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Anatomical Considerations and Technique for Nasolabial Fold Thread Lifting

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Summary: This review presents a comprehensive analysis of nasolabial fold classification and correction using thread-lifting techniques. Three distinct types of nasolabial folds are identified: those caused by paranasal volume deficiency, differential tissue laxity, and muscular insertions. The study emphasized the importance of Lore fascia as a key anatomical landmark and optimal adhesion point for thread placement, offering advantages over the traditional temporal approach. The technique uses a combination of bidirectional threads (Sihler Bi Lift) for tissue repositioning and volumizing threads (Sihler Volume) for fine line correction. Special consideration is given to the anatomical course of the facial artery and its branches, particularly in Asian populations, where more than 70% of people demonstrate medial crossing of the nasolabial fold. This comprehensive approach enables effective correction while minimizing complications. *(Plast Reconstr Surg Glob Open 2025;13:e7150; doi: 10.1097/GOX.0000000000007150; Published online 1 October 2025.)*

INTRODUCTION

The nasolabial fold is a complex anatomical feature, and its effective treatment requires a precise understanding of its varying presentations and underlying causes. The traditional single-classification approach does not fully capture the multifaceted nature of these folds, highlighting the need for a more refined categorization system to achieve optimal treatment outcomes.

The anatomical foundation of nasolabial folds involves intricate interactions between superficial and deep fat compartments, muscular attachments, and ligamentous structures. A thorough understanding of these relationships is essential for selecting the most appropriate treatment vectors and techniques.[1–5]

Lore fascia has emerged as a key adhesion point in thread-lifting techniques, representing a significant advancement over traditional temporal approaches. Its use offers improved access and control while minimizing the risk of complications involving vital structures.[6,7]

The unique characteristics of Asian facial anatomy, particularly regarding vascular patterns and tissue thickness distributions, necessitate specific considerations in procedural planning and execution to ensure both safety and efficacy. Although the anatomical variations described in this article are primarily based on studies of Korean patients, the general principles can be adapted by patients of other ethnicities with appropriate considerations for their specific anatomical variations.

CLASSIFICATION OF NASOLABIAL FOLDS

The nasolabial fold is commonly defined as the bilateral oblique lines extending from the superior border of the alar base toward the cheeks, forming a characteristic “八” shape. Although the term “nasolabial fold” is used broadly regardless of its underlying cause, effective clinical intervention requires a more nuanced classification based on the contributing anatomical factors. For optimal treatment planning, these folds can be categorized into 3 distinct types (Fig. 1).[3,8–10]

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Type 1: Paranasal Volume Deficiency

The first type of nasolabial fold primarily results from volume deficiency in the paranasal region. Patients with a naturally concave canine fossa of the maxilla tend to have minimal superficial fat in the paranasal area below the nasolabial fold line, in contrast to the more prominent nasolabial fat superior to the fold. When compounded by a lack of deep fat layers, this volume deficiency creates a characteristic triangular depression in the paranasal region. The resulting disparity between the sunken paranasal area and the prominent fat layer above the nasolabial fold forms a noticeable step-off, giving the appearance of a deep line that mimics a wrinkle.[1]

Type 2: Differential Tissue Laxity

The second type of nasolabial fold develops due to differences in skin laxity above and below the fold line. The skin of the upper lip region, located inferior to the fold line, remains relatively fixed to the underlying orbicularis oris muscle, resisting ptosis. In contrast, the tissue superior to the fold line becomes increasingly lax with age, allowing the descent of the malar fat pad.

Aging is typically associated with hypertrophy of the superficial nasolabial fat above the fold line, whereas the paranasal region below the fold undergoes volume loss, further exaggerating the disparity in tissue thickness. The sagging, voluminous tissue above the fold drapes over the more firmly anchored paranasal region, deepening the nasolabial fold and making it more prominent.[1]

Type 3: Muscular Insertions

The third type of nasolabial fold is not primarily caused by volumetric imbalances or age-related ptosis but instead arises from the cutaneous insertions of the upper lip elevator muscles, including the levator labii superioris alaeque nasi, levator labii superioris, and zygomaticus major and minor. These muscle fibers attach to the skin near the nasolabial fold line, typically exerting tension on the skin below the lower border of the nasolabial fat. During facial animation, muscle contraction accentuates the fold by pulling the inferior aspect downward while causing superior bulging of the fat layer. Initially appearing only during dynamic facial expressions in youth, repeated movements over time lead to the development of a permanent, visible line, even at rest.[1]

Takeaways

Question: Which anatomical and technical factors drive successful nasolabial fold thread lifting?

Findings: Outcomes improve when folds are classified into 3 types, Lore fascia is used as the anchor plane, the mainly medial course of the facial artery in Asians is respected, and thread choice (barbed for lift, smooth/volumizing for fine lines, Sihler Thread [Sihler, Inc., Korea]) is matched to depth.

Meaning: Precise fold typing, awareness of ethnic vascular patterns, and tailored thread selection and placement together yield reliable correction with fewer complications.

It is important to note that these 3 types of nasolabial folds can occur independently but often coexist in varying degrees in the same patient. Therefore, a comprehensive assessment of the predominant type and any secondary contributing factors is essential for treatment planning. Although our classification system guides thread selection and placement, combinational approaches are often necessary for optimal results.

ANATOMICAL CONSIDERATIONS

Relevant Facial Planes and Ligamentous Structures

When approaching the nasolabial fold region, understanding the relevant facial planes is crucial for both safety and efficacy. From superficial to deep, these include the skin, subcutaneous fat, superficial musculoaponeurotic system (SMAS), deep fat compartments, and periosteum. For thread-lifting procedures targeting nasolabial folds, the optimal plane varies depending on the specific region being traversed and the type of thread being used.

These 3 types of nasolabial folds can occur independently but frequently coexist. Barbed thread lifting, which targets the ptotic skin and soft tissue superior to the fold line (second type), can improve the fold by flattening the

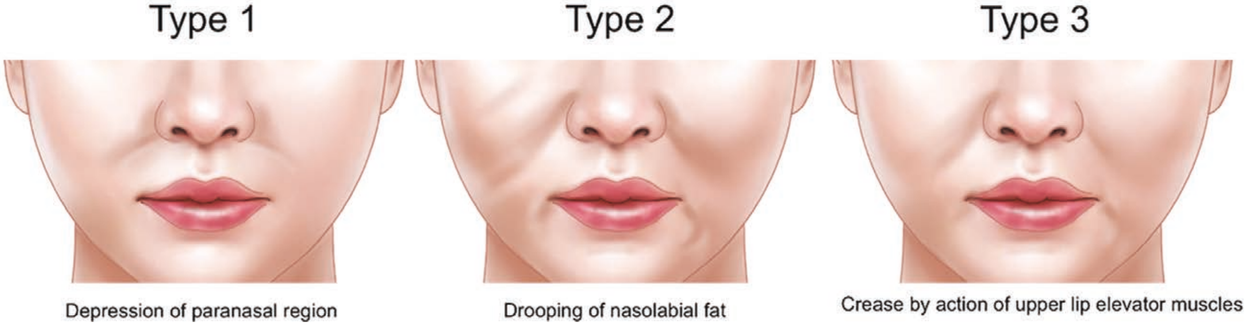

Fig. 1. Three types of nasolabial fold: type 1, depression of paranasal region; type 2, drooping of nasolabial fat; and type 3, crease by action of upper lip elevator muscles. A comprehensive illustration demonstrating the distinct anatomical presentations of nasolabial folds: paranasal volume deficiency creating a step-off appearance, ptotic nasolabial fat causing tissue draping, and muscle-induced creasing from repetitive animation of upper lip elevators.

superior bulge while simultaneously reducing the relative depression of the paranasal region. For the third type, characterized by muscle-induced creasing and dynamic accentuation, volumizing monofilaments inserted along the fold line can be beneficial. This technique enhances skin firmness, reduces fold depth, and minimizes dynamic creasing during facial expressions. Additionally, postprocedural collagen stimulation contributes to overall skin tightening, helping to soften static lines visible at rest.

When lifting ptotic tissues superior to the nasolabial fold, the ideal vector for barbed threads should be perpendicular to the fold line. However, using the temporal hairline or the antihelix between the temple and ear as adhesion points presents practical challenges. The cannula must navigate around the prominent malar eminence to reach the nasolabial fold, which can complicate manipulation and lead to inconsistent insertion plane depth, particularly as it curves around the malar prominence.

Moreover, this trajectory may interfere with the origin of the zygomaticus muscles near the malar eminence, potentially restricting upper lip elevation and further accentuating malar projection in individuals with prominent cheekbones. To address these concerns, Lore fascia, a robust fascial structure located immediately anterior to the tragus, is recommended as the adhesion point. This approach facilitates direct access to the nasolabial fold region while avoiding interference with the malar eminence.

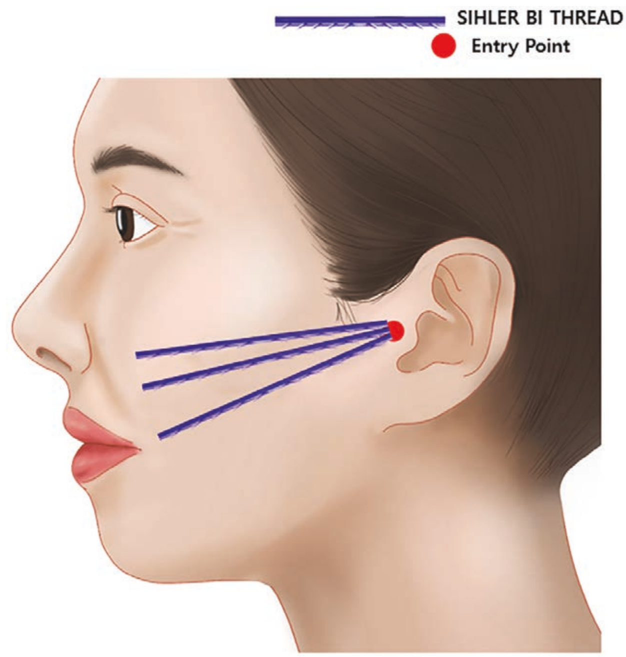

Fig. 2. Diagram showing Lore (tympanoparotid) fascia extending from the tympanomastoid fissure to the parotid capsule, emphasizing its role as a key anchorage layer for thread lifting. The threads used are Sihler Bi Lift 10 cm (Sihler Inc., Korea).

Lore Fascia Anatomy and Significance

Lore fascia, also referred to as the tympanoparotid or temporoparotid fascia due to its anatomical location, originates from the tympanomastoid fissure at the junction of the ear cartilage and mastoid bone, extending into the parotid gland. As it descends inferiorly beneath the tragus, it becomes increasingly dense and coarse, covering the ear cartilage superiorly and the parotid gland anteriorly. This fascial structure is situated deep to the SMAS layer and is distinct from both the platysma auricular ligament, located beneath the earlobe, and the broader platysma auricular fascia, which spans between the ear and the platysma muscle.[6,7,11,12] Anatomically, retracting the parotid fascia anteriorly exposes the superior and inferior borders of a firm, rectangular ligamentous structure that extends from the parotid gland to the ear cartilage beneath the tragus (Fig. 2).

Maxillary Ligaments

The lateral maxillary ligament, also referred to as the buccal ligament, is positioned lateral to the nasolabial fold and functions to anchor the underlying fascial tissues to the skin (Fig. 3). In contrast, the medial maxillary ligament, located medial and superior to the nasolabial fold, is a more robust structure originating from the bone. Effective traction on this ligament is critical for achieving a significant improvement in the alar-facial groove (Fig. 4).

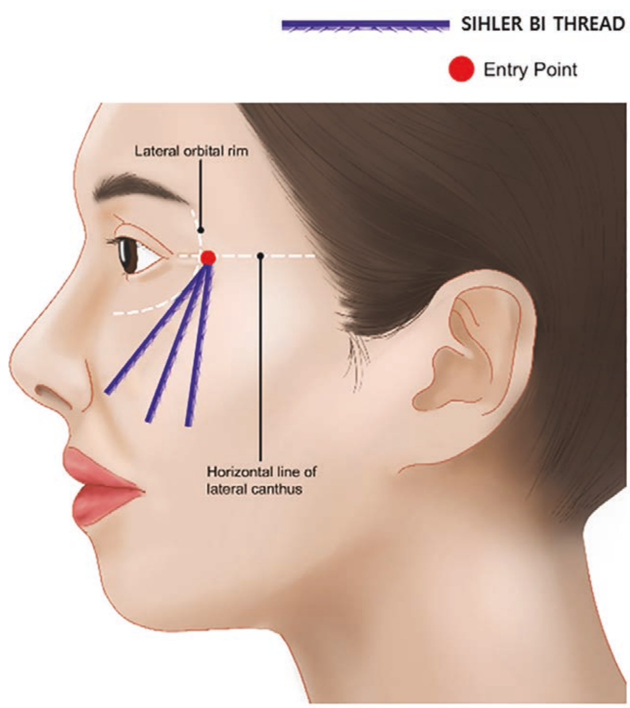

Fig. 3. Illustration locating the lateral maxillary (buccal) ligament lateral to the nasolabial fold and depicting its function in tethering skin to deeper facial tissues. The threads used are Sihler Bi Lift 10 cm (Sihler Inc., Korea).

The muscles responsible for upper lip elevation originate from the zygomatic region and progressively become more superficial as they descend, merging with the SMAS near the nasolabial fold and continuing within the same anatomical plane. Notably, in this region, some muscle

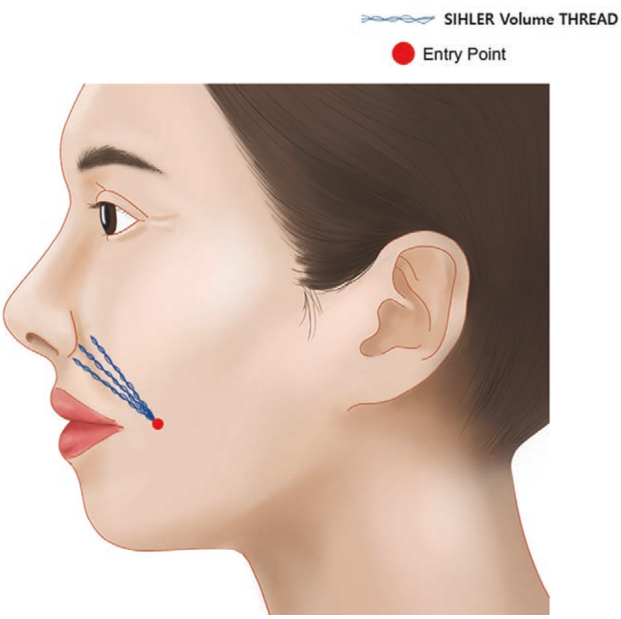

Fig. 4. Depiction of the medial maxillary ligament medial and superior to the nasolabial fold, highlighting its bony origin and contribution to the alar-facial groove contour. The threads used are Sihler Volume (Sihler Inc., Korea).

fibers insert directly into the skin. To preserve muscular function, barbed threads should be positioned primarily within the superficial fat layer above the SMAS, avoiding deeper placement within the SMAS itself, which is continuous with these muscles.

Proper thread placement is essential to prevent aesthetic complications. If positioned too superficially, the threads may cause visible dimpling or depressions in the skin during facial expressions. To mitigate this risk, the threads should be embedded within a sufficiently thick layer of fat, ensuring both structural support and a smooth postoperative appearance.

Vascular Considerations

During the procedure, particular attention must be given to vascular structures at risk, including the superficial temporal artery, which ascends along the preauricular crease anterior to the entry point; the premasseteric branch of the facial artery, which courses along the anterior border of the masseter muscle; and the facial artery as it approaches and follows the trajectory of the nasolabial fold.[13] In an anatomical study of Koh et al,[14] involving 42 Korean patients, the facial artery crossed the nasolabial fold medially in more than 70% of cases. When positioned laterally, it remained within 5 mm of the fold in more than half of the specimens. Similar patterns were observed in Japanese and Chinese patients, although with slightly lower rates of medial crossing (65% and 68%, respectively). In contrast, White populations exhibit greater variability, with approximately 55% showing medial crossing, according to published literature.[15]

Neural Considerations

The facial nerve branches are another critical consideration during thread-lifting procedures. After emerging from the stylomastoid foramen, the facial nerve travels deep to the parotid gland where it divides into temporal, zygomatic, buccal, mandibular, and cervical branches. These branches then exit the anterior border of the parotid and course anteriorly toward their target muscles. For nasolabial fold thread lifting, the zygomatic and buccal branches are at greatest risk.

To avoid facial nerve injury, thread insertion should remain in the subcutaneous plane above the SMAS when traversing the lateral face. The facial nerve branches typically course deep to the SMAS until they approach their target muscles. The danger zone where branches become more superficial is approximately 3–4 cm lateral to the lateral orbital rim. When using the Lore fascia entry point, the initial penetration is necessarily deep (sub-SMAS) but should transition to a more superficial plane before reaching this danger zone.

PROCEDURAL DESIGN AND TECHNIQUE

Patient Selection and Assessment

Ideal candidates for this procedure include patients with moderate to severe nasolabial folds without excessive skin laxity. The technique is particularly effective for patients 35–55 years of age with good skin elasticity and predominant type 2 nasolabial folds. Patients with extremely thin skin, severe sun damage, or unrealistic expectations are poor candidates.

A thorough preprocedural assessment is essential to identify the predominant fold type(s) and any contributing factors. This includes evaluation at rest and during animation to distinguish static from dynamic components. Pinch tests can help assess tissue thickness and elasticity, whereas manual elevation of the malar fat pad simulates the expected outcome of the lifting procedure.[16–19]

Entry Point and Penetration Technique

To use Lore fascia, a robust fascial structure immediately anterior to the tragus, as an adhesion point, the entry point should be created on the skin covering the tragus, slightly posterior to the tragus–cheek junction. After needle puncture and cannula insertion, a firm resistance can be felt anterior to the tragus, indicating Lore fascia. Penetrating this dense structure, which connects the ear cartilage to the deep fascia, SMAS, and skin via ligamentous fibers, allows the cannula to enter the sub-SMAS plane. Once in this layer, the cannula advances more smoothly along the SMAS.

The penetration depth at the entry point is typically 5–7 mm, directing the cannula anteriorly and slightly superiorly. A distinct "pop" sensation is felt as the cannula penetrates Lore fascia. At this initial stage, the cannula is in the sub-SMAS plane, which provides a safe corridor past the superficial temporal artery and parotid gland. This deep position is maintained for only 1.5–2 cm of the cannula's path before transitioning to a more superficial plane. (**See Video [online]**, which shows a demonstration of nasolabial fold correction with barbed threads, covering entry points, vector alignment, and placement depth for effective tissue repositioning.)

Transition to Subcutaneous Plane

As the cannula advances toward the nasolabial fold, the insertion plane should be adjusted at the lateral–anterior facial boundary. (**See Video [online]**.) Typically, medial to a vertical line drawn from the lateral orbital rim, the cannula is positioned in the deep subcutaneous fat layer just above the SMAS. Near the nasolabial fold, where the SMAS becomes thinner and provides less resistance, caution is required to avoid penetrating excessively deep planes, as this may irritate the oral mucosa or cause discomfort during mouth opening.

This transition from sub-SMAS to the subcutaneous plane is critical for both safety and efficacy. The transition occurs approximately 2 cm anterior to the tragus and should be executed with a gentle upward adjustment of the cannula angle. This change in plane places the cannula above the SMAS layer where the facial nerve branches run, significantly reducing the risk of nerve injury. The ideal final position is 2–3 mm below the dermis, within the subcutaneous fat layer.

Thread Positioning and Fixation

When performing the procedure, the nasolabial fat pad should first be manually elevated to create a visible bulge, which serves as the primary target for lifting. (**See Video [online]**.) The cannula should then be inserted at the inferior margin of this fat pad and advanced upward. It is critical to consider the vascular anatomy in this region, particularly because the facial artery crosses the nasolabial fold medially in more than 70% of Korean patients. Even when the artery takes a lateral course, it remains within 5 mm of the fold in more than half of cases. To minimize the risk of vascular injury, the cannula tip should be advanced to within a few millimeters of the fold line but should not cross it. This approach is anatomically sufficient because the nasolabial fat extends obliquely in a lateral direction from the nasolabial crease, allowing effective engagement of the ptotic fat layer without crossing the fold line.

Following the procedure, the bulging nasolabial fat pad is mobilized laterally and flattened, creating the visual impression of decreased volume. This strategic repositioning reduces the height differential between this area and the depressed paranasal region, thereby softening the step-off appearance and attenuating the nasolabial fold. Additionally, the redistribution of tissue toward the relatively depressed midcheek groove contributes to a more harmonious and smoother anterior malar contour.

DISCUSSION

Classifying nasolabial folds into 3 distinct types allows for more precise treatment planning and execution, with each type requiring careful selection of thread type, placement depth, and vector direction to achieve optimal results. Our experience demonstrates that although these types often coexist, identifying the predominant mechanism enables more precise intervention with appropriate thread selection and placement techniques.[1,9,20]

Using Lore fascia as an entry and anchoring point represents a significant technical advancement. This robust structure provides superior anchoring capability compared with traditional temporal approaches, particularly in Asian patients with prominent malar eminences. The anterior tragus position offers more direct access to the nasolabial region without requiring the cannula to navigate around bony prominences, resulting in more predictable thread placement and tissue engagement.

The precise selection of tissue planes is perhaps the most critical aspect of safe and effective thread lifting. Our technique emphasizes a deliberate transition from sub-SMAS to subcutaneous planes as the cannula moves from lateral to anterior face. This approach allows for initial safe passage past vital structures near the entry point while ultimately engaging the appropriate tissue layers at the target site.

The importance of ethnic and individual anatomical variations cannot be overstated in thread-lifting procedures. Our findings regarding vascular patterns in Asian populations highlight the need for technique modifications based on patient demographics. Although the fundamental principles remain consistent, practitioners should adapt specific technical aspects such as entry points, thread vectors, and depth of placement based on individual facial analysis and ethnic considerations.

CONCLUSIONS

Thread lifting for nasolabial fold correction offers an effective minimally invasive option when performed with proper patient selection and precise technique based on thorough anatomical understanding. Our 3-type classification system provides a practical framework for targeted treatment, whereas the use of Lore fascia as an anchoring point significantly improves safety and efficacy. Future research should focus on long-term outcomes, comparative thread studies, and technique refinements for diverse populations.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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