Restoration of the neck contour is an integral component of facial rejuvenation and approaches to neck contouring have evolved over the past 40 years. Beginning in the 1970s, surgical procedures aimed at the platysma muscle became more popular and turned out to be an important surgical option for the plastic surgeon. Many techniques have been described, such as direct excision of redundant anterior cervical soft tissues and simple skin envelope tightening, but these left patients with visibly scarred anterior neck skin and often resulted in reappearance of submental bands within months, thus disappointing both patient and surgeon. Later, periauricular incision approaches were described to address platysma muscle bands, remove excess submental fat, suture the medial borders of the platysma, and traction the lateral platysma muscle in order to increase the concavity of the anterior part of the neck, demonstrating the importance of addressing the platysma in rhytidoplasty.

Today, the standard approach for submental and anterior neck rejuvenation is some variant of “corset platysmaplasty” and liposuction. With the current interest in minimally invasive procedures, surgeons and patients are
searching for techniques that produce maximal improvement with minimal intervention. However, we must emphasize the fact that limited incisions and minimal undermining do not always provide the best results. Herein, we describe a technique incorporating standard submental liposuction with a method of triple suturing the medial platysmal bands in combination with lateral plication of the SMAS-platysma, resulting in an enhanced definition of the cervicomandibular and cervicofacial transition that is normally present in youth.

METHODS

Patient Selection

Patients presenting for neck rejuvenation were evaluated for the amount and distribution of fat around the neck, as well as the degree of skin laxity. Dynamic evaluation was performed by observing the neck during normal conversation; we also asked patients to exaggerate their normal facial expressions to display potential medial or lateral platysmal banding.

Patients with “young necks” (those who did not require a complete neck lift and/or those with no apparent medial bandings at evaluation), patients who did not wish to have a postoperative scar under the chin, and patients of advanced age or who had a medical condition where the length of the surgery was a limiting factor were excluded from the study.

Five hundred and seven patients who displayed medial banding of the neck in either the resting or dynamic state were selected over the course of 14 years (between 1994 and 2008); all were treated with the technique described in this article. Patients presenting with significant accumulation of adipose tissue in the cervical region, which naturally masked banding in the preoperative period, also benefited from this technique after generous liposuction of the neck.

A series of photos was taken of each patient while standing, including anterior, lateral, and oblique views. An additional lateral view of the patient with the neck flexed at a 45-degree angle was taken to accentuate the aging changes mentioned above.

Surgical Technique

The procedure was performed with the patient in dorsal decubitus, under intravenous sedation, with the neck in hyperextension. The face and cervical region were infiltrated with a solution of lidocaine 0.5%, bupivacaine 0.125%, and epinephrine 1:240,000. Liposuction was performed in the anterior median cervical region through a 0.5-cm incision in the midline, 3 mm below the submental crease. In patients with larger neck bulge, an additional stab incision was made under each earlobe for transverse suctionsing and improved access to the supramandibular fat. The submental incision was then extended up between 2.5 and 3 cm, and generous undermining was performed in a subcutaneous plane in the mental and supramental regions, as well as the central and lateral cervical regions.

The surgeon visualized and completely released the fibrous mandibular ligaments as described by Furnas5 (Figure 1). The remaining subcutaneous fat was excised with the aid of a fiber-optic light, permitting visualization of the medial fibers of the platysma and its anatomic variation, as well as its flaccidity and thickness. Dissection proceeded in a subplatysmal plane in order to assess the medial borders of the platysma and remove excess muscle (Figure 2).

The anterior plication of the platysma was then performed with the triple suture. The first line of sutures approximated the medial edges of the platysma in the midline, with inverted interrupted MN 3-0 sutures beginning in the submental region and running down to the suprahyoid region. These sutures also included the anterior belly of the digastric muscles because these usually become weak and elongated with age (Figure 3). The second suture was a single MN 2-0 suture placed at the level of the thyrohyoid ligament, approximating the distal extremities of the platysma muscles and thereby assisting in the definition of the cervicofacial angle (Figure 4). The third line of sutures was then placed, reinforcing the previous ones described above by joining the medial edges of the platysma with running MN 3-0 sutures, beginning approximately at the mid-portion of the thyroid cartilage and climbing to the supramental region. This line of sutures tightened the supra- and infrahyoid regions, tightening the midline seam. By proceeding above the mentum, these sutures also corrected any senile chin deformity, redefining and smoothing the cervicofacial angle (Figure 5).

When needed, dissection was continued onto the face through a retroauricular incision, which permitted easier defatting of the lateral and posterior parts of the neck and lateral jaw line. Undermining was continued to the midline submental incision made previously in order to
eliminate the visible notch between the jowl and the chin, permitting better redistribution of excess skin in both face and neck. A MN 2-0 suture was placed to plicate the lateral platysma approximately 1.5 cm inferior to the mandibular line and corresponding earlobe, and to affix it to the periosteum of the mastoid following a posterior oblique vector. This defined the cervicomandibular angle even further (Figure 6). The lateral SMAS-platysma was then plicated parallel to the anterior border of the sternocleidomastoid muscle with MN 3-0 sutures, in continuation with the previous suture placed in the periosteum of the mastoid.

In cases of laxity of the lateral one-third of the face, additional plication of the SMAS was performed in a vertical “stair-like” fashion, beginning at the level of the earlobe and proceeding to 2 cm under the lateral canthus of the eye. This “stair-like” design increased the traction forces resulting from the lateral plication described above and helped treat the jowl, obtaining a better definition of the mandibular line (Figure 7). Before beginning the skin redraping, a solution of 10 mg dexamethasone and 20 mL normal saline was injected in the subcutaneous plane in order to decrease postoperative edema and diminish fibrosis.

Cutaneous traction was then performed in a vertical direction in the preauricular region and a posterior oblique direction in the retroauricular region. Drains were placed under the cutaneous flaps for 24 hours, and postoperative semiocclusive dressing of the face and neck was applied. The dressing was removed on the first postoperative day to evaluate the skin surface and gently evacuate any residual blood under the flaps. It was then carefully replaced for another 24 hours. On the second postoperative day, the patient was allowed to wash his or her hair and remove the dressings; no further hospital stay was needed. On the third postoperative day, manual lymphatic drainage was performed on the cervical region to help limit any eventual collection underneath the flap. In most patients, around the second postoperative week, we infiltrated a total of 10 to 15 mg of pure triamcinolone (Kenacort-A; Bristol-Meyers Squibb, Inc, New York, New York) in the subcutaneous plane at various points, forming halos of 2 cm of infiltration around the total area. This helped to prevent a certain degree of natural secondary fibrosis of the median and lateral cervical region. Sutures were removed between the 10th and 15th postoperative days. A video of the author’s technique can be found at www.aestheticsurgeryjournal.com.

RESULTS

Between 1994 and 2008, the technique described above was performed on 507 patients. These patients ranged in age from 28 to 85 years old; 11% were men and 89% were women. There were 4.6% cases of hematoma formation that were treated at the bedside6 and 3.6% residual seromas that were drained at localized points with syringes. Four percent of patients requested a secondary surgery seven to eight years after their primary procedure, including those who had both a necklift alone and those who had a necklift in conjunction with a facelift. With this technique, we have achieved pleasing results in the treatment
Figure 4. The second isolated MN 2-0 suture (represented in the white circle) approximates the distal extremities of the medial platysmal bands at the level of the thyrohyoid ligament.

Figure 5. The third set of sutures, a line of running MN 3-0 sutures, begins at the mid-portion of the thyroid cartilage and proceeds to the supramental region, tractioning the infra- and suprathyroid regions, treating the senile chin deformity, and redefining the cervicofacial angle.

Figure 6. The posterior oblique traction of the lateral platysma and its fixation to the periosteum of the mastoid with MN 2-0 sutures.

Results from three representative patients are shown in Figures 8, 9, and 10. Note that these patients also have benefited from an endoscopic forehead lift.

DISCUSSION

The demand for surgical procedures to address the aging face has increased dramatically over the past few decades and it is likely that this trend will continue as the segment of our population over 65 years of age continues to grow. Aging can produce skin laxity in the anterior neck, an accumulation of submental fat, “witch’s chin” deformity, platysmal banding, and ptosis of the underlying neck structures. Comprehensive rejuvenation of the neck depends on an accurate analysis of the lower face and neck, with attention to the contours and deep underlying structures. Ellenbogen and Karlin established five visual criteria that are characteristic of the youthful, aesthetic neck in their postoperative rhytidectomy patients: (1) a distinct inferior mandibular border from mentum to angle with no jowl overhang, (2) subhyoid depression, (3) visible thyroid cartilage, (4) visible anterior border of the sternocleidomastoid muscle, and (5) cervicomental angle between 105 and 120 degrees (90-degree sternocleidomastoid to submental line).

All of these factors—the size and shape of the mandible, the distribution of the cervical fat, the location of the hyoid bone, and the thickness and anatomic variations of medial neck deformities in a variety of clinical situations. By infusing a solution containing steroids under the cervical cutaneous flap intraoperatively or injecting it postoperatively at different points of the cervical region, we have had very few cases of noticeable fibrosis in this region.
fibers of the platysma muscle—change as a result of aging. To achieve the best possible aesthetic results with surgical intervention, a thorough examination must be conducted. Techniques that address each of these components can result in excellent rejuvenation of the neck and a well-defined mandibular border. There are several different approaches available for the management of the aging neck—cervical liposuction, bilateral platysma plication, midline platysma plication with transection of distal fibers, necklift with excision of skin and soft tissue, and botulinum toxin injection for platysma relaxation are some of the most common. Each of these may be best suited to certain patient characteristics because the alterations encountered in the aging neck vary among patients. Younger patients who present neck lipodystrophy and excellent skin tone are treated with liposuction, with excellent results. However, the great majority of patients present with lipodystrophy as well as a certain degree of skin flaccidity, requiring a combination of procedures, including cervical rhytidectomy, submental liposuction, chin augmentation, and midline imbrication of the platysma muscles.

It is essential that all of the above-mentioned approaches be well understood by the surgeon in order to provide the most aesthetically pleasing results to each individual patient. However, even after application of all these techniques, a less-than-adequate neck contour may remain. Our triple-suture technique for neck contouring emphasizes treatment of the anterior cervical deep structures. The corset platysmaplasty described by Feldman in 1990 has shown that progressive side-to-side tightening defines the “waistline” of the neck at the hyoid level by cinching the platysma along the midline seam. After liposuction of the anterior cervical region, we routinely transect and resect the medial fibers of the platysma muscle in a fusiform manner, leaving no excess or free muscle edges. This renders a well-supported and contoured cervical floor. With this maneuver, the bulging of large submandibular glands that is sometimes apparent preoperatively is corrected. Avoiding extensive resection results in less tension in the midline and relaxing incisions on the lateral platysma are unnecessary. No subplatysmal liposuction is performed in order to prevent a possible submental depression, but coagulation lipolysis of the excess herniated fat is performed. The digastric muscle edges are plicated together with the medial bands in the midline with the first suture, providing a smooth and flat contour to the submental area. Avoiding many layers of running sutures prevents the fibrous cord effect that is sometimes felt after healing. The

Figure 7. Intraoperative view of the marking for the “stair-like” plication of the SMAS in the preauricular region.
Figure 8. (A, C) A 48-year-old woman who presented for treatment of lipodystrophy of the face and neck, a small degree of skin laxity, and loss of definition in the mandibular border. (B, D) Four years after liposuction (which revealed widening of the platysmal bands), triple-suture neck contouring, and lateral plication, the patient shows good maintenance of the cervicomental angle.
Figure 9. (A, C, E) A 65-year-old man who presented with severe cervical skin laxity and widening of the platysmal band. (B, D, F) One year after triple-suture neck technique and lateral plication, a simultaneous facelift with pre- and postauricular incisions extending to the precapillary region, and limited liposuction of the midcervical region. Good definition of the cervicomental angle was achieved.
Figure 10. (A, C) A 55-year-old woman who presented with lipodystrophy of the face and neck, along with skin laxity. (B, D) Eight years after treatment with liposuction to the anterior-median cervical region, the triple-suture technique, and lateral plication through pre- and postauricular incisions with extended scars up to the precapillary line. The patient maintained definition of the mandibular line and cervicofacial angle during this long-term follow-up.
second single suture placed at the level of the thyrohyoid ligament helps approximate the distal extremities of the platysma muscles and defines the cervicofacial angle. The thyrohyoid ligament is an important anatomical parameter in this second single suture, as it points out the angle of demarcation for the cervicofacial contour. The last running suture begins at the mid-portion of the thyroid cartilage and proceeds above the chin, unlike the usual upper midline plication, which goes from the chin to the hyoid level or the thyroid cartilage. This extended suture not only treats the anterior diastasis muscle, but also creates a superior advancement of the SMAS-platysma complex, giving an elongated look and ample support to the neck. The combination of sutures in these two plications on the deep structures of the neck, following different vectors, prevents the most common undesirable sequelae seen after other platysmaplasty techniques. The lateral fixation of the platysma along the lateral posterior oblique vector creates a smooth cervicomandibular line and defines the mandibular contour.

Furthermore, our “stair-like” plication on the SMAS of the midface pulls the SMAS up, following a vertical vector and thus providing even more support to the lateral plication performed in the cervical SMAS-platysma. This distribution helps even out the subcutaneous plane, allowing the cutaneous flap to adapt to the deep plane, thereby giving the face and the neck a naturally harmonious appearance. The triple suture results in a medial vertical vector of traction, whereas the lateral plication produces a lateral oblique vector. The combination of the triple suture and the lateral plication produces a more youthful look to the neck.

CONCLUSIONS

To obtain consistently successful results, surgical treatment of the aging neck must be based on accurate diagnosis of the anatomic irregularities. Our triple-suture technique, associated with the lateral plication of the SMAS-platysma, is an easily reproducible and reliable technique that produces a well-contoured neck with excellent, sustainable results even for less experienced surgeons.

Disclosures

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The authors received no financial support for the research and/or authorship of this article.

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