Chapter 5
Neck and Facial Contouring

Onelio Garcia Jr.

Preoperative Considerations

Patient selection is of paramount importance in achieving successful aesthetic results with neck contouring. One should never trade fat for loose skin, particularly in a visible area like the neck. An accurate assessment of skin elasticity is mandatory, particularly in older patients or those with significant amounts of submental fat. Some patients with extensive submental fat may need to accept a secondary open procedure if prominent platysma bands are exposed following the neck defatting. Although complications are rare with this procedure, the informed consent for neck contouring with ultrasonic liposuction should include the possibility of postoperative contour deformities, asymmetry, prolonged edema, exposed platysma bands, thermal injury, pigmentation changes, neck skin paresthesia, and vascular injury.

As with all other liposuction procedures, patients need to discontinue medications that interfere with coagulation (including over-the-counter products containing ASA or nonsteroidal anti-inflammatories) well in advance of their surgery date. All comorbid conditions such as hypertension or diabetes need to be under control prior to surgery and a full preoperative medical clearance is obtained in patients over 50 years of age.

The evaluation should include presence of scars, history of previous neck and or facial surgery, presence of platysma bands, assessment of submental fat (preplatysmal vs sub-platysmal), thyroid enlargement, parotid enlargements or masses, assessment of the jowls, submandibular gland enlargement, and any neck range of motion limitations. Of paramount importance is an assessment of how much fat volume extraction the skin elasticity of the neck will tolerate without losing its current skin tone. This is the one preoperative evaluation that takes significant

O. Garcia Jr. (✉)
Division of Plastic Surgery, University of Miami, Miller School of Medicine, Miami, FL, USA

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experience performing body contouring with liposuction to perfect so for the surgeon inexperienced with these cases it is best to err on the conservative side. A secondary surgery to remove some residual submental fat is a relatively simple procedure, whereas correction of a flaccid neck secondary to overextraction of submental fat is a more complex open procedure which the patient may not readily accept.

Standard photography is similar to that used for facial rejuvenation procedures. Photographic assessment should include a full-face and neck frontal view, 90 degrees from each side and 45 degrees from each side (Fig. 5.1a–e). Typical preoperative markings are performed with the patient standing or sitting upright and looking straight ahead. It is useful during the preoperative markings to note the location of the Jugular veins and also mark their location (Fig. 5.2a, b).

The instrumentation used for neck and facial VAL is highly precise. The probes and cannulas are much smaller than those employed in body contouring, typically 2.4 mm in diameter (Fig. 5.3). Occasionally 3 mm cannulas are employed for larger submental extractions; however diameters greater than 3 mm are not recommended in the face and neck areas.

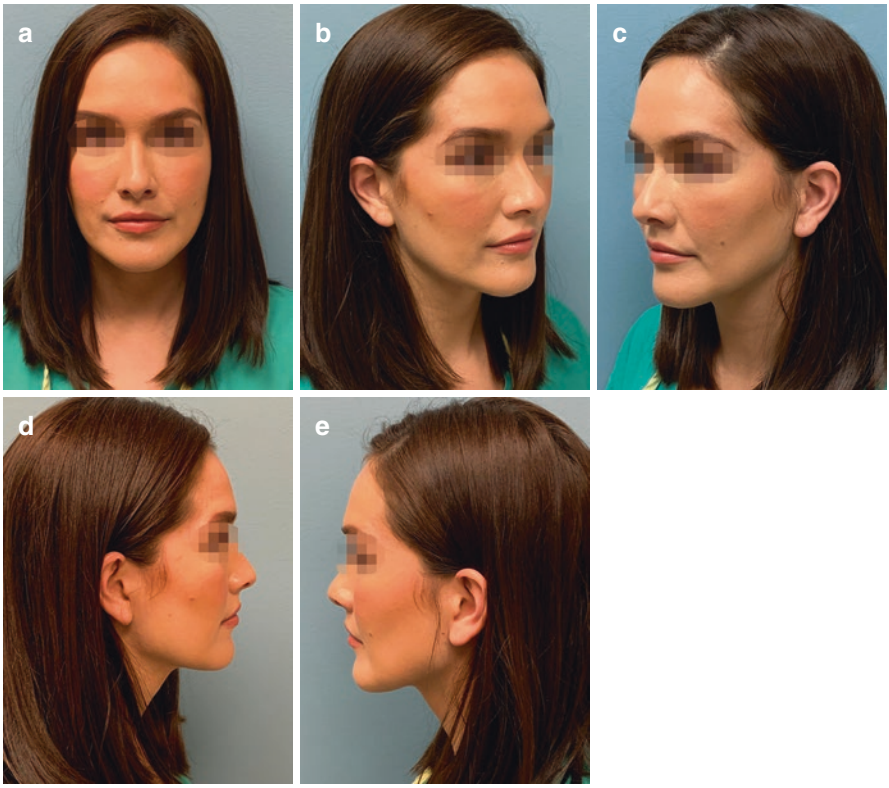

Fig. 5.1 Five standard preoperative photos for face and neck contouring. Full face and neck (**a**) front view, (**b**) right and (**c**) left oblique views, and (**d**) right and (**e**) left lateral view

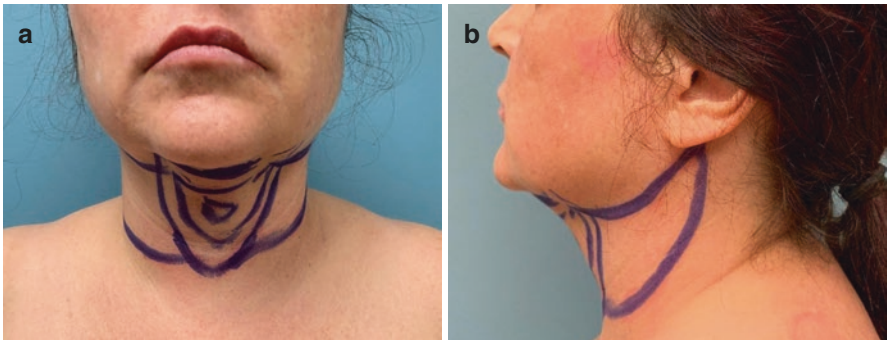

Fig. 5.2 Standard preoperative markings for neck contouring. (**a**) Front view, (**b**) lateral view

Fig. 5.3 Special face and neck instrumentation for VAL

Surgical Technique

Typically three access incisions are used for neck and facial contouring, one behind each earlobe and one in the submental crease (Fig. 5.4). This type of access avoids placing torque on the ultrasound probes and provides good access to the entire neck. It is important to treat the whole surface area of the neck below the mandibular border in order to achieve better skin retraction. Involving the whole neck in the

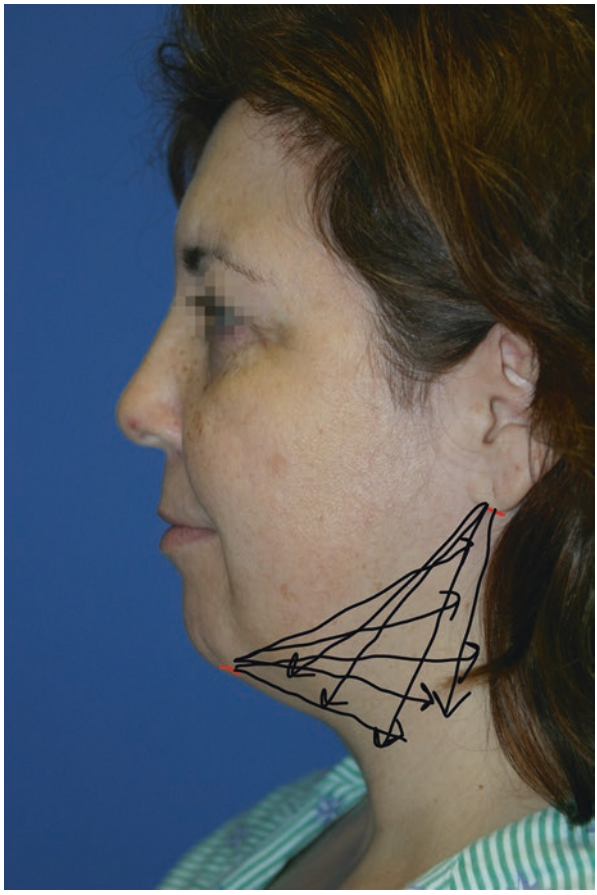

Fig. 5.4 Access incisions are marked; red and black arrows denote the path for the ultrasound probes and the aspiration cannulas

contouring yields a more harmonious result than spot suctioning. This is particularly important in cases that involve higher-volume submental extractions.

My standard wetting solution (Garcia's formula) [2] is modified for neck and facial contouring. When using general anesthesia, the formula consists of 1 L of lactated Ringer's solution at room temperature, defined as 21°C (70°F), plus 2 ml of epinephrine 1:1000. This is double the concentration of epinephrine recommended for body contouring procedures where the wetting solution is dispersed in larger volumes over a large surface area. Obtaining good tumescence in a relatively small surface area such as the neck requires much less fluid and in the author's experience the higher concentration of epinephrine results in highly efficient vasoconstriction in the area which results in minimal postoperative bruising. For intravenous sedation and local procedures, 50 ml of 1% Xylocaine is added to the wetting solution. Infusion rates are 150 ml/minute for local procedures and 200–250 ml/minute for general anesthesia procedures. This is the rare surgical procedure where local anesthesia may not be the safest alternative. It is the author's preference to

perform large-volume submental liposuctions under general anesthesia. The large amounts of fluids that are infused into the neck tissues to create tumescence may lead to airway complications in patients under intravenous sedation.

Contouring of the neck and submental area by means of VAL is a safe and efficient technique which yields highly aesthetic results. The patient satisfaction rate is high. It is associated with a low complication rate when performed using the recommended parameters for both the ultrasound energy settings and the time interval that the tissues are exposed to the ultrasound energy [3, 4]. A significant advantage of VAL for contouring the neck is less postoperative bruising, resulting in decreased downtime for the patient. The ultrasound-assisted liposuction techniques are associated with less blood in the aspirate when compared to traditional liposuction [5, 6], which translates to decreased postoperative ecchymosis. For a typical neck contouring procedure the author uses a 2.4 mm three-ring or five-ring VASER probe (Solta Medical, Bothell, WA) at 50–60% energy levels in pulsed (VASER) mode for approximately 3 minutes. Aspiration is performed with 2.4 and 3 mm VentX cannulas (Solta Medical, Bothell, WA). Although the approach to neck and submental contouring is similar for most patients, there are some variations in the extent of the surface area treated and the ultrasound exposure time, based on the approximate volume to be removed and the preoperative skin tone.

Postoperatively TopiFoam is contoured to precisely fit the area treated and a commercially available head and neck compression garment is applied (Fig. 5.5). Patients are asked to maintain head elevation for several days, avoid high sodium intake, and avoid strenuous physical activity. Moisturizing massages are begun several days after surgery, as tolerated.

Fig. 5.5 (**a**, **b**) Typical face and neck compression garment

Surgical Outcomes

A 35-year-old woman is seen in consultation requesting improvement of her neck contour. She is within her ideal body weight and denies history of significant weight loss. Her exam revealed moderate submental lipodystrophy with relatively good skin tone. VAL of the submental area extending into the lateral neck was recommended. Extending both, the VASER exposure field and the superficial liposuction over a greater surface area aids in skin retraction. The outpatient surgery was performed under intravenous sedation and local anesthesia. Three access incisions were used, retro-auricular on both sides and submental. The author's wetting solution formula for local cases consisting of 1 mg of epinephrine 1:1000 and 50 ml of 1% Xylocaine in a liter of Ringer's lactate solution was infused at the rate of 200 ml per minute. A total of 200 ml of the solution was evenly dispersed throughout the neck. A 2.4 mm, three-ring VASER probe at 60% energy level was utilized for 1 minute and 30 seconds in pulsed mode. Aspiration was performed with a 3 mm VentX cannula. Most of the treatment involved the submental area with minimal extension into the lateral neck. The aspirate volume totaled 60 ml. The access incisions were closed with a buried absorbable monofilament 4–0 suture and a facial compression garment over contoured TopiFoam was applied. Surgical results at 4 months are depicted in Fig. 5.6a–d.

A 38-year-old woman was seen in consultation requesting improvement in her neck contour. She has moderate lipodystrophy superficial to the platysma assessed by the pinch test. A VAL of the neck and submental area was recommended. The outpatient surgery was performed under intravenous sedation and local anesthesia. Retro-auricular and submental incisions were used for access. The author's recommended wetting solution formula for local cases was infused at 200 ml per minute to a total volume of 250 ml. A 2.4 mm, five-ring VASER probe at 60% energy level was utilized for 2 minutes in pulsed mode. Aspiration was accomplished with a 3.0 mm VentX cannula. Incisions were closed with buried absorbable sutures. A facial compression garment over a shaped TopiFoam sheet was applied immediately following the procedure. A total aspirate volume of 72 ml was extracted. Surgical results at 5 months are depicted in Fig. 5.7a–d.

A 30-year-old male is seen in consultation regarding the contour of his neck. He has an athletic physique and is well within his ideal body. Exam revealed mild submental lipodystrophy with good skin tone. A VAL of the neck and submental area was recommended. The outpatient surgery was performed under general anesthesia. Retro-auricular and submental incisions were used for access. The author's wetting solution formula for general anesthesia cases consisting of 1 mg of epinephrine in 1 L of Ringer's lactate was infused at 250 ml per minute. A 2.4 mm, five-ring VASER probe at 60% energy level was used in pulsed mode for 2 minutes. The liposuction component of the surgery was performed with a 3 mm VentX cannula, extracting a total volume of 70 ml. Incisions were closed with buried absorbable sutures and a compression garment over a contoured TopiFoam sheet was applied at the end of the procedure. Surgical results at 4 months are depicted in Fig. 5.8a–d.

Fig. 5.6 A 35-year-old female patient with minimal submental lipodystrophy underwent VASER-assisted liposuction of the submental area and neck. Preoperative appearance (**a**, **b**). Postoperative appearance at 3 months (**c**, **d**)

Fig. 5.7 A 44-year-old female patient with moderate submental lipodystrophy underwent VASER-assisted liposuction of the submental area and neck. Preoperative appearance (**a**, **b**). Postoperative appearance at 5 months (**c**, **d**)

A 44-year-old woman is seen in consultation regarding significant submental fat deposits and moderate anterior skin laxity. She has lost approximately 30 pounds but has had a stable weight for the past year. She does not desire an open facial and neck rejuvenation procedure. A limited neck and submental VAL was recommended with

Fig. 5.8 A 30-year-old male patient with moderate to severe submental lipodystrophy underwent VASER-assisted liposuction of the submental area and neck. Preoperative appearance (**a**, **b**). Postoperative appearance at 4 months (**c**, **d**)

slightly extended VASER exposure time. The patient appeared to have realistic expectations for a postoperative result and was well aware of the contouring limitations imposed, as a result of her neck skin laxity. The outpatient surgery was performed under general anesthesia. Retro-auricular and submental incisions were used for access. The author's general anesthesia wetting solution formula was infused at 250 ml per minute to a total volume of 300 ml. A higher wetting solution volume was utilized to allow slightly longer VASER exposure and to extend the treatment along the lateral neck to include a greater surface area in the skin retraction. A 2.4 mm, five-ring VASER probe at 60% energy level was applied for 3 minutes and 30 seconds in pulsed mode. The liposuction was performed with a 3 mm VentX cannula. A total volume of 90 ml was extracted from the neck and submental areas. A facial compression garment was applied over shaped TopiFoam at the conclusion of the

surgery. Surgical results at 6 months are depicted in Fig. 5.9a–d. Occasionally VAL techniques are used as an adjunct to facial rejuvenation open procedures. The use of VAL in these cases is helpful in defatting the submental area and better defining the

Fig. 5.9 A 52-year-old female patient with severe submental lipodystrophy underwent VASER-assisted liposuction of the submental area and neck. Preoperative appearance (**a**, **b**). Postoperative appearance at 6 months (**c**, **d**)

neck line. A 42-year-old woman with significant submental and neck lipodystrophy was seen in consultation requesting facial rejuvenation and improvement of her neck contour. Due to some premature signs of facial aging, an open facial rejuvenation procedure complemented by VASER-assisted submental and neck contouring was recommended. She was treated with a 2.4 mm, five-ring VASER probe at 60% energy level for 3 minutes in pulsed mode. Because she was undergoing an open face and neck procedure, the submental extraction and neck contouring were performed aggressively removing 92 ml of total aspirate. Anterior plication of the platysma was performed as part of the rejuvenation procedure since the submental VAL exposed platysma bands. Surgical results at 6 months are depicted in Fig. 5.10a–d.

Some patients with significant lipodystrophy of the submental area as well as signs of facial aging are not willing to undergo open facial rejuvenation procedures. Their appearance can be improved with judicious neck contouring using VASER-assisted liposuction, extending the treatment area over the entire neck in order to allow for better skin retraction. A 49-year-old woman with significant fatty deposits in her submental area and with moderate skin laxity was seen in consultation. She requested improvement of her neck contour but was not willing to undergo an open surgical procedure. Her outpatient surgery consisted of VASER-assisted liposuction of her neck and submental area under general anesthesia. The author's wetting solution for general anesthesia was infused at 250 ml per minute to a total volume of 350 ml. A 2.4 mm, five-ring VASER probe was employed at 60% energy level for 3 minutes and 40 seconds in pulsed mode. Aspiration was performed with 3.0 mm and 2.4 mm VentX cannulas and a total volume of 115 ml was extracted. Surgical results at 8 months are depicted in Fig. 5.11a–d.

HIV-Associated Cervicodorsal Lipodystrophy

Another indication for using VAL in the neck is in the treatment of HIV-associated cervicodorsal lipodystrophy. Suppression of viral replication by means of highly active antiretroviral therapies (HAART) is part of the current therapy used in the treatment of human immunodeficiency virus (HIV). Although these drugs have increased survival for patients infected with HIV, their use is associated with several metabolic complications and morphologic changes. The condition was first described by Carr [7] and can occur in 10–60% of HIV patients receiving these therapies [8]. Plastic surgeons are sometimes called upon to treat abnormal fat redistributions resulting from the prolonged use of these drugs. These abnormal fat deposits are frequently found in the neck particularly in the cervicodorsal region. The deposits can be significant in size and can present as an aesthetic problem but can also be highly uncomfortable for the patient since they are associated with a variety of symptoms such as pain, postural changes, sleep apnea, and range of motion limitations [9]. Ultrasonic-assisted liposuction has been reported by Hultman et al. [10] to be a highly efficient method of treatment for this extremely tight and fibrous fatty deposit. Davidson et al. [11] proposed an algorithm for the surgical management of this condition. A suitable candidate for surgical treatment has stable HIV disease, is under the care of an infectious disease specialist, has laboratory values (cell counts and viral panels) consistent with safe surgery, and has realistic expectations about the aesthetic

Fig. 5.10 A 45-year-old with large-volume submental fat underwent facial rejuvenation surgery with VASER-assisted liposuction of neck and submental area. Preoperative appearance (**a**, **b**, **c**). Postoperative appearance at 5 months (**c**, **d**, **e**)

Fig. 5.11 A 49-year-old woman undergoes VASER-assisted liposuction for correction of extensive lipodystrophy of her submental area. Preoperative appearance (**a**, **b**). Postoperative appearance at 8 months (**c**, **d**)

and functional outcomes. Informed consent should discuss the possibility of recurrence of the deformity, incomplete resection, and the possibility for further surgery.

Surgical Technique

The author's approach to the treatment of this condition is similar to the treatment employed in highly fibrous gynecomastia. The wetting solution consists of 1 ml of 1:1000 epinephrine in 1 L of lactated Ringer's solution at room temperature. A significant amount of fluid is used. The infusion rate is 300–400 ml/minute evenly distributed throughout the area to the point of tumescence. One- or two-ring ultrasound probes are used and the energy settings are 80–90% in continuous mode. The

time exposure will vary depending on the volume of fat being treated and the fibrous nature of the tissue. The endpoint should be a lack of tissue resistance to the probe. Aspiration is performed with 3.7 and 3.0 mm VentX cannulas.

A 48-year-old woman diagnosed with HIV and currently under treatment is seen in consultation regarding enlarging cervicodorsal lipodystrophy. The condition has become symptomatic and is affecting her neck range of motion. A VAL of the area was recommended and after obtaining full medical clearance she will undergo the outpatient surgery under general anesthesia. The author's wetting solution for general anesthesia was infused at 300 ml per minute. A total of 750 ml of the solution was infused, with fairly even distribution throughout the lipodystrophy area. A 3.7 mm, two-ring VASER probe at 80% energy level was employed for 3 minutes and 40 seconds in continuous mode. Aspiration was performed with 3.7 mm and 3.0 mm VentX cannulas. A total of 340 ml of aspirate was extracted. Surgical results at 3 months are depicted in Fig. 5.12. Sheets of TopiFoam and a compression vest

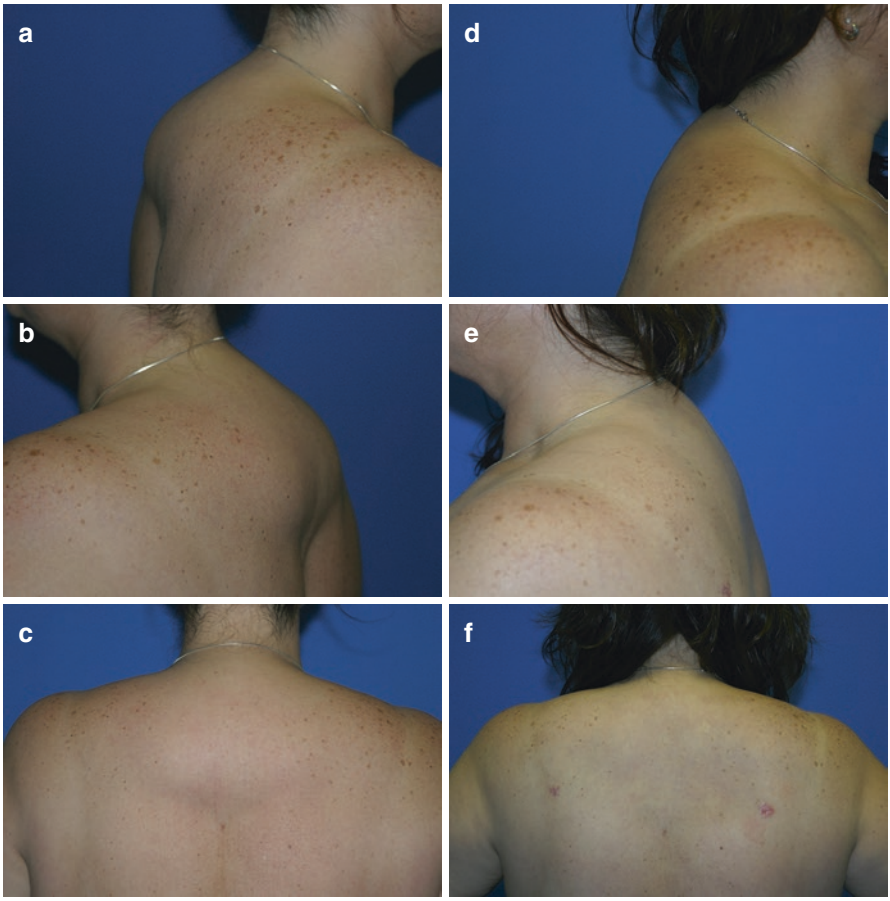

Fig. 5.12 A 48-year-old female with HIV-associated cervicodorsal lipodystrophy. Preoperative appearance. (**a**) Posterior, (**b**) left lateral, (**c**) right lateral. Postoperative appearance at 4 months. (**d**) Posterior, (**e**) left lateral, (**f**) right lateral

are employed postoperatively for 3–4 weeks and moisturizing massages are started after the first week as tolerated.

Conclusion

VASER-assisted liposuction of the neck and submental area is a safe and effective method for aesthetic contouring of these areas. In the author's experience it is associated with minimal complications and high patient satisfaction. The VAL technique is also an efficient method of treatment for HIV-associated cervicodorsal lipodystrophy.

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