

# The Difficult Neck in Facelifting

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## Abstract

### Keywords

- ▶ facelift
- ▶ difficult neck
- ▶ SMAS
- ▶ platysmaplasty

As the popularity and acceptance of facial and cervical rejuvenation procedures grows, surgeons are increasingly encountering patients with less favorable anatomical characteristics for rhytidectomy. These patients will typically display an obtuse cervicomental angle, underprojected chin, excess cervical adiposity, and platysmal banding, in addition to ptotic submandibular glands, tenacious jowls, and prejowl volume deficits. Recognition of these problems and the correct application of available techniques to address the difficult neck in facelifting are critical in maximizing success.

Concerns over age-related changes in the neck are fairly universal among patients who present for a facelift consultation. In fact, the development of prominent jowling and soft tissue laxity, banding, or fullness in the neck seem to cause patients much more consternation than other incipient changes of facial aging. Identifying a patient's specific aesthetic concerns is of paramount importance during any consultation and leads to a more productive and thoughtful discussion on what is attainable with current rejuvenation procedures.

The majority of patients seeking rhytidectomy want a restorative procedure to turn back time and reverse the effects of gravity on their facial and cervical tissues. Younger patients who present for a facelift, on the other hand, may have never possessed defined neck and jaw lines owing to inherited characteristics or have noted a progression toward unfavorable familial characteristics occurring with increased age.

Unfortunately, not all those who present for rhytidectomy are endowed with favorable anatomic characteristics that can often predict a more optimal result from surgery. Increasingly, those with less than ideal facial and cervical anatomy for rhytidectomy present for consultation. Achieving success in this setting largely depends on being able to recognize any deficiencies in the patient's underlying anatomy and correctly applying available techniques to specifically address them.

A thorough understanding and meticulous assessment of the anterior neck compartment are key to identifying challenging anatomical features in prospective rhytidectomy patients. Evaluation of osseous anatomy, musculocutaneous soft

tissues, and skin can aid in classifying patients with suboptimal neck appearance, predicting which patients will be technically more difficult and allowing the surgeon to set more realistic treatment goals for success in the preoperative discussion.

The goal of this article is to further elucidate concepts related to the difficult neck in rhytidectomy and provide recommendations to assist surgeons in optimizing their surgical results.

## Pertinent Anatomical Considerations in the Challenging Neck

Soft tissue laxity resulting from gravitational and atrophic effects on skin, fat, fascia, muscle, and underlying bone can promulgate the effects of aging on the neck. The quality of the skin, in terms of its thickness, elasticity, and compliance, should be noted on initial encounter even though management of the skin during rhytidectomy is fairly consistent in our hands. Simulating a vertical lift with upward traction on the preparotid tissues during the consultation will give the surgeon a better sense of the degree of cutaneous redundancy as well as underlying soft tissue and bony characteristics of the submental, submandibular, and mandibular regions, including the amount and distribution of adipose tissue in the neck, the presence of ptotic submandibular glands, and the tenacity of jowl fat. This, in turn, provides the opportunity to assess the need for adjunctive interventions specifically directed toward the neck.

Adipose hypertrophy in the cervical region is variable as far as its correlation with age, dependent on environmental



**Fig. 1** A 1.4-mm Tulip cannula being used for direct jowl microliposuction.

and genetic influences. Fat is typically distributed in a layered fashion within the neck, mostly in the subcutaneous and supraplatysmal layers within the superficial cervical fascia, but also underneath the platysma and between anterior bellies of the digastric muscle.<sup>1,2</sup> Excess deposits of adipose in the neck can lead to a heavier appearance of the cervical tissues and less favorable results with standard, limited-incision facelifting procedures. Furthermore, hypertrophy and ptosis of superficial jowl fat (which overlies buccal fat) obscures the boundary between the cheek and chin and contributes to the appearance of a heavy face and neck.<sup>3</sup> Management of these separate fat compartments will be discussed later.

The platysma muscle has the most critical role in conserving cervical contour through the aging process. The fundamental mechanism behind modern-day rhytidectomy relies on the contiguous anatomical relationship between the platysma and its overlying fascia, and the superficial musculoaponeurotic system (SMAS) in the face, which makes up the myocutaneous sling of the neck. Despite varying patterns of midline decussation between bellies of the platysma muscle anteriorly,<sup>4</sup> there appears to be a

gradual diatheses over time, leading to platysmal banding. Reconstituting the midportion of the sling is crucial for success in cervicofacial rhytidectomy in anatomically challenging patients.

Assessing the position of the hyoid bone and how it influences the cervicomental angle is very important in determining the difficulty of neck contouring during rhytidectomy. The cervicomental angle is formed between the anterior border of the neck and transverse portion of the submandibular region and should ideally range from 90 to 105 degrees. It typically correlates to the position of the hyoid relative to the mandible. The relationship between the hyoid and a line drawn tangentially through the gnathion superiorly strongly impacts the apparent angulation of the cervicomental junction, with a lower and more anteriorly placed hyoid, resulting in a significantly more obtuse angle, which, in turn, confers a “heavier” appearance to the neck. Additionally, projection of the anterior mandible influences the transitional relationship between the face and neck, whereby an underdeveloped mentum or retruded mandible gives rise to a wider, less defined cervicomental angle.<sup>5</sup> Ideally, the pogonion should lie along a vertical line drawn from the subnasale to the vermilion border of the lower lip in men, and 2 to 3 mm posterior to this line in women.

Finally, volume deficiencies in the prejowl region due to atrophic changes in and around the underlying mandible should be recognized. Reconstitution of volume to normalize the contour of the jaw can have profound effects on the overall aesthetic outcome of rhytidectomy in the difficult neck patient.

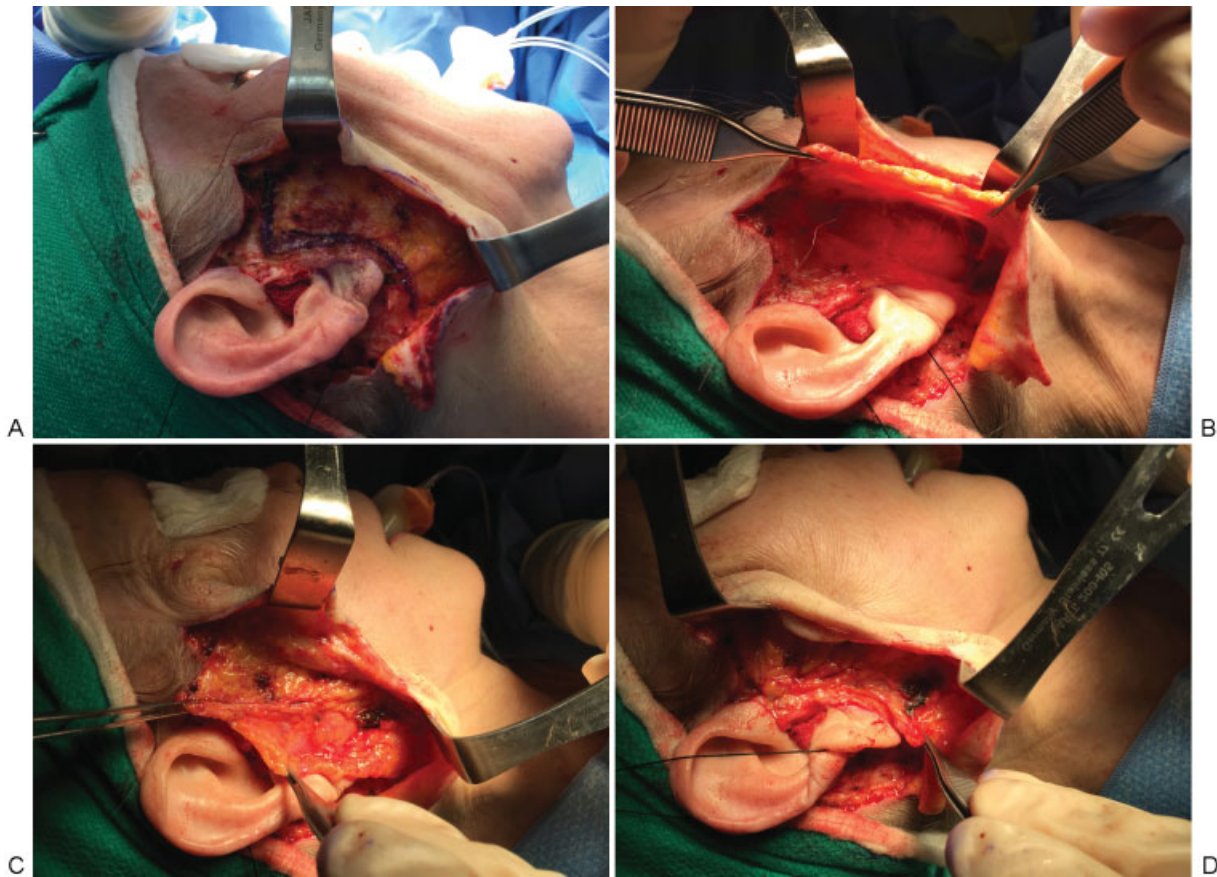
## Surgical Techniques

### Submental and Cervical Fat

Depending on the overall distribution of fat within the cervical soft tissues, those with excessive deposits can be treated with liposuction and/or direct lipectomy. The procedure begins with a 1.5-cm submental incision made just posterior to the submental crease, followed by sharp, subcutaneous elevation of the cervical skin flap using facelift scissors. Dissection with scissors is preferred to blunt



**Fig. 2** (A) Preauricular incision. (B) Postauricular incision with w-plasty, trichophytic component along occipital hairline.

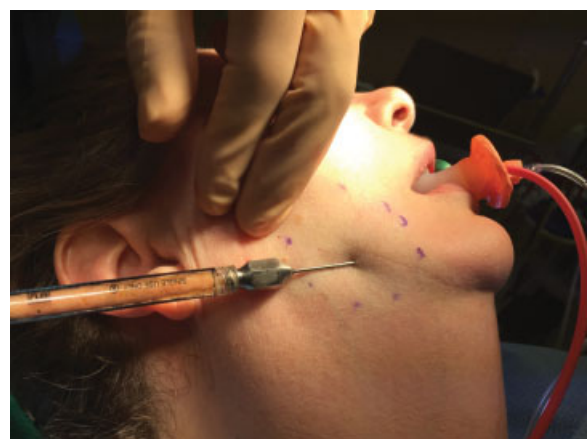


**Fig. 3** (A) "J" superficial musculoaponeurotic system (SMAS) excision. (B) "High SMAS" flap with release of zygomatico-cutaneous ligament. (C) Superior SMAS plication. (D) Posterior SMAS plication.

tunneling dissection with the liposuction cannula because the former permits more uniform undermining and mitigates the risk of uneven contour to the skin. It also allows us to maintain a thin and even layer of fat on the undersurface of the cervical skin flap, which further aids to reduce contour irregularities. Elevation is carried down well past the cervicomental angle and over and even inferior to the thyroid cartilage. Laterally, the skin flaps are elevated to the anterior border of the sternocleidomastoid muscles. Meticulous hemostasis with bipolar cautery is critical.

Open liposuction (using a 3- to 4-mm spatula-tip cannula), in cases with diffuse cervical adiposity, followed by direct midline scissor lipectomy is then undertaken in a standard fashion. The goal is to carefully remove any excessive deposits of fat overlying the platysma and expose its medial borders. Overaggressive liposuction can lead to cutaneous injury and subdermal scarring and, in the region of the cervicomental angle, can contribute toward contour asymmetries over time. The same applies for the submental area. Although subplatysmal fat is seldom excised, if there is an abundant amount of fat that protrudes between the medial borders of the platysma, it is sparingly excised so as not to risk skeletonizing the anterior cervical compartment and risking a cobra-neck deformity. Leaving sufficient preplatysmal fat can help minimize contour irregularities from subplatysmal fat resection.

It is especially important in cases with a low hyoid bone position to excise a small amount of subplatysmal fat just superior to the desired cervical mental angle and then plicate the platysmal flaps into this volume deficiency. When the SMAS is elevated superiorly during rhytidectomy, the platysma is retrodisplaced and elevated superiorly, maximizing the height of the cervical mental angle in these difficult patients.



**Fig. 4** Donofrio straight blunt cannula used for prejawl autologous fat transfer.



**Fig. 5** Classic cobra-neck deformity.

### Platysma

Once overlying excess cervical fat is removed, subplatysmal flaps are carefully elevated laterally using sharp and blunt dissection. A small triangular wedge at the level of the cervicomental angle is then excised with Bovie electrocautery. If significant anterior platysmal banding is present, a myotomy is continued laterally for 2 to 3 cm at the level of the desired cervical mental angle. A tight imbricating platysmal corset suture with 3-0 polydioxone suture is then initiated inferiorly from the desired location of the cervical mental angle to its superior most extent in the submental region. Additional simple interrupted buried knots are then placed just caudad to the corset and in its midpoint to reinforce the platysmaplasty and further define the cervicomental angle. The preplatysmal plane is then reassessed for any irregular or extraneous fat deposits, which are then removed at this time. Careful hemostasis is once again ensured at this point. Medial banding is easily addressed with this technique. Lateral and inferior banding is more challenging and often requires an extended, horizontal incision in the platysma at the level of the cervicomental angle. The author cautions



**Fig. 6** Case 1. Top panel: preoperative images, frontal, three-quarter, and profile views. Bottom panel: three-month postoperative images, frontal, three-quarter, and profile views.



**Fig. 7** Case 2. Top panel: preoperative images, frontal, three-quarter, and profile views. Bottom panel: three-month postoperative images, frontal, three-quarter, and profile views.

against extended platysmal incisions or excisions of the platysma above this level due to the possibility of pseudo-marginal mandibular nerve paralysis (from injury to the cervical branch of the facial nerve).<sup>6</sup>

### Chin

To address underprojection of the chin, as with microgenia or retrognathia, in cases with either class I occlusion or patients not desiring dental repositioning, we use extended silicone chin implants in the setting of rhytidectomy. Alloplastic implants can be easily placed through the existing submental incision used for open cervical procedures. The incision is taken down to the periosteum of the mental tubercle in the midline, preserving the midline periosteum, where pressure from the implant might cause bony resorption otherwise. Two vertical paramedian incisions are then made through the periosteum on either side down to the bone, after which a narrow, subperiosteal tunnel is dissected bilaterally along the inferior borders of the mandible. A tight and precise pocket is critical for successful placement of the implant. We find the converse nasal retractor to be the ideal retracting tool for this purpose in terms of contour and length for tunnel creation. The implant is then secured to the periosteum in the midline with a 5-0 monofilament absorbable suture through the implant itself. This enables further stabilization until fibrous encapsulation takes place.

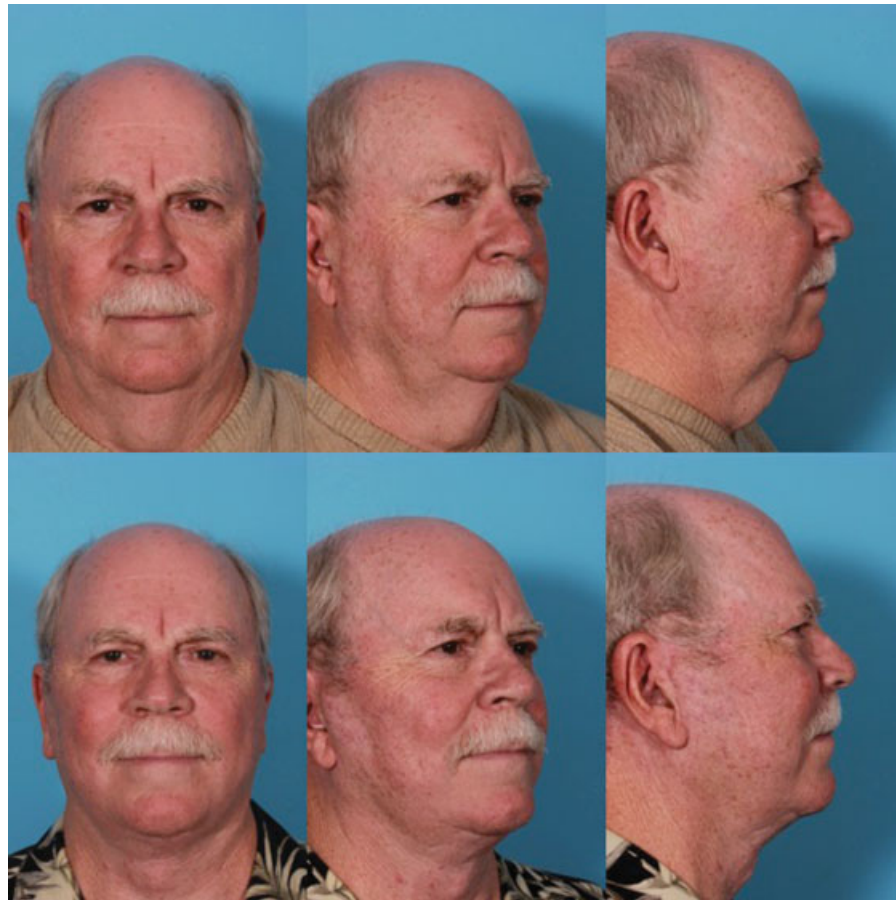
### Jowl Adipose Excess

In cases where the jowl not only appears ptotic but even with manual elevation appears to be overly prominent, direct jowl microliposuction is performed. The authors prefer using a 1.4-mm multiport cannula on a 10-mL syringe to perform direct microliposuction of excessive superficial jowl fat through two puncture sites made with an 18-gauge *NoKor* needle (Becton, Dickinson and Company) (►Fig. 1). One insertion site is lateral and the other superior to the jowl fat to crisscross the tunnels. Approximately 3 to 4 mL of fat is typically extracted from each side.

### Rhytidectomy and SMAS Excision with Imbrication

As management of the neck often requires elevation of the SMAS and platysma, the authors perform a standard extended high-SMAS rhytidectomy technique. Significant release and vertical elevation of the SMAS is critical to neck improvement in most patients with difficult anatomy. A curvilinear incision is designed just below the temporal hair tuft, coursing inferiorly in front of the ear, behind the tragus, around and posterior to the lobule, then extending on the posterior concha, back to the occipital hairline and following it down in w-plasty trichophytic fashion (►Fig. 2).

The length of the occipital hairline incision can be varied to compensate for the amount of posterior skin redundancy.



**Fig. 8** Case 3. Top panel: preoperative images, frontal, three-quarter, and profile views. Bottom panel: three-month postoperative images, frontal, three-quarter, and profile views.

Our incision design allows for an appropriate lifting vector (superior in the face and superior/posterior in the neck) for imbrication of the SMAS while ensuring adequate skin trimming to manage excessive cutaneous redundancy.

Skin flaps are sharply elevated postauricularly and then anteriorly over the SMAS approximately 6 cm radially from the attachment of the lobule so as to mitigate the formation of any dog ears with anticipated SMAS elevation. Continuity is established with the cervical subcutaneous pocket. A “J” (right side, reversed on left) shaped excision of the SMAS is then performed from the infralobular region up to the zygomatic arch, which is then extended anteriorly along the zygoma, a “high SMAS” technique (►Fig. 3A). The SMAS is then undermined sharply over the parotid fascia and, in case of a heavier neck with significant platysmal laxity and noncompliant skin, over the masseteric fascia, releasing the zygomatico-cutaneous ligament while preserving the mandibular cutaneous ligament (►Fig. 3B).

The superior border of the SMAS is then vertically lifted, trimmed, and secured to the deep temporal fascia just anterior to the helical root (►Fig. 3C), while its posterior border is tacked to the mastoid periosteum behind the ear (►Fig. 3D). Skin flaps are then redraped and cut to appropriate contour without any tension.

#### Prejowl Sulcus

Although injectable fillers can be used in the setting of rhytidectomy to help reconstitute volume loss in the prejowl sulcus and jawline, we have found that autologous fat transfer is an excellent complement to rhytidectomy in most aging face cases and can be used extremely effectively to help recontour the inferior border of the mandible for further enhancement of the cervicofacial junction. We typically use one puncture site posteriorly over the inferior aspect of the body of the mandible and place harvested fat along its entire anterior length with a 1.2 mm × 6 cm spoon-tip cannula (Tulip Medical Inc.) or 16-gauge Donofrio straight blunt cannula (Byron Medical Inc.) (►Fig. 4). Fat transfer is typically undertaken prior to the platysmaplasty and rhytidectomy procedures.

#### Submandibular Glands

It is the authors' experience that the majority of patients with ptotic submandibular glands can be managed effectively and long-term with appropriate vertical elevation of the muscular sling created by the plicated platysmal sling and SMAS elevation using the high SMAS technique. The gland will be elevated into a less visible superior position with this SMAS elevation. At times, however, the glands may continue to be visible and therefore patients are



**Fig. 9** Case 4. Top panel: preoperative images, frontal, three-quarter, and profile views. Bottom panel: three-month postoperative images, frontal, three-quarter, and profile views.

counseled to this possibility. Although the authors do not perform intracapsular partial or total excision or repositioning of the submandibular glands, some surgeons advocate these techniques to maximize cosmetic benefit.<sup>7</sup>

#### Revision Neck with Cobra-Neck Deformity

Overaggressive submental lipectomy can lead to an unnatural skeletonized appearance of the central cervical compartment, which in combination with inadequate platysmaplasty can result in a cobra-neck deformity (►Fig. 5). Correction of this deformity may be achieved by identifying the lateral border of the deformity with the creation and use of hardy platysmal flaps, incorporating supra- and subplatysmal adipose tissue with a plication of the entire muscular adipose flap to fill in the tissue void that created the cobra-neck deformity.

### Cases

#### Case 1

A 60-year-old female presented for lower facelift (►Fig. 6). Preoperative evaluation revealed significant jowling with microgenia, a low and anterior hyoid, and excessive submental adiposity. The patient underwent open cervical liposuction and direct lipectomy, augmentation genioplasty with a large silicone extended anatomical chin implant (Implantech Associates, Inc.), and lower facelift with platysmaplasty.

#### Case 2

A 63-year-old female presented for lower facelift (►Fig. 7). Preoperative evaluation revealed prominent jowling, significant blunting of cervicomental angle due to excessive skin laxity with accumulation of subcutaneous fat producing a “turkey gobbler” deformity, and heavy neck appearance. The patient underwent full-face autologous fat transfer, open cervical liposuction and direct lipectomy, and lower facelift with platysmaplasty. Autologous fat (2 mL) was placed in the prejowl sulcus on each side.

#### Case 3

A 67-year-old man presented for neck lift (►Fig. 8). Preoperative evaluation revealed significant skin laxity, diffuse cervical adiposity, a low hyoid position, and prominent jowling. The patient underwent open cervical liposuction and direct lipectomy, and lower facelift with platysmaplasty.

#### Case 4

A 58-year-old female presented for lower facelift (►Fig. 9). Preoperative evaluation revealed tenacious and prominent jowling, microgenia, low hyoid position, and excess cervical adiposity. The patient underwent open cervical liposuction and direct lipectomy, jowl microliposuction, augmentation genioplasty with a medium silicone extended anatomical chin implant, and lower facelift with platysmaplasty.



**Fig. 10** Case 5. Top panel: preoperative images, frontal, three-quarter, and profile views. Bottom panel: three-month postoperative images, frontal, three-quarter, and profile views.

### Case 5

A 64-year-old female presented for revision lower facelift (→ **Fig. 10**). Preoperative evaluation revealed a significant cobra-neck deformity with prominent submandibular gland ptosis. The patient underwent full-face autologous fat transfer and lower facelift with platysmaplasty. Autologous fat (2 mL) was used to supplement the prejowl sulcus.

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