

# Ophthalmology<sup>TM</sup> ROUNDS

AS PRESENTED IN THE  
ROUNDS OF THE DEPARTMENT  
OF OPHTHALMOLOGY  
AND VISION SCIENCES,  
FACULTY OF MEDICINE,  
UNIVERSITY OF TORONTO

## The Complications of Blepharoplasty Surgery – Part 1

BY JAMES OESTREICHER, MD, FRCSC

**Cosmetic surgery is becoming much more of a consideration for a greater number of people. Women and men, regardless of age, occupation, or socio-economic level, are interested in maintaining a youthful persona and optimizing their appearance. The incidence of cosmetic eyelid operations is increasing exponentially, being performed by many different specialties. However, when complications occur, it is the ophthalmologist who is called upon for help.**

**Because of the myriad of possible complications, it is crucial to understand the problems that may occur and the available and advisable treatment. Dr. James Oestreicher, a leading Canadian Oculoplastic Surgeon, has covered the whole of this extensive topic and, because of the complexity of the subject, his presentation has been divided into two parts. Part 1 is featured in this issue of *Ophthalmology Rounds* and Part 2 will be in the next.**

Jeffrey Hurwitz, Editor, *Ophthalmology Rounds*

“Blepharoplasty” is an operation to change the shape, appearance, or configuration of the eyelids, as its Latin roots suggest. Generally, the goals are to restore youthful contours by removing redundant skin, fat, and muscle, tightening supporting structures such as the canthal tendons and, occasionally and more importantly, correcting associated abnormalities such as ptosis, brow ptosis, entropion, ectropion, or eyelid retraction.

Complications may be minor or serious, but can be considered from opposite viewpoints by the surgeon and the patient.<sup>1,2</sup> Trust and communication are key, as with any doctor-patient relationship, but possibly, they are even more important in a completely elective, esthetic procedure associated with high expectations and standards. The surgeon's confidence (but not overconfidence) and experience are essential in the post-operative period. Most patients merely need reassurance; however, some complications may need intervention “down the line” if the problem (usually asymmetry) does not resolve. The surgeon must be aware of the natural history of certain postoperative appearances, bearing in mind how the actual surgery went. He or she must avoid being pressured into premature corrective action by an anxious or demanding patient, while assuring that effective corrective action will be available at an appropriate time in the future. In other words, the surgeon must be there for his patient and put their outcomes foremost. By doing so, the trust built preoperatively will continue through the critical postoperative period (Figure 1).

### Preoperative assessment

In the initial consultation (and subsequently, if required), patients are encouraged to voice their desires and concerns regarding the esthetic and functional appearance of their eyelids. Privacy and the use of a suitably-sized hand mirror are key. If patients cannot describe or demonstrate the changes and the final results they desire, it



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behooves the surgeon to facilitate the discussion or present alternatives until a clear agreement occurs – otherwise, the surgery should not be performed.

It is important to elicit the particular concerns of each individual patient as these can vary widely. Examples include a particular dislike of lateral hooding, a fear of blindness, a “staring” or “overdone” look (very common), a desire to avoid a sunken look (a common concern in younger patients), and concerns about the length of the recovery period, as well as intraoperative and perioperative pain. This is when the surgeon must recognize unrealistic expectations, eg, patients who want no upper lid fold at all, post-op patients (who may already appear over-corrected) desiring further “improvement,” those who plan to return to high-demand occupations the day after surgery, and others who make travel arrangements within the first week of the operation. Patients who view cosmetic surgery as a commodity rather than a medical procedure with attendant risks should not be operated on. While some unrealistic patients can be educated and subsequently operated on with confidence, others cannot.<sup>3</sup>

The surgeon should systemically inquire about cardiac and thyroid disease, hypertension, diabetes, bleeding diathesis, medications, allergies, and keloid scar formation. Patients should stop taking aspirin, anticoagulants, nonsteroidal anti-inflammatory agents, vitamin E, ginkgo, and other herbal medications up to 3 weeks preoperatively, if possible.

The surgeon must look for ophthalmic and periorbicular disease by taking a history and performing a full eye examination. The examination should include assessment of vision, motility, strabismus, orbital or eyelid asymmetry, dry eye, ptosis, lid retraction, exophthalmos, lid fold height, lid laxity, inferior scleral show, entropion, ectropion, brow ptosis, and asymmetry. A slit lamp examination and Schirmer’s test are necessary in this author’s view. The amount of excess skin in the upper lids, the amount of excess or prolapsed fat, the position of the lacrimal glands, and the extent of lateral hooding and medial bulging are important when planning the surgery. Important factors to assess in the lower lids are excess skin, fine rhytids (wrinkles), prolapsed fat (quantity and location), malar bags or festoons, lid laxity, scleral show, and pigmentary characteristics. The patient’s racial, ethnic, or congenital facial features must be noted and discussed to determine what, if anything, is to be changed.

Old photographs are useful, particularly to determine the patient’s youthful upper eyelid fold configuration. Many people never had a full “wide open”

upper lid (ie, they were always heavy-lidded) and their lid crease height is at 7 mm, not 10 mm. Usually, it is a mistake to change the nature of their upper eyelids too drastically, unless this desire and the possible postoperative appearance are made abundantly clear. It must be understood that old photographs do not represent a guarantee or even a goal, but rather serve as a guidepost.

Surgical planning includes whether upper or lower eyelids, or both will have surgery. Technique (steel blade versus CO<sub>2</sub> laser, transconjunctival versus external lower blepharoplasty) must be decided, along with adjunctive procedures. Adjunctive procedures include brow ptosis repair (internal transblepharoplasty, direct, coronal, or endoscopic), ptosis repair, lacrimal gland suspension, eyelid lengthening, and lower eyelid tightening or lateral canthopexy. Another key decision is to perform lower eyelid skin excision or laser resurfacing (or neither).

This author favours CO<sub>2</sub> laser blepharoplasty with a transconjunctival lower lid approach. CO<sub>2</sub> skin resurfacing is useful to address skin redundancy and festoons (in patients with appropriate skin types). Brow elevation surgery is overrated and overdone. Lower lid fat removal is preferable rather than fat repositioning. Mid-face elevation is also a risky overrated procedure.

## **Complications**

### *Orbital hemorrhage with vision loss*

This complication is at the top of every surgeon’s list although, statistically, most will never see it. The incidence is estimated to be 1 in 2,000 to 1 in 25,000.<sup>4</sup> Risk factors obviously include hypertension, anticoagulant or antiplatelet medication use, prolonged complicated surgery, and re-operation through scarred tissue. The etiology is a form of compartment syndrome, with the orbit bounded by four bony walls and the orbital septum acting as the compartment. With an acute hemorrhage, intra-orbital pressure rises abruptly and the blood supply to the optic nerve is cut off. Hence, any concomitant rise in intraocular pressure is secondary and treating it will not affect outcome. Use of the CO<sub>2</sub> laser has likely decreased the incidence of this complication, since it coagulates as it cuts and avoids excess traction from clamping the fat prior to cautery and cutting.

Recognition of this complication is key, as is a rapid response. The surgeon will note proptosis, decreased motility, increased orbital tension and, usually, associated bleeding. The patient will have

**Figure 1: Complication of blepharoplasty surgery – lagophthalmos**



**A.** Lower eyelid of this patient shows cicatricial ectropion with middle lamellar scarring causing lid retraction, after blepharoplasty. The patient has severe symptomatic lagophthalmos as well as an unsightly appearance.



**B. Significant lagophthalmos.** The patient had symptomatic exposure keratitis despite copious lubrication and taping the eyelids closed at night.



**C.** Lower eyelid of the same patient shown in A. and B. after redraping of the lower eyelid skin (no skin graft required), as well as lower eyelid elevation and scar release with posterior hard palate mucosal graft. There is essentially no remaining ectropion or retraction and her lagophthalmos is also gone.

asymmetrical pain and decreased vision. Laser eye protectors (metallic scleral contact lenses) block vision and these must be removed to assess visual acuity. Postoperative hemorrhage can be recognized by the patient if he or she is properly educated to look for unusual or asymmetrical pain, decreased vision, or proptosis. Patients must be taught to check their vision one eye at a time. An effective emergency contact arrangement should be in place so prompt assessment and intervention can be carried out.<sup>5</sup>

Rapid treatment is key. Control of obvious bleeding points, if present, is important. However, rapid release of orbital pressure by opening the wound, lateral canthotomy, and inferior and/or superior cantholysis is critical. The surgeon should bluntly spread posteriorly into the orbit, down the lateral wall, and through the wounds to access deep hematomas and release them. If done in a blunt fashion in the plane of the lateral wall and in the plane of the levator aponeurosis and inferior rectus (ie, parallel to these structures), the risk of significant damage to orbital structures is low. Frank orbital hemorrhage with proptosis, a frozen globe, and vision loss calls for bold measures. Systemic osmotic agents (mannitol) and steroids are an adjunct, but do not replace prompt pressure release. True bony decompression – either at the bedside through the infero-medial floor or more fully in the operating room – is rarely required. Anti-glaucoma medications or anterior chamber drainage are treatments aimed at central retinal artery occlusion, not orbital hemorrhage. Computed tomography (CT) scanning of the orbits is important, but only after treatment has been carried out. A deep

loculated undrained hematoma is found only rarely. Usually, streaking hemorrhage and air are visualized that are more likely to be hallmarks of surgical trauma.

Unfortunately, beyond 1 to 6 hours of total or near-total vision loss, treatment is unlikely to be effective. Up to 24 hours, cantholysis and pressure release (if the orbit is still tense) and steroid treatment can be utilized. Beyond this time period, however, one may be over-treating the patient and exposing them to additional complications with very little prospect of improvement. After 24 hours of “spinal-trauma” dose levels of steroids (solu-medrol 30 mg/kg bolus over 15 minutes followed by 5.4 mg/kg per hour) without response, the drug should be discontinued, possibly after repeat imaging.

Since time is of the essence, it should be recognized that an experienced oculoplastic surgeon is not essential to perform a bedside canthotomy/-cantholysis and pressure release. All ophthalmologists should feel comfortable treating orbital hemorrhage with canthotomy and cantholysis.

Post-treatment admission to hospital is recommended, with close monitoring of visual acuity, head elevation, ice water compresses, and intravenous steroids until vision is stable for 24 hours and CT scanning has been performed. Steroids can be stopped abruptly if administered for <3 days, even at extremely high doses. Topical and systemic antibiotics are utilized for the open wounds, with repair planned electively in 1 to 2 weeks, if they do not close on their own. Hospital staff or the patient should monitor the stability of improved vision for 1 to 3 days after treatment is stopped.

### *Superficial ecchymosis and hematoma*

Every blepharoplasty patient will experience superficial ecchymosis and hematoma to some extent, so bruising is not really a complication so much as an expected side effect. However, if excessive, it can lead to a prolonged recovery, infection, cicatrization, and skin pigmentation. The use of the CO<sub>2</sub> laser will minimize bruising, as will continued avoidance of drugs with anti-coagulant effects, control of hypertension, and avoidance of postoperative trauma, bending, and straining. It is important for the surgeon to be meticulous with cauterization, either by defocusing the CO<sub>2</sub> laser or by performing bipolar cautery. This is one time when patients benefit from a surgeon's obsessiveness with a dry surgical field. The trauma of cautery is less than the trauma of prolonged postoperative ecchymosis.

The patient can aid recovery with a few simple interventions. They should rest with their head elevated at least 45° to 60°. Ice water compresses should be utilized continuously for 3 days (except when eating or sleeping). Patients will recover faster when compresses are applied throughout most of the first night. Ice packs or frozen masks are too heavy and cold and may damage eyelid tissues or dehiscence wounds. Preoperative and postoperative oral arnica (a herbal healing agent) has been claimed anecdotally to help, when given in normal doses.

### *Ocular injury*

Obviously, blepharoplasty surgery is performed very close to the globe and the potential for injury exists. There is increased risk in the patient with proptosis, such as those with thyroid eye disease or a large or projecting glaucoma bleb. Globe injury can occur with the CO<sub>2</sub> laser, a steel scalpel, or local anesthetic injections.

Laser eye protectors are essential if the CO<sub>2</sub> laser is utilized, but there must be enough ocular lubrication to avoid a corneal abrasion when they are inserted or removed. The laser must always be directed away from the globe even though eye shields are in place. Visual acuity measurement and slit lamp examination are critical on the first postoperative visit (almost always the day after surgery) to rule-out ocular injury and document its absence.

Postoperative ocular and wound lubrication with ophthalmic antibiotic ointment is very important in preventing corneal breakdown,

ocular dryness, and conjunctival chemosis. This is because most patients will initially experience small amounts of lagophthalmos from the ongoing local anesthetic effect on the orbicularis, that causes both swelling and stiffness of the eyelids. A vicious cycle can develop wherein the chemotic conjunctiva dries out because it is swollen, and then swells because it is dry. This can also lead to corneal dellen formation, or a dry cornea can break down *de novo*. Patients should not drive for a week because of the blurriness caused by the ointment.

In the setting of blepharoplasty surgery, non-infected corneal abrasions are best treated with a bandage contact lens. This allows rapid relief of symptoms, rapid healing, the ability to monitor vision, and eliminates pressure on wounds caused by a patch. However, a contact lens requires daily or near-daily visits to the surgeon until the abrasion is healed and the lens removed. Any true globe injury must have urgent and appropriate treatment by an ophthalmologist.

### *Diplopia*

Fortunately, diplopia after blepharoplasty is extremely rare. The commonest form is caused when local anesthetic is supplemented intraoperatively by direct fat injection once the conjunctiva (lower lid) or skin (upper lid) is open. There is a more rapid and wider diffusion of the local anesthetic agent that affects other structures such as the cranial nerves. The inferior oblique and levator should be identified (and preserved) during surgery, to ensure that they have not been injured. The diplopia is usually of a form suggesting extravasation of a local anesthetic, (eg, a partial third or sixth nerve palsy). If this is a concern, the patient should be observed until there are signs of improvement. Despite the use of a lidocaine/marcaine mix, this form of diplopia always resolves by the next day.

Injury to the inferior oblique or, less commonly, other extraocular muscles, is rare. One sign of imminent damage to the muscle is excess bleeding. The surgeon must stop the bleeding but, at the same time, avoid excess cautery or other trauma to the muscle. The oblique divides the medial lower fat pad from the central lower fat pad and, thus, it should be easily identified and protected. This is also a good way to ensure that the medial fat pad has not been "forgotten" in terms of fat removal.

Diplopia that persists beyond the first day will often resolve with eye movements or fusion exercises if there is no gross deficit. Occasionally, assistance from strabismus-oriented colleagues can be very helpful if the deficit persists. Finally, there are some patients who develop unrelated cranial nerve palsies some weeks or months after surgery, by chance alone. These should be investigated and followed in the normal fashion for such conditions.

### *Ptosis*

It is quite common for patients undergoing upper lid blepharoplasty to exhibit varying degrees of ptosis the day after surgery. The experienced surgeon who has identified and preserved the levator muscle and aponeurosis during surgery will not panic. Eyelid edema and levator edema are common temporary causes of ptosis. The levator aponeurosis is the stage on which fat removal during upper blepharoplasty is played and it is natural for early postoperative dysfunction to be seen on occasion.

There are several caveats, however. The surgeon must know his or her patient's anatomy to distinguish septum from levator. The septum must be opened if fat is to be removed, but not the levator. The two fuse low in the upper eyelid, so the inexperienced surgeon is well-advised to open the septum higher up, where there is a good barrier of underlying pre-aponeurotic fat to protect the levator. The septum fuses with the orbital arcus marginalis so, if it is pulled on, it tightens when a finger is placed under the brow. Similarly, it will not move when grasped and the patient is asked to look up, but the levator will feel like a "trout pulling on a fishing line." In addition, when the pre-aponeurotic fat is grasped and the septal attachments divided, it is possible to pull the superficial levator aponeurosis up with it. Hence, it is important to be gentle when freeing fat from the underlying levator since the latter can be damaged inadvertently. Similarly, when using the CO<sub>2</sub> laser to cut fat lobules free, a "backstop" is needed (usually a Q-tip) to absorb the transmitted laser energy and avoid damage to tissues that lie beneath (ie, levator, Muller's muscle, conjunctiva, and globe). The same principle applies for lower-lid fat removal to protect the inferior oblique.

If a definite levator laceration is observed, it should be repaired if it is causing ptosis. It may be necessary to lighten the patient's sedation to

gain an accurate assessment of lid height; sitting the patient upright is also useful. In the absence of a definite levator laceration, persistent postoperative ptosis is usually followed for 3 months before being repaired since the majority will resolve during this period. The exception is the patient who has had a combined blepharoplasty and levator advancement ptosis repair and is obviously undercorrected after about a week. Their wound can be readily opened and the slipped levator suture replaced fairly easily. However, another option is to wait the 3 months and then perform a posterior Fasanella-Servat procedure, thus avoiding opening the anterior wound entirely. This is fast, predictable, and avoids overcorrection and scar abnormalities.

Avoidance of under- or overcorrection in ptosis repair, combined with blepharoplasty, is an entire topic unto itself. Careful dissection, light sedation, clear dry tissue planes, and careful suture placement are all key factors, but patients should be informed that there is a definite chance of re-operation in these more complex situations.

### *Wound dehiscence*

Even minor postoperative trauma can result in wound dehiscence if the patient is unlucky. Infection and patients who are restless sleepers can be additive risk factors. Skin sutures with 6-0 prolene (that can imbricate levator or pretarsal tissues for crease formation) are preferred. Prolene is inert and ties cleanly, which is useful in precisely closing a wound. Absorbable upper lid sutures, either in the skin or buried, have a risk of tissue reaction or dehiscence. Silk in upper lid blepharoplasty wounds is less satisfactory. CO<sub>2</sub> laser incisions require 7 days to heal; therefore, sutures are removed on day 7 or 8. A running prolene suture, with several interrupted reinforcements, is useful. Patient discomfort from suture removal is minimized by using Jeweller's forceps and sharp Vannas scissors.

The conjunctival incision made in a transconjunctival blepharoplasty never requires sutures; they cause more harm than good. It is often necessary to tighten the lower eyelid at the time of blepharoplasty. If a full tarsal strip procedure<sup>6,7</sup> is required, the patient is rigorously cautioned about avoiding pulling or sleeping on the eyelid to avoid dehiscence. Deep (tarsus to periosteum) 5-0 prolene sutures and skin sutures of 6-0 silk are utilized, with the silk

sutures removed at 7 to 9 days. Slight dehiscence can be treated with topical and oral antibiotics, but a complete dehiscence needs prompt debridement and repair to avoid lower lid retraction and scarring. Milder eyelid laxity is treated by a form of lateral canthal tendon plication at the time of lower lid blepharoplasty. Dehiscence in this case is less common and milder and, therefore, can usually be managed supportively.

An examination of the complications of blepharoplasty surgery will continue in Part 2 in the next issue of *Ophthalmology Rounds*. Other problems such as scar and pigmentary abnormalities, epiphora and ocular discomfort, upper eye overcorrection, lower eyelid overcorrection and retraction, asymmetry, and Asian blepharoplasty will be examined.

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