Although cervical skin and platysmal laxity are more apparent at the lateral area of the neck, the reported treatments focus on performing plication on the anterior midline or releasing the muscle’s lateral border and tractioning it back. Because of the ineffectiveness of such methods in solving more complex cases, surgeons have been trying more efficient procedures that are also riskier and could therefore increase the complication rate.

**Objective:** The author describes a simple method for treating cervical laxity using composite platysmaplasty. He also reports on the use of closed platysma myotomy to treat remaining or recurrent platysmal bands.

**Methods:** A vertical incision was made on the platysma, parallel to the midline, followed by the creation of a flap made of skin and platysma at the area where tone loss was more evident. When this flap was pulled back, it formed a double muscle layer that pressed on the submandibular gland, pushing it back into its original position. The tightening achieved by the fixation of the flap provided excellent definition of the mandible line. The platysma bands were approached by a method of percutaneous incision of the platysma.

**Results:** Between October 2005 and December 2008, 129 patients underwent surgery. Seventeen patients underwent closed percutaneous platysma myotomy in conjunction with platysmaplasty. Four patients underwent platysma myotomy to treat platysmal bands in a secondary procedure from two to eight months after the original surgery. All patients were satisfied with the aesthetic results of treatment. The only serious complications were two cases of temporary neuropraxia of the cervical branch and one hematoma with partial necrosis of retroauricular skin.

**Conclusions:** Composite platysmaplasty, combined with closed platysma myotomy when indicated, has a short learning curve and provides satisfactory results with a low complication rate and fast recovery. While closed platysma myotomy has been performed by the author as an independent procedure, those operations are not covered in this report and deserve a separate study. (Aesthet Surg J;29:344-355.)
anterior or posterior borders of the platysma. Consequently, if the muscle is tightened toward the lateral area, directly over the submandibular gland and right under the mandible line, the results will be more effective. Sutures and platysma plication on the lateral area close to the submandibular gland, always preceded by significant skin undermining, have been used as an aid for lateral traction and medial plication.7,8 This leads to a more elastic platysma that is incapable of supporting efficient plication.

To achieve efficient tightening in all cases, regardless of complexity, a simple plication on the area close to the submandibular gland is insufficient. It is necessary to make a vertical incision on the platysma without dissecting the skin beyond the incision and to maintain the platysma attachments with the skin on the medial area. Keeping in mind the cervical and mandibular nerves’ “danger zone,” one can make a vertical incision on the platysma parallel to the muscle fibers’ direction and close to the anterior midline, creating a composite flap of skin and platysma. This enables performance of traction of the skin and the muscle at the same time. It also enables plication platysmaplasty, creating a double layer of platysma over the gland (one layer over the other) which exerts more effective pressure. Because undermining is restricted to create the composite flap, the midline remains untouched, avoiding the problems usually seen with extensive dissection in the anterior part of the neck.

In this article, the author describes a cervical lifting technique by which a flap consisting of skin and platysma is tractioned pursuant to the principles above, executing a platysmaplasty that provides effective results even in complex cases. A percutaneous platysma myotomy supporting technique for scarless lysis of the platysmal bands is also described.

ANATOMY

“Danger Zones” Under the Platysma
Platysma undermining, or platysma myotomy, must be performed so as to avoid damaging the cervicomandibular stem branches of the facial nerve, the mandibular marginal nerve and the cervical nerve that proceeds between the deep cervical fascia (investing fascia), and the platysma itself. The marginal mandibular and cervical nerves proceed within the parotid gland and exit at its lower border. The cervical nerve is always posterior to the mandible angle; the mandibular nerve may be either posterior and follow parallel to the mandibular border and below it, or it may cross the mandibular ramus and proceed above it.

The pathway of the mandibular and cervical nerves and the number of branches—and any potential anastomosis between them and other nerves (such as the large auricular nerve and cervical plexus branches)—are subject to much variation. Therefore, studies involving a large number of cadaver dissections were important to define the “danger zones” for incisions that approach the subplatysmal structures, regardless of any anatomic variations found.17-23

Most textbooks describe the mandibular nerve as being cephalad to the mandibular border at the point where it crosses the facial vessels24,25; however, Seward20 and later Ziarah and Atkinson18,19 found the mandibular nerve proceeding below the mandibular border but very close to it, slightly before a vertical line that passes posteriorly to the second premolar tooth in 6% of the cases. Among the described “danger zones,”17-24 we chose to use the one described by Ziarah and Atkinson19 because it was the most encompassing (based on more than 100 dissections) and because it included the study of the cervical nerve. The cervical nerve is responsible for the mobility of the platysma muscle, which includes a segment that expands to the angles of the mouth and, by contracting, draws down those angles, thereby serving as an aid to mimicry and smiling. The marginal mandibular branch is a motor nerve that innervates the depressor muscle of lip and the depressor muscle of the angle of the mouth. Ellenbogen26 stressed that transient paralysis of the movements that lower the angles of the mouth might not be caused by an injury of the marginal nerve, but rather by an injury of cervical nerve filaments that leads to partial paralysis of the platysma, and because the platysma has numerous terminal filaments, such “pseudoparalysis” was transient. In order to avoid damage to not only the mandibular nerve but also the cervical nerve, the author chose to use the “danger zone” that also provides protection to that nerve.

“Danger Zone” for the Cervical and Mandibular Nerves
The limits of the “danger zone” for the marginal mandibular and cervical nerves18,19 was traced by taking the mandibular angle, the lower mandibular border, and the second premolar tooth as reference points. Starting at the mandibular angle, we measured 3 cm in the caudal sense, drawing a vertical line (line P; Figure 1, A). A vertical line was drawn from the second premolar tooth to the mandibular border and then up to 4 cm below the mandibular border line, following the muscle fibers (line A; Figure 1, A). The lower tips of the two lines were joined by a horizontal line, closing the “danger zone.”

METHODS

Skin Marks
A line was traced line parallel to the mandibular border and 1 cm below it. That line was then extended vertically from the mandibular angle to meet the sternocleidomastoid muscle border, as an extended line P shown in Figure 1. A second line was drawn from the second premolar tooth, extending vertically up to the mandibular border and then following the course of the platysma fibers (as with line A in Figure 1, but extending until it intersected the hyoid bone). That line indicated the anterior limit of the “danger zone” described by Ziarah and...
Aktinson for the protection of the mandibular and cervical nerves. These lines were termed the posterior line (P) and anterior line (A) by this author to designate not only the skin marks, but also the lines used on the platysma after the undermining.

Operative Technique

The cervical detachment was performed over the platysmal fascia in the area delimited between lines P and A, as previously marked on the skin. The platysma was exposed, leaving as much adipose tissue as possible adhered to the skin flap. The caudal limit of the undermining varied depending on the degree of flaccidity, but in most cases of moderate laxity, a line parallel to the mandible passing slightly below the hyoid bone usually served as a guide for the caudal detachment (Figure 2, A and B).

Taking line A (at the platysma undermining anterior limit) as a guide, a vertical incision was made on the platysma, running about 3 to 4 cm along the course of the fibers, from 1 cm below the mandibular border to the hyoid bone (Figure 2, C), leaving the anterior border of the incised platysma attached to the skin. This incision gave access to the subplatysmal plane; a small, blunt detachment of about 1 to 2 cm was required to loosen it and enable traction of the composite flap that was created (Figure 2, D). In cases of severe laxity and lack of tone, the caudal detachment had to be increased, but the vertical incision on the platysma did not follow this increase along its entire length; 0.5 or 1 cm was usually sufficient. Long vertical incisions were not performed in order to avoid excessive cutting of the cervical nerve terminal branches.

The cervical composite flap was tractioned and anchored only after the midface area was detached. In order to calculate the appropriate anchorage site, it was necessary to traction the skin flap of the previously-released cheek area (simulating a facelift traction) while the assistant kept the traction in place. The composite flap was pulled by the surgeon using a Kocher or Allis clamp, taking the anterior border of the incised platysma attached on the flap. The muscle was taken with the forceps at the spot where the cervicomandibular angle was to be placed (Figure 3, A and B). With the forceps pulled firmly, the first anchoring suture was made. In most cases, this anchoring procedure was performed by taking the platysma border located on the composite flap and fixing it with a 2-0 Vicryl suture on the platysma right below the mandibular angle, almost approximating line A to line P (Figure 3, C). The platysma muscle tissue below the mandibular angle is quite firm and deeply adherent, and therefore it makes for an excellent anchoring point. This tissue was always included in the anchoring procedure because, in addition to being firm enough to ensure that anchoring was maintained, the tensile strength adjustment and the tightening of the platysmal tissue immediately below the mandibular border immediately produced a marked definition of the mandibular...
Figure 2. **A, B.** The dissection along the skin marks as shown in Figure 1 exposes the platysma up to line A, leaving as much fat as possible on the skin flap. **C, D.** On line A, an incision is made opening the platysma in the direction of the muscle fibers and a small blunt dissection is made under the platysma adhered to the skin.

The improved definition of the mandibular line and cervicomandibular angle were apparent as soon as this first anchoring was complete. New sutures were placed between the borders of the muscle flap, or between the adjacent adipose tissue and this firm tissue right below the mandibular angle to fixate the anchoring more securely (Figure 3, D).

In cases in which little loss of tone was present, the border of the platysma tied to the skin–muscle flap did not reach the firm tissue near the mandibular angle. In such cases, the first suture was made on the platysma tissue somewhat anteriorly, but the following anchoring sutures were placed between the adipose tissue of the flap and the platysma, below the mandibular angle.

The tightening obtained by this method of platysmaplasty produced such a good repositioning of the cervicomandibular angle that liposuction was considered only in cases involving truly heavy necks. Moreover, when dissection was performed keeping all the fat attached on the skin, the fat moved together with the traction, shifting to a higher and more posterior position where it was less apparent. When liposuction was indicated, it was performed at the subplatysmal level in order to avoid loosening of muscle–skin adherence. Such subplatysmal liposuction was performed only on the medial area, between the two vertical platysma incisions.

There was no need to thin the area below the mandibular angle by performing lipectomy or liposuction because the dissection left the fat attached to the skin, so it was no longer in the area when the skin-fat-muscle flap was pulled. However, in some cases, an open lipectomy by scissors over the sternocleidomastoid area was necessary in order to obtain a thinner neck.

The incisions and traction of the skin at the midface area and the remainder of the surgery can be performed according to each surgeon’s habits and routine. However, because the anchoring of the composite flap creates a large amount of excessive skin, the surgeon must be prepared to accommodate or to remove such excess. In most cases, short incisions at the retroauricular area are not sufficient to resolve this issue, and incisions at the hairline or on the scalp are required.

**Closed Platysma Myotomy**

The closed platysma myotomy technique using mini-incisions was introduced by Julien Bourguet, who was also the first to describe platysma bands. In 1926, he described how to treat platysmal bands that remained postoperatively after cervicofacial lifting. Using an extremely fine knife designed for cataract surgery, he performed mini-incisions to obtain transversal cuts on the platysma under the skin, thereby improving the more pronounced muscle bands. Zaylan revived this
Figure 3. A, B, The muscle on the composite flap is pulled with a Kocher forceps toward a point just below the mandibular angle (several attempts may have to be made to choose the best point for traction). C, D, Two or three sutures secure the composite flap muscle on the tissue below the mandibular angle. A few more Vicryl sutures are used to secure the flap to the area next to the sternocleidomastoid.

mini-incision approach by performing serial notching of the platysmal bands.

The author has performed the closed platysma myotomy together with composite platysmaplasty, placing 3-0 braided nylon sutures to lyse platysmal bands without incising the skin in the same fashion as described by Fournier and Carréra,29 who used metallic thread to perform this procedure. The lifting achieved with composite platysmaplasty is very efficient and, in most cases, no other auxiliary procedure is required to provide good results. However, if the patient has rigid and marked platysmal bands of McKinney grades III or IV,30 it is necessary to loosen the fibrotic muscle fibers. In these cases, as suggested above, the author has found the method introduced by Fournier and Carréra using nylon threads to be very efficient.

The platysmal bands were marked preoperatively with the patient awake and standing. Holding the platysmal band between the thumb and the index finger, a vertical line was drawn on top of the held band and two lines were drawn parallel to the first, one at each side, at the base of the tissue held between the two fingers. The distance between the line on the top of platysma band and the two parallel lines was about 1 or 1.5 cm on each side.

The anesthetic vasoconstriction solution was infiltrated at least 10 minutes before the procedure to avoid bleeding. Once again, the platysmal band was held between the thumb and the index finger and a large hypodermic needle (30 × 16) was introduced, entering at the previously drawn medial line and going out at the lateral line, so that the needle crossed the tissue held between the fingers (Figure 4, A). To expedite the process, several needles can be placed. A 3-0 braided nylon thread, without the needle, was introduced through the 30 × 16 needle's eye, following the same course as the needle, and pushed until the tip appeared on the other side, with the end of the thread being pulled about 10 cm (Figure 4, B). The needle was pulled with one hand, while the other hand maintained the thread in position. The needle was reintroduced through the other side (that is, from the lateral line to the medial line) using the holes made in the first pass. However, this time, instead of going very deeply and being aided by the finger pinch, the needle was pushed close to the skin, following a path anterior to the platysma (Figure 4, C). For this second pass, the finger pinch was not used; instead, the fingers were used to guide the needle through its new path until it exited through the hole previously made at the medial line. The nylon thread was reintroduced through the needle's sharp tip lumen, coming back in the opposite direction (Figure 4, C); when the thread appeared at the other end, it was pulled through and the needle was removed. Using this procedure, the platysma was...
caught up by the thread, which was tractioned with each end in one hand, alternating hands in a sawing movement. The thread cut through the entire platysma after a few such alternating movements (Figure 4, D). The same procedure was repeated in at least two other places on the marked area.

This procedure can be used as an isolated procedure in patients with minor skin laxity. The author has performed such procedures, but they are not part of this study. The results of closed platysma myotomy are different when performed alone versus when associated with a cervicoplasty. The rate of recurrent platysmal bands when performing closed platysma myotomy alone is higher and the analysis of the results deserve a separate study.

RESULTS

Between November 2005 and December 2008, 129 patients underwent facelift procedures performed by the author (Figures 5 to 8). All of the surgeries were performed using the technique described in this article; in the aforementioned period, no other technique was used by the author, regardless of the complexity of the cases. The mean patient age was 48 years (range 39-78 years). Eleven patients were men. Patients exhibiting all grades of McKinney’s classification addressing the different aging levels and platysmal band advancement were approached by this technique. In 17 of the last 108 patients, the closed platysma myotomy was performed in conjunction with the facelift procedure. All patients presenting with McKinney grade IV platysma bands underwent this procedure. Other patients who received platysma myotomy were chosen based on a simulation of the neck lifting procedure, with skin traction performed using both hands. The patients who showed some apparent remaining platysmal bands during this test were chosen for closed platysma myotomy.

Four patients (4.48%) who originally received only a composite platysmaplasty procedure showed recurrent platysma bands postoperatively and required platysma
myotomy revision surgery a few months later. Two of the 17 patients (11.7%) who underwent closed platysma myotomy associated with composite platysmaplasty required additional platysma myotomy (both in only one side of the platysmal band) to obtain the desired result. These two patients who had severe McKinney grade IV bands exhibited some improvement in their appearance after composite platysmaplasty, but the percutaneous sectioning of the platysma was clearly indicated as an isolated procedure to obtain better results. All patients who underwent a secondary procedure obtained a satisfactory aesthetic result. In all patients with postoperative platysmal bands, the bands were visible just one month after the original surgery; in other patients, no recurrent bands were observed during the period of this study (three years). This indicates that any recurrence will occur early and that otherwise the duration of results is quite acceptable. Five patients required additional liposuction of the submandibular area to improve the cervicomental angle and the definition of the mandibular line.

Complications included a severe hematoma that required draining in the operating room and resulted in a small necrosis of the skin behind the ear, and one seroma behind the ear that was drained several times and resulted in a small fibrosis that resolved spontaneously, aided by massages performed by the patient. Two cases of cervical nerve neuropraxis, both on the left side, resolved spontaneously in approximately 30 days. One 71-year-old female patient with extremely severe laxity underwent a secondary facelift seven months after the first operation, in which only a skin flap was dissected.

**DISCUSSION**

The loss of tone of the cervical skin and consequent laxity of the platysma is more evident at the lateral part of the neck. This is why platysmal bands are almost always doubled at the sides and not at the anterior line. Single platysmal bands at the midline are rare. Excessive skin hanging at the midline is visible almost exclusively when laxity is related to some weight loss and is rarely caused by aging alone.

The plications that imbricate on the borders of the platysma at the anterior part of the neck do not bear on the area where the platysma is more excessive, and therefore are efficient only in cases involving little complexity. The fact that, in some patients, the muscle is divided at the anterior side is no reason to join together the platysmal borders using plication. Congenital decussation of the platysmal borders or separated borders at the anterior line have no effect in young or elderly patients either.

The extensive detachment required to expose the platysma and to tighten it through folds on the anterior line has a negative effect on the muscle, making it more elastic and less tensile. This occurs because the platysma and skin are structures that adhere to one another and are more resistant when maintained as a single unit. The platysma is a skin muscle with the same embryologic origin as the skin adhering tightly to it. For this reason, a loss of skin tone is associated with a loss of platysma tone; that is, whenever the skin loses its tone, the muscle will also loosen with the same degree of intensity and at the same locations.

When the skin is separated from the platysma and extensive detachment is performed to expose the muscle, two problems can develop. The first is a greatly increased risk of complications related to excessive detachment, such as small hematomas, seromas, necrosis, and wrinkled skin in the late postoperative period. The second (and greater) problem is that when the lax skin is separated from the muscle—which is also lax and therefore provides poor support to the subplatysmal structures—the muscle is even less able to support such structures. It becomes even more elastic and fails to accommodate the structures that were ptotic because of muscle laxity.

The subplatysmal structures, especially the submandibular gland, become more visible with aging because the lax platysma loses the tension required to support these structures, whose adherence to other structures also worsens with aging. If we remove adipose tissue that helps (even if only minimally) to keep maintain firmness, the muscle becomes even more limp and the subplatysmal structures’ cover becomes even thinner. For this reason, it is well-known that performance of any kind of liposuction in association with detachment of cervical skin increases the risk of the submandibular glands becoming even more evident.

Plications at the midline and lateral line, whether isolated or associated with one another, do not adequately reposition the subplatysmal structures in complex cases. Were the plications effective, there would be no need for any auxiliary procedure such as a glandulectomy or management of the diagastric muscle.

Regardless of the causes that render the subplatysmal structures more visible, the effective tightening of the platysma, performed directly where laxity is more evident, leads those structures to return to their original anatomic position, restoring a younger appearance and marked definition of the mandible line without any need to approach the subplatysmal gland. However, as shown above, plication of the platysma directly over the submandibular gland is more difficult and less effective when the muscle is detached. For this reason, the author chose to perform vertical incisions and to restrict the detachment only to what was necessary, creating a composite flap in which the platysma remains attached to the skin so that the muscle does not lose the tensile strength required for adequate stretching and tightening.

There are many advantages to tractioning both structures—the skin and platysma—in a single block compared to skin detachment. The most important of these is that composite flaps are thicker, have better blood supply, and are less prone to scarring than thin flaps of skin alone. Detaching only the necessary skin shortens surgery time and provides a better appearance in the immediate postoperative period, so that the recovery
process is usually faster than when more extensive detachments are performed.

CONCLUSIONS
The composite platysmaplasty technique is an easy procedure and can be performed by beginner surgeons. Because it does not require extensive detachment and does not directly approach the deep subplatysmal structures, it enables faster recovery with fewer complications and can be used by surgeons who prefer to perform less complicated surgeries. On the other hand, when the desired tonicity of the platysma is achieved by tightening
Figure 6. **A, C**, Preoperative view of a 66-year-old woman who complained of severe face and neck laxity and an obtuse neck. The submandibular gland was easily palpable. **B, D**, Six months after full facelift and composite platysmaplasty. Liposuction was performed only in the medial area, between the two vertical platysma incisions at the subplatysmal level.
Figure 7. A, Preoperative view of a 67-year-old woman who underwent a full facelift with a composite platysmaplasty without platysma myotomy two months earlier and presented with recurrent McKinney grade IV platysmal bands, seen with the muscle relaxed. B, Three months after closed platysma myotomy and five months after facelift and necklift.

Figure 8. A, Preoperative view of a 57-year-old woman with grade IV platysmal bands. B, Six months after full facelift with composite platysmaplasty, with closed platysma myotomy performed during the same surgical procedure.
and overlapping two layers of platysma muscle directly over the submandibular gland and accompanied by a percutaneous lysis of the band fibers, the two problems that have been previously been treated through aggressive surgery—the recurrence of platysmal bands and ptosis of the submandibular gland—are easily solved.

Platysmal bands are no more than sagging of excessive skin and platysma as a result of gravity and the fact that they become fibrotic with age. If not prominent, platysmal bands are easily corrected with the use of composite platysmaplasty. However, when they appear hard and firm during simulation of the lifting effect by pulling up the face and neck tissue with one’s hands, a platysma myotomy is indicated and performed in the same procedure. If platysmal bands remain or recur in the immediate postoperative period, the procedure can be performed under with local anesthesia a few months after the original surgery.

DISCLOSURES

The author has no disclosures with respect to the contents of this article.

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