

Neck Contouring Without Rhytidectomy in the Presence of Excess Skin

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Received: 1 September 2017 / Accepted: 8 November 2017 / Published online: 22 December 2017
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Abstract

Background Patients with severe neck skin laxity due to excess submental adipose tissue have required either standard rhytidectomy or direct excision of neck skin with Z-plasty and submental lipectomy. Our recent experiences with four patients who declined cervicofacial rhytidectomy demonstrate that submental lipectomy and platysmarrhaphy appear to obtain sufficient improvement.

Methods The submental area, submandibular area, and lateral neck are injected with local anesthetic. An incision is made in the submental area anterior to the existing crease, and the incision is taken through the subcutaneous tissue to the underlying fat. The skin is undermined in the deep subcutaneous plane. The lateral fat that cannot be visualized directly is suctioned using a number 2 cannula. Supra-platysmal and subplatysmal excess fat are excised under direct vision. The anterior bellies of the digastric muscle are excised partially or completely to obtain a flat contour if necessary. The submaxillary gland is partially or totally removed as indicated. The platysmarrhaphy is performed, and a TLS drain is placed in position and brought out through the left post-auricular sulcus using the attached trocar. The submental incision is then closed without skin excision.

Result Non-excisional surgical neck rejuvenation was performed on four patients with significant skin laxity. There was adequate improvement in the cervicomental angle and neck profile contour in all patients, indicating that significant improvement may be achieved without skin excision.

Conclusion Patients with excess skin can achieve acceptable results with submental lipectomy and platysmarrhaphy without rhytidectomy or direct excision of neck skin.

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Keywords Neck rejuvenation · Neck contouring · Excess neck skin · Skin laxity

Background

Optimal neck rejuvenation on a patient with excess skin can be accomplished by either lateral facial rhytidectomy or direct neck skin excision with Z-plasty. Submental lipectomy with cervicofacial rhytidectomy is considered the paragon for lower face and neck rejuvenation [1]. Additionally, direct neck approaches have been pursued in these patients with success. These approaches include liposuction of superficial submental and/or submandibular fat, anterior lipectomy of supra- and/or subplatysmal fat and vest-over-pants-type platysmarrhaphy, and direct anterior skin excision and Z-plasty [2–14]. However, patients' reluctance toward rhytidectomy and skin excision due to financial or complexity reasons has forced

Electronic supplementary material The online version of this article (<https://doi.org/10.1007/s00266-017-1030-9>) contains supplementary material, which is available to authorized users.

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approaches that otherwise would have not been deemed worthwhile.

We present our experience with four patients in whom the senior author reluctantly performed neck contouring without rhytidectomy or skin excision and was surprised with the magnitude of improvement. We offer an explanation as to why this type of outcome is feasible.

Surgical Technique

Prior to administration of general anesthesia, the neck is marked with the patient in a sitting position. At this time, the amount of excess fat to be removed is estimated. This step is crucial, especially on patients who undergo general anesthesia with a laryngeal mask airway (LMA) because the assessment of excess fat becomes extremely difficult due to the bulk of an LMA. Additionally, the decisions regarding removal of the anterior belly of the digastric muscle and the submaxillary glands are confirmed preoperatively, while the patient is upright. After induction of anesthesia, the submental and submandibular areas as well as the lateral neck are prepped and injected superficially and in the deeper planes generously using lidocaine containing 1:200,000 epinephrine. While the surgeon is sitting at the head of the table, an incision is made in the submental area anterior to the existing crease approximately 3 cm in length. The incision is taken through the subcutaneous tissue to the underlying fat. Using a number 2 suction cannula, an adequate lipectomy is carried out in the lateral portions of the neck that cannot be visualized directly. A healthy, sufficiently thick skin flap is elevated, spanning from the mandibular border to the lowest portion of the neck where excess fat needs to be removed, and then laterally to the mandibular angle. The fat overlying the platysma is removed using a pair of long facelift scissors to contour the neck while carefully protecting the underlying muscle. On senescent patients where the muscle is attenuated, extreme caution is exercised to avoid removing the muscle with the fat. It is often safer to remove the fat close to the midline first to expose the platysma, elevate the platysma border, and remove the fat more thoroughly laterally after the platysmorrhaphy. To do this, the platysmal borders are identified, separated, and carefully dissected in the subplatysmal plane with the spreading action of the long facelift scissors. The excess fat is then excised from the subplatysmal plane using the cautery.

Based on the preoperative assessment, the surgeon decides whether to completely or partially remove the fat overlying the mylohyoid muscle between the digastric muscles as well as to completely or partially remove the anterior belly of the digastric muscle. With the decision, the anterior belly of the digastric muscle should be partially

or completely removed to prevent hollowing in the submental midline area, which could be more discernable while swallowing. Next, a vest-over-pants platysmorrhaphy [15] is done using 4-0 Mersilene suture (Ethicon, Cincinnati OH). The suture is passed through the entire thickness of the right platysma muscle (for the right-handed surgeon) about 2.5 to 4 cm away from the medial border of the right platysma, distance depending on the magnitude of muscle laxity. The suture is then retrieved from the deep surface of the muscle and passed through the left platysma about 0.5 cm from the medial boarder. It is then passed through the deep surface of the right platysma, retrieved on the superficial surface of the muscle, and tied over the muscle to pull the left platysma border deep to the right platysma. Another suture is placed 2 cm caudal to the first suture, using the same vest-over-pants technique. Depending on the size of the neck, a third suture may be necessary. The most posterior suture is placed cephalad to the thyroid cartilage, and caution is taken not to place a suture at or caudal to the thyroid cartilage to prevent a choking feeling. The right platysma muscle is now draped over the left platysma, and these muscles are sutured to each other with two additional, moderately tight simple interrupted sutures (video). The wound is irrigated with an antibiotic solution, and a TLS suction drain is placed under the skin flap and brought out through the submental incision or behind the ear using the attached trocar. The submental incision is then closed with 6-0 Monocryl (Ethicon, Cincinnati OH) and 6-0 fast-absorbing plain catgut sutures, with a single skin hook placed at each end of the incision to aid in alignment of the surgical incision. Steri-strips are then applied. A cervical pressure garment is used for a minimum of 3 days, and the drain is removed on postoperative day 3 or 4.

Thus far, we have performed non-excisional surgical neck rejuvenation on four patients with significant skin laxity. All patients were recommended to undergo neck rejuvenation with concomitant rhytidectomy for optimal results, and they were counseled preoperatively that the procedure may give just modest improvement in neck contour. Two of these patients underwent partial excision of the anterior bellies of the digastric muscles in addition to submental lipectomy and platysmorrhaphy. All four patients had reasonable improvement in cervicomenal contour. Before and after photographs of the representative patients are shown (Figures 1, 2, 3).

Discussion

Patient characteristics, including degree of skin laxity and magnitude of obtuseness of the cervicomenal angle, often guide the approach to neck contouring [1, 3, 5]. Skin laxity



Fig. 1 Patient before (left) and 2 years after (right) submental lipectomy, platysmarrhaphy, and limited excision of anterior belly of the digastric muscle. The cervicomenal angle improved from 150° to

115°. Note the persistent jowls before and after neck rejuvenation, as this will need to be addressed with a facelift

is graded I through IV, with grade I being no laxity and grade IV being severe laxity [14]. The cervicomenal angle is graded similarly, with grade I being normal and increasing in deformity until grade IV, which is severely

obtuse [3]. Patients with no skin laxity to moderate skin laxity (grades I–III) are considered appropriate for direct neck approaches without skin excision because of the unique ability of neck skin to contract once released from



Fig. 2 Patient before (left) and 6 months after (right) submental lipectomy, platysmarrhaphy, and limited excision of anterior belly of the digastric muscle. The cervicomenal angle improved from 145° to 115°

the underlying platysma [1, 3, 13, 16]. Patients with severe laxity (grade IV), however, have been found to require either standard rhytidectomy or direct excision of neck skin [1, 9, 10, 12, 13, 16–19]. It is important to note that the grading system is not validated.

This approach of grading patients' necks and pursuing skin-sparing anterior approaches in those with mild to moderate skin laxity, and directly excising skin in patients with severe skin laxity and severely oblique cervicomenal angles has met satisfactory results. Zins and Fardo



Fig. 3 Patient before (left) and 1 year after (right) submental lipectomy and platysmarrhaphy. The cervicomenal angle improved from 150° to 120°

see 1–2 grade improvements in cervicomenal angle in 97% of 33 patients operated on following this algorithm [13]. Similarly, Knize, when operating on younger patients with good submental skin elasticity, sees an improvement of at least 1 grade in cervicomenal angle in

100% of 56 patients. He warns against the submental lipectomy and platysmaplasty approach without skin excision in patients with no residual skin elasticity, although he notes that some of this can be overcome with extended use of external skin compression [3]. In a

follow-up paper, however, Knize reports good esthetic results in a 69-year-old “marginal candidate” with grade IV cervicomenal angle who only underwent submental lipectomy and platysmaplasty [4]. Similarly, in an update on non-excisional anterior cervicoplasty, Ramirez suggests that severe skin laxity and so-called bull’s necks are relative contraindications, as opposed to absolute contraindications, to non-excisional neck rejuvenation [20].

In patients with significant lower face and neck soft tissue laxity, the ideal operation is the cervicofacial rhytidectomy because almost all the patients in this category would benefit from facial rejuvenation in addition to neck rejuvenation. Redundant skin, excess submental supra-platysmal and subplatysmal fat, platysma bands, prominent anterior belly of the digastric muscles, ptotic submaxillary glands, and bony dysmorphology (i.e., retro/microgenia, retrognathia, malpositioned hyoid bone) contribute to neck flaws.

In patients with excess submental supra-platysmal and subplatysmal fat, adequate submental lipectomy is performed. The senior author places the submental incision anterior to the submental crease because these scars heal more favorably being less mobile, and this technique also results in elimination of the submental crease by releasing the bands very effectively. It should be noted that platysmarrhaphy using the vest-over-pants maneuver is performed in all patients undergoing submental lipectomy to correct platysma bands and to prevent bands that may occur in the future. We have seen great success with vest-over-pants platysmarrhaphy, and as long as other methods of platysmaplasty provide effective correction of platysma bands, the surgeon can use his/her platysmaplasty of choice.

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 preoperatively as an extra roll of tissue which is firmer than fat. These patients also have excessive fat between the digastric muscles, which will result in submental hollowing upon removal without reduction in the digastric volume, especially with swallowing.

Submandibular salivary gland hypertrophy and/or gland ptosis can be present with aging. This creates submandibular fullness and an ill-defined mandibular border, contributing to an obtuse cervicomenal angle. Although gland prominence may be corrected by platysmarrhaphy, it may be unmasked by submental lipectomy. In moderate to severe hypertrophy, resection should be performed for optimal results.

Bony structural flaws such as retro/microgenia or retrognathia should be addressed by improving the underlying bony frame with osteotomy or implants.

In all patients, to achieve consistently satisfactory results, it is imperative to perform circumspect preoperative analysis. Each neck flaw should be detected and corrected using the outlined techniques for a complete elimination of flaws. Our patients presented with severely obtuse cervicomenal angles due to redundant skin, excess submental fat, and prominent anterior belly of the digastric muscle. Therefore, submental lipectomy, platysmarrhaphy, and limited digastric muscle excision with concomitant rhytidectomy would have been the ideal procedure based on the current understanding of neck rejuvenation.

Ideal candidates for non-excisional submental lipectomy with platysmarrhaphy or platysmaplasty have thick, elastic neck skin. They include primarily younger patients but also older patients with good residual skin tone and thicker neck skin. Such limited procedures have not been recommended on patients with thin, wrinkled neck skin and minimal subcutaneous fat because although the cervicomenal angle can be improved, postoperative skin texture is not cosmetically acceptable. Therefore, these patients are recommended to undergo additional rhytidectomy or direct excision of the submental skin.

A non-excisional approach appears to obtain sufficient improvement based on the senior author’s recent experience, especially when the patients have significant amounts of fat above and below the platysma. Analyzing the geometry of the redundant skin and newly created large surface area to accommodate the skin makes this success understandable. We hypothesize that the excess skin covering a convex surface is consumed by the corrected concave neck contour, as it is seen in the included patients and the illustration (Figure 4). Preoperatively, in both cases, the neck profile has a convex shape, with a severely obtuse cervicomenal angle. Postoperatively, the neck profile assumes a concave shape after removal of excess fat and prominent anterior bellies of the digastric muscles, producing satisfactory results.

The main shortcoming of this report is the small sample size. However, this report reinforces the feasibility of achieving a reasonable outcome with neck contouring without skin excision. We plan on reporting a follow-up with larger sample size in the future.

Conclusion

Patients who desire neck and lower face changes should undergo neck rejuvenation procedures outlined above with concomitant rhytidectomy for the best outcome. However, for those who seek neck contour improvement without lower face and neck rhytidectomy, good outcomes can be attained, even in elderly patients with skin laxity and / or obtuse cervicomenal angle.

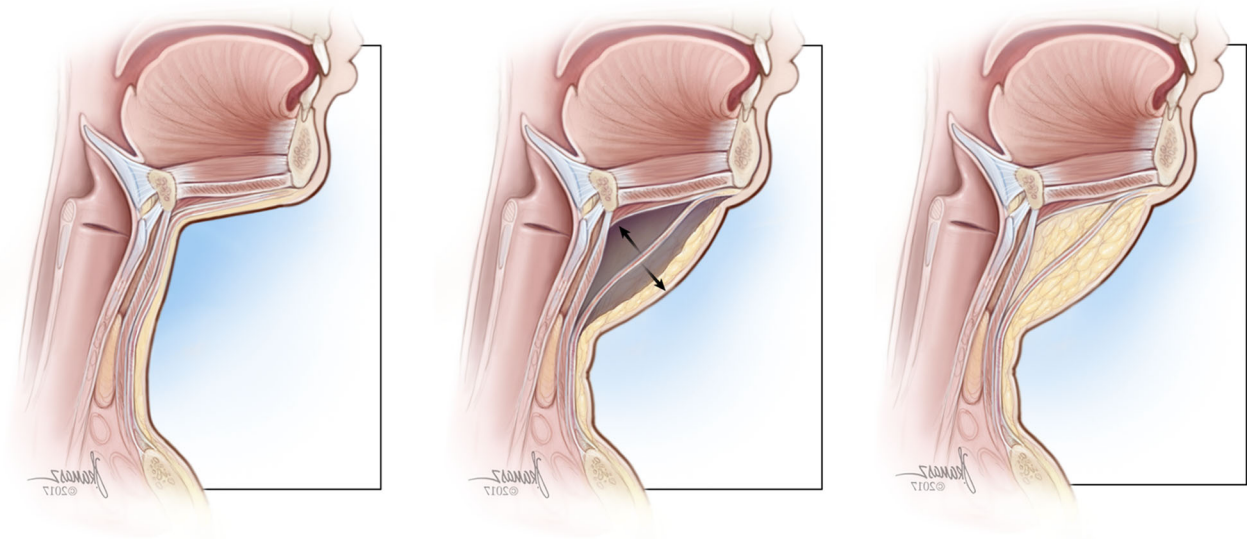


Fig. 4 Graphic illustration of the conversion of convexity to concavity explaining the rationale for consumption of redundant skin

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflicts of interest

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