Attention to the lower third of the face is essential to achieving superlative results in facial rejuvenation. This article focuses on the cutaneous upper lip. While genetics may predispose patients to dysmorphologies in this area, aging alters its balance in a predictable manner. Namely, philtral lengthening over time begets dental hooding and lip inversion, resulting in decreased vermilion height.\textsuperscript{1-6}

Despite its centrality in facial harmony and beauty, the upper lip is often neglected in facial rejuvenation procedures. Possible reasons include greater focus by surgeons and patients on other features, inability to recognize imperfections, inexperience with lip lifting, or dissatisfaction with current techniques. Today’s standard lip lift techniques include subnasal resection (indirect) and vermilion advancement (direct), both of which leave a continuous cicatrix. Besides reducing visible scarring, the “ideal” lip lift should restore dental show, increase visible vermilion, enhance pout, and inhibit scar migration to yield lasting results.

In this Featured Operative Technique article, we describe a new endonasal approach that meets those goals. We provide a description of each technical step of the procedure and offer discussion of nuances and clinical pearls. Moreover, this article provides photographic and quantitative evidence of improvement within a large patient series, discusses complications and management, and juxtaposes our technique with various alternatives in the literature.

\textbf{PATIENT SELECTION}

The main indication for a lip lift is excess distance between the nasal base and upper lip vermilion border, irrespective of lip fullness or etiology. While the majority of lifts that we perform are for rejuvenation purposes, others are performed on younger patients with congenitally long philtra. Candidates are generally selected during preoperative consultation but may also be identified upon photographic review.
We advocate a recently described classification system when analyzing the upper lip aesthetic unit and selecting patients who would benefit from lip lifting. This system categorizes patients by labial and philtral height and is supplemented by 2 diagnostic aids: (1) a philtral-labial score, computed as the ratio of philtral height to upper lip height at the midline, and (2) dental show, or upper incisor height exposed with slightly parted lips at rest. These tools help confirm suspicion of upper lip anomalies with objective evidence.

As Table 1 illustrates, Types 2 and 3 in the classification system are associated with tall philtra, a philtral-labial score of at least 3, and no dental show. These patients also often present with upper lip inversion. Adults who meet these criteria and whose medical health permits surgery are prime lip lift candidates, assuming that they possess normal maxillary height. Otherwise, skeletal abnormalities should be addressed before any soft tissue correction. Another surgical candidate is a “duckbill” patient, who previously underwent lip augmentation (usually excessively performed) when a lip lift would have been more beneficial.

Defect-free (Type 0) and thin-lipped (Type 1) patients are poor candidates. Type 0 patients may elect to undergo augmentation, but lifts are contraindicated. Likewise, lifting may unfurl a senile Type 1 lip to reveal more vermilion but only as an ancillary benefit and at the expense of an abnormally short philtrum. Other exclusion criteria may include a history of hypertrophic scarring and large ratios of lip width to nasal base or markedly downturned commissures owing to undercorrection of the lateral lip.

Because nostril sills conceal scarring in their underlying crease, some surgeons discourage indirect lifts on patients with hypoplastic ones. By contrast, prominent sills are not prerequisites in our patient selection, for endonasal scarring obviates their camouflaging ability. Other immaterial concerns include age, skin thickness, and Fitzpatrick skin type.

**OPERATIVE TECHNIQUE**

**Markings**

The patient is marked with a wavy ellipse denoting the area of planned resection (Figure 1). A video of this method is available online at www.aestheticsurgeryjournal.com. You may also scan the code on the first page of this article with your smartphone to be taken directly to the video at www.YouTube.com. The more facile superior margin is traced through points A, B, and C along natural contours. The inferior margin curvilinearly connects points C, D, and E in accordance with the following criteria: (1) the ellipse’s vertical dimension is consistent in both subnasal and endonasal aspects, respectively, unless adjustments are required for lip or nostril asymmetry; (2) its ends taper into the alar creases to prevent tissue bunching; (3) flap width is 2 to 3 mm, depending on nostril floor width and whether sill narrowing is planned; and (4) flap length (vertical distance E-D) is 4 to 8 mm.

Several reference points merit special consideration. First, since point A is fixed, point D specifies the degree of

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**Table 1. Upper Lip Classification System, Diagnostic Tools, and Surgical Management**

<table>
<thead>
<tr>
<th>Type</th>
<th>Philtral Height</th>
<th>Labial Height</th>
<th>PLS</th>
<th>Dental show</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Normal</td>
<td>Normal</td>
<td>&lt; 3</td>
<td>1-2 mm</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>Normal</td>
<td>Short</td>
<td>3-5</td>
<td>≥ 1 mm</td>
<td>Lip Augmentation</td>
</tr>
<tr>
<td>2</td>
<td>Tall</td>
<td>Normal</td>
<td>3-5</td>
<td>0 mm</td>
<td>Lip Lift</td>
</tr>
<tr>
<td>3</td>
<td>Tall</td>
<td>Short</td>
<td>&gt; 5</td>
<td>0 mm</td>
<td>Combination</td>
</tr>
</tbody>
</table>


*Age- and sex-dependent.

*Lip augmentation and lip lift.
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lift. This measurement ranges between 4 and 12 mm and is based on preoperative analysis of maxillary, philtral, and labial heights in conjunction with desired dental show.\(^\text{10}\) While experience alone may enable optimal placement of point D, a more systematic approach involves raising the cutaneous upper lip to the nasal base from progressively lower points and marking the point that yields optimal dental exposure\(^2\) (Figure 2). Second, point B lies at the place where tugging the nasal mucosa with forceps becomes difficult (Figure 3), usually 5 to 9 mm above the sill, and is therefore identified after local infiltration.

Last, point E is ultimately set such that the flaps are long enough to reach the sturdy vestibular tissue at point B yet slightly shorter than the distance between the sill and point B. In contrast to the distance from point A to point D, which corresponds to magnitude of lift, the length between points B and E controls tension. Starting with longer flaps is highly recommended because they can always be trimmed later to bear full tension, whereas flaps that are too short cannot be reverted to the desired length.

Operative Steps

Following preoperative planning, the perioral region is prepped with povidone-iodine solution, and sterile drapes are applied (Figure 4). Approximately 5 mL of buffered lidocaine with epinephrine is infiltrated uniformly throughout the marked area, and resection is performed in the subcutaneous plane (Figure 5). Note that more pronounced sills demand more superficial resection (Figure 6). Hemostasis is secured with pinpoint electrocautery.

Once resection is complete (Figure 7), the flaps are undermined (Figure 8) and advanced into the nasal vestibule. Fine-tuning is often necessary at this juncture to expose more dentition, relieve subnasal tension, and/or ensure a symmetric inset. In other words, the goal is to unite points D and A when merging points E and B. This process may entail additional cutaneous lip excision and a 2- to 3-mm resection of the flap tips (Figure 9).

Figure 2. The lip is bimanually pulled superiorly from different levels until approximately 2 mm of dental show is attained.

Figure 3. (A) Note how deep the forceps must enter the vestibule before encountering solid mucosa. (B) Traditional bull horn resections affix the lip to mobile tissue near the sill (left). By contrast, our endonasal lift affixes the flaps to relatively sturdier tissue in the vestibule (right).
Cautionary advice is warranted in men and in patients with prominent philtral columns. For the former, we recommend electrolysis of any hair-bearing skin being elevated above the sill; for the latter, we suggest thinning the flaps to avoid the unnatural appearance of intranasal philtral extension.

Next, key anchoring sutures are placed with 4-0 chromic catgut (Figure 10); the surgeon should be mindful of incorporating the tough supraperiosteal tissue of the vestibular floor. The remaining endonasal closure is performed in a simple interrupted technique with 5-0 chromic catgut, and the skin is closed with 6-0 Prolene (Ethicon, Inc; Somerville, New Jersey) (Figure 11). Bacitracin ointment is applied. The entire procedure takes 1 hour to complete and may be performed in isolation or as an adjunct to facial rejuvenation surgery.

A video demonstrating the operative technique is available online at www.aestheticsurgeryjournal.com. You may also scan the code on the first page of this article with your smartphone to be taken directly to the video at www.YouTube.com.

**Postoperative Care**

Patients are discharged with advice to refrain from smoking for 2 weeks, take pain medication as necessary, avoid excessive chewing, and clean incisions with diluted hydrogen peroxide, followed by antibiotic ointment dressing twice daily for 1 week. Patients are also told that consuming arnica montana tablets, sleeping elevated on 2 or 3 pillows, and application of cool moist compresses all help to mitigate swelling, bruising, and discomfort. The Prolene sutures are removed at 1 week.

**RESULTS**

The senior authors (P.R. and S.H.) performed a total of 311 endonasal lip lifts between August 1, 1998, and April 30, 2013, with follow-up spanning 1 to 10 years (mean, 3 years). Patients in this series had an average age of 52 years (range, 24 to 69 years). The population was 89% (n = 277) women, 7% (n = 22) men, and 4% (n = 12) transgender. The majority of the patients self-reported as Caucasian (82%, n = 255), followed by Hispanic (10%, n = 31), Asian (7%, n = 22), and African American (1%, n = 3).

In all cases, our technique eliminated the continuous subnasal scars of indirect lip lifts. Decreases in philtral height (average, 6 mm) were accompanied by enhanced vermilion show, creating a more favorable balance. In a random selection of 50 patients from the series, calculations revealed a mean philtral-labial score decline from 4.6 (Type 2) to 3.0 (Type 1). The latter figure remained just above the Type 0 philtral-labial score range but was 35% closer to normal than where it began. Consistent enhancement was also obtained in pout and dental show, while sill width was successfully tailored to patient needs.

The long-term rate of complications in this patient series was 34% (n = 141) (Table 2). Major complications such as infection, bleeding, complete dehiscence, and noticeable loss of lift never occurred. However, adverse scarring events (1%; n = 3) and small areas of wound separation (2%; n = 6) did arise, for which infrequent revisions were necessary (21 revisions). Other minor issues, such as undercorrection, alar distortion, and sill widening, were respectively managed with additional lifting, alar rotation, and flap narrowing under local anesthesia. Additionally, early in the series, sill integrity was compromised, resulting in a lack of demarcation between the vestibule and cutaneous lip. As our technique evolved, the incidence of undercorrection, alar distortion, sill widening, and sill deformation decreased from above 20% to below 5%.
Typical clinical results are shown in Figures 12 through 15.

**DISCUSSION**

Cosmetic procedures to shorten the cutaneous upper lip evolved between the 1950s and 1980s. During this period, the subnasal “bull horn” and supravermilion “gull wing” resections were described and popularized. Given their inherent by-product of conspicuous scarring, some surgeons have since abandoned these methods altogether, while others favor their application on elderly patients and those with fair complexions or thin skin.

Our procedure differs from other indirect forms of cheilopexy in several respects. First, while some techniques do not involve cutting across the sill, the de-epithelialization method described above ensures minimal disturbance to preoperative sill bulk. Second, excess flap skin and subcutaneous tissue are removed rather than folded into the philtral columns; we believe that the folding method competes with lip elevation. Third, our

**Figure 6.** Care is taken to spare the full subcutaneous and dermal components of the sills. (A) Note how the scalpel is angled to de-epithelialize this region only. (B) This will allow the flaps to rest upon a convex surface, thus minimizing topographical effacement.

**Figure 7.** Resection is complete. Note the height of the defect (4 mm) and the length of the flaps before shortening. Also note the visible dermis (white) at the sills, indicating a relatively shallower resection.

**Figure 8.** This patient’s flaps were completely undermined in the subcutaneous plane. The depth and degree of undermining vary according to surgeon’s preference.
Figure 9. (A) This sequence illustrates how the flaps are pulled superiorly with forceps to gauge dental show restoration and determine if any tweaks are warranted. Namely, the inferior defect margin may be lowered or excess flap excised if the previous step dictates such a need. The result is a more pleasing dental show. On this patient, (B) the lower margin was raised to its expected position, and (C) 2 mm of excess flap was eliminated.

Figure 10. Key anchoring sutures are in place. (A) Typically, subnasal tension will be absent (ie, no visible subalar or subcolumellar defect), and the caudal wound edges will be vertically aligned with the alar and columellar bases. (B) In this case, however, we performed excess resection below the alar creases to achieve more lateral lifting.
incisions are useful when performing adjunctive rhinoplasty procedures such as tempering wide sills and alar flaring, which we routinely perform via a previously described technique. Fourth, we use flaps instead of darts to anchor the key sutures more cephalad. Scarring is thus “visibly” discontinuous and its spread decreased, thereby minimizing relapse and rendering overcorrection unnecessary.

Because scarring and tension are vestibular based, hypothetical downward migration is conveniently hidden, and beveled incisions at the nasal base with subsequent subcutaneous closure are unwarranted. Compared to the only other intranasal flap approach that we encountered, our flaps are much narrower and affixed to a sturdy portion of the vestibular floor, as opposed to the loose areolar tissue near the entrance. Early in our development of this technique, we noted widening of the nostril base when using flaps that spanned the full unaltered sill. We discovered that when flap width was roughly halved, sills appeared narrow initially but stretched to preoperative dimensions within 3 months. Thereafter, the revision rate declined.

We also made technical adjustments designed to curtail undercorrection, alar distortion, and sill effacement. Inadequate lip reduction was common early in our series, but we learned to avoid it by practicing the maneuver outlined in Figure 2. Experience has shown that it is often necessary to resect a large height of skin (at least 5 mm) to account for unfurling, effect noticeable change, and achieve desired results. As for alar preservation, the lateral aspect of the flap inset should cross the alar-sill junction rather than the ala proper. We implemented this modification after noticing alar interruption (Figure 13) in several patients.

Initially, “tensioning” skin flaps over the sills imparted an unaesthetic flatness, but our technique evolved to retain sill convexity. When undermining the flaps, for example, we tried thickening them where they would overlie the sill, but predicting the exact location was difficult. Outcomes improved when we de-epithelialized the sill instead. In the trade-off between sill preservation and scar segmentation, we put greater emphasis on the latter. No patient of ours has ever complained of sill alteration—a subtlety perhaps better appreciated by the trained eye. Of course, this trade-off is irrelevant in sill-deficient patients, on whom resection may be performed with impunity.

There are some functional limitations common not only to our technique but also to subnasal resections in general. First, since these act predominately on the central two-thirds of the upper lip, the commissures are not raised considerably. In fact, they may appear downturned temporarily, which resolves in 3 to 4 weeks as swelling subsides. A more caudal subalar resection with our technique enables some lateral lifting (Figure 10B) but not to the same extent as a corner lift. Second, the endonasal lift neither augments nor narrows the Cupid’s bow noticeably. A simultaneous vertical midline excision may serve this purpose, though we caution against the last 2 procedures due to potential scarring or deformities.

Table 2. Compendium of Complications in 311 Patients

<table>
<thead>
<tr>
<th>Complication</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bleeding</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Complete dehiscence</td>
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<td>0</td>
</tr>
<tr>
<td>Relapse</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Adverse scarring events</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Localized wound separation</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Undercorrection</td>
<td>25</td>
<td>8</td>
</tr>
<tr>
<td>Alar distortion</td>
<td>38</td>
<td>12</td>
</tr>
<tr>
<td>Sill widening</td>
<td>29</td>
<td>9</td>
</tr>
<tr>
<td>Sill deformation</td>
<td>40</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>141</td>
<td>34</td>
</tr>
</tbody>
</table>

Figure 11. The inset is complete. Compared to Figure 4, the vermillion already appears heightened, and dental show is noticeably improved.
The endonasal technique fulfills our criteria of an “ideal” lip lift. By localizing tension deep within the nasal vestibule onto relatively immobile tissue, we achieve enhanced stability as well as scarring hidden intranasally and camouflaged at the nasolabial junction. Moreover, the procedure restores dental show, restores youthful pout, and increases visible vermilion while enabling concomitant repair of caudal nasal defects and retaining a semblance of sill contour. However, its ability to raise the corners or manipulate Cupid’s bow architecture is limited. Proper patient selection and careful technique are key to low reoperation rates.

Figure 12. (A, C) This 53-year-old woman with a Type 2 defect presented after a previous lip augmentation. (B, D) Five months after a 6-mm vertical excision lip lift. Note the restoration of dental show and youthful pout. Additionally, note how sill bulk mirrors preoperative dimensions. She did not undergo any additional facial rejuvenation procedures.
Figure 13. (A, C) This 41-year-old woman with a Type 2 defect expressed dissatisfaction with her ptotic upper lip. (B, D) Thirteen months after a 7-mm lip lift and rhinoplasty, sagittal lip projection was improved and 2 mm of dental show achieved. Despite mild disruption of the alae medially, the patient was pleased with her result and declined any revision.
Figure 14. (A, C) This 67-year-old woman with a Type 3 defect was unhappy with her perioral appearance in general. (B, D) Sixteen months after a 5-mm lip lift, face- and necklift, bilateral buccal fat pad excision, and rhinoplasty. Note the heightened vermillion, augmented pout, and imperceptible scarring. We attempted to spare what little sill she had.
Disclosures

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REFERENCES


Figure 15. (A, C) This 59-year-old woman with a Type 2 defect complained of a long upper lip. (B, D) Fourteen months after a 6-mm lip lift, the increased vermilion height imparts a fuller appearance and enhanced philtral-labial harmony. The patient’s sill integrity was successfully maintained. She declined any other perioral surgery, including lower lip augmentation.