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Case Report

Skin Facelift with Supra-SMAS Plication

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Abstract

Effects of aging are evidenced in all parts of the human form, but no place more prominently than in the face. Patient selection and appropriate preoperative screening are of critical importance to obtaining a high degree of patient and physician satisfaction. Once an appropriate patient has been identified, one must choose the correct operation. The article reflects on three decades of performing a host of procedures on a variety of patients and problems. It is intended as a guide to modern principles and techniques of facial rejuvenation, specifically the skin facelift with supra-SMAS (superficial Musculoaponeurotic system) plication.

Keywords: Facelift; Rhytidectomy; Superficial Musculoaponeurotic System (SMAS); Rejuvenation; Platysma

This article is the culmination of 30 years of experience with aesthetic facial surgery. It is intended as a guide to modern principles and techniques of facial rejuvenation.

Aging, as it is seen in the tissues of the face, be-gins with the loss of skin elasticity. In a young person the skin has a great deal of elasticity, which allows it to remain taut and firmly draped over the underlying soft tissue. With time this suppleness is lost, resulting in drooping of the skin. The skin has fibrous attachments to the subcutaneous fat and muscle. Consequently, laxity of the skin results in the creation of new folds, hollows, and bands. Specifically, fat is drawn downward by the weight of the sagging skin, resulting in a more pronounced naso-labial fold, nasomandibular fold, and hollow overlying the cheek. It is important to note that muscle is neither causative nor a victim of this redistribution of the tissues. Therefore, the repair of these changes will rely on the replacement of subcutaneous fat back into its original position and the re-draping of the skin.

Patient Selection and Preoperative Screening

Patient selection and appropriate preoperative screening are of critical importance to obtaining a high degree of patient and physician satisfaction. Nothing will ensure a bad result as surely as poor candidate selection. It is necessary to ask potential patients "What bothers you about your face?" Often patients will find importance in a seemingly minor defect and be satisfied with other, more glaring flaws. It is equally important to point out the asymmetries in the patient's face. This is best accomplished with standard and reversal mirrors to be utilized during the initial consultation. Emotional instability noted during this consultation must obviate surgery at that time. Some common warning signs include speaking badly about another surgeon, excessive praise of you as a surgeon, unrealistic expectation (of end results or life impact), and a recent tragic loss (e.g., death of a loved one).

Smokers must discontinue all nicotine products 1 month prior to the operation. Aspirin and all non-steroidal anti-inflammatory medications should be discontinued at least 1 week prior to the operation. Patients must be cleared by a medical doctor and examined

by an ophthalmologist for visual field testing and a Schemer testing the case of blepharoplasty. For patients under the care of a psychiatrist, a direct conference with the patient' scare giver is mandatory. All patients are required to undergo a complete blood count, UA, tests for pro-thrombin time and partial thromboplastin time, CXR, and Electrocardiogram (EKG). A complete history is essential, particularly in screening for bleeding disorders. Using these basic guidelines, the senior author has turned down approximately 20% of patients seeking cosmetic surgery. Furthermore, with thorough preoperative evaluation, in nearly 5000 facial cosmetic procedures per-formed there have been no deaths, no malpractice suits, three temporary nerve injuries, and one skin sloughing.

More common complications have included hematoma requiring immediate operative evacuation (< 0.5%), infections (< 0.1%), and laceration of the greater auricular nerve requiring repair (seen on four occasions; all regained normal sensation without neuronal formation). The most common disturbing squealed have been small hematomas of the cheek (dime-sized) that result in firm, indurate areas. All have resolved in time. Ultrasound, massage of affected areas, and patient reassurance are important in the treatment of these squealed. Early recognition of flap cyanosis or ischemia may allow salvage of the flap with appropriate treatment.

Once an appropriate patient has been identified, one must choose the correct operation. A careful analysis of the patient's anatomy will reveal the asymmetries and defects that require repair. A photographic record is essential for preoperative planning as well as the documentation of preoperative appearance of the patient. Preoperative photographs are critical in cases where a patient becomes acutely aware of his or her own facial asymmetry postoperatively.

It is helpful to obtain both slides and prints of the preoperative images. This may be best achieved using a digital camera to provide both mediums with one device. More conventionally, slide film and print film maybe used. Five views must be obtained: a full anterior view, two opposing oblique views, and two opposing lateral views. It is critical to standardize the conditions of all preop and postop photographs for equitable comparison and evaluation of these images. The face must be viewed in thirds: the brow, the mid face and jaw, and the neck. Each area affects the others, so that one must gain gestalt view of the patient's problems. A brow lift may obviate the need for blepharoplasty. A rhytidectomy may yield unsatisfactory results without a sub-mental lipectomy. Thorough planning will ensure the choice of an appropriate procedure.

Procedure

Facial cosmetic surgery may be safely performed using sedation and local anesthesia. The procedure begins with preoperative sedation. The regimen used by the senior author includes morphine sulfate 6 to 10 mg intra-muscularly with Nembutal 100 mg orally given 45 minutes prior to the operating room (dose adjusted for patient's size and tolerance). The patient is attached to monitors including EKG, blood pressure, and pulseoximetry. The patient is prepped and draped, and markings are performed at this time. Versed is given slowly in0.5 mg increments to a maximum of 3 mg. Sedation should remain as light as possible while keeping the patient comfortable but awake. Attention must be given to the potential respiratory depressive effects of this regimen, particularly in the elderly.

Local anesthesia is given using a total of 200 cc of 0.25% lidocaine with1:400,000epinephrine. This local is given in the appro-AQ3 priate plane to create hydro-dissection. In the brow it is delivered either sub-galeal or subcutaneous as needed for the procedure. In the face it is delivered in the subcutaneous layer, and in the neck it is placed above the platysma. This concentration of local anesthetic pro-vides excellent hemostats is an anesthetic effect while avoiding hypertension and tachycardia.

Operative markings are made in accordance with the preoperative evaluation of the patient. The extent of undermining, limits of sub-mental excision, and placement of the anterior and posterior hairline incisions vary with the individual patient. The first markings made highlight the cervical creases. All prominent creases are marked. A marking is made in the midline from the mentum to the inferior most crease. The sub-mental incision is marked in the sub-mental crease and is limited by the body of the mandible. The sub-mental fat to be resected must be marked on all borders based on physical examination (observation and palpation) (Figure 1).

Figure 1: Markings of neck.

The extent of undermining is marked with a dotted line beginning1 cm lateral to the lateral canthus running over Macgregor's patches extending to the sub-mental incision approximately 1 cm anterior and parallel to the nasomandibular crease (Figure 2).

Figure 2: Marking, profile.

Incisional markings begin in the brow at the root of the ear running inferiorly with a slight curvature into the tragus. From the same starting point (at the root of the ear) a 1 cm inverted V is drawn into the bald spot immediately anterior to the ear. This mark is carried anteriorly running immediately inferior and parallel to the base of the sideburn, ending with a slight upward turn hugging the end of the side burn hair (Figure 3).

Figure 3: Incision markings, close-up.

This incision will maintain the natural side burn hairline postoperatively. The marking along the tragus must lie precisely at the junction of external and internal skin. From the inferior most point of the tragus markings follow the base of the lobule posteriorly into the sulcus. Markings in the sulcus extend for only 1cm, and then rise onto the posterior surface of the conch 3 to 4 mm superior to the sulcus. A visual line drawn from the lateral canthus through the superior most aspect of the tragus marks the superior limit of the conchal marking.

At this point, the marking proceeds superoposteriorly1 to 2 cm across the hairless portion of the mastoid, ending at the hairline, creating the most superior point in the posterior incision. This mark continues postero-inferiorly parallel to the hairline to a point slightly inferior to the lowest cervical crease. At this point, a short (1 cm) cutback is made in an antero-inferior direction at an approximate angle of 120 degrees. In females, this posterior incision is made approximately 1.5to 2.0 cm above the hairline. In males, the same incision is made precisely at the hairline (Figure 4).

Figure 4 : Incision markings, posterior.

Once markings are complete, the patient is given intravenous Versed titrated very slowly. Local is then given using the regimen described above. A 25 gauge needle is used to infiltrate along the incision lines. A 22gauge spinal needle is used to infiltrate throughout the area of undermining, thus affecting a hydrodissection, which reduces bleeding and better defines the plane of dissection.

Incisions are made using a no. 15 blade down to the subcutaneous tissue anteriorly and to the fascia over laying the mastoid posteriorly. An Allis clamp is placed at the superior most aspect of both the anterior and the posterior flaps (Figure 5).

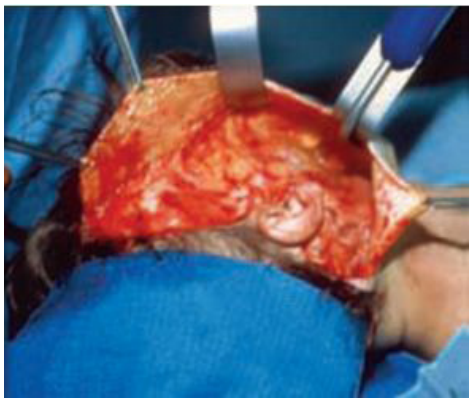

Figure 5: Total flap dissections, posterior view.

Dissection continues anteriorly using the blade until a small curved retractor will fit into the pocket of dissection. At this point, dissection continues, using the retractor to provide exposure of the plane with a light source pointed into the wound from behind the surgeon. The blade is abandoned for 6-inch straight serrated Gorney scissors, which are used to complete the anterior dissection in a subcutaneous plane to its most distal mark. Care must be taken during this dissection to avoid excessive bleeding in the area of Macgregor's patches. In this area, dense fibro fatty attachments exist between the dermis and the underlying fascia, which will tend to bleed during dissection. Homeostasis must be carefully achieved using a bipolar electrocautery. It is critical that thick flaps be maintained. Approximately 3 to 5 mm of fatty tissue must be left attached to the dermis. The plane of dissection should remain within the fat superficial to the under lying SMAS.

The posterior dissection starts at the mastoid. A flap is raised using a blade with care not to button hole the thin skin in this area. Dissection continues inferiorly in this shallow plane until reaching the beginning of the Sternocleidomastoid Muscle (SCM). The greater auricular nerve enters the plane of dissection at the posterior border of the SCM approximately at its midpoint. Also of importance is the proximity of the external jugular vein. Careful attention must be given to preserve these structures. Interruption of the nerve must be recognized and repaired to avoid loss of sensation to the ear and formation of a painful neuroma. Once the flap has been dissected to a point past the anterior border of the SCM, the plane of dissection changes and becomes deeper to a level immediately overlying the platysma muscle. The flap is elevated toward the midline, lifting all the cervical fat off the platysma.

The sub-mental incision is made, and a small (2-3mm) superficial flap is raised toward the tip of the chin. This flap will release the depression of skin at the sub-mental crease, allowing for a more pleasing scar. The cervical skin and fat are then dissected off the platysma. Two double hooks are used to help elevate the skin and fat as scissors are used for dissection. The platysma frequently presents with diastase is in the midline. Therefore, it is important to begin this dissection off the midline. In this way one is assured of maintaining the proper plane of dissection. The dissection is carried to the inferior most creases and laterally to join the previously dissected flaps. The entire platysma is now exposed from the border of the mandible to the lowest cervical crease.

At this point, a small-lighted Aufricht retractor may be used to completely illuminate the sub-mental and lateral dissections (Figure 6).

Figure 6: Total flap dissections, anterior view.

Fat resections of any size may be accomplished; given the broad exposure of this dissection (Figure 7).

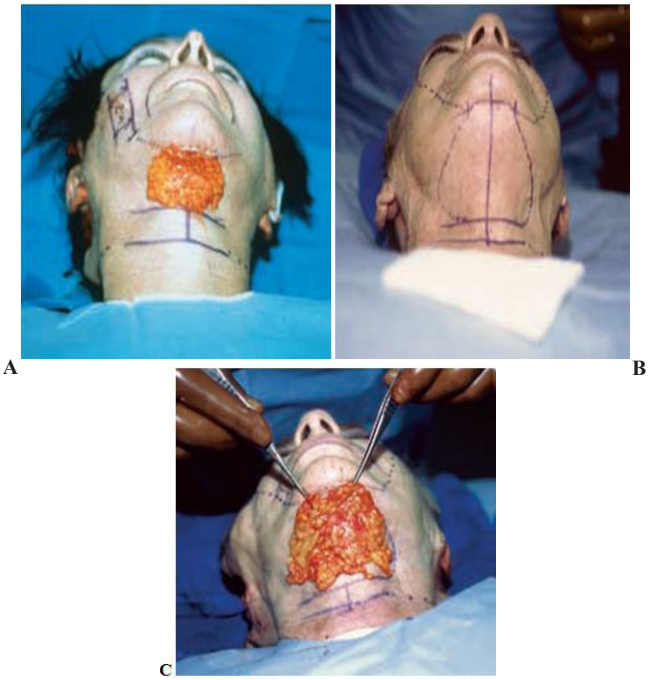

Figure 7: (A) Small sub-mental fat pad, post-excision; (B) Medium-sized sub-mental fat pad, pre-excision; (C) Medium sized sub-mental fat pad, post-excision.

Two double hooks are used to elevate the skin edge. The attached fat is grasped using a Brown/Adson forceps for counter traction as the fat is dissected free from the skin. It is important to leave an adequate amount of fat (3-5 mm) on the skin flap to ensure its viability. Furthermore, any exposed dermis may heal with dense attachments to the platysma, resulting in unpleasing defor-

mities postoperatively. Once a plane is developed, the dissection continues to the lowest and most lateral points of fatty deposit. The resection should now be completed, and the fat is easily removed. In cases of larger fat deposits (Figure 8).

Figure 8: (A) Large sub-mental fat pad, post-excision, lateral; (B) Large sub-mental fat pad, post-excision, anterior.

There may remain attachments to the jaw-line and lower portions of the neck. These attachments are released using curved serrated Gorney scissors. The contour of the remaining tissues must be smooth and without significant irregularities.

Once the lipectomy has been completed, the platysma is left entirely exposed. Although many techniques for handling the platysma have been described, it is most often not necessary to manipulate this layer. In cases where a significant laxity of the muscle is noted, a repair of the diastase is is usually sufficient to achieve pleasing and lasting results. This is performed using buried interrupted simple 4-0 clear nylon sutures (Figure 9).

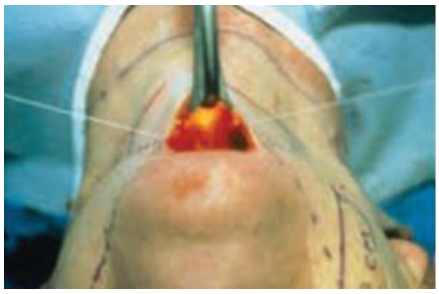

Figure 9: Platysma diastase is repair.

This repair must begin at the mentum and end superior to the hyoid bone. If sutures are placed lower than this level, skin irregularities will result. It is equally necessary to take small bites at the edge of the platysma to avoid bunching of tissue in there pair. This avoids the creation of a single midline band. The sub-mental incision is then closed with buried interrupted 4-0 Vicryl sutures in the dermal layer. Bites must be substantial enough to effect a version of the skin edges. Immediately postoperatively one will notice a slight ridge of tissue. As the suture dissolves, this ridge flattens, leaving a subtle crease where a depression once was.

Attention is now turned to improving the nasomandibular fold and restoring a more pleasing cheek contour. This portion of the operation has been described as an anterior SMAS plication. This is a misnomer. The tissue being plicated is truly the fibro fatty tissue that lies anterior to the SMAS. With aging, the skin of the face loses elasticity and is drawn by gravity downward. The under lying fat is likewise pulled in this direction, leaving a hollow in the area of the cheek and creating a nasomandibular fold and jowl.

The patient is repositioned to allow access to the cheek. A curved retractor is placed in a direction toward the lateral commeasure. Using a clear 4-0 nylon suture, a bite is taken in the fibro fatty tissue 1 to 3 cm lateral to the lateral commeasure. This is pulled toward the lobule of the ear. Tissue along this same line, but closer to the ear, is grasped in a forceps and brought in approximation with the needle (Figure 10).

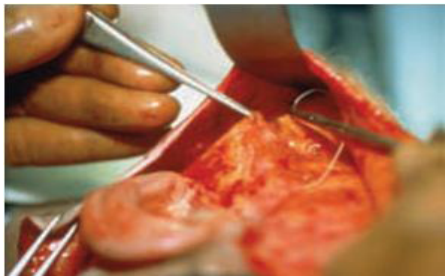

Figure 10: Key (first) stitch placement in SMAS plication.

Varying points along this line are experimented with until a point is found that generates the appropriate amount of tension. These two points are then sutured together. This creates a folding of the fibro fatty tissue, resulting in both an upward and inverted V, with the vertices centered at this first stitch. One must palpate this area to ensure that there is no palpable nodule from the suture or fat and that the surrounding tissue lies smoothly.

Some points must be made about plication of the fibro fatty tissue anterior to the SMAS. First, the correct vector of pull on the fibro fatty tissue is perpendicular to the nasomandibular crease and jowl (Figure 2). The sutures are sewn in this perpendicular direction and in a row that is parallel to the nasomandibular crease (Figure11).

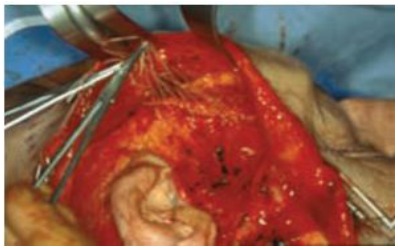

Figure 11: SMAS plication sutures in place (not tied).

The stitches are placed approximately 1 cm apart, beginning in the superior direction from the first stitch. Three or four stitches are placed superiorly and inferiorly. The superior stitches should stop inferior to Mac-Gregory's patches. The inferior sutures must continue to a point below the edge of the mandible. In this way the

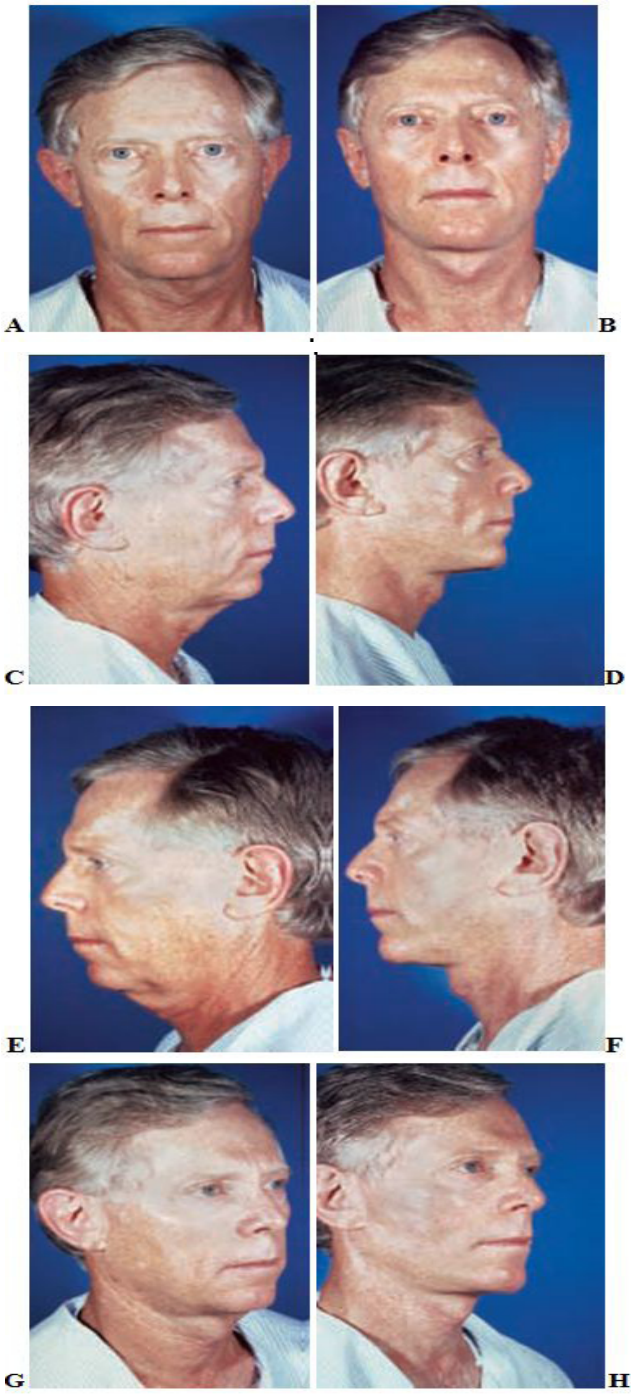

Figure 12: (continued) Preoperative (A, C, E, G, I). Postoperative (B, D, F, H, J).

jowl and nasomandibular fold are corrected. The resulting collection of fibro fatty tissue now lies in the natural position in the cheek, thus restoring a normal contour. Palpation of the tissue after placement of each suture is mandatory to ensure a good contour, free of palpable sutures or tissue irregularities. The photograph [is merely for illustrative purposes. Notice the placement of all sutures showing the proximal and distal bites. This would not be performed during the operation but serves to demonstrate the technique very well. When all sutures are tied, skin dimpling in the area of the naso-labial crease is sometimes seen. This is easily remedied using a sharp straight scissors to extend the original dissection to include this area. Bleeding is always seen during this final dissection. Control of bleeding in this area and throughout the tissues must be achieved before proceeding to skin closure.

Skin closure begins with the approximation of the inverted V anterior to the root of the ear. Prior to placing this stitch, the skin of the sideburn is undermined to a depth of 3 to 4 mm. A 3-0 nylon simple suture is placed in the skin to close this point. The patient's head is repositioned, turning it away from the surgeon and lifting the chin. Allis clamps are replaced in their original position and are pulled in a superior and posterior direction. This red rapes the skin, allowing the cheek, jowl, and neck to lie flat. Straight scissors are used to cut a small slit, thus re-establishing the position of the ear lobule with no tension. With the ear lobule in its new position, the skin flaps are trimmed to a shape accommodating the incision lines. The flap anterior to the ear is held with the Allis clamp in the surgeon's left hand and stretched comfortably over the ear. The point where the flap over lies the (now approximated) inverted V is palpated using forceps.

Figure 13: Preoperative (A, C, E, G).Postoperative (B, D, F, H).

A no. 11 blade is used to incise the skin, stabbing precisely at this point and cutting outward toward the ear. This point is then sutured into place using 3-0 nylon. This focal point where two sutures have been placed is the first of three points of tension.

The posterior skin flap still grasped in an Allis clamp is pulled in a superior direction in line with the SCM. The point where the flap overlies the incision at the junction of the conch a and mastoid is palpated with forceps. That point is similarly incised with a no. 11 blade. This point is sutured in place with 3–0 nylon, thus creating the second point of tension. The Allis clamp is replaced in the middle of the remaining posterior skin flap. The flap is pulled in a direction perpendicular to the hairline. The resulting red raping places the skin in position while removing any redundancy in the neck skin. The edge of the skin flap that now corresponds to the superior most point of the incision is sewn to that point. This creates the third point of tension. With all three tension points approximated, the redundant portions of the skin flaps are removed in a contour that matches the incision lines.

Skin closure proceeds in the pre-auricular area from the sideburn to the lobule using 5-0 nylon interrupted or running simple sutures. The posterior skin over lying the conch a is then closed using 5–0 nylon running horizontal mattress sutures to Evert edges. The lobule is closed using 5-0 nylon interrupted horizontal mattress sutures. The posterior hairline incision is closed using a 3-0 PDS sub-cuticular suture that is left untied to allow for removal. No drains are necessary.

Postoperative Care

The head drapes are removed, and the patient's chin is raised. Sterile mineral oil–soaked cotton dressings are applied to the face and neck and secured using two 4 inch ling dressings for compression. Postoperatively the patient is kept with the head of the bed elevated to a minimum of 30 degrees. This decreases the blood pressure in the face. The patient is not allowed to use pillows to avoid any compression of the great veins of the neck. No bath room privileges are given, and the patient is kept on strict bed rest. The patient is allowed to take fluids only. Medications include pain relief, anti-emetics, anti-hypertensive's (as indicated), and sleep aids. No antibiotics or steroids are needed. Any complaints of breakthrough pain must be expressed to the surgeon immediately to allow an assessment for hematoma as soon as possible. All hematomas must be immediately evacuated in the operating room. This can be performed with local anesthesia. It is important to open all incisions.

On postoperative day 1 the dressing is removed. The wound is inspected for any signs of cyanosis, ischemia, hematoma, or infection. Cyanosis is best treated with topical nitroglycerin paste.

This should be applied to the area of cyanosis in a thin coat every 2 to 4 hours. Patients can expect a headache shortly after application of the paste, which can be controlled with Tylenol. Releasing the involved tension points immediately relieves ischemia. The wound is spread using a hemostat. An advantage of leaving the PDS untied is the ability to release tension on the posterior incision and later pull the wound closed after ischemia is resolved. A light dressing is applied, and the patient is discharged home with limited activity on a regular diet.

The patient removes the dressing on the third postoperative day. The patient is instructed to shower and shampoo hair. An office visit is scheduled for this day. The pre-auricular sutures are removed on day 3. On day 6 the patient returns to the office for removal of the conchal suture. The remaining sutures are removed on day 9.

Case Studies

Patient A Male, mid-fifties (Fig. 12), Patient B Female, mid-forties (Fig. 13).

Conclusion

This technique has been used by the senior author in nearly 3000 cases over three decades of practice. With a very high margin for safety, complications of this technique are less common than those of more invasive techniques. The subcutaneous facelift with supra-SMAS plication should be included in one's armamentarium to be used when SMAS flap techniques are not necessary or not indicated. It has proven to be a safe and effective way to achieve consistent and lasting results.