11.2

Facelift: Introduction to deep tissue techniques

Richard J. Warren

SYNOPSIS

- In its pure form, the subcutaneous, skin-only facelift has a limited effect on the position of heavier deep tissue.
- In SMAS plication, a skin flap is created with suture manipulation of the superficial fat and the underlying SMAS/platysma.
- In loop suture techniques (MACS lift), a skin flap is created with long suture loops taking multiple bites of superficial fat and platysma – fixed to a single point on the deep temporal fascia.
- The supraplatysma plane creates a single flap of skin and superficial fat mobilized and advanced along the same vector.
- SMASectomy involves a skin flap plus excision of superficial fat and SMAS from the angle of the mandible to the malar prominence, with direct suture closure of the resulting defect.
- A SMAS flap raised with skin attached (deep plane) creates a flap of SMAS/platysma, superficial fat and skin, all mobilized and advanced along the same vector.
- A separate SMAS flap (dual plane) creates two flaps, the skin flap and the superficial fat/SMAS/platysma, which are advanced along two different vectors.
- The subperiosteal lift involves dissection against bone, with mobilization and advancement of all soft tissue elements.

Introduction

In the previous chapter, the generic subcutaneous "skin-only" facelift was described. However, as reviewed in Chapter 6, the anatomy of facial aging is a complex process involving all layers of the face from the skin through to the bone. Logically, surgical rejuvenation of the aging face should address all or most of these tissue layers. To this end, rejuvenation of the skin is reviewed in Chapter 5. Within the soft tissue of the face, the two principle age-related changes are loss of midface volume and soft tissue descent. (Surgical methods to add volume are described in Chapters 14 and 15.) With regard to soft tissue descent, a host of surgical approaches have been described. In this chapter the standard methods available to elevate and rearrange the deep soft tissues of the face are outlined; in the coming chapters, they will be described in detail by authors who developed these techniques, or by authors who use them routinely. The subcutaneous facelift is included here for comparison purposes, although in its classic form, there is no attempt to address the deeper tissues of the face.

Subcutaneous facelift

The "skin-only" facelift (***Fig. 11.2.1***) is used to tighten loose facial skin by advancing a random pattern skin flap and removing the excess. By definition, there is nothing done to the deep facial tissues. A tried and true technique, this method can be effective when the only significant problem is loose skin. For example, some patients with very thin faces and little or no subcutaneous fat may present with loose skin only. It is also useful in secondary or tertiary situations where deep tissues have previously been repositioned and the presenting problem is a recurrence of skin laxity. In that setting, a short scar approach will often suffice. Advantages of the skin-only facelift include its simplicity, a rapid postoperative recovery, and the use of a dissection plane which does not risk damage to the facial nerve or other deep structures. Disadvantages include: a minimal effect on underlying facial shape and the inherent disadvantage that skin is an elastic structure which will stretch when tension is applied. Therefore, the longevity of effect is in question, especially when the skin is used to reposition heavy facial tissues. Unfortunately, if the surgeon increases skin tension in a misguided attempt to reposition ptotic deep tissue, the shape of the face can be distorted. Skin tension will flatten facial shape, negating the rounded contours of youth. Also patients in the facelift age group have usually lost elasticity in their skin and therefore, with tension, are prone to a stretched look with wrinkles re-oriented in abnormal directions. Lastly, excess skin tension at the incision

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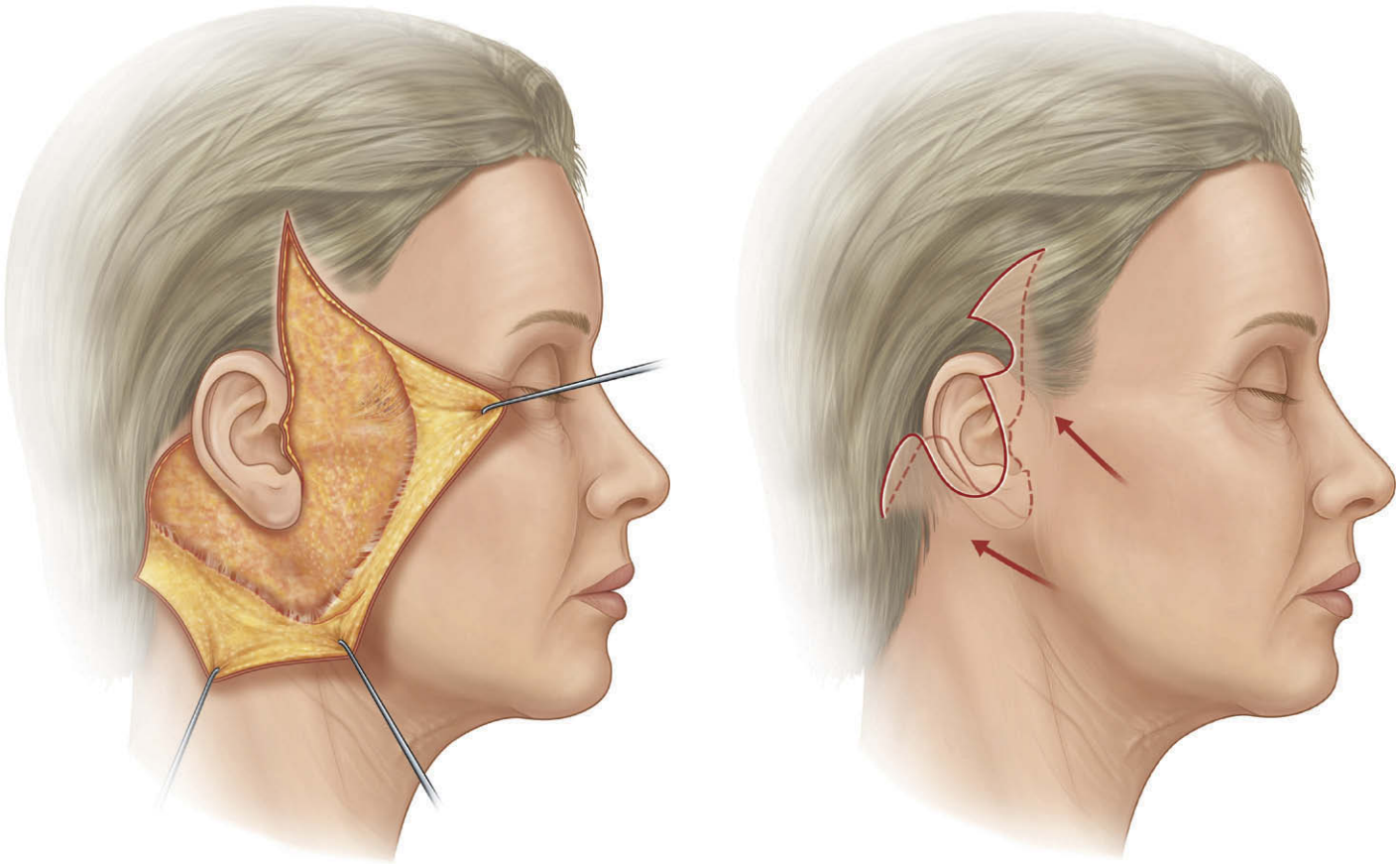

Fig. 11.2.1 Subcutaneous facelift.

line can cause malposition of the hairline, alopecia, distorted earlobes, widened scars, and the potential for skin flap necrosis.

SMAS plication

After surgeons learned to raise a large random pattern skin flap, it became apparent that facial shape could be changed by using sutures to manipulate the underlying soft tissue.[1]

Suture plication creates an infolding of the superficial fat, drawing fat from the lower in the face up to the point where the sutures are placed. Areas of fixed tissue, such as the fixed SMAS ***(Fig. 11.2.2)*** over the parotid gland are less movable, and can act as an anchoring point; anterior to the parotid, mobile tissues can be easily manipulated.[2] Multiple sutures with customized vectors can be used allowing reshaping of the superficial facial fat. The technique is relatively easy to master; it can be customized for the individual case, and can be modified intraoperatively by removing and replacing sutures as necessary. The superficial fat can be shifted in a different direction than the skin. When plication sutures are placed properly, there is little or no risk to branches of the facial nerve. Proponents of plication claim long-lasting results without the need for invasive and potentially dangerous dissections.[3] The primary concern with plication is the potential loss of effect if sutures cut through the soft tissue (the "cheese wire" effect). Another concern is that the degree of improvement may be limited by the tethering effect of the retaining ligaments which in this technique are not released. When the subcutaneous fat is fragile, suture fixation may fail, and plication may have a limited effect in patients with heavy jowls and ptotic tissues in the neck.

Loop sutures (MACS lift)

A variation of suture plication is the loop suture method ***(Fig. 11.2.3)***, for which the main variant is the MACS lift (minimal access cranial suspension). This procedure, which itself was derived from the "S-lift", relies on long suture loops which take multiple small bites of soft tissue.[4,5] Some of these bites are strategically placed into the SMAS and platysma. The loop sutures are fixated to the deep temporal fascia at a point just superior to the zygomatic arch and anterior to the ear. The theoretical explanation for the efficacy of this technique relates to the use of multiple bites of tissue which the developers of the technique feel creates "microimbrications" of the superficial fat and SMAS.[5] Anteriorly, a third suture can be placed to advance the malar fat pad, although the fat pad is not surgically released and its repositioning depends on its own intrinsic mobility. Treatment of the neck usually involves closed liposuction. Proponents of this technique recommend a nearly vertical vector for the skin flap, with a short scar incision. The advantages with this technique are similar to those of plication, although proponents point to the added benefit of using a more firm point of fixation (deep fascia) and the

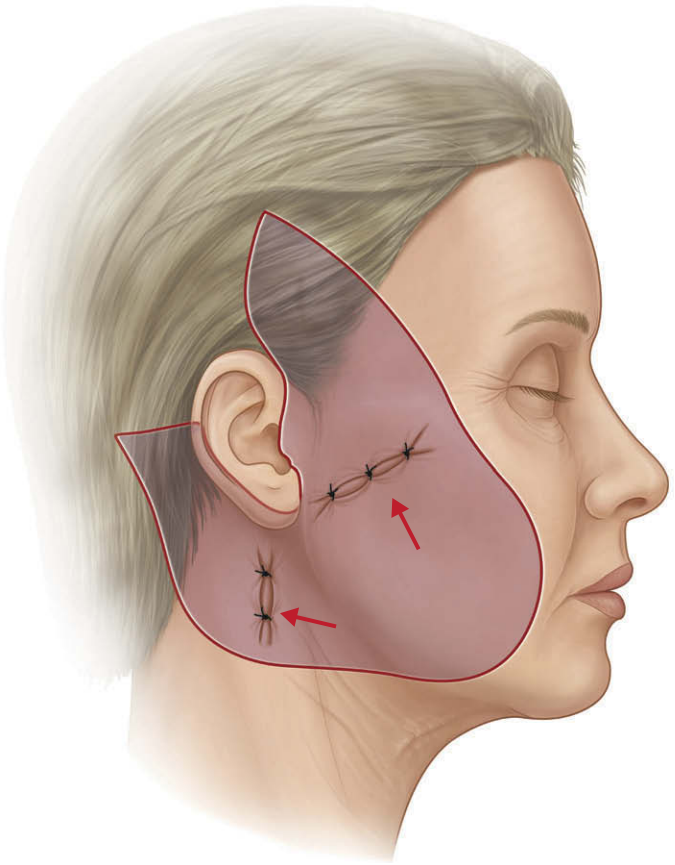

Fig. 11.2.2 Subcutaneous flap with SMAS plication.

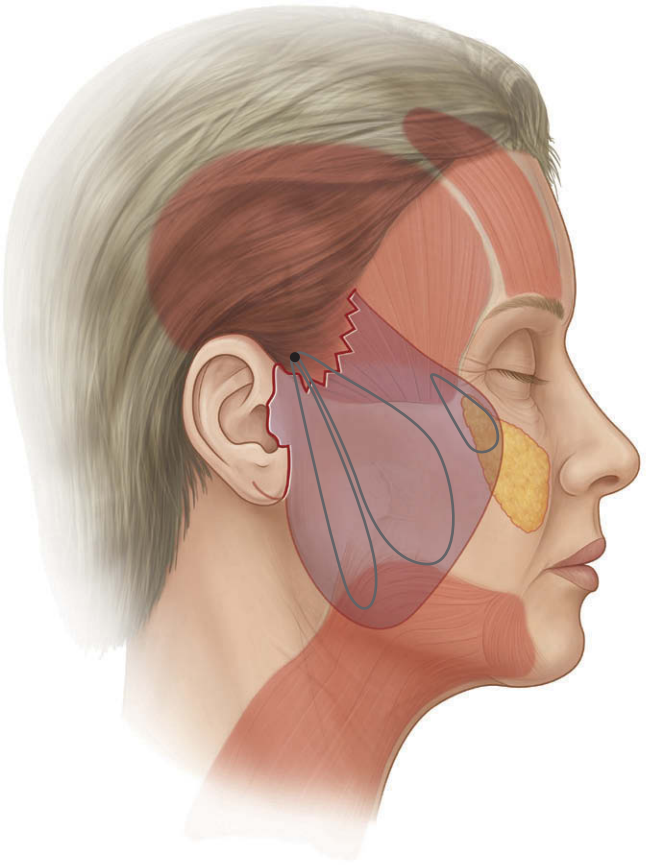

Fig. 11.2.3 Subcutaneous flap with loop sutures (MACS lift).

improved effect of micro-imbrications. Disadvantages are the same as SMAS plication: potential loss of effect if the sutures pull through, the lack of ligamentous release and concerns about the effectiveness of sutures holding heavy jowls and ptotic neck tissues against gravity. Lastly, surgeons must address the tendency for loop sutures to cause fat to bunch up, potentially leaving bulges which can be visible through the skin.

Supra-platysmal plane facelift

The supra-platysmal plane facelift (***Fig. 11.2.4***) involves a deep subcutaneous dissection carried out immediately superficial to the SMAS and platysma. Originally described as the extended supra-platysmal (ESP) dissection plane, this procedure raises the superficial fat and skin as a single layer, leaving the SMAS layer untouched. The zygomatic ligaments are released as dissection of the superficial facial fat extends over the malar prominence as far forward as the nasolabial folds. The theory behind this technique is the belief that the superficial fat is a ptotic structure, but the underlying SMAS and platysma are not.[6] After the flap has been raised, the fat on the underside of the flap can by contoured and sutures can also be placed from this fat to underlying fixation points. This technique provides good mobilization because ligaments are released, and it produces a thick very robust flap. Also, with no surgical penetration of the underlying SMAS, there is theoretically no risk to branches of the facial nerve. Concerns about this method are that the flap is unidirectional (the skin and fat move en bloc), and the fact that repositioning the weight of this flap depends primarily on skin tension at the suture line.

Subcutaneous facelift with SMAS removal (SMASectomy)

In the SMASectomy procedure (***Fig. 11.2.5***), a strip of SMAS and overlying fat is removed with direct suture closure of the resulting defect.[7] The excised strip angles obliquely across the cheek from the angle of the mandible to the lateral malar eminence at the edge of the malar fat pad. The procedure has been described after using either a conventional facelift incision or a short scar approach. Advantages include the fact that the location of traction is close to the ptotic lower facial tissues, and therefore potentially more effective than a SMAS flap raised at a higher level. The technique allows for skin and SMAS to be moved along different vectors. By suturing two opposing freshly cut edges, fixation is potentially more secure than plication alone. The cut edges being sutured have not been undermined, potentially making them more viable, and the resulting fixation more secure than undermined flaps.

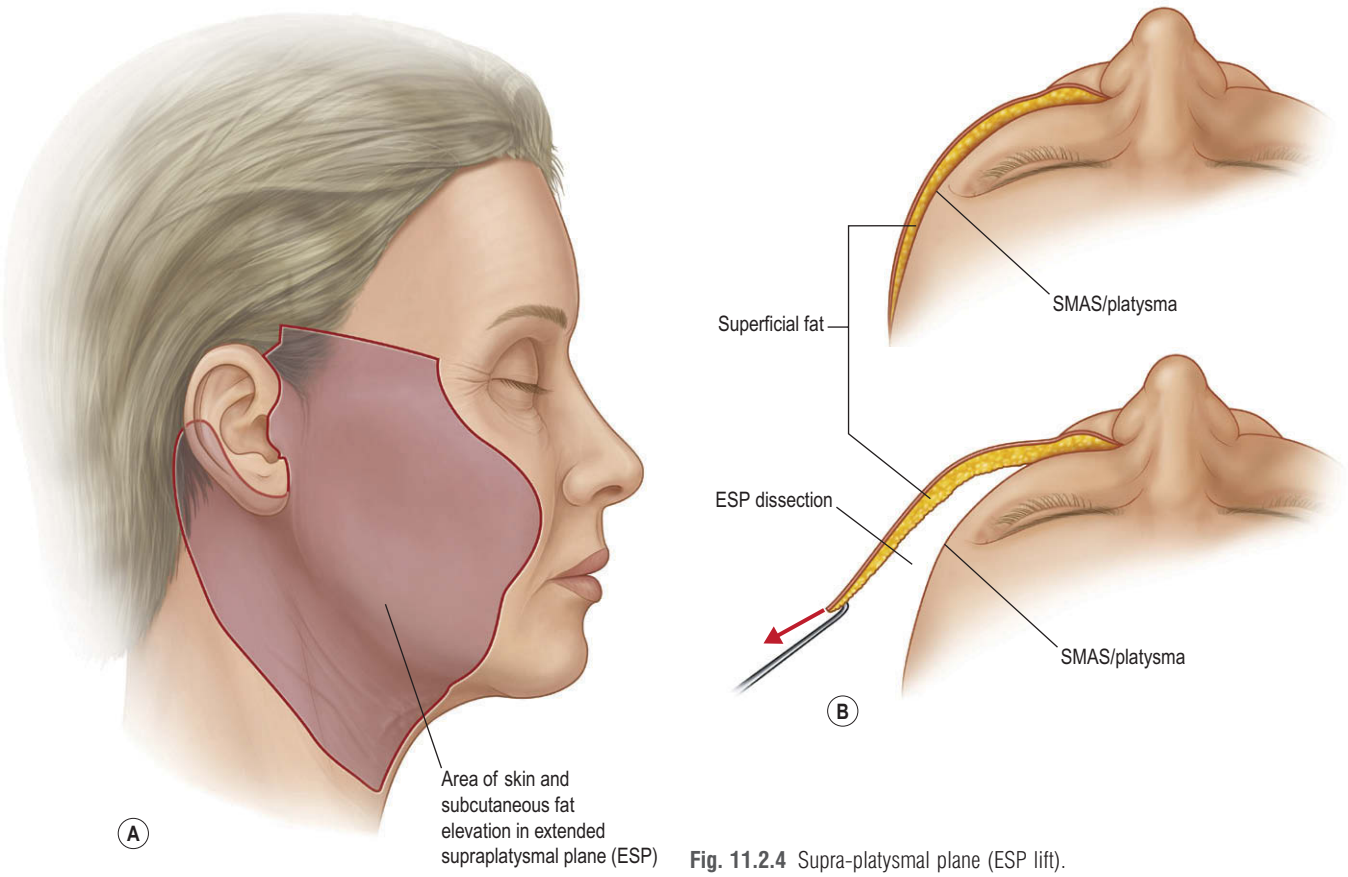

Fig. 11.2.4 Supra-platysmal plane (ESP lift).

Compared with a SMAS flap, the procedure is more rapid, with less theoretical risk to the facial nerve because there is no deep plane dissection. Proponents feel that fixation is effective because the location of the SMASectomy resection is roughly at the junction of the mobile SMAS, which allows mobile tissue to be sutured to the fixed SMAS. Disadvantages include the possibility of injuring a facial nerve branch (if the SMAS removal is done too deeply) and the lack of any ligamentous release, which may limit the movement of certain tissues such as the malar fat pad.

SMAS flap with skin attached (deep plane facelift)

Tord Skoog, in 1974, published his method of raising skin, subcutaneous fat, and the SMAS as a single layer which created a thick robust flap with excellent blood supply. It also contained a stretch-resistant structure (the SMAS), with the promise of a long-lasting result.[8] Originally, there was limited improvement in the anterior face with little or no change to the nasolabial fold. This lack of anterior movement was later found to be due to tethering of the SMAS to the lip elevators: zygomaticus major and minor, and levator labii superioris.[9] In order to overcome some of these shortcomings, multiple variations have been developed (Barton: high SMAS; Hamra: deep plane) ***(Fig. 11.2.6)***.[10–13] The skin is normally raised for only 2–3 cm anterior to the tragus, the SMAS is then incised, and the rest of the dissection is done deep to the SMAS as far as the zygomaticus major muscle from which the SMAS is released. The skin and subcutaneous fat are left attached to the SMAS and the entire flap is then advanced and fixated as the surgeon desires. Advantages of this technique are the robustness and physical strength of the flap, and the requirement for only one plane of dissection. Ligaments are also thoroughly released. Certain variations of the technique also allow for repositioning of the malar fat pad.[10,13] Disadvantages include the inherent risk of dissecting under the SMAS with the potential for damage to the facial nerve. Also, these procedures are "monobloc" techniques where the skin, subcutaneous fat and SMAS are generally moved in one direction.

Subcutaneous facelift with separate SMAS flap (dual plane facelift)

Surgeons wishing to move the SMAS and subcutaneous fat in a different direction than the skin arrived at the concept of two separate flaps: the random pattern facelift skin flap and an SMAS flap carrying the superficial fat ***(Fig. 11.2.7)***. Multiple variations of this popular concept have been developed with terminology introduced by different authors (extended SMAS: Stuzin; high SMAS: Connell and Marten; FAME: Aston).[14–22] As in plication, MACS and SMASectomy, proponents of this method feel that that moving the skin and subcutaneous soft

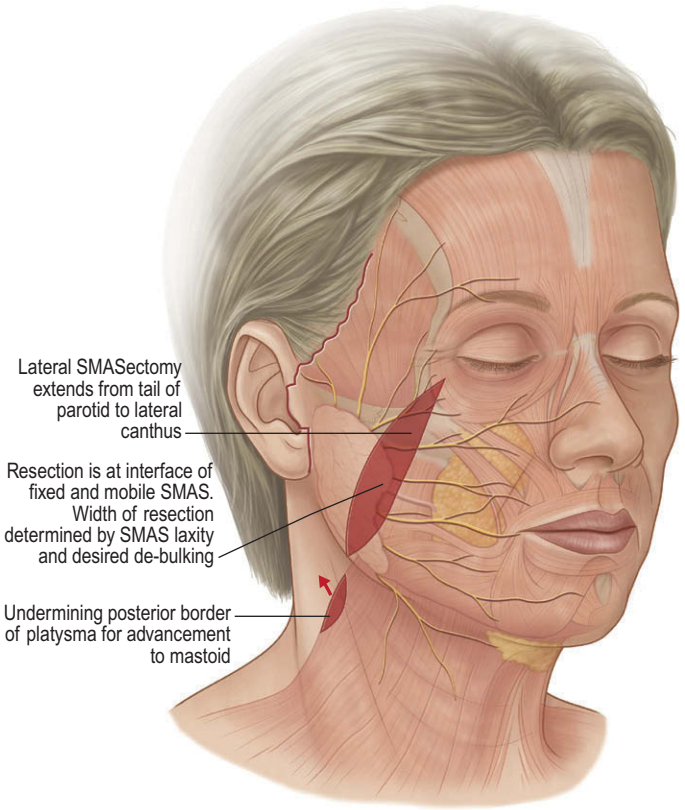

Fig. 11.2.5 Subcutaneous flap with SMAS excision (SMASectomy).

tissues along different vectors will result in a more accurate reversal of the aging process. Typically, the deep tissue flap is shifted more vertically than the skin flap. A second advantage is the ability to reposition deep facial tissues by mobilizing and fixating the SMAS flap internally without the need to rely on skin tension for support. Theoretically, the disadvantages of excess skin tension are therefore avoided. Also, as in the deep plane technique, ligaments are surgically released, resulting in excellent mobilization and advancement for the SMAS and overlying fat. Disadvantages relate to a more time-consuming procedure because two different surgical planes are developed. In addition, these two planes introduce the inherent problems of each: potential damage to deep structure when doing the SMAS flap dissection, and potential problems with the skin flap if it is too thinly dissected or if it is placed on too much tension. In a thin patient, both layers can be quite thin, which increases the technical demands placed on the surgeon.

Subperiosteal facelift

Paul Tessier, in 1979, first presented his concept for a subperiosteal approach using craniofacial principles to elevate facial tissue.[23,24] Variations were developed,[25,26] but it was not until the introduction of the endoscope that surgeons widely adopted this concept ***(Fig. 11.2.8)***.

Approaching from the temple, the midface can be dissected in either the subperiosteal[27,28] or supra-periosteal plane.[29,30] Added exposure can be achieved with a lower eyelid or an intra-oral incision. The advantages are a dissection which is deep to all vital structures, a relatively short incision, and harmonious lifting of the midface and lateral brow. There is little or no tension on the skin thus eliminating problems from excess tension on the skin. Some surgeons feel this technique is uniquely advantageous for the patient requiring improvement in the infraorbital midface in conjunction with lateral browlifting. The younger patient who requires midface improvement without skin tightening has been proposed as a good candidate for this technique. Disadvantages of subperiosteal lifting include the additional technology and equipment involved, a limited effect in the lower face/neck region and limited effect on superficial structures, particularly loose skin. Furthermore, the early aging midface which seems suited to this technique may in fact be due to volume loss, a problem which can be correctable with less invasive procedures such as fat grafting.

Summary

Multiple techniques have been devised to elevate and reposition tissues in the aging face. In the following chapters, leading surgeons will address two issues: first, they describe how they handle the deep tissues of the face, and second, they explain the logic behind their own particular technique. This is a field where personal opinions are strong, and at the time of this writing, the greatest difference of opinion among facelift surgeons relates to the various methods used to manipulate deep facial tissue. All surgeons have been striving for the same objective: a procedure which will be effective, have a relatively a long-lasting result, and a high margin of safety. Over the years, a number of studies have been done to compare different facelift techniques.[31–40] In order to assess the available data, a systematic review of the world literature over a 60-year period was made in an attempt to locate reliable studies which could attest to the efficacy and safety of one method over another.[41] Despite this exhaustive review, no clear indication could be found that any one facelift technique was superior to the others. Therefore, surgeons must continue to use their own judgment for technique selection based on their patient's needs, balanced against their personal convictions about quality, longevity and safety.

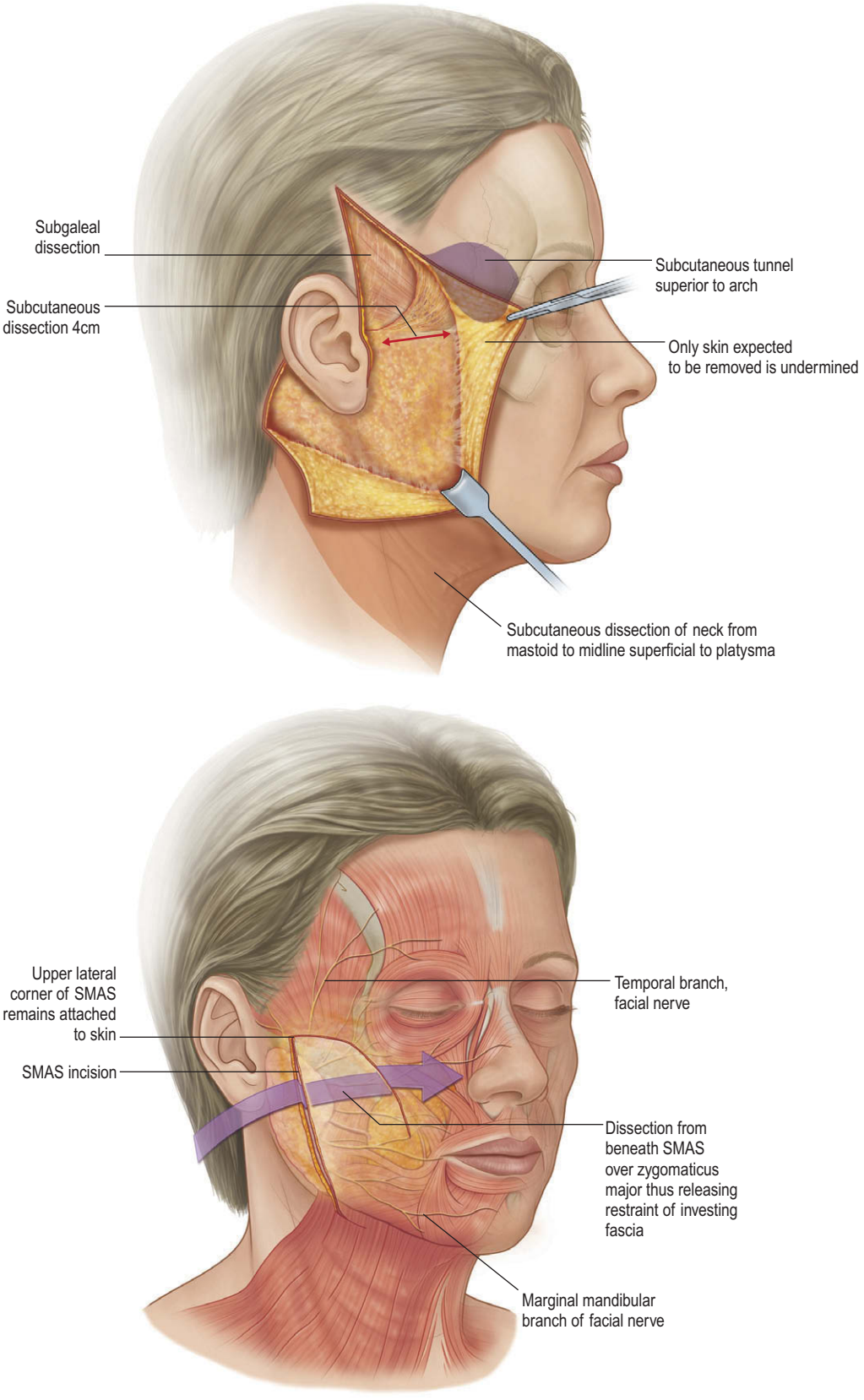

Fig. 11.2.6 SMAS flap with skin attached (deep plane facelift).

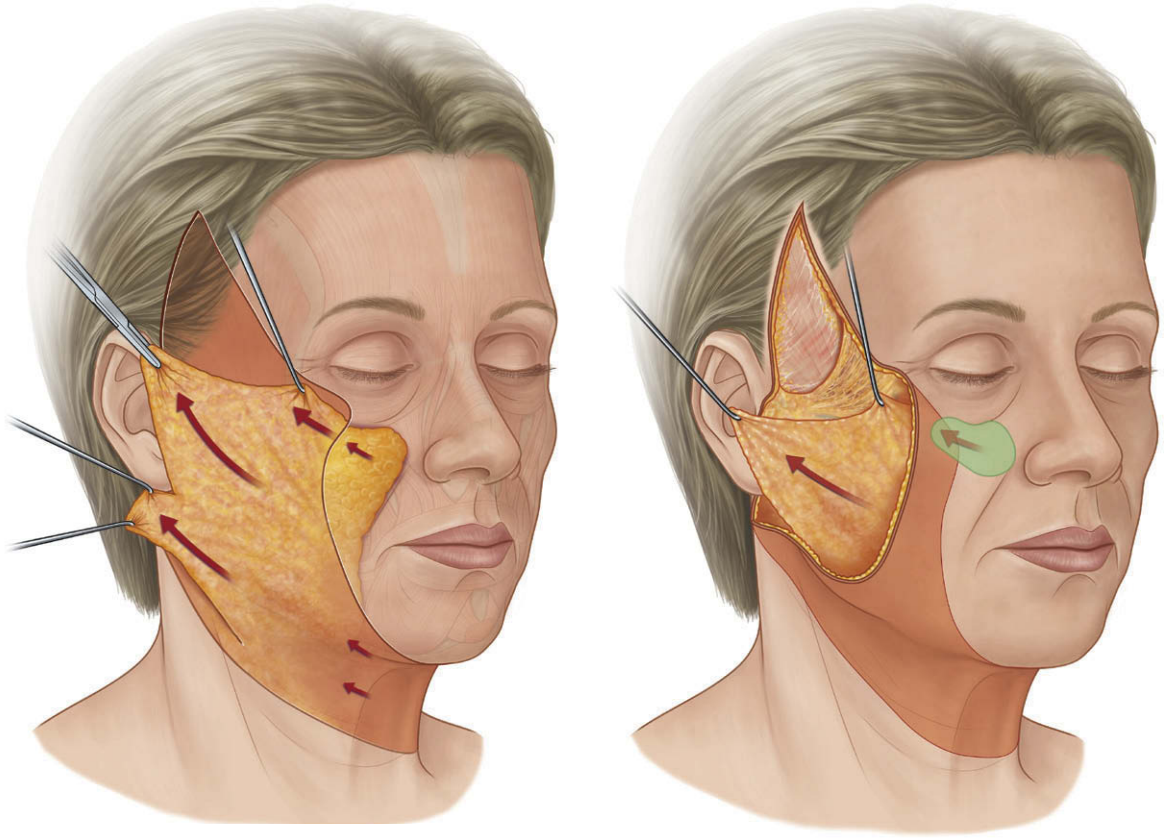

Fig. 11.2.7 Subcutaneous facelift with separate SMAS flap (dual plane facelift).

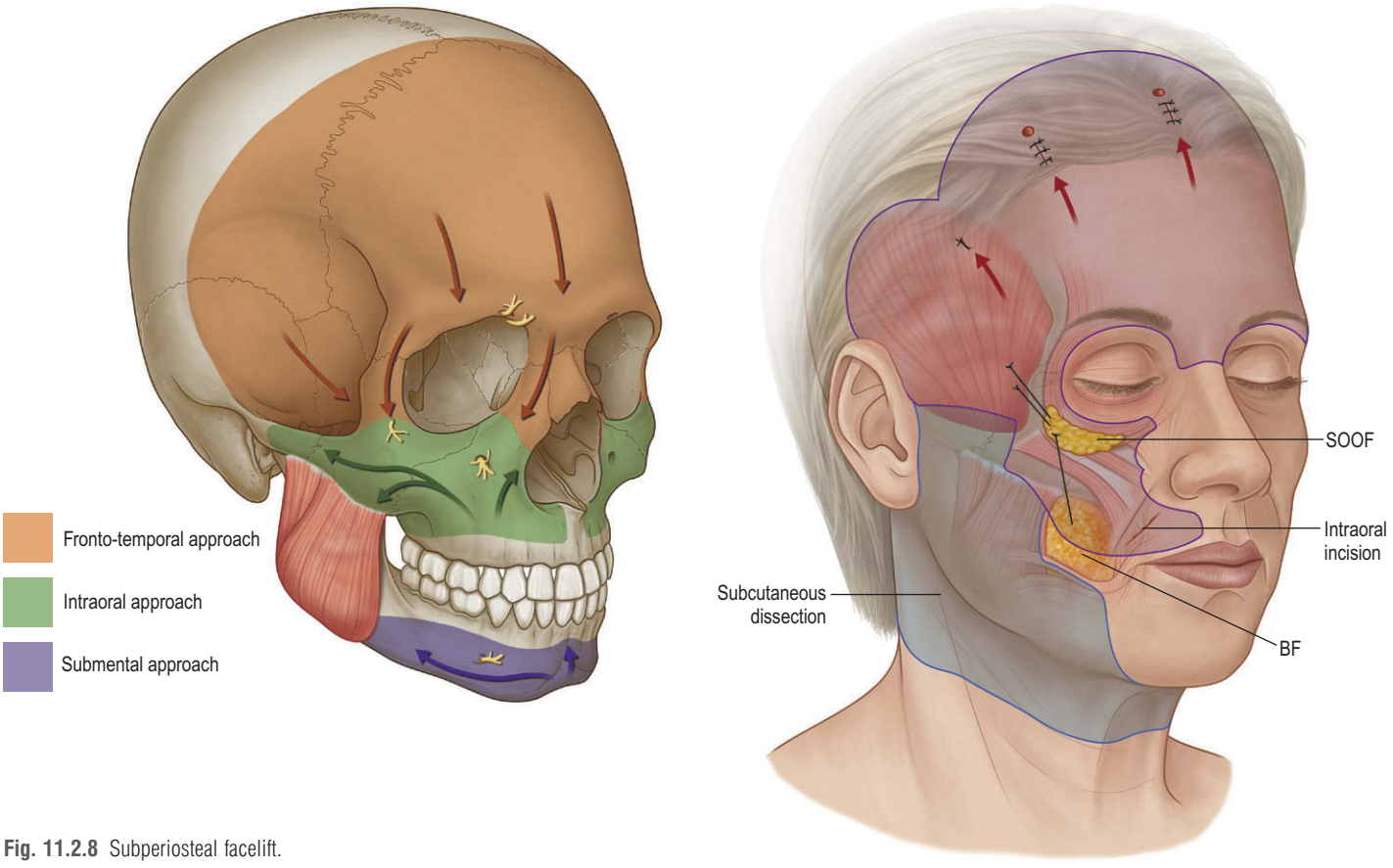

Fig. 11.2.8 Subperiosteal facelift.

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   The authors describe their logic for using soft tissue plication and describe their particular method, called the PSP lift (platysma SMAS plication). A series of 117 consecutive patients is reported, all of whom were followed objectively with a 5-point scale. There was excellent improvement with a low complication rate: 3.4% hematoma and 3.4% transient facial nerve palsies.

5. Tonnard P, Verpaele A, Monstrey S, et al. Minimal access cranial suspension lift: a modified S-Lift. *Plast Reconstr Surg*. 2002;109:2074.

   The authors report that in 1999, they modified the previously described S-lift to include improved suture fixation and soft tissue elevation, which they named the MACS lift, an acronym for minimal access cranial suspension. Two long loop sutures are used to elevate facial soft tissue with fixation to the deep temporal fascia above the zygomatic arch and a third suture is used for the malar fat pad in the extended version of the procedure. A total of 88 patients over 20 months were presented with a low complication rate. The operative technique is described in detail.

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   The author presents his logic behind using a facelift flap, which contains skin and all the subcutaneous fat down to, but not including the SMAS. The technique is described in detail and the results with a series of 300 patients are presented. There was high patient satisfaction reported, no nerve injuries and relatively rapid recovery.

7. Baker D. Lateral SMASectomy. *Plast Reconstr Surg*. 1997;100(2):509.

   The author presents his personal evolution in arriving at the SMASectomy technique, describing his logic in doing so, and reports a series of 1500 cases over 5-year period. One transient buccal branch injury was encountered. The author feels this technique affords a safe, effective technique, but acknowledges that other techniques also produce excellent results.

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   In this classic text, the author describes the first technique to utilize the sub-SMAS plane to elevate ptotic facial tissue. Illustrations effectively convey the basics of this new technique.

13. Barton FE Jr, Hunt J. The high-superficial aponeurotic system technique in facial rejuvenation: an update. *Plast Reconstr Surg*. 2003;112:1910.

    This is a follow-up of a previous publication by Barton, which described his variation for a SMAS-based facelift technique called the high SMAS technique. In this paper, 267 patient records were reviewed using the nasolabial fold as an indicator of surgical result 6 months after surgery. Using this hard endpoint, improvement was almost universally achieved with a low complication rate. Recommendations are made as to the extent of dissection required based on depth of the nasolabial fold.

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    This review article outlines the authors' understanding of facial anatomy as it pertains to facelift surgery, their understanding of facial aging, and it describes their surgical procedure in detail. The procedure is called the extended SMAS dissection because it involves raising the malar fat pad in conjunction with the SMAS flap. The authors emphasize the importance of flap fixation in order to create a long lasting result.

18. Marten TJ. High SMAS facelift: combined single flap lifting of the jawline, cheek, and midface. *Clin Plast Surg*. 2008;35(4):569–603.

    The review article outlines the author's logic in utilizing a two layer facelift, emphasizing that skin has a covering function, and that deep tissue manipulation is necessary for facial reshaping. The high SMAS facelift is described in detail, with emphasis on skin incisions, and the proper selection of vectors.

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    The authors' experience with subperiosteal facelift techniques is reviewed. Pertinent points include: (1) using an interconnected subperiosteal approach which involve the entire zygomatic arch; (2) utilizing upward pull of the muscles of facial expression to elevate the mouth; (3) keeping the dissection deep in the temple to protect the temporal branch, and (4) utilizing the temporal fascia as a lifter and anchoring point.

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    This paper presents the results of a systematic review that assessed all studies in the English language literature from 1950 until 2009 in which there was a comparison of facelift techniques. There were 57 studies identified; only 10 of these directly compared the efficacy of different facelift techniques. The study found there to be a lack of quality data regarding the efficacy and safety of facelift techniques and concluded that there was no evidence to support the use of any one facelift technique over another.