A Natural Flat Volumized Lips Filler Technique: Retrospective Analysis of 920 Patients

Melike Kibar Ozturk, MD,* and Ayse Kubra Kibar Guzin, MD†

BACKGROUND Traditionally, hyaluronidase (HYAL) is used after hyaluronic acid (HA) injection to dissolve the undesired migration of product.

OBJECTIVE To describe a novel lip augmentation technique that uses HA and HYAL simultaneously in patients who previously had HA migration.

METHODS AND MATERIALS Nine hundred twenty female patients were included. In the first group (n = 793), HA injections were performed in subcutaneous plane of the lips. In the second group who had previous product migration (n = 127), 7.5 units of HYAL is injected in 4 points in ergotrid area before proceeding with HA injection.

RESULTS The medicis lip fullness scale scores after 2 weeks improved in all patients, while 92% of patients perceived the results as "very much improved" with Global Aesthetic Improvement Scale (p < .001). There was no difference between 2 groups regarding the patient satisfaction rates (p > .05), while filler migration was seen in 0.2% (n: 15) of patients in the first group during the follow-up period.

CONCLUSION The new vertical injection approach provided an increased vertical height, optimal eversion, and an incisor display on the lips. The simultaneous use of HYAL before HA injection seems to be a safe and effective practice in 1-stage treatment of the previously injected lips with filler migration into ergotrid area.

Hyaluronic acid (HA)–based lip filling is one of the most frequently used lip treatments.[1–3] Several HA injection techniques are proposed in the literature to obtain a more natural and aesthetically pleasing result.[4–10] These include "6-step procedure" by Sarnoff and colleagues,[4] "4-point" and "3-point" techniques by Sahan and colleagues[5] and Adel,[6] "no-touch" technique by Surek and colleagues,[7] "stepwise" technique by Keramidas and colleagues,[8] "French kiss" technique by Trevidic and colleagues,[9] and "bi–bi lips" technique by Stephane and colleagues.[10]

Young patients generally seek more defined lips with an upper incisor display (Figure 1A–D) and less projection, as they coin this particular look as "flat lips." Rather than the golden ratio,[4,8] some patients specifically request an increased upper/lower lip ratio (Figure 1E,F).

A trend of increasing complaints has been reported recently due to the less satisfactory results after several injections with HA fillers. The most common complaints were (1) losing maxillary teeth display during speech, (2) over projection with "duck" lips,[4] and (3) lengthening and overfilling of the cutaneous part of the upper lip (filler migration) while the red, dry lip becomes thinner and inverted.

By definition, filler migration is the extra filler material that is found in a location other than original site of injection.[11,12] The technique-related explanations of filler migration are poor technique (filler injected into an adjacent area), a high volume of filler injected into an area, and filler injected under pressure with filler overflowing into an adjacent area. Strong muscle activity is another mechanism for filler migration specifically for lips.[4,6,11,12] This migration of filler into ergotrid area results in the loss of convexity of the subnasale–Cupids bow line that leads to a concave profile (Figure 2A).

The purpose of this study was to present the retrospective results in 920 patients who underwent the novel "natural volumizing" technique. In this technique, the authors aim to obtain an optimum lip eversion by increasing the height of both upper and lower vermillion vertically without any migration. This hypothesis was that the results of the new technique would be similar in 2 study groups that underwent HA injection with or without simultaneous HYAL use.

Materials and Methods

Study Population

Nine hundred twenty patients with a mean age of 29.8 (21–55) years underwent the "natural volumized lips technique" between 2021 and 2023. The ethnicities

From the Khalifa University, College of Medicine, Abu Dhabi, United Arab Emirates; † Gazi University, Clinical Pharmacology Department, Ankara, Turkey*

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Work was performed at Doctor Kibar Clinic, Abu Dhabi, United Arab Emirates.

Address correspondence and reprint requests to: Melike Kibar Ozturk, MD, Khalifa University, College of Medicine, 203, Building 29, Al-Muntazah, Khalifa Park Area, Abu Dhabi, United Arab Emirates, or e-mail: kibarmelike@hotmail.com

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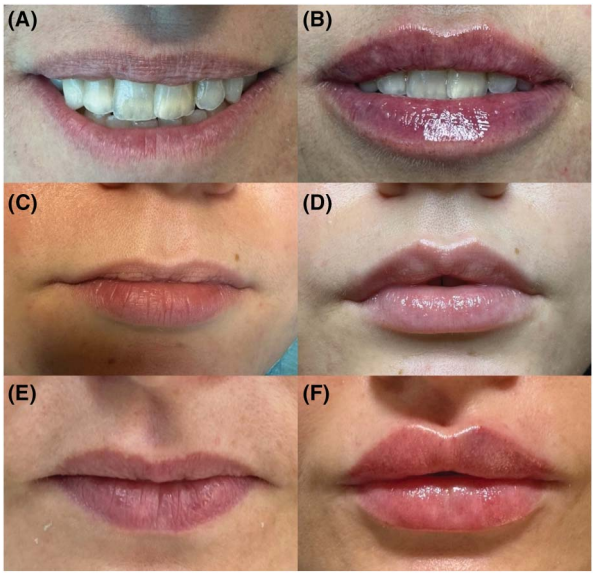

Figure 1. Photographs of upper incisor display in 2 patients: (A and C): before and (B), (D): immediately after 1 mL HA injection, and photographs showing increased Phi ratio in a patient: (E): before and (F): immediately after 1.5 to 3 mL HA injection in 2 sessions. HA, hyaluronic acid.

included people with origins in the Middle East and Europe, the Philippine Islands, and India. Exclusion criteria were (1) anticoagulant use; (2) pregnancy or breastfeeding; (3) history of allergies to injectable HA, HYAL, bee proteins, or lidocaine; and (4) history of permanent or semipermanent tissue augmentation. The study protocol was set the following ethical standards of the institutional research committee and the ethical principles expressed in the Declaration of Helsinki.

Patients were grouped in 2 study groups for evaluating the effect of simultaneous HYAL usage with HA injection. Seven hundred ninty-three (86.2%) patients who underwent only HA injection formed the first group. There were 127 (13.8%) patients in the second group who had previously injected lips with filler migration into ergotrid area and willing to have more volume on the red lips with less volume in ergotrid area. The patients in this group underwent simultaneous HYAL and HA injection in a single-stage approach. The diagnosis of filler migration in ergotrid area is based on the history of a lip filler in another facility in the past and the presence of a mass and swelling in ergotrid area that increased gradually after HA injection on the lips. The diagnosis is substantiated with careful clinical examination of reference lines that are used to assess horizontal lip position, according to the cephalometric norms of the ethnicities. For example, for the Asian patient who lacks prominent nose and chin, one can see the improvement of reference lines after simultaneous HYAL usage with HA injection (Figure 2).

Baseline assessments including pretreatment photographs and scoring with a validated medicis lip fullness scale (MLFS) were performed by 2 authors. The MLFS is a validated, 5-point scale to assess lip fullness (1 = very thin, 5 = very full).[13] All study participants were assessed immediately after the procedure and after 2 weeks for the following criteria: (1) MLFS, (2) AEs, and (3) assessment of physician and patient satisfaction with the Global Aesthetic Improvement Scale (GAIS).[9,14] The Global Aesthetic Improvement Scale is a 5-point scale ranging from "worse" to "very much improved" (1: very much improved, 2: much

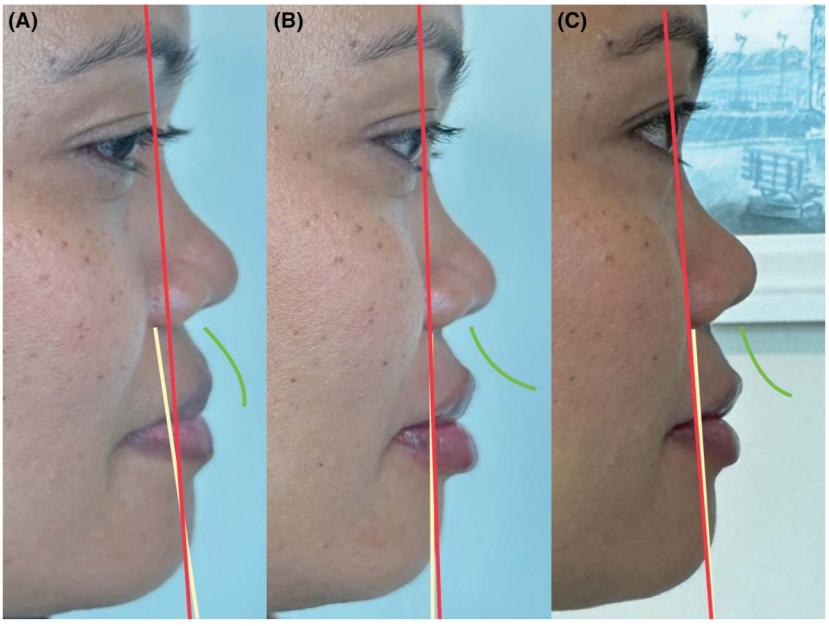

Figure 2. Improvement in Sushner S2 line (red lines) and Burrstone B line (yellow lines) and change from concavity (A) to convexity (B and C) in subnasal–Cupid bow line (green lines) after simultaneous injection of HYAL and HA: (A): before; (B): immediately after; and (C): after 2 weeks. HA, hyaluronic acid; HYAL, hyaluronidase.

improved, 3: improved, 4: no change, 5: worse). At the final follow-up, the patients were interviewed on the phone about how they perceive their lips and how satisfied they feel after 6 months.

Injection Protocol

Written informed consent was obtained from all patients. The procedure was performed with the patients in the semisupine position with 60° angulation from the horizontal plane. After removing make-up, a mixture of 2.5% lidocaine and 2.5% prilocaine (Emla; AstraZeneca, Karlskoga, Sweden) was applied topically 30 minutes before injection. After antisepsis of cutaneous lip with chlorhexidine, a 30-gauge needle with 13-mm length was used to inject the HA filler with 1 pass in the subcutaneous plane (superficial to the orbicularis oris muscle) in a retrograde, vertical fashion. The needle entry points were located 1 mm below the vermillion border for the upper lip and 1 mm above the vermillion border for the lower lip (see **Supplemental Digital Content 1**, Video online 1, http://links.lww.com/DSS/B384).

The second group consisted of patients who had previously injected lips with filler migration into ergotrid area (Figures 2 and 3). In this group, a total of 30 I.U. (0.2 mL) of HYAL (Dermaqual Paris-Disolvidase 1.500 I.U. mesolyophilized powder reconstituted with 10 mL of NaCl 0.9%) is injected perpendicularly in 4 points with a 32-gauge, 4-mm length needle, 5 to 10 mm above the vermillion border, before proceeding with HA injection using the same technique described above. The hyaluronidase allergy test was performed in the second group 30 minutes before HYAL injection. For HYAL injection, 2 points were usually marked in each cutaneous upper half-lip. The first point was marked at the junction of the middle and lateral third (about 2 cm from the midline), and the second point was 1 cm lateral to this point (Figure 4) (see **Supplemental Digital Content 2**, Video online 2, http://links.lww.com/DSS/B385).

All patients in this series were treated with Restylane Kysse (Galderma, Uppsala, Sweden) with the following characteristics: cross-linking with butanediol diglycidyl ether 7% and concentration: 20 mg/mL.

Statistical Analysis

Descriptive statistics were generated for the entire sample. Categorical variables including the patient satisfaction scores and adverse effects (AE) were expressed as absolute numbers and percentages. The categorical variables were analyzed with the chi-square test. For all comparisons, a 2-tailed value of $p < .05$ was considered statistically significant. Statistical analysis was performed with SPSS software (version 28.0; SPSS Inc., Chicago, IL).

Results

All patients displayed significant improvements in MLFS following the procedure ($p < .05$). In total, 92% of patients marked the results as very much improved and 8% as much improved or improved after 2 weeks of the procedure with GAIS. The GAIS scores are summarized in Table 1.

At the 2-week follow-up, there was no statistical difference between 2 groups regarding the amount of decline in upper lip heights ($p > .05$). There was no difference between 2 groups regarding the patient satisfaction rates at immediate, 2-week, and 6-month follow-up intervals ($p > .05$).

Adverse Effects of Hyaluronic Acid Injection

The most common AEs were injection site pain and tenderness (75.3%), injection site swelling (67.5%), and bruises (34.8%). Early onset nodules (<2 weeks) were seen in 7% of the patients: 6% of them cleared by themselves and the remaining 1% cleared after hyper diluted HYAL injection. The authors encountered filler migration in 0.2% (*n*: 15) of patients in the first group during the follow-up period. Interestingly, 3 patients reported pronunciation difficulties after 2 to 3 repeat filler injections over 6 months. Fifteen patients complained of persistent dryness in their lip, and 23 patients complained of paleness of their lips. There was no statistical difference regarding the complications observed in 2 groups ($p > .05$).

Discussion

The results of this study show that the novel "natural volumized lips" technique yields excellent cosmetic results with high patient satisfaction rates with mild AEs during the 6-month follow-up period. This is comparable with the outcomes of the reported techniques in the literature.[4–10]

This technique is based on the idea of "giving a younger version of the lips to the individual" with more correct vertical proportions and upper incisor teeth display visible during speech while concealing lower incisor show.[4] In the authors' study, Tansait and colleagues suggested a similar vertical technique with needle. In contrast to this technique, they suggested injecting to the midline labial tubercle of the upper lip, both philtral ridges, vermillion borders, and lip margins.[15] There are also several techniques in the literature that bear a vertical and radial approach with cannula[5,6] that mainly focus on medial zone of the lip. The suggested entry points to lips in these techniques were generally defined as 5 mm[5,7] or 10 mm[9] above the vermillion borders. The authors of these techniques usually suggested leaving 0.1 mL aliquots to the end points, while the authors prefer only linear threads of 0.02 mL HA without any boluses. The authors suggest starting the injection 1 mm below the vermillion border for the upper lip. This serves the following 2 purposes: (1) to prevent migration in ergotrid area and (2) to stay in the relatively safer zone of vascularity.[15–22] In a recent ultrasound-based study, the superior labial artery was shown to have a mean distance of 2.2 ± 1.5 mm from the vermilion border in the upper lip.[19]

From the clinical standpoint, subcutaneous plane may be a safer plane for injecting HA fillers rather than the deeper layers.[15,19] According to 2 anatomical[18,21] and 2

Figure 3. Preinjection and postinjection photographs of a patient who had previously injected lips with filler migration into ergotrid area. This patient underwent a simultaneous injection of 30 U of HYAL and 1.5 mL HA filler: (A and D): before; (B), (E): immediately after; and (C and F): after 2 weeks. HA, hyaluronic acid; HYAL, hyaluronidase.

radiological[19,20] studies, the superior and inferior labial arteries most frequently run deep within the lips, located between the orbicularis oris muscle and the oral mucosa. The elongation of upper lip with loss of its vertical proportions is a common finding during the aging process.[22] The natural volumization technique helps to revolumize these vertical proportions while avoiding over projection with the help of tiny, linear threads. These authors believe that bolus injections focused on medial tubercles of the lips leads to elongation and protrusion of the upper lip which, in turn, yields an older-looking version of the individual, yet the patterns of tubercles are different for everyone.[23] In this context, latest anatomical research by Cotofana and colleagues[24] identified 24 compartments in the lips. Of interest, compartment boundaries were formed by vertically oriented septations, and the authors suggested administration of the volumizing product using a vertical, compartment respecting injection approach to obtain more natural results.

Figure 4. Picture depicting the injection points. White arrows: The borders of HA injection zone. White crosses: HYAL injection points. HA, hyaluronic acid; HYAL, hyaluronidase.

Overall, the patients in both groups reported an excellent outcome with this technique. This may be attributed to several factors, including[1] no injections were performed neither at vermillion border and margins, nor at the philtral columns[2]; only 1 pass was performed along the whole lips[3]; HYAL injection was applied to the cutaneous lips simultaneously before the HA injection in dry, red lip, if needed; and[4] no product was injected in the intramuscular or submucosal plane below the orbicularis oris muscle since its constant "milking" action may cause clumping of robust fillers that may result in migration of product.[4,6,10,11] In this study, the authors encountered filler migration in 0.2% (*n*: 15) of patients in the first group during the follow-up period similar to previous reports.[25–27] This migration in ergotrid area may be the effect of cumulative high volume of filler on

TABLE 1. Global Aesthetic Improvement Scale Scores in Percentages, Immediately After the Procedure and After 2 Weeks (Assessed by the Dermatologist and Reported by the Patient), and After 6 Months (Reported by the Patient in Phone Interview).

GAIS	Very Much Improved P\D	Much Improved P\D	Improved P\D	No Change P\D	Worse P\D
Immediately after	87.8\94	7\5	5.2\1	0\0	0\0
After 2 wk	92\95	7\4	1\1	0\0	0\0
After 6 mo	90	6	4	0	0\0

P, patient; D, dermatologist.

lips since all 15 patients were injected more than 4 mL in their lips before.[10,11]

The conventional approach in lip fillers is to avoid resolving and injecting HA fillers simultaneously. By contrast, the authors believe this application may have some advantages such as saving time by eliminating the waiting period between HYAL and HA filler injections and the barrier effect created by small amounts of HYAL to prevent caudal migration of the newly injected filler. This is the first clinical study in the literature to describe a novel technique that involves simultaneous lip filler resolving and filling in 1 application. The injection point for HYAL was at least 5 mm above the vermillion border with a 4-mm length needle in a relatively safe anatomical location since it was shown that the superior labial artery has a mean distance of 2.2 ± 1.5 mm from the vermilion border and the depth of the superior labial artery in the upper lip is 5.6 ± 1.3 mm.[19] To evert lips, some techniques[7,9] involve bolus injections in the submucosal region below the red, dry lips. This is completely in contrast with the technique where the authors avoid injecting in this area to prevent over projection of posterior lip compartments that may present as intraoral mucosal masses.[4] In this study, almost all the migrated fillers in ergotrid area were resolved clinically after 30 minutes with a total dose of 30 U HYAL, similar to the degradation rates of Restylane reported in previous studies.[28,29]

In this study, the most common AEs were injection site pain, tenderness, and swelling. These are parallel to the findings reported in the literature.[1,2] One disadvantage of this technique is formation of early onset nodules when a large amount of filler accumulates superficially.[6,10,11,15] The authors suggest injecting slowly and tiny amounts to avoid these nodules. Another interesting finding in this study was the pronunciation difficulty encountered in 5 patients after 2 to 3 repeat injections in 6 months. We believe this may be related to the increased maxillary/incisor display ratio that may have a detrimental effect on vocalizing specific sounds such as "chee" and "M."[30,31] The major limitation of this study is the lack of long-term follow-up to evaluate the longevity of the filled lips and possible longer-term adverse events. Although the number of patients included in this study is one of the highest among its peers in the literature, its retrospective nature may also be considered as a limitation.

Conclusion

The "natural volumized lips" procedure provides a natural youthful effect on lips with an increased vertical height, optimum eversion, and an incisor display. The simultaneous use of HYAL before HA injection seems to be a safe and effective practice in 1-stage treatment of the migrated lips.

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