

Chapter 29: Rhytidectomy

Devinder S. Mangat, E. Gaylon McCollough, Richard W. Maack

A rhytidectomy, or face-lift, is the most commonly performed procedure for rejuvenation of the aging face, although it is actually the second most commonly performed cosmetic operation. A wider acceptance of cosmetic surgery, coupled with technical advances and superior surgical training, has made the face-lift procedure a more "radical" operation than the one known at the turn of the century. As society has become more beauty conscious and youth oriented, an increasing number of both men and women have sought cosmetic surgery to remain youthful looking and thus productive and competitive in various professions. Further, the stigma associated with facial cosmetic surgery that once caused patients to undergo and surgeons to perform these procedures in a sphere of secrecy no longer exists. The widespread media discussion of cosmetic facial surgery not only has increased public awareness of the surgery but also has precipitated an overall improvement in the postoperative results of cosmetic surgery. This can be attributed in part to greater dedication, higher standards, and stronger competition in the profession. The numerous symposia held each year on this subject have increased the exchange of ideas among cosmetic surgeons and thus produced significant advances in the practice of cosmetic facial surgery.

This chapter does not provide a complete description of the face-lift procedure but rather outlines the current philosophy, techniques, and results that represent the state of the art in this field.

Historical Background

Until the 1960s medical journals and textbooks contained few articles on cosmetic surgery and in particular the face-lift. The prevalence until then of attitudes downgrading cosmetic surgery as "unnecessary" and "treating only vanity" explains why little was written on the subject. The increase in the number of publications dealing with facial cosmetic surgery began at nearly the same time in Europe and America.

Charles C. Miller is credited with writing the first published article on cosmetic surgery in America. In 1906 he wrote about "the excision of baglike folds of the eyelids". He described numerous cosmetic procedures on the various facial parts, including fusiform excisions of skin in an effort to treat excessive "folds of skin".

Eugen Hollander, a Berlin surgeon, was probably the first to specifically write about the procedure now known as the face-lift or rhytidectomy. His 1912 publication describes the removal of fusiform segments of temporal, periauricular, and postauricular skin to eliminate sagging cheeks and droopy oral commissures. Although many surgeons took credit for being the first to perform a "face-lift" type of procedure, in fact earlier another surgeon had performed the surgery. Jacques Joseph, in Berlin, published a book in 1912 entitled *Handbuch von Kosmetik*, in which he describes the face-lift operation for correction of sagging cheek tissues. Others credited with early writing about surgery on the aging face are Passot (1919), Bettmen (1920), Bourquet (1919), and Huret (1926). Eric Lexer, in 1931, described a procedure similar to Hollander's in which he emphasized skin undermining in addition to fusiform skin excision to obtain a satisfactory result. Maliniak (1932), was one of the first to

describe submental fat excision in restoration of the aging face.

Mme. Dr. A. (Suzanne) Noel, a Frenchwoman, in 1925 published *La Chirurgie Esthetique: Son Rôle Social*, then considered one of the most complete textbooks on cosmetic surgery. It included a large number of preoperative and postoperative photographs of patients undergoing face-lifts and other facial cosmetic procedures. Rogers (1971) has written a more thorough history of cosmetic surgery, and we recommend it for reference.

Extensive changes and advances have been made in rhytidectomy technique during the past 10 to 15 years. We continue to see new techniques being developed in an attempt to obtain a better, more natural postoperative facial appearance. These advances are credited to numerous surgeons, among whom are Conley (1968), Skoog (1975), Webster et al (1976), Gonzalez-Uloa (1962), Rees (1980), and Anderson (1975). Through the dedication of these pioneers and teachers, we are currently experiencing the increasing popularity of facial cosmetic surgery, which is in turn adding significantly to the quality of life for patients.

Patient Selection

The fact that the rhytidectomy has quickly become the second most common cosmetic procedure emphasizes the need for careful selection of candidates to ensure not only a satisfactory result but also a satisfied patient. An individual's physical health, emotional state, and facial anatomy all play a significant role in determining the final outcome of a rhytidectomy.

Physical health

The patient undergoing this elective procedure should be in good general health with all organ systems functioning satisfactorily, particularly the cardiovascular and pulmonary systems. A patient with significant renal or hepatic disease should be advised against surgery. Careful thought has to be given to operating on heavy smokers and excessive alcohol users. Such factors should either eliminate a potential candidate or cause the surgeon to perform a more "conservative" procedure. A person with uncontrolled diabetes is also considered a relatively poor risk for a face-lift. A younger diabetic with early microvascular disease may, however, qualify for a "short-flap" procedure that is combined with an aggressive superficial muscular aponeurotic system (SMAS) plication.

Emotional health

The psychologic status of a prospective patient must be evaluated thoroughly. A person under emotional stress, undergoing marital discord, or with unreasonable expectations for a face-lift operation should be advised to delay surgery until the stressful situation has improved or his or her expectations have become more realistic. Approximately 10% of patients seeking cosmetic surgery are not acceptable because of an unfavorable psychologic profile.

Anatomic factors

The specific characteristics of the bony framework of the face, the muscles, the fascia, the subcutaneous fat, and the skin determine in large part the type of result one may expect from a rhytidectomy. High cheek bones, a prominent mandibular outline, a hyoid bone located high in the neck producing an aesthetically pleasing acute cervicomental angle, and healthy skin with minimal actinic damage all constitute ideal anatomic features and indicate a likelihood of a pleasing surgical result.

As aging occurs, both the skull and the facial skeleton undergo some atrophy. This change, along with a loss of skin elasticity, thinned epidermis, absorption of subcutaneous fat, and the ever-present gravitational forces all contribute to the droopy brows, cheeks, and submental area so characteristic of the aging face. A patient with minimal actinic damage who is in his or her early 40s derives the greatest benefit from surgery and achieves a natural postoperative appearance. Conversely, a patient in the sixth decade of life whose skin displays the ravages of excessive sun exposure may require a chemical peel or other ancillary procedures in addition to a rhytidectomy to achieve a desired result.

One of the limiting factors in rhytidectomy is submental sag, or "turkey-gobbler" deformity, which is usually due to a combination of skin sag, platysma muscle banding, and excessive submental fat deposition. Some feel that an unfavorably low position of the hyoid bone contributes to this problem (Fig. 29-1). A submental procedure is required, which includes lipectomy, extensive undermining, and elongation of the anterior edges of the platysma muscles. Sometimes an augmentation mentoplasty is necessary to achieve a satisfactory result. Another challenging problem is a rounded face with thick skin and abundant subcutaneous fat (Fig. 29-2). Such cases may need extensive lipectomy in addition to rhytidectomy for a satisfactory result. Suction lipectomy has added a new dimension to treatment of this deformity. Despite the possibility of using all available techniques before surgery the surgeon must inform these patients about the anatomic limitations and the probability of a less than ideal result.

When required by the anatomic variations of the facial skeleton, the surgeon may be wise to consider ancillary procedures to complement the rhytidectomy and make the face more pleasing. Reduction of prominent supraorbital rims, augmentation of flat malar eminences with malar implants, and augmentation of the chin to improve facial profile and emphasize the cervicomental contour are some of the related procedures that should be considered in a patient seeking rejuvenation of an aging face.

Although certain anatomic factors can limit the outcome of a rhytidectomy, the recognition of these factors allows one to compensate for them and do more than a "standard" procedure to get a better than average result.

Facial Musculature

Facial musculature and the associated fascia play a very important role in the aging process; facial rejuvenation surgery must take into account the action of these muscles and fascial planes. A rhytidectomy that simply "tightens up" the loose skin will not produce a lasting result and will not correct some of the neck and cheek deformities that require

restructuring of muscle, fascia, and fat.

The face and neck contain a complete network of muscles that are closely associated with each other and form groups that produce facial movement in the upper, middle, and lower thirds of the face (Fig. 29-3). Twenty-four pairs of muscles in the face are responsible for facial expression and movement of the forehead, brows, cheeks, lips, ears, and scalp. The contraction of these muscles, combined with atrophy of subcutaneous tissues and actinic damage, produces the wrinkle lines in the forehead, glabella, periorbital area, and perioral area. The direction of these lines is always perpendicular to the orientation and contractional vectors of the muscles (Fig. 29-4). This fact dictates which techniques will be required to aid in rejuvenation of a given face. Except in the forehead, no operative procedure can be safely used to eliminate these lines. A rhytidectomy may need to be supplemented by a forehead lift or a chemical peel to obtain the desired result and reduce excessive wrinkles.

With the exception of the forehead muscles, the platysma is the only other muscle that is actually altered or rearranged in a face-lift procedure. Disturbing the rest of the facial muscles in the middle and lower thirds of the face is rarely necessary or safe. The platysma arises from the upper chest as a thin, flat, paired muscle that covers the entire lateral aspect of the neck and extends to the lower part of the face, where it inserts into the skin. The platysma does not extend across the midline of the neck, so that usually a 4 to 5 cm section in the anterior midline of the neck is devoid of platysma. This deficiency contributes to several deformities of the submental and neck region, such as (1) *anterior banding*, caused by the divergent medial borders of the platysma, connection of which may require suturing of the platysmal bands in the midline, and (2) the unpleasant "*turkey-gobbler*" deformity, which is in part due to the anatomic variation produced by the platysma muscle as well as excessive skin, fat, and sometimes a malpositioned hyoid bone. Further discussion of the platysma and its treatment will follow later in this chapter.

SMAS

A superficial muscular aponeurotic system (SMAS) of fibrous and fascial tissue extends from the temporalis and frontalis muscles superiorly to the platysma inferiorly. Repositioning or suspending the SMAS has become the most significant improvement in face-lift surgery over the past 2 decades. Although procedures on the SMAS had been performed in the past, it was not until 1976 that this aponeurotic system was first anatomically described - by Mitz and Peyronie, following their efforts with cadaver dissections. Their article remains essential reading for any surgeon using the SMAS to facilitate the rhytidectomy procedure. Most authorities now consider advancement of the SMAS, accompanied by plication, imbrication, or flap tightening, to be the single most important component of a rhytidectomy and the one that contributes to a longer-lasting result.

This aponeurotic system can easily be identified as a shiny, fibrous layer adherent to the parotidmasseteric fascia, from which it extends inferiorly and anteriorly to attach to the dermis in the cheek area, the platysma over the mandible, and the sternocleidomastoid muscle fascia (Fig. 29-5). Superiorly, the SMAS is tightly adherent to the zygomatic arch and temporalis fascia. The frontal branch of the facial nerve courses just beneath the SMAS in this area. Procedures utilizing the SMAS are described later in this chapter.

Facial Nerve

To avoid the potential, distressing complication of facial weakness resulting from intraoperative facial nerve injury, any surgeon who performs a rhytidectomy should thoroughly understand the distribution of the facial nerve branches and their frequent anatomic variations. A textbook of head and neck anatomy will provide a discussion of facial nerve anatomy. The present discussion will be restricted to surgical anatomy and its application to rhytidectomy.

The temporal branch passes over the zygomatic arch as it leaves the parotid gland and become quite superficial in the region lateral to the eye. Any dissection in this area should be at the immediate subdermal level. The marginal mandibular branch is the other nerve that is at considerable risk for injury because it drops below the border of the mandible and is just deep to the platysma as it courses to the perioral region. Dissection in this area should not be extended beneath the platysma muscle. Injury to the buccal branch usually occurs when dissection in the cheek area becomes too deep. Keeping the cheek flap thin, with only a small amount of subcutaneous fat under the dermis, should prevent injury to the buccal branch.

Preoperative Evaluation

A history questionnaire similar to the one developed by Anderson and Johnson (1978) can be a useful guide in patient selection and screening even before the consultation. The patient's physical and mental health statuses are determined during the preoperative consultation visits. Excluding patients with unrealistic expectations or misdirected motivations for having the operative procedure is important. These patients should be asked to reevaluate their desires and consider postponing surgery.

In addition to performing a physical examination of the head and neck, the clinician must take photographs, which can be used both for analysis and for pointing out asymmetries, deformities, and anatomic limitations to the patient. A 90- to 105-mm macro lens is used for facial photography; the standard views taken include frontal, left and right lateral, left and right oblique, and submental, and close-up views of both ears. Additional close-up views can be taken to demonstrate forehead wrinkles, perioral lines, and platysmal banding in the neck.

During a subsequent preoperative consultation, the placement of the incisions and thus the eventual scars may be demonstrated on the photographs. Anatomic limitations such as deep nasofacial creases or an obtuse cervicomental angle should be pointed out to the patient and the likelihood of a less than ideal result emphasized. Any significant asymmetries in the brow, cheeks, oral commissures, or the neck should be identified preoperatively because they will probably persist postoperatively. Patients usually detect these differences in the postoperative period and tend to blame the operative procedure for their "sudden appearance".

In addition to taking the usual review of systems and careful history of past illnesses or surgery, the surgeon must inquire about any bleeding tendencies or the use of salicylate-containing products or other anticoagulants. These medications must be discontinued for 2 weeks before rhytidectomy. The standard laboratory tests should include a complete blood count, coagulation profile (prothrombin time, partial thromboplastin time, and platelet count), urine analysis, blood glucose, and blood urea nitrogen. A chest radiograph and an

electrocardiogram may be indicated in patients with suspected cardiac or pulmonary disease. Patients taking antihypertensives should have a serum electrolyte study. A physical examination by the patient's personal physician is most beneficial as an adjunct to the laboratory investigation.

Patient Preparation

To lower the bacterial count preoperatively, all patients are instructed to shampoo the hair and wash the face and neck with a surgical soap such as pHisoHex or Septisol the night before surgery. The hair is not shaved or clipped but simply parted along the planned incisions and taped in small bunches to keep it out of the way.

Any one of the several premedication regimens used by various surgeons is effective. These usually include a tranquilizer, a hypnotic, and a narcotic. The use of scopolamine instead of atropine provides an amnesic effect, which is desirable for patients under local anesthesia.

Anesthesia

The surgeon's preference usually governs the choice of anesthesia for this procedure. The patient's wishes and, to a certain extent, the type of procedure to be used, however, influence the choice of anesthesia. In most instances, a patient who is a poor risk for a general anesthetic is probably also a poor candidate for a rhytidectomy.

Local anesthesia is used in conjunction with sedation so that the patient is in a "twilight" sleep and has relative amnesia for the procedure. The local anesthetic used is 2% lidocaine containing 1:100,000 epinephrine for the incision and 1% lidocaine with 1:100,000 epinephrine in areas to be undermined on the face and neck. The face is injected one side at a time to reduce risks of lidocaine toxicity and the side effects of the epinephrine. For a complete face-lift, approximately 20 mL of the local anesthetic solution is used on each side. When one is using local anesthesia, intravenous sedation is administered to produce a twilight sleep just before the injection of the local anesthetic agent (and occasionally during the procedure, depending on the patient's anxiety level). We have used local anesthesia with sedation exclusively for rhytidectomy in more than 2000 patients, with excellent patient and physician satisfaction. More than 98% of patients have their rhytidectomies under local anesthesia with sedation, and the vast majority of these complain of no discomfort or inconvenience.

General anesthesia is also a perfectly acceptable method, which can be used in the properly equipped outpatient office facility or in the hospital. It does not, however, obviate the use of local anesthetic agents such as lidocaine containing epinephrine, because the latter is necessary to ensure adequate vasoconstriction and to minimize bleeding during the procedure. An experienced anesthesiologist can use hypotensive general anesthesia in the carefully selected patient.

Operative Technique

The procedure is performed with the patient's head positioned in a neurosurgical headrest or in a "dental" chair. The dental chair has two advantages: the narrow, tapered headrest allows the surgeon to work close to the patient; the chair permits the patient to be placed easily in the Trendelenburg or the reverse Trendelenburg position. The surgeon's position beside the patient is ideal if the headrest portion of the operating table can be placed in the surgeon's lap.

The patient is placed supine in a slightly reversed Trendelenburg position. No hair is shaved along the incision lines, which are outlined with a marking pen. The hair is simply parted along the incision lines and retracted with tape. The hair above and behind the planned incisions is retracted by the use of 1-inch tape placed circumferentially around the head (Fig. 29-6). Additional scrubbing of the head is unnecessary if the patient has washed the face and hair with pHisoHex or Septisol at least twice before surgery.

Incision

There is no standard rhytidectomy incision; the type of procedure to be used and the anatomic characteristics of the particular patient determine the incision selection.

Fig. 29-6 shows some of the commonly used incisions. Fig. 29-6, A, shows a pretragal incision, which is utilized when a prominent preauricular crease is present. The resulting scar is well camouflaged in this crease. The incision shown in Fig. 29-6, B, is modified in the region of the sideburn. The temporal incision, instead of extending directly to the preauricular crease, is carried into the sideburn hair in a curvilinear fashion to preserve the tuft of the hair anterior to the pinna. This incision prevents hair-bearing skin in front of the upper pinna from being excised and discarded when the temporal-cheek flap is rotated and advanced posterosuperiorly. This modification in the rhytidectomy incision allows for a more natural postoperative appearance even after multiple face-lift procedures. Fig. 29-6, C, shows a posttragal incision in which the tragus has been skeletonized. The posttragal incision must be carefully performed because a distorted tragus can result postoperatively. Fig. 29-6, D, illustrates a high postauricular incision, which ensures a well-camouflaged scar, since it is placed entirely within the occipital hairline. When a large amount of skin is removed, however, this incision causes the hairline to be moved too far superiorly.

In addition to marking of the incisions, the area to be undermined is outlined with a marking pen to indicate appropriate anatomic landmarks to be considered during elevation of the flaps.

After injection of the local anesthetic, one must wait at least 15 minutes before making the incision to allow adequate vasoconstriction to occur. The incision in the hairline is beveled slightly to parallel the hair follicles, thereby avoiding injury to them. The surgeon undermines and elevates the flaps with scissors, making sure that a relatively thin layer of fat is maintained on the flap. Out over the face, the flap should be thin enough to allow the operating light to shine through it. Care must be taken in the mastoid area and over the sternocleidomastoid muscle because of tight adherence of the skin to the underlying structures. Sharp dissection with a knife may be preferred in those two areas. Injury to the greater

auricular nerve can be avoided by being certain to elevate a thin flap over the upper third of the sternocleidomastoid muscle.

Flap elevation

Elevation of the temporal flap is carried out with blunt dissection at the level of the temporalis fascia to prevent injury to hair follicles. When the dissection reaches the temporal hairline, however, further anterior dissection must be at the subdermal level. Anterior elevation of the flap in this area should be limited, to avoid injury to the frontal and zygomatic branches of the facial nerve. In general, dissection should be avoided over the malar eminence so as to avoid injury to the zygomatic and buccal branches of the facial nerve. Deeper dissection in this area may also lead to troublesome bleeding.

Elevation of the flaps in the cheek and neck can be accomplished with relative ease; the flaps are kept relatively thin, with only a thin layer of fat on the undersurface of the dermis. When a "long-flap lift" is performed, dissection can be extended to the nasofacial crease and close to the oral commissure. In the long-flap procedure, the skin flap extends just beyond the particular facial deformity that is being treated, whether it is in the cheek, the jowls, or the neck. The risk of injury to the ramus mandibularis can be minimized by keeping the dissection superficial over the body of the mandible since in this region the nerve lies just beneath the platysma muscle. The length of the flap to be elevated in the neck depends on the amount of skin redundancy and elasticity in the submandibular and submental areas. When there is a great deal of adipose tissue in the submental area or prominent platysma banding in a "turkey-gobbler" deformity, many surgeons prefer to add a submental incision to perform submental liposuction or other techniques in that area.

Short versus long flap

Many surgeons disagree about the relative efficacy of the "long flap" versus the "short flap" in rhytidectomy. The former implies extensive undermining, including the connection of the two cheek-neck flap across the submentum. The short-flap technique, in contrast, involves more limited undermining and depends heavily on SMAS suspension or plication to produce the desired result. Today most surgeons include SMAS tightening techniques even when elevating the long flaps.

The anterior extent of the dissection in the short-flap procedure is usually 4 to 6 cm (Fig. 29-7) from the incision in the temporal, cheek, and cervical areas. The flap is elevated just far enough forward to identify SMAS and allow its suspension, imbrication, or plication. Following SMAS suspension, a moderate amount of additional tension can be placed on the skin flap at the time of skin excision and tailoring. After the excess skin has been excised, the amount of elevated flap remaining may be no more than 1 to 2 cm in some areas. The short-flap technique offers the following advantages when compared to the long-flap procedure:

1. Lower incidence of postoperative hematoma formation.
2. Reduced risk of facial nerve injury.
3. Lesser tendency toward skin necrosis.
4. Shorter operating time.
5. Less postoperative facial edema and ecchymosis.

When the long-flap technique (Fig. 29-8) is used for correction of submental deformities, it is usually best to make a separate submental incision. The submental flap is elevated inferiorly to the level of the thyroid notch and laterally to a perpendicular line drawn downward from the oral commissures. The cheek flaps can then be connected to the submental flap from the two sides.

Elevation of a long flap allows excision of fat in the submandibular and cheek areas in the patient with a "heavy face". Platysmal flaps, transection of the platysma, or other procedures on this muscle can most readily be accomplished through a submental incision. Other advantages of the long-flap technique are as follows:

1. More effective correction of excessive jowls and loose neck skin.
2. Possibly a longer-lasting result when compared to the short-flap procedure.
3. Better correction of excessive melolabial folds.

A long flap allows a layer of fibrosis to be deposited in a larger area, which in itself is thought by many to produce some prolongation of the benefit of surgery. There are definite disadvantages associated with the long-flap procedure as compared to the short-flap method. These have already been alluded to above. It can be safely stated that the long flap *without* a SMAS suspension offers no advantage over the short-flap procedure *with* a SMAS suspension, carries a higher complication rate, and requires a longer operative time.

A third method, which we prefer, combines the advantages of the short- and long-flap techniques while minimizing the risks associated with the long-flap elevation. With this technique, a "medium-length" flap of about 6 cm in length is undermined in the usual manner to expose the SMAS. Further flap undermining is then accomplished medially for several centimeters using blunt dissection with a "dry tunnelling" technique using the 4 mm liposuction cannula. Remaining in the subcutaneous plane, the cannula is advanced medially, without suction, to the melolabial fold and the oral commissure, freeing the flap from the underlying tissues (Fig. 29-9). This blunt method of elevation reduces the risk of facial nerve injury and causes minimal bleeding, yet affords the advantages of further flap elevation as seen with the long flap. This technique is used most often in patients with prominent melolabial folds and excessive amounts of inelastic skin.

Management of SMAS

Primarily three methods are available for using the SMAS to facilitate the rhytidectomy procedure. Some surgeons elevate the SMAS as a separate flap. An incision is made into the SMAS in the preauricular area, beginning just below the zygomatic arch and then coursing along the preauricular line and extending along the posterior border of the platysma muscle for a short distance. If a SMAS flap is to be elevated, a sheet of fascia is elevated forward to the anterior border of the parotid gland in the cheek and up to the

sternocleidomastoid muscle in the neck. This layer of SMAS is then advanced in the posterosuperior direction and sutured to the mastoid periosteum and tragal perichondrium after the redundant portions are trimmed.

The second method, which we prefer, involves excising a strip of SMAS in the preauricular and infraauricular areas and then plicating the two edges with a 2-0 braided white nonabsorbable suture (Ethibond or Mersilene). The advantage to this equally effective method of advancing the SMAS posterosuperiorly and suspending it is that it involves less risk of injuring the marginal mandibular nerve or prominent blood vessels. After employing many of the more classical techniques, we prefer to use this method of treating the SMAS and have found it to be most helpful.

To avoid injury to the frontal branch of the facial nerve, dissection of the SMAS should begin at least 1 cm inferior to the zygomatic arch. Similarly, because of the close association of the marginal mandibular branch to the SMAS, its anteroinferior dissection should stop 1 cm above the inferior border of the mandible. To protect the buccal branch, the dissection should not go beyond the anterior border of the parotid gland. These limits are crucial only if a SMAS "flap" is to be developed and advanced.

Imbrication of the SMAS, the third method, is similar to the plication method but does not involve excising a strip of SMAS. The anteroinferior part of the SMAS is simply suspended to the more posterosuperior portion. Imbrication of the SMAS may not be the procedure of choice, since it sometimes produced bunched-up tissues under the cheek flap, which may persist for a long period of time.

The use of a SMAS technique offers a "two-layer suspension" of tissues, one at the level of the muscle fascia and the other at the level of the skin itself. This suspension offers the following advantages over the standard cutaneous face-lift technique:

1. Suspending the SMAS allows the facial muscles to be tightened throughout the face, thus producing a more significant and lasting improvement in appearance.
2. The SMAS technique may make the short-flap procedure as effective as the long-flap procedure, thus avoiding the greater risk, increased morbidity, and longer operating time associated with the latter.
3. SMAS suspension avoids placing excessive tension on the skin flaps, thereby minimizing the risk of skin loss and poor healing.

Repositioning the skin flaps and tailoring must be accomplished skillfully to avoid significant deformities of the ear and unsightly scars. The direction in which the flaps are pulled is primarily posterosuperior. However, the cephalad orientation is slightly exaggerated to avoid dog-ears in the occipital hairline closure and to prevent the masklike facies or "plastic look" created by an excessive posterior pull (Fig. 29-10). Most of the tension is carried by the temporal and postauricular portions of the flap. No tension should occur in the preauricular closure and in the area of the earlobe. When excising skin from beneath the earlobe, the surgeon underestimates the amount to be excised so that the closure lies free with no tension. If the closure beneath the earlobe is subjected to any tension at the time of

surgery, a downward pull in the postoperative phase will result in the very displeasing stretched-earlobe deformity.

We use stainless steel Autosuture for the closures in the hair-bearing areas in the temporal and occipital regions. The preauricular, postauricular, and submental incisions are closed with 5-0 plain catgut sutures. A few horizontal mattress sutures placed around the earlobe and at the apex of the postauricular incision can often produce a more precise closure and better scars later. Some surgeons suggest placing a Z-plasty at the apex of the postauricular incision to avoid linear scar contracture and a bandlike hypertrophic scar.

No drains are used with the short-flap technique, but placing a snug circumferential dressing with even pressure over all flaps is of great importance. Drains are used bilaterally with the long flap, with the soft Silastic drains being brought out in the occipital hairline superior to the incision and connected to a compressive reservoir. The patient can keep the reservoir activated and regularly emptied without any difficulty. A circumferential dressing is also used during the first 24 hours (Fig. 29-11). The dressings and drains are removed within 24 hours, and a light elastic "sling" dressing is placed, which provides light pressure and support. Most patients choose to wear this elastic sling for several weeks in the postoperative period because it not only provides support in the neck area but also protects the incisions and reminds them not to turn their heads excessively (Fig. 29-12). All patients are given written postoperative instructions (in booklet form) regarding activity, medications, diet, care of incisions, restrictions, and the expected postoperative changes. These instructions are helpful for the patients and their families and also prevent unnecessary phone calls to the surgeon in the postoperative period.

Management of submandibular and cervical areas with suction lipectomy

The standard rhytidectomy alone has not produced optimal lasting results in patients with excess fat in the neck, submandibular, and facial regions. Without eradication of these fat pad accumulations, a well-defined cervicomenal angle is not restored, resulting in a less than adequate postoperative result. A number of different methods have been used over the years to complement the rhytidectomy by reducing excess fat deposits.

Until several years ago, sharp dissection under direct vision through horizontal submental incisions had primarily been used to excise cervical fat accumulations. Risks with this method, although infrequent, have included nerve injury, hematoma, skin damage, and postoperative submental depression from too vigorous a lipectomy. More recently, suction lipectomy has become the preferred method for removing submandibular and cervical fat in association with a rhytidectomy. This procedure is less traumatic and faster than the sharp dissection lipectomy with the risks of nerve injury or hematoma being minimal.

The submental liposuction is performed before the rhytidectomy. Fat is removed by means of a high negative pressure created by a suction machine through a blunt cannula. The submental and cervical areas are injected with 0.5% lidocaine with 1:100,000 epinephrine, and 15 minutes are allowed to pass to achieve good hemostasis. A 1 to 2 cm incision is made in the submental crease, and a subcutaneous flap is developed for about 1 cm with sharp dissection. A blunt 4 mm cannula is then inserted into this incision with its opening directed away from the skin. Using no suction, subcutaneous tunnels are created with gentle pressure

on the cannula in a radial pattern from the submentum to about the level of the thyroid cartilage inferiorly, to the anterior borders of the sternocleidomastoid muscles laterally, and to the angles of the mandible posteriorly. The opposite hand is used to stabilize and guide the cannula in the neck. In this manner, most of the fat is separated from the overlying skin. This smaller cannula is then replaced with a 6 mm cannula, again with its opening toward the platysma. Once in place, suction is started and a back-and-forth motion is used to remove fat in a specific area, again, guiding the cannula with the other hand (Fig. 29-13). After several passes, the cannula is removed and the suction is stopped. This procedure is repeated until adequate fat is removed to create a well-defined cervicomental angle. Care should be taken to prevent puncture through the platysma and possible subsequent nerve or vessel injury. A limited subplatysmal liposuction may be performed safely only in the midline of the neck and occasionally is necessary to accomplish desired results.

After completion of the liposuction, the same incision can then be used, if it is in the treatment plan, for a chin implant. The incision is easily closed with a locking No 6-0 mild chromic gut suture. At this point the rhytidectomy is performed. On completion of the rhytidectomy, it is important to include the submental and cervical regions in the pressure dressing.

During the rhytidectomy, an "open" liposuction technique is employed, if needed, to remove excess lower cheek and parotid fat pads. After tightening the SMAS and suturing it into its new position, bulky excess fatty accumulations are often present on the parotid fascia and lower cheeks. These are easily reduced by passing the liposuction cannula onto these areas under the still raised (open) skin flap and suctioning. Repetitive gentle passes with the cannula opening toward the fascia are used until minimal fat remains. It is important to avoid violating the parotid fascia or suctioning near the midface where there is risk of nerve or vessel injury. After this "open" liposuction, the rhytidectomy is resumed as previously described.

Management of platysma

Management of the platysma muscle is becoming an increasingly important part of face-lift surgery. Skoog (1975) and others have pointed out the relationship of the platysma muscle to the facial aponeurosis. Cheek and jowl sagging is corrected by a subaponeurotic dissection and SMAS suspension as described above. Tailoring and repositioning of the platysma are necessary for recontouring the neck. The medial borders of the platysma (Fig. 29-14) are frequently seen as prominent cords (Fig. 29-15) in the submental area on either side of the midline. These platysmal bands, together with accumulated submental fat, constitute the "turkey-gobbler" deformity, which is difficult to correct without close attention to the platysma.

Skoog and other authors have described various procedures for the platysma muscle. These include the following:

1. Resection of the medial borders of the platysma anteriorly.
2. Posterior plication of the platysma, as with SMAS suspension.
3. Partial division of the platysma muscle with creation of platysmal flaps - usually as a large Z-plasty to elongate the muscle in the midline by interdigitating the Z flaps.
4. Complete division of the platysma muscle bilaterally at the level of the thyroid cartilage and plication of the outer segments in the midline.

We have found that in a vast majority of patients in whom the condition is severe, suturing the medial borders of the platysma proves adequate for correcting most neck abnormalities caused by this muscle. Through a submental incision, the excessive fat accumulated over the platysma muscle is excised, thus exposing the anterior margins of the muscle. The medial borders of the muscles either are sutured directly to each other or, if they are extremely redundant, may be overlapped and sutured in place. When there is very prominent shortening and "banding" of the muscle border, the Z-plasty technique provides excellent connection.

Imperfections and Complications

The surgeon can minimize complications following rhytidectomy by careful selection of patients, gentle handling of tissues, and meticulous hemostasis and by using as conservative a procedure as possible to achieve the desired result. In spite of the surgeon's abilities and thorough attention to detail, complications and imperfections can still occur, sometimes unavoidably.

Facial nerve paralysis should be a relatively rare occurrence but could involve the frontal, buccal, or marginal mandibular branches. Injury to the frontal branch can be avoided by limiting dissection in the area between the lateral canthus and the sideburn. Extensive or deep dissection in the buccal area usually leads to buccal branch injury. The marginal mandibular nerve can be protected by staying superficial to the platysma. If a subplatysmal dissection is necessary, it must not be extended more than 2 cm below the mandible.

Hematoma, the most common significant complication of rhytidectomy, has been reported to occur in 4% to 10% of patients and tends to be more common in male patients than in female patients. Meticulous intraoperative hemostasis and the use of drains and pressure dressings help to prevent small accumulation of blood beneath the flaps. Factors to be considered when hematoma occurs are salicylate use, sudden hypertension in the postoperative period, and nausea and vomiting, which may increase venous pressure. Hematomas should be evacuated as soon as they are detected, to avoid circulatory compromise of the skin flaps.

Skin loss results from inadequate circulation and can occur when the skin flap is too thin or too long or when an excessive amount of tension is placed on the flap during tailoring and suturing. An undetected hematoma may also produce skin loss. The most common site for skin loss is in the mastoid area, followed in frequency by preauricular skin. When skin necrosis has been detected, the area should be kept covered with an antibiotic ointment that does not contain neomycin. The use of this "wet dressing" avoids the development of an eschar and promotes quicker healing. Epithelialization occurs quite well and an unsightly scar is rare, particularly in the postauricular area. Occasionally, the scar resulting from skin loss

will later require scar revision.

Infection is very uncommon following rhytidectomy. Postoperative infection will most often occur if a hematoma went undetected or in a diabetic patient. We believe that all patients should receive prophylactic preoperative and postoperative antibiotics.

Hair loss occurs most commonly around the temporal part of the incision and occasionally in the occipital hairline. Permanent hair loss occurs if tension in the skin flaps has been excessive or if the hair follicles are damaged during elevation of the flap or because of the use of a nonbeveled incision in a patient with sparse hair. Temporary hair loss (traumatic alopecia) occurs more commonly and generally resolves spontaneously within 3 to 6 months. When extensive hair loss occurs, punch grafting, strip grafting, or flaps may be necessary for correction.

Greater auricular nerve injury occurs if the dissection below the ear in the upper neck is too deep and extends into the sternocleidomastoid muscle. If the nerve is sectioned, permanent numbness of the lower part of the ear will result. If this injury is recognized intraoperatively, reanastomosis of the nerve is indicated. Also, a deeply placed permanent suture can sometimes injure the nerve.

Hypertrophic scars widen when excessive tension is placed on the skin flaps. Some patients may develop hypertrophic scars, particularly in the postauricular area, and these can be treated with small repeated doses of intralesionally injected steroids. Dark-complexioned patients must be cautioned about the possibility of prominent scars. Redheads, those of Latin ancestry, and blacks are more likely to develop hypertrophic scars than others.

A deformed earlobe is often a telltale sign that a person has undergone rhytidectomy. The "pulled down" elongated earlobe results from poor tailoring of skin around the lobule. When too much skin is excised in this area, the earlobe is placed under tension, resulting in this noticeable deformity.

The "*cobra*" deformity of the submental area is a cup-shaped retraction of skin occurring when overzealous submental lipectomy has been performed and the platysmal bands have not been sutured in the midline.

Summary

The face-lift operation has undergone significant change over the past decade, making the results aesthetically more pleasing and longer lasting. The patient for rhytidectomy must be selected carefully, with particular attention being paid to mental and physical health, skin attributes, and social habits. A "standard" face-lift procedure does not exist; the surgeon must analyze each patient's face and neck and tailor procedure that will correct the specific imperfections that have resulted with age. The results using the short flap and the long flap with platysma and SMAS suspension and submental liposuction are shown in Figs. 29-16 to 29-20.