

# Suture-Suspension Neck Lift Technique: A Versatile Technique for Male Neck Rejuvenation

George J. Bitar and Rana A. Shalhoub

## Summary

Performing facial rejuvenation on this male population, especially neck lifts, has gained in popularity and has been very rewarding. In this chapter, I will discuss the evolution of neck lifts on men with the latest modifications and lessons learned over the years.

**Keywords:** face-lift, laxity, male, neck lift, platysma, platysmaplasty, rhytidectomy, suture, suture suspension

## Introduction

In recent years, there has been an explosion of treatment options to address an aging, ptotic neck. These include all forms of liposuction (laser assisted, ultrasound assisted, Vaser, and so on): Ultherapy, Kybella, CoolMini, and Botox. Many male patients are interested in facial rejuvenation, but unwilling to undergo a full face-lift. Although we have come a long way in terms of destigmatizing plastic surgery for men, there continue to be patients who do not want anyone to know they underwent facial rejuvenation surgery. A neck lift is a procedure that sits well with men more so than a face-lift, in terms of keeping the fact that they had plastic surgery a secret. The suture-suspension neck lift leaves no preauricular scars; it involves only postauricular and submental scars that are hidden, and thus, desirable. While social media, print magazines, and plastic surgery reality TV shows promote a youthful appearance, they do not necessarily educate patients on the different alternatives to achieve a younger, more refreshed look. There is no “one-size-fits-all” procedure that is perfect for every patient. Although it

may be important to address facial rhytids and skin laxity to achieve a younger look, addressing jawline contour and creating a more youthful-looking neck-line may be enough to achieve the look a patient is hoping to achieve, especially when a man is bothered by his “loose neck” and does not mind facial wrinkles as much.

There are several techniques used to perform neck lifts, both as an isolated procedure and in conjunction with a face-lift.<sup>1,2,3,4,5</sup> In 1973, Guerrero-Santos et al.<sup>2</sup> described the muscular lift, followed by Feldman in 1990,<sup>3</sup> who described the corset platysmaplasty.<sup>4</sup> In 1990, Giampapa and Di Bernardo<sup>6</sup> developed the suture-suspension neck lift. Initially, they performed the suture-suspension neck lift on open face-lift patients, but later modified their technique and started performing closed neck lifts. The suture-suspension neck lift has undergone many technical changes and improvements since then. Conrad et al.<sup>5</sup> described the Gore-Tex suspension cervical fascia rhytidectomy. In 1995, Giampapa and Di Bernardo<sup>6</sup> described a modified technique that involved the use of platysmal resection as well as two interlocking permanent sutures through a subcutaneous tunnel. This tunnel is immediately below the submandibular border running from the midline to the mastoid bony fascia. This creates an artificial ligament, which is believed to be responsible for the positive long-term effects of this procedure.<sup>6</sup> This was combined with liposuction of the neck to achieve the desired result. The postoperative course included dressings for 7 days.

In 2001, the addition of the fibrin sealant to suture-suspension neck lifts, by Giampapa and Bitar,<sup>7</sup> proved to be very valuable in decreasing the rates of hematomas, seromas, ecchymosis, edema, and postoperative discomfort. Articles on the technical

points in refinement of the neck lift technique by Giampapa et al.<sup>8</sup> as well as a 13-year follow-up study on suture-suspension neck lifts by Giampapa et al.<sup>9</sup> have served as a continued effort to improve on this versatile technique.

In the last decade, refinements and additions have been proposed by various authors when addressing neck lifts alone or in combination with face-lifts. Familiarizing oneself with the various techniques enables us as plastic surgeons to balance safety and results to give our patients an aesthetically pleasing facial enhancement while minimizing the risks to do so.<sup>10,11,12,13,14</sup> In 2009, I added laser-assisted liposuction to my neck lift technique to improve skin tightening and simplify the procedure because of less bleeding. Additionally, I have been performing neck lifts under local anesthesia since 2013, which has greatly reduced the number of complications associated with general anesthesia. In my experience, most male patients prefer this method over the traditional method of performing a neck lift with general anesthesia or anesthesia with intravenous sedation. I have also found that with the popularity of bariatric surgery growing over the past 20 years, more men who have undergone massive weight loss are seeking plastic surgery for body contouring and facial rejuvenation.

## Classification of Neck Types

It is essential to thoroughly evaluate the anatomy of each patient's neck and subsequently select the

appropriate treatment. Most necks fall into one of the following neck classifications<sup>14</sup>:

### Classification of Neck Types

#### Class I deformity (Fig. 10.1)

- No midface laxity.
- Mild platysmal laxity.
- Mild submental fat.

#### Class II deformity (Fig. 10.2)

- Mild midface laxity/mild jowling.
- Moderate subplatysmal fat.

#### Class III deformity (Fig. 10.3)

- Moderate midface laxity and prominent jowling.
- Moderate platysmal laxity.
- Moderate submental fat.

#### Class IV deformity (Fig. 10.4)

- Midface laxity and prominent jowling with extensive labial mandibular deformities.
- Moderate-to-severe platysmal laxity.
- Severe submental fat and subcutaneous laxity in the lower portion of the neck.

Patients with a class I deformity are ideal candidates for the suture-suspension neck lift and demonstrate excellent early and long-term results. Patients in this category may elect to have neck liposuction only, CoolSculpting, or Kybella as opposed to a neck lift. The advantages of these noninvasive procedures may include reduced cost, faster



**Fig. 10.1** Class I neck deformity (a) before, and (b) after suture-suspension neck lift.



**Fig. 10.2** Class II neck deformity (a) before, and (b) after suture-suspension neck lift.



**Fig. 10.3** Class III neck deformity (a) before, and (b) after suture-suspension neck lift.

recovery, less invasive surgery, and fewer incisions. The disadvantage is the lack of dramatic and long-term improvement that the suture-suspension neck lift can provide because of skin excision and tightening of the platysma muscles (**Fig. 10.1**).

Class II patients should opt for a suture-suspension neck lift to address loose skin and neck muscles. This involves plication of the platysma muscles, removal of submental and subplatysmal fat with liposuction, as well as postauricular skin excision. These patients generally exhibit excellent skin contraction and improvement in neck contour. Any

procedure that just addresses the fat will fall short of providing an aesthetically pleasing result (**Fig. 10.2**).

The treatment for class III patients is to perform a suture-suspension neck lift with resection of a portion of the anterior medial bands of the platysma muscles, vigorous liposuction of the submental and subplatysmal fat, as well as direct excision of the subplatysmal fat. Postauricular skin resection is more extensive in class III necks. 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





**Fig. 10.4** Class IV neck deformity (a) before, and (b) after suture-suspension neck lift.

with this technique alone, and other ancillary techniques may need to be employed (**Fig. 10.3**).

The treatment for class IV patients is a face-lift with complete undermining of the cervical mental area with anterior midface skin. Although suture suspension can be used for the neck lift portion of the face-lift, a more extensive procedure should be undertaken for the best results (**Fig. 10.4**).

Occasionally, a patient who has a class IV neck cannot have a full face-lift for medical, financial, or other personal reasons. In this case, the patient needs to be told explicitly that a neck lift will not yield results similar to those of a face-lift. Additionally, the addition of ancillary procedures to the midface such as fat grafting or implants may improve the result.

## The Six Points of Neck Evaluation

Ellenbogen and Karlin<sup>18</sup> referenced five criteria for a youthful-looking neck:

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

The suture-suspension neck lift technique addresses the first three criteria. In males, a visible thyroid cartilage contour gives a desirable masculine look,

while a visible anterior border of the sternocleidomastoid border can be achieved with the right suctioning technique.

A specific numerical protocol was designed 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, which are utilized presently when evaluating a prospective patient for neck rejuvenation. Those points are:

- Cervicomenal angle depth.
- Mandibular border definition.
- Mandibular angle definition.
- Labiomandibular fold prominence (jowling).
- Mental prominence.
- Neck width.

## Steps for Suture-Suspension Platysmaplasty Technique

### Preoperative Assessment

It is essential to explain to the male patient what a neck lift can and cannot accomplish.<sup>16</sup> Generally, male patients have a tendency to rush through the initial consultation and overlook the limitations and potential complications of the surgery. Risks, benefits, and what to expect in the postoperative course are discussed at length. Usually, a patient seeks a neck lift, because he wants an improvement in the



appearance of his neck but does not want a full face-lift. The main indication for a suture-suspension neck lift is a poorly defined cervicomental angle and mandibular border, which is commonly seen as a result of the aging process. This loss of definition is the result of 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 profile view, when looking at a face and seeing the cheek blend into the side of the neck. In short, contour loss is associated with an aging face. To properly evaluate a patient for a neck lift procedure, it is important to evaluate the midface, jawline, 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 in midface structures is important to achieve 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. This point cannot be overemphasized, because patients may feel that they will get all the benefits of a face-lift with a neck lift, but with “less surgery.” This 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 it is not a substitute for a face-lift. Additionally, I generally pinch the patient’s cheeks and jowls during the consultation to remind them physically that these areas will not be improved with a neck lift. Alternatively, I discuss other nonsurgical modalities to improve the cheeks, nasolabial folds, and jowls during the consultation as complementary procedures to the neck lift, such as Ultherapy, Silhouette InstaLift, fillers, and lasers.

### **Jawline 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 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 with wide jaws do very well with a neck lift. Patients with a narrow

face or a fat neck with lack of jaw definition may not have as good a result. These are generalizations, and exceptions are found every so often.

### **Neck Evaluation**

To evaluate the neck with the patient in an interactive manner, we suggest taking a long Q-tip and pressing against the neck line to show how deep the cervicomental angle is, that is, the distance between the anteriormost tip of the mentum and the thyroid cartilage. Doing this in front of a mirror will show the patient the amount of realistic improvement expected from a neck lift. In males with a narrow neck, even the most advanced 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.<sup>17</sup> Categorizing the neck in classes I to IV will aid in determining what procedure is offered to the patient.

### **Neck Lift or Face-Lift**

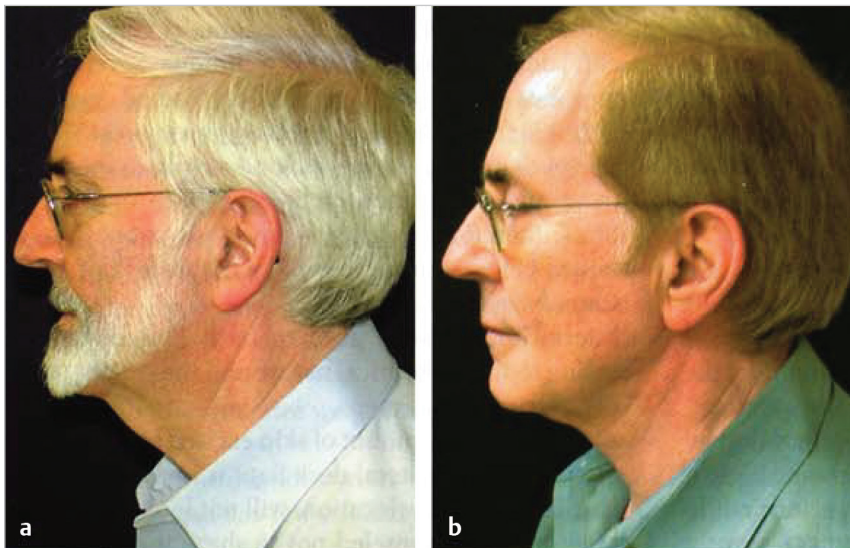
There are patients for whom a neck lift is not appropriate, and a full face-lift is the procedure that will yield the most improvement. The appropriate way to address these patients is to be assertive about the fact that they will need a full face-lift if they would like dramatic improvement. If there are factors that prevent them from having a face-lift, such as health or financial considerations, then they need to understand and acknowledge that their results with a neck lift will be suboptimal.

A patient may question whether he can first have a neck lift followed by a midface lift in the future. The patient can be given the option to have the neck lift done first and the face-lift later, without the need to redo the neck lift portion of the face-lift.

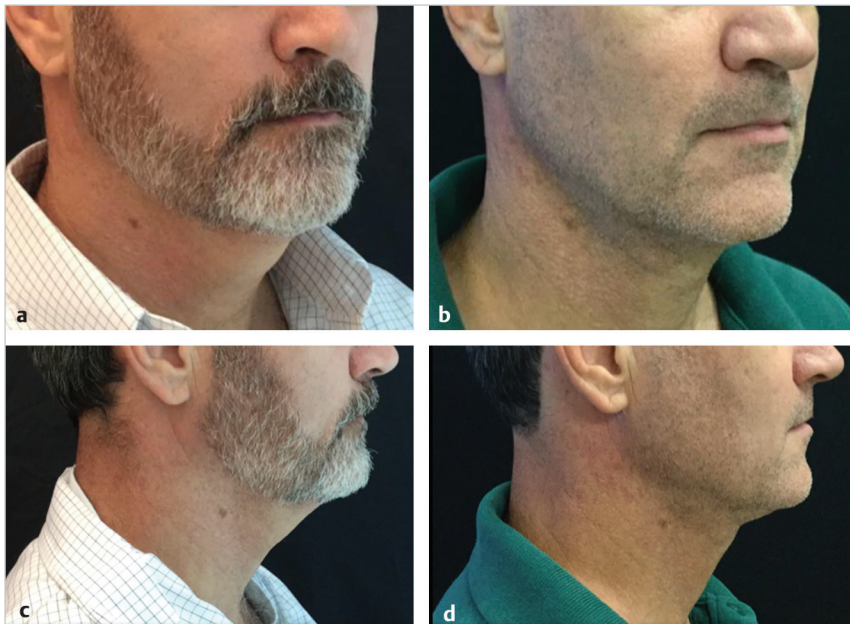
### **Suture-Suspension Platysmaplasty Indications**

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 the majority of the following criteria (**Fig. 10.5**):

- Poorly defined cervical mental angle.
- Poorly defined submandibular border.
- Absence of laxity in the midface structures (as no tightening of the underlying superficial



**Fig. 10.5** Ideal male neck lift candidate (a) before, and (b) after a suture-suspension neck lift.



**Fig. 10.6** (a,b) Three-quarters, and (c,d) profile images (a,c) before, and (b,d) after suture-suspension neck lift of a patient with a class III neck.

musculoaponeurotic system fibers and facial muscles in the midface is accomplished through this procedure).

- 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 face-lift).
- Unwillingness or inability to undergo a full face-lift.

Patients with a class I or II neck who seem to be ideal candidates for a neck lift may opt for nonsurgical modalities such as Kybella, CoolSculpting, or

laser-assisted liposuction instead. For classes III and IV necks, male patients usually choose a neck lift (Fig. 10.6, Fig. 10.7, and Video 10.1). Men find 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 face-lift incision is used. Furthermore, the neck lift portion of this procedure can be performed during primary and secondary face-lifts for treating fatty necks and acute cervicomental angles, which were difficult to correct with previous surgical procedures.



**Fig. 10.7** (a,b) Three-quarters, and (c,d) profile images (a,c) before, and (b,d) after suture-suspension neck lift of a patient with a class IV neck.

**Video 10.1** Neck lift procedure.

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### Advantages of the Suture-Suspension Technique for Neck Contouring

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

### Surgical Technique

Patients should get medical clearance before proceeding with surgery, and specialist clearance when necessary. It is useful to give prospective patients' contact information of other males who have had the surgery and consented to be used as a reference.

The prospective patient may contact them by phone and ask them questions. Once the patient is ready to proceed with surgery, the immediate preoperative preparation begins. Optimizing a patient for surgery is done differently by individual surgeons. It is beneficial to place the patient on Arnica for 5 days preoperatively and have the patient stop all blood-thinning supplements and medications. Additionally, it is important the patient abstain from smoking for 2 weeks and alcohol for 1 week preoperatively.

### Surgical Marking

The patient is marked in the holding area in the supine position (**Fig. 10.8**). First, a midline is drawn. Next, the mandible contour is marked, and a line 1.5 cm inferior and parallel 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 Preparations

The suture-suspension neck lift can be performed under general or local anesthesia. The preparation of the patient will differ slightly depending on whether or not the patient will be awake. If the patient opts to





**Fig. 10.8 (a–d)** Preoperative surgical markings.

undergo general anesthesia, they are given prophylactic antibiotics, deep venous thrombosis prophylaxis, and then intubated. The table is turned 180°, and the patient's arms are tucked to the side. The submandibular area, postauricular area, and lower neck are infiltrated in a fashion similar to a face-lift with about 75 to 150 mL on each side with tumescent solution for a total of 150 to 300 mL (250 mL of saline, 50 mL of 1% plain lidocaine, and two ampules of 1:1,000 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. Male patients 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 muscle.

If the patient opts for local anesthesia, the patient is given the following medications in the preoperative area, respectively: 4 mg Zofran, 1 mg Ativan,

500 mg Keflex, and 5/325 mg Percocet. These medications may be substituted if a patient has allergies that prevent him/her from taking one of the original medications. The medications are given 15 minutes apart, and vital signs are taken before each new medication is administered. The surgeon will inject the submental region and postauricular regions with 1% lidocaine with epinephrine 15 minutes after the pain medication is administered. These will be the incision sites as well as entry points for tumescent solution and liposuction. Once the lidocaine takes effect, the tumescent solution will be injected in a similar fashion as described above. Next, the patient is transferred to the operating room where they are prepped and draped in sterile fashion. The patient is reminded not to contaminate the sterile field while they are being prepped. Their arms are tucked to their sides during the procedure.

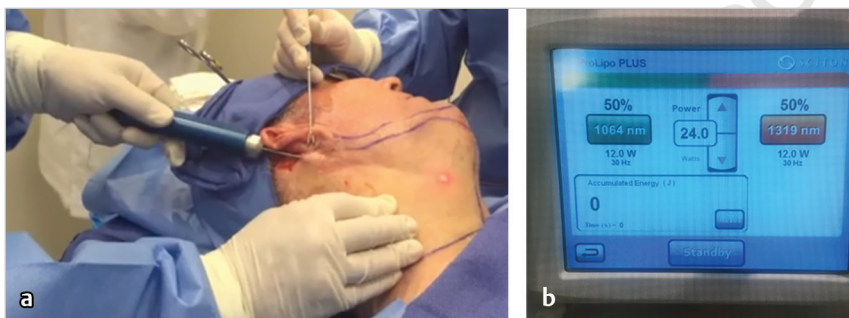
### Laser-Assisted Liposuction

One modification I made to the suture- suspension neck lift is the use of laser-assisted liposuction. In men, the neck area has a richer blood supply than in women because of the blood-rich, hair-bearing bearded area. The advantages of using the laser include skin tightening and less bleeding, especially for a class III or IV neck. After the tumescent solution has taken effect, laser-assisted liposuction is performed (**Fig. 10.9a**). I use a Sciton Joule laser with ProLipo PLUS, and the settings are a blend of 1,064 nm 50% and 1,319 nm 50% at 20 to 24 watts (**Fig. 10.9b**). Other lasers can be used depending on the surgeon's level of comfort with the technology. The key is to be conservative until excellent command of the laser liposuction technology is gained because of fear of skin injury if the laser-assisted liposuction is overly aggressive. The neck is liposuctioned initially with a 3- to 4-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 creating a better definition of the jawline. Specific areas such as the anterior border of the sternocleidomastoid muscle, the jowl, and the angle of the mandible are liposuctioned in the appropriate patient. Liposuction should never be overly aggressive, because a certain amount of subdermal fat is desirable to keep the neck looking youthful and not skeletonized. Some necks do not need any liposuction. As a rule of thumb, it is better to liposuction less fat rather than be overly aggressive.

### 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 face-lift scissors (**Fig. 10.10**). A curvilinear incision seems to heal better than a straight incision after scar contraction. Excess subplatysmal fatty tissue



**Fig. 10.9** (a) Laser-assisted liposuction with ProLipo PLUS. (b) Laser liposuction settings on Sciton Joule laser for male neck lift.



**Fig. 10.10** The submental incision allows for visualization of subplatysmal fat and platysma muscles.



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 to 3 cm on each side of the platysmal border or are imbricated at the midline with buried 4-0 Prolene sutures. This technique reapproximates and shortens the width of the platysma muscle, thus decreasing the width of the neck.

### **Skin Excision**

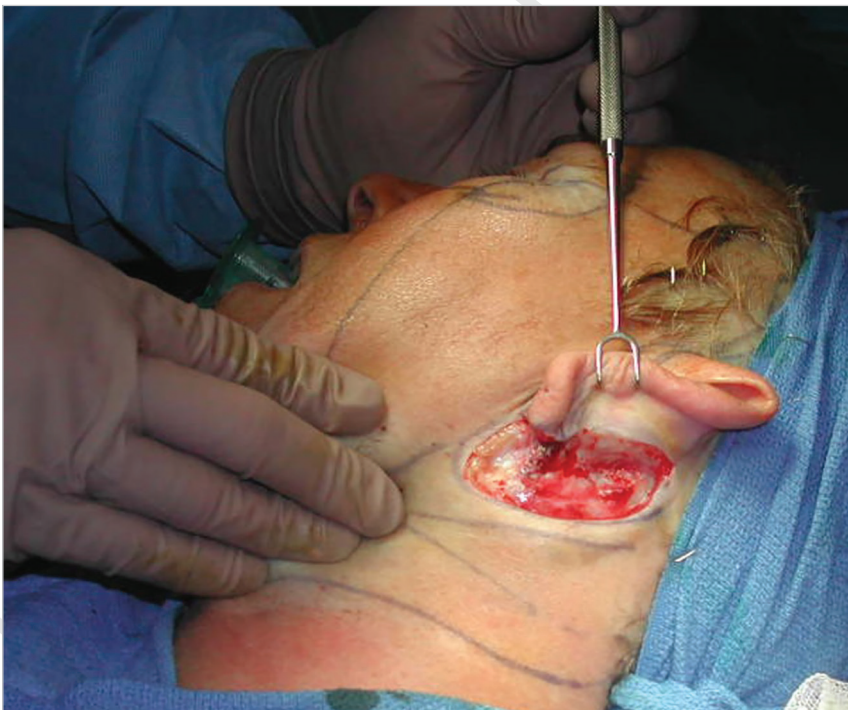
The postauricular skin on each side is identified, and an ellipse of skin is excised that extends from the ear lobule area to the midlevel of the postauricular sulcus (**Fig. 10.11**). This maneuver eliminates the redundant skin from the neck in an easily hidden incision and allows better access to the underlying mastoid fascia. The amount of skin excised is often an area that causes less experienced surgeons some anxiety. How much skin should be excised? The answer is not much! It is better to err on the side of resecting a lesser amount of skin because the skin will redrape over the underlying muscle. If too much skin is resected, the scar may widen, a subsequent “pixie ear” deformity or skin necrosis may ensue. The skin between the mastoid area and the submental area is then undermined to connect

to the previously made tunnel in the anterior neck. If a significant amount of skin needs to be excised, such as in a massive weight loss patient, then the patient should be strongly advised to have a face-lift instead. If they opt to only undergo a neck lift, the patient must accept that despite an aggressive neck lift, there will still be some loose skin because this procedure has its limits in terms of skin management. Furthermore, a full neck has too little skin rather than too much because when the cervicomenal angle is augmented, and a concavity is subsequently created, more skin is required to fill this deeper angle.

After the interlocking sutures have been placed and before closing the incisions, the fibrin sealant is sprayed under the skin flaps or drains are placed (see the next section on The Interlocking Suture Placement). Next, the postauricular incisions are closed with 3-0 Monocryl sutures for the dermis and 3-0 Chromic for the skin. The submental incision is then closed with 3-0 Monocryl and interrupted 4-0 nylon sutures. Xeroform and ABD dressings, as well as a Kerlix wrap, are placed over the skin, along with a Velcro overhead strap for support.

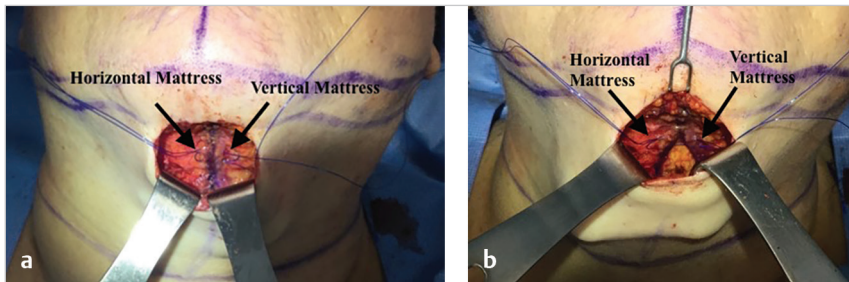
### **The Interlocking Suture Placement**

The interlocking mattress sutures are the sine qua non of this operation (**Fig. 10.12**). At the depth desired to create the new cervicomenal angle,

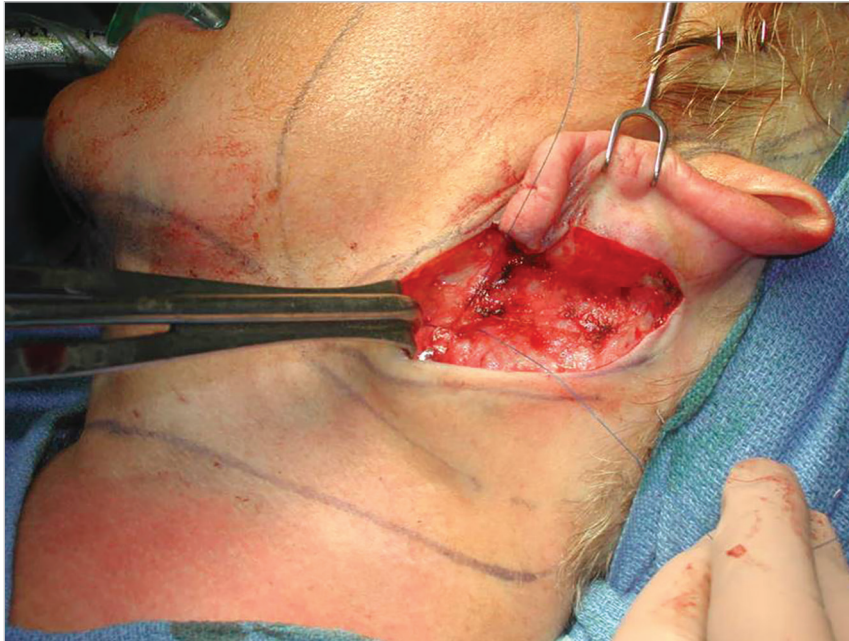


**Fig. 10.11** Postauricular skin excision.





**Fig. 10.12** Interlocking submental suture (a) before, and (b) after tightening.



**Fig. 10.13** Loop suture.

which is usually at the level the hyoid bone, a 0 Prolene suture 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. 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. Next, the suture is sutured deep into the mastoid fascia while the patient's face is turned toward the opposite side and maximally extended to allow maximum neck mobility as the healing and scarring process ensues. 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 cervicomenal 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***

In men who have a very well-defined boney jawline, the interlocking sutures as described above are sufficient. To better define the angle of the mandible in a man with a poorly defined mandibular angle due to fat, bony anatomy, or muscle laxity, a submandibular angle "loop suture" is placed<sup>8</sup> (**Fig. 10.13**, **Video 10.2**). This is a maneuver done after liposuction is performed, skin resection is completed, and a subcutaneous tunnel is performed. A "loop suture" involves securing the nonabsorbable interlocking 0 Prolene suture under the area of the angle of the mandible at the anterior sternocleidomastoid border, before suturing it to the mastoid fascia. After the loop has been created, the suture is secured at the mastoid process periosteum. It is critical to keep the

tension off the interlocking suture moderate. 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.

#### Video 10.2 Loop suture.

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The angle loop suture creates a more natural and anatomically pleasing result (**Fig. 10.14**). Additionally, it creates a “hinge mechanism,” 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.

### Tissue Fibrin Sealant

To improve the recovery phase of the suture-suspension technique, a fibrin tissue sealant, which is applied in the subcutaneous tunnel, may be used in lieu of surgical drains.<sup>7</sup> I use the ready-to-use Tisseel tissue fibrin sealant because of its ease of use and reliable results. The goals of the sealant are as follows:

- 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.

### Application of the Fibrin Sealant

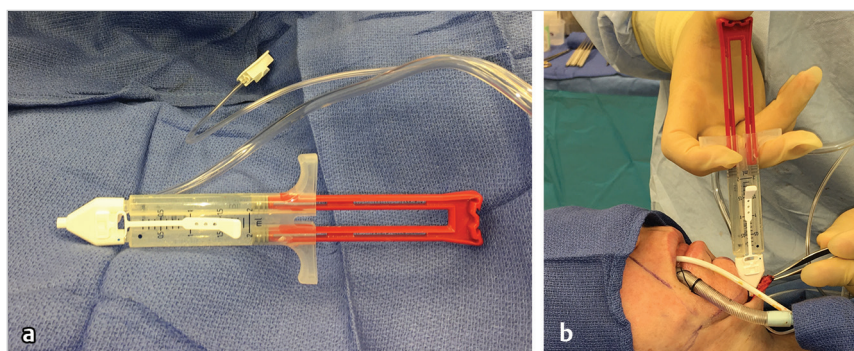
After hemostasis has been achieved, the fibrin sealant is applied. On the side table, the fibrin sealant is prepared simultaneously, or reconstituted in two separate syringes. One syringe contains the sealer protein concentrate dried powder mixed with the fibrinolysis inhibitor solution to make the Tisseel 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 hours.

The two syringes are mounted on a Duploject applicator (**Fig. 10.15a**). The fibrin sealant is then sprayed, simultaneously, into the pockets in thin layers for 1 minute, the time required for the liquid sealant to activate (**Fig. 10.15b**). 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 minutes, 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.



**Fig. 10.14** (a) Before, and (b) after suture-suspension neck lift illustrating the loop suture.





**Fig. 10.15** (a) Tissue fibrin sealant before application. (b) Application of fibrin sealant during suture-suspension neck lift.



**Fig. 10.16** Postauricular suture-suspension neck lift scar.

## Postoperative Care

Postoperative care is minimal. Patients are kept on oral pain and nausea medications for 3 to 5 days and antibiotics for 1 week. They are instructed to keep their head elevated while sleeping. The drains and original dressings are removed 24 to 48 hours postoperatively. Male patients are advised not to shave for 7 to 10 days after the operation, to avoid trauma to the neck flaps. Patients are instructed to resume activities of daily living in 2 to 3 days, but to put strenuous activity, including exercise, on hold for 3 to 4 weeks. Men must also be counseled to rest after surgery to avoid early complications such as hematomas, 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. I like to follow up with my patients at day 1, 1 week, 1 month, 3 months, 6 months, and 1 year postoperatively.

I advise them to expect gradual healing and final results in about 6 to 12 months. Scars usually heal very well and are hidden in the submental region, which can be further camouflaged with facial hair, and behind the ears (**Fig. 10.16**). I advise patients to apply silicone gel to the scars starting 4 weeks postoperatively for 6 to 12 months. The further out a patient is from surgery, the better the scars will look.

## Addressing the Six Basic Points

It is important to explore each anatomical aspect of the neck and address each one individually to get the overall perception of a youthful and aesthetically pleasing neck.<sup>8</sup> There are many factors that contribute to the loss of shape and neck contour. These anatomical changes are the result of loss of tone of the dermal elastic fibers, which are associated with sagging of the skin, ptosis of the soft tissue of the neck and chin, banding of the platysma muscles at the anterior



neck, as well as elimination of the anterior sterno-cleidomastoid border. Other transformations include changes in fat deposition, bone resorption, and sub-mandibular gland protrusion. Additionally, the cervical spine collapses during the aging process. 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.

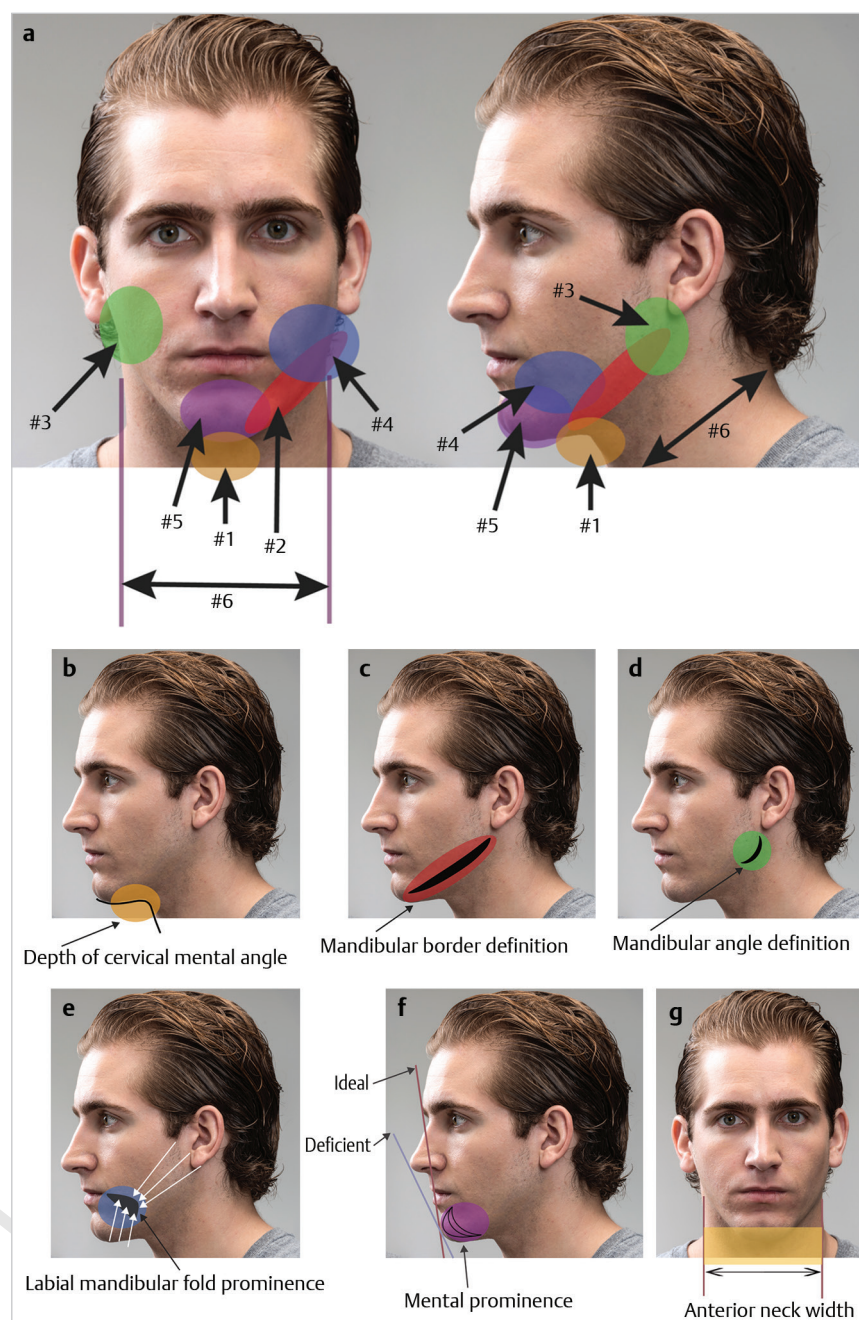
The key anatomical points used clinically when evaluating and surgically treating the aging neck are the following (**Fig. 10.17a**):

1. Cervicomenal angle depth (**Fig. 10.17b**).
2. Mandibular border definition (**Fig. 10.17c**).

3. Mandibular angle definition (**Fig. 10.17d**).
4. Labiomandibular fold prominence (jowling) (**Fig. 10.17e**).
5. Mental prominence (**Fig. 10.17f**).
6. Neck width (**Fig. 10.17g**).

## Case Examples

Over the last 16 years in private practice, I have performed neck lifts on men ranging in age from the early 30s to the late 70s. Some men had complimentary procedures simultaneously, such as face-lifts, chin implants, fat grafting, or



**Fig. 10.17** (a) The six key points to consider when evaluating a neck. (b) Cervicomenal angle depth. This deficiency is corrected by (1) adjusting tension of interlocking suspension sutures; (2) removing subplatysmal fat; (3) suturing digastric muscles together; and (4) transecting platysmal borders. (c) Mandibular border definition. This deficiency is corrected by (1) laser-assisted liposuction above and below the mandibular border; (2) fat grafting to the mandibular border; and (3) long-term fillers with Radiesse. (d) Mandibular angle definition. This deficiency is corrected by (1) loop suture elevation of SMAS; (2) fat grafting into masseter muscles; (3) long-term fillers; and (4) alloplastic chin augmentation. (e) Labial mandibular fold prominence. This deformity is corrected by (1) laser-assisted lipectomy from submental and postauricular approaches; (2) camouflage fat grafting; (3) depressor labii muscle release; and (4) Silhouette Instalift. (f) Mental prominence. This deficiency is corrected by (1) alloplastic chin augmentation; (2) fat grafting to the chin; and (3) long-term fillers such as Radiesse. (g) Anterior neck width. This deformity is corrected by (1) resection and medial advancement of the platysmal muscle along the full length of the neck; (2) imbrication of the platysma muscles in the midline and (3) laser-assisted lipectomy of prominent subcutaneous fat.

blepharoplasties (Fig. 10.18, Fig. 10.19, Fig. 10.20). The recovery time, the time necessary to return to activities of daily living and be cosmetically inconspicuous, has been reduced to just a few days. The

full recovery time requires 6 to 12 months to allow for soft-tissue contraction to reach its optimal state and for the fine edema resolution to be complete.

### Case No. 1: Neck Lift with Chin Augmentation (Fig. 10.18)



**Fig. 10.18** (a) Before, and (b) after suture-suspension neck lift with chin augmentation.

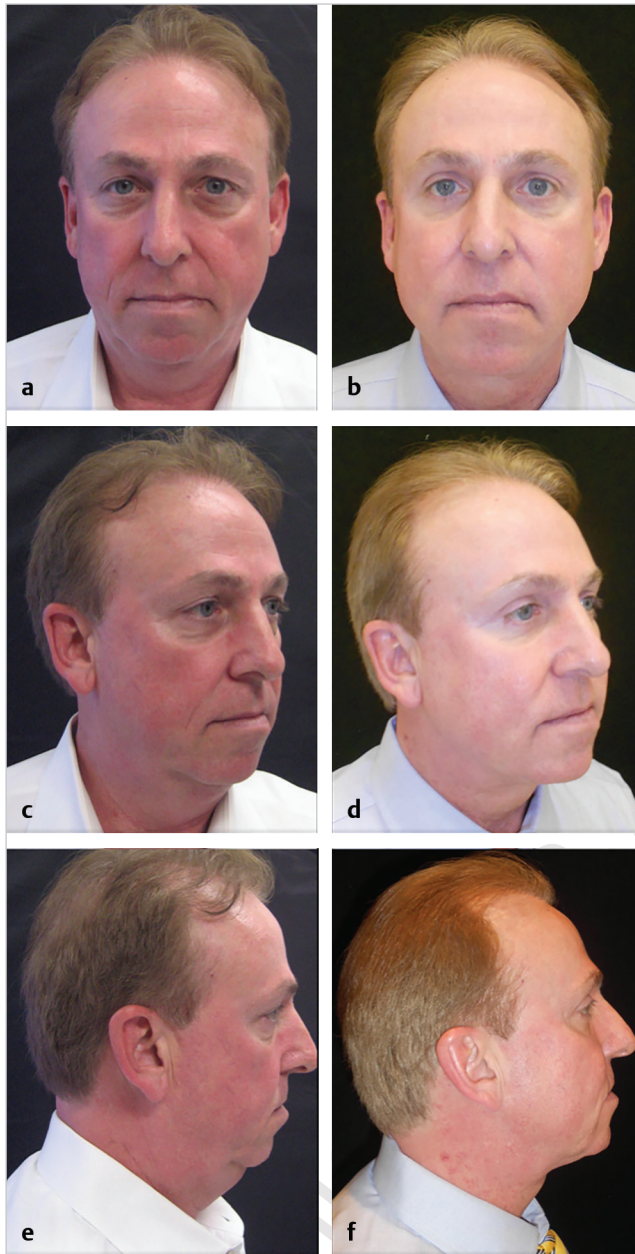
### Case No. 2: Neck Lift and Facial Fat Grafting (Fig. 10.19)



**Fig. 10.19** (a,c) Before, and (b,d) after suture-suspension neck lift and facial fat grafting.



### Case No. 3: Neck Lift and Upper Blepharoplasty (Fig. 10.20)



**Fig. 10.20** (a,c,e) Before, and (b,d,f) after suture-suspension neck lift and upper blepharoplasty.

### Management of Complications

My complication rates have been about 7% for minor complications such as wound dehiscence, wound hypertrophy requiring steroid injections, self-resolving hematomas or seromas, widened scars, skin irregularities, minor infections, and overly tightened or undertightened sutures. The rate of

complications that required reoperation has been 3%, including hematoma evacuations, further liposuction or suture tightening, and further skin resection, mainly in men who opted for a neck lift when they would have been better candidates for a face-lift. No mortalities or long-term serious complications have been recorded in my male neck lift population.

### Discussing Potential Complications

It is very important to go over in detail the risks of a neck lift and compare them with those of a face-lift, as well as nonsurgical rejuvenation such as Ultherapy, Kybella, CoolSculpting, and fillers to the jawline and chin. I discuss with patients the risks of hematomas, seromas, skin necrosis, unsightly scars, nerve damage, initial discomfort from the tightness, asymmetry, unsatisfactory results, and the potential for revision surgery. To get the patients involved in their care makes him an active participant who can identify a complication and alert the surgeon in a timely fashion to treat it. For example, it is more effective to explain to patients why smoking can increase the rate of complications, rather than 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. Avoiding surgery until the patient is smoke-free for at least 2 weeks before and 2 weeks after surgery may help in decreasing the rate of complications caused by smoking.

### Planning the Surgery to Avoid Complications

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. The inferior and lateral borders of the dissection should be only as wide and low as there is fat to be liposuctioned and loose skin to be tightened.

### Skin Management to Avoid Complications

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. Attention to the amount of skin excised and the vector of pull for the bilateral neck flaps is important so that the hairline, in its new location, will not look artificial. It is best to err on the side of excising less skin initially and, at the time of closure, resecting more skin if necessary. Also, postoperative modalities such as laser and Ultherapy may be used to tighten or improve the quality of skin postoperatively.

### **Fat Management to Avoid Complications**

If a neck has a small amount 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 the risk of hematoma in an area where the adipose layer is thin and the skin adheres to the underlying sternocleidomastoid muscle. A 3- or 4-mm spatulated cannula can give good results in terms of ease of liposuction and contour regularity. 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 to highlight the border itself. This maneuver will accentuate the angle and create an aesthetically pleasing strong jawline 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 midanterior neck contour, and is difficult to correct.

### **Platysma Management to Avoid Complications**

It is important to suture the platysmal midline edges with buried permanent sutures, such as 3-0 Prolene. In a secondary neck lift, sometimes the edges of the platysma are scarred, and the anatomy is not well delineated. One must be careful not to suture the digastric muscles by accident. If absorbable sutures are used, the tension can allow the muscles to spread apart when the sutures dissolve. This action results in losing the tightening effect that the midline

sutures have created to narrow the neck width. Second, 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 afterward and be dissatisfied with. Third, it is important to allow the artificial ligament-like Prolene suspension suture to be tied at a firm but not a very tight position, to avoid patients complaining of tightness or a choking feeling. A patient can live with a less than perfect result, but neck muscles that are very tight are painful and create long-term discomfort.

Also, the suspension suture needs to be placed within the mastoid fascia, about a finger breadth in front of the postauricular sulcus, where the mastoid is bulging, and not too low on the mastoid to get the optimal neck contour. Last, 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.

### **Fibrin Sealant to Avoid Complications**

After spraying the sealant, gentle manual pressure should be applied evenly with the surgeon's fingers spread over the whole neck for 3 minutes 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 to 3 mL, because then it will be more likely to form pools of the sealant. Also, in my experience, it is important for the assistant to be well versed in fibrin sealant preparation. If the sealant is not prepared well, it can congeal and render it useless. If a surgeon has doubts about the sealant working, he or she should use JP drains.

### **Dressing Placement to Avoid Complications**

Once the desired contour is accomplished (**Fig. 10.21**), a surgical dressing will be applied. This dressing will be removed 1 day after the surgery and replaced with a neck binder. The dressings should not be too tight, otherwise there could be ensuing necrosis of the submental region where the skin has



**Fig. 10.21** Immediate before-and-after image of a patient who underwent a suture-suspension neck lift under local anesthesia with improved neck contour.



**Fig. 10.22** Immediate postoperative dressing with JP drains.

been undermined. One should be able to place two fingers comfortably between the dressings and the skin at the conclusion of the procedure (**Fig. 10.22**).

### Potential Complications

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

### Managing Hematomas or Seromas

Since the 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 of choice. 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.

### Prolonged “Tightness in the Neck”

It is normal for people to comment about neck tightness initially as a result of 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. I have had to do this in only three patients in 16 years, once for a legitimately overly tight suture, with symptoms subsiding shortly after the surgery when the edema had resolved. The second and third times were for complaints that were similar in nature and psychological, and removing the sutures proved of no benefit. In my experience, if a patient starts complaining about neck tightness, pain, discomfort, or difficulty swallowing more than a year after the surgery, the problem is probably unrelated to the suture suspension.

### ***Prolonged Skin Contractures***

This is most likely to happen to the postauricular scar because the superior skin edge of the incision is shorter 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 anteriorly, one of the hallmarks of the suture-suspension neck lift 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.

### ***Asymmetry of the Mouth***

This could be a result of 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 (<1% of all patients). This usually resolves in 2 to 3 months postoperatively.

## **Special Considerations in Suture-Suspension Neck Lift**

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

- Secondary neck lift.
- Face-lift with suture-suspension neck lift.
- Neck lifts after massive weight loss.

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

- Fat grafting.
- Submandibular gland management.
- Chin augmentation.

### **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 underwent a face-lift 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 face-lift. The ideal candidate for a secondary neck lift, after a face-lift, is someone who had aesthetically pleasing midface and jowl areas but is dissatisfied with the resulting neck contour.

Common conditions leading to a secondary neck lift are as follows:

- Excess or ptotic neck skin.
- Ptotic platysma muscle at the midline (with or without muscle plication).
- 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 face-lift; it has limitations when it comes to midface and jowl rejuvenation. The limitations that caused the patient to be unsatisfied from a primary neck lift may not be addressed with a secondary neck lift and may require a face-lift.

### ***Technical Considerations***

A secondary neck lift is more challenging in many ways. The anatomy may be more difficult to discern because of the previous operation. The skin is more difficult to dissect because of lack of adipose tissue, which may make inadvertent "buttonholing" 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 an increase in adipose tissue, bony resorption, and skin or muscle laxity, which would be treated with liposuction or direct excision. If the submandibular glands have prolapsed, or if they were not addressed in the first procedure, then performing a submandibular gland suspension is recommended. Most commonly, there is excess skin that should be excised.

In a suture-suspension neck lift, the durability of results depends on the suture, that is, the 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 Lift**

If a patient who underwent a suture-suspension neck lift is bothered by the 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 then 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 be revised.

In a few cases, the subplatysmal fat was overly excised and the patients ended with a concavity in the submental region. Either fat grafting or retightening the muscles at the midline should be performed depending on the severity.

### **Rhytidectomy and Suture-Suspension Neck Lift**

The suture-suspension neck lift has proven to be a very important tool in neck management when performing a face-lift. This is because of the versatility of this technique and the ease of adjustment to different neck types. We frequently combine the suture-suspension neck lift with both primary and secondary face-lifts. The evaluation and decision to perform a suture-suspension neck lift along with a face-lift should be individualized to each patient.

### **Incision**

When combining a face-lift and suture-suspension neck lift, the posterior neck incision is made and continued around the earlobes 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. My preference is to first perform the neck liposuction if needed. Then, I elevate the skin flaps of the face and neck. Next, I perform a suture-suspension neck lift in an open face-lift. In addition, I perform a partial superficial muscular aponeurotic system (SMAS) excision and plication depending on the SMAS and muscle laxity, and finally resect the excess skin and close the skin flaps.

### **Platysmal Plication**

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

### **Fibrin Sealant**

Fibrin sealant can be used in a full rhytidectomy as opposed 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.

### **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 weight loss. To operate on a patient who has had bariatric surgery, we need to have thorough knowledge of the patient's medical history. Medical changes, including the elimination of certain diseases, occur after a

patient undergoes a gastric bypass operation with ensuing massive weight loss. The physical changes that occur are essentially trading a large body for excess skin, and some other medical conditions that can arise such as:

- Anemia.
- Poor nutrition (low albumin).
- Significant skin laxity.
- Decrease in blood supply to tissues.
- 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 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 for 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 unique issues that must be addressed. The weight loss plateaus at different times after bariatric surgery, generally between 1 and 2 years. Therefore, cosmetic surgery should ideally not be performed prior to 18 months after the weight loss surgery because the patient may regain weight.

#### **Neck Lift Versus Face-Lift**

The amount of skin and fat that should 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 to 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 face-lift. The patient needs to be made aware that there is the possibility

of additional surgery 6 to 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.

### **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 face-lift or neck lift, chest lift, reduction or lift with implants, arm lifts, abdominoplasty, lower body lifts, and/or 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. One patient's priorities may be for his/her 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.

### **Technical Considerations**

If a patient chooses to have a neck lift as opposed to a face-lift, 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. That is an important factor to remember, as these patients may be at a higher propensity of immediate postoperative hematomas as well as late hematomas in the 10- to 14-day postoperative period, when the fibrin sealant has dissolved and the body is laying down its own fibrin. Men with an underlying history of hypertension should be managed very carefully in the postoperative period to decrease the chance of high blood pressure causing a significant hematoma.



## Revision Surgery

Before a revision 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 revision 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. In general, I like to wait a year to revise any neck lift procedure irrespective of who the initial surgeon was, because of prolonged edema and the need to wait for scar tissue and skin to soften.

## Ancillary Procedures

### Fat Grafting

Fat grafting is a great complimentary procedure to a neck lift and may eliminate the need for a full face-lift. 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, or 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. Next, the fat is transferred into 3-mL syringes with Coleman cannulas with side holes to avoid vascular events. An 18-gauge needle is used to piece the skin, and the hole is small enough so that it does not need to be sutured, but the cannula diameter is large enough that the fat can be injected easily.

### Nasolabial Folds and Cheek

The fat is injected in the subcutaneous tissue, mostly at the level of the subcutaneous and dermal plexuses, with good 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 pyriform 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.

## Mandibular Border and Angle of the Mandible

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.

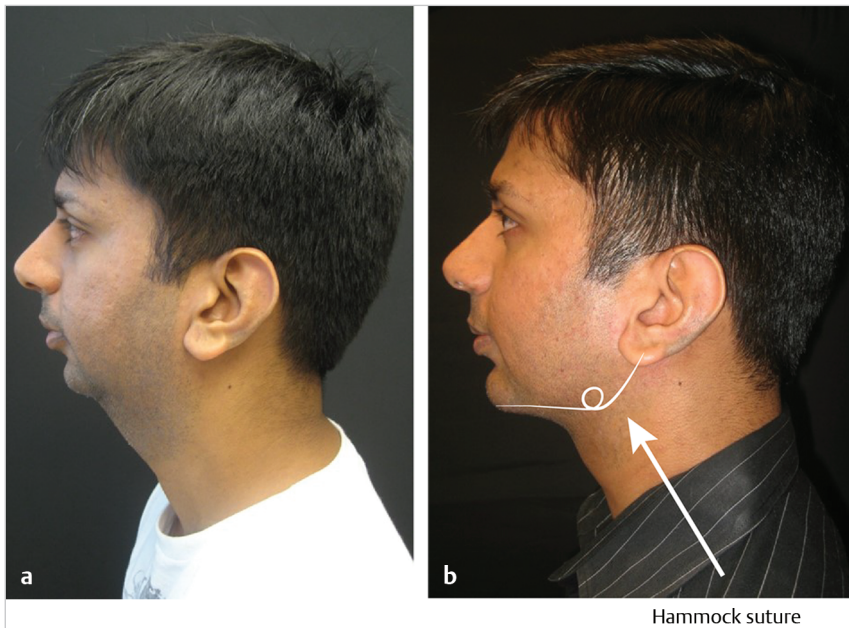
### Labial Mandibular Folds and Lips

A stab at the oral commissure provides access for injecting the lips (although this is not very common for male patients) and the labial mandibular area. To correct the labial mandibular area, when the corners of the mouth appear turned down, fat is injected in a crisscross fashion at the corner of the mouth, thus lifting the corner. The lips and the more inferior aspect of the labial mandibular crease can then be filled as needed.

### The Submandibular Glands

Prolapsed or prominent submandibular gland can be an area of concern and needs 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 has prolapsed or prominent submandibular glands, the result will be suboptimal. The submandibular gland needs 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 will feel 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 gland, then the patient may be dissatisfied with a good result because the “bulge” is more evident after the fat has been removed and the skin and muscles have been tightened.

Submandibular gland management is an area where plastic surgeons differ substantially. My philosophy is that resecting the submandibular glands is risky, because of a high complication rate. After the platysmal plication has been performed, the prominent gland prolapses inferiorly. This is called the *hammock effect* (Fig. 10.23). When the suspension suture is placed, the muscle will hold 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



**Fig. 10.23** (a) Before, and (b) after suture-suspension neck lift with chin augmentation illustrating the hammock suture.

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. In my experience, this may not be a perfect solution to handle a ptotic submandibular gland, but it gives a fairly good result in small or moderately enlarged submandibular glands and an adequate improvement in larger glands. Experienced plastic surgeons are much more likely to notice the submandibular gland area imperfections than patients who are very happy with their neck contour, and for the most part do not complain about the submandibular gland area.

## Steps for 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 recessive chin focus primarily around the alloplastic chin implant.<sup>14</sup> The use of sliding genioplasty, with or without wire fixation, is also an option, but it requires significantly more time and effort and will result in more pain for the patient with potential complications. Fat grafting to the chin can moderately enhance the chin prominence as well. Long-term fillers such as Radiesse have been used with success.

## Assessing the Chin Projection

Using 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 determine whether the chin is normal, hyperplastic, or hypoplastic. A 4- to 5-mm augmentation is usually recommended. If the implant is 4 to 5 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 recession. A 6- to 7-mm augmentation is enough to take up extra skin and give the male jaw a more aesthetically pleasing profile that surpasses the vertical line beyond the lower lip.

## 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.



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 gives 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. 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.

## Conclusions and Future Trends

There are many techniques for neck rejuvenation in males. I have tried to discuss, in detail, one particular technique that I feel is simple, versatile, reproducible, and yields good results for most men. The key to any happy outcome is good communication with the patient and early management of expectations. The technical points that I discussed serve to guide

surgeons performing suture-suspension neck lifts to achieve happiness and consistently good results for their patients.

In my experience with secondary neck lift patients, whether they had a face-lift as their primary procedure or a neck lift with suboptimal results, patients are usually very satisfied after their specific concerns were addressed. This fact underscores the flexibility of the suture-suspension neck lift technique and its ability to be adjusted to improve a wide spectrum of neck contours.

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

The suture-suspension neck lift has proven to be an excellent technique to achieve a more defined neck contour. Ancillary techniques such as Ultherapy, thread lifts, more permanent fillers, improved fat grafting, and chin augmentation will undoubtedly enhance the results accomplished by this versatile technique.

## Pearls and Pitfalls

### Pearls

- Familiarizing oneself with various techniques enables surgeons to balance safety and results to give patients an aesthetically pleasing facial enhancement while minimizing the risks.
- Thoroughly evaluate the anatomy of each patient's neck and subsequently select the appropriate treatment.
- Patients with a class I deformity are ideal candidates for the suture-suspension neck lift and demonstrate excellent early and long-term results.
- Class II patients should opt for a suture-suspension neck lift to address loose skin and neck muscles.
- The treatment for class III patients is to perform a suture-suspension neck lift with resection of a portion of the anterior medial bands of the platysma muscles, vigorous liposuction of the submental and subplatysmal fat, as well as direct excision of the subplatysmal fat.
- The treatment for class IV patients is a face-lift with complete undermining of the cervical mental area with anterior midface skin.
- It is essential to explain to the patient what a neck lift can and cannot accomplish.
- Candidates for the suture-suspension neck lift are those with poorly defined cervical mental angle; poorly defined submandibular border; absence of laxity in the midface structures; mild-to-moderate amount of jowling and neck; and those who are unwilling or unable to undergo a full face-lift.
- Patients with a class I or II neck who seem to be ideal candidates for a neck lift may opt for nonsurgical modalities such as Kybella, CoolSculpting, or laser-assisted liposuction instead.
- It is beneficial to place the patient on Arnica for 5 days preoperatively and have the patient stop all blood-thinning supplements and medications.
- It is important that the patient abstain from smoking for 2 weeks and alcohol for 1 week preoperatively.
- Male patients 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 muscle.
- The advantages of laser-assisted liposuction include skin tightening and less bleeding, especially for a class III or IV neck.

### Pitfalls

- As a rule of thumb, it is better to liposuction less fat rather than be overly aggressive.
- It is better to err on the side of resecting a lesser amount of skin, because the skin will redrape over the underlying muscle. If too much skin is resected, the scar may widen, and a subsequent “pixie ear” deformity or skin necrosis may ensue.
- The use of tissue fibrin sealant can eliminate the dead space and avoid seromas or hematomas; support the healing process by decreasing tension on the incision sites; decrease edema; promote hemostasis; and eliminate postoperative wrinkling or rippling of the skin.
- Patients are advised to apply silicone gel to the scars starting 4 weeks postoperatively for 6 to 12 months.
- The key anatomical points used to evaluate and surgically treat the aging neck are the cervicomental angle depth, mandibular border definition, mandibular angle definition, labiomandibular fold prominence (jowling), mental prominence, and neck width.
- Discuss with patients the risks of hematomas, seromas, skin necrosis, unsightly scars, nerve damage, initial discomfort from the tightness, asymmetry, unsatisfactory results, and the potential for revision surgery.
- Getting patients involved in their care makes them active participants who can identify complications and alert the surgeon in a timely fashion.
- Avoiding surgery until the patient is smoke-free for at least 2 weeks before and 2 weeks after surgery may help in decreasing the rate of complications.
- The inferior and lateral borders of the skin dissection should be only as wide and low as there is fat to be liposuctioned and loose skin to be tightened.
- 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.
- The management of platysma is important. One must be careful not to suture the digastric muscles by accident, and it is important to allow the artificial ligament-like Prolene suspension suture to be tied at a firm, but not a very tight position, to avoid patients complaining of tightness or a choking feeling.
- Fat grafting, submandibular gland management, and chin augmentation are ancillary techniques performed to enhance neck lift results.
- For secondary neck lifts, it is essential to determine the patient's expectations and reasons for dissatisfaction of the initial operation.
- For secondary neck lifts, if the subplatysmal fat was overly excised, fat grafting or retightening the muscles at the midline should be performed depending on the severity.
- Timing of surgery, incision, and anesthesia are considerations for neck lifts in massive weight loss patients.
- Ancillary techniques such as Ultherapy, thread lifts, more permanent fillers, improved fat grafting techniques, and chin augmentation may enhance the results of the suture-suspension neck lift.

### Bulleted Steps

#### Steps for Suture-Suspension Neck Lift

1. Numb the neck using tumescent solution (use 250 cc of saline, 50 cc of 1% lidocaine, two ampules of 1:1,000 epinephrine).
2. Use the laser to tighten the skin and break up fibrous fat. The recommended settings are 1,064 nm 50% and 1,319 nm 50% at 20 to 24 watts depending on the neck.
3. Liposuction subdermal fat using a spatulated 3- or 4-mm cannula.
4. Make a curvilinear submental incision.
5. Excise excess subplatysmal fat.
6. Use buried 3-0 Prolene sutures to bring platysmal muscles together over the midline.
7. Use 0 Prolene sutures to create an interlocking suture at the level of the hyoid bone. The ends of these sutures are passed through the tunnel and sutured deep into the mastoid fascia.
8. Excise an ellipse of excess skin that extends from the ear lobule to the midlevel of the postauricular sulcus bilaterally.
9. Spray fibrin sealant under the skin flaps or place drains.
10. The postauricular incisions are closed with 3-0 Monocryl sutures for the dermis and 3-0 Chromic for the skin. Close the submental incision with 3-0 Monocryl and interrupted 4-0 nylon sutures.



## Steps for Chin Augmentation

1. Make a curvilinear submental incision.
2. Create a subperiosteal pocket using cautery for dissection.
3. Use K-wires to fix the implant in place once the appropriate angle and positioning of the implant are determined. Use 0.035 K-wires.
4. Close the pocket in two layers.
5. Irrigate with antibiotic solution.

## References

- [1] Zins JE, Fardo D. The “anterior-only” approach to neck rejuvenation: An Alternative to face lift surgery. *Plast Reconstr Surg.* 2005;115(6):1761–1768
- [2] Guerrero-Santos J, Espaillet L, Morales F. Muscular lift in cervical rhytidoplasty. *Plast Reconstr Surg.* 1974;54(2):127–130
- [3] Feldman J. Corset platysmaplasty. *Plast Reconstr Surg.* 1990;85(3):333–343
- [4] Feldman JI. My approach to neck lift. Presented at the Colorado Society of Plastic Surgeons, Denver, April 1995
- [5] Conrad K, Chapnik JS, Reifen E. E-PTFE (Gore-Tex) suspension cervical facial rhytidectomy. *Arch Otolaryngol Head Neck Surg.* 1993;119(6):694–698
- [6] Giampapa VC, Di Bernardo BE. Neck recontouring with suture suspension and liposuction: An alternative for the early rhytidectomy candidate. *Aesthetic Plast Surg.* 1995;19(3):217–223
- [7] Giampapa VC, Bitar GJ. Use of fibrin sealant in neck contouring. *Aesthet Surg J.* 2002;22(6):519–525
- [8] Giampapa V, Bitzos I, Ramirez O, Granick M. Suture suspension platysmaplasty for neck rejuvenation revisited: Technical fine points for improving outcomes. *Aesthetic Plast Surg.* 2005;29(5):341–350, discussion 351–352
- [9] Giampapa V, Bitzos I, Ramirez O, Granick M. Long-term results of suture suspension platysmaplasty for neck rejuvenation: A 13-year follow-up evaluation. *Aesthetic Plast Surg.* 2005;29(5):332–340
- [10] Auersvald A, Auersvald LA, Oscar Uebel C. Subplatysmal necklift: A retrospective analysis of 504 patients. *Aesthet Surg J.* 2017;37(1):1–11
- [11] Feldman J. Neck Lift. St Louis, MO: Quality Medical; 2006
- [12] Feldman JJ. Neck lift my way: An update. *Plast Reconstr Surg.* 2014;134(6):1173–1183
- [13] Connell BF, Sundine MJ. *Aesthetic Rejuvenation of the Face and Neck.* New York, NY: Thieme; 2016
- [14] Bitar G, Giampapa V. Algorithm for neck rejuvenation. In: *Simplified Facial Rejuvenation.* Amsterdam, Netherlands: Springer; 2007:594–612
- [15] Bitar GJ. What men want. *Plastic Surgery Prod.* 2006;16(2):20–26
- [16] Bitar GJ. Understanding the characteristics of massive weight loss patients. *Plast Surg Prod.* 2006;16(5):38–44
- [17] Bitar GJ. Liposuction or lift? An algorithm for neck rejuvenation. *Plast Surg Prod.* 2005;15(9):24–28
- [18] Ellenbogen R, Karlin V. Visual criteria for restoring the youthful neck. *Plast Reconstr Surg.* 1980;66(6):826–837