A 26-Year Experience with Vest-over-Pants Technique Platysmarrhaphy

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Background: The purpose of this article is to review the efficacy of the vest-over-pants technique for elimination of the platysma bands and improvement of the cervicomental angle.

Methods: This is a retrospective chart review of 88 patients with neck aging selected randomly by a visiting fellow and a medical student. The collected information included patient demographics, cervical surgical techniques, and complications. Patient photographs obtained preoperatively and at least 8 months postoperatively were compared on front and profile views to determine the visibility of the platysmal bands and the neck contouring. Through an incision placed anterior to the submental crease, the platysma borders were identified and elevated. After completion of the other intended procedures, the platysma borders were then overlapped using the vest-over-pants technique with 4-0 Mersilene.

Results: The mean patient age was 57.56 years. There were 76 women (86.4 percent) and 12 men (13.6 percent). The average follow-up was 28.8 months. Of the 88 patients, 93.2 percent underwent concomitant rhytidectomy, 94.3 percent underwent submental lipectomy, 95.9 percent underwent submandibular contouring, 61.4 percent underwent removal of the anterior belly of the digastic muscle, and 5.7 percent underwent suspension or partial or total excision of the submandibular salivary gland. None of the patients had residual recurrence of the platysma bands during the follow-up period.

Conclusion: On the basis of the detailed analysis of this group of patients and 26-year experience with this technique, the authors conclude that this procedure provides logical and enduring elimination of prominent platysma bands and suspension of neck structures. (Plast. Reconstr. Surg. 126: 1027, 2010.)

Most patients who seek facial rejuvenation are more concerned about the neck area than the rest of the face. Ellenbogen and Karlin have outlined the criteria for a youthful neck, including a distinct inferior mandibular border, a visible subhyoid depression, a visible thyroid cartilage bulge, a visible anterior sternocleidomastoid muscle border, a submental-sternocleidomastoid line angle of 90 degrees, or a cervicomental angle of 105 to 120 degrees. Characteristic signs of the aging neck include skin laxity, an obtuse cervicomental angle attributable to subplatysmal and supraplatysmal fat deposits, prominent anterior belly of digastic muscles, platysmal bands, and possible ptosis of the submandibular gland. These imperfections may be associated with a low-set prominent hyoid, jowls, obscured mandibular border, and receding or ptotic chin. Often, a varying combination of these flaws coexist (Tables 1 and 2).

In this article, we report a technique of platysmarrhaphy that has been used by the senior author (B.G.) over the past 26 years. The charts and full sets of photographs of patients selected randomly by a visiting fellow, without the direct involvement of the senior author, were analyzed to review the outcomes associated with this procedure, which is the subject of this report.

Disclosure: The authors have no financial interest or commercial association that is related directly or indirectly to the scientific work reported in this article.
PATIENTS AND METHODS

This is a retrospective study that includes a chart review of 88 patients with aging neck who underwent neck contouring performed by the senior author between 1999 and 2006. These patients were selected randomly by a visiting fellow and a medical student. The random selection involved picking the charts of available patients from the different years without knowledge of the results and the outcome of the operations. Neck contouring with the vest-over-pants technique was performed in all patients. Patients with cervicofacial dysmorphologies or neck aging signs underwent either rhytidectomy and neck contouring or neck contouring alone. Standardized patient photographs (frontal, lateral, oblique, and flexed neck) had been obtained preoperatively and at least 8 months postoperatively. Each neck aging parameter was separately classified preoperatively and postoperatively as none, mild, moderate, or severe. Using Ellenbogen’s criteria, preoperative photographs were analyzed by an independent observer (visiting fellow) regarding the aging signs of the neck with a more intense focus on the platysma bands. Postoperative photographs were analyzed and the surgical outcome was classified as excellent, good, fair, and poor in terms of the overall neck contour. Patients younger than 30 years, patients with postoperative follow-up less than 8 months, and those with associated craniofacial anomalies were excluded. The presence and severity of the platysma bands was recorded. All patients underwent platysmorrhaphy, even those who did not exhibit prominent platysma bands, to improve the neck contour following lipectomy.

Surgical Technique

A 3.5-cm submental skin incision is designed approximately a few millimeters anterior to the existing submental crease. The submental and submandibular areas and lateral neck are injected superficially and in the deeper planes using lidocaine containing 1:200,000 epinephrine. Subcutaneous dissection of the neck is performed from the mentum anteriorly to the thyroid cartilage caudally and from the midline to the mandibular angle laterally. A reasonably thick skin flap is elevated to minimize irregularities and excessive skeletonization. Lateral dissection is performed through either a submental incision or periauricular incisions, when this surgery is performed concomitantly with rhytidectomy. Submandibular contouring is performed using a liposuction technique only if the plan includes isolated submental contouring. Otherwise, the lateral neck and the submandibular area are contoured under direct visualization through the rhytidectomy incision. Although adequate fat is left under the skin flap, the remaining fat attached to the platysma is removed thoroughly. This is followed by identification of the platysmal borders. The platysmal borders are separated and retracted laterally. Subplatysmal dissection is carried out to expose the subplatysmal fat and anterior belly of the digastric muscles. The subplatysmal fat is removed completely only if removal of the anterior belly of the digastric muscles is planned. Otherwise, the subplatysmal fat is removed partially and conservatively to avoid submental hollowing. Complete or partial excision of the anterior belly of the digastric muscles using coagulation cautery is performed if the patient has a significant enough obtuse neck and malpositioned hyoid bone. The submaxillary glands are suspended if the glands are ptotic. Partial or complete removal of the gland is indicated rarely when the glands are hypertrophic.

While standing above the head, a 4-0 Mer- silene suture (Ethicon, Inc., Somerville, N.J.) is passed through the lateral portion of the right platysma approximately 3 cm from the posterior border of the symphysis and, on average, 3 cm from the middle border, depending on the laxity of the platysma muscle (Fig. 1, above, left). The suture is then passed close to the medial border of the left platysma (Fig. 1, above, right). The suture

<table>
<thead>
<tr>
<th>Procedure</th>
<th>No. (%)</th>
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<tbody>
<tr>
<td>Platysmorrhaphy</td>
<td>88 (100)</td>
</tr>
<tr>
<td>Rhytidectomy</td>
<td>82 (93.2)</td>
</tr>
<tr>
<td>Submental lipectomy</td>
<td>83 (94.3)</td>
</tr>
<tr>
<td>Liposuction</td>
<td>4 (4.5)</td>
</tr>
<tr>
<td>Submandibular contouring</td>
<td>84 (95.9)</td>
</tr>
<tr>
<td>Removal of anterior belly of digastric</td>
<td>54 (61.4)</td>
</tr>
<tr>
<td>Caudal transection of platysma</td>
<td>15 (17.0)</td>
</tr>
<tr>
<td>Suspension of submandibular salivary gland</td>
<td>2 (2.3)</td>
</tr>
<tr>
<td>Partial or total excision of submandibular salivary gland</td>
<td>3 (3.4)</td>
</tr>
<tr>
<td>Genioplasty</td>
<td>3 (3.4)</td>
</tr>
</tbody>
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Table 2. Medial Platysmal Band

<table>
<thead>
<tr>
<th></th>
<th>None (%)</th>
<th>I (%)</th>
<th>II (%)</th>
<th>III (%)</th>
<th>IV (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperatively</td>
<td>15 (17.0)</td>
<td>31 (35.2)</td>
<td>23 (26.1)</td>
<td>13 (14.8)</td>
<td>6 (6.8)</td>
<td>0.000</td>
</tr>
<tr>
<td>Postoperatively</td>
<td>88 (100)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
</tr>
</tbody>
</table>
is then brought back through the lateral portion of the right platysma approximately 1 cm apart from the entrance of the sutures (Fig. 1, second row, left) and tied to tack the left platysma flap under the right platysma (Fig. 1, second row, right). This suture is repeated in two or at most three sites in the same vertical row (Fig. 1, third row, left). The free border of the right platysma is pulled over the left platysma by passing a suture near the free border of the right platysma (Fig. 1, third row, right), which is then passed through the left platysma approximately 3 cm laterally (Fig. 1, below, left) and tied (Fig. 1, below, center). This technique creates an area of platysma flap overlap (vest-over-pants), avoiding central roll commonly inherent in the repeated central plication. At no point does the repair extend caudal to the hyoid bone. The senior author does not find partial transection of the medial borders of the platysma necessary. Although he has transected the platysma in its entire width as far caudally as possible, the senior author has avoided this part of

**Fig. 1.** (Above, left) A 4-0 Mersilene suture is passed through the lateral portion of the right platysma approximately 3 cm from the posterior border of the symphysis and, on average, 3 cm from the midline depending on the laxity of the platysma muscle. (Above, right) The suture is passed through the medial border of the left platysma. (Second row, left) The suture is brought back through the lateral portion of the right platysma about 1 cm apart from the entrance of the sutures. (Second row, right) The suture is tied to tack the left platysma flap under the right platysma. (Third row, left) This suture is repeated in two or at most three sites in the same vertical row. (Third row, right) The free border of the right platysma is pulled over the left platysma by passing a suture near the free border of the right platysma. (Below, left) The suture is passed through the left platysma approximately 3 cm laterally. (Below, center) The suture is tied. (Below, right) Two or three sutures are used to complete the repair.
the technique since the completion of the study. The surgical field is irrigated with saline containing antibiotic. A drain is placed under the flap and brought out through the postauricular area on one side for an isolated submental lipectomy and both sides if the procedure is being performed in conjunction with rhytidectomy. The submental incision is repaired using 6-0 Monocryl and 6-0 fast absorbable catgut.

Statistical Analysis

The data were analyzed using SPSS software version 15 (SPSS, Inc., Chicago, Ill.). Quantitative data are reported as mean ± SD. Qualitative data are reported as frequency and percentage. A Wilcoxon signed ranks test was used when comparing preoperative and postoperative data of qualitative variables. A value of $p \leq 0.05$ was considered significant.

Fig. 2. Patient before (left) and 1 year after (right) platysmarrhaphy and facial rhytidectomy (frontal and profile views).
RESULTS

The mean patient age was $57.56 \pm 8.71$ years (range, 30 to 76 years). There were 76 women (86.4 percent) and 12 men (13.6 percent). The average follow-up was $28.8 \pm 20.35$ months.

Fifteen patients (17 percent) had no platysma bands preoperatively, whereas 73 patients (83 percent) had prominent platysma bands preoperatively (Figs. 2 through 5). Fifteen patients who did not exhibit platysma bands still underwent the vest-over-pants technique to avoid the visibility of the platysma borders following significant submental contouring, which would have unmasked otherwise hidden platysma bands. No one had residual bands postoperatively ($p < 0.001$). Fifteen patients (17 percent) underwent caudal transection of the platysma. There was no statistically significant difference in the results when the platysma was divided completely caudally versus when the platysma left intact. Although there

![Fig. 3. Patient before (left) and 11 months after (right) platysmorrhaphy and facial rhytidectomy (frontal and profile views).](image-url)
were submental flaws such as rare submental depression, none could be attributed to the platysmarrhaphy.

**DISCUSSION**

A variety of factors can disturb neck congruity. Redundant skin, platysmal bands and excess fat in the subplatysmal and supraplatysmal planes, prominent anterior belly of the digastric muscles, and hypertrophic or ptotic submaxillary glands can commonly contribute to a displeasing neck. A vast number of surgical and nonsurgical techniques have been introduced to deal with platysma bands. Botulinum toxin type A is one of the modalities used to eliminate platysmal bands.

De Castro defined three anatomical patterns of platysma muscles. The knowledge and understanding of the behavior of medial fibers of the platysma as a result of aging is essential for plan-

![Fig. 4. Patient before (left) and 18 months after (right) a rhytidectomy and platysmarrhaphy (frontal and profile views).](image)
ning the surgical procedures. McKinney classified medial platysmal bands into four different grades.\textsuperscript{3} Surgical procedures for platysmal bands (platysmaplasty) have included excision and imbrication or plication of the muscle, either anteriorly or by lateral elevation, excision of medial margins, lateral platysmal plication to the sternocleidomastoid fascia,\textsuperscript{4–6} and midline platysma muscular overlap in a double-breasted fashion through a lateral suture suspension technique.\textsuperscript{7}

Guyuron has shown the importance of the hyoid bone and the attached muscles in a balanced neck. Transection of these muscles at their attachment improves neck contour.\textsuperscript{8}

The senior author places the submental incision anterior to the submental crease. This provides good exposure for lipectomy, muscle plication, and even removal of submandibular glands, and releases the bands creating the submental crease.
Techniques for direct access of the platysma and imbrication have been described since the 1970s. These methods, however, have their shortcomings and often produce recurrent paramedian muscle bands, visible submandibular gland bulges, and various contour irregularities. The corset platysmaplasty was developed by Feldman to avoid those postoperative imperfections. This technique could result in a palpable central neck roll. The senior author has been using the vest-over-pants technique since 1983 in an attempt to redistribute the redundant platysma bands over a larger area to minimize the palpability and to augment the stability. As is demonstrated in this article by the independent reviewer, in 100 percent of the patients, this technique has provided complete elimination of the bands. As a matter of fact, during the 26-year experience with this technique, no patient has undergone a secondary platysma procedure for repair of the platysma bands, even though many have undergone second- and even third-generation face lifts. However, in all of these second- and third-generation face lifts, there was some neck skin laxity that was corrected with a facial rhytidectomy.

Del Campo combined passing a suture with “hammock platysmaplasty” in which the platysma muscles are overlapped in a double-breasted fashion in the midneck through a minimal submental incision and two retroauricular incisions. He introduced the single overlapping for grade I and grade II bands and double overlapping for grade III and grade IV deformities.

Platysma has also been transected to eliminate the platysma bands. The senior author has not found this technique helpful, and there was no statistical difference between those who had transection of the platysma and those who did not, in relation to the platysma band visibility. On patients who have severely obtuse necks, one of the major contributing factors is a prominent anterior belly of the digastric muscle. The muscle bulk can be palpated as an extra roll of soft tissue oriented laterocaudally. These patients also have excessive fat between the digastrics which, if removed without reduction of the digastic volume, will results in submental hollowing, especially while the patient swallows. Although removal of these muscles, subplatysmal fat, supraplatysmal fat, submaxillary glands, and contouring of the submandibular region each contribute to the cervicomental definition, none reduces the visibility of the platysma bands.

With senescence, there is submandibular salivary gland hypertrophy and/or gland ptosis. This contributes to submandibular fullness and an ill-defined mandibular border. Although gland prominence may be lessened by platysmarrhaphy, it may be unmasked by submental lipectomy. Platysmarrhaphy and superficial musculoaponeurotic system–platysma repair often improves the gland position. The senior author has suspended the gland with a basket technique and Mitek anchor (DePuy Mitek, Inc., Raynham, Mass.). He may also partially or totally excise the gland, depending on the case.

CONCLUSIONS

The neck dysmorphology can be the consequence of excess skin, excess subplatysmal or supraplatysmal fat, prominent platysma bands, protruding anterior belly of the digastric muscles, ptotic or hypertrophic submaxillary glands, or horizontal microgenia. An optimal outcome can only be attained by dealing with all of these flaws, when they coexist. In this article, the senior author’s 26-year experience in correcting one of these imperfections is reported.

There are not many techniques that do not change in 26 years, especially in the hands of those who are constantly striving for improvement of results, unless the technique is delivering the intended objectives fully and consistently. In the view of the authors, this is a sensible technique that distributes the redundant platysma over a larger surface area rather than gathering in the center, and provides enduring results by having multiple fixation points that provide a secure repair.

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PATIENT CONSENT

Patients provided written consent for the use of their images.

REFERENCES