Paparella: Volume IV: Plastic and Reconstructive Surgery and Interrelated Disciplines

Section 1: Plastic and Reconstructive Surgery

Chapter 9: Blepharoplasty

Rhytidectomy and Coronal Forehead Lift

The eyes make up perhaps the most important aesthetic unit of the face and their appearance is of major concern to the aesthetically conscious patient. The eyes give clues to a person's age, level of fitness and well-being, emotional state, and mood. Unfortunately, this is also the anatomic site that demonstrates some of the earliest signs of the aging process. Recognition of the situation and selection of the appropriate corrective procedure is of significant importance to the facial plastic surgeon.

Eyelid Anatomy

The upper and lower lids have a characteristic surface anatomy. The upper lid is arbitrarily divided into orbital, preseptal, and pretarsal portions. Externally, the orbital portion corresponds to the area of the upper lid falling roughly between the orbital rim and the superior border of the tarsus. The portion of the lid superior to the tarsal plate is designated as preseptal, and the tarsal portion of the eyelid is that which overlies the tarsal cartilaginous plate. The upper lid crease is essentially formed by the attachment of the levator at the aponeurosis of the lid skin. The superior fold varies considerably and ranges from as high as 12 mm to as low as 5 mm above the lid margin. The upper lid is generally positioned over the upper cornea at the midpoint between the corneal edge and the pupil border with the patient looking in straightforward gaze. The skin of the upper lid is approximately 0.13 inch in depth, which corresponds to a thick split-thickness skin graft.

As the skin approaches the bony orbital rim of the eye, it becomes thicker. This transition of thin to thick skin is of particular importance surgically in that wound characteristics will be different along surgical incisions in that site.

The cross-sectional microscopic examination of the lid reveals it to be in essentially two layers: (1) an anterior lamella, which contains the orbicularis muscle and its cutaneous attachments; and (2) a posterior lamella, which contains the tarsus and conjunctival lining. The anterior lamella also contains orbicularis muscle and the insertion of the eyelashes with accompanying ciliary glands. Sweat glands and sebaceous glands likewise are seen to accompany the lashes. The clinically described "gray line" is the junction of the stratified squamous epithelium of the external surface, which changes to low stratified columnar epithelium of the conjunctiva. The posterior lamella contains the tarsus in addition to meibomian glands. The orifices of the meibomian glands may be seen as a visual line posterior to the so-called gray line. These can form a key landmark for precise alignment during lid reconstruction.

The orbicularis muscle is divided into three parts: orbital, preseptal, and pretarsal. These confluent muscle divisions act in unison on contraction and relaxation. They are

innovated by the seventh cranial nerve. The pretarsal portion of the orbicularis muscle lies directly over the tarsal plate and is divided into two heads at the nasal attachment of the lid. The more superficial head lies anterior to the canalicular system and includes the anterior portion of the medial canthal tendon. The deep head of the pretarsal muscle inserts on the fascia underlying the lacrimal sac and the posterior lacrimal crest to form the posterior limb of the medial canthal tendon. The upper and lower pretarsal muscles join to form a less well defined lateral canthal tendon inserting at the lateral orbital rim. The preseptal portions of the orbicularis muscle arise from the medial canthal tendon and insert by joining at the lateral orbital rim into the lateral canthal tendon. The orbital division of the orbicularis muscles is not attached other than by overlying skin and joins laterally to form the lateral palpebral raphae. It is this orbital division of muscle that, when contacting on eye closure, produces the laterally radiating wrinkles or crow's-feet lines.

The orbital septum is continuous with the orbital periosteum. It attaches to the bony orbital margin throughout its course inferiorly. The orbital septum acts as a diaphragm or barrier to the orbital contents. The tarsal plate of the upper lid is a crescent-shaped structure having its origins within the septal layer. Its corresponding component in the lower lid is a small longitudinal band of cartilage that forms the inferior tarsus.

Orbital fat tends to lie in separate compartments separated by fascial barriers. The upper lid has two basic divisions of fat, the nasal fat pad and the preaponeurotic fat pad. In the lower lid, orbital fat tends to be found in three distinct compartments. The inferior oblique muscle separates the medial and central components, and this muscle should be avoided when resecting fat. The lateral compartment is separated from the central compartment by fascial division. In general, the fat of the medial lower compartment is pale in color and perhaps firmer than the contrasting fat content of the central and lateral compartments, which is softer and tends to be more yellow in color.

Preoperative Evaluation

Patient selection is important, particularly in individuals who are candidates for cosmetic blepharoplasty. Certainly, only those physical complaints that can be reliably corrected by blepharoplasty should be selected and those that do not respond well to surgery avoided. Equally important is that patients are well motivated with reasonable and realistic expectations for this elective cosmetic procedure. Although most of the clinical conditions that are collectively called "baggy lids" by patients can be corrected, there are several problems that cannot be helped surgically. Typically, patients with dermatoachalasis and aging skin changes along with protuberant fat pads and orbicularis muscle hypertrophy can be corrected at simple outpatient surgery. They should be evaluated and counseled as to the degree of involvement from brow ptosis. The upper lid anatomy can be significantly affected by the level of the brow. Failure to correct brow ptosis in clinically significant patients will produce a less satisfactory result. Occasionally, simple correction of the brow makes it possible to avoid upper lid blepharoplasty.

There are a number of conditions that cannot be improved by surgery, including a range of both local and systemic disorders that result in lid edema. Those edematous states are related to either metabolic disorders or allergic problems, and these of course will continue even after surgery. Hypertrophic and darker skin color in the periorbital area are not

corrected by blepharoplasty.

Any history of allergies related to medications, and specifically local anesthetics, should be identified. Patients who are on aspiring or any medications with anticoagulant properties should cease intake of those medications for at least 2 weeks before surgery. It is a good idea to have the eyes checked before surgery, documenting visual acuity, the level of moisturization, and any preexisting ophthalmic problem. Patients with weak lower lid tarsus should realize that some type of lid-tightening or lid-shortening procedure must be performed in addition to blepharoplasty to avoid postoperative problems. Also, the possibility of ptosis of the upper lids should be evaluated, as an additional procedure would be required to correct such a condition.

Surgical Technique

Upper Lid Blepharoplasty

In the sitting or upright position the upper lid should be marked and the surgical plan outlined, since the appearance of the anatomy is changed in a reclining patient. With a fine line marker, the upper lid crease, which typically corresponds to the superior edge of the tarsal plate, is outlined and the line of the excision is extended laterally, with an upward rotation of the line as it extends farther towards the lateral orbital rim. An attempt is made to avoid extending the excision beyond the lateral orbital rim into the thicker periorbital skin. Fat pads of the upper lid are located and marked over the area of prominence. Both sides should be marked independently, because asymmetry and variation from one eye to the other is not unusual. Incisions that extend medially beyond the concavity of the junction of the nose to the lid should be avoided in order not to risk a webbed scar. If a brow lift is to be included, these incisional markings should also be made preoperatively with the patient in the upright position.

With the patient's eyes closed, the redundant skin is grasped with the blades of smooth forceps and the amount of excess skin is estimated and similarly marked.

Local anesthetic, typically 1 per cent lidocaine (Xylocaine) with 1:100.000 epinephrine is infiltrated, using a No. 27 or smaller-gauge needle. An attempt is made to avoid distortion of the upper lid by avoidance of overinjection. The skin incisions are then made following the planned operative marks, and the skin to be resected is grasped and retracted medially while countertraction is maintained in the subcutaneous plane. Hemostasis is obtained with bipolar cautery or disposable ophthalmic heat cautery. The same procedure is performed on the opposite lid.

In patients with particularly heavy skin and a poorly defined upper lid crease, resection of a small strip of orbicularis muscle is helpful. Attention is given to avoid the superficial levator aponeurosis, and resection of the orbicularis muscle only is performed. Resection of this small strip of muscle will help the skin adhere to this layer and further demarcate a lid crease. No deep sutures are used for closure in this area. If the patient has clinically observable fat pads, a superficial stab excision through the muscle layer with spreading allows the septum to be opened, the fat clamped and resected, and the base cauterized. No individual closure of the muscle layer or the septum is required after this maneuver.

The wound is closed with a running intracuticular 6-0 Prolene suture. The medial and lateral ends of the suture are left long so that they can be tacked to the skin with a small surgical tape.

Lower Lid Blepharoplasty

The lower lid blepharoplasty may be performed by elevating separate flaps (the skin flap followed by muscle excision), or these may be combined with what is typically known as the skin-muscle flap technique. Most frequently the latter is utilized. This separates the skin and orbicularis musculature from the septum orbitalis and the orbital contents.

The lower lid is marked preoperatively at the same time as the upper lids with the patient in an upright position. A planned line of excision several millimeters below the lashes is identified and extended laterally and superiorly to blend with the natural skin creases. Just as in the upper lid, an attempt should be made to avoid significant lateral extension beyond the orbital rim into thicker skin. Protruding fat pads are marked for later ease in identification.

After infiltrating local anesthetic, the skin is now incised along a line parallel with the lower lid lash line as marked preoperatively. The skin-muscle flap is then developed with the aid of small curved blunt scissors. The plane of dissection is beneath the level of the orbicularis muscle but superficial to the septum orbitalis, and is continued from lateral to medial to a point corresponding with the medial puncta. Inferiorly, the dissection is extended down to approximately the level of the orbital rim. Hemostasis is obtained by means of bipolar cautery; a small bulb irrigator is often helpful to keep the field clear at this stage.

At this point the septum orbitalis and its underlying fat pads are in direct vision. If the amount of fat protrusion is minimal, a direct cauterization of the septum orbitalis may effectively tighten the septum and replace the fat back into normal position. This is accomplished with a sweeping motion of the cautery over the most protruding area, in effect creating cauterized stripes until a flat septal appearance is accomplished. In those patients that do not benefit from a cautery technique (for example, those with excessively large amounts of fat), fat pads may be approached openly and excised. The septum is opened directly above the fat compartment, and without traction the fat is allowed to extrude into the wound. The base is clamped with a small hemostat, the excess fat is cut away, and its base is cauterized. It is important that the fat be grasped with forceps beneath the hemostat before the latter is released. The fatty stump is inspected for bleeding; if any is present, it is cauterized before allowing the stump to retract back into the orbital contents. This is completed for all three compartments, medial, central, and lateral, as required.

The skin-muscle flap is now redraped and a smooth configuration of the lid is attained. It is important to avoid over-resection of the skin-muscle flap in the vertical direction. The flap is redraped in a lateral, superior fashion. Often in a young patient whose problem has primarily been one of the fat pad, minimal skin may need to be resected. Conservativism is always favored in the lower lid. An overaggressive resection with too much vertical shortening should be avoided; this could result in ectropion, and this danger should be uppermost in the mind of the surgeon at this point in the procedure.

After a resection and redraping of the skin, the muscle level is grasped and a 5-0 Vicryl suture is used to suture the muscular layer in a suspensory fashion to the orbital periosteum at the level of the lateral canthus. Following resection of excess skin and muscle and placement of the suspensory suture, the wound is closed in one layer. An ophthalmic antibiotic ointment is placed on the suture lines of the upper and lower lids and small ice pads are placed over the eyes for the next 4 to 12 postoperative hours. No other dressings are used.

Horizontal Lid Shortening

When horizontal lid laxity exists in the blepharoplasty patient, a horizontal lid-shortening maneuver must be contemplated. Preoperative identification of these patients generally is made by an abnormal lower lid "snap test". In this group of patients, a full-thickness lid-shortening procedure avoids scleral show and ectropion postoperatively.

The procedure is accomplished after elevation of the skin or skin-muscle flap. A pentagonal block may be resected lateral to the limbus. This is essentially a modified Kuhnt-Szymanowski procedure. To determine the width of the resection (usually 3 to 4 mm), the lateral-most half of the pentagon is made first, allowing the medial segment to overlap and identifying the amount of redundancy. The medial portion is then resected and the wound closed.

The wound is approximated with 6-0 silk sutures at the area of the pentagonal resection. Sutures should not go through the conjunctiva. Additional augmentation can be gained by placing a single 6-0 Vicryl suture through the tarsal plate. The silk marginal sutures are left long enough to be brought out over the skin flap and anchored inferiorly with a Steri-Strip. The skin or skin-muscle flap is then handled as described above and closed in routine fashion. The marginal sutures are left in place for a full 7 days.

An alternative technique is the lateral canthoplasty, a modification of the technique of Hamako and Baylis. It has the advantage over wedge resection that the surgeon can actually see the lower lid position in a more predictable manner. In addition, the infrequent, but unsightly complication of a notch in the lower lid rim is eliminated.

After elevation of a skin-muscle flap, the tarsal contribution to the lower lid lateral canthal tendon is identified and severed laterally. Care is taken not to injure the lateral canthal tendon from the upper lid. The severed tendon is then pulled slightly superiorly and laterally. Excessive skin, the orbicularis oculi muscle lid margin, and the lashes are resected. This leaves the tarsus attached to the previously fashioned inferior limb of the lateral canthal tendon. When the tarsal-canthal unit is attached to the lateral orbital rim, the lower lid is both shortened and suspended.

The attachment to the lateral orbital rim is made slightly superior to Whitnall's (orbital) tubercle on the orbital side of the rim. This tubercle can be found on the orbital side of the surface of the orbital rim just inferior to the frontozygomatic suture line. The attachment to the lateral orbital rim is made to a laterally based periosteal flap, using 4-0 PDS. Drill holes in the lateral orbital rim are not required. A slight overcorrection is performed in the operating room, in anticipation of a degree of postoperative settling.

Complications

As in all types of surgery, complications can occur in blepharoplasty despite all appropriate precautions. Serious complications are uncommon, and can generally be managed successfully when they do occur.

Vision Loss. Perhaps the worse complication of blepharoplasty is vision loss or complete blindness. Fortunately, this is extremely rare. The mechanism has not been totally identified, but is presumed to be related to retrobulbar hemorrhage leading to intraorbital and intraocular pressure compromising the circulation to the optic disc and central retinal artery.

Ectropion. This is a more common complication and a distressing problem after blepharoplasty of the lower lid. Ectropion may be related to excessive removal of skin in the vertical direction. A frequent problem, albeit less often recognized, is failure to treat laxity of the eyelids. The so-called snap test is a useful preoperative guide in lids that do not spring back to coapted position against the globe when pulled out if they are shortened and tightened as part of the procedure. Minor degrees of ectropion generally improve with time, and taping and massage, in addition to forceful squinting exercises frequently clear the problem without further surgery.

Dry Eye. Most patients have a temporary dryness of the eyes that generally is not a problem. However, prolonged dryness of the eye, or an eye that was dry preoperatively and in which the condition is exacerbated after surgery, can result in corneal irritation. Lubricants and artificial tears, along with patching are helpful ways to prevent subsequent ophthalmic problems until normal moisturization has returned.

Lagophthalmos. Lagophthalmos is less common than problems with the lower lid, and tends to be related to excessive skin excision of the upper lid. When permanent, it is best corrected by placement of a thin full-thickness skin graft for the area. Other causes of lagophthalmos may be related to damage to the orbital septum or involvement of the latter with suturing.

Ptosis. It is important to check for ptosis during the preoperative eye evaluation. Postoperative ptosis may be temporary and due to edema, hematoma, or reversible injury to the levator aponeurosis, such as from cautery. Many patients have had ptosis before surgery without recognizing it, and may only begin to notice it postoperatively if it is not corrected. In this situation it is not a complication of cosmetic surgery, but a condition that will not be improved without additional procedures. Postoperative ptosis should be treated conservatively and ophthalmic correction of levator repair considered if the condition does not appear to be responding.

Unsightly Scars. The thin skin of the lid usually heals with acceptable scars. However, just as in other anatomic sites, hypertrophic or contracted scars may occur. Most of these resolve with conservative treatment, but small scar revisions may sometime be required.

Postoperative Care

The sutures are removed after 4 to 6 days and the eye is moisturized with antibiotic ointment until that time.