandatory for the patient to promptly receive silicone tube intubation through the injured canaliculus.

16.8.4 Recommendations

Generally, we favor the skin redraping technique for a large proportion of our patients. This method has demonstrated effectiveness in addressing mild-to-moderate epicanthal folds; hence, it could be endorsed as the primary method for all grade 2 epicanthal folds. Additionally, it may be recommended for those with grade 3 epicanthal folds who have apprehensions about the potential scarring or incision resulting from external epicanthoplasty or those who do not desire the complete removal of the epicanthal fold. In our practice, we have found that the key to a successful epicanthoplasty with minimal scarring lies in the careful release of all local traction forces impacting the medial canthal area.

References

1. Anderson RL, Gordy DD. The tarsal strip procedure. Arch Ophthalmol. 1979;97(11):2192–6. https://doi.org/10.1001/archopht.1979.01020020510021. Epub 1979/11/01.
2. Wang Y, Holds JB, Douglas RS, Massry GG. The Spectrum of aesthetic Canthal suspension. Facial Plast Surg Clin North Am. 2021;29(2):275–89. https://doi.org/10.1016/j.fsc.2021.01.005. Epub 2021/04/29.
3. Taban M, Nakra T, Hwang C, Hoenig JA, Douglas RS, Shorr N, et al. Aesthetic lateral canthoplasty. Ophthalmic Plast Reconstr Surg. 2010;26(3):190–4. https://doi.org/10.1097/IOP.0b013e3181baa23f. Epub 2010/05/22.
4. McCord CD, Boswell CB, Hester TR. Lateral canthal anchoring. Plast Reconstr Surg. 2003;112(1):222–37. https://doi.org/10.1097/01.prs.0000066340.85485.df. discussion 38-9. Epub 2003/07/02.
5. Georgescu D. Surgical preferences for lateral canthoplasty and canthopexy. Curr Opin Ophthalmol. 2014;25(5):449–54. https://doi.org/10.1097/icu.0000000000000094. Epub 2014/07/23.
6. Esmaeilkhanian H, Kashkouli MB, Abdolalizadeh P, Aghamirsalim M, Shayanfar N, Karimi N. Revisiting anchor Epicanthoplasty in mild to moderate Asian Epicanthal folds: a clinicopathological study. Aesth Plast Surg. 2021;45(1):181–90. https://doi.org/10.1007/s00266-020-01901-0. Epub 2020/08/09.
7. Lai CS, Lai CH, Wu YC, Chang KP, Lee SS, Lin SD. Medial epicanthoplasty based on anatomic variations. J Plast Reconstr Aesthet Surg. 2012;65(9):1182–7. https://doi.org/10.1016/j.bjps.2011.12.038. Epub 2012/07/04.
8. Park JI. Modified Z-epicanthoplasty in the Asian eyelid. Arch Facial Plast Surg. 2000;2(1):43–7. https://doi.org/10.1001/archfaci.2.1.43. Epub 2000/08/05.