

# A Progressive Approach to Neck Rejuvenation

Mark M. Beaty, MD

## KEYWORDS

- Necklift • Facelift • SMAS • Individualized care • Natural results • Facelift evaluation
- Rhytidectomy • Surgical technique

## KEY POINTS

- The progressive approach to neck and facial rejuvenation is a comprehensive method for evaluation and correction of common aging changes seen in the lower face and neck.
- The progressive approach takes into account a thorough preoperative assessment but also relies on systematic intraoperative evaluation of each patient as the procedure progresses so as to make surgical decisions based on the maximal amount of information obtainable.
- The ongoing assessments through the surgical procedure itself promote a decision-making process that ensures that appropriate and sufficient steps are taken to correct the aging changes discovered in each patient thoroughly and in a manner most conducive to the structure of their particular anatomy.
- The surgical results with this approach are natural in appearance, as the rejuvenation method chosen is specifically and continuously adjusted for optimal results in the particular patient throughout the evaluation and surgical process.
- The increased burden on the surgeon to master a variety of techniques and to develop the judgment needed to decide in a progressive manner which is the most appropriate for use in each patient is more than compensated for by improved results and greater patient satisfaction.

## OVERVIEW AND HISTORY OF RHYTIDECTOMY

Approaches to neck rejuvenation have progressed steadily since the inception of the formal description and teaching of rejuvenation techniques effective in the neck and lower face in the early twentieth century. Beginning with techniques based only on skin elevation and advancement with or without lipectomy, a wide variety of techniques have been advanced and advocated by various groups of surgeons over the years. More aggressive management of the supportive tissues of the face and neck provided increasingly satisfying and durable results but are more complex surgeries, typically with more extended healing times. Most technique development occurred in North America in the twentieth century and is summarized as follows.

### Direct Lipectomy

In the early twentieth century, several European surgeons including Lexer,<sup>1</sup> Bourget,<sup>2</sup> and Passot<sup>3</sup> reported successful improvement in the contours of the aging neck and face with techniques involving elevation and advancement of the facial and neck skin. These techniques were associated with various degrees of direct lipectomy. The primary differences among these techniques were length and placement of incisions and the extent of skin undermining performed. At this point in the evolution of rhytidectomy, there was no consideration given to manipulation of the deeper supportive tissues of the face and neck. Results were of limited degree and short duration, with a significant incidence of unfavorable scarring and unnatural appearance due to the tension placed

---

Beaty Facial Plastic Surgery, 2365 Old Milton Parkway, Suite 400, Alpharetta, GA 30009, USA  
E-mail address: mmmbeaty@comcast.net

Facial Plast Surg Clin N Am 22 (2014) 177–190

<http://dx.doi.org/10.1016/j.fsc.2014.01.001>

1064-7406/14/\$ – see front matter © 2014 Elsevier Inc. All rights reserved.

on the skin flap and incisions exceeding the ability of these tissues to support and maintain the repair. Despite these limitations, skin-only rejuvenation procedures were the mainstay of the surgical treatment of neck and facial aging for many decades.

### ***Platysma***

The next major innovation in rhytidectomy technique occurred in 1968, with Tord Skoog's<sup>4</sup> description of a procedure that included the platysma muscle in the lower face and neck as a composite unit with the skin flap. This significant improvement allowed much better correction of contours along the jawline, as the inclusion of supportive muscular and fibromuscular tissue allowed a more robust reconstruction of facial contour than was possible with skin-only approaches. The technique was still limited in its ability to manage jowl formation, and the fatty fullness that is often present in the lower face along the jawline was not directly addressed. There was no real consideration of management of the position of midface tissues and the nasolabial fold was not improved significantly. A large series of Skoog rhytidectomies was reported by Lemmon and Hamra<sup>5</sup> and confirmed the limitations inherent to the technique.

### ***SMAS***

The next major development in the refinement of rhytidectomy technique was the description of the superficial musculo-aponeurotic system (SMAS) as a discreet fibromuscular tissue layer by Mitz and Peyronie.<sup>6</sup> The recognition that the SMAS comprised the primary supporting and contour-defining structure of the lower face and neck has served as the theoretical basis for most popular rhytidectomy techniques in use today. A variety of approaches to the SMAS and different methods of dissection, manipulation, and repositioning of this tissue have been advocated over time by various investigators. The popularity of different methods and their associated degree of invasiveness has waxed and waned rather than progressed steadily toward more extensive procedures. When SMAS repositioning is limited to the lower face, regardless of method chosen for advancement and fixation, then efficacy for correction of the neck is limited.<sup>3</sup> The mobilization and advancement techniques possible with an SMAS approach allow some choice in advancement vectors for the SMAS, including development of segmented flaps that can advance in differing directions. This may allow greater flexibility of correction in the lower face and neck compared with methods limiting advancement to

a single vector. When needed, it is also possible to use different vectors of advancement for the SMAS and the skin. There is a variety of opinion regarding the most favorable vectors for advancement of the SMAS through the range of possibilities from oblique to vertical advancement of the tissue. In recent years, the popularity of more vertical advancements of the SMAS has increased, with advocates arguing that more natural-appearing results are obtained along with better correction of the neck due to the lifting of the platysma as an integral unit with the SMAS along a sliding plane over the deep cervical fascia.

Specific methodology for advancement and fixation of the SMAS covers a wide range of techniques. Plication techniques<sup>7</sup> encompass a group of procedures in which the SMAS is folded upon itself and fixated with suture. The simplest approach to managing the SMAS, the technique is relatively safe with no exposure of the facial nerve. Bunching of the SMAS may occur as it is gathered within the sutures, however, creating the risk of contour irregularities that may be challenging to manage. Imbrication techniques were developed that purported to avoid some of these difficulties. By removing segments of SMAS in a variety of configurations, the necessity of folding tissue can be eliminated; however, the plane of tissue advancement is dictated by the segment excised and may not always provide the optimal improvement in facial contour for a given patient. Additionally, there is some greater risk of the facial nerve being affected when the SMAS is excised, particularly if this excision is done anterior to the parotid gland. In recent years, a variety of named lifts have been advocated, such as the S lift and O lift, which are essentially variations of an SMAS plication lift using specific conformations of suture placement.<sup>8</sup> Thus, the popularity of both plication and imbrication techniques remains high, and in properly selected patients the results are quite good. These techniques are often performed through limited incision approaches, increasing their appeal to patients desiring less-invasive procedures with shorter healing times.

### ***Deep Plane***

Hamra's<sup>9,10</sup> description of the deep plane facelift and the composite facelift represent the next major advance in the development of facelift technique. Realizing the limitations imposed by traditional SMAS techniques, including limited mobilization of midfacial structures and minimal improvement at the nasolabial fold, Hamra's techniques advanced a method for mobilizing a robust composite flap of SMAS, platysma, cutaneous

tissue, and the malar fat pad. This dissection allows greater mobilization of the midfacial structures and better effacement of the nasolabial fold while preserving blood supply by eliminating multiple planes of dissection over the same area of the face. The deep plane technique is advocated as allowing greater correction of facial laxity through increased tension on the well-supported and vascularized flap that includes SMAS and muscle. It may also offer a safer option for patients having a potentially compromised vascular supply, such as those who smoke or are diabetic. These advantages are in addition to the better result achieved in the midface and nasolabial fold for patients needing correction in this area. The technique itself is surgically more complex and should primarily be reserved for highly experienced surgeons who are used to operating in the vicinity of the facial nerve. Healing time can be variable, with some surgeons believing swelling is more persistent with the deep plane technique and others feeling swelling resolves more quickly. Because the facelift flap is raised as a composite unit, the vector of advancement is in one direction, but the increased tension that can be borne by the composite flap allows for a more vertical lift and more natural-appearing results.

### ***Subperiosteal***

There have been several descriptions of incorporating subperiosteal techniques as a part of facelift technique, primarily described in the midface.<sup>11</sup> This may include midface lift as a stand-alone procedure or may incorporate subperiosteal dissection in conjunction with other aspects of a more comprehensive facelift approach. These approaches strive to reposition high-volume tissues, such as the malar mound, to improve facial contour. Especially in light of advances in volume enhancement with both fat and injectable fillers, the popularity of subperiosteal lifting approaches has diminished in recent years.

### ***Short Incision***

Current demands of patients' social and business schedules have promoted increased interest in procedures using short incisions and incorporating minimal healing time. A variety of short scar lifts have been described including the minimal access cranial suspension (MACS) lift<sup>12</sup> and anterior vertical vector lifts as described by Jacono<sup>13</sup> and Gentile.<sup>3</sup> The focus of these procedures is to apply a more vertical vector to the lifting of the SMAS, which concurrently improves the contour of the neck, often without directly addressing the neck musculature via platysmaplasty.

These techniques can be performed through more limited incisions than more traditional SMAS techniques as well, avoiding extensive skin elevation in the face and often eliminating any skin elevation in the neck. The results of vertical vector lift also have a lower likelihood of creating a pulled or wind-swept look, as the vector of correction is applied along the lines of actual tissue descent.

### ***Technique Selection***

All of the previously discussed techniques have advocates among the community of facial rejuvenation surgeons. During my career, I have been privileged to learn many techniques and approaches to facial rejuvenation through broad experience with various mentors and teachers. Having seen and used most of these methods, the author now recognizes that most of the modern techniques in use for facial rejuvenation are effective and advisable for some patients. There is little evidence for the dogmatic advocacy of a particular technique outside of creating a hook for marketing purposes or because there is a limitation of preferred procedures within the surgeon's personal armamentarium. In fact, now more than ever, the need to match the neck and facial rejuvenation technique chosen to a particular patient's needs is often the most important key to a successful outcome. The algorithm one needs to develop to select the most appropriate technique is complex and challenging, especially when one recognizes that trying to apply any single technique to a variety of patients with differing needs will not yield the best possible outcomes. Choice of rejuvenation method should be guided, but not entirely determined, by the patient's anatomy and extent of aging changes. Especially in the current environment, where many of our patients are active in the workforce, have significant limitations on available recovery time, and/or have no desire to decrease their activity levels, factors other than purely physical evaluation take on increasing importance in the proper selection of technique for each individual.

For all of the reasons mentioned, the development of a progressive approach to neck and facial rejuvenation is desirable for both the physician and the patient. Although this method remains based on a thorough preoperative examination for narrowing the expected parameters of treatment, the final decisions regarding specific technique and the extent of tissue repositioning are made on direct examination intraoperatively. By using a systematic approach to opening incisions and manipulating tissues after evaluating them directly, the degree of intervention is matched more precisely to the needs of the particular patient. This

ensures maximal correction of the esthetic problems encountered with the shortest possible incisions and without excessive, unnecessary, or difficult dissection. Minimized healing times increase patient satisfaction, as does the assurance that the needed procedures will be performed through the most limited possible incisions.

## TREATMENT GOALS

The overall goal for neck rejuvenation procedures is to contour the neck to provide an aesthetically pleasing cervicomenal angle with a smoothly flowing surface that is continuous and consistent with the contours of the lower face.<sup>14</sup> The appearance of excess fatty fullness in the neck should be minimized and bulky or heavy-appearing contours should be eliminated. The skin should be taut, yet free of a stretched appearance and there should be no visible surgical scarring. The skin should follow the contours of the neck and compliment their flow without appearing distorted. There should be no platysmal banding or bulges visible at rest or during animation. It is likewise important to recognize that the neck is anatomically continuous with and aesthetically related to the appearance of the lower face and jawline. Therefore, the neck and lower face must be aesthetically treated as a unit to avoid mismatch in appearance that may be unsightly.

## PREOPERATIVE EVALUATION

The preoperative evaluation of candidates for the progressive approach to neck rejuvenation surgery begins with a thorough evaluation of the neck and face with attention to the aesthetic details most related to the final outcome desired in the neck. The contour and position of the platysma muscle serves as the basis for the contour of the neck and as such is the starting point for assessment. Laxity of the platysma contributes to fullness of the neck and effacement of the cervicomenal angle due to muscle laxity must be differentiated from excess preplatysmal fat for proper management. Platysmal banding may be observed either at rest or with animation and depending on its severity will dictate either direct management or the possibility of correction by superior and lateral tightening of the platysma. The patient must also be advised of any aspects of his or her neck anatomy that cannot be changed significantly, such as a low-riding hyoid bone.

### Fat Assessment

Fatty fullness of the neck is assessed for bulk, aesthetic impact, and location. Preplatysmal fat

can generally be managed with suction lipoplasty, whereas bulky subplatysmal fat will require an open approach to the neck with subplatysmal dissection to access the undesirable fatty tissue. Fatty fullness also must be distinguished from contour changes due to platysmal laxity or ptosis of the submandibular glands, as these problems will require additional management to correct, including various sorts of platysmaplasty and consideration of partial resection of the submandibular glands.

### Skin Quality and Quantity

Skin quality and quantity are evaluated to assess the likely amount of excision necessary, as well as the ease with which the skin envelope will conform to the underlying reconstituted contours of the neck. Loose, actinically damaged skin will be much less forgiving when trying to develop smooth neck contours than healthy, well-cared-for skin. The placement and likely extent of incisions will depend in large part on the necessary repositioning of the skin. Although incisions can be well camouflaged in the hairline, shorter incisions are desirable from a length-of-recovery standpoint. Reductions in operating time realized with shorter incision approaches are an additional patient benefit.

### Lower Face and Jawline

It is also important to recognize the relationship between the lower face and jawline and the appearance of the neck. As people age, it is common to develop descent on the lower facial tissue as the zygomatic and masseteric cutaneous ligaments loosen. This allows some of the lower facial tissue to hang beneath the jawline and descend into the neck, profoundly affecting the contour of the neck. In these instances, it is imperative to correct the position of the lower facial tissues so as to achieve meaningful improvement in the aesthetics of the neck.

There are several classification systems that describe and categorize changes commonly seen in the lower face and neck.<sup>15-19</sup> All attempt to describe the changes seen and associate them with the underlying anatomic cause, thereby giving the surgeon guidance in selection of appropriate procedures for correcting the observed aesthetic problems. Classification systems are useful in facilitating communication about observed facial and neck changes. However, one must exercise caution in placing too much emphasis on a physical examination to determine procedure selection, as many aging changes seen in the face and neck are multifactorial in etiology

and may defy specific diagnosis until observed directly at the time of surgery. There are currently no available tools to preoperatively assess the anatomic integrity and tensile strength of deep supportive tissues in the face and neck. Therefore, whereas preoperative evaluation yields a great deal of information for surgical planning, a progressive approach to the procedure itself allows greater accuracy in choosing the best surgical maneuvers for any given individual.

### ***Patient Health***

Finally, beyond the anatomic factors influencing the surgeon's choices for specific methods of neck rejuvenation, the preoperative assessment should include evaluation of any health issues, such as tobacco use, diabetes, or collagen vascular disease, which may affect the choice of procedure. Previous facial surgeries or injuries should be thoroughly discussed and assessed for any influence they may have on preferred approach. Additionally, as previously mentioned, the patient's desires for allowable healing time and extent of intervention must be taken into account. Once armed with the full scope of available knowledge regarding the patient's anatomy, health issues, and desires for degree of change, balanced with their available recovery time, the surgeon has the basis to develop an effective, progressive approach to neck and face rejuvenation.

### **PROCEDURAL APPROACH**

After completing appropriate counseling the patient is prepared for surgery. All markings for incisions and landmarks are made in the examining room with the patient sitting up. Proposed incision lines are delineated with surgical marker to the greatest extent deemed likely according to the preoperative examination. Following a progressive approach allows the option of using a shorter incision if the intraoperative observations support such a limited incision approach. The method also requires preparation for the maximal likely intervention so incisions are marked accordingly in both the submental crease and in the periauricular area. Cutaneous landmarks for the anterior border of the sternocleidomastoid muscle, angle of the mandible and course of the frontal branch of the facial nerve are marked if necessary and desired.

### ***Patient Preparation and Anesthesia***

The patient is taken to the operating room and placed in supine position. The progressive approach is performed under general anesthesia

for maximal control of patient comfort regardless of the ultimate extent of dissection and tissue manipulation undertaken.

Preparation of the face is conducted to the full extent of anticipated dissection and draping is also designed accordingly.

Incision lines are infiltrated with 1% lidocaine with epinephrine. More dilute lidocaine with epinephrine solution is used for a diffuse infiltration of the subcutaneous tissues of the face and neck to the extent they may be undermined. The author does not use tumescent solution because accurate evaluation of the integrity and strength of the SMAS/platysma complex requires that the tissue is not distended.

IV antibiotics and steroids are given.

### ***Platysma Correction***

- The neck procedure begins with a small incision in the submental crease. Through this limited access a subcutaneous pocket is created with facelift scissors and advanced for 2 to 3 cm in all directions.
- A Senn retractor is placed and the neck directly assessed for the presence of preplatysmal fat. If significant amounts of preplatysmal fat are encountered suction lipoplasty is performed.
- Pretunnelling of the subcutaneous fatty plane is performed over the entire submental region, limited by the anterior border of the sternocleidomastoid muscle laterally and the thyroid cartilage inferiorly.
- Suction lipoplasty is then performed with appropriate cannulas per the surgeon's preference, clearing the platysma of excess fat. If there is minimal preplatysmal fat present then suction lipoplasty is not necessary. At this point the bellies of the platysma muscle are visible directly.
- Examination is made to evaluate for laxity of the platysma, integrity of the decussated attachment of the medial borders of the platysma, and the presence of platysmal bands. If the problem is limited to mild or moderate laxity of the muscle with a small amount of separation at the medial borders then a midline plication may be performed without further extension of the submental incision. In some cases no further intervention may be needed at all in the submental neck.
- If there is more extensive manipulation needed to correct the shape of the platysma, the

incision should be extended as needed up to a total length of 3–4 cm. Through this access the needed modifications to the submental area are made which may include direct lipectomy, division of platysmal bands, transverse division of the muscle, or more extensive platysmaplasty such as the corset technique.

The goal of this portion of the procedure is to create a pleasing cervicomental angle at the level of the hyoid bone and restore a taut submental support for deeper structures including the submental salivary glands. Any platysmal bands are addressed by lysis, excision, corset style oversewing or a combination of the above methods. Additionally, there must be sufficient connection at the medial border of the platysma to allow lift in the vertical direction from the facial portion of the procedure to effectively support the contents of the submental triangle.

#### ***Assessment of Skin and Tissue of Lower Face***

The next step in the progressive approach is to access and assess the skin and supportive tissue of the lower face. Some information regarding these structures can be determined preoperatively such as skin thickness, degree of photodamage, and extent of observable supportive tissue laxity and deformity. Based upon these factors an initial incision and skin elevation is performed sufficient to access and examine the SMAS to determine thickness, integrity and uniformity of the fibrofatty tissue as well as to assess the skin.

Generally, the initial incision can be limited to the immediate periauricular area extending from the helix of the ear to the lobule using either a pretragal or post-tragal approach as indicated and then coursing up the postauricular sulcus for several centimeters.

A limited skin flap is raised just beneath the dermal plexus of vessels for a distance of only 3 or 4 centimeters. At this point the initial skin and SMAS assessment is made, allowing for performance of a deep plane lift if indicated.

Direct examination of the undersurface of the skin is performed visually and the skin is palpated to assess thickness and compliance.

This examination coupled with information acquired preoperatively regarding any health conditions the patient may have, smoking history and sun exposure history is considered in determining the desirable extent of skin flap elevation.

The author also feels a better assessment of skin compliance is made with a digital exam and physically feeling the stretch present in the skin. This may have a significant bearing on

whether a short flap, long flap, or deep plane composite flap approach is most appropriate for that patient.

#### ***Deep Plane Dissection***

In many cases there is no need to proceed with a deep plane dissection as the SMAS can be accessed and manipulated with a less aggressive approach; however, if a deep plane approach is selected, the procedure is performed by making an incision through the SMAS along an oblique line two centimeters inferior to the expected course of the frontal branch of the facial nerve as described by Hamra.<sup>11</sup>

- Elevation in the sub-SMAS plane is continued over the masseteric fascia and inferiorly to the mandibular angle.
- This dissection is brought into continuity with a subcutaneous dissection in the midface following the posterior border of the zygomatic major muscle to protect branches of the facial nerve which enter the muscles of facial expression from beneath.
- The resulting composite flap includes the malar fat pad, dividing the zygomatic cutaneous ligament for complete release of the midface tissues. This creates a robust composite flap capable of supporting thin, tenuous, or damaged skin and allowing maximal effacement of the nasolabial fold and elevation under higher tension of lower facial tissue without increasing tension on the skin closure.

#### ***Extensive Skin Undermining***

In the author's experience there are also a significant number of patients who have extensive skin laxity in the midface and antero-medial aspect of the lower face who benefit from a much more extensive skin undermining than what is conducted in the standard deep plane approach. Many of these patients still need extended SMAS undermining in the lower face to properly release and correct the jowl and nasolabial fold but, when combined with a long skin flap achieve better results because of:

- Improved skin redraping
- Ability to advance the skin flap along vectors different from the SMAS flap
- An additional dissected plane, which heals and generates new collagen

The specific condition of the skin regarding its laxity and compliance is best assessed when the skin flap is partially raised and this factor makes the progressive approach especially useful in deciding between a deep plane lift and a multiplanar, extended SMAS lift.

**Direct Observation of SMAS**

Once the initial skin flap is raised and an assessment made of the extent of skin undermining necessary for the patient, the next step in the progressive approach is to directly assess the SMAS for thickness, integrity and compliance. While there are indicators present from the preoperative assessment suggesting the nature of a patient's SMAS such as observed anatomy, history of previous facial surgery, and medical history; the author finds that until direct observation is made the complete combination of factors important for deciding which method of management is best for a particular patient are difficult to discern accurately. During training the author had the opportunity to work with several different facial plastic surgeons, each of whom had a favored technique for managing SMAS advancement. In most cases, the preferred technique was used whether it was the best choice for that particular patient or not. As I gained more personal experience in my own practice, it became apparent that a more systematic, progressive approach would be beneficial to patients. Upon direct observation and palpation of the SMAS the thickness and integrity of this tissue becomes apparent to the surgeon. In some cases it is necessary to incise the SMAS over the periparotid fascia and perform a short SMAS elevation to better visualize and palpate the tissue to complete this important part of the intraoperative assessment.

The key factors in assessing the SMAS are thickness, strength, compliance, and integrity.

- Currently, each of these SMAS assessments is best made by direct observation and manipulation of the tissue both digitally and with instrumentation. Visual evaluation and direct palpation of the SMAS reveals its thickness and amount of fatty tissue present intermingled with the fibromuscular supportive network yielding an indication of likely thickness and strength.
- The surgeon next grasps the SMAS with forceps and mobilizes the tissue layer firmly in all directions. Visual observation and the tactile feel for how the SMAS moves when manipulated in this manner yields an excellent assessment of the inherent strength of the tissue and to what

degree its mobilization affects the fundamental contours of the face. The stretching of the SMAS by forceps manipulation also helps the surgeon to assess the degree of compliance present in the tissue. In the author's experience, tissue of similar thickness and inherent strength may have strikingly differing compliance ranging from a quite inelastic sheet which moves as a single unit to flexible and easily dis-tended tissue which may advance but then stretch back toward its former position as distance from a distal fixation point increases.

- Finally, a thorough visual inspection of the SMAS will reveal whether any tears, scarred areas or thin spots are present. This is most frequently a factor in patients who have previously undergone facial surgery but may be seen as an inherent characteristic, especially in older patients where tissue aging and volume loss may have taken a significant toll on soft tissue integrity.

While the variety of tissue findings is infinitely variable just like the infinite variety of aging changes seen in our patients themselves, the most common findings in assessment of the SMAS are summarized in **Table 1**.

**SMAS Techniques**

**Thick strong SMAS tissue**

Thick strong SMAS tissue with good mobility, average compliance and no evidence of weak points or tears is managed with a SMAS imbrication technique, often with an extended sub-SMAS dissection.

- An incision is made through the SMAS in a curvilinear manner over the periparotid fascia coursing from the inferior aspect of the earlobe toward the lateral canthus, terminating just prior to the inferior border of the orbicularis oculi.
- A sub-SMAS elevation is performed to the anterior border of the parotid gland at which time a trial mobilization of the flap is conducted and

**Table 1**  
Evaluation and treatment of SMAS

SMAS Thickness	SMAS Strength	Technique Used
Thick	Strong	Extended SMAS flap
Thin	Strong	SMAS imbrications
Thick	Weak	SMAS plication
Thin	Weak	Multiple SMAS plication

the degree of correction in the neck and lower face observed. As the midline platysma has already been corrected as needed during the first portion of the progressive technique and the platysma extends to interdigitate with the SMAS in the lower face,<sup>20</sup> this mobilization clearly shows the amount of neck correction which will be achieved.

- If the correction of neck, jowl, and lower facial contour is judged sufficient, no further dissection is needed.
- If there is further improvement desired, sub SMAS dissection may continue over the masseteric fascia with facelift scissors, spreading parallel to the course of the facial nerve. This dissection may be carried to the posterior border of the zygomaticus major muscle as needed to achieve the desired amount of contour change in the lower face.
- Once the sub SMAS elevation is completed, the flap is manipulated with Brown Adson forceps or Allis clamps to determine the most favorable vector of advancement. This will usually be in a primarily vertical direction.
- It is often useful to create a small posterior flap by dividing the SMAS just beneath the earlobe which can be advanced to the perimastoid area and affixed, helping to sharpen the cervicomental angle.<sup>11</sup>
- Once the supportive tissue is repositioned, the skin is redraped for closure without tension along a series of vectors creating the most favorable adherence of skin contour to underlying facial contour. The excess skin is tailored appropriately and meticulous closure in layers performed.

#### **Thin strong SMAS tissue**

Thin strong SMAS tissue with average compliance is best managed by SMAS imbrication without significant dissection. When examination reveals the SMAS layer having good strength but less than average thickness, the likelihood of difficulty elevating the flap increases, particularly posing problems such as tearing or excessive thinning of the SMAS during dissection, reducing the strength of the advancement and repair. Using the progressive approach, the author will opt in this situation to perform a SMAS imbrication with minimal to no extension of SMAS flap elevation.

- A strip of fibrofatty tissue is excised with facelift scissors over the periparotid fascia coursing

from the anterior border of the sternocleidomastoid muscle around the lobule and then in an “S” shaped course toward the lateral canthus.

- A minimal elevation of the SMAS flap may be conducted, if indicated.
- The flap is then advanced in a primarily vertical vector, closing the edges of the SMAS excision onto each other meticulously. This allows maximal directed advancement of the supportive facial structures without bunching of tissue. There is opportunity to adjust the amount of advancement during the procedure by further trimming the edges of the SMAS excision or by incorporating a slight overlap of tissue in the SMAS closure.

The healing process for the imbricated SMAS yields a sturdy closure with a completely reconstructed fibrofatty tissue unit which is not reliant on long-term suture retention. Like the extended SMAS elevation technique, the SMAS imbrication technique allows advancement of the skin along a vector which may differ from that used to advance the SMAS, increasing the flexibility of options available to the surgeon for skin contouring during closure.

#### **Thick weak SMAS tissue**

Thick but weak and fatty SMAS tissue, whether demonstrating previous tears or not, is managed by SMAS plication techniques. In some cases the SMAS appears robust to visual examination but when manipulated proves to be quite fatty and easily torn. Manipulation in multiple vectors will reveal poor contour correction with advancement of the fibrofatty tissue as the inherent weakness and tendency to tear precludes the establishment of adequate support by repositioning of the tissue as a unit. In this instance, the progressive approach to neck and face lifting entails using a SMAS plication technique. The primary advantage of plication maneuvers in this setting is that the SMAS is supported by placement of permanent suture to gather tissue together rather than relying on the inherent strength of the tissue itself to support the facial contour changes. There are many techniques for SMAS plication described, including but not limited to the S-lift, O-lift, minimal access cranial suspension (MACS) lift, and Quicklift.<sup>8,12,21</sup> Plication lifts all achieve their effect by gathering facial tissues upon themselves with gathering or folding sutures. The repositioning of tissues can be accomplished in multiple vectors depending on the specific placement of the sutures used. An additional potential advantage of plication techniques is that



tissue gathered into the midface area may have a volumizing effect, further enhancing the overall contours of the neck and face.

Like all aspects of the progressive approach to neck and facial rejuvenation, selection of the specific suture placement for the SMAS plication is dependent upon the needs of the particular patient. While a primarily vertical vector is generally preferred, there may be aesthetic advantages to creating some oblique component to tissue advancement in certain patients. Rather than rigidly adhering to one approach, (phrase deleted) selection of the best placement of plication sutures can be made intraoperatively as the contour changes observed with differing amounts and vectors of tissue movement are directly assessed as the surgeon manipulates the tissue. Depending on the specific situation, either standard or self-retaining barbed sutures may be used. Patterns of suturing may range widely, with various patterns of purse-string suture, running linear closures or interrupted mattress or figure of eight sutures all having potential efficacy, depending on the patient's needs. Again, the specific pattern depends upon the direction of advancement desired and the quality and nature of the tissue encountered. Once the SMAS is advanced, skin tailoring is undertaken. Incisions are kept as short as practical while allowing smooth and complete redraping of the skin, however, extension of incisions is performed as needed along previously marked extended incision lines to prevent dog ears or tension on the closure.

#### ***Thin weak SMAS tissue***

Thin and weak SMAS tissue is generally managed by plication techniques using multiple plication points. Gathering of large areas of SMAS tissue may not be practical in this group of patients. Accurate advancement along the desired vectors of correction is best achieved in these patients by placing multiple, interrupted mattress or figure of eight sutures to individually correct a series of contiguous but limited areas, thereby avoiding distortions that may occur by trying to broadly gather a weak or tenuous SMAS layer into larger pllicated folds. The author generally proceeds sequentially from superior to inferior in placing the plication sutures, adjusting the vector of each as needed to best repair the weakness in the SMAS at that particular point. Once the desired contours are achieved, the tissue is examined for any excessive lumping or irregularity, which can be corrected by replacing the offending sutures or by trimming areas of gathered SMAS tissue selectively. As with all plication techniques, the dissection plane containing the facial nerve is not approached, increasing safety when compared to a potentially

difficult sub-SMAS dissection when the tissue is weak, thin, and easily torn. Skin flap tailoring and incision closure is performed as previously described for other procedural options.

#### **COMPLICATIONS**

Neck and facelift complications are well-recognized and those most frequently cited are primarily composed of unfavorable scarring, hematoma, seroma, and motor nerve damage. Although not considered complications, an experienced facial rejuvenation surgeon recognizes that undercorrection of aging changes, unnatural appearance, and extended recovery time are extremely distressing to patients, leading to dissatisfaction. Each of these issues is minimized by use of the progressive approach to neck and facial rejuvenation. The approach is designed to ensure that an appropriate, individualized dissection technique will be used for each patient. Limiting dissection and tissue manipulation to only what is necessary for each individual patient decreases the overall risk and incidence of hematoma, seroma, unfavorable scarring, and nerve damage. Objective intraoperative evaluation of the supportive structure of the face ensures adequate correction with natural tissue draping. Because the progressive approach encourages performing only the intervention necessary to correct the patient's concerns, recovery time is kept to a minimum.

#### **POSTOPERATIVE CARE**

Postoperative care for patients undergoing the progressive approach to neck and face lifting is explained to the patient and his or her caregiver before the procedure when questions can be thoroughly reviewed and answered. Dressings are applied in the operating room and are generally composed of elastic compression dressings for neck support, lower facial compression, or both. Appropriate bolsters of gauze are placed as well, particularly in the periauricular area. Drains are usually not necessary but may be placed in the neck occasionally, if indicated. The dressing is worn full-time for the first 24 to 48 hours, after which removal for parts of the day is allowed. The patient is instructed in the office on the first postoperative day how to clean the incisions and is allowed to shower and wash the hair with baby shampoo on the second postoperative day. Patients are placed on antibiotics for the first week postoperatively and most are placed on a short course of steroid to minimize swelling. Physical activity is kept to ambulation and light activity around the house for

at least the first week. Sutures and clips are removed between 5 and 10 days postoperatively. No heavy lifting or exercise is allowed for the first 2 to 3 weeks postoperatively. Makeup can be applied by the 10th postoperative day and may be helpful for covering bruised areas.

### EXPECTED RECOVERY

Most patients are feeling well enough to participate in regular daily activities after the second week following surgery. Depending on the extent of surgery needed and the patient's physiology, there will be variable amounts of swelling and bruising. This will gradually resolve during the recovery phase. Anti-inflammatory preparations, such as arnica montana, can be helpful in many patients for speeding the resolution of swelling and bruising. Overall, most patients can be back to their daily routine by 3 weeks after surgery, or earlier in some cases.

### OUTCOMES

The author has incorporated the progressive approach to neck and facial rejuvenation in his practice for the past 3 years. The approach has been used on a wide variety of patients ranging in age from their mid 40s to their mid 60s. A wide range of anatomic corrections have been undertaken, including neck deformities ranging from heavy necks with extensive preplatysmal fat and low hyoid placement to patients with primarily loose skin with platysmal banding. Using the progressive approach, a satisfactory improvement is seen in this wide variety of patients, as seen in the examples that follow. The additional benefits of keeping recovery time, swelling, and bruising to a minimum has increased patient satisfaction

and compliance with postoperative instructions in the author's experience.

- In this example, we see a patient in her late 40s, desiring improvement in neck contour, platysmal banding, and lower facial contour (**Fig. 1**). In this case, exploration of the neck revealed significant platysmal bands that were managed with a midline plication. Lower facial exploration revealed strong but relatively thin fibrofatty tissue. An SMAS imbrication procedure was performed, producing an excellent correction of the neck and jawline, as well as good effacement of the nasolabial folds.
- In the next example, the patient, in her early 50s (**Fig. 2**), demonstrated moderate to severe aging changes of the lower face and neck including heavy platysmal bands, moderate jowling, and significant deepening of the nasolabial folds. Following the progressive approach, she required excision and midline imbrication of her platysmal bands. The patient was found to have a robust SMAS layer, which was managed by dissection of an extended SMAS flap with multivector repositioning. Excellent correction of the neck and lower facial contour was achieved with improvement of the nasolabial folds while retaining a very natural appearance.
- In this example, the patient, in her early 40s (**Fig. 3**), desired a smoother, more taut appearance to the lower face. The neck exploration demonstrated no significant laxity so only minimal suction lipoplasty was performed. A short skin flap was raised and SMAS manipulation revealed an excellent response to direct folding of the tissue. A plication procedure was



**Fig. 1.** Patient in her late 40s desiring improvement in neck contour, platysmal banding, and lower facial contour.



**Fig. 2.** Patient in her early 50s demonstrating moderate to severe aging changes of the lower face and neck including heavy platysmal bands, moderate jowling, and significant deepening of the nasolabial folds.

performed, advancing tissue in a shaped manner to yield improved tightness of the lower face as well as volumization of the midface.

- This patient, in her early 60s (**Fig. 4**), demonstrated significant laxity and contour deformity of the lower face and neck. Neck exploration showed minimal fat but multiple areas of platysmal banding that were discontinuous. Individual band management with excision of tissue and imbrication was conducted to restore a smooth and strong platysmal sling. The SMAS layer in the lower face was found to be thin with several discontinuous areas on initial examination. A long skin flap was elevated, exposing the SMAS broadly and multiple plications performed to achieve advancement and support without risk of tearing or disrupting the tissue. Good improvement of neck and facial contours was achieved while retaining a natural appearance.
- This patient in her early 50s (**Fig. 5**) wanted improvement of sagging neck and jowls, as well as reduced prominence of the nasolabial folds. She was a former cigarette smoker who had quit in the past year. On elevating an initial skin flap, the subdermal vascular plexus appeared tenuous and a robust SMAS layer noted. The patient was managed with a deep plane facelift achieving her goals of maximal correction of the neck, jawline, and nasolabial fold in a safe manner with minimal risk of skin compromise. The composite deep plane flap allowed enough tension to be placed on the tissue suspension that the neck laxity and platysmal banding were corrected without direct excision or plication.
- This male patient in his early 50s (**Fig. 6**) demonstrates heavy tissue in both the lower face and neck and desired a more refreshed appearance. The neck exploration revealed modest



**Fig. 3.** Patient in her early 40s who desired a smoother, more taut appearance to the lower face.



**Fig. 4.** Patient in her early 60s demonstrating significant laxity and contour deformity of the lower face and neck.



**Fig. 5.** Patient in her early 50s seeking improvement of sagging neck and jowls, as well as reduced prominence of the nasolabial folds.



**Fig. 6.** Male patient in his early 50s demonstrating heavy tissue in both the lower face and neck and who desired a more refreshed appearance.



**Fig. 7.** Female patient in her late 40s with a very heavy neck and extensive jowling that completely obscured her jawline.

preplatysmal fat and significant muscle laxity. Midline platysmal plication corrected the laxity and a combination of suction and direct lipectomy removed the excessive bulk from the neck. An SMAS imbrication lift was performed to manage the lower facial laxity and complete correction of the heavy appearance in the neck while maintaining a natural appearance without overcorrection or feminization of the face.

- This female patient in her late 40s (**Fig. 7**) had a very heavy neck with extensive jowling that completely obscured her jawline. The neck exploration revealed extensive preplatysmal fat and laxity of the muscle. Suction lipoplasty and platysmal plication provided a surprising degree of correction and revealed that while the hyoid bone was modestly low, a nice cervicomental angle could be achieved. An extended SMAS flap dissection provided much improved contour to the jawline while maintaining the fundamental shape and softness of her facial features.

## SUMMARY

The progressive approach to neck and facial rejuvenation is a comprehensive method for evaluation and correction of common aging changes seen in the lower face and neck. Rather than focusing on the merits of a particular procedure and developing ways of applying the procedure to patients' needs, this approach first focuses on the patients' needs and then attempts to accurately select and perform the best procedure to

address those needs. The progressive approach takes into account a thorough preoperative assessment but also relies on systematic intraoperative evaluation of each patient as the procedure progresses so as to make surgical decisions based on the maximal amount of information obtainable. Using this approach better ensures that incisions and dissection are kept to a minimum, thereby decreasing the likelihood of visible scarring or tissue distortion and reducing recovery times. At the same time, the ongoing assessments through the surgical procedure itself promote a decision-making process that ensures appropriate and sufficient steps are taken to correct the aging changes discovered in each patient thoroughly and in a manner most conducive to the structure of their particular anatomy.

The author's development of this approach represents a gradual evolution of technique over years of practice and was motivated by his dissatisfaction with reliance on a single or primary set of surgical approaches. The author has been fortunate to train with and observe excellent surgeons who used different techniques for management of the aging neck and lower face and therefore has an extensive body of knowledge and experience to draw on. By gaining experience in many surgical techniques, the ability to conduct an accurate and ongoing assessment of the best possible intervention at each step of the treatment process is developed. The surgical results with this approach are natural in appearance, as the rejuvenation method chosen is specifically and continuously adjusted for optimal results in the particular patient throughout the evaluation and surgical process. The additional advantage of

minimizing unneeded dissection and tissue manipulation shortens the recovery process, increasing patient satisfaction. The increased burden on the surgeon to master a variety of techniques and to develop the judgment needed to decide in a progressive manner which is the most appropriate for use in each patient is more than compensated for by improved results and greater patient satisfaction.

## REFERENCES

1. Lexer E. *Die gesamte Wiederherstellung schiurgie*, vol. 2. Leipzig (Germany): JA Barth; 1931.
2. Lam SM. Julien Bourguet: father of cervical thydectomy. *Arch Facial Plast Surg* 2004;6(2):137.
3. Gentile RD. Mixed-plane rhytidectomy: the superior vertical-vector approach to rejuvenation of the neck. In: Gentile RD, editor. *Neck rejuvenation*. New York: Thieme; 2011. p. 56–81.
4. Skoog T. *Plastic surgery: new methods and refinements*. Philadelphia: WB Saunders; 1974.
5. Lemmon ML, Hamra ST. Skoog thydectomy: a five-year experience with 577 patients. *Plast Reconstr Surg* 1980;65(3):283–97.
6. Mitz V, Peyronie M. The superficial musculo-aponeurotic system (SMAS) in the parotid and cheek area. *Plast Reconstr Surg* 1976;58(1):80–8.
7. Beaty MM. Imbrication, plication, and wide undermining techniques. In: Gentile RD, editor. *Neck rejuvenation*. New York: Thieme; 2011. p. 82–91.
8. Saylan Z. The S-lift for facial rejuvenation. *Int J Cosmet Surg* 1999;7:18–22.
9. Hamra ST. The deep-plane rhytidectomy. *Plast Reconstr Surg* 1990;86(1):53–61.
10. Hamra ST. Composite rhytidectomy. *Plast Reconstr Surg* 1992;90(1):1–13.
11. Quatella VC, Villano ME. *Male rhytidectomy*. *Facial Plast Surg Clin of North Am*. Philadelphia: WB Saunders; 1999.
12. Tonnard P, Verpaele A, Monstrey S, et al. Minimal access cranial suspension lift: a modified S-lift. *Plast Reconstr Surg* 2002;109(6):2074–86.
13. Jacono AA, Parikh SS. The Minimal Access Deep Plane Extended Vertical Facelift. *Aesthetic Surg J* 2011;31(8):874–90.
14. Kolstad CK, Sykes JM. Evaluation of the anatomy and aging-related changes of the neck. In: Gentile RD, editor. *Neck rejuvenation*. New York: Thieme; 2011. p. 13–20.
15. Matarasso A, Matarasso SL, Brandt FS, et al. Botulinum A exotoxin for the management of platysmal bands. *Plast Reconstr Surg* 1999;103(2):645–52.
16. Kamer FM, Letkoff LA. Submental surgery: A graduated approach to the aging neck. *Arch Otolaryngol Head Neck Surg* 1991;117(1):40–6.
17. Rohrich RJ, Rios JL, Smith PD, et al. Neck rejuvenation revisited. *Plast Reconstr Surg* 2006;118(5):1251–63.
18. Dedo DD. “How I do it”—plastic surgery. Practical suggestions on facial plastic surgery. A pre-operative classification of the neck for cervicofacial rhytidectomy. *Laryngoscope* 1980;90(11 Pt 1):1894–6.
19. McCullough EG. The McCullough facial rejuvenation system: a condition-specific classification algorithm. *Facial Plast Surg* 2011;27(1):112–23.
20. Miller PJ, Zoumalan RA, Carron MA. The anatomy and physiology of the neck. In: Gentile RD, editor. *Neck rejuvenation*. New York: Thieme; 2011. p. 1–12.
21. Brandy DA. The quicklift: a modification of the S lift. *Cosm Derm* 2004;17(6):351–60.