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Simplified Facial Rejuvenation

CHAPTER 79

79

Algorithm for Neck Rejuvenation

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Springer

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79.1 Introduction

"I want to look better, but I don't want a full facelift". That is a statement a plastic surgeon hears frequently from a patient. What can a plastic surgeon offer a patient who wants a significant facial rejuvenation but does not want a full facelift? In a world where there is a new technique being advertised everyday on TV, or in high-end magazines, about looking younger with minimal downtime, it is more important than ever to get educated as plastic surgeons and to educate the public on what to realistically expect. No one procedure is perfect for every patient. The neck and the jaw line show the early signs of facial aging, so achieving a youthful neck line is a very critical step in facial rejuvenation.

Many techniques have been described to perform neck lifts as an isolated procedure or in conjunction with a rhytidectomy [1–5]. In 1973 Guerrero-Santos et al. [2] described the muscular lift. Feldman [3, 4] described the corset platysmaplasty in 1989. In 1990 Giampapa developed the concept of the suture-suspension neck lift. He started performing the suture-suspension neck lift in open facelift patients. It later evolved into a closed neck lift approach. In the following years, the suture-suspension neck-lift technique underwent many technical changes and improvements. Conrad et al. [5] described the Gore-Tex suspension cervical fascial rhytidectomy. In 1995 an article by Giampapa and Di Bernardo [6] was published on neck recontouring with a new technique involving the use of platysmal resection and the use of two interlocking permanent sutures through a subcutaneous tunnel immediately below the submandibular border running from the midline to the mastoid bony fascia, creating an artificial ligament, which may be responsible for the positive long-term effects of this procedure. This is combined with liposuction of the neck to achieve the desired result. The postoperative course included dressings for 7 days.

The addition of the fibrin sealant to suture-suspension neck lifts, in 2001, by Giampapa and Bitar [7] proved to be a very valuable improvement in decreasing the rates of hematomas, seromas, ecchymosis, edema, and postoperative discomfort. Recently, articles on the technical points in refinement of the neck lift technique by Giampapa et al. [8], as well as a 13-year follow-up study on suture-suspension neck lifts by Giampapa et al. [9], have served as a continued effort to improve on this versatile technique.

79.2 Technique

79.2.1 Classification of Neck Types

It is important to evaluate the individual anatomy of each patient's neck and select the treatment accordingly. The following neck classifications include most neck types and are a valuable tool in order to address the key anatomical points and the treatment approach:

1. Class I deformity (Fig. 79.1)
   (a) No midface laxity
   (b) Mild platysmal laxity
   (c) Mild submental fat

These patients are the best candidates for the suture-suspension platysmaplasty technique and demonstrate excellent early, as well as long-term, results. Some people with a class I neck elect to have liposuction only. The advantage of liposuction only may be reduction of cost, quicker recovery, less invasive surgery, and fewer incisions. The disadvantage is the lack of a dramatic improvement secondary to the suture-suspension platysmaplasty and skin excision that is performed in a neck lift, but not in a liposuction of the neck solely.

2. Class II deformity (Fig. 79.2)
   (a) Mild midface laxity/mild jowling
   (b) Moderate subplatysmal fat

The treatment of a class II neck is suture-suspension platysmaplasty with plication of the platysma muscle and submental and/or subplatysmal fat removal with moderate liposuction, as well as appropriate postauricular skin excision. These patients exhibit excellent early and long-term results and respond well with excellent skin contraction and improvement in neck contour.

3. Class III deformity (Fig. 79.3)
   (a)Moderate midface laxity and prominent jowling

(b) Moderate platysmal laxity
(c) Moderate submental fat

The treatment is suture-suspension technique with resection of a portion of the anterior medial bands of the platysma muscle with vigorous suction of the submental and/or subplatysmal fat, and removal with direct excision of the subplatysmal fat. Postauricular skin resection is more extensive in a class III neck. These patients exhibit a good result and respond well with good skin contraction to the anterior cervical and lateral neck. Correction of jowling is usually not complete with this technique alone, and other ancillary techniques may need to be employed.

4. Class IV deformity (Fig. 79.4)
   (a) Midface laxity and prominent jowling with extensive labial mandibular deformities
   (b) Moderate to severe platysmal laxity
   (c) Severe submental fat and subcutaneous laxity in the lower portion of the neck

The treatment is a rhytidectomy with complete undermining of the cervical mental area along with anterior midface skin. Although suture suspension can be utilized for the platysmaplasty portion of the rhytidectomy, a more extensive procedure needs to be undertaken for the best results.

Occasionally, a patient who has a class IV neck cannot have a full facelift for medical reasons, financial reasons, or other personal reasons. In this situation, the patient needs to be told explicitly that a neck lift will not yield results similar to those of a facelift. Also, adding ancillary procedures to the midface such as fat grafting or implants may improve the result and need to be discussed with the patient to the extent of the surgeon's expertise.

Fig. 79.1 Class I deformity

Fig. 79.2 Class II deformity

Fig. 79.3 Class III deformity

Fig. 79.4 Class IV deformity

79.2.2 The Six Basic Points of the Neck Evaluation

Ellenbogen and Karlin [10] originally discussed the five youthful neck criteria:

1. Acute cervicomental angle (between 105 and 120°)
2. Distinct inferior mandible border
3. Subhyoid depression
4. A visible thyroid cartilage
5. A visible anterior sternocleidomastoid border

The suture-suspension platysmaplasty technique addresses the first three criteria. In men, a visible thyroid cartilage contour gives a desirable masculine look, but in a woman, a surgeon has to be careful not to lose the feminine appearance of the neck. Furthermore, a visible anterior border of the sternocleidomastoid border can be achieved with the right suctioning technique.

A specific numerical protocol was designed in order to identify all of the important points of the neck anatomy that undergo the most modification with aging. Additionally, these are the points on which the surgical techniques focus, as described below, and that are utilized presently when evaluating a prospective patient for neck rejuvenation. Those points are:

1. Cervicomental angle depth
2. Mandibular border definition
3. Mandibular angle definition
4. Labiomandibular fold prominence (jowling)
5. Mental prominence
6. Neck width

79.2.3 The Suture-Suspension Platysmaplasty Technique

79.2.3.1 Preoperative Assessment

It is essential to explain to the patient what a neck lift can accomplish [11], and what it cannot accomplish. Limitations, risks, benefits, and what to expect in the postoperative course are discussed at length. Usually a patient comes because they want an improvement in their neck but do not want a full facelift. The main indication for a suture-suspension neck lift is a poorly defined cervicomental angle and mandibular border, which is common with the aging process. This loss of definition is due to the aging process and the loss of key hormones that occur with the aging process, which causes loss of skin tone, loss of muscle tone, and reduced muscle fiber density. A poor definition of the submandibular border is evident from a side view, when looking at a face and seeing the cheek blending into the side of the neck. In short, contour loss is a stigma of an aging face. In order to properly evaluate a patient for a neck lift procedure, it is important to evaluate the midface, jaw line, and neck. Next a suitable operative plan is formulated.

Midface Evaluation

Evaluating the midface is very important for a potential neck lift patient. Minimal laxity to midface structures is important in achieving a good neck lift. At the initial consultation, it should be made clear to the patient that a neck lift is not the procedure of choice to improve the jowls or the nasolabial folds. We usually pinch the patients' jowls to remind them, physically, that this area will not be improved with a neck lift. This point cannot be overemphasized because patients may feel that they will get all the benefits of a facelift with a neck lift, but with "less surgery". That is not true, especially if the patient has significant jowling. A neck lift is meant to make a new cervicomental angle and new definition, but is it not a substitute for a facelift, especially when addressing the jowls in a person with significant midface laxity. There is the occasional patient who comes back after surgery and says, "My neck looks great, but what about this" (pointing to the jowls), and we, as surgeons, remind them of discussing that specific point preoperatively. They acknowledge that fact when they remember the preoperative pinch to that area!

Jaw Line Evaluation

One of the goals of a neck lift is to recreate the mandibular contour by repositioning the platysma and tucking it underneath the border of the mandible. With a wider and more prominent jaw, we obtain better results. One of the initial questions in a consultation is, "Does the patient have a nice, full, wide jaw, or is it narrow?" If the patient has a narrow jaw, the results are not going to be as dramatic as in an individual with a wide jaw. Patients of Romanian or Slavic descent who have wide jaws do very well with a neck lift. Northern Europeans with narrow faces or Latin Americans with smaller facial features may not have as good a result. Of course these are generalities and exceptions are found.

Neck Evaluation

In order to evaluate the neck with the patient in an interactive manner, we suggest taking a long Q-Tip, or something long and thin, and pressing against the neck line to show how deep the cervicomental angle is, i.e., the distance between the anteriormost tip of the mentum and the thyroid cartilage. This maneuver done in front of the mirror will show the patient the amount of realistic improvement expected from a neck lift. In people with a narrow neck, even the best neck lift may

not yield a dramatic improvement if the patient's expectations are unrealistic. In evaluating the neck, attention needs to be given to the amount of fat, its distribution in the neck, platysmal laxity, and skin laxity [12]. Categorizing the neck as in classes I–IV will aid in determining what procedure is offered to the patient.

Neck Lift or Facelift?

There are, of course, patients for whom a neck lift is not appropriate, and a full facelift is the procedure of choice. The appropriate way to handle these patients is to be firm about the fact that they will need a full facelift if they would like reasonable improvement. If there are other matters which prompt them to have a neck lift instead, such as health issues, financial considerations, or other reasons, then they need to know that their results with a neck lift will be suboptimal.

An important question a patient may ask is, "If I do my neck now, can I do my upper face later?" The patient should be given the option to have the neck lift done now and the face later, when the neck does not need to be redone. Performing a facelift as the initial procedure is another option. We, as surgeons, can give our patients what they want in stages, keeping the incisions acceptable, by doing a neck lift first, and a midface lift later. We believe that patients like to have options given to them. Cosmetic surgery patients on the whole are smart, educated people, and should have the appropriate information to decide on what surgery suits them, not the surgeon.

Suture-Suspension Platysmaplasty Indications

The procedure described here may be an additional procedure in the plastic surgeon's armamentarium for treating the aging neck. An appropriate candidate for this procedure should meet some of the following criteria (Fig. 79.5):

1. Poorly defined cervical mental angle.
2. Poorly defined submandibular border.
3. Absence of laxity in the midface structures (since no tightening of the underlying superficial musculoaponeurotic system fibers and facial muscles in the midface is accomplished through this procedure).
4. Mild to moderate amount of jowling and neck fat (those with large amounts of neck and jowl fat will find some soft-tissue irregularities if this procedure is used alone in lieu of a facelift).
5. Unwillingness or inability to undergo a full facelift.

Patients who previously would have been considered "early rhytidectomy candidates", i.e., with a class I or a class II neck, seem to the ideal candidates. Men have found this technique to be an excellent option to avoid preauricular incisions with the multiple problems associated with the beard and hair-baring areas, which are repositioned posteriorly onto the tragus when the standard facelift incision is used. Furthermore, the platysmaplasty portion of this procedure can be performed during primary and secondary rhytidectomies for treating fatty necks and acute cervicomental angles which have been difficult to correct with previous surgical procedures.

Advantages of the Suture-Suspension Technique for Neck Contouring

1. Excellent option for male patients who want a nicely contoured neck and jaw without a facelift.
2. Quick recovery of 5–10 days compared with a facelift.
3. Little chance of nerve damage or soft-tissue loss, since the neck does not have the abundance of motor nerves that the face has, and the skin undermining is less than in a facelift.
4. No preauricular or hair-baring area incisions are involved.
5. Can be used during both primary and secondary rhytidectomy for the difficult neck in the obtuse cervicomental angle patients.
6. Good option for treating the prolapsed submandibular gland deformity.

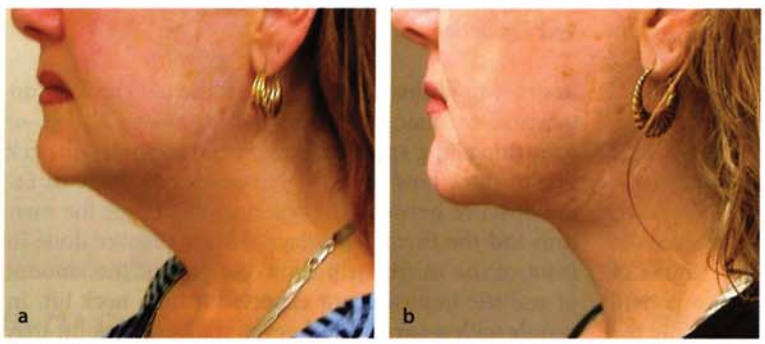


Fig. 79.5 Suture suspension indication. **a** Before. **b** After

79.2.3.2 Surgical Technique

Patients should get medical and psychiatric clearance when appropriate before proceeding to surgery. It is a good idea to give prospective patients references of people who have had the surgery and consented to be used as references, so the prospective patient may contact them by phone and ask them questions. After the patient is ready for surgery, the immediate preoperative preparation commences. Optimizing a patient for surgery is done differently by different surgeons. Some useful steps have been to place patients on vitamin K and Arnica for 5 days preoperatively, requesting that the patients stop taking aspirin and aspirin products for 10 days, and that they abstain from smoking for 2 weeks preoperatively and 2 weeks postoperatively.

Surgical Marking

The patient is marked in the holding area in the supine position (Fig. 79.6). First, a midline line is drawn. Next, the mandible contour is marked and a line parallel and 1.5 cm inferior to the mandible border is also marked to create the subcutaneous tunnel. The submental curvilinear incision and the inferior border of the dissection are then marked. The inferior border depends on the individual's neck laxity. Finally, the postauricular ellipse of skin to be incised is marked. The extent of that ellipse, similar to the lower border of dissection, depends on the skin laxity in the lateral neck.

Surgical Prep

The patient is initially given prophylactic antibiotics, deep venous thrombosis prophylaxis, and is intubated with either general anesthesia or intravenous sedation given as a surgeon's choice. The table is turned 180°, and the arms of the patient are tucked to the side. The submandibular area, postauricular area, and lower neck are infiltrated in a fashion similar to a rhytidectomy with about 75–150 ml on each side with tumescent solution for a total of 150–300 ml (500 ml of saline, 50 ml of 1% plain lidocaine, and 1 ampule of 1:10,000 epinephrine). The patient is then prepped in the usual sterile fashion and draped with a head and a full body drape while the tumescent fluid is allowed to take effect. Men may need to be injected with more tumescent solution than women because of the increase in blood supply to the neck hair follicles and thicker muscles.

Suction-Assisted Lipectomy

After the tumescent solution has taken effect, the neck is liposuctioned initially with 2–3-mm spatulated cannulas and finally with a 4-mm liposuction spatulated cannula. The area of the submandibular tunnel is suctioned along its dermal surface with the 4-mm cannula facing the dermis. This maneuver helps encourage skin contraction in this area. Specific areas such as the anterior border of the sternocleidomastoid, the jowls, and the angle of the mandible are liposuctioned in the appropriate patient. The inferior border of the liposuction

Fig. 79.6 Surgical marking

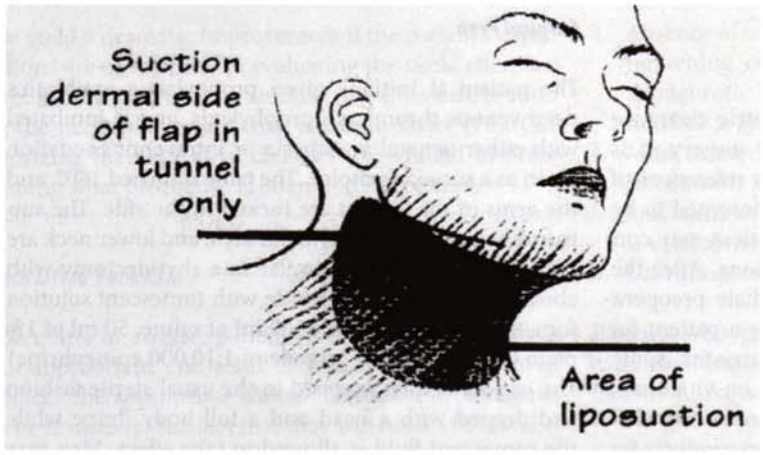


Fig. 79.7 At times, the whole extent of the neck needs to be suctioned if there is a significant fatty layer (i.e., in class III or class IV neck deformities)

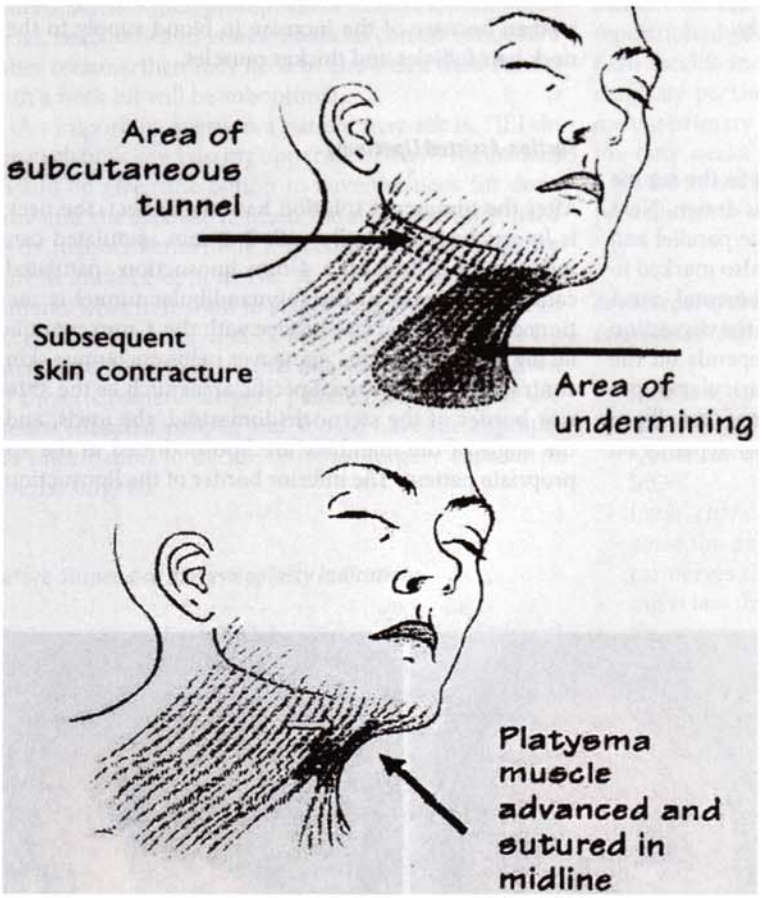


Fig. 79.8 Management of the platysma muscle

area depends on the amount of fat in the lower aspect of the neck. At times, the whole extent of the neck needs to be suctioned if there is a significant fatty layer (i.e., in class III or class IV neck deformities) (Fig. 79.7).

Management of the Platysma Muscle

A midline curvilinear submental incision is made in the horizontal crease, and the skin immediately overlying the platysma muscles is elevated with facelift scissors (Fig. 79.8). A curvilinear incision seems to heal better than a straight incision after scar contraction. Excess subplatysmal fatty tissue is excised under direct visualization with a lighted retractor. The platysmal border in the midline is sometimes resected, if there is significant laxity, in a triangular fashion, and the platysmal borders are cauterized. Prominent platysmal bands are transected for approximately 2–3 cm on each side of the platysmal border or are imbricated at the midline with

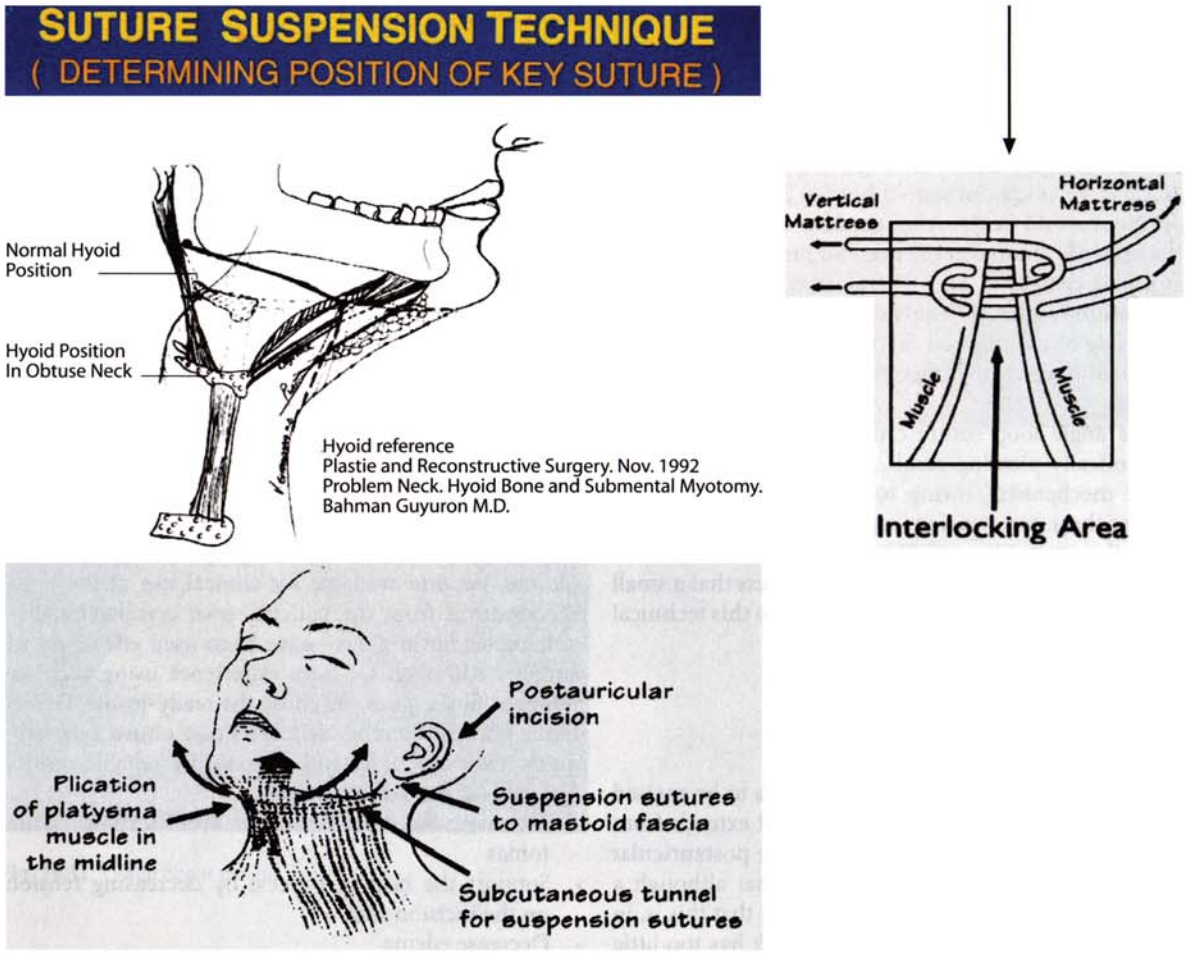


Fig. 79.9 Suture-suspension technique

buried 4-0 Prolene sutures. This technique reapproximates and shortens the width of the platysma muscle, thus decreasing the width of the neck.

The Interlocking Suture Placement

At the depth desired to create the new cervicomental angle, usually the hyoid bone, a 3-0 Prolene suture (and an 0 Prolene suture in men) is placed in a horizontal mattress fashion from right to left, including both borders of the platysma muscle. Another similar suture is placed from left to right in a vertical mattress style interlocking with the first suture. The ends of both sutures are taken out through the submental incision and the sutures are clamped separately with a Webster needle holder to avoid weakening the suture (Fig. 79.9).

The postauricular skin on each side is identified and an ellipse of skin is excised. This maneuver eliminates the redundant skin from the neck in an easily hidden incision and allows better access to the underlying mastoid fascia. The skin between the mastoid area and the submental area is then undermined to connect to the previously made tunnel. A long curved hemostat is placed at the postauricular sulcus and exits through the tunnel at the submental incision. The left suture is grasped by the instrument and taken through the submandibular tunnel. Then, the suture is sutured deep into the mastoid fascia while the patient's face is turned towards the opposite side and maximally extended. The suture is then tied just enough so that the platysma muscle is tucked up underneath the border of the mandible. Similarly, the vertical mattress suture is tied to the right mastoid. The suspension sutures result in a superior and internal vector force that creates the new cervicomental angle and defines the submandibular border. The inherent properties of soft-tissue contraction allow the overlying skin to adapt to the new muscle positions.

The Submandibular Angle Loop Suture

An important technical fine point that evolved over the last 13 years is the submandibular angle loop suture [8]. This involves securing the non-absorbable interlocking suture under the area of the angle of the mandible at the anterior sternocleidomastoid border, before suturing it on the mastoid fascia. After the loop has been created, the suture is secured at the mastoid process periosteum, and it is critical to keep the tension of the interlocking suture moderate. The suture should be placed on each side of the mastoid fascia while the patient's face is turned towards the opposite side and maximally extended.

The angle loop suture creates a more natural and anatomically pleasing result. Additionally, it creates a "hinge mechanism", owing to its geometry, which decreases the suture tension, especially when the patient turns the neck sideways. This eliminates the chance of "overcorrection", and the feeling of tightness that a small percentage of patients experienced before this technical modification was introduced.

Skin Excision

Usually, only small amount of skin needs to be excised in the form of an elliptical skin strip that extends from the ear lobule area to the midlevel of the postauricular sulcus. It is important to understand that although a fatty neck appears to have too much skin that this is, in essence, an illusion. In reality, a full neck has too little skin rather than too much, owing to the fact that when the cervicomental angle is augmented, and a concavity is subsequently created, more skin is required to fill this deeper angle (Fig. 79.10). Patients with very redundant skin need more excised but with care to avoid skin tension and a subsequent "pixie ear" deformity.

After the interlocking sutures have been placed and before closing the incisions, the fibrin sealant is sprayed under the skin flaps. Next, the postauricular incisions are closed. The submental incision is then closed. Paper tape is used to dress the neck followed by either foam or ABD dressings. Usually, dressings are placed over the skin, along with a Velcro overhead strap for support.

Tissue Fibrin Sealant

To improve the recovery phase of the suture-suspension technique, a fibrin tissue sealant (Fig. 79.11), which may be applied in the subcutaneous tunnel, is used, in lieu of surgical drains [7]. In 2001, the Tisseel Vapor Heated (VH) fibrin sealant, a sealant prepared from human plasma, became available for clinical use in the USA. Bioadhesives from the patients' own cryoprecipitate—autologous fibrin glues—have been used effectively in surgery. Although we have experience using such autologous fibrin glues, we chose the ready-to-use Tisseel tissue fibrin sealant because of its ease of use, relatively quick learning curve, and consistently reliable results. The goals of the sealant are to:

- Eliminate the dead space and avoid seromas/hematomas
- Support the healing process by decreasing tension on the incision sites
- Decrease edema
- Promote hemostasis
- Eliminate postoperative wrinkling or rippling of the skin

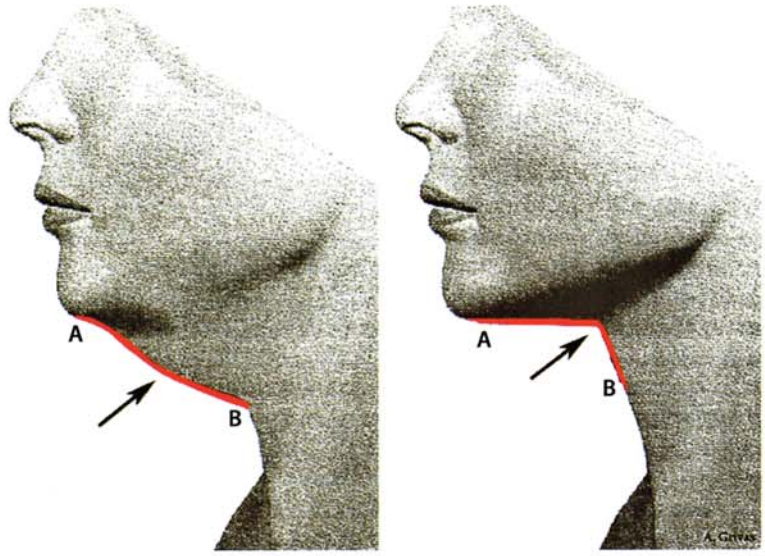


Fig. 79.10 In reality, a full neck has too little skin rather than too much, owing to the fact that when the cervicomental angle is augmented, and a concavity is subsequently created, more skin is required to fill this deeper angle

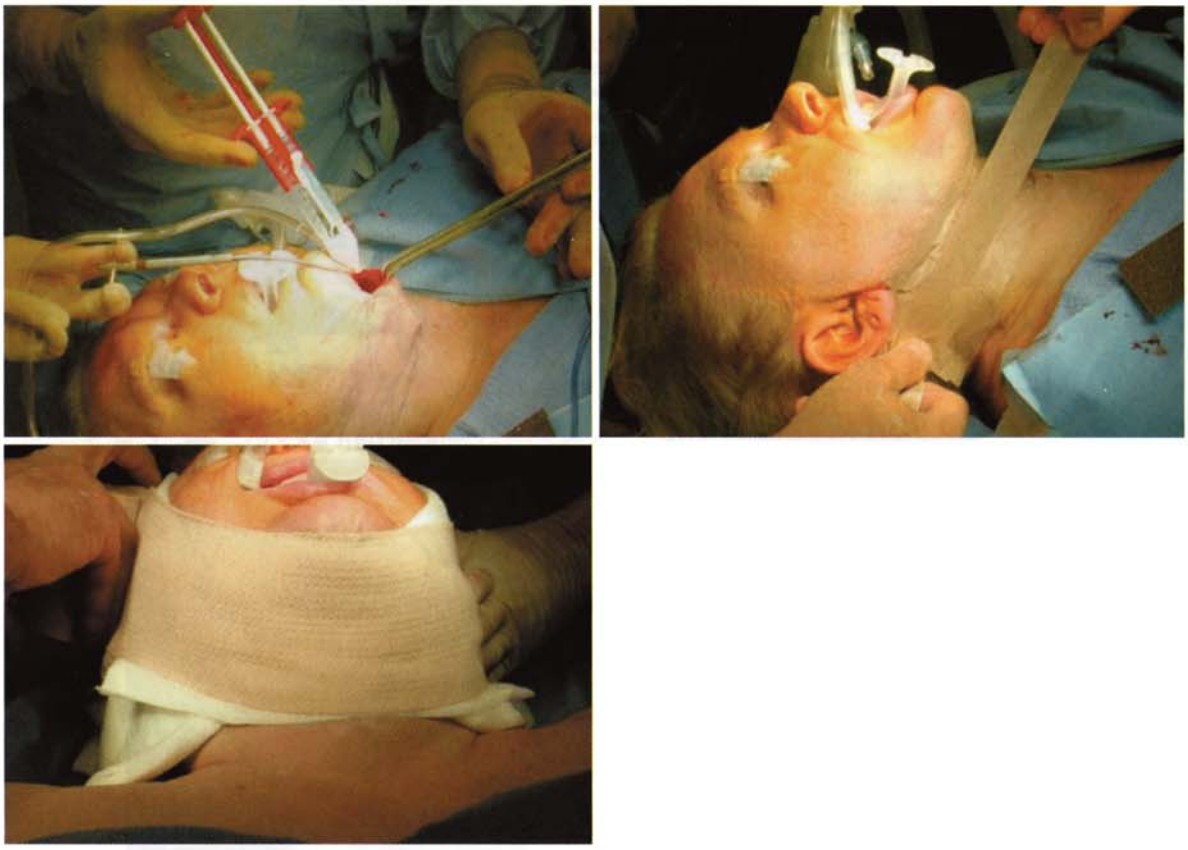


Fig. 79.11 Tissue fibrin sealant

Application of the Fibrin Sealant

After excellent hemostasis has been achieved, the fibrin sealant is applied. On the side table, the fibrin sealant is prepared simultaneously, or reconstituted, in two separate syringes. One syringe contains the sealer protein concentrate dried powder mixed with the fibrinolysis inhibitor solution, to make the Tisseel solution. The other syringe holds the human thrombin, which is freeze-dried and mixed with the calcium chloride solution, to form the thrombin solution. Once the reconstitution has taken place, the Tisseel fibrin sealant must be used within 4 h.

The two syringes are mounted on a Duplojet applicator. The fibrin sealant is then sprayed, simultaneously, into the pockets, in thin layers, for 60 s, the time required for the liquid sealant to activate. Gentle manual pressure is applied over the neck skin, with the surgeon's fingers spread evenly over the whole neck, to prevent pooling of the fibrin sealant to any given area. Such pooling may result in overlying skin necrosis, hematomas, seromas, or skin wrinkling, caused by interruption of the vascular supply to the overlying dermis. Pressure is applied for 3 min, the time required for the fibrin sealant to solidify. Past potential complications of rippling or fluid collections are avoided because the skin flaps adhere immediately to the underlying tissues. The incisions are then closed, and dressings are applied.

79.2.3.3 Postoperative Care

Postoperative care is minimal. Patients are kept on oral pain medications for 3–5 days and antibiotics for 1 week. They are instructed to keep their head elevated while sleeping. The dressings and the paper tape are removed after 48 h. Male patients are advised not to shave for 7–10 days after the operation, to avoid trauma to the neck flaps. Patients are instructed to resume activities of daily living in 2–3 days and strenuous activity, including exercise, in 3–4 weeks.

79.3 Selective Neck Enhancement/Addressing the Six Basic Points

After the basic procedure has been described, it is important to explore each anatomical aspect of the neck,

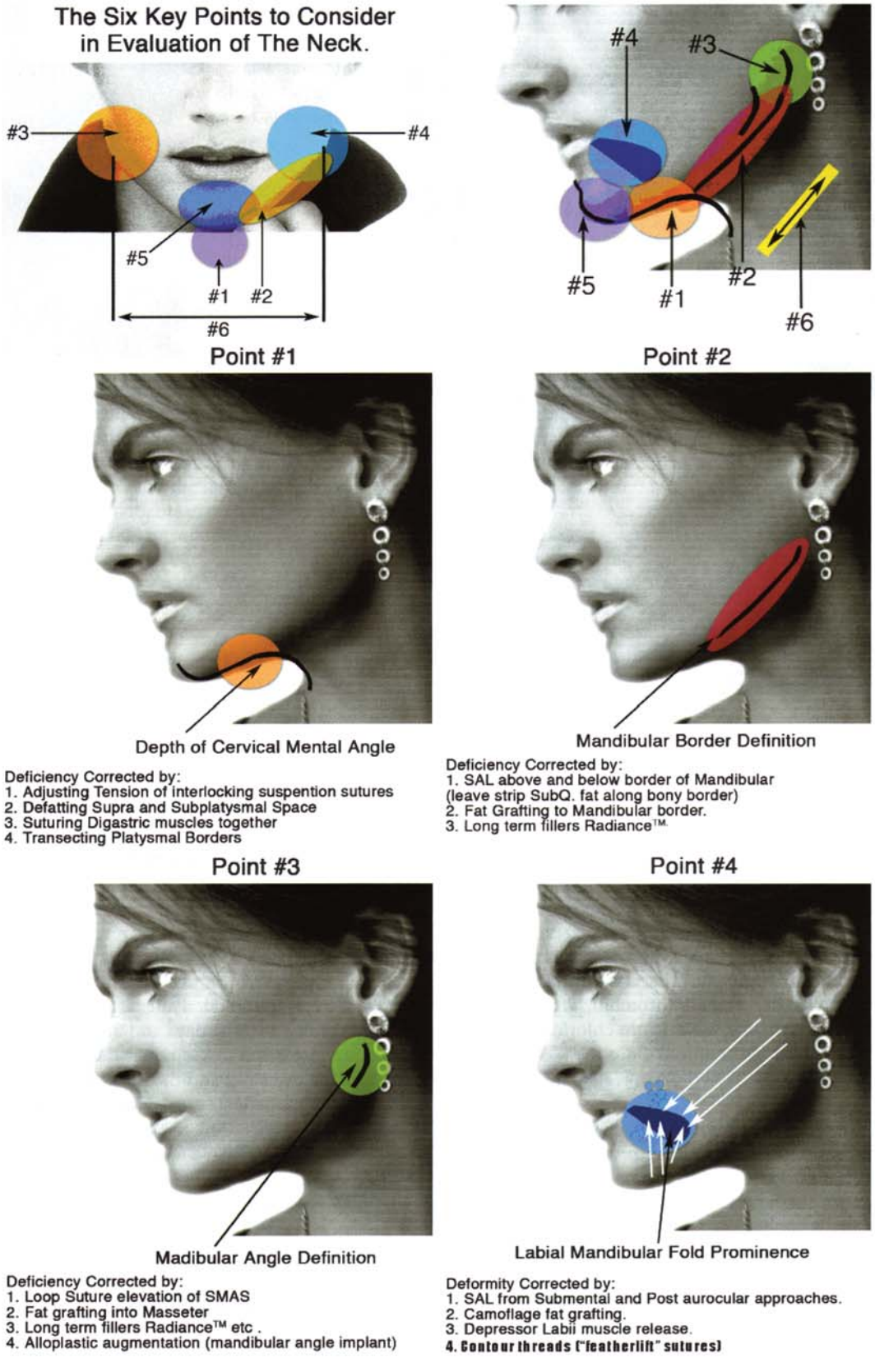


Fig. 79.12 Six key points to consider in evaluation of the neck

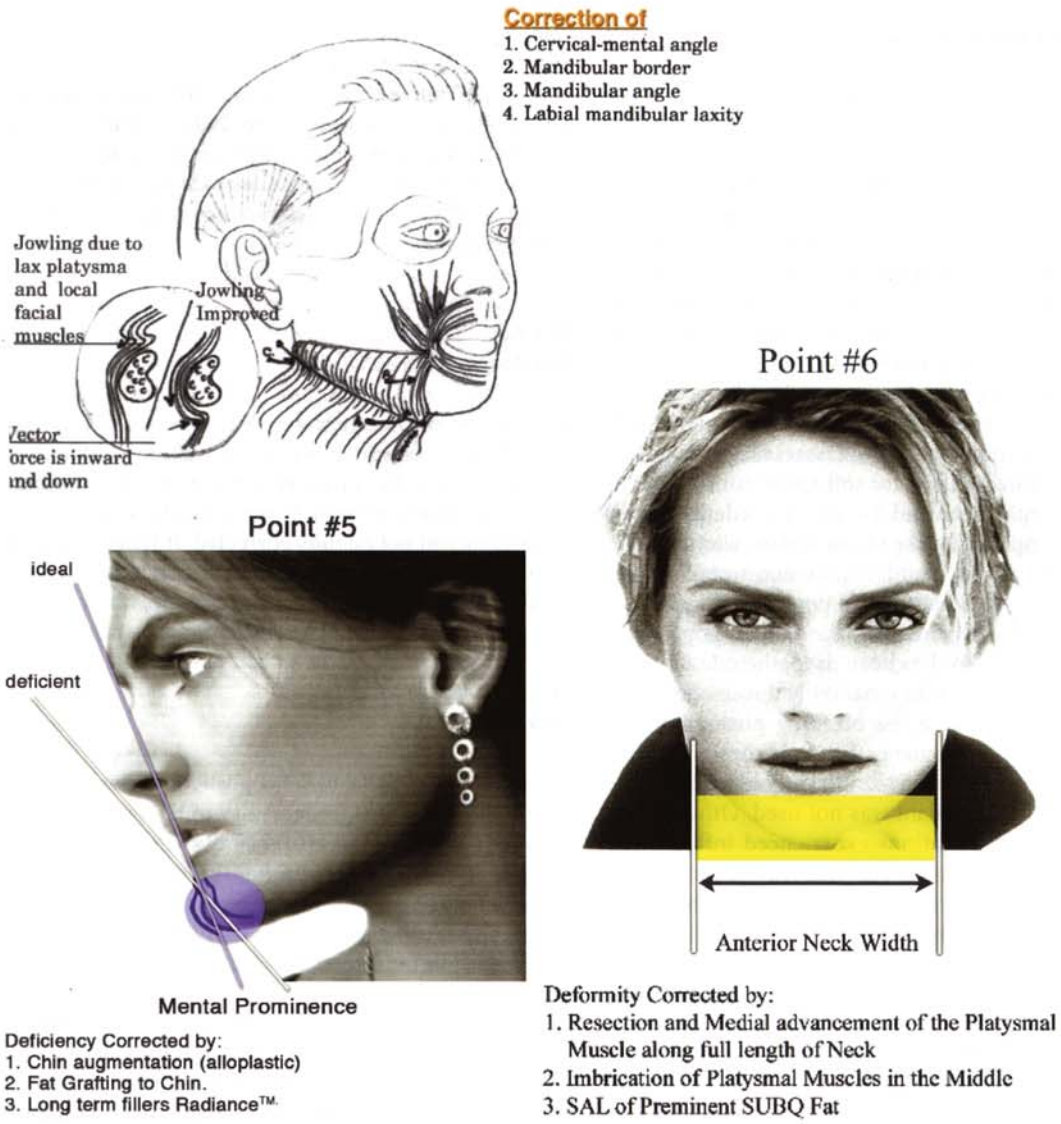


Fig. 79.12 *(Continued)* Six key points to consider in evaluation of the neck

and address it individually, to get the overall perception of a youthful and aesthetically pleasing neck [8]. The observation of the aging neck shows evidence of many factors contributing to its loss of shape and contour. These anatomical changes have been described over the years and include loss of tone of the dermal elastic fibers with sagging of the skin, ptosis of the soft tissues of the neck and chin, banding of the platysma muscles at the anterior neck, elimination of the anterior sternocleidomastoid border, increased fat deposition, bone resorption, submandibular gland protrusion, and others. Additionally, during the aging process the cervical spine collapses. This, in essence, not only shortens the height of the neck, but is subsequently responsible for creating an increased width in the anterior dimension of the neck.

The key anatomical points utilized clinically when evaluating and surgically treating the aging neck are the following (Fig. 79.12):

1. Cervicomental angle depth
2. Mandibular border definition
3. Mandibular angle definition
4. Labiomandibular fold prominence (jowling)
5. Mental prominence
6. Neck width

79.4 Results and Complications

79.4.1 Results

Neck-lift patients have ranged in age from the early 30s to the late 70s, both male and female. Some patients had simultaneous procedures, such as chin augmentation, fat grafting, or blepharoplasties, along with the suture-suspension technique and fibrin sealant. The "recovery time", that is the time necessary to return to activities of daily living and be cosmetically inconspicuous at work and at home, has been reduced to just a few days. The full recovery time is similar to that of the neck recontouring alone without the Tisseel fibrin sealant. It requires 6 months to allow for soft-tissue contraction to reach its optimal state and for the fine edema resolution to be complete. Before fibrin sealant was used, hematoma/seroma rates, in our experience, were 2–3% in neck lifts performed on the male population and about 1% in neck lifts performed on the female population. Since the fibrin sealant has been used, the rate of hematoma/seroma formation has markedly diminished.

Furthermore, because the bleeding postoperatively is minimized by the sealant, the ecchymosis that our patients have had has been significantly less than in patients on whom the sealant was not used. Other minor and moderate complications experienced infrequently are addressed in the following section. No mortalities or long-term serious complications have been recorded in our patient population.

79.4.2 Avoidance of Complications and Pitfalls

79.4.2.1 Discussing Potential Complications

Honesty is the best policy. It is very important to go over, in detail, the risks of a neck lift and comparing them with those of a facelift. We discuss, with our patients, the risks of hematoma, seroma, skin necrosis, unsightly scars, nerve damage, discomfort from the tightness initially, asymmetry, unsatisfactory results, and the potential for revisional surgery. To get the patients involved in their care makes them active participants who can identify a complication and alert the surgeon in a timely fashion to treat it. Furthermore, it is more effective to explain to patients why smoking can increase the rate of complications, rather that telling them to quit smoking before the surgery. Postoperatively, smokers may develop postauricular skin ischemia, or necrosis, where the skin is under the most tension, so avoidance of surgery until the patient is smoke-free for at least 2 weeks may help in decreasing the rate of complications.

79.4.2.2 Planning the Surgery

A neck lift can be a fairly straightforward procedure with a low rate of complications, but attention to detail is critical. The first step is to draw the markings correctly. The larger the surface area dissected, the more edema, ecchymosis, and chance for a fluid collection, postoperatively.

79.4.2.3 Skin Management

The amount of postauricular skin to be excised is very important. If too much skin is excised, it is difficult to be able to close the incisions without placing the neck under significant tension. If not enough is excised, the neck laxity will not be fully corrected. It is best to err on the side of excising less skin initially and, at the time of closure, resecting more skin, if necessary.

79.4.2.4 Fat Management

If a neck has paucity of fat, liposuction can do more harm than good. It is unnecessary to liposuction or undermine the anterior base of the neck if it is not lax, or if it has a normal amount of adipose tissue. This can create an irregular appearance of the skin and a skeletonized neck look that is unattractive. Equally important is to not suction the lateral base of the neck. Usually it is unnecessary, and may increase risk of hematoma in an area where the adipose layer is thin and the skin adheres to the underlying sternocleidomastoid muscle. A 3 or a 4-mm spatulated cannula can give good results in terms of ease of liposuction and contour regularity. In order to improve the mandibular border, and decrease the jowling, it is important to liposuction both above and below the mandibular border, leaving a strip of subcutaneous fat along the bony mandibular border for highlighting the border itself. This maneuver will accentuate the angle and create an aesthetically pleasing strong jaw line, that is especially desirable in men. We have not had any clinically significant injuries to the marginal mandibular nerve with this technique. It is critical to not overresect the preplatysmal fat at the midline because that can lead to a hollow appearance of the mid anterior neck contour, and is difficult to correct.

79.4.2.5 Platysma Management

It is important to suture the platysmal midline edges with buried permanent sutures, such as 4.0 Prolene. If

absorbable sutures are used, when the sutures dissolve, the tension can allow the muscles to spread apart. This action results in losing the tightening effect that the midline sutures have created to narrow the neck width. Secondly, when suturing the two medial edges of the platysma, the suture "bites" should not be taken too wide, thus bunching up the platysma at the midline and creating an undesirable ridge, which people will feel afterwards and be dissatisfied. Thirdly, it is important to allow the artificial ligament-like Prolene suspension suture to be tied at a firm, but not too tight, position, to avoid patients complaining of tightness or a choking feeling. Also, the suspension suture needs to be placed within the mastoid fascia, and not too low on the mastoid, to get the optimal neck contour. Lastly, it is important to bury the Prolene suture knots in the postauricular region with overlying absorbable sutures, where the two ends of the suspension suture are tied to the mastoid fascia to form the artificial sling. If the surgeon does not bury the sutures, the knots in the postauricular region create two masses behind the patient's ears that will cause concern, irritation, or erosion through the skin.

79.4.2.6 Fibrin Sealant

After spraying the sealant, gentle manual pressure should be applied evenly with the surgeon's fingers spread over the whole neck for 3 min, to prevent pooling of the fibrin sealant in any given area and possible skin necrosis of the overlying skin. It is not advisable to spray more than the stated amount of 2–3 ml because then it will be more likely to form pools of the sealant as well.

79.4.2.7 Dressing Placement

The dressings should not be too tight, otherwise, there could be ensuing necrosis of the submental region where the skin has been undermined. One should be able to place two fingers comfortably between the dressings and the skin at the conclusion of the procedure.

79.4.3 Complications

79.4.3.1 Wound Dehiscence

Minor complications, such as a small wound dehiscence, have been treated conservatively with dressing changes and topical antibiotic ointment, with satisfactory resolution.

79.4.3.2 Managing Hematomas/Seromas

Since Tisseel sealant was introduced, the rate of hematoma has been less than 1%. In the case of an immediate postoperative hematoma, drainage is the treatment. If a hematoma forms later, then surgical judgment needs to be exercised. The patient can be taken back to the operating room for drainage, aspirated in the office, or observed, depending on the size of the hematoma and the symptoms. Seromas are usually aspirated in the office.

79.4.3.3 Prolonged "Tightness in the Neck"

It is normal for people to comment about neck tightness, initially, owing to the platysma plication and the suspension suture. If the tightness feeling persists and is excessive, then this is easily alleviated by a small postauricular incision, with the patient under local anesthesia, identification of the suspension suture, cutting one end, and removing the other end. This will alleviate the tightness, but it will also result in a slight decrease in the definition along the cervicomental angle and mandibular borders.

79.4.3.4 Prolonged Skin Contractures

This is most likely to happen to the postauricular scar because the superior skin edge of the incision is longer than the inferior skin edge, as a result of the elliptical skin excision. This can result in "bunched-up skin", initially. If the scar is to be kept postauricular, and not get extended preauricular, one of the hallmarks of the suture-suspension platysmaplasty technique, then this early result is avoidable by not being overly zealous when excising the postauricular skin. If the scar is hypertrophic, then Kenalog injections can be used as well as scar massage. Time will also soften the scars.

79.4.3.5 Asymmetry of the Mouth

This could be due to marginal mandibular nerve neuropraxia, edema, or tension on the platysma muscle, creating a temporary depression at the corners of the mouth for patients who have a platysma–depressor labii connection in their muscular anatomy (less than 1% of all patients). This usually resolves in 2–3 months postoperatively.

79.5 Discussion

After understanding the fundamentals of a suture-suspension platysmaplasty, it is important to address specific situations in which this technique may be used. The basic principals of handling the following types of neck-lift operations will be discussed:

1. Secondary neck lift
2. Rhytidectomy with suture-suspension platysmaplasty
3. Male neck lifts
4. Neck lifts after massive weight loss

Furthermore, in order for a neck lift operation to be yield optimal results, a few ancillary techniques will enhance the neck lift results:

1. Fat grafting
2. Submandibular gland management
3. Chin augmentation

79.5.1 Applications of the Suture-Suspension Neck-Lift Techniques in Different Circumstances

79.5.1.1 Secondary Neck Lift

A patient who had suboptimal results from a prior neck lift may be a good candidate for a secondary neck lift. The aging process and gravity may be other reasons for dissatisfaction. Patients who had undergone a facelift in the preceding years may present to the surgeon's office with photographs of a satisfactory result shortly after the procedure, but are no longer happy. They may also be candidates for a secondary neck lift. A secondary neck lift can be performed to improve the result of a primary neck lift or a facelift. The ideal candidate for a secondary neck lift, after a facelift, is someone who had aesthetically pleasing midface and jowl areas but is dissatisfied with the resultant neck contour.

Common conditions leading to a secondary neck lift are:

1. Excess or ptotic neck skin.
2. Ptotic platysma muscle at the midline (with or without muscle placation).
3. Excess adipose tissue (either because no liposuction was initially performed or because the patient gained weight).

Counseling the Patient

In the preoperative consultation with the patient, it is essential to determine the patient's expectations and reasons for dissatisfaction with the initial operation. It is important to stress that a neck lift is not a facelift; it has limitations when it comes to midface and jowl rejuvenation. Those limitations that made a patient unsatisfied from a primary neck lift may not be addressed with a secondary neck lift and may require a facelift.

Technical Considerations

A secondary neck lift is more challenging in some ways. The anatomy may be more difficult to discern, owing to the previous operation. The skin is more difficult to dissect, owing to lack of adipose tissue, which may make inadvertent "button-holing" of the skin more likely.

In the time period between the initial neck rejuvenation procedure and the secondary neck lift, anatomical differences may have occurred such as increase in adipose content, which would be treated with liposuction or direct excision. If the submandibular glands have prolapsed, or if they had never been addressed in the first procedure, then performing a submandibular gland suspension is recommended. Most commonly, there is excess skin, which should be excised.

In a suture-suspension platysmaplasty, the durability of results depends on the suture, i.e. "artificial ligament", extending between the mastoid fascia of both sides. This suture is permanent and does not change position or migrate over time. Significant improvement may be accomplished in a secondary neck lift by performing a suture-suspension procedure, if one was not performed initially.

Revision of Suture-Suspension Neck Lifts

If a patient who underwent a suture-suspension neck lift is bothered by remaining excess skin, the problem may either be that the initial excision was not aggressive enough, or that laxity of the skin created excess skin with time. In this patient, the initial neck-lift incisions are utilized. Liposuction is performed, if necessary. The skin is elevated and the appropriate amount of skin is excised. If the area undermined is substantial, fibrin sealant may be used. The suspension suture should be intact and does not need to revised.

In a few cases, the subplatysmal fat was overly excised and the patients ended with a concavity in the submental region. In order to correct this deformity, the platysma may need to be retightened at the midline using a non-absorbable suture with buried knots to avoid their palpation or visualization.

79.5.1.2 Rhytidectomy and Suture Suspension of the Neck

The suture-suspension platysmaplasty has proven to be a very important "tool" in neck management when performing a rhytidectomy. This fact is due to the versatility

of this technique and the ease of adjustment to different neck types. We have frequently combined the suture-suspension platysmaplasty with both primary and secondary rhytidectomies. The evaluation and decision to perform a suture-suspension platysmaplasty along with a rhytidectomy should be individualized to each patient.

Incision

When combining a rhytidectomy and a suture-suspension platysmaplasty, the posterior neck incision is made and continued around the ear lobes inferiorly, progressing superiorly along the pretragal area, and ending at the superioanterior aspect of the ear or extending higher into the temple, if a temporal lift is to be performed. If the neck laxity is mild to moderate, it is unnecessary to extend the posterior incision into the hairline.

Dissection

There are numerous rhytidectomy techniques, the discussion of which is outside the scope of this chapter. The authors' preference is to perform limited skin undermining and plication of the superficial musculoaponeurotic system as needed.

Platysmal Plication

It is easier to perform a platysmal plication with the elevation of the skin that offers more visibility in a rhytidectomy as opposed to the limited elevation in a neck lift. The management of the neck in a rhytidectomy is comparable to its management in a suture-suspension platysmaplasty, as previously discussed.

Fibrin Sealant

Fibrin sealant can be used in a full rhytidectomy as apposed to drains. It is sprayed under the neck flaps first, until it gels, and is then sprayed in the facial region (under the skin flaps of the cheeks down to the jowls). This two-step approach affords the surgeon control of the areas sprayed and allows the fibrin sealant to gel in a systematic approach.

79.5.1.3 The Male Neck Lift

The suture-suspension technique is an excellent rejuvenation tool for male patients that frequently present to the plastic surgeon's office and report, "I don't want a facelift, I only want this to be gone…" and they hold the submental/neck area with their hand. Men find this technique especially appealing because the incisions are hidden behind the ears. The stigma of having had a "facelift" does not exist with this technique. Several technical points distinguish a neck lift performed on a man (Fig. 79.13) from that performed on a woman [13]:

- The neck area has a richer blood supply in men than in women because of the blood flow to the hair follicles; therefore, excellent hemostasis should be obtained before closure to avoid a higher risk of hematoma formation.
- Interlocking sutures need to be 0 Prolene sutures, owing to the anatomical nature and the weight of the neck structures in men.
- Attention to the amount of skin excised and the vector of pull for the bilateral neck flaps is important so the hairline, in its new location, will not look artificial.
- Men must be counseled not to shave their necks for a couple of weeks after surgery to avoid injury to the neck flaps with decreased sensation, postoperatively.
- Men must also be counseled to rest after surgery to avoid early complications such as hematoma, especially those with underlying hypertension. Men tend to become more impatient after surgery than women, and are more likely to return to high-energy activities prematurely.

79.5.1.4 Neck Lift After Massive Weight Loss

Obesity as a Health Risk

Obesity is a chronic disease in which there is excess of body adiposity leading to severe secondary health problems. The three components of obesity are genetic, lifestyle, and the aging process. As more societies become affluent with consumption of high caloric food on the rise, and exercise in decline, there is an epidemic of obesity around the world, in certain societies, in adults. A more alarming trend is that recently, in the USA, adolescent and childhood obesity is on the rise as well. Consequently, bariatric surgery has become commonplace, and plastic surgery after massive weight loss is also on a steep rise. A neck-lift procedure is usually part of an overall body-contouring plan for massive weight loss patients [14].

Plastic Surgery After Massive Weight Loss

Surgery following massive weight loss as a result of bariatric surgery is a unique field within plastic surgery, in certain ways. It has aspects of both reconstructive and aesthetic surgery. These patients have some unique characteristics:

1. They all have a history of clinically severe obesity.
2. They have undergone bariatric surgery, typically within the previous 1–4 years.

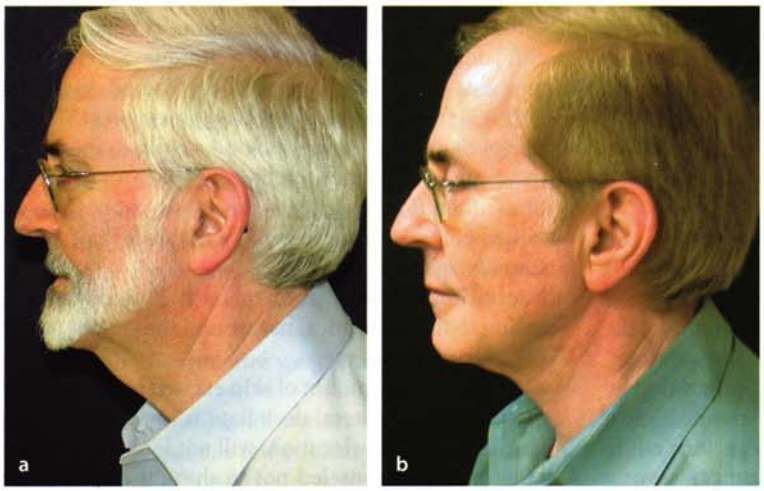


Fig. 79.13 Male neck lift. **a** Before. **b** After

3. They are strongly determined to get rid of their loose skin.
4. The vast majority are women.

For some patients, the decision to undergo bariatric surgery is part of a "new me" plan. They have bariatric surgery, lose weight, want to improve their eating habits and exercise patterns, and lead a healthier lifestyle. Plastic surgery can be at the center of this transformation and can play a very positive role, if utilized appropriately. Changes occur in the process of weight loss with respect to family dynamics, romantic relationships, social interactions, work habits, self-esteem, and other issues unique to each individual patient. The more a plastic surgeon is tuned in to these changes, the better we are able to serve these patients.

Increased Risk in Massive Weight Loss Patients

Neck lifts performed in massive weight loss patients are an essential part of treating the excess skin resulting from the rapid massive weight loss. In order to operate on a patient who has had bariatric surgery, we need to have thorough knowledge of the patient's medical history, and the options to offer him/her. After a patient undergoes a gastric bypass operation with ensuing massive weight loss, medical changes, including the elimination of certain diseases, occur. The physical changes that occur are essentially trading a large body for excess skin, and some other medical conditions that can arise such as:

1. Anemia
2. Poor nutrition (low albumin)
3. Significant skin laxity
4. Decrease in blood supply to tissues
5. Attenuation of the fascia

These risk factors create an increased risk of complications, such as hematomas, skin necrosis, as well as poor skin contraction after a body-contouring operation. The new goals that need to be set for this patient include proper dieting, exercise, and a healthier lifestyle. A neck lift may be part of an overall body-contouring plan for these patients. Deciding when to do the neck lift should be part of the medical consultation.

Considerations in Neck Lifts in Massive Weight Loss Patients

Timing of Surgery

In addition to a routine consultation with a full history and physical examination, massive weight loss patients have certain issues that need to be addressed. The weight loss plateaus at different times after bariatric surgery, generally between 1 and 2 years, so cosmetic surgery, ideally, should not be performed before 18 months, since the patient can regain the weight.

Neck Lift Versus Facelift

The amount of skin and fat that is to be excised needs to be addressed with the patient carefully. These patients have a significant amount of excess skin and fat in the neck region. Even with an aggressive neck lift there still may be laxity of skin 6–12 months later that may

lead to unhappiness and the patient seeking a secondary procedure. The patient needs to be reminded that a neck lift will address the laxity of skin and will improve it but it will not yield a perfect result, because of the significant amount of excess skin. These patients should be offered a rhytidectomy, as an alternative, and one should only resort to performing a neck lift if the patient refuses to have a full facelift. The patient needs to be made aware that there is the possibility of additional surgery 6–12 months later, to remove excess skin, if the patient requires "the best result possible"; however, the retightening of the platysma is usually unnecessary at that time.

79.5.1.5
Performing a Neck Lift As Part of a Multiple Procedure Plan

When a massive weight loss patient asks for multiple procedures, the plan is very subjective. Typically, procedures that a patient would ask for are a facelift or neck lift, breast lift, reduction or lift with implants, arm lifts, abdominoplasty or lower-body lifts, and thigh lifts. In counseling the patient, a safe treatment plan has to be conceived after a thorough understanding of the patient's goals. One approach is to discuss, with patients, their priorities. Some patients' priorities are for their face to look more youthful and to get rid of the stigma of weight loss by removing the excess neck skin. Other patients would like to get rid of the excess body skin first, and then address the neck at a later time.

Surgeries on different body parts can be performed during the same operation as long as the time under anesthesia is reasonable and the amount of surgery not excessive. For example, a neck lift can be performed with arm lifts or breast lifts with implants and then, at a later date, further operations on other body parts can be performed.

79.5.2
Technical Considerations

If a patient chooses to have a neck lift as opposed to a facelift, then it needs to be in most cases an extended neck lift. The incision should extend anteriorly to the tragus to be able to liposuction the jowls and excise the skin that is superior to the mandibular border, up to the tragus, and therefore improve the jowl status in this patient.

One consideration with people who have had gastric bypass surgery is that they have a small stomach, and are more likely to have nausea and vomiting with anesthesia, and to retch after surgery. That is an important factor to remember, since these patients may be at a higher propensity of immediate postoperative hematomas as well as late hematomas in the 10–14-day postoperative period, when the fibrin sealant has dissolved and the body is laying down its own fibrin.

79.5.3
Revisional Surgery

Before a revisional surgery is contemplated, the patient needs to be advised that skin laxity can be the cause of a disappointment in a secondary neck lift, no matter how tight the skin is sutured. A revisional surgery can be performed through the existing scars. More liposuction may need to be performed. If there is excess skin, then excising it is appropriate. If the muscles are lax or are in bands, then muscle plication should be performed. Fibrin sealant can be placed and the surgery can proceed as previously described with the primary neck lift.

79.5.4
Ancillary Procedures

79.5.4.1
Fat Grafting

The goal in fat grafting is to inject groups of transplanted fat that are small enough so that blood vessels can grow into the fat cells and nourish them. The fat is harvested from the abdomen with a manual syringe, the "mushroom cannula". The fat is aspirated and then centrifuged to separate all the oil and blood products from the fat. The supernatant fluid and oils are then removed at the side table. The test tubes of fat are then refrigerated in the operating room until the fat is to be injected. Next, the fat is transferred into 3-ml syringes with 18-gauge needles. An 18-gauge needle hole is small enough not to need to be sutured, but the needle diameter is large enough that the fat can be injected easily.

79.5.4.2
Nasolabial Folds and Cheek

The fat is injected in the subcutaneous tissue, mostly at the level of the subcutaneous and dermal plexuses, with excellent blood supply. Caution is used not to squeeze or traumatize the fat unnecessarily, to guarantee the highest rate of fat cell survival. For more volume, rather than filling a fold or a wrinkle, the fat can be injected in the deeper muscle layers. The method of injection is as follows. A stab incision is made in the periform aperture. The nasolabial folds are injected inferior to the subcutaneous tissues and then inferior to the mucosa. The cheeks can be injected with the fat to create a more youthful cheek with a visible prominence.

Fig. 79.14 The angle of the mandible can be enhanced by fat grafting. **a** Before. **b** After

79.5.4.3 Mandibular Border and Angle of the Mandible

In order to improve the mandibular border, whether in conjunction with a neck lift operation or as an individual procedure, fat grafting along the border of the mandible gives a noticeable improvement. The angle of the mandible can be enhanced in the same way, especially for narrow mandibles (Fig. 79.14).

79.5.4.4 Labial Mandibular Folds and Lips

A stab at the oral commissure provides access for injecting the upper lips, the lower lips, and the labial mandibular area. To correct the labial mandibular area, when the corners of mouth appear turned down, fat is injected in a crisscross fashion at the corner of the mouth, thus lifting the corners. The lips, and the more inferior aspect of the labial mandibular crease, can then be filled as needed.

79.5.4.5 The Submandibular Glands

Prolapsed or prominent submandibular glands can be a problem and need to be addressed initially with the patient, before the surgery. The patient has to be told that even with a good neck lift technique, if he/she has prolapsed or prominent submandibular glands, the result will not be as good. The submandibular glands need to be pointed out to the patient and a discussion about the attempt to improve the contour should be undertaken preoperatively. To demonstrate the location and size of the submandibular gland, a long Q-Tip is placed at the cervicomental angle and pressed. The patient feels where the submandibular gland is and can see the outline in a mirror. If the submandibular glands are not shown to the patient preoperatively, when the neck laxity may be masking the glands, then the patient may be dissatisfied with a good result because the "bulge" is more evident after the fat has been liposuctioned and the skin and muscles have been tightened.

It is not recommended to resect the submandibular glands, owing to a high complication rate. After the platysmal plication has been performed, the prominent gland prolapses inferiorly. This is called the "hammock effect". If a person sits in a hammock, there is a hanging effect because the weight is great, the hammock is weak, or a combination of both. With the submandibular gland sitting above the platysma, the analogy holds true. When the suspension suture is placed, the muscle is holding up the gland. A 3.0 Prolene suspension suture is sutured to the medial aspect of the platysma fibers, passing inferior to the submandibular gland, and tied to the mastoid fascia through the same tunnel where the suture suspension has been placed. The result is the reinforcement of the weak area and the superior elevation of the submandibular gland.

79.5.4.6 Chin Augmentation

Options for Chin Augmentation

Appropriate chin projection adds tremendously to the overall length and beauty of an aesthetically balanced neck. It also prevents the skin from becoming redundant in the submental area. Cosmetic techniques to augment a deficient or retrussive chin prominence focus primarily around the alloplastic chin implant. The use of sliding geneoplasties, with or without wire fixation, is also an option, but requires significantly more time, effort, and pain with more potential complications. Fat grafting to the chin can moderately enhance the chin prominence as well. Long-term fillers have been utilized with success.

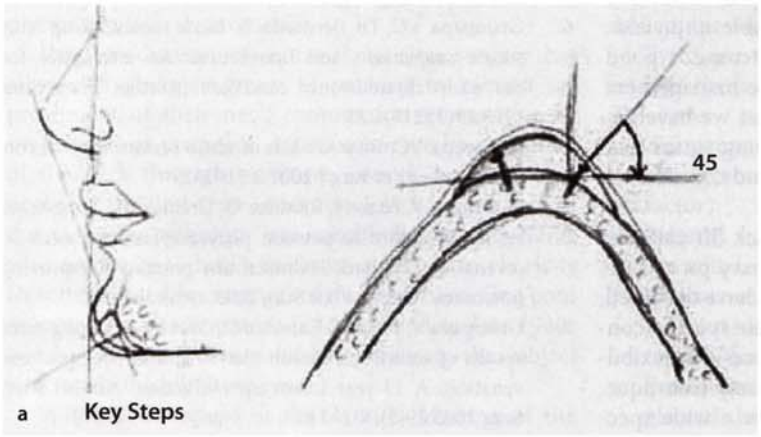
Assessing the Chin Projection

Utilizing a very simple technique, by drawing a vertical line from the glabella down through the upper lip and a second vertical line from the nasal tip to the chin prominence, will help to quickly define whether the chin is normal, hyperplastic, or hypoplastic. A 3–4-mm augmentation is usually recommended. If the implant is 3–4 mm in projection, there is another 2 mm of projection from the soft tissues, which should be enough to balance the chin, except for severe cases of retrusion. That 4–5 mm is enough to take up extra skin and give the female jaw a more aesthetically pleasing profile. With men, it is desirable to have a chin augmentation that surpasses the vertical line beyond the lower lip to give a more masculine look.

Chin Augmentation Technique with K-Wire Fixation

The neck-lift submental incision may be used to insert the chin implant. Cautery and a subperiosteal elevator are used to create the chin implant pocket. The pocket should be wide to decrease the chance of excessive force on the implant, which may lead to capsular formation around the implant and ensuing implant distortion or malpositioning. The implant is then positioned at the edge of the mentum at 45° to give both horizontal and vertical projection. Two 0.035 K-wires are placed through the implant, at about 45° to the implant, which makes them perpendicular to the bone, just into the outer cortex to stabilize the implant. The K-wires are cut off right at the surface of the implant (Fig. 79.15).

Chin Augmentation K-Wire Fixation



- Curvilinear submental incision.
- "Extra-wide" subperiosteal pocket (use cautery for dissection).
- K-Wire fixation of implant (adjust appropriate angle of implant) use .035 K-Wires.
- Close pocket in two layers.
- Antibiotic irrigation.

Fig. 79.15 **a** Chin augmentation with K-wire fixation. **b** Before. **c** After

The advantages of this K-wire fixation are several. First, it enables the implant to sit at 45° to the edge of the mentum and give both horizontal and vertical projection with the fixation. Second, it anchors the implant, so it is virtually impossible for the implant to migrate or rotate. Third, it creates two points of interface with the bone, so, theoretically, the whole surface of the implant is not juxtaposed to the bone and can decrease the bony resorption by the implant. We have 5–6 year X-rays on four patients where we do not see any normal bony resorption. The periosteum is then closed by releasing about 5 mm of the muscle, where it joins the mentum. It is then irrigated with a little antibiotic solution before closure. The platysma can be closed over the implant.

79.6 Conclusions and Future Trends

There are many techniques for neck rejuvenation. We have tried to discuss, in detail, one particular technique that we feel is simple, versatile, reproducible, and yields good results. The key to any happy outcome is good communication with the patient and the management of expectations. The technical points that we have discussed serve to guide surgeons performing suture-suspension neck lifts to achieve happiness and consistently good results for their patients.

In our experience with secondary neck lift patients, whether they had a facelift as their primary procedure or a neck lift with suboptimal results, we have observed the patients to be very satisfied after their specific concerns were addressed. This fact underscores the flexibility of the suture-suspension platysmaplasty technique, and its ability to be adjusted to improve a wide spectrum of neck contours, primarily or secondarily.

Someone may choose to have a neck lift and full-face fat grafting as opposed to a facelift for a variety of reasons, including cost, risk, healing time, and ease of postoperative management. It is important for the plastic surgeon who performs neck lifts to be well versed with the ancillary options to provide to a patient.

In recent articles about fine-tuning the suture-suspension techniques to address the six major points as well as the long-term follow-up studies, this neck lift technique has proven to stand the test of time. Future ancillary techniques, such as thread lifts, more permanent fillers, and improved grafted fat survival will undoubtedly enhance the results accomplished with the suture-suspension platysmaplasty.

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