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Suture Suspension Platysmaplasty for Neck Rejuvenation Revisited: Technical Fine Points for Improving Outcomes

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Abstract.
Background: The suture suspension platysmaplasty technique for neck rejuvenation was introduced more than 13 years ago. Over the years and after a large number of procedures performed for all classes of neck deformities, a number of technical fine points evolved that resulted in even more aesthetically pleasing and predictable results. These technical fine points are presented in detail, and their direct anatomic effects are analyzed. Finally, the points that constitute the youthful neck are redefined with detailed schematic presentation.
Anatomic Considerations: All aspects of neck rejuvenation with the suture suspension platysmaplasty are analyzed, with a focus on the changes that occur in terms of the following six key anatomic points: cervicomental angle depth, mandibular border definition, mandibular angle definition, labiomandibular fold prominence (jowling), mental prominence, and neck width.
Technical Fine Points: Additional technical fine points have evolved over the past 13 years to optimize the results and produce a more natural appearing and aesthetically pleasing neck: the "angle loop" of the suspension sutures, anatomic suction-assisted lipectomy using appropriate cannulas, application of moderate tension to the interlocking suspension suture to avoid the "overcorrected neck," imbrication of the midline platysma, conservative skin excision, and augmentation of the chin to increase the depth of the cervicomental angle.
Conclusion: The interlocking suture technique, by creating an artificial permanent "ligament" under the mandible, corrects the anatomic components of the neck (points 1 to 6) with excellent long-term outcomes and patient satisfaction rates. The additional technical fine points have made the aesthetic results more natural and pleasing, while making the technique more simple, safe, and reproducible.

Key words: Neck rejuvenation—Platysmaplasty—Suture suspension—Technical fine points

Many factors [9] contribute to the loss of shape and contour of the aging neck. These anatomic changes include loss of tone to the dermal elastic fibers with sagging of the skin, ptosis of the soft tissues in the neck and chin, banding of the platysma muscles at the anterior neck, elimination of the anterior sternocleidomastoid border, and increased fat deposition, bone resorption, and submandibular gland protrusion, to name a few. Additionally, during the aging process, the cervical spine collapses. This not only shortens the height of the neck, but also is subsequently responsible for creating an increased width in the anterior dimension of the neck.

The appearance of the neck is strongly affected by several factors: the depth of the cervicomental angle, the definition and perceived length of the mandibular border, the definition and sharpness of the mandibular angle, and the prominence, height, and width of the chin, as well as the presence or prominence of the labiomandibular fold. Each of these specific areas contributes directly to the overall perception of a youthful and aesthetically pleasing neck.

As mentioned in a recent publication on aging [9], each of the aforementioned factors is directly related to the aging process. In turn, the aging process includes multiple variables such as drops in key hor-

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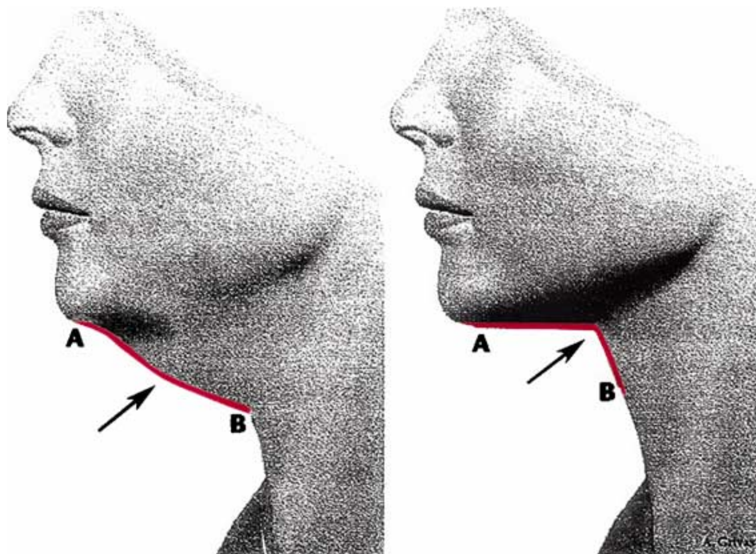

Fig. 1. Skin excision laterally must be conservative because more skin is required to fill a concavity after the cervicomental angle is changed [10].

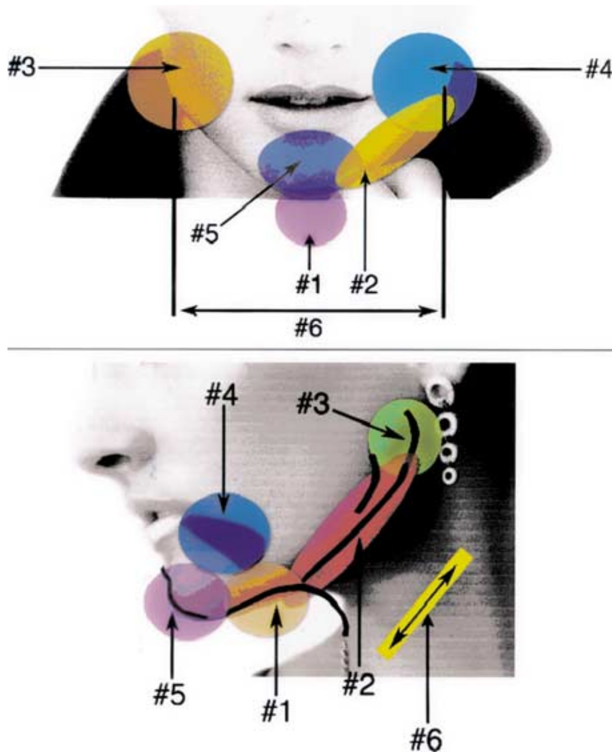

Fig. 2. The six key anatomic points to be considered in evaluation of the neck.

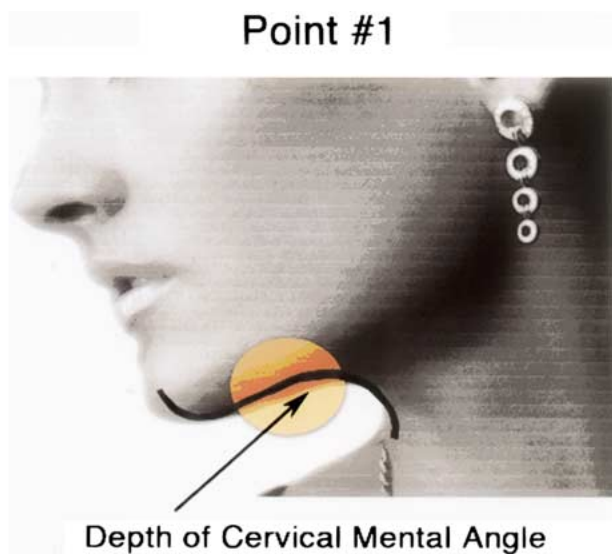

Fig. 3. Deficiency corrected by adjustment of the tension on the interlocking suspension sutures, defatting of the supra- and subplatysmal spaces, suturing of the digastric muscles together, and transection of the platysmal borders.

monal levels, increased levels of free radical damage to skin and muscle, loss of buffering antioxidant levels, skin dehydration, and overall damage to the skin by ultraviolet A and B radiation.

As mentioned in previous articles [2], the criteria for a youthful neck include a distinct inferior mandibular border, a visible subhyoid depression, a visible thyroid cartilage bulge, a visible anterior sternocleidomastoid border, and a submental sternocleidomastoid line angle of 90° or a cervicomental angle of 105 to 120°. Although these criteria are useful, it is essential to consider the previously mentioned six anatomic points and not just the cervicomental angle alone to create optimal facial harmony and balance.

Another key concept to consider is that although a fatty neck appears to have too much skin, this is in essence an illusion. In reality, a full neck has too little skin rather than too much. When the cervicomental angle is augmented and a concavity is subsequently created, more skin is required to fill this deeper angle [10] (Fig. 1).

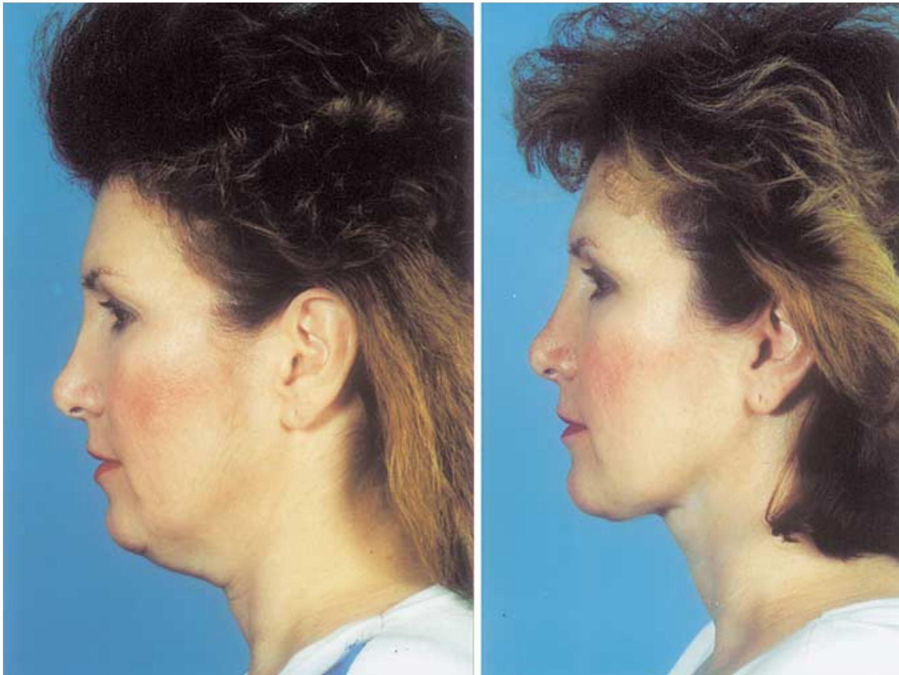

Fig. 4. Point #1 example; Class 3 neck deformity and isolated suture suspension platysmaplasty.

Patient Evaluation and Criteria for a Youthful Neck

For adequate preoperative and postoperative evaluation patients undergoing neck contouring, a specific numeric protocol was designed to identify the points of the neck anatomy that undergo the greatest modification with aging. These are the points on which the suture suspension platysmaplasty technique is focused. Every candidate for potential neck rejuvenation undergoes evaluation of the following anatomic key points (Fig. 2). cervicomental angle depth, mandibular border definition, mandibular angle definition, labiomandibular fold prominence (jowling), mental prominence, and neck width.

Surgical Technique According to Anatomic Area

Cervicomental Angle Depth (Point #1)

Cervicomental angle depth (Figs. 3, 4), described originally by Ellenbogen and Karlin [2], is limited by the patient's anatomy. A number of options exist for enhancing this point. First, placement of the interlocking suspension suture allows for a superior and internal vector that elevates the platysma muscle into its new position, usually immediately above the hyoid. Adjustment of the tension on this suture allows for adjustment of the angle depth from mild to moderate. This factor is discussed in detail preoperatively with the patient, and a decision is made according to the individual anatomy and the patient's wishes. Additionally, defatting of the supra- and subplatysmal fat also can enhance this angle or help it remain soft, depending on the effort during the dissection in this area. Special liposuction cannulas (spatula shaped) are used for this purpose with varying degrees of suctioning, again, according to the individual anatomy. It is crucial to avoid the "overcorrected neck," which occurs if too much fat is removed from the supraplatysmal or subplatysmal plane, or if too much tension is applied to the suspension sutures.

Fig. 5. Deficiency corrected by suction-assisted lipectomy above and below the mandibular border (leaving a strip of subcutaneous fat along the bony border), fat grafting to the mandibular border, and long-term fillers such as Radiesse.

Fig. 6. Point #2 example; Class 4 neck deformity and suture suspension platysmaplasty combined with rhytidectomy and mandibular border enhancement.

Suturing of the digastric muscles together [15] can further enhance the angle and help create a more concave or flat submental triangle. Finally, transection of the platysmal muscle borders medially has been popular, but use of this technique has rarely been found necessary except for patients with extremely thick platysmal bands or severe medial redundancy.

Mandibular Border Definition (Point #2)

The key elements of this step in the neck procedure (Figs. 5, 6) involve suctioning both above and below the border of the mandible and leaving a strip of subcutaneous fat along the bony mandibular border for highlighting of the border itself. The suctioning along the lower border of the mandible is accomplished by using a spatula cannula to suction both exposed surfaces (platysmal and dermal fat) gently to help enhance the submandibular definition.

Additional tools for this anatomic point are fat grafting along the border of the mandible during the primary platysmaplasty, or long-term fillers such as Radiesse. These tools have been used with excellent results, especially for mandibles that are relatively hypoplastic (narrow jaw configuration). Finally, alloplastic implants [16] can be considered as a last resort.

Mandibular Angle Definition (Point #3)

Modification of the suspension suture to create a loop immediately before placement of the suture through the mastoid fascia has resulted in extremely well-defined mandibular angles (Figs. 7, 8, 16). This is done by taking a small bite of the sternocleidomastoid muscle immediately below the angle of the mandible, then coming out and taking a second bite, thereby creating a loop with the suture. The other end of the suture is placed through the loop, as illustrated in Fig 16. The suspension suture is then placed to the mastoid fascia with the appropriate tension (moderate).

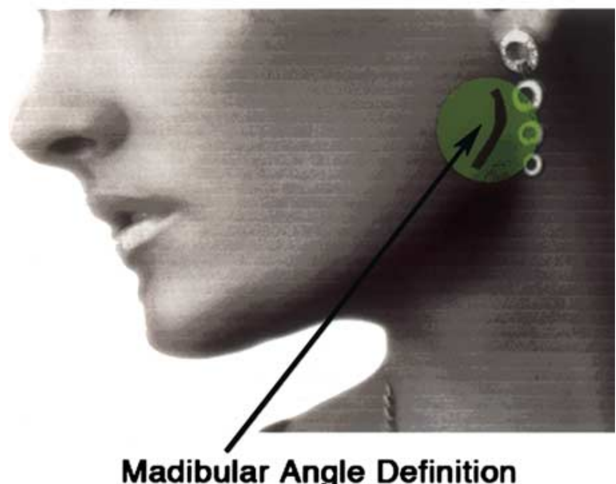

Fig. 7. Deficiency corrected by "angle loop" suture (see Fig. 16), fat grafting into the masseter, long-term fillers such as Radiesse, and alloplastic augmentation (mandibular angle implant).

Additionally, fat grafting into the masseter muscle has resulted in even more defined mandibular angles. The same results were observed when long-term fillers

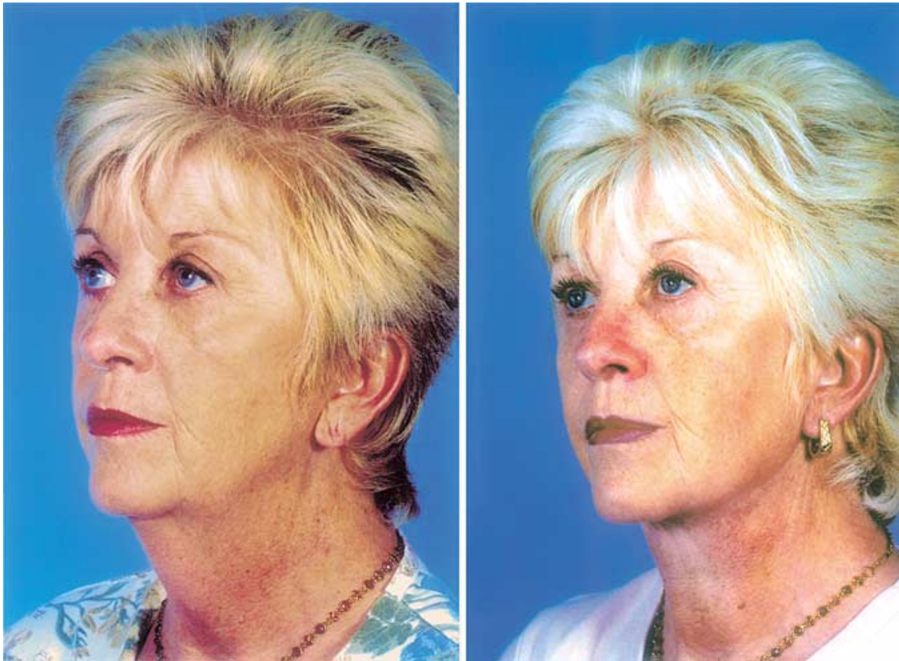

Fig. 8. Point #3 example: Class 4 neck deformity and isolated suture suspension platysmaplasty with mandibular angle enhancement.

such as Radiesse were injected into the inferior mandibular border or the superolateral ramus. Alloplastic augmentation, another alternative, can be performed simultaneously or as another separate procedure, as described by one of the coauthors [16].

Labiomandibular Fold Prominence (Jowling) (Point #4)

Labiomandibular fold prominence (Figs. 9, 10) is frequently considered above the neck proper, but it in essence contributes directly to an overall youthful and clean appearance of the neck. Suctioning of this area both from below the submental incision and from the postauricular incision allows for a bilateral vector force resulting in skin contracture in a superolateral direction with consequent flattening of the labiomandibular fold. Camouflage fat grafting around the labiomandibular area also can markedly help to decrease the deformity. As viewed frontally, prominent labiomandibular areas create a "squared-off" ptotic appearance, contributing to the aged look. This also can be improved with the aforementioned techniques. The use of a small intraoral incision and subperiosteal dissection of the depressor labii muscle can allow the muscle component of the labiomandibular fold to be released, thereby helping to alleviate the downward turned corners of the mouth and the prominent mandibular fold as well. Another tool for correcting this deformity is the recently approved barbed-suture Contour Threads (usually requiring two threads to be placed through the postauricular incision). Contour Threads also are used currently in conjunction with suture suspension platysmaplasty for correction of both the midface and brow areas.

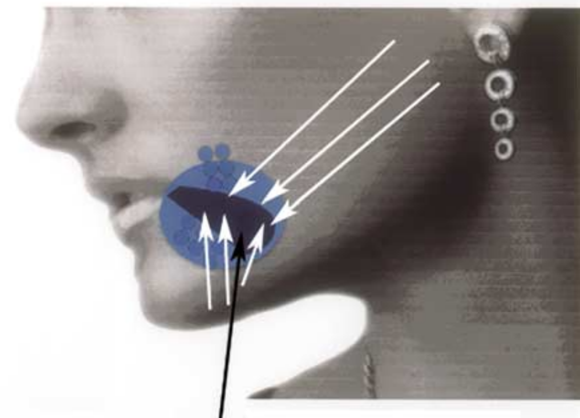

Fig. 9. Deformity corrected by suction-assisted lipectomy of the jowl through submental and postauricular approaches, camouflage fat grafting, depressor labii muscle release, barbed sutures (Contour Threads), and extended postauricular skin ellipse excision.

Finally, an extended skin ellipse with the postauricular skin excision can further correct skin redundancy when prominent jowling is present.

Mental Prominence (Point #5)

There is no doubt that a naturally prominent chin projection adds tremendously to the overall length and beauty of an aesthetically balanced neck (Figs.

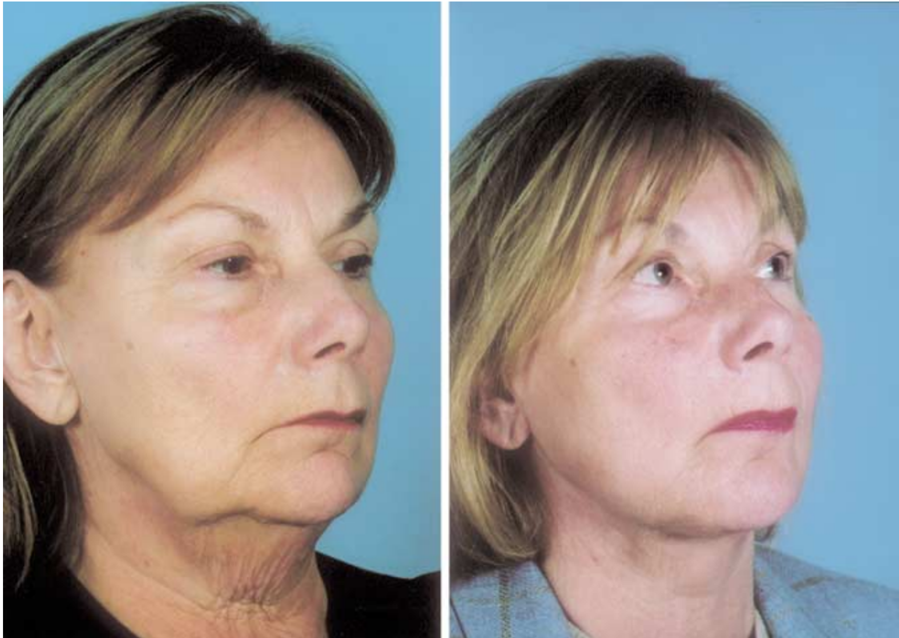

Fig. 10. Point #4 example: Class #4 neck deformity and suture suspension platysmaplasty combined with suction-assisted lipectomy of the jowl areas and extended skin excision with the postauricular ellipse.

11, 12). It also helps keep skin from becoming redundant in the submental area. Proven cosmetic techniques for augmenting a deficient chin prominence focus primarily around alloplastic chin implants. The use of sliding genioplasties with or without wire fixation are also options, but require significantly more time and effort for cosmetic patients with more potential complications. Fat grafting to the chin can modestly enhance the chin prominence as well. Long-term fillers such as Radiesse have been used with great success for minor enhancement.

A very simple technique that involves drawing a vertical line from the glabella through the upper lip and a second vertical line from the nasal tip to the chin prominence helps to define quickly whether the chin is normal, hyperplastic, or hypoplastic.

Width of the Neck (Point #6)

In many patients, the neck width is markedly increased with aging (Figs. 13, 14). This increase is mainly attributable to muscle laxity, collapse of the cervical spine, and an increase in subcutaneous and submental fat deposits. The creation of an aesthetically pleasing, thin neck can be accomplished by resection of the redundant midline platysma muscle and reconstitution of the platysma muscle at the midline. A number of techniques have been described, including midline imbrication [4], direct excision, or both. It should be noted that oversuctioning or overresecting of the neck fat can result in a poor final result and can potentially masculanize a feminine neck, especially in the female patient with thin skin.

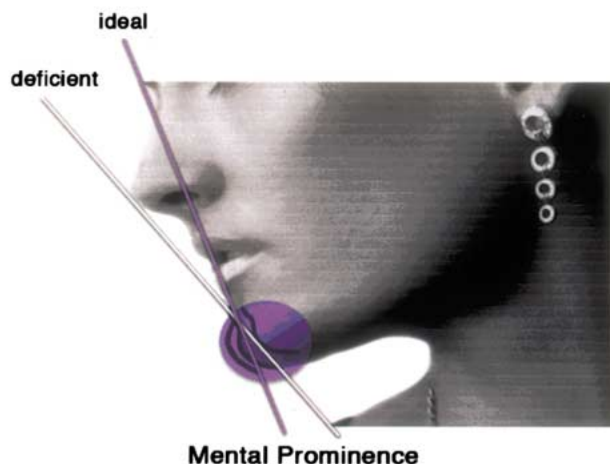

Fig. 11. Deficiency corrected by chin augmentation (Alloplastic), fat grafting to the chin, and long-term fillers such as Radiesse.

Surgical Technique Summarized

All the steps of the original suture suspension platysmaplasty technique, as described in previous articles [6–8,10], were followed for all patients (Fig. 15). These briefly include the submental and postauricular incisions, the neck undermining (varied depending on the degree of ptosis and laxity), the subcutaneous tunnel under the mandible edge, the plication of the platysmal edges medially, and most importantly, the interlocking suture extending from the midline to the mastoid fascia bilaterally.

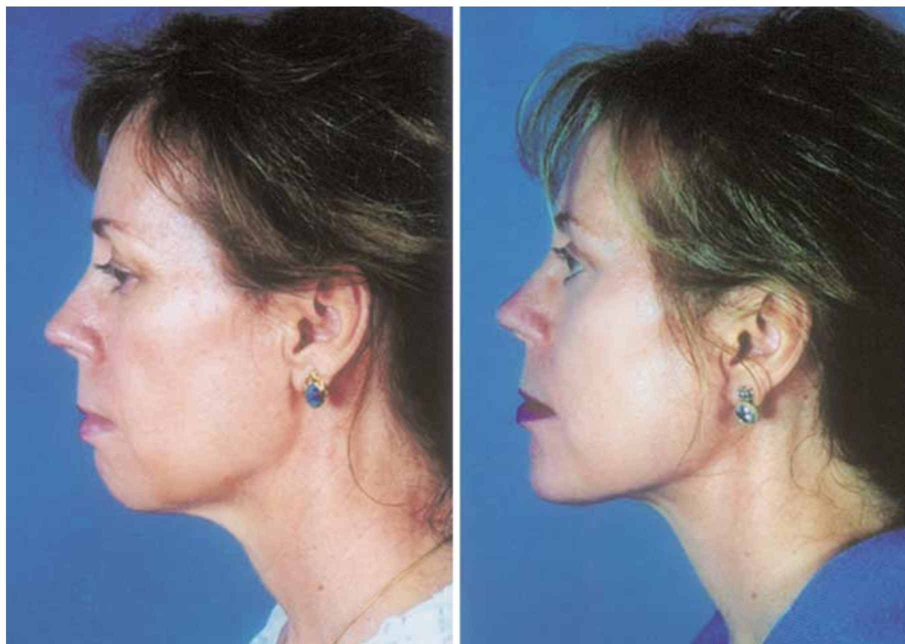

Fig. 12. Point #5 example; Class 1 neck deformity and suture suspension platysmaplasty combined with chin augmentation.

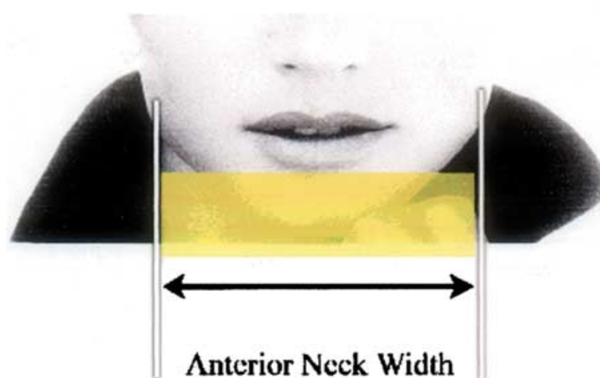

Fig. 13. Deformity corrected by resection and medial advancement of the platysma muscle along the full length of the neck, imbrication of the platysma muscles in the midline, suction-assisted lipectomy of excess subcutaneous fat depositions, and extended postauricular skin ellipse excision.

Overview of Technical Fine Points

In addition to the technical points presented during the analysis of the six anatomic points, the following have evolved over the past 13 years to optimize the results of suture suspension platysmaplasty.

1. The "angle loop" suture, a nonabsorbable, interlocking suspension suture, is secured under the area of the angle of the mandible before it is sutured on the mastoid fascia (Fig. 16). Specifically, one end (A) of the interlocking suture creates the loop, and the other end (B) passes through the loop. Only the first end (A, the end with the needle) is secured on the sternocleidomastoid muscle with two "bites" on its fascia (less than 1 cm apart). Then, they both get secured on the mastoid area, as originally described.
2. Suction-assisted lipectomy of the neck area with appropriate cannulas and special attention to the area above and below the mandibular border, the jowls, and the labiomandibular prominence (to increase jaw definition and alleviate the squareness of the jaw on the frontal view).
3. Only moderate tension is applied to the interlocking suspension sutures to avoid the "overcorrected neck." The suture should be placed on each side of the mastoid fascia while the patient's face is turned toward the opposite side and maximally extended, thereby putting maximal tension on the muscle by the suspension suture as it is secured on the mastoid.
4. The midline platysma is imbricated with running and interrupted sutures to narrow the width of the neck. Specifically, first, the interrupted sutures are placed, which support most of the tension and mark the new cervicomental angle depth.
5. Conservative (but adequate) skin excision with the postauricular ellipse is performed (Fig. 1). The amount of skin excision is usually extended for patients with significant laxity or prominent jowling.
6. The chin is augmented to increase the "depth" of the cervicomental angle when a weak mentum is present. The augmentation is based on the simple vertical and nasal chin lines described under point 5.

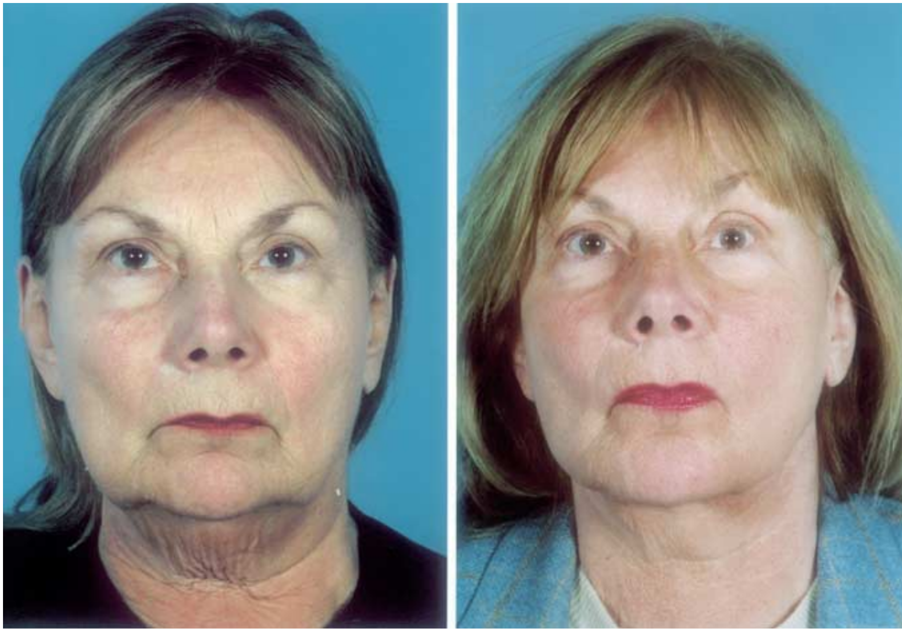

Fig. 14. Point #6 example; Class 4 neck deformity and suture suspension platysmaplasty combined with suction-assisted lipectomy of the jowl areas and extended skin excision with the postauricular ellipse.

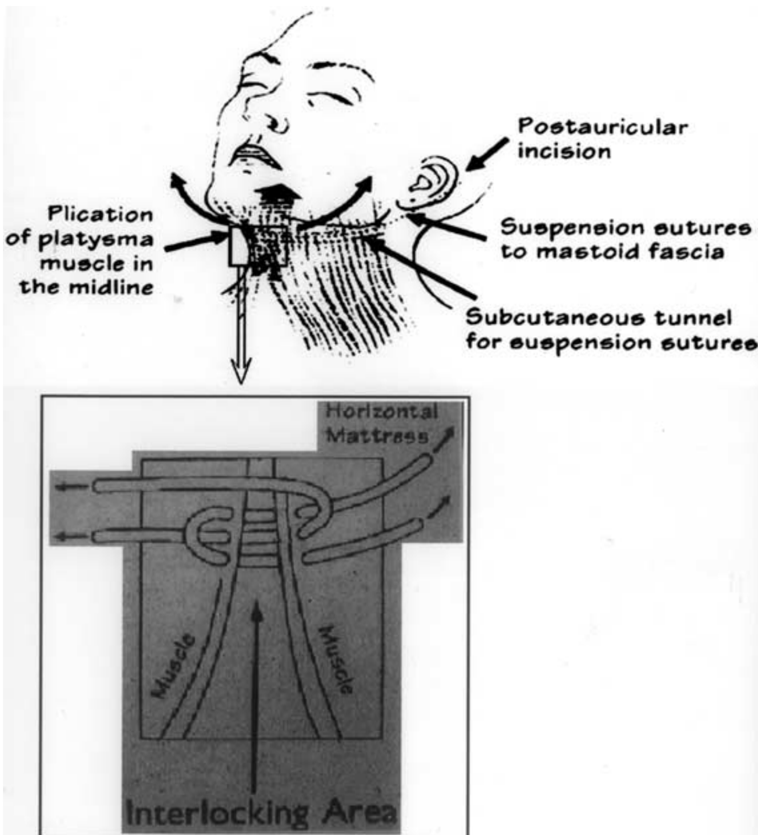

Fig. 15. The basic steps of suture suspension platysmaplasty with magnification for the interlocking point of the two suspension sutures.

Conclusion

The suture suspension platysmaplasty technique, by creating a permanent artificial "ligament" under the mandible, corrects the deformities of the aging neck with aesthetically pleasing results. In essence, this technique suspends the midline platysma muscle and displaces the lateral platysma muscle under the border of the mandible in a natural way. Fixation of the suture on the mastoid fascia with the appropriate

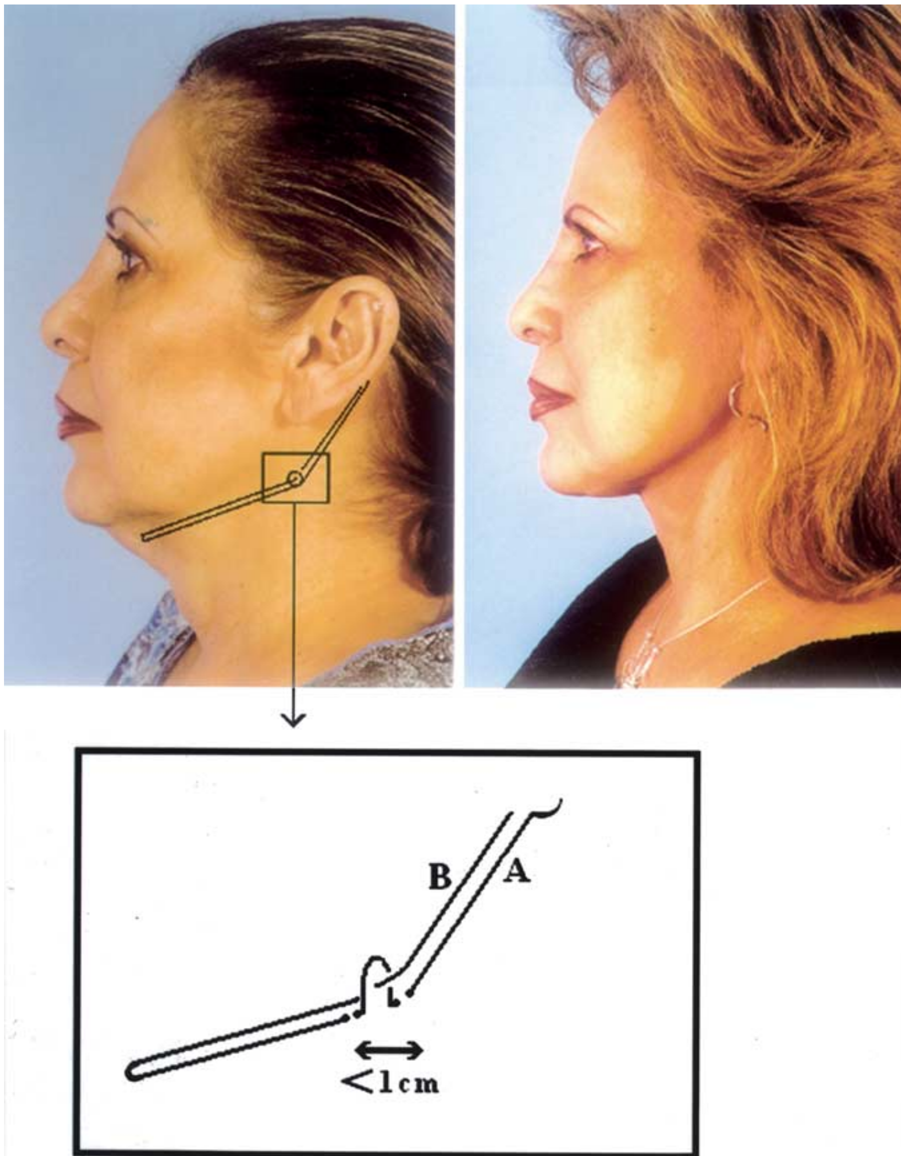

Fig. 16. The "angle loop" suture depicting the area of placement on the sternocleidomastoid muscle under the angle of the mandible for a patient with class 3 neck deformity.

tension is an essential step in this procedure. The tension is adjusted by keeping the head fully rotated and maximally extended to the opposite side of the suture fixation on the mastoid fascia. The "angle loop" modification of the technique further enhances the aesthetic results. We believe the technique is simple, safe, and reproducible with excellent patient satisfaction outcomes.

References

1. Brandt FS, et al.: Botulinum toxin for rejuvenation of the neck. *Clin Dermatol* **21:**513–520, 2003
2. Ellanbogen R, Karlin V: Visual criteria for success in restoring the youthful neck. *Plast Reconstr Surg* **66:**826, 1980
3. Ellis DA, Pelausa EO: Fibrin glue in facial plastic and reconstructive surgery. *J Otolaryngol* **17:**74–77, 1988
4. Feldman JJ: Corset platysmaplasty. *Plast Reconstr Surg* **85:**333–343, 1990
5. Fuente del Campo A: Midline platysma muscular overlap for neck restoration. *Plast Reconstr Surg* **102:**1710–1714, discussion 1715, 1998
6. Giampapa VC: Suture suspension technique offers predictable, long-lasting neck rejuvenation. *Aesth Surg J* **20:**253–255, 2000
7. Giampapa VC, Bitar G: Use of fibrin sealant in neck contouring. *Aesth Surg J* **22:**519–525, 2002
8. Giampapa VC, DiBernardo B: Neck recontouring with suture suspension and liposuction: An alternative for the early rhytidectomy candidate. *Aesth Plast Surg* **19:**217–223, 1995
9. Giampapa VC, Fuente del Campo A, Ramirez OM: Anti-aging medicine and the aesthetic surgeon: A new perspective for our specialty. *Aesth Plast Surg* **27:**493–501, 2003; Epub 2004, Mar 22, review
10. Gregory S, Latrenta : *Atlas of aesthetic face and neck surgery*. WB Saunders: Philadelphia, pp 282–286, 2003

11. Gryskiewicz JM: Submental suction-assisted lipectomy without platysmaplasty: Pushing the (skin) envelope to avoid a face-lift for unsuitable candidates. *Plast Reconstr Surg* **112:**1393–1405, discussion 1406–1407, 2003
12. Guerrerosantos J, Espaillat L, Morales F: Muscular lift in cervical rhytidoplasty. *Plast Reconstr Surg* **54:** 127–130, 1974
13. Hoefflin SM: Anatomy of the platysma and lip depressor muscles: A simplified mnemonic approach (review). *Dermatol Surg* **24:**1225–1231, 1998
14. Jasin ME: Submentoplasty as an isolated rejuvenative procedure for the neck. *Arch Facial Plast Surg* **5:** 180–183, 2003
15. Ramirez OM: Cervicoplasty: Nonexcisional anterior approach. *Plast Reconstr Surg* **99:**1576, 1997
16. Ramirez OM: Mandibular matrix implant system: A method to restore skeletal support to the lower face. *Plast Reconstr Surg* **106:**176–189, 2000
17. Vogel A, O'Grady K, Toriumi DM: Surgical tissue adhesives in facial plastic and reconstructive surgery (review). *Facial Plast Surg* **9:**49–57, 1993