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Lorne King Rosenfield

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# The Pinch Rhytidectomy: A Safe, Effective, “Low SMAS” Variation on the Theme

Lorne King Rosenfield, MD

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## Abstract

**Background:** The competitive efficacy of the superficial musculoaponeurotic system (SMAS) rhytidectomy (SMASectomy) facelift has been well established. However, the outcomes after an associated open necklift have not been as reliable; the persistent incidence of recurrent bands and iatrogenic deformities has prompted a change in technique.

**Objectives:** The author conducted a long-term retrospective review to evaluate a variation on the SMASectomy facelift technique. A solely lateral, “low SMAS” approach was substituted for direct necklift in all patients.

**Methods:** Patients who were candidates for a facelift underwent this laterally based, SMASectomy technique. Those who underwent concomitant full-face CO<sub>2</sub> laser resurfacing were excluded from the review. A total of 198 patients treated consecutively during a 7-year period (2006–2012) were included in the study.

**Results:** Postoperative follow-up ranged from 1 to 7 years. All patients’ neck deformities were fully corrected by the solely lateral SMASectomy technique. In addition, the patients recovered more rapidly than with traditional direct necklift, with no nerve injuries, skin compromise, or hypertrophic scarring.

**Conclusions:** Results indicate that midline open necklift can be replaced by the low SMASectomy.

## Level of Evidence: 4

## Keywords

facelift, pinch rhytidectomy, low SMAS, lateral SMASectomy, necklift, neck rejuvenation



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The essential goals of facelift surgery have changed little since its introduction more than 100 years ago: rejuvenation of the face, with the removal of aged and excess skin at the cheek and neck. However, there have been significant advances in the procedures to achieve these and even greater goals. From excising hairline lenticular skin to adjusting the cant of the lateral canthus, erasing wrinkles, and reconstituting volume and shape, both nuanced and dramatic manipulations of the face are now attainable. Although the number of antithetical variations in technique is bewildering,<sup>1</sup> the differences may be distilled into 2 seminal options, relating to the plane and the extent of dissection. Although many facelift approaches are successful, reflected by the relative uniformity of satisfactory results, the surgeon must objectively measure outcomes<sup>2</sup> and effectively determine a preference for one technique over another.

In my experience performing facelifts, one goal was consistently unmet and became the primary impetus for developing a variation of the traditional technique. Specifically, I found that despite diligent application of the traditional superficial musculoaponeurotic system (SMAS) rhytidectomy (SMASectomy) and formal open necklift, the incidence of

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Dr Rosenfield is a professor in the Division of Plastic Surgery, Department of Surgery, University of California, San Francisco, and an adjunct assistant professor in the Division of Plastic Surgery, Department of Surgery, Stanford University, Stanford, California.

## Corresponding Author:

Dr Lorne King Rosenfield, 1750 El Camino Real, Suite 405, Burlingame, CA 94010, USA.  
E-mail: [dr@drrosenfield.com](mailto:dr@drrosenfield.com)

recurrent bands and iatrogenic neck deformities remained unsatisfactory. These outcomes often led to reoperation of the scarred neck, with unpredictable results.

This article presents a long-term review of a variation on the current SMASectomy facelift technique. This solely lateral “low SMAS” approach obviates open necklift and its potential liabilities while delivering a safe and effective correction.

## METHODS

All patients who were candidates for a primary or secondary facelift from January 1, 2006, through December 31, 2012, at the author’s surgery center underwent laterally based SMASectomy. The only patients excluded from the study were those who underwent concomitant full-face CO<sub>2</sub> laser resurfacing. A total of 198 patients, treated consecutively over the 7-year period, were included in this review. Written informed consent was provided by all patients.

### Surgical Technique

#### Preoperative Preparation

All patients were prescribed a 3-day, twice-daily, methicillin-resistant *Staphylococcus aureus* (MRSA) prevention protocol consisting of intranasal and intra-auricular mupirocin (Bactroban; GlaxoSmithKline, Research Triangle Park, North Carolina) and chlorhexidine (Hibiclens; Mölnlycke Health Care US, LLC, Norcross, Georgia) showers. In addition, all patients began a medical-grade skin care regimen within 2 weeks of the surgery, which included a light chemical peel performed by an in-house aesthetician.

#### Anesthesia

All patients received a local anesthetic of 1% lidocaine with 1:600 000 epinephrine, plus either conscious sedation or monitored (MAC)/general anesthesia.

#### Instrumentation and Dissection

Skin flap elevation and SMASectomy were accomplished with straight supercut 6-inch Mayo scissors. The skin flap dissection extended just beyond the planned SMAS manipulation.

#### SMAS Suturing

SMASectomy plication was completed with 4-0 Vicryl (Ethicon, Somerville, New Jersey) in an interrupted fashion. The tissue harnessed was always the strongest available. The preferred anterior margin of the neck sutures was the lateral border of the platysmal itself or otherwise the SMAS. The posterior margin was either the SMAS or the fascia overlying the neck musculature.

#### Ancillary Procedures

When indicated, liposuction was performed at the submental/jowl regions. No patient underwent autologous fat grafting.

#### Closure and Dressings

A 4-mm Jac-Cell Medic (Quebec, Canada) drain was placed on each side of the face and neck and usually was removed by the morning after surgery. In addition, a soft head-dressing wrap was worn until that morning.

#### Recovery and Postoperative Care

Consistently following the surgery, all patients recovered for 1 or 2 nights under the care of the same private nurse. To reduce swelling, all patients received a Medrol dose pack, *Arnica montana* and bromelain herbs, and a series of lymphatic drainage treatments.

## RESULTS

Postoperative follow-up ranged from 1 to 7 years (mean, 4.0 years) (Figures 1-3; additional images are available online at [www.aestheticsurgeryjournal.com](http://www.aestheticsurgeryjournal.com) as Appendix Figures 1 and 2). Demographic data appear in Table 1.

The most impressive finding was the consistently successful treatment of all aging neck deformities with this solely lateral approach. This limited dissection, along with careful application of fixation vectors, provided additional benefits over the traditional adjunctive submental necklift: substantially less swelling, a commensurately swifter recovery, and predictable and natural early and late results. It is a reasonable maxim of plastic surgery that if an aesthetic result looks good on the table, it is likely to remain so long term. Specifically, patients who underwent laterally based SMASectomy “aged well” without the often subtle yet undesirable signs of rhytidectomy.

The incidence of hematoma (<3%) was lower than with traditional submental necklift. There were no motor nerve injuries, skin slough, hypertrophic scarring, or iatrogenic neck deformities (Table 2). Early in this series, lateral neck seromas were more common (5%) as a result of the more extensive lateral neck dissection. This complication was later eliminated by routine placement of drains, which were maintained for the first 24 to 48 hours. In 4 patients with significantly redundant skin, this same dissection posed a small risk of residual postauricular neck pleats, which resolved entirely in all but 1 patient (0.5%), who required a revisional procedure. Nine patients (4.5%) presented with recurrent anterior neck bands mandating direct surgical revision.

The primary aesthetic benchmark—reversal of the principal signs of aging—was accomplished in all patients. In fact, as a consequence of the more caudal suturing of the



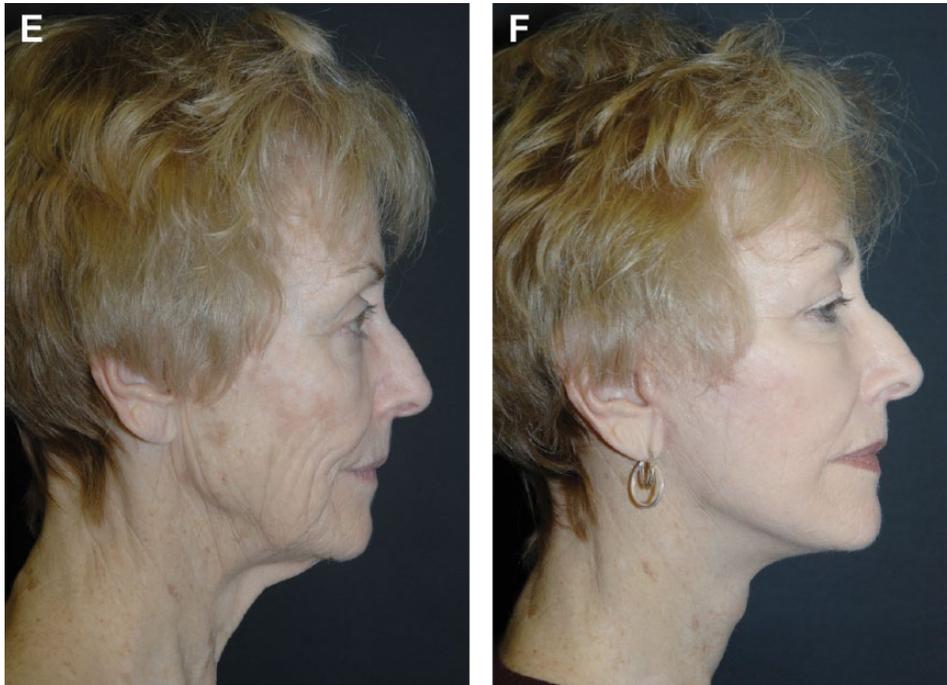
**Figure 1.** (A, C) Preoperative views of this 57-year-old woman. (B, D) One year after facelift plus upper/lower blepharoplasty. Note the marked improvement of her neck deformity.

platysma laterally, the neck was often more fully enhanced. Additionally, the early-term (6-month) results were stable, with very modest and acceptable occurrence of neck skin/neck bands (4.5%). In my experience, the incidence of

recurrent neck bands with direct necklift was at least the same and often more, which coincides with the medical literature.<sup>3-5</sup> When indicated, the more obvious recurrent bands were corrected under local anesthesia through



**Figure 2.** (A, C, E) Preoperative views of this 71-year-old woman. (B, D, F) Two years after facelift plus upper/lower blepharoplasty. The natural result was achieved with aesthetic correction of the neck fully to the chest.



**Figure 2. (continued)** (A, C, E) Preoperative views of this 71-year-old woman. (B, D, F) Two years after facelift plus upper/lower blepharoplasty. The natural result was achieved with aesthetic correction of the neck fully to the chest.

excision or plication, with relatively greater ease because there was no scarring at the surgical site. Otherwise, a simple submental liposuction was adequate. Follow-up (to 7 years) demonstrated satisfactory long-term outcomes. A result loss of approximately 15% can be expected in the first 6 months, followed by very slow reversal of the remaining result over the ensuing 7 to 10 years.<sup>3,4</sup>

Another observation I made through this review was that the more extensive and premature the preoperative skin laxity, the more likely and more significant the postoperative relaxation. A corollary would be that the thinner the skin and subcutaneous tissue, the more effective the rejuvenation surgery. The greater effect of gravity caused by heavier skin, and the increased friction induced by heavier tissues, may be resistant to surgical efforts. This is true regardless of the rejuvenation technique, simply because the skin we leave behind after surgery is of no better quality than the skin we excise. The forces of creep and stress relaxation are inevitable.<sup>4</sup> It is probable that a very small subset of rhytidectomy patients may present with either unusually premature aging or excess skin and may exhibit formes frustes of cutis laxa or Ehlers-Danlos syndrome.<sup>6,7</sup> (We will soon begin a clinical/histologic study to investigate this further.) As noted by Beighton et al,<sup>7</sup> the expected result of a facelift in these cases would be a recurrence of “remorseless progression”; therefore, such candidates would benefit from comprehensive preoperative counseling and planning.<sup>4,5</sup>

## DISCUSSION

### Origins and Evolution of the Pinch Rhytidectomy

Although the competitive efficacy of Dan Baker’s SMASectomy facelift has been validated repeatedly,<sup>8</sup> the essence of its effectiveness has been elusive. An insightful query from Dr Gilbert Gradinger (personal verbal communication, March 1996) shed some light on the issue: does redundant tissue need to be mobilized in order to be tightened? The benefits of SMASectomy are obvious and numerous: the potentially risky dissection in and around the facial nerves is avoided, the sometimes difficult mandate to deliver a fully intact SMAS flap is eliminated, and the often extensive postoperative swelling and bruising is attenuated. The addition of the high SMASectomy, as described by Fritz Barton,<sup>9</sup> has contributed a satisfying lift of the midface.

The traditional approach to treat significant excess skin and redundant platysmal bands has been through submental dissection.<sup>10</sup> As noted by Stuzin,<sup>11</sup> the open-neck technique does proffer real advantage: uniquely precise control of neck contouring. On the other hand, this method increases operating time and the potential for morbidity, including neck hematoma, flap ischemia, and iatrogenic deformities.<sup>12</sup> In addition, midline platysmal plication can



**Figure 3.** (A, C) Preoperative views of this 62-year-old woman. (B, D) Eighteen months after facelift and blepharoplasties. The result was natural, with predictable neck relaxation.

**Table 1.** Patient Demographics

Characteristic	Value
Age, y	
Mean	62
Range	52-72
Follow-up, y	
Mean	4.0
Range	1-7
Sex, No. (%)	
Female	191 (96.5)
Male	7 (3.5)

**Table 2.** Complications

Complication	No. (%) of Patients
Skin necrosis	0
Facial motor nerve injury	0
Sensory nerve injury (greater auricular nerve)	0
Hypertrophic scarring	0
Hematoma	5 (2.5)
Seroma	
Early in series	10 (5.0)
Later in series (after drains implemented)	0
Anterior neck band recurrence, requiring revisional surgery	9 (4.5)
Postauricular neck pleating requiring revisional surgery	1 (0.5)
Infection	0

induce vertical shortening (a bowstringing) that can actually accentuate the resident bands.<sup>13</sup> Finally, it is logical to presume that the dueling vectors created by the midline and postauricular neck plication can encourage both early and late reappearance of bands.<sup>14</sup>

These disadvantages have led surgeons to develop alternatives to direct neck lift. Mustoe et al<sup>14</sup> and Jacono and Parikh<sup>15</sup> have described variations on deep-plane facelift and subplatysmal neck lift that afford an exclusively lateral-based facelift. Tonnard et al<sup>16</sup> popularized the vertical suspension suture lift to also obviate open necklift. I too had sought a solution that could evolve from the traditional SMASectomy technique. The procedure entails a similar solely lateral approach realized by harnessing the unabridged SMASectomy. Thus, the “low SMAS-pinch” rhytidectomy was conceived and practiced, then subsequently evaluated in the present study.

There are 2 primary limitations to this study: its retrospective nature and the evaluation of results by a single surgeon. However, efforts were made to maximize objectivity. Three areas were consistently evaluated during review of clinical outcomes and photographs: primary correction of the nasolabial and marionette folds, improvement of the jowl and jawline, and correction of platysmal bands and neck obliquity. It is likely that excluding adjunctive treatments such as concomitant fat injections allowed a more “pure” evaluation of the procedure’s efficacy. Finally, because the benchmark of this technique is that it allows neck rejuvenation from a solely lateral approach, a cadaver dissection study could help assess the anatomic efficacy of this procedure.

## Principles and Strategies of the Pinch Rhytidectomy

### **Skin-SMAS Assessment and Manipulation**

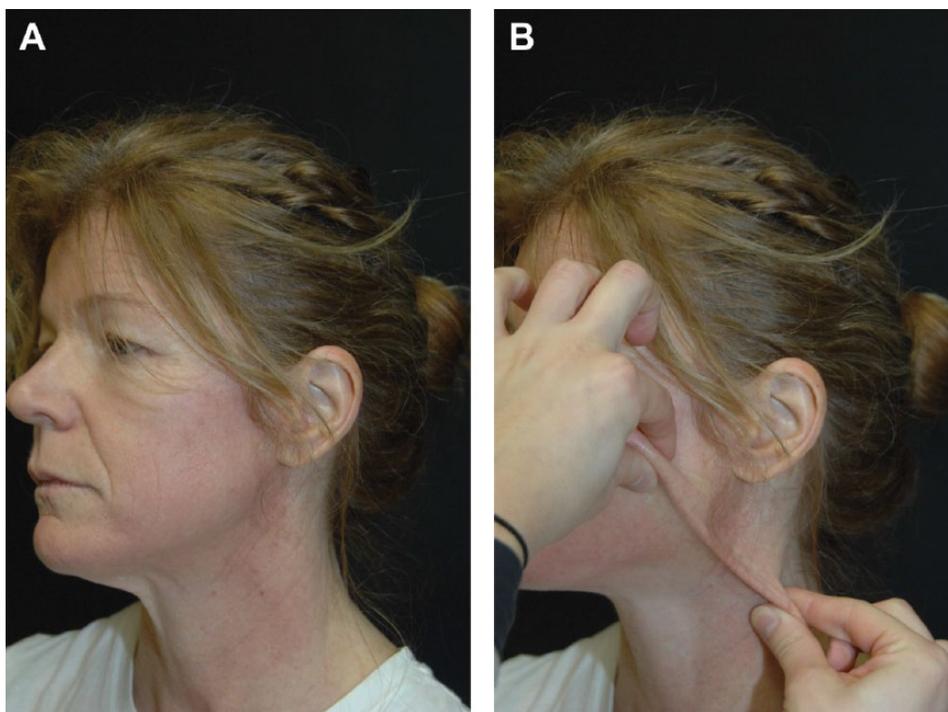
As noted for the pinch blepharoplasty<sup>17</sup> and even the high-tension abdominoplasty,<sup>18</sup> it is not necessary to undermine the eyelid skin or the abdominal skin (respectively) for either to be mobilized and tightened effectively. Similarly, undermining/mobilizing the skin and SMAS is not required for tightening in this lateral-based procedure, allowing the surgeon to circumvent extensive undermining of the cheek flap and avoid formal central neck dissection.

The concept of the “pinch” is applied to the skin preoperatively and to the SMAS intraoperatively. Preoperatively, the concept can be tested and the result visualized by pinching the excess skin, mimicking full correction of the cheek, jowl, and neck (Figure 4). In my experience, this validation is consistent regardless of the extent of excess skin or platysma. Additionally, this maneuver provides an estimate of the extent of the anticipated skin excision. Intraoperatively, this principle is applied by pinching the excess SMAS between 2 forceps to measure and mark the excess and demonstrate the correction of facial aging.

### **Treatment of Retaining Ligaments**

There is far more consensus on the anatomy of the retaining ligaments of the face than on their ideal surgical treatment. Although proper release would seem necessary to facilitate lifting, it could be argued that the ligaments naturally attenuate and relax with age, therefore requiring tightening instead.<sup>1,19-21</sup>

The pinch rhytidectomy approach falls somewhere between these opposing strategies. Along the path of the robust SMASectomy, many underlying primary restrictive retaining ligaments of the face and neck are excised, whereas attenuated ligaments may be tightened by the SMAS plication itself. This is particularly relevant to the laterally based neck suturing: the probable release of the



**Figure 4.** (A, B) Images of this 58-year-old woman, although not a study patient, demonstrate the preoperative pinch of the skin to measure the extent of skin excess and envision its translation into a full neck correction.

platysma-retaining ligaments during the low SMASectomy allows for the tissue's pivotal advancement.<sup>14,15</sup>

### **SMAS Plication**

As noted by Baker,<sup>10</sup> the general goal of SMAS tightening is removal of excess mobile SMAS, with anchoring of its lateral margin to the immobile SMAS. A particularly unyielding portion of the SMAS (residing in the preauricular area known as Lore's fascia<sup>22</sup>) was originally described by Labbé et al,<sup>23</sup> who performed a suspension-induced correction of the jawline and neck. Since then, many surgeons have confirmed this observation and advanced the concept.<sup>10,13-16,24</sup> Most recently, Kailash et al<sup>25</sup> performed anchoring to the lateral fascia/platysma in neck rejuvenation.

Identifying and plicating similarly tenacious tissue along the length of the facial suture line is the *raison d'être* of the pinch rhytidectomy. This expanded principle is the simple but effective maneuver of the "pinch test," conducted between 2 forceps, demonstrating the full extent of excess tissue and the ideal point of fixation.

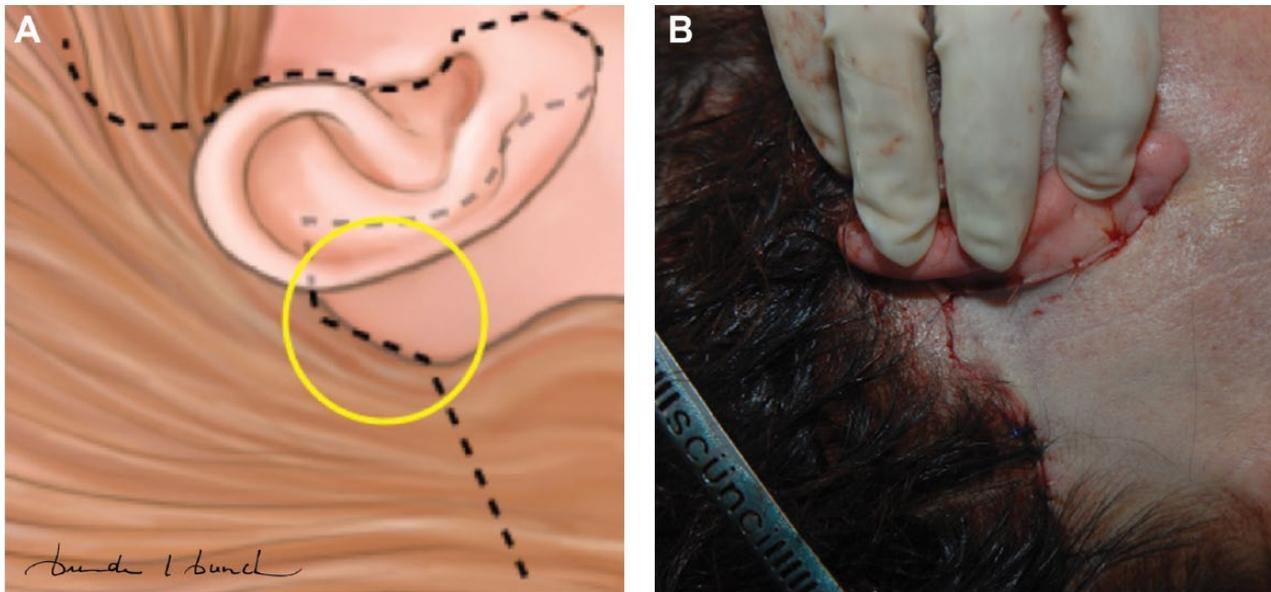
### **Skin Management**

The boundaries of skin dissection need only extend slightly beyond the prospective SMAS to be manipulated. Because the neck deformity is approached solely laterally, the skin dissection and fascial sutures must extend more caudally (low SMAS) at least to the lowest platysmal band if full



**Figure 5.** The lateral and deeply caudal superficial musculoaponeurotic system/platysma plication shown intraoperatively as performed in this 62-year-old woman.

neck correction is to be obtained (Figure 5). To rally this necessary exposure while still maintaining the desirable superiorly placed postauricular incision, a short hairline jog is made prior to its continuation into the scalp (Figure 6). These deeper sutures often produce a more complete anterior neck correction of both platysma and skin, fully to the chest. Symmetrically, the skin dissection must extend more superiorly (high SMAS), above the zygomatic arch, to accomplish a proper midface/malar lift.



**Figure 6.** (A) Illustration and (B) intraoperative photograph of this 64-year-old woman show the jog marking, which facilitates the deeper exposure necessary for proper suturing at the neck.

Regardless of the extent of dissection, some tissues are recalcitrant to effacement. There is often a predictable futility to extensive undermining of distant, discrepantly redundant tissues of the face. Specifically, the nasolabial and marionette folds, the malar bag, and cheek festoons are more lax than the adjacent tissues of the face. In general, no amount of local tissue release or distant skin traction could be expected to fully efface excess tissue in these areas. Direct excision or local laser ablation may be more definitive.

### **Vector Analysis of the SMAS and Skin**

The evaluation and treatment of the SMAS and skin should be governed by a careful vector analysis of excess. This concept is based on my original study of vectors of skin excess in abdominoplasty.<sup>26</sup> Ideally, for maximal correction of the abdomen, the vector of draw should be perpendicular to the vector of excess (Figure 7).

Any horizontal excess, typically manifested by platysmal bands in older patients, requires a more horizontal draw of the tissue or a direct excision through a vertical incision (as applied in the classic male “T-Z” direct necklift). This concept explains why a decidedly vertical lift may improve the jowls and jawline yet accentuate the platysmal bands (Figure 8). Reciprocally, vertical excess, most often seen in the neck rolls of younger facelift patients, is best effaced with a vertical draw of the skin or, rarely, with excision through a horizontal incision.<sup>28</sup> Thus, a more horizontal draw may improve the platysmal bands but magnify any coexisting horizontal neck rolls (Figure 9).

Most often, the facelift patient exhibits both horizontal and vertical excesses (Figure 10). As noted above,

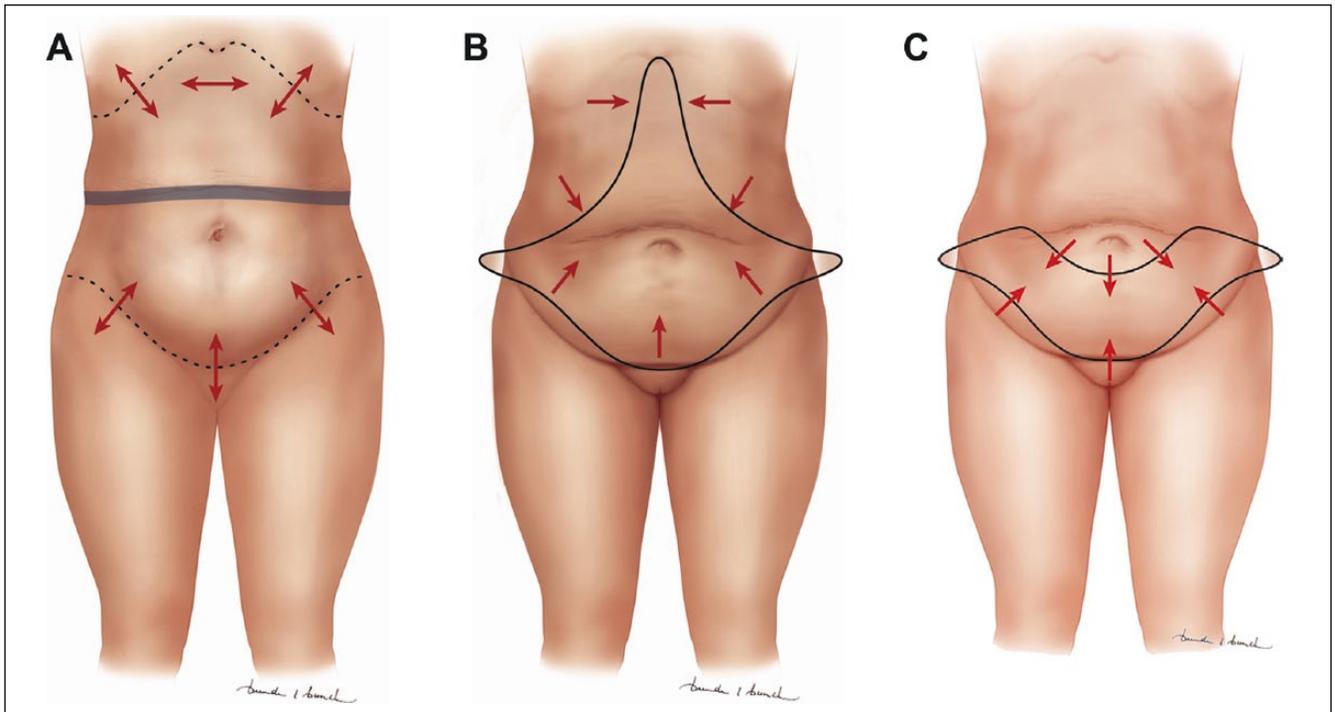
favoring one vector at the expense of the other can result in successful proximate correction but unintentional distortion of neighboring tissues. Consequently, the facial vector chosen is often an oblique compromise, mirroring the goal of the Lockwood high lateral tension abdominoplasty (Figure 11).

Patient age often affects the degree of adjustment required. The younger facelift patient usually has more horizontal rolls at the neck (Figure 12), whereas the older patient has more vertical skin and muscle bands in the neck (Figure 13). With pinch rhytidectomy, it is possible to conduct additional nuanced treatment of both the redundant SMAS (by adjusting the cant of fascial suturing) and the excess skin (by modulating the direction of the skin incision at the temple and mastoid regions) (Figures 14 and 15).

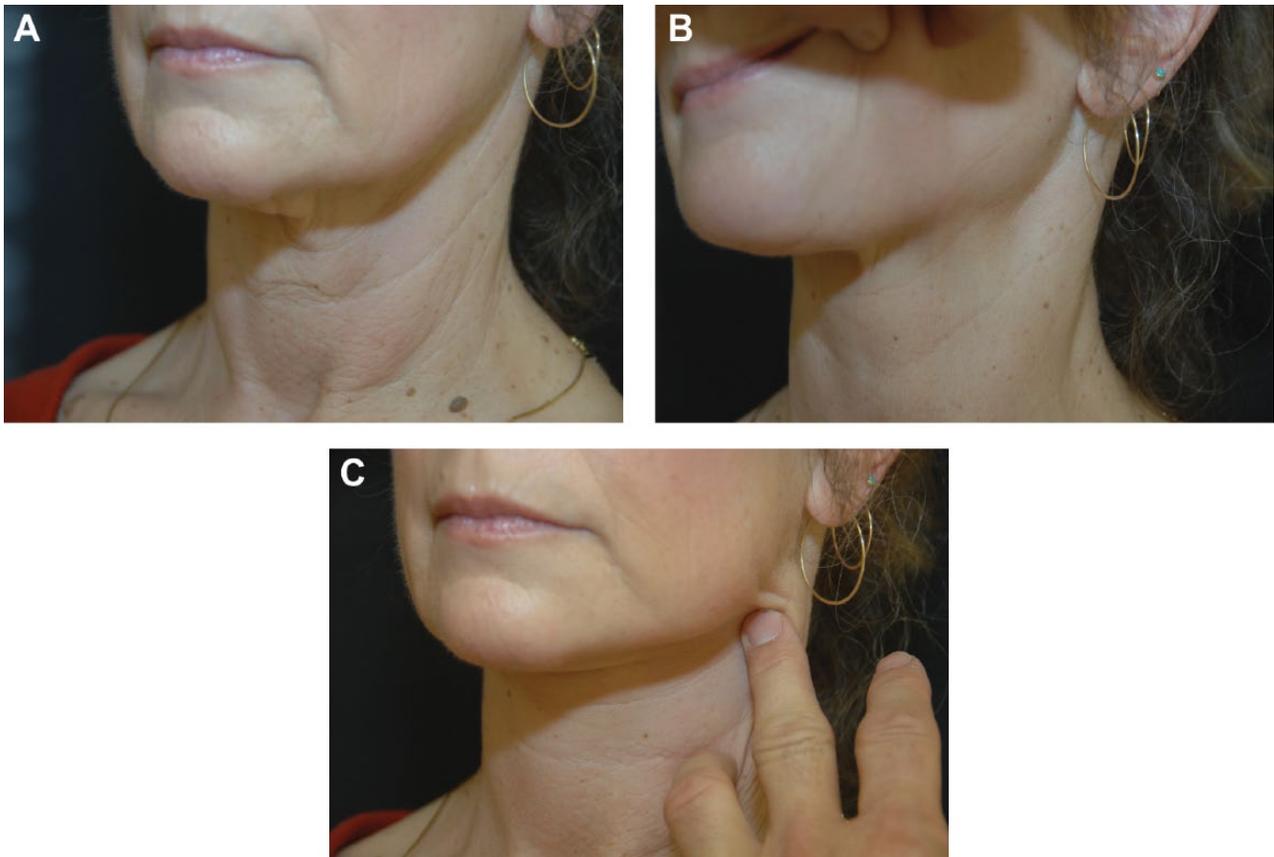
Jacano and Ransom<sup>27</sup> recently described their application of vectors to the rhytidectomy.

### **SMASectomy Design**

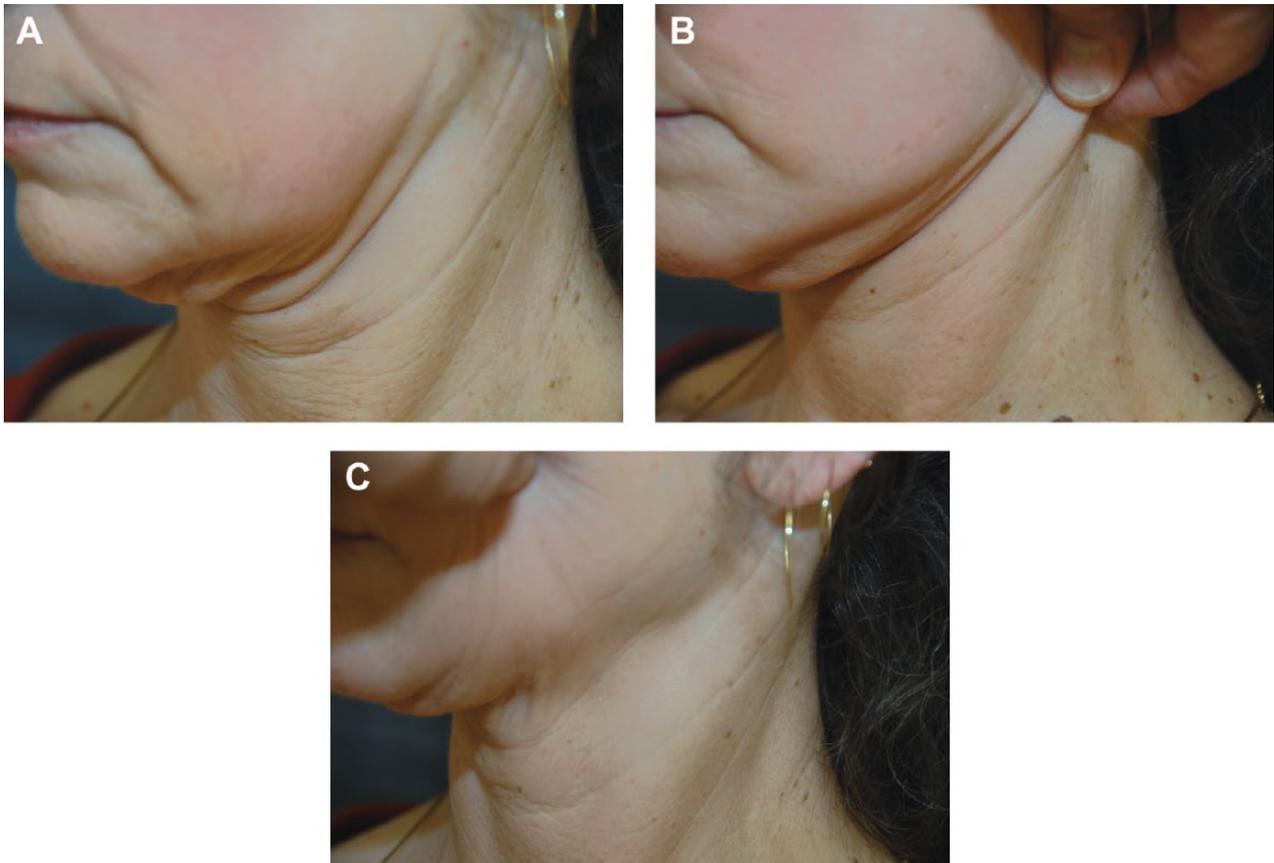
Keeping the vector concept in mind, the prospective SMASectomy is designed to approximate a hockey-stick shape, with the shaft parallel to the nasolabial and marionette folds in the face, the heel placed at the angle of the mandible, and the toe of the stick passing slightly posterolaterally, matching the cant of the platysma and its bands. The upper limit of the marking is drawn along a horizontal line running from the lateral canthus (to effect the high SMAS plication), and the lowest point is along a line at the most inferior aspect of the platysmal bands (to realize the low SMAS plication) (Figure 16).



**Figure 7.** Illustrations show vectors of abdominal excess (A, arrows) and design of excision for (B) fleur-de-lis abdominoplasty and (C) high-tension abdominoplasty.



**Figure 8.** (A) The vertical platysmal bands (horizontal excess) in this 58-year-old woman are worsened by a vertical draw (B) and improved by a horizontal draw (C).



**Figure 9.** (A) The horizontal neck rolls (vertical excess) in this 49-year-old woman are worsened by a horizontal draw (B) and improved by a vertical draw (C).



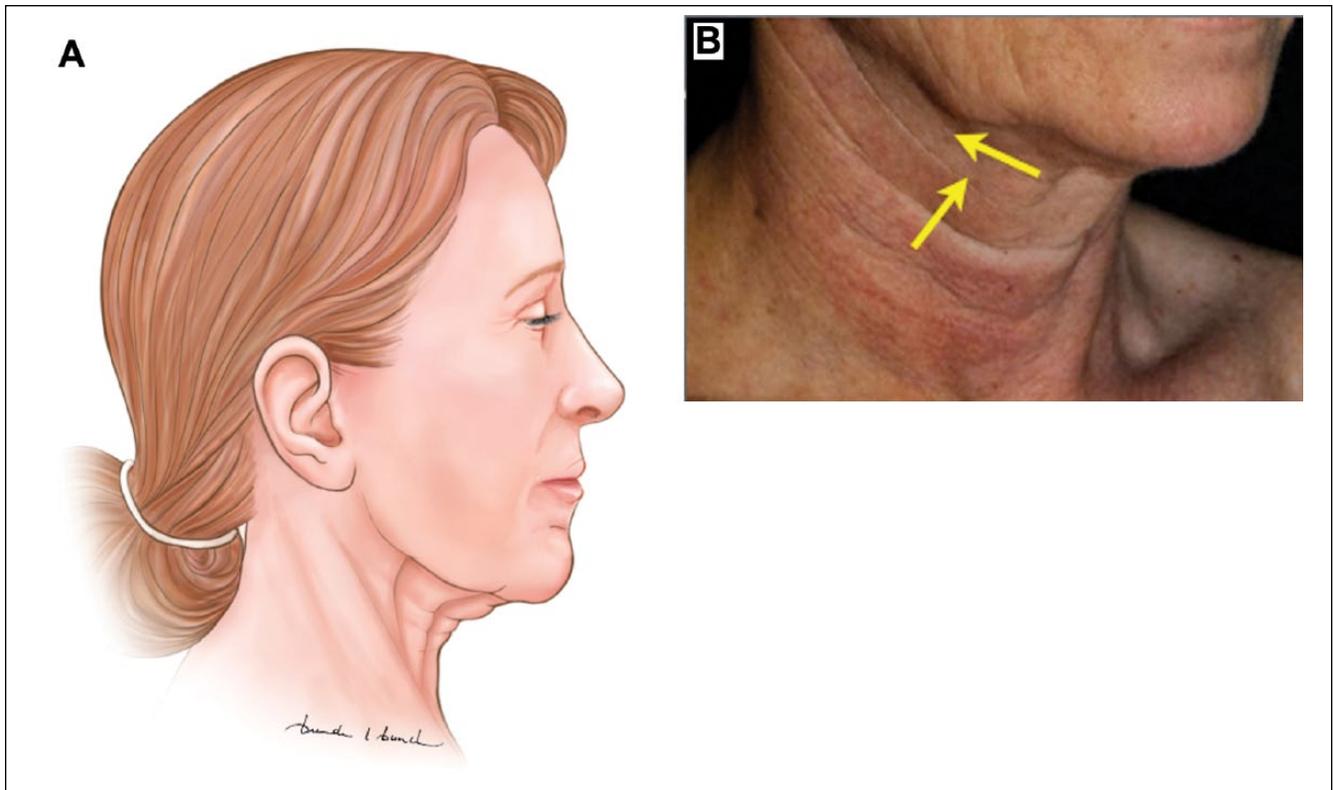
**Figure 10.** The often-varying vectors of excess (arrows) are demonstrated preoperatively in this 57-year-old rhytidectomy patient.

### ***SMAS and Skin Management***

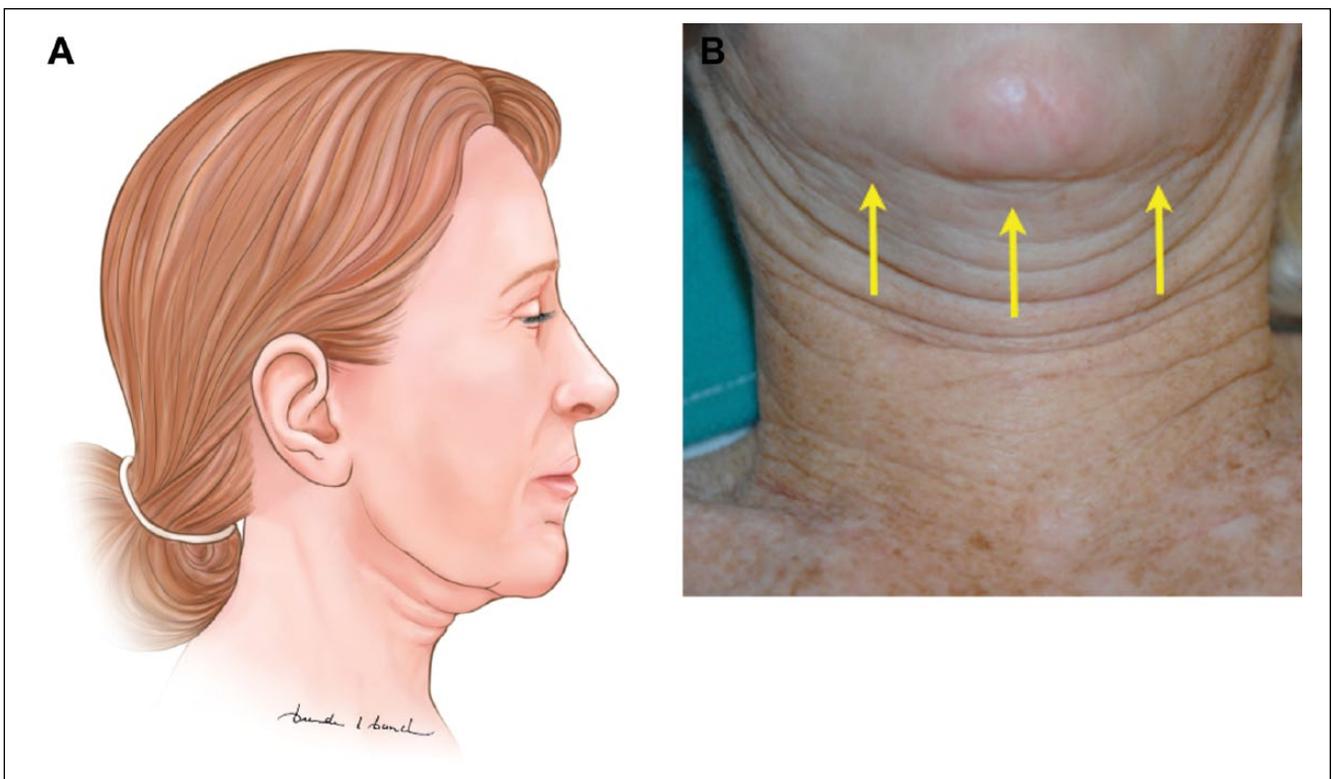
SMAS management usually entails direct excision but may be a simple tightening (plication) in the thinner and/or secondary facelift patient; the goal is to tighten this investing “girdle.” As the metaphor suggests, the SMAS can be taken in as needed to better define the underlying soft tissue and bony anatomy. Generally, a combination of these steps is undertaken. The excess SMAS is initially excised, and key sutures are placed at the mid-cheek, the angle of the mandible, and the mid-neck to determine its adequacy. More draw is achieved by incremental SMAS excision or supplemental plication as the SMAS defect is closed and the result becomes apparent. The closure technique is akin to placing multiple screws: gradual tightening from top to bottom and back again. Because the skin elevation is intentionally modest, the SMAS sutures must be wider and tighter. The SMAS gap may be as wide as 2.5 to 4.0 cm, and its plication must be “watertight,” with closely placed sutures (Figure 17).

If necessary, liposuction of the neck or jowl may be accomplished through a submental stab incision or via the open facial wound, respectively.

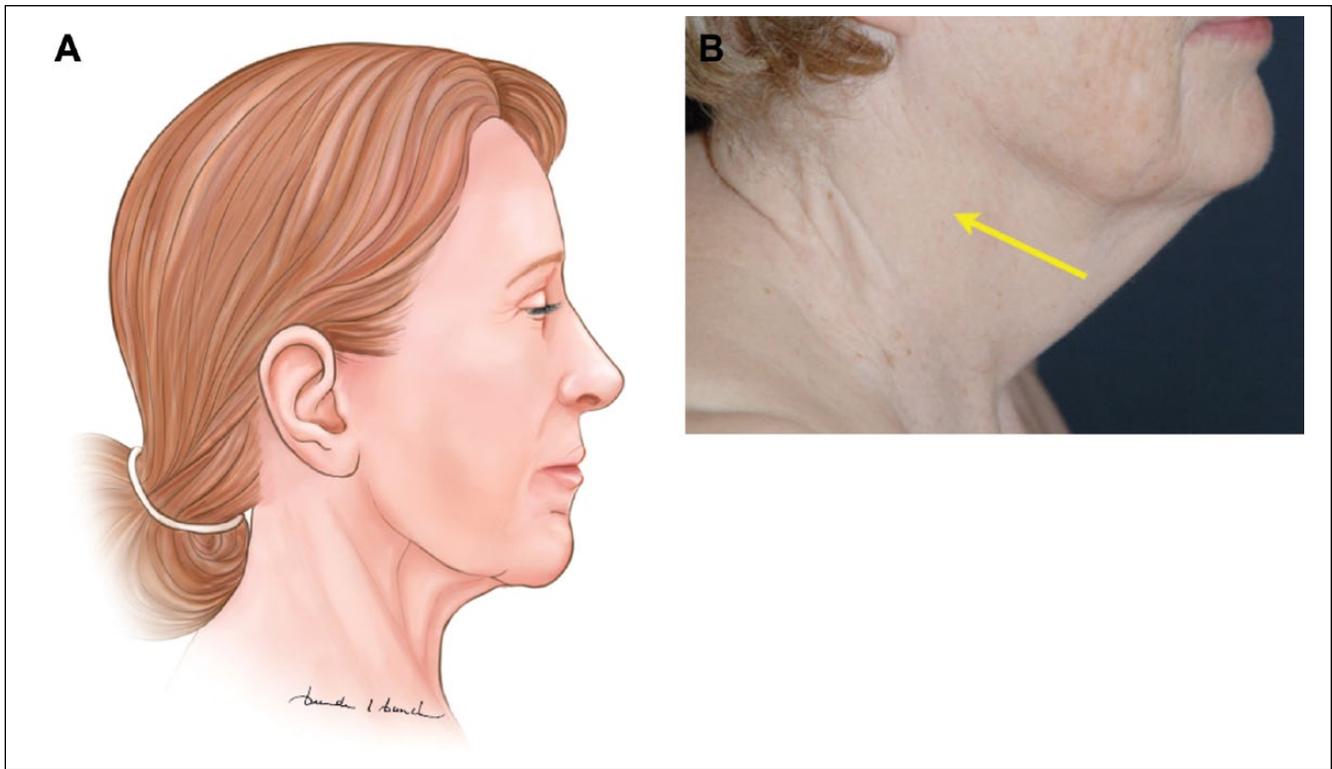
The skin is redraped under no tension, deliberately drawn less obliquely than the underlying SMAS, to achieve the most



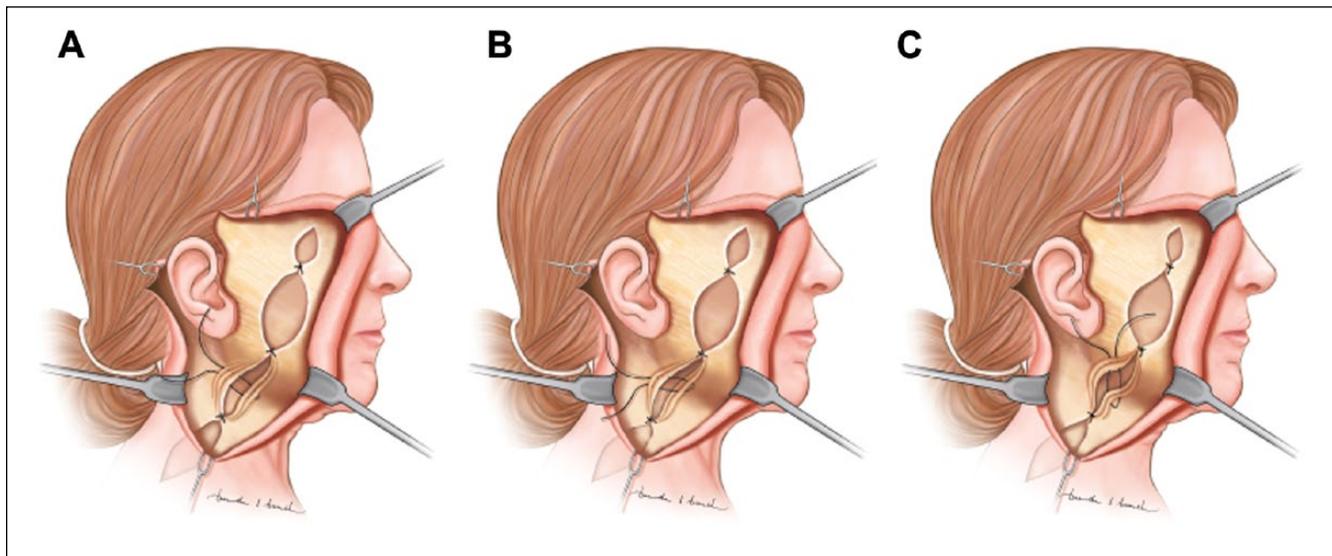
**Figure 11.** (A) Illustration and (B) preoperative photograph of this 57-year-old woman show both horizontal and vertical vectors of excess in the neck, predicating the oblique nature of the ideal vector of draw.



**Figure 12.** (A) Illustration and (B) preoperative photograph of this 45-year-old woman show vertical vectors of excess in the neck of the younger patient (horizontal rolls), predicating a more vertical draw.



**Figure 13.** (A) Illustration and (B) preoperative photograph of a 73-year-old woman demonstrate the decidedly horizontal vectors of excess in the neck of the older patient (vertical platysmal bands), predicating a more horizontal draw.



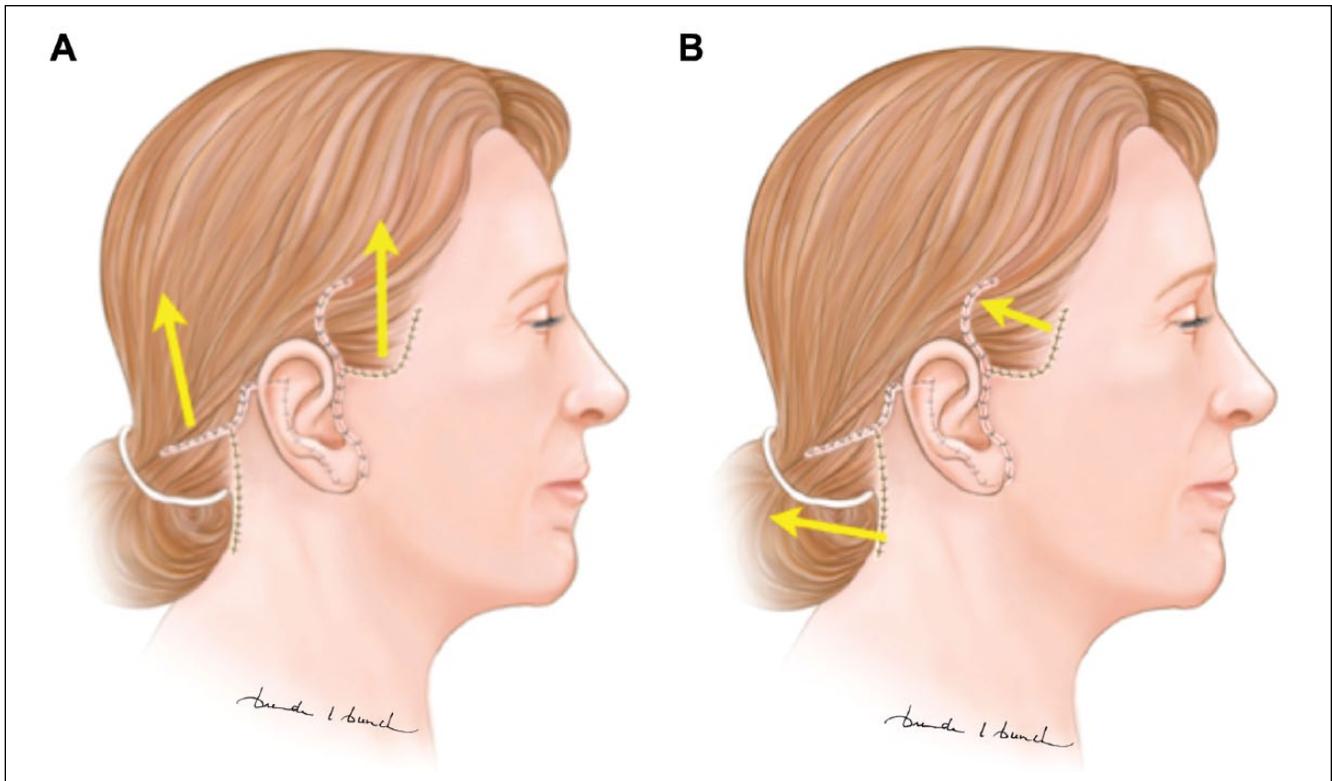
**Figure 14.** Illustrations of the adjustment of cant of superficial musculoaponeurotic system suturing according to the desired vector of draw: (A) vertically, (B) horizontally, or (C) obliquely.

natural vector. The final result should approximate the virtual result demonstrated preoperatively (Figure 18).

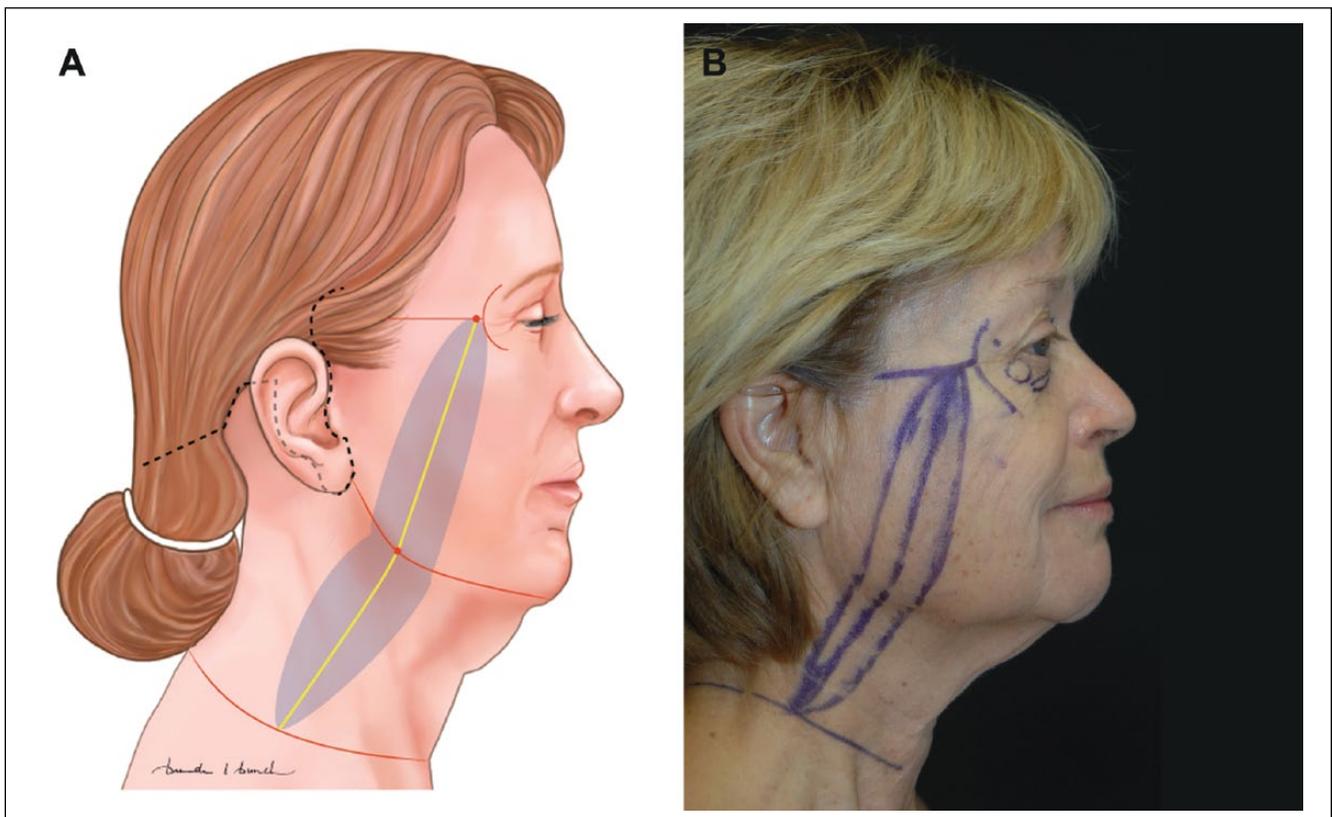
**CONCLUSIONS**

The efficacy of the solely laterally based pinch SMASectomy relative to the traditional open necklift has been established.

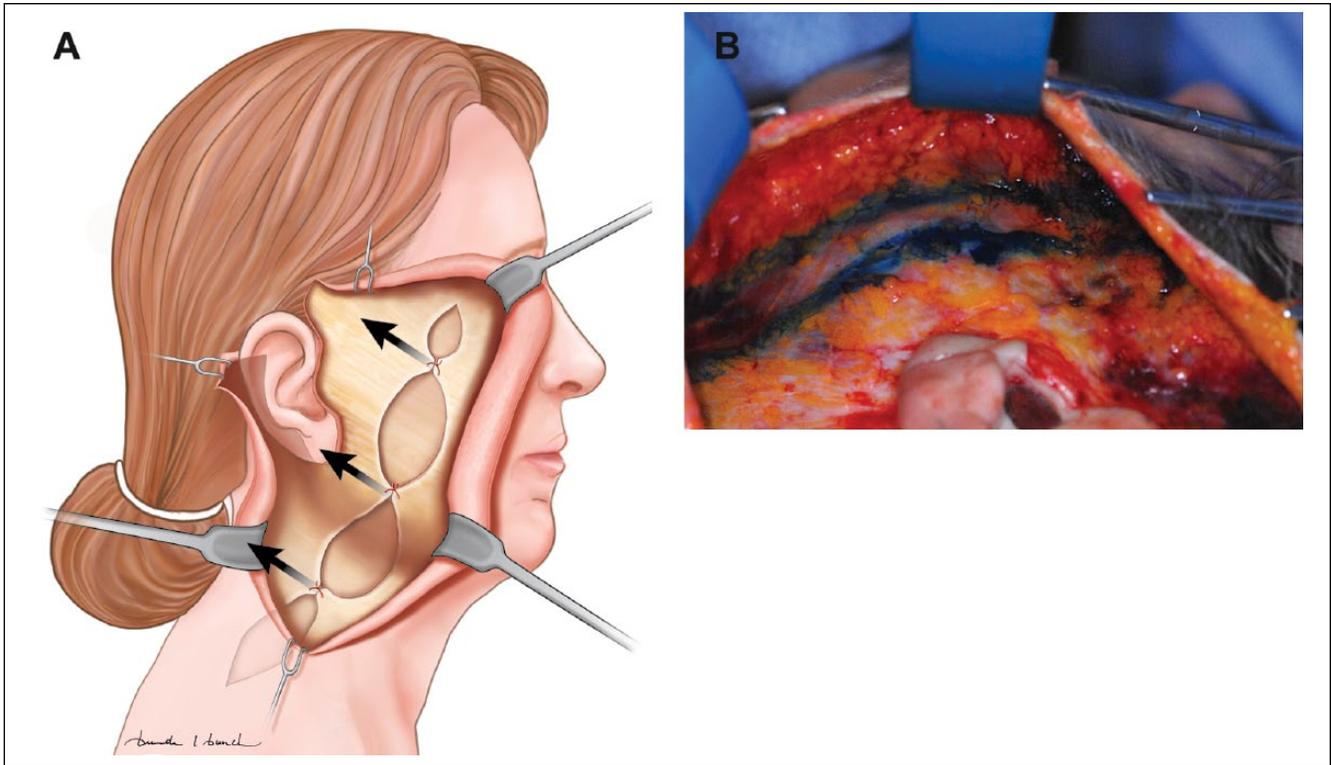
This higher, lower, wider, and tighter manipulation obviates a direct necklift and produces a complete, natural, and enduring neck rejuvenation. The SMAS and skin can be drawn independently and most effectively by adjusting the vectors of SMAS tightening as well as the orientation of the skin incisions. Moreover, patients recover more rapidly, with little risk of skin ischemia or motor nerve injury. In our ongoing quest



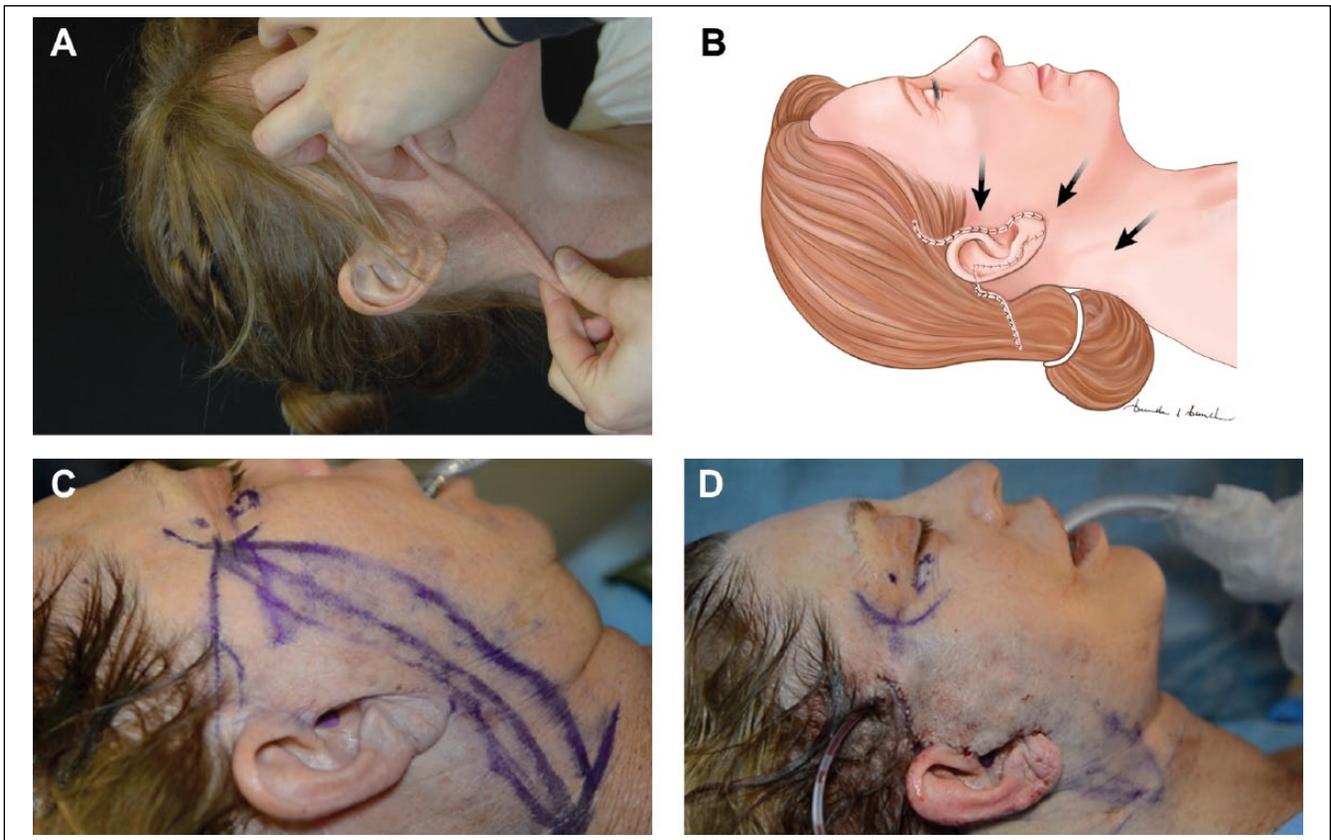
**Figure 15.** Illustrations of the adjustments in incisions to aid the preferred vector of skin draw: (A) for vertical excess or (B) for horizontal excess.



**Figure 16.** (A) Illustration and (B) preoperative photograph of a 62-year-old woman demonstrate the hockey-stick shape of markings for superficial musculoaponeurotic system (SMAS) rhytidectomy to effect high and low SMAS plication.



**Figure 17.** (A) Illustration and (B) intraoperative photograph of a 65-year-old woman undergoing superficial musculoaponeurotic system (SMAS) rhytidectomy (SMASectomy). The wider SMASectomy is demonstrated (blue margins in B), available for additional draw by further SMAS excision and/or plication.



**Figure 18.** (A) Preoperative virtual vector plication of the superficial musculoaponeurotic system is demonstrated on this 58-year-old woman. (B) Illustration of the plication shows the vectors of skin closure. Markings on the same patient (C) immediately before and (D) immediately after closure.

for the best facelift approach, the low SMAS pinch rhytidectomy has proven a reliable variation, delivering optimal aesthetic results with less surgical dissection.

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