

**Dr. Mentz authored the facelift textbook** outlining the latest techniques in comprehensive facial rejuvenation written for a textbook on plastic surgery procedures. The chapter describes techniques for planning, preparing, operating, and recovering from facelifts, written for plastic surgeons. Techniques for suspension lifting (feather lift), SMAS lifting, subperiosteal lifting, and endoscopic lifting were demonstrated. Multilayer Rhytidectomy, Chapter 15 of Operative Plastic Surgery, 143-162.

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## **MULTILAYER RHYTIDECTOMY (Facelift)**

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The basic concept behind multilayer (composite, deep-layer, or multivector) face lifting is twofold. The first concept is that soft tissue sagging is best rejuvenated by repositioning and suspension. This is in contrast to excision of the underlying soft tissues and overtightening the skin to compensate for soft tissue looseness. The second concept is that facial skin relaxation and soft tissue descent occur at different rates and in different directions. Rejuvenation of the face should then reposition and tighten at separate tensions and in separate directions. The skin in the cheek require flap movement posteriorly and slightly cephalad and the cheek and jowl soft tissue requires vertical repositioning and fixation. Skin and soft tissues of the brow, cheek and neck must be treated separately to accomplish full and natural rejuvenation.

The conventional facelift relies on skin tightening only and fails to address the effects of aging and gravity on structures deep to the skin. Underlying facial muscles as well as the fatty deposits will sag and stretch. To accommodate for deep tissue looseness several surgeons have recommended plication of the soft structures or removal of fatty deposits. This was first

performed in the neck (Adamson, Horton and Crawford-1964, Millard, Pigott and Hedo-1968) and then in the midface (Pennisi and Capozzi-1972, Baker and Gordon-1969).

Actual deep layer undermining was not advocated until 1974 by Skoog. Mitz and Peyronie used cadaver dissections to define the superficial musculoaponeurotic system (SMAS) in 1976. Early problems with deep lifting included early recurrence of skin folds since the skin was attached to the deep SMAS flap. There were several adaptations that included both skin and SMAS undermining combined with SMAS repositioning (Owsley-1977, 1983,1985; Hamra-1984; Lemmon-1983; McKinney and Tresley-1984). Treatment of lower face and neck laxity advanced with many modifications of SMAS and platysma suspension to create a muscular sling (Connell-1978, Ashton-1979, Kaye-1981, Owsley-1983, Lemmon-1983, Hamra-1984).

Since the introduction of the composite rhytidectomy by Hamra in 1992 there have been many adaptations and modifications of deep level lifting. Hamra's initial composite rhytidectomy included limited skin undermining, wide midface SMAS elevation, orbicularis repositioning and neck platysma treatment. Furnas and Stuzin provided valuable information by defining the specific anatomy of the frontal branch of the facial nerve and SMAS retaining ligaments, particularly the zygomatic and masseteric cutaneous retaining ligaments. When these ligaments are released the midface SMAS can be better elevated and repositioned. Additional elevation has been achieved by partially releasing the temporoparietal mesentery (Stuzin-1989) and the neck platysma (Owsley-1983). Further elevation of the midface SMAS through endoscopic malar fat pad suspension can achieve still more SMAS excursion (Anderson and Lo-1998, Mentz-1999). Since midface swelling is increased with these maneuvers additional lower lid support is necessary for preventing lower lid lag or ectropion. There have been multiple modifications regarding the orbicularis muscle for suspension. Better understanding of the

anatomy of the facial nerve innervation to the zygomaticus and orbicularis muscles has altered the original SMAS dissection (Hamra-1998, Ramirez-1999, Mentz-1999). Many surgeons have incorporated liposuction (Illouz and Fournier-1983, Teimourian-1983, Hetter-1984, Lewis-1985) into the submental lipectomy. The use of endoscopic surgery in the forehead and midface (Fuente del Campo-1993, Isse-1994, Graham, Core-1995, Ramirez-1996) has allowed for creative and effective suspension techniques and reduction of scar length. Finally, the use of skin resurfacing topical agents, laser, fat grafting and the use of botulism toxin has allowed for improvement of surgical results.

The use of multilayer techniques is becoming more popular. Rationalizing a more complex operation has been difficult and has been subject to evaluation of additional risks and potential benefits. Kamer in 1998 compared revision rates of skin only, SMAS flap and deep plane rhytidectomies. With the same surgeon performing all 892 facelifts the tuck or revision rate was 21.7% for skin only, 11.4% for SMAS, and 3.3% for deep plane lifts.

## **Patient Assessment**

In assessing the patient for rhytidectomy, two or more consultations should occur. The first visit should include evaluation of the patient's medical history, along with assessment of their special needs and goals. Special risks such as hypertension, heart disease, smoking, bleeding dysfunction and specific medications are important and will be discussed later. A thorough physical examination should be performed. The condition of the skin, soft tissues, and general anatomy should be noted.

The patient should be examined in a brightly-lit room. When analyzing the aging human face, one must be aware that changes are due to loss of skin elasticity and sagging of deep

anatomic structures. When examining a patient, the surgeon should evaluate all related aging facial structures and understand the changes that take place in each area. The patient is appraised while upright for accurate analysis of the anatomy. After analysis one should combine the patient's wishes with surgical recommendations to develop a preoperative plan and appropriate goal. A careful explanation regarding features that will likely have significant improvement and areas that may not improve at all.

### ***Figure 1 The Aging Patient***

*The aging patient. With age the skin will lose elasticity and wrinkle. The skin loosens in a direction transverse to the underlying muscles. The soft tissues will descend with gravity and drape between fixed retaining ligaments. Because of these differences these structures are best lifted separately.*

Facial aging occurs because of several factors. These include degradation of skin quality, color and elasticity, subcutaneous fat accumulation or atrophy, loosening of deep layer, furrowing of skin overlying facial muscles, and exposure of skeletal, muscular and glandular structures.

The **forehead** is often considered a single unit, which includes forehead, brows and upper eyelids. Ptosis of the forehead, causing lowering of the brow, is consistent and usually compatible with the degree of the aging of the face. The corrugator muscles are known to cause the vertical frown lines of the glabella, and full or partial removal of the muscles may alleviate these lines. Because the forehead is an integral part of the aging face, the forehead lift can improve flap shift in any rhytidectomy. While a more superficial subcutaneous facelift may not

oblige the surgeon to do a forehead lift, a midface SMAS lift will likely create skin and soft tissue redundancy in the zygomatic arch and lateral orbital area if the brows are not repositioned at the same time. Doing the forehead lift will also allow the surgeon to remove less eyelid skin during upper blepharoplasty. Optimal rejuvenation of the upper eyelid typically requires both browlift and upper blepharoplasty. Upper lid ptosis may require levator aponeurosis plication. Lacrimal gland ptosis at the lateral edge of the orbital rim may require pexy under the rim. Individual goals for specific brow position should be assessed. Allowing the patient to visualize several brow positions with a hand mirror will help guide the surgeon.

Aging of the **lower eyelids** includes decent of the lateral canthus, loosening of the lower lid supporting structures, bulging of orbital fat, decent of the midcheek soft tissue and exposure of the infraorbital rim and tear trough. The lower eyelids should be assessed for skin laxity, lid laxity (snap test), dryness (Schirmer test), lid and lateral canthal position, orbital fat protuberance, malar prominence and tear troughing. Deep layer midface repositioning will increase the risks of ocular problems. Lower eyelid surgery has a significant potential for problems such as scleral show, denervation of the orbicularis muscle, ectropion, dry or scratchy eyes, hollow appearing eyes or flattened midface or recurrent tear trough. Special risk factors include large skin excess, loose lower lids, dry eyes, down sloping lateral canthus, large excess of orbital fat, minimal malar prominence (negative vector is less prominent than the cornea), and a deep tear trough. To reduce problems, a surgeon must consider conservative skin resection, eyelid tightening procedures, lateral canthal elevation or repositioning, orbital fat pad repositioning or resection, reducing exposure and trauma to facial nerve branches and malar fat pad repositioning for support and aesthetics.

In the **midface**, aging appears as drooping of the soft tissues and fat, and skin excess. As

these structures of the cheek descend there is exposure of the infraorbital rim and tear trough, accumulation of skin and soft tissue above the nasolabial fold with the corners of the mouth turning down and a bulging of the jowls. As soft tissues descend they drape and gather between the SMAS retaining ligaments. The midcheek structures may be elevated vertically with SMAS repositioning to lift the malar and jowl fatty tissue and the corner of the mouth. Release of SMAS retaining ligaments allows greater excursion and adequate “shelving” of the malar pad. A multilayer approach combining vertical soft tissue repositioning and midface suspension with oblique skin tightening may provide the best approach to this area. Prominent nasolabial folds should be treated independently with a filler such as fat or facial grafting to insure reasonable improvement.

The **neck** is an integral part of facial aging and must be addressed to be in harmony with a rejuvenated face. Aging in the neck can lead to skin excess, fatty accumulation or atrophy, platysmal looseness, separation, or banding, and descent of the submaxillary gland and laryngeal structures. Facial platysma must first be repositioned at the cheek in a vertical vector for adequate “shelving” of the malar pad and repositioning of the jowls. The midline platysmaplasty is performed secondarily so as not to pull down the midface SMAS structures. The platysma may be transected medially, laterally, or completely to maximize SMAS movement along specific vectors. Medial transection allows more jowl movement, lateral transection allows more cheek movement and complete transection allows maximal flap shift. Excessive fat is conservatively trimmed and the muscle bands in the midline may be excised or sutured together. The lateral platysma is suspended in a posterior vector from superficial cervical fascia covering the mastoid. The anterior borders of platysma are approximated to cover the midline cervical area with a platysmal supportive sling. The skin excess is undermined and excised behind the ear.

## ***Figure 2 Facial Rejuvenation***

*Facial rejuvenation requires both skin tightening and soft tissue repositioning. With multilayer face lifting the direction and tension for each layer and portion of the face may be tailored to each patient.*

## **Indications/Contraindications**

The indication for rhytidectomy is general skin and soft tissue laxity. Patient motivation and goals must be evaluated. Two simple tests may be utilized to assess patient desires and goals. First, have the patient place four fingers vertically along the temporal hairline to the ear. Does the patient sense improvement with tension? If the patient does appreciate an improvement then do the second test. Give the patient a hand mirror and ask the patient to lie back in a reclining chair and relax. If they are satisfied with this appearance as a final result, then they may be a good candidate for facial rejuvenation. Computer imaging also has an important role in evaluating patient objectives and demonstrating surgical limitations. Unrealistic goals may be a warning sign that the patient cannot be satisfied even with a reasonable result.

Other contraindications to rhytidectomy include major bleeding disorders, smoking, vascular diseases like Raynaud's phenomenon, unstable psychological conditions or significant anesthetic risks. Medical problems such as diabetes mellitus, hypertension, asthma, or thyroid disorders may be treated and controlled prior to surgery. Those patients with controlled hypertension may require special perioperative care. Preexisting scars or radiation damage may also be a contraindication. More unusual contraindications include progeria, Werner's syndrome,

Ehlers-Danlos syndrome, and some diet medicines.

Smokers should stop two weeks before and after surgery. Aspirin, aspirin containing products or nonsteroidal anti-inflammatory drugs should be stopped two weeks prior to surgery. Patients prone to hair loss may be pretreated with Rogaine. Patients with prior history of Bell's palsy or Herpetic sores have an increase risk of recurrence and may be treated with antiviral prophylaxis. The risk of postoperative hematoma is increased in males and patients with hypertension, upper respiratory infection, history of alcohol usage, gastrointestinal problems, or a smoking history.

## **Patient Preparation**

A second consultation is necessary for informed consent, photos, review of patient goals and the operative plan. Some preoperative considerations include:

- 1) Avoid sun exposure, tobacco, and alcohol two weeks before surgery.
- 2) No aspirin, nonsteroidal anti-inflammatory drugs, estrogen compounds or vitamin E two weeks before surgery.
- 3) No haircut should be done to allow better cover of the incisions. If the patient dyes their hair, they should be treated one week before surgery and wait until six weeks after surgery before dyeing their hair again. Hair should be shampooed the night prior to surgery.
- 4) Do not take any health food teas or vitamins two weeks before surgery. Gingko, garlic, parsley, vitamin E, ginseng and others may increase bleeding and bruising or create cardiac irritability.
- 5) Healthy food choices are advisable, including vitamin K rich vegetables like collard greens, kale, broccoli, spinach and alfalfa. Alfalfa capsules, vitamin K supplements or arnica are sometimes utilized to decrease bruising.

- 6) The morning of surgery wash the face with a mild soap and do not apply makeup.
- 7) Preoperative Clonidine may be given one hour prior to surgery to reduce postoperative hypertension. It should be noted that Clonidine increases the potency of anesthetic agents and narcotics.

## **Room Setup**

The operation can be performed with local anesthesia and sedation or with general anesthesia. It is up to the surgeon and the patient to decide which may be best. The operating room should be outfitted with equipment necessary to care for any operating room emergency. Comfortable surroundings, good lighting, appropriate instruments are also necessary. Often lighting from both sides of the flap will help define precise flap thickness. Endoscopes, drills, headlights, suction, tumescent pumps may also be necessary. The operating room table may be fitted with a separate headpiece or a standard bed with a silicone doughnut will improve access to the incision easier.

## **Patient Markings and Incisions**

Immediately before the surgery the patient should be placed into a sitting position and the eyelids, nasolabial folds, asymmetries in the brow, cheek or jaw line, submental chin incision and midline should be clearly marked. Once the patient is made comfortable or is asleep the hair may be placed into rubber bands or greased with KY or Vaseline and the marks may be placed for the facelift incisions. This is best done prior to the local anesthetic.

There are four parts of the incision: 1) the temporal incision, 2) the preauricular incision, 3) the postauricular incision, and 4) the occipitomastoid incision. Placement of the incisions is very important and may vary depending on many factors. Flap shift or skin recoil can advance

the scar. Several techniques can be utilized to account for this.

### ***FIGURE 3 incisions***

*The preauricular incision is the most important component of facelift incisions since it is the most visible. The incision should accommodate for flap recoil or flap shift, because the preauricular scar will advance away from the ear as the patient heals. The helical portion is placed 1 mm closer to the ear than the upper helical width. The lobular portion is placed in the crease anteriorly and a 1 mm cuff of cheek skin remains on the lower and posterior edge of the lobule. The pretragal incision may be placed at the edge or in front of the tragus. It is useful to place tension on the preauricular skin to duplicate flap shift as the incision is marked.*

The **temporal incision** extends approximately 5 centimeters above the helical root. It may be placed in front of the hairline only if the temporal hairline is extremely high. This placement will be more obvious and may be beveled toward the forehead on both surfaces to allow hair to grow through the incision. In most patients it can be placed 4-5 centimeters behind the hairline (cutting parallel to the hair follicles) to hide the scar. Although this method will elevate the temporal hairline, it reduces scar detectability. In short haired individuals, swimmers, tennis players, golfers, sailors or patients with a lifestyle that may make this incision more visible the incision may be zigzagged in the temporal hair to reduce the “show” of a linear scalp scar. This application is also true for the occipitomastoid incision and requires a few more minutes to do.

The **preauricular incision** is patterned around the ear and should follow anatomic margins. The incision is best marked by gently pulling the skin forward to duplicate the

postoperative scar advancement or flap shift. This incision is always closed without tension to reduce scar widening.

The helical portion should be marked with tension and to match the width of the upper helical width. The incision should then contour along the curve of the helix to the tragal notch. The tragal portion may be incised in front or at the edge of the tragus. Incisions behind the tragus will distort the appearance. The pretragal incision preserves the natural tragal dimensions with a minimal scar and may best be utilized when the tragus is large. The tragal edge incision will tend to flatten a prominent tragus but the scar will be hidden as a highlight at the edge. This incision is best utilized when there is a color mismatch between the ear and the new preauricular skin. The lobular portion of the incision can be used to reduce a long or stretched ear lobule by removing a small lobular wedge. For normal sized earlobes a 1-mm reserve of cheek skin may be left on the lower and posterior edges of the lobe for reattachment at the closure. Either way the most important step here is to set back the lobule at least 15 to 30 because flap shift and scar advancement will advance the lobule some amount. If this is not done the lobule will elongate and appear stretched or “pixie”. . In men, some surgeons prefer to place the incision just behind the sideburn to preserve the fair hairfree preauricular skin. The standard preauricular incision may be utilized if the hair follicles in the area in front of the ear are removed. This keeps bearded skin from growing adjacent to the ear and is a less conspicuous scar. This can easily be done by gently defatting and carefully applying the cautery on low setting to the underside of the hair follicles.

#### ***Figure 4 Preauricular Incision***

*Closure of the preauricular incision should incorporate a lobe setback of 15-30 in*

*anticipation of the lobe advancement as the patient heals.*

The **postauricular incision** should be made directly in the retroauricular sulcus.

Carefully mark the sulcus without lifting the pinna. Elevation of the pinna will pull mastoid skin onto the ear, therefore leaving the mark outside the sulcus on the mastoid skin. If the mark is placed on an elevated concha it should be 2 to 3 mm onto the ear so that when relaxed the incision lies in the sulcus. The flap shift here is tangential to the incision and therefore does not advance to the mastoid.

The **occipitomastoid incision** first must cross a hair free area just behind the ear before reaching the mastoid hairline. This incision is best hidden if begun at or above where the helix touches the hairline. This is usually at the external auricular canal level. However, the incision may have to be lowered if the patient has a large amount of neck skin to be resected behind the ear. The advancement and rotation of a large amount of cervical skin (with the pivot point at the most posterior end of the incision) may shorten the flap in the sulcus and leave a gap. Correcting the gap by advancing postauricular skin anteriorly will create skin bunching at the lobule. Consequently, when planning to resect a larger amount of cervical skin, the incision is placed lower on the mastoid. The remainder of the incision may be placed either in the hair (an angle 90 degrees from the postauricular incision prevents sharp angulation at the flap tip) or at the hairline. The hairline occipital incision should be used in patients with extreme neck laxity in order to reduce postauricular baldness from excising too much hair bearing skin. When the incision is placed in the hair (cutting parallel to the hair follicles), the hairline border must be lined up as well as possible at closure to prevent hairline stair stepping. For active or shorthaired individuals the same considerations apply when considering a zigzag occipital incision. All scalp

incisions should be made parallel to the hair follicles.

The **submental incision** for access to the anterior platysma and submental fat should be as short as possible (usually 3 cm will allow for a Deavor). It is best placed just behind the submental crease, but not in the crease. The midline should be marked prior to surgery.

Proper sequencing for closure will improve skin redraping and place appropriate tension on each portion of the incision. This is also true for SMAS fixation.

## **Operative Technique**

After the marks have been placed and the hair secured loosely in rubber bands or smoothed with KY or Vaseline the operation can proceed. Under local anesthesia 1% lidocaine with 1:100,000 epinephrine is used along the incisions and .25% lidocaine with 1:400,000 epinephrine is used in the area of proposed undermining. Under general anesthesia a tumescent pump can speed the infiltration process using a 1:200,000 epinephrine solution and a 25 gauge spinal needle. If tumescent body liposuction has been performed prior to the facelift the lidocaine infiltration should be kept to a minimum or left out to reduce lidocaine toxicity. Infiltration of each region 15 to 30 minutes prior to dissection will improve vasoconstriction. Meticulous hemostasis is paramount. Ice placed in sterile gloves can be used intraoperatively to reduce bruising and swelling. Slight elevation of the head of the bed can also reduce intraoperative swelling.

The procedural sequencing for facial rejuvenation begins with the forehead then proceeds with eyes, then left and right facelifts, and finally the midline neck. Eyelids are best done after the brow to prevent overexcision of upper eyelid skin. Bilateral facial SMAS repositioning must proceed the cervical platysmaplasty. When neck tightening is done first it tethers the SMAS

inferiorly. This prevents optimal shelving of the malar fat pad and full repositioning of the jowl.

When planning deep layer lifting and SMAS repositioning expect postoperative midface swelling and SMAS recoil internally. This may place increased weight and stress on the lower lid so that lower lid support is necessary to prevent scleral show or ectropion. The second important factor in preventing lower lid sequelae is preservation of orbicular innervation. Since innervation comes from facial nerve fibers, which arise from near the zygomaticus muscle inferiorly, the lower lid dissection should not be continuous with the facial dissection.

The lateral canthus may be elevated and tightened with a lateral canthus suture (5-0 Vicril) placed through the longitudinal axis of the lateral canthal tendon and suture this to the inner wall of the lateral orbital periosteum. Hamra calls this a “transcanthal” canthopexy. It can be placed more superior for enhanced elevation of the lateral canthus. This canthopexy can provide a more youthful orbital fissure shape by slanting the fissure slightly up and will reduce complications from lax lids and temporary midcheek swelling. It will orientalize the eyes for two to three weeks.

### ***Figure 5 Transcanthal Canthopexy***

*A 5-0 Vicril is placed through the canthal ligament and anchored to inner orbital periosteum.*

*This suture will tighten the ligament and elevate the lateral canthus. Combined with the malar fat pad repositioning provides improved lower lid support.*

After the browlift and eyelids are done (the lower eyelids should be left open), the facelift incision is made. The amount of subcutaneous undermining depends on several factors. Patient age, skin laxity and quality, smoking history and patient health may limit the amount of

undermining to ensure adequate blood supply for healing. In deep layer facelifting, wide undermining may be less important in achieving optimum results, while less undermining improves blood supply and allows concurrent facial skin repositioning with SMAS elevation. Generally, skin undermining should be just enough to allow skin redraping without causing tethering defects or buckling of the skin. Patients with prominent skin wrinkling will benefit from more extensive skin undermining.

Subcutaneous undermining in the cheek is most precisely performed with a light on the flap for transillumination and a light in the wound for dissection. An experienced assistant holds the skin with skin hooks or Deavor and the surgeon applies counter traction on the skin of the face while using a scissor to dissect. Retraction and flap handling should be gentle and even. Dissection should be under direct vision. Blind scissor pushing tends to leave the skin flap uneven, streaky or too thick. The skin flap should appear even, yellow and pebbled when transilluminated. Cloudy or streaky flaps on transillumination are uneven. Uneven flaps may leave skin irregularities. Flaps too thick leave the SMAS layer too thin or perforated.

### ***Figure 6 Four Hand Technique***

*Proper elevation of the skin flap requires 2 hooks or Deavors in the wound. The surgeon places counter traction behind the dissection and the scissor advances the dissection. A transillumination and direct light assist in creating an even subcutaneous dissection.*

Begin the undermining in the temporal area by creating a pocket underneath the temporoparietal fascia and above the deep temporal fascia in an area superior to the helix level and out to 2 cm lateral to the eyebrow to protect the frontal branch of the facial nerve. Under

direct vision the dissection may advance to the orbital rim. This can provide release of the lateral orbital retaining ligament and create a tunnel for the malar fat pad suspension. This thicker flap provides better protection to temporal hair follicles.

The midface dissection is in a different plane. In this area skin undermining is in the subcutaneous plane and overlaps the deeper temporal dissection by 1 or 2 cm leaving a temporoparietal mesentery to protect the frontal branch. This mesentery may be backcut along the frontal branch of the superficial temporal artery and the parietal branch may be ligated. The frontal branch of the superficial temporal artery is just lateral to the frontal branch of the facial nerve and can be used as a useful landmark when it is necessary to backcut the temporoparietal mesentery. This backcut will improve lateral elevation of the brow.

### ***Figure 7 the Temporoparietal Mesentery***

***The temporoparietal mesentery may be backcut lateral to the frontal branch of the superficial temporal artery to reduce subcutaneous temporal dissection. The frontal branch of the superficial temporal artery is just lateral to the frontal branch of the facial nerve.***

Subcutaneous undermining above the SMAS is continued down onto the cheek to the anterior edge of the masseter muscle. Wide undermining to the nasolabial folds may only be necessary in patients with moduis area skin excess and wrinkling. It is usually necessary to undermine over the malar cheek pad in a vascular area called McGregor's patch.

The neck dissection begins at the occipital incision and dissection is initially carried next to the sternocleidomastiod muscle to keep the flap thick in the hair bearing skin. At the ear lobule level the dissection is superficial to the superficial cervical fascia of the

sternocleidomastoid muscle to protect the great auricular nerve. The great auricular nerve will arise from the posterior surface of the sternocleidomastoid and run vertically toward the ear lobule deep to superficial cervical fascia. The subcutaneous cervical dissection should be continuous with cheek dissection and extended to the midline in the neck.

### ***Figure 8 Great Auricular Nerve***

*The posterior dissection begins deep to the superficial cervical fascia leaving the postauricular flap thicker above the lobe level. Below the earlobe the dissection stays above the superficial cervical fascia to protect the great auricular nerve. The nerve is usually centered on the sternocleidomastoid 6.5 cm below the earlobe and lies below the fascia directly on the muscle.*

SMAS flap elevation begins over the parotid gland, staying superficial to the parotidomasseteric fascia and one centimeter below the zygomatic arch. Dissection extends downward and vertically along the anterior edge of the sternocleidomastoid muscle. Gentle vertical scissor spreading will allow careful separation of the tissues. Care must be taken to protect the ophthalmic and buccal facial nerve branches that are covered by the thin fascia covering the masseter. The flap is transected one centimeter caudal to the zygomatic arch and this backcut extends toward the lateral canthus until the zygomaticus major muscle is visualized. The backcut then turns toward the modius following the direction of and overlying the zygomaticus major muscle.

### ***Figure 9 Retaining Ligaments***

*Retaining ligaments. Zygomatic ligaments originate from periosteum and insert into the dermis.*

*Masseteric ligaments originate from parotid gland and the anterior border of the masseter muscle.*

The malar retaining ligaments must be released. Careful dissection proceeds here. In 15% of patients there are ophthalmic branches superficial to the zygomaticus muscle and facial nerve fibers connect the zygomaticus and orbicularis muscles. The facial nerve typically courses underneath the zygomatic muscles and splits there into two larger group fascicles. The lateral group is typically 10 millimeters below the zygomaticus origin. This group gives fibers to the zygomaticus muscles and continues through to the orbicularis muscle entering perpendicular to the muscle fibers. The neural fibers pass through the orbital muscle, preseptal muscle and finally pretarsal muscle (Ramirez-1999). Any separation of the zygomaticus origin, orbital orbicularis, preseptal orbicularis or preseptal orbicularis may cause denervation.

Since the facial nerve fibers enter the zygomaticus muscle from its deep surface, the dissection extends superficial to the muscle over the malar prominence to release the remaining malar retaining ligaments above the zygomaticus muscle. It is safe to stay 10 millimeters below the origin, leaving this portion connected to orbicularis muscle. This leaves continuous the zygomaticus-orbicularis muscle mesentery (Hamra-1988). Connecting the lower lid dissection to the facial dissection will break this mesentery which contains orbicularis nerve fibers. The SMAS backcut should remain 1 cm below the zygomatic arch and 1 cm below the origin of the zygomaticus muscle origin, extending over the muscle inferiorly for 2 cm for release (Mentz-1999). It is only necessary to extend the dissection just past the malar and masseteric retaining ligaments. Usually finger palpation while pulling the SMAS cephalically will guide the surgeon to any remaining ligaments. The malar fat pad is the final releasing point and is done either with

a finger (Ashton) or scissor (Owsley). The instrument is passed under SMAS and over the zygomaticus muscles to release the malar fat pad at the top of the nasolabial fold. More extensive release lower in the midcheek will not substantially improve SMAS excursion or malar fat pad shelving and will likely increase prolonged midface edema and denervation. Since the ophthalmic facial nerve fibers enter the orbicularis muscle from the deep and inferior surface and directly perpendicular to the muscle fibers care should be taken to leave a mesentery of tissue between the lower blepharoplasty and sub-SMAS dissections.

### ***Figure 10 SMAS Elevation***

*The SMAS flap extends just beyond the masseter and malar retaining ligaments. The backcut begins 1 cm below the zygomatic arch, 1cm below the zygomaticus origin and then continues inferiorly over the zygomaticus major muscle.*

After SMAS release, repositioning begins with cephalic traction. The SMAS flap is repositioned first with malar fat pad suspension, then zygomatic arch sutures, and then SMAS division to the earlobe and cervical anchoring of the posterior flap. The cephalic excess may be excised in patients with strong zygomatic arches. For most patients the cephalic excess may be overlapped or folded (Lambros) and sutured for zygomatic augmentation. If the SMAS is thin or has little fibrous content Stuzin recommends folding the flap over a 1 by 4-centimeter sheet of Vicril mesh before suturing to reduce suture pull through. The axis of SMAS rotation is the medial extent of the SMAS backcut below the lateral canthus.

### ***Figure 11 Malar Fat Pad Suspension***

*Malar fat pad suspension sutures provide elevation of the SMAS pivot point. The suture is fixed into the deep surface of the malar fat pad and passes underneath the temporoparietal flap and is anchored to temporal fascia.*

Further SMAS elevation in the midcheek can be achieved with suspension sutures elevating the rotation axis of the SMAS flap (Anderson-1998, Mentz-1999). This is done prior to SMAS cheek suturing. A 4-0 Ticron suture is placed through the deep surface of the cheek fat pad just overlying the zygomaticus major muscle. The suture is passed through the lateral orbital rim endoscopic tunnel beneath the temporoparietal fascia. It can be anchored to temporal fascia in a vertical vector. A second suture placed in the deep surface of the cheek fat pad is also passed and anchored at a more oblique vector. The two suspension sutures anchor the cheek fat pad superiorly and posteriorly and moves the SMAS rotation axis in a posterior superior direction

thus improving the midface soft tissue repositioning. The advantage of distant fixation reduces the lateral canthal bunching and downward tension on the lateral brow that may occur with direct sutures in the lateral canthal area. Secondly, the malar suture may be placed far more medially than a direct suture and can provide a pivot point near the pupil. Thirdly, the distant fixation elevates the pivot point from a lower level and may provide a more direct advantage in elevation of the jowl.

The SMAS is split at the earlobe to allow bi-directional advancement. Cervical suspension is achieved by advancing the posterior edge of the platysma and SMAS flap and anchoring it posteriorly to mastoid and superficial cervical fascia. The lower edge of the platysma may be backcut for increased excursion of the cheek SMAS. Transection should be at least 6 centimeters below the mandibular border to protect the marginal mandibular nerve. Following adequate cephalad elevation of midface SMAS and posterior repositioning of the cervical platysma, the midline platysmaplasty may be performed. Maximal relocation of the midface soft tissues can be achieved by first tightening the cervical platysma posteriorly and then plicating the medial edges of the platysma.

Cervical subcutaneous fat may be reduced en block, piecemeal under direct vision, or by liposuction. Leave 2-3 mm of subcutaneous fat over the platysma is necessary to prevent skeletalization of the muscle and exposure of the submaxillary gland. It is best to perform the cervical defatting after midface SMAS elevation so that the subcutaneous fat has shifted prior to fat removal. A defatted submandibular groove elevated with SMAS onto the mandible may produce an irregular border and blunt the sternomastoid-mandibular trough. Bernard recommends defatting the sternomastoid -mandibular trough just behind the mandibular ramus to better define the mandibular angle. Cervical fat deep to the platysma in the midline may be

trimmed conservatively. Leaving some deep fat can help disguise a prominent or ptotic submaxillary gland.

The platysma may be sutured at the midline after some central fat removal. The platysma muscle is backcut depending on the desired results. Midline wedge excision at the cervicomental angle deepens the angle and may further release the jowl. Lateral platysma release is for patients with poorly defined posterior jawlines and improves lateral flap shift. Full width platysma transection is reserved for patients with full necks and provides maximal SMAS excursion. Platysmal transection is performed at least 6 cm below the mandibular margin and should not be performed on patients with thin skin or little subcutaneous fat. The edges of the cut margin must be beveled to yield a smooth contour.

### ***Figure 12a,b, c Platysma Treatments***

*Platysmal treatment may require medial, lateral or complete transection. The transection will further release the facial SMAS and improve SMAS excursion. Medial release will allow more jowl and cheek movement and sharpen the cervicomental angle. Lateral release will allow more mandibular angle show. Complete release will allow more mandible show and a sharper cervicomental angle. Platysmal transection should be at least 6 cm below the mandible and should not be done on lean necks.*

Following the deep midface and cervical repositioning, the skin excess may be excised and closed. Since the first area closed will relax slightly as the adjacent areas around it are closed begin with the temporal anchor stitch so that the facial incisions will hold the least tension.

Martin describes a six-step method for anchoring and closure.

### ***Figure 13 Six-Step Closing***

*Sequential skin closure allows proper flap shift and improves skin tension balance. Suture 1 is at the helical root, 2 at the apex of the postauricular flap, 3 at the temporal midpoint, 4 at the occipital midpoint, 5 above the tragus, and 6 below the tragus.*

The amount of cephalic skin movement is estimated by moving the flap up and down against the ear. The surgeon should utilize the least amount of cephalic rotation necessary to achieve reduction of periorbital and perioral redundancy. Excess rotation will unnecessarily raise the temporal hairline and make it more difficult for the surgeon at the second facelift to retain a natural hairline. No deep suture is necessary and the skin closure should be at just greater than normal tension. A T shaped incision allows accurate suture placement and facilitates extension of the incision without cutting the suture. The first point of suspension is placed at the skin above the helical root using 4-0 silk or proline. The second point of suspension is placed at the apex of the postauricular incision. The neck skin is shifted parallel to the neck crease. This stitch is under subtle tension. The third point of suspension will be at the midpoint of the temporal incision and the fourth used to line up the occipitomastoid hairline. Lining up the hairline will be important in preventing a stairstep or notched hairline. Overexcision will result in an unnatural hairline, occipitomastoid baldness, flap compromise and wide scars. Neck contouring is more dependent on lipectomy and platysmal suspension rather than skin tightness. The mastoid skin is closed with half buried vertical mattress sutures to avoid unsightly suture marks on the hair free cervical side. Next the pretragal hollow is created by removing some preauricular fat anterior to the tragus and defatting the pretragal skin. In males the hair follicles are exposed and cauterized on a low

setting. Then suture five and six are placed above and below the tragus with 6-0 suture. The remainder of the incision is closed with 4-0 in the hairline, 5-0 in the postauricular sulcus and 6-0 in the preauricular area. Drains may or may not be used.

## **Drains and Dressings**

The decision to use drains, either Penrose, ribbed or suction is a matter of personal preference. Drains do not prevent the formation of large hematomas, but will reduce small collections of blood or serum. The application of the dressing is done after thorough washing of the hair with shampoo and conditioner to reduce tangling and improve cleanliness. A Kerlix is moistened with saline and folded into a U shaped bandage to cover the ears, neck and ears. A second dry Kerlix is used loosely and circumferentially. And finally four-inch Coban is loosely applied to hold the bandages in place. The dressing is not a pressure dressing.

## **Postoperative Care**

After surgery overnight assistance is recommended to monitor the patient and to assist with patient care. These recommendations may be helpful:

- 1) Elevate the head of the bed at all times.
- 2) Ice packs or frozen peas in zip lock bags to the eyes for the first 48 hours.
- 3) Anti-nausea medication at the first indication of any nausea.
- 4) Antibiotics are routinely used for five days postop.
- 5) Bandage removal on the first postoperative day with drain removal and cleaning of all incisions and eyelashes with saline. Careful inspection of the wound is done at this time. Oozing wounds can be coated with a topical antibiotic.
- 6) Keep the neck at either extended or neutral. Neck flexion places increased tension on the postauricular flap.

- 7) Pain control and sleep medications with appropriate medications are given to improve comfort and reduce blood pressure.
- 8) The hair should be washed on the first postoperative day and every day afterward.
- 9) No makeup should be applied until one day after the sutures have been removed.
- 10) Remove sutures on the fifth to the seventh day postoperatively. Several anchor sutures may be left for support.
- 11) No strenuous activity for the first two weeks. Active sports are not permitted for six weeks.
- 12) Patients are encouraged to walk and be up and about as much as possible.

***Figure 14 Pre and postop photos***

***Figure 15 Pre and postop photos***

***Figure 16 Pre and postop photos***

## **Caveats**

Every surgical procedure has associated complications. The most frequent problems include hematoma, skin slough, nerve injuries, hair loss, scars, pigmentation, pain and asymmetry. Hematoma usually occurs in the first 12 hours and may be a small collection of blood that may be watched or a large collection of blood that may threaten the skin flap survival. Large or medium hematomas should be treated immediately, the blood removed and bleeding site searched for and coagulated. The cause of postoperative bleeding is multifactorial. The bleeding may be caused from anti-inflammatory agents, vitamin E, aspirin, anticoagulants,

postoperative blood pressure elevation, uncoagulated vessels, coughing, vomiting, straining, and in males.

Nerve injuries may be the most dreaded of all complications. The nerves may be injured by laceration, cautery, or stretch. The buccal branches, marginal mandibular, and temporal branches of the facial nerve may be injured. The great auricular and spinal accessory nerve in the neck may also be exposed to injury. Careful dissection and accurate knowledge of the anatomy are essential. If a nerve has been transected, then microscopic repair should be performed at the time of the surgery.

Alopecia may be a result of flap tension or direct injury by superficial dissection or cautery. Visible scars may result from cautery at the wound edge or tension. Loss of hair in the scar may be treated with micrografts. Thick scars may benefit from steroid injection and later revision if necessary. Asymmetry and contour irregularities may be corrected after all swelling has subsided. Hemosiderin staining causing hyperpigmentation usually disappears in the first 12 months.

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