

Oculoplastics & Cosmetics

Nicholas J. Schmitt, M.D.

Oculoplastics is the surgical treatment of conditions affecting the orbit, eyelids, tear ducts, and the face. It also deals with the reconstruction of the eye and associated structures.

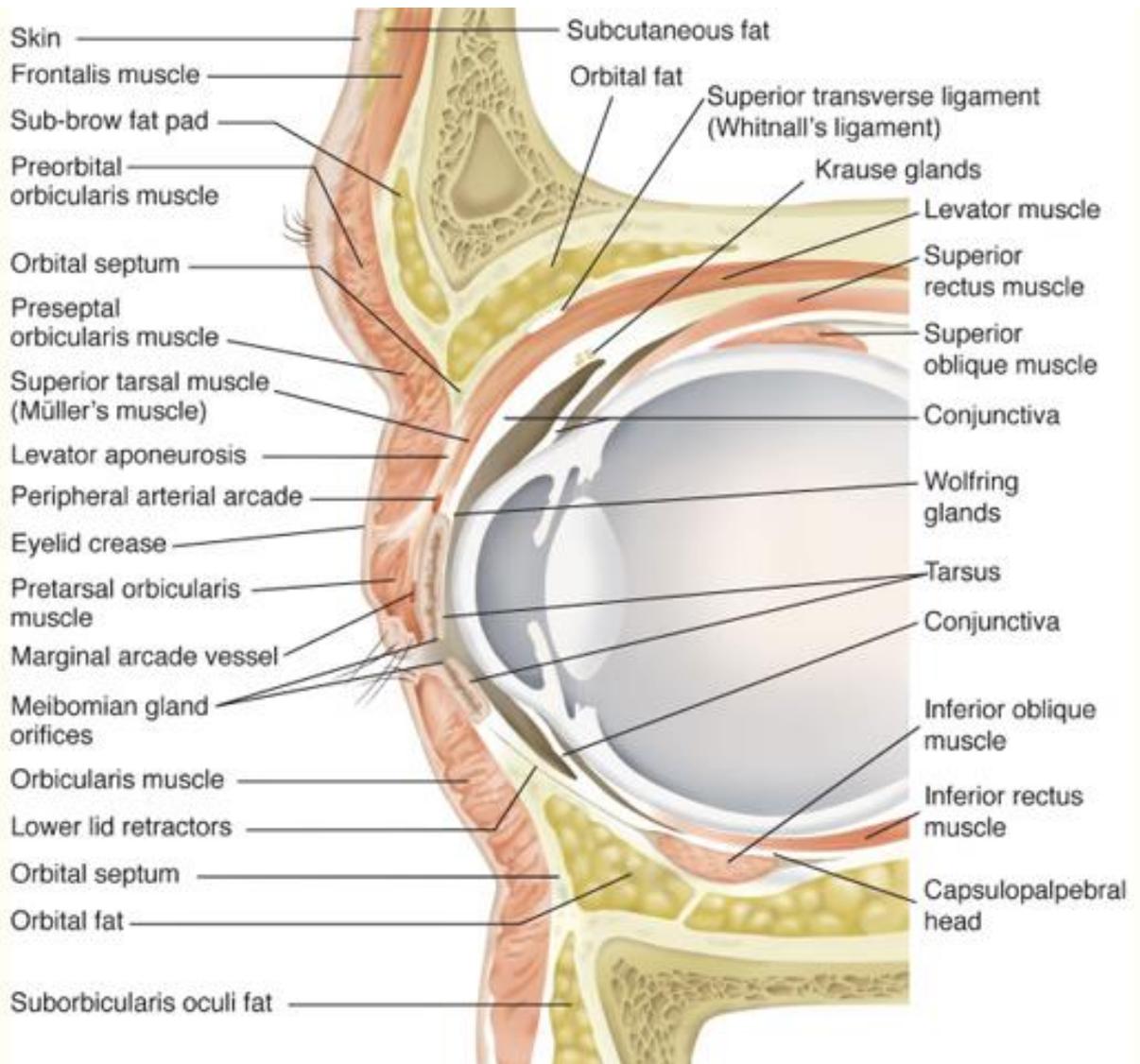


TABLE OF CONTENTS

Blepharoplasty	3
Ptosis	3
Levator Muscle	3
Ptosis Surgery	4
Brow Lift	4
Endoscopic Forehead Lift	4
The Pretrichial Eyebrow/Forehead Lift	4
Direct Brow Lift	4
Lacrimal (Tearing)	5
Ectropion	5
Entropion	5
Dacryocystitis	6
<u>Dacryosystorhinostomy (DCR)</u>	6
Thyroid-associated Orbitopathy (TAO) / Grave's Disease	6
Two Phases of TAO	7
Orbital Decompression	7
Strabismus Correction	8
Nonspecific Orbital Inflammation (NSOI) /Pseudotumor	8
Oculofacial Trauma	9
Nonsurgical Rejuvenation	11
BOTOX	11
Fillers	11

Blepharoplasty

Blepharoplasty (Blepharo- means “eyelid”, and –plasty means “change”) is surgical repair or reconstruction of an eyelid. It is the most commonly performed facial plastic surgery procedure. This is because the eyelids account for a large part of the expressiveness of the face. When you look at someone, you look at his or her eyes. If the eyelids are sagging, droopy, or puffy, the face will look fatigued, sad, and tired despite good health and adequate rest. If the eyes look bright and alert, an otherwise aging face will appear rejuvenated. Thus, blepharoplasty is a procedure that can rejuvenate the face as well as the eyes.

Blepharoplasty is tailored individually for each patient. The right combination of skin and fat removal, fat repositioning, and lid tightening is applied to achieve a more rejuvenated and youthful appearance in each individual patient. Sometimes, less is more.

Upper eyelid blepharoplasty is typically performed as a same day surgery under light sedation and local anesthesia. Excess skin is removed. Bulging orbital fat may be removed, sculpted or repositioned. Lateral sub-brow fat that contributes to upper lid fullness may be removed and/or sculpted.

Lower eyelid blepharoplasty is performed to soften the puffiness of the lower eyelids caused by prolapsed orbital fat. Fat may be repositioned to improve a tear trough deformity. Excess skin is removed, if necessary. Lower lid laxity or droop may be simultaneously corrected. Blending of the lid-cheek junction is performed with lower eyelid tightening and a cheek lift.

Ptosis

Ptosis (pronounced to’ sis) simply means droopy eyelid. It is one of the most common eyelid problems. The lid may droop slightly, or cover the entire pupil. Ptosis can restrict and even block normal vision. It can be present in children and adults, and is usually treated with surgery.

There is a difference between a droopy eyelid and a baggy eyelid. A droopy eyelid is low. A baggy eyelid (dermatochalasis) has excess skin and fat. The two often occur at the same time in adults.

Ptosis can be inherited, be present at birth, occur later in life, and affect one or both eyelids. Signs and symptoms include: the drooping lid itself, looking up underneath drooping lids (a “chin-up posture”), raising the eyebrows in an attempt to lift the lids, loss of interest in reading due to forehead muscle fatigue, and headaches due to forehead muscle fatigue. The most common cause of ptosis in adults is the separation of the levator muscle from the eyelid.

The Levator Muscle is the main muscle that lifts the eyelid. This may occur due to aging changes, after an injury to the eyelid, after eye surgery such as cataract surgery, or with an eyelid tumor. Less commonly, ptosis in adults may occur with neurological disorders. Additional testing is performed to help diagnose these conditions.

Ptosis Surgery - treatment is usually surgical and involves tightening of the levator muscle within the eyelid. This is performed as a same day surgery with light sedation and local anesthesia. If necessary, a blepharoplasty is performed first. Otherwise, a small incision is made in the natural upper lid skin crease. The levator muscle is tightened using a small, permanent suture. The patient is asked to open her eyes so that lid height, symmetry, and contour can be assessed. It is important for the patient to be alert during this part of the surgery to give the best results. Further adjustments are made, if necessary. The incision is closed using a fine absorbable suture. The patient is seen for a postoperative visit 1 week later. Sometimes, the lid height will need adjusting at that visit, which is comfortably performed in the office under local anesthesia.

Brow Lift

Eyebrow and Forehead Lifting addresses eyebrow position and loose or wrinkled forehead skin and underlying tissue. To fully understand the benefits of eyebrow and forehead lifting, one must be aware of the importance of the position of the eyebrows. Eyebrow position changes as we age.

Our natural eyebrow position, the effects of gravity and fat deflation, how active our eyebrow and forehead muscles are, and previous eyelid, eyebrow or forehead surgeries (if applicable), all contribute to the position our eyebrows are in today.

There are several types of eyebrow and forehead lifts. The type you and your surgeon choose will depend on your current eyebrow position, facial structure, and on what is possible to maximize your appearance. The main types of forehead lifting are as follows:

Endoscopic Forehead Lift - the gold standard cosmetic procedure in that it requires five small incisions hidden in the hair and leaves no visible scar. This procedure can lift everything from the hairline to the eyebrows. It tightens and smoothes the entire forehead while lifting the eyebrow area which “opens up” the entire upper face. Eyebrow shape and asymmetry can be addressed with this type of lift. Following the procedure there will be some bruising and swelling. Patients are usually comfortable returning to their normal routine activities in about 2 weeks.

The Pretrichial Eyebrow/ Forehead Lift - requires a long incision. This procedure is ideal for patients who want to both lift the eyebrows and raise and shorten the forehead by removing a strip of skin and underlying tissue along the incision. Because the forehead is shortened, the hairline is lowered which is ideal for those with a high forehead and receding hairline. This procedure lifts everything from the hairline down to the eyebrows and can address eyebrow shape and asymmetry. The scar from the incision, once healed, is camouflaged in a deep forehead crease. Following the procedure there will be some bruising and swelling. Patients usually return

Direct (Temporal) Brow Lift - requires removing a section of skin and underlying tissue above and following the full or partial length of the eyebrows. This procedure is ideal for those who do not want to involve the hairline. The Direct Brow Lift lifts a sagging brow while tightening and smoothing the forehead by pulling the skin and tissue of the forehead down rather than up. It therefore lowers the hairline, which is ideal for a receding hairline and/ or a high forehead. This procedure also addresses eyebrow shape and asymmetry. Care is taken to position the scar just along the eyebrows so that it is camouflaged. Patients will experience some bruising and swelling following the procedure. They can usually return to their normal routine activities in about 2 weeks.

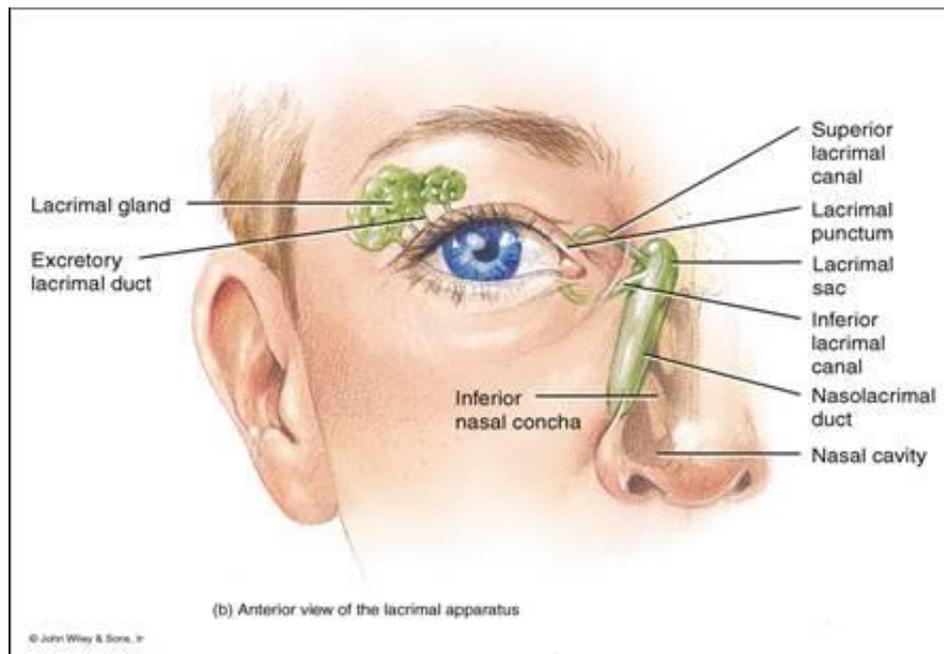
Lacrimal (Tearing)

Tearing, which is the actual spilling of tears down the cheek, differs from “watering,” where tears well up without spilling down the cheek. The distinction between tearing and watering is important, because tearing implies a partial or complete blockage somewhere along the tear drainage system, such as a nasolacrimal duct obstruction. Watering implies a problem with the eyelids or the tear film.

Watering eyes can be caused by eyelid malpositioning which makes the lower punctum not in the proper position to collect the tears. Two types of malpositioning are:

- **Ectropion** – out-turned lid
- **Entropion** – in-turned lid

It is important to understand that multiple factors can simultaneously contribute to tearing: tear film abnormalities, eyelid malposition, and nasolacrimal duct obstruction. Thus, a thorough exam in the office is necessary to determine which factors contribute to a patient’s tearing problem.



Tears are primarily made from the lacrimal gland, which is located in the outside corner of the orbit. Tears are distributed over the ocular surface with each blink, much like a windshield wiper on a car’s windshield. The tear film is an important component of the eye’s optical system. Thus, an abnormality of the tear film can cause blurry vision as well as irritated, dry eyes and reflex tearing.

The tear drainage system begins at the inner corner of the upper and lower eyelids. Small openings called puncta on the inner margins of the lids collect the tears, which then drain through passageways called canaliculi into the nasolacrimal sac. The sac is located between the inner corner of the eyelids and the bridge of the nose. The nasolacrimal sac empties in the nasolacrimal duct, which is a bony passageway into the nose. Tears are then swallowed.

A blockage can occur anywhere along the drainage system, from the puncta to the canaliculi, to the nasolacrimal sac and finally the nasolacrimal duct into the nose.

If only the punctal openings are blocked, a simple procedure called a punctoplasty is performed in the office under local anesthesia. More often, though, a blockage exists further downstream, usually in the nasolacrimal duct.

Examination in the office is used to determine where along this pathway a blockage may exist in a patient with tearing.

Dacryocystitis – an infection of the tear sac that may occur with a nasolacrimal duct obstruction. Symptoms can range from mild redness and irritation on the inside corner of the eyelids to a severe cellulitis requiring emergent care. Antibiotics are used in the short term, but ultimately a dacryocystorhinostomy (DCR) is necessary to prevent the infection from recurring.

Dacryocystorhinostomy (DCR) - is used to alleviate tearing caused by a nasolacrimal duct obstruction. Dacryocysto means “tear sac”, and rhinostomy means “opening to nose.” The purpose of a DCR is to create a new pathway for the tears to enter the nose directly from the nasolacrimal sac, effectively bypassing the blocked nasolacrimal duct. This is accomplished through a small incision near the inside corner of the eyelids. The incision is hidden in a skin crease, and scarring is rarely an issue. A new connection is made between the nasolacrimal sac and the nose, thus allowing tears to directly enter the nose. A DCR is a same-day surgery under local with sedation and local anesthesia.

Postoperatively, there is minimal discomfort. Care includes frequent ice pack applications, head elevation, and limiting bending over and heavy lifting. Patients should avoid nose blowing for 2 weeks. Nasal decongestants and moisturizers may be used during this time period.

Thyroid-associated Orbitopathy (TAO)

Thyroid-associated orbitopathy (TAO), also known as thyroid eye disease or Graves’ eye disease, is the most common specific inflammatory condition affecting the and periorbital tissues. The management of TAO involves both surgical and medical components.

TAO is associated with Graves’ thyroid disease, and can present at any time in the course of the disease, whether the patient is in a euthyroid, hypothyroid, or hyperthyroid state.

The cause of TAO is unknown. In theory, the immune system promotes inflammation directed at the structures around the eye. Extraocular muscles are the primary site of inflammation. Orbital fat and eyelid muscles are also commonly involved.

Demographically, TAO is most prevalent among middle-aged Caucasian women, though it occurs in all races. It is particularly rare among Asians. Though less often affected, men tend to have a more severe course than women.

There are two phases of TAO:

1. The active, inflammatory phase may last from 6 months to 5 years. Signs and symptoms change or progress over weeks to months.
2. The non-active, post-inflammatory phase begins once the signs and symptoms have remained stable for at least 6 months.

Signs and symptoms of Active TAO include:

- eyelid retraction (particularly lateral flare) causing “thyroid stare”
- dry eye syndrome, periorbital edema (swelling)
- conjunctival swelling (boggy, wet eyes)
- restrictive strabismus with double vision
- proptosis (bulging eyes)
- vision loss due to compressive optic neuropathy

The active phase of thyroid associated managed by corneal lubrication, oral corticosteroids, corticosteroid injections to the orbit, orbital radiation, and orbital decompression in the rare case of optic nerve compression.

Generally, surgical management is reserved for the post-inflammatory or non-active phase of the disease, except when vision-threatening disorders (e.g., optic neuropathy or severe corneal exposure) are present.

Signs and symptoms of the Non-active TAO:

- phase include eyelid retraction
- exposure keratopathy
- restrictive strabismus (tightness and pulling sensations when moving the eyes causing double vision)
- proptosis
- compressive optic neuropathy with vision loss.

If mild to moderate, management may only require artificial tears. If more severe, then surgery is usually required. Surgical management of TAO must follow a staged sequence of procedures:

1. Orbital Decompression
2. Strabismus Correction
3. Correction of Eyelid Retraction

Because of the variable nature of TAO, surgery to correct disease-related functional abnormalities is carefully timed and individualized. Though not all stages are necessary for every patient, orbital decompression is performed first, followed by strabismus correction, and, finally, correction of lid retraction.

Orbital decompression - is achieved by removal of orbital bony wall and/or orbital fat. Removing portions of one or more of the bony walls of the orbit expands the volume available to the orbital fat and extraocular muscles. Typically, a balanced orbital decompression is performed, which involves removal of the lateral orbital wall and medial orbital wall, along with orbital fat.

There are several indications for orbital decompression in patients with TAO: compressive optic neuropathy, exposure keratopathy due to proptosis, orbital pain, elevated intraocular pressure, and cosmetic deformity.

Strabismus Correction - the goal of surgical therapy is not to eliminate double vision entirely, but rather to move the region of single binocular vision into a more functional area (straight ahead and down). Because of the unpredictable nature of restricted extraocular muscles, surgery is usually performed with adjustable sutures.

Correction of Eyelid Retraction - Upper lid retraction can cause dry-eye symptoms and corneal exposure, and may even induce a corneal ulcer due to inadequate lid closure. It also contributes significantly to cosmetic disfigurement. Due to the tendency for spontaneous improvement, surgery for isolated upper lid retraction is usually done after at least 1 year of observation.

Eyelid retraction surgery is performed after decompressive and strabismus surgeries have been completed and the lid position has been stable for 6 months or more.

Upper lid retraction is corrected with a levator recession operation. The levator is lengthened, thus allowing the upper lid to cover more of the eye. One can think of this operation as the opposite of a ptosis repair.

Lower eyelid retraction is a common problem in TAO patients. Patients with lower eyelid retraction complain of tearing, dryness, and foreign-body sensation. They frequently have evidence of exposure keratopathy. The most commonly used method of elevating the lower lid involves placing a tissue graft, thus effectively elongating the lower lid providing better coverage of the eye.

Nonspecific Orbital Inflammation (NSOI)

Nonspecific orbital inflammation (NSOI), also known as pseudotumor, is disease of the eye that not uncommonly presents to the emergency room or ophthalmologist. Typically, its onset is acute and manifests with severe orbital pain, swelling around the eyes, limitation and pain with eye movements, and even loss of vision. It is easily confused with infection (pre-septal or post-septal eyelid cellulitis) and may be treated initially –and unsuccessfully– with antibiotics.

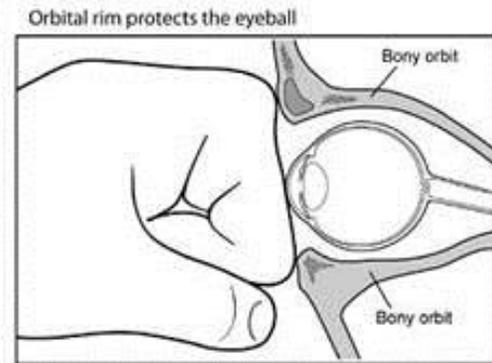
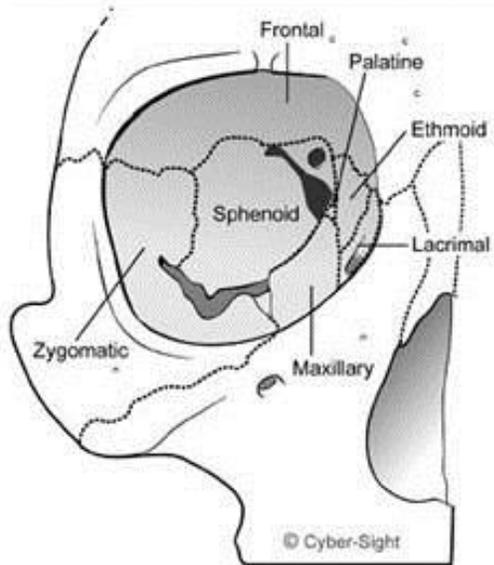
Computed tomography of the orbits may reveal thickening of the extraocular muscles, stranding of the orbital fat, a poorly defined mass (hence the name “pseudotumor”), thickening of the sclera, soft tissue inflammation in the eyelids, or even nothing at all. NSOI can affect children as well as adults. Typically, it responds very quickly to high dose corticosteroids. In fact, this rapid response usually confirms the diagnosis. Atypical presentations warrant further testing, including blood tests and tissue biopsy.

NSOI is so named because of the way a biopsy of affected tissue appears microscopically. There is a scattering of plasma cells, lymphocytes, neutrophils, and histiocytes with no particular pattern. The differential diagnosis for pseudotumor includes the following: TAO, non-infectious granulomatous inflammation (specific orbital inflammation such as Wegener’s granulomatosis and sarcoidosis), infectious orbital inflammation (bacterial, fungal, and parasitic), lymphocytic inflammation (Sjogren’s syndrome and Kimura’s disease), xanthogranulomatous and histiocytic inflammations (non-Langerhans cell histiocytosis and Langerhans cell

histiocytosis), fibrotic inflammation (idiopathic sclerosing orbital inflammation and chronic dacryocystitis), and amyloid deposition.

The treatment for NSOI is immunosuppression. Typically, high dose oral prednisone at 60-80 mg a day is tapered over a long period of months. Occasionally, patients may become steroid dependent and unable to be weaned from the prednisone without relapses. Alternative treatments include other forms of immunosuppression, such as methotrexate and immunomodulators such as infliximab. Irradiation of the orbit is also an option, although a tissue diagnosis should be obtained before pursuing radiation treatment. Irradiation is contraindicated in patients with diabetes, due to potential worsening of diabetic retinopathy.

Oculofacial Trauma



Injuries to the globe, eyelid, lacrimal system, and orbit should be considered when dealing with facial trauma. Careful ocular and adnexal exams are necessary to diagnose hidden ocular injuries. Furthermore, it is easy to focus on an obvious or serious ocular injury and lose sight of concomitant injuries. Expect the unexpected.

To begin with, obtain a careful history. The nature of the injury, timing, associated injuries are documented as best as circumstances will allow. Is there loss of vision, pain, double vision, or trismus? Is there a retained foreign body within the globe, eyelid, or orbit? Prior ocular history is also important. Previous surgeries, injuries, medical problems such as glaucoma, refractive error, amblyopia use of glasses and contacts are documented. Life threatening injuries obviously take precedence over globe or orbit injuries.

Examination includes as thorough an eye exam as possible, including visual acuity, ocular motility, confrontational visual fields, intraocular pressure, color vision. Next, an overview of the ocular adnexa, slit lamp exam, dilated fundoscopic exam. Consider B-scan ultrasonography computed tomography (CT scan), and/or magnetic resonance imaging (MRI) to rule out foreign bodies, fractures, and neuro-ophthalmic injuries. Eyelid injuries can involve retained organic or inorganic foreign bodies. Organic matter, such as vegetable matter should always be removed. Inorganic bodies, such as glass and bullet fragments are removed. Though

typically inert and usually not function-impairing, inorganic foreign bodies can prevent future or immediate MRI scans due to their magnetic properties.

Eyelid injuries can include partial and full thickness lacerations. Do not discard even remotely viable tissue during repair, as the eyelids heal well due to their rich blood supply. If eyelid tissue is lost, reconstruction with flaps, allografts, or skin grafts is necessary. Immediate protection of the globe is always the priority. Eyelid lacerations often involve the lacrimal apparatus, such as canalicular lacerations. Repair canalicular lacerations with silicone stents. Lacerations involving the medial canthal tendon are particularly challenging. One must reattach the posterior limb of the medial canthal tendon to the posterior lacrimal crest to restore anatomic positioning of the lower eyelid to the globe. Lateral canthal tendon repair is simpler to repair, but just as important to proper eyelid orientation. If lateral eyelid tissue is lost, a periosteal flap with a myocutaneous advancement flap is necessary for repair.

Orbital injuries can vary and imaging is usually necessary. CT scan is the first line imaging modality due to speed, bony anatomy, possibility of metallic foreign body. Obtain an MRI for more soft tissue detail, particularly if the optic nerve, chiasm, tract and cavernous sinus are involved.

Orbital Injuries can result in subperiosteal hematomas, intra- or extraconal hematomas, wall and orbital buttress fractures, foreign bodies, and extra ocular muscle contusions, lacerations, and hematomas. Orbital hematomas can often be watched if stable and not causing an orbital compartment syndrome. Otherwise, they are immediately evacuated. Repair orbital wall fractures in one to two weeks if there is persistent diplopia due to extra ocular muscle involvement or enophthalmos. Perform urgent repair (within 24 hours) for pediatric patients with “green stick” trap-door fractures, or obvious muscle entrapment in adults. Zygomaticomaxillary facial complex fractures with significant zygomatic displacement or trismus should also be repaired in one to two weeks. The reason for waiting is to allow bruising and swelling to subside and allow easier repair. Preoperative antibiotics and corticosteroids are typically given.

Management of retained orbital foreign bodies depends on several variables. If possible, remove organic foreign bodies, particularly vegetable matter. Otherwise, chronic bacterial and fungal infections may develop. Organic foreign bodies are notoriously difficult to detect on both CT and MRI, even with contrast dye. Explorative orbital surgery is necessary if a high suspicion for foreign body exists even with negative imaging.

Remove retained inorganic orbital foreign bodies if they indent the globe, interfere with extra ocular muscle function, or are causing a direct optic neuropathy. Otherwise, they may be observed. Copper and iron foreign bodies may produce a chemical orbital cellulitis, and their removal is weighed against possible surgical iatrogenic trauma.

Globe injuries can range from mild to severe. A thorough ocular exam at the slit lamp or hand light is key. Examine corneal epithelial defects with a Seidel test if one suspects a full-thickness laceration. A shallow anterior chamber with an irregular pupil suggests a corneal, scleral or globe perforation until proven otherwise. Explore conjunctival lacerations for scleral perforations. Intraocular foreign bodies may be detected on CT or MRI, as well as B-scan ultrasonography. Look for traumatic iritis and hyphema. Retinal tears and detachments as well as intraocular foreign body warrant retinal consultation as soon as possible.

Head trauma can cause damage anywhere along the visual pathway: optic nerves, chiasm, tracts, and radiations. Traumatic indirect or direct optic neuropathy is common with oculofacial trauma. Decreased visual acuity, color vision, and abnormal pupillary reflex raises suspicion for neurological damage and ruled out if possible.

In summary, oculofacial trauma can present in a myriad of ways. It is important to keep an open mind when evaluating these patients and obtain the most expedient and thorough exam as possible.

Non-Surgical Rejuvenation

Botox is the most popular cosmetic medical treatment in the U.S., and is a favorite among men and women looking for non-surgical facial rejuvenation. Botox has a long history in ophthalmology and was first used for spastic eyelid disorders in the 1980s. It is still the most effective treatment available for blepharospasm, and most ophthalmologists have many years of experience in its use.

How can Botox help?

Botox is a safe, naturally occurring substance that causes muscle relaxation typically lasting three to four months. In high doses, Botox will weaken muscles substantially, while in lower doses, the relaxation and weakening are subtle. These effects can be harnessed by your physician to improve frown lines between the brows, crow's feet at the outer corners of the eyes, horizontal lines in the forehead, and eyebrow height and shape. Botox can also be used to treat vertical lip lines, down-turn at the lips, and twitching or spasm of the eyelids, cheeks, and face.

How is Botox administered?

It is injected with a tiny needle directly into the muscle(s) causing wrinkles, spasm, or facial aging. Mildly uncomfortable, the injections take only a few seconds. Effects begin to be visible at two to three days and are usually fully evident by 1 week. Bruising rarely occurs and fades naturally. Improvements in facial appearance and muscle relaxation typically last three to four months.

Facial fillers are an enormously popular alternative in non-surgical facial rejuvenation. They are sometimes used alone, but can also be an adjunct to Botox. They work safely by restoring lost volume under the skin thereby effacing wrinkles and emptiness from aging, most commonly at the lips and creases around the mouth. They are also quite effective at restoring volume to the areas around the eye. Recent advances in technology have resulted in far more long-lasting and natural improvements than ever before.

How can fillers help?

The most commonly used facial filler is hyaluronic acid, a naturally occurring substance already present in your skin. Hyaluronic acid typically lasts six to twelve months and can be used to improve lip shape and/or size, creases around the mouth, frown lines between the eyebrows, facial scars and depressions, and dark circles below the eyes.

Facial Filler Brands:

- Restylane
- Perlane
- Juvederm
- Belotero

How are facial fillers administered?

Dr. Schmitt will review your specific concerns and medical history and advise you about the best uses for facial fillers in your situation. Fillers are injected with a tiny needle directed in the area of concern, sometimes with ice, anesthetic cream, or anesthetic block injections to minimize discomfort. Effects are visible immediately, but mild local swelling occurs rapidly and lasts for about 24 hours. Bruising infrequently occurs and fades naturally.

What are the risks?

Bruising can occur with any injection. Infection is very uncommon. Botox can rarely introduce weakness in a nearby muscle, causing asymmetry, or a droopy eyelid or lip. To minimize this risk, your physician will recommend that you avoid touching the injected areas for several hours so that the Botox will bind to the intended muscles only. Fillers can also cause asymmetry, and rarely, a local sensitivity reaction.

References:

Nweyeplastics.com

Nweyeclinic.com

www.plasticsurgery.org