ORIGINAL RESEARCH

Patient Satisfaction during Upper Lip Augmentation Procedures: V-Y in V-Y Technique Compared to Micro-fat Injection: A Randomized Clinical Trial

Samer D Shekh Khalil[1], Munir Harfoush[2], Batoul Alkour[3], Yasser Alsayed Tolibah[4]

Received on: 01 September 2024; *Accepted on:* 19 October 2024; *Published on:* 26 November 2024

Abstract

Aim: To compare two different techniques for lip augmentation: A surgical technique (V-Y in V-Y) and a filler technique (autogenous micro-fat injections), with a focus on comparing the patients' satisfaction using the Visual analog scale (VAS).

Materials and methods: This randomized controlled trial was conducted on 40 female patients, aged 18–45, who were outpatients at the Oral and Maxillofacial Surgery Department. The patients were randomly assigned with a 1:1 allocation ratio into two groups. The first group (n = 20) underwent the surgical procedure using the V-Y in the V-Y Technique. The second group (n = 20) received autogenous micro-fat injections using an abdomen fat extraction technique that was subsequently centrifuged. The VAS assessed the patient's satisfaction after 1 and 6 months.

Results: There was a statistically significant difference in the evaluation of patient satisfaction with treatment 1-month post-procedure when comparing the surgical procedure group and the fat injection ($p < 0.001$), favoring the fat injection group. Moreover, there was a statistically significant difference in the evaluation of patient satisfaction with treatment 6 months post-procedure when comparing both groups ($p < 0.001$), favoring the surgical group.

Conclusion: The micro-fat injection technique had higher VAS scores reported by patients in the first month of treatment. In contrast, the surgical technique using the V-Y method was more favorably received by patients in the sixth month of treatment.

Clinical significance: The V-Y in V-Y technique may yield more favorable long-term outcomes for upper lip augmentation, while micro-fat injection is initially well-received by patients, but satisfaction tends to diminish over time.

Keywords: Lip augmentation, Micro-fat injection, VAS scale, V-Y in V-Y technique.

The Journal of Contemporary Dental Practice (2024): 10.5005/jp-journals-10024-3739

Introduction

The demand for cosmetic procedures has increased due to the rise in congenital deformities and defects, as well as psychological and emotional factors related to an individual's desire to look more beautiful and youthful. This is the most common reason for undergoing cosmetic procedures.[1] Recently, it has become clear that the lips are essential in enhancing facial esthetics, as they are considered the primary esthetic feature of the lower third of the face.[2]

A full and prominent appearance of the upper lip is considered particularly attractive,[3] and there is currently a significant trend towards achieving this look. Enhancing this appearance is one of the most common and increasingly demanded procedures in cosmetic surgery. To achieve this goal, surgeons have employed various techniques throughout the ages, including surgical and non-surgical approaches, which can be classified into temporary and permanent effects.[4]

Injectable fillers, such as silicone, and fat grafts, have been used, each with specific indications, advantages, and disadvantages.[5] Moreover, several surgical procedures have been developed in pursuit of a permanent outcome, each with different techniques aimed to achieve this result, as they do not require the introduction of foreign materials and offer durability.[6]

Therefore, many surgical and non-surgical techniques have been employed to increase the volume of the upper lip and enhance its full and prominent appearance.[3,6]

[1,2]Department of Maxillofacial Surgery, Damascus University, Damascus, Syria

[3]Department of Dermatology, Ministry of Health, Damascus, Syria

[4]Department of Pediatric Dentistry, Damascus University, Damascus, Syria

Corresponding Author: Yasser Alsayed Tolibah, Department of Pediatric Dentistry, Damascus University, Damascus, Syria, Phone: +963988812044, e-mail: Yasseralsayedtolibah@gmail.com

How to cite this article: Khalil SDS, Harfoush M, Alkour B, *et al*. Patient Satisfaction during Upper Lip Augmentation Procedures: V-Y in V-Y Technique Compared to Micro-fat Injection: A Randomized Clinical Trial. J Contemp Dent Pract 2024;25(8):715–721.

Source of support: The project was funded by Damascus University (funder No. 501100020595).

Conflict of interest: None

Patient consent statement: The author(s) have obtained written informed consent from the patient for publication of the case report details and related images.

The V-Y in V-Y technique, proposed by Mutaf in 2006, involves two vertically oriented V-shaped incisions, one of which is within the other, and these incisions are sutured into a Y shape. This technique not only increases the prominence of the lip but also achieves the primary goal of increasing its volume. As such, it can be an effective method in helping to correct the facial profile

of patients with mild maxillary retrognathia who do not wish to undergo orthodontic surgical treatments.[4]

Regarding fat, autologous fat is considered the first filler material used to fill soft tissues, with its first use dating back more than a century.[7] Fat is injected into the subcutaneous level while withdrawing the needle. The technique relies on applying small amounts of adipocytes at different levels to achieve maximum contact with the vascular elements. After application, the graft remains malleable, meaning its shape can be gently adjusted, allowing for shape control.[8] Using fat as a volumizing filler and for facial reconstruction is ideal due to its high acceptance, safety, natural appearance, and feel. However, the only limitation is the unpredictability of the amount of fat absorption and its viability, usually ranging from 40 to 60% of the grafted amount. Through numerous studies, it has been found that small volumes of facial grafts, like any other graft, require good vascularization to prolong their survival. Unlike body fat grafts, facial fat grafts typically involve small, concentrated amounts, often between 20 and 60 cc of purified fat.[9]

Reviewing the published literature reveals significant variability in patient satisfaction with the procedures used to increase upper lip volume. Some patients were dissatisfied with the temporary nature of the results, others were unhappy with the post-surgical complications and their inability to resume daily activities after the surgery, while another group was satisfied and pleased with the outcomes they achieved.

Before starting any cosmetic procedure, it is crucial to fully explain the details of the technique to be applied to the patient and obtain informed consent. Moreover, there are several reasons that justify conducting this study to compare the two techniques in the context of upper lip augmentation. Despite the procedural differences, with micro-fat injections being minimally invasive and offering a shorter recovery time, the V-Y in V-Y technique remains a more invasive surgical approach. Therefore, this study was conceived to compare patient satisfaction with upper lip volume augmentation using two different techniques in terms of the method applied, post-procedure complications, and the longevity of the results: the V-Y in V-Y surgical technique and the micro-fat injection filler technique.

Materials and Methods

Study Design, Settings, and Ethical Approval

This parallel randomized single-blinded clinical trial has utilized a two-arms superiority design with a 1:1 allocation ratio to compare two techniques in esthetic appearance of upper lip management; surgical augmentation using the V-Y in V-Y technique and augmentation using micro-fat injection. This study was conducted from August 2021 to September 2023 at the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Damascus University. The study protocol, questionnaires, and informed consent are in full accordance with the ethical guidelines of the Declaration of Helsinki. The research project was ethically approved by the Local Research Ethics Committee of the Faculty of Dentistry (UDDS-585/22042021/SRC-574). The project was funded by Damascus University (funder No. 501100020595). This study was registered in the ISRCTN database (ID number: ISRCTN13077857). This RCT has been written according to the new CONSORT statement.

Sample Size Calculation

Based on the data of a previous study,[10] the sample size in the present study was calculated by G*Power 3.1.9.4 (Heinrich Heine Universität, Düsseldorf, Germany). A sample size of 40 patients was obtained from the two groups (20 patients in each group). This sample size achieved 80% power to detect differences with a 0.05 significance level.

Recruitment and Eligibility Criteria

During the study period, 70 female patients aged between 18 and 45 years were referred to the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Damascus University requiring augmentation of the upper lip only. The principal researcher (S.S.K) conducted an examination to identify healthy individuals with a linear height ratio of the upper to lower lip is 1:2, with a lip fullness grade of 0–2 according to the Merz scale.[11] Two photographs (a frontal and a profile) were taken of each patient prior to the procedure. The patient was seated with their back perpendicular to the ground, the Frankfurt plane parallel to the ground, looking straight ahead, with the camera lens level with the lips at a distance of 1 meter. These photographs were then reviewed by three physicians, not affiliated with the research team, who were randomly selected. Fifteen individuals were excluded from the study because they had either undergone lip augmentation procedures before or during the study period or were undergoing orthodontic treatment that was not yet completed. Additionally, patients scheduled for any facial surgery during the study period that could impact the final lip augmentation results were also excluded. All participants who agreed to join the study signed an informed consent form after being fully briefed on the trial and its treatment components.

Randomization

Patients were randomly assigned to one of two procedures: A (augmentation using the V-Y in V-Y technique, $n = 20$) or B (augmentation using micro-fat injection, $n = 20$) to enhance the esthetic appearance of the upper lip. The allocation sequence was generated by a computer with a 1:1 allocation ratio. The sequence was concealed in opaque-sealed envelopes labeled with the patients' initials, which were opened immediately before surgery.

Blinding

The study was conducted as a single-blinded trial, where the treating surgeon (SK) and patients could not be blinded to the technique used due to the nature of the intervention. However, in the subsequent data analysis, the outcome assessors—two pre-trained PhD students from the Department of Oral and Maxillofacial Surgery at Damascus University—remained unaware of the patients' allocation.

Fat Extraction Procedures

The fat extraction procedure was performed following the Coleman protocol. The skin in the lower abdomen was sterilized with povidone, and a surgical incision was made using an 11-gauge blade around the navel. Klein solution (1 liter saline, 50 mL lidocaine, 5 mL epinephrine) was injected into the fat deposit in the lower abdomen until a firm swelling (tumescent anesthesia) was achieved, and the area was left for 15 minutes. Fat tissue was then harvested using a 15 cm long, 3 mm diameter blunt-tip cannula with side openings. A 10 mL syringe was attached to the cannula, and a gradual negative pressure of 1 cm^3 was applied to minimize damage to the fat cells. An average of 10 mL of fat was extracted,

depending on patient need and indication. After harvesting, the fat was transferred to dry plastic tubes and centrifuged at 3000 rpm for 3 min (1200 G) using a centrifuge (Andreas Hettich GmbH & Co. KG, Tuttlingen, Germany). This resulted in three layers: an oily top layer of necrotic fat cells, which was discarded; a middle layer of viable fat cells used for grafting; and a bottom layer of debris and blood remnants also discarded.

Clinical Procedures

Augmentation Using the V-Y in V-Y Technique Group

Patients were prepared by rinsing with 0.12% chlorhexidine for 1 min. The external skin around the mouth was then sterilized using povidone-iodine. Surgical drapes were applied, and the procedure was performed on the mucosal surface of the upper lip. Before administering anesthesia (to avoid distortion caused by tissue infiltration with anesthetic fluid), the upper lip was externally divided into three equal sections, maintaining a 4–5 mm distance from the commissures on both sides. The incision sites were then marked using methylene blue.

An infraorbital nerve block was administered bilaterally using 2% lidocaine with 1:80,000 epinephrine (Huons Lidocaine HCL, Seoul, Korea), followed by local infiltration at the incision sites beneath the mucosa to minimize bleeding during the procedure.

The work focused on the mucosal surface of the upper lip. The first incision was made in the shape of a large V, beginning at the wet-dry junction and covering the majority of the upper lip, with its apex at the frenulum. The second incision, a smaller V-shape, also started at the wet-dry junction and involved the middle third of the lip, with its arms parallel to the larger V. Careful and symmetrical marking of the incisions was ensured to achieve optimal, even results. With this "V in V" positioning, two separate flaps were created: the first was a bipedicled flap supported by the lateral portions of the lip, while the second was a smaller unipedicled flap supported by the middle third of the lip.

The incisions were made through the mucosal and submucosal layers, extending down to the muscular layer without involving it, using an 11-blade scalpel (GMS, Anji Spenq Industrial Co. Ltd, Zhejiang, China). During the large V incision, the frenulum of the lip was transected.

Next, the flaps were dissected from the orbicularis oris muscle, with the dissection plane extending slightly above the wet-dry junction of the lip. After achieving hemostasis, each incision was closed in a Y-shape rather than the original V. The large incision was first approximated at its apex with simple interrupted sutures, followed by the same technique for the small incision, ensuring an equal number of sutures and spacing between them. This created the lower limb (tail) of the Y. The remaining portions of the incisions were then closed with continuous sutures using 4/0 polypropylene monofilament blue (Niche Healthcare, Manchester, United Kingdom) with a round-bodied needle.

Augmentation Using Autogenous Micro-fat Injection Technique Group

The perioral area was disinfected with povidone, followed by anesthesia using an infraorbital injection on each side with a local anesthetic (2% lidocaine with 1:80,000 epinephrine). A 16-gauge needle was used to puncture the lip, 3–4 mm away from the corner of the mouth. An 18-gauge blunt-tip injection cannula with a side port was then inserted.

The injection was performed using a combination of the retrograde linear technique and serial puncture technique, with approximately 1 cc of fat injected into the lip. The fat was then massaged to distribute it symmetrically, and the necessary post-procedure instructions were provided.

Occasionally, the needle may become clogged with fat, making the injection difficult and inconsistent. This issue can be alleviated by passing the fat through the needle into another empty syringe, after which the injection process becomes smooth and easy with even application of the fat.

Assessment of Patient Satisfaction (Outcome Measurement)

Patient satisfaction was evaluated and compared between the two groups at two time points: one month and six months after the procedure (Figs 1 and 2). A visual analog scale (VAS) was used for this purpose. The VAS consists of a horizontal 10 cm line with descriptors at each end representing the extremes of satisfaction (i.e., complete dissatisfaction and extreme satisfaction). Patients indicate their level of satisfaction by marking this line. Measurements were converted into a score ranging from 0 to 10 points. The primary question was: "How satisfied are you with the technique applied to you?". The question was posed by a blinded committee that was unaware of the specific surgical procedure performed. This assessment was conducted both 1 and 6 months after the procedure.

Statistical Analysis

The data were tabulated and analyzed using the Statistical Package for Social Sciences (SPSS Version 26). Kolmogorov–Smirnov test and Shapiro–Wilk test indicated a normal distribution of VAS Scores among the groups ($p > 0.05$). Therefore, the paired sample *t*-test was used to compare patient satisfaction with treatment between the two follow-up periods (1 and 6 months) within each group. Moreover, the *t*-test was employed to compare patient satisfaction with treatment across the follow-up periods between the groups. The level of significance was at $\alpha = 0.05$.

The flow chart of the patients is presented in Figure 3.

Results

Forty female patients were included in this study (twenty in each group). Table 1 describes the mean, standard deviation, maximum, and minimum age of patients in each group and in both groups. It is worth noting that no complications or adverse events were recorded for either technique, and no patient withdrawals were reported in either group.

Comparison of Patient Satisfaction with Treatment between the Two Follow-up Periods within the V-Y in V-Y Technique Group

To compare patient satisfaction with treatment using the VAS scores in patients from the surgical group between the two follow-up periods (1 and 6 months post-procedure), the paired sample *t*-test was used. The results are presented in Table 2.

Based on the results presented in Table 2, a statistically significant difference was found in the evaluation of patient satisfaction with treatment among patients in the surgical group when comparing the two time periods—after 1 and 6 months post-operation. This statistically significant difference favors the follow-up conducted 6 months after the procedure.

Figs 1A to C: V-Y in V-Y technique group: (A) Before the procedure; (B) After 1 month; and (C) After 6 months

Figs 2A to C: Micro-fat injection technique group. (A) Before the procedure; (B) After 1 month; and (C) After 6 months

The Comparison of Patient Satisfaction with Treatment between the Two follow-up Stages within the Fat Injection Group

To compare patient satisfaction with treatment using the VAS scores in patients from the fat injection group between the two follow-up periods (1 and 6 months post-procedure), the paired sample *t*-test was used. The results are presented in Table 3.

Based on the results presented in Table 3, a statistically significant difference was found in the evaluation of patient satisfaction with treatment among patients in the fat injection group when comparing the two time periods—after 1 and 6 months post-operation. This statistically significant difference favors the follow-up conducted 1 month after the procedure.

The Comparison of Patient Satisfaction with Treatment between the Two Research Sample Groups

To compare the patient satisfaction with treatment using the VAS score in the surgical procedure group and those in the fat injection group during the two follow-up stages (1 and 6 months post-procedure), *t*-test was used. The results are presented in Table 4.

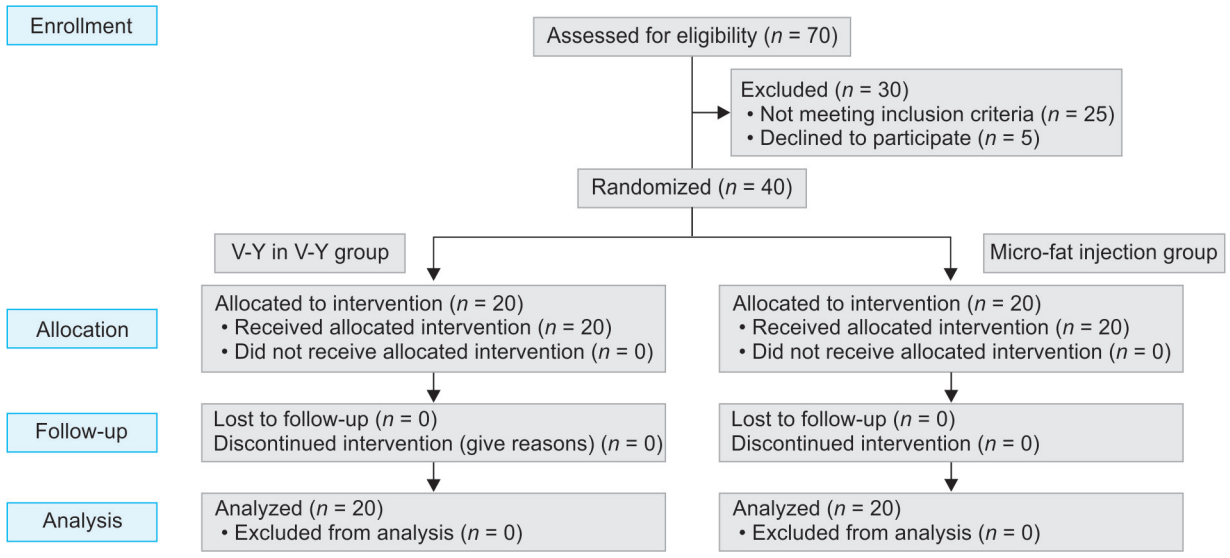

Fig. 3: CONSORT flowchart of the presented study

Table 1: Descriptive analysis of patients age in the study sample

Group	*Mean ± Standard deviation*	*Minimum*	*Maximum*
Surgical group	28.9 ± 2.028	25	32
Fat injection group	31.4 ± 2.789	27	35
Both groups	30.2 ± 2.706	25	35

Table 2: VAS mean, standard deviation, and paired sample *t*-test in the V-Y in V-Y technique group

Follow-up period	*Patients number*	*Mean ± Standard deviation*	*t-test value*	*p-value*
1 month	20	2.0 ± 1.225	16.760	<0.001
6 months	20	7.89 ± 0.782		

Table 3: VAS mean, standard deviation, and paired sample *t*-test in the micro-fat injection group

Follow-up period	*Patients number*	*Mean ± Standard deviation*	*t-test value*	*p-value*
1 month	20	6.67 ± 1.323	18.8	<0.001
6 months	20	1.44 ± 0.882		

Based on the results presented in Table 4, there is a statistically significant difference in the evaluation of patient satisfaction with treatment 1-month post-procedure when comparing the surgical procedure group and the fat injection group. This statistically significant difference favors the fat injection group. Moreover, there is a statistically significant difference in the evaluation of patient satisfaction with treatment 6 months post-procedure when comparing the surgical procedure group and the fat injection group. This statistically significant difference favors the surgical group.

It can be said that the V-Y in V-Y surgical technique seems to offer better long-term satisfaction, while the fat injection technique may provide more immediate but shorter-lasting results. The absence of complications and high patient retention highlights the safety of both methods.

Discussion

We cannot overlook the increasing desire among a large segment of people for lip augmentation, which enhances the esthetic appearance of the face.[6] Various methods of augmentation have been developed, from filler injections to surgical corrections.[3] Autologous fat has been used as a lip filler, distinguished by its autologous origin, being readily available in ample quantities, and costing less compared to other fillers. Additionally, because it is autologous, there are no immune reactions.[8] Various surgical techniques, such as the V-Y in V-Y technique, have also been used to achieve permanent results. This technique involves manipulation of the upper lip mucosa, leaving no visible scar which is considered a major concern in cosmetic surgery.[4] However, the medical literature does not mention the existence of an optimal method that is fully satisfactory from the patients' perspective. Therefore, it was necessary to conduct research comparing the outcomes of both surgical and non-surgical methods in terms of patient acceptance of each procedure.

Reviewing the literature, numerous donor sites for fat harvesting were found, including the lower abdomen, buttocks, thighs, and the inner surface of the knee, with no particular site being designated as superior.[12] Asking the patient about areas with abundant fat reserves can serve as a helpful starting point for the surgeon. However, clinical evaluation through observation and palpation remains the most reliable method for making the final decision on the donor site.[13] In this study, the lower abdomen was chosen as the donor site for fat harvesting due to several reasons: ease of access, the availability of sufficient fat in this area in most cases, its relative safety, and the reduced level of discomfort for the patient, as the procedure was performed under local anesthesia with the patient awake. Additionally, all study participants were female.

The surgical V-Y in V-Y technique was performed following the method described by Mutaf.[4] Before anesthesia, the outer lip was divided into thirds, avoiding each oral commissure, as tissue expansion due to anesthesia could affect the accuracy of the markings. Incisions were made within the mucosal and submucosal layers, using an 11-gauge blade instead of the commonly used 15-gauge blade in oral surgeries. The 11-gauge blade provided a clean and smooth incision, which is crucial for optimal final results.[4]

Table 4: The results of the *t*-test for examining differences in patient satisfaction with treatment between the two groups at the follow-up periods

Follow-up period	*Group*	*Patient number*	*Mean ± Standard deviation*	*t-test value*	*p-value*
After 1 month	Surgical group	20	2.0 ± 1.225	–7.766	<0.001
	Fat injection group	20	6.67 ± 1.323		
After 6 months	Surgical group	20	7.89 ± 0.782	16.405	<0.001
	Fat injection group	20	1.44 ± 0.882		

After the incision, a curved blunt-tipped dissecting scissor was used to avoid tearing the mucosa and to prevent damage to important anatomical structures, such as the superior labial artery and terminal branches of the buccal nerve.[4]

In the V-Y in V-Y technique, only the mucosa is manipulated, with no involvement of the upper lip's muscle layer. This leads to faster healing and avoids the formation of visible scars which is considered an issue that is one of the most troublesome in cosmetic surgery.[14]

Fat processing is essential because harvested fat contains not only adipocytes but also collagen fibers, blood, and debris.[15] These elements can cause inflammation at the recipient site, potentially damaging the fat graft. Blood must be removed, as its presence accelerates the degradation of the transplanted fat.[16] Additionally, injecting debris can give a false impression of overcorrection, as the debris will be fully absorbed within just a few hours.[17]

To compare patient satisfaction with treatment between the surgical group and the fat injection group using the VAS at the two follow-up periods (1 and 6 months post-procedure).

At the 1-month follow-up, the current findings revealed that the fat injection group had a higher satisfaction score (three times) than the surgical group.

This increased satisfaction in the fat injection group can be attributed to the stabilization of fat injection results during this period, while patients who underwent surgery were still experiencing post-surgical symptoms such as Edam, lip stiffness, difficulty with eating and speaking, and even challenges with smiling.

On the other hand, at the 6-month follow-up, the current findings revealed that the surgical group had a higher satisfaction score (about four times) than the fat injection group.

This can be explained by the fact that, after 6 months, a significant portion of the injected fat had been absorbed, leading to a decline in the esthetic results that patients of the fat injection group had hoped for. This result was in agreement with a previous study,[18] as it noted a dynamic change in facial volume, where patients experienced an initial decrease in volume followed by a rebound effect, ultimately leading to improved facial volume 19 months after treatment, regardless of the amount of fat injected. The differing results in this study may be attributed to variations in the methods used for preparing and injecting autologous fat. In contrast, in the surgical group, the post-operative symptoms had subsided, and the esthetic results had stabilized, leading to higher patient satisfaction.

There were no complications observed in either group, which aligns with findings from a systematic review indicating that autologous fat grafting for rejuvenating the eyelids and periorbital area provided a high rate of patient satisfaction without leading to severe complications. Although only the short-term patient satisfaction results were higher in the micro-fat injection group, this reflects the safety profile of fat grafting techniques used in both cosmetic and reconstructive procedures, where the risk of adverse effects is minimal, especially when performed by experienced professionals.[19]

To the researchers' knowledge, no randomized controlled clinical trials have previously been conducted to compare patient satisfaction between surgical methods and fillers for lip augmentation. However, it is noteworthy that, in contrast to the results of the current study, hyaluronic acid fillers (lidocaine-containing hyaluronic acid fillers, CPM-HAL1 and CPM-HAL2) for lip augmentation achieved a high level of acceptance among German patients (approximately 93% of participants) over a monitoring period of 4 months.[10] Additionally, in another study, patient satisfaction with lip augmentation results were significantly influenced by the direction of the injection needle. Satisfaction increased markedly (with an average score of 4.73/5) when the filler injection needle was oriented from top to bottom considering the migration to the cutaneous part of the upper lip, which can be attributed to the better distribution of the filler within the lip.[20] It is noteworthy that Saypha LIPS Lidocaine fillers demonstrated long-term and high acceptance in lip augmentation for patients with severe lip volume deficiency.[21]

The main limitation of this study is the inability to apply both techniques to the same patient in order to compare overall patient satisfaction with the procedure, as the current study focused solely on upper lip augmentation. Another limitation is the relatively small sample size. Future studies could address this by including larger groups with more samples.

Conclusion

In the context of upper lip augmentation procedures, the micro-fat injection technique had higher VAS scores reported by patients in the first month of treatment. In contrast, the surgical technique using the V-Y method was more favorably received by patients in the sixth month of treatment.

Acknowledgments

The presented article is a part of the MSC study of Samer Daas Shekh Khalil approved by the IRB, Damascus University College of Dentistry, Damascus, Syria (UDDS-585/22042021/SRC-574).

Author Contributions

SDSK conceptualized the idea and provided the clinical procedure.; YAT and BA contributed to the writing, documenting, interpretation of data, and the revision, formatting, and re-editing of the manuscript.; MH conceptualized the idea and supervised the research. All authors have read and agreed to the published version of the manuscript.

Institutional Review Board Statement

The study was conducted according to the guidelines of the Declaration of Helsinki and was approved by the Institutional

Review Board of Damascus University (UDDS-585/22042021/SRC-574).

Data Availability Statement

De-identified data are available upon reasonable request to the corresponding author.

Orcid

Yasser Alsayed Tolibah https://orcid.org/0000-0001-5498-9991

References

1. Haas CF, Champion A, Secor D. Motivating factors for seeking cosmetic surgery: A synthesis of the literature. Plast Surg Nurs 2008;28(4):177–182. DOI: 10.1097/PSN.0b013e31818ea832.
2. Guo Y, Wei W, Li Q, et al. Efficacy and safety of hyaluronic acid fillers for lip augmentation in a Chinese population. J Cosmet Dermatol 2022;21(5):1959–1966. DOI: 10.1111/jocd.14757.
3. Ghasemi S, Akbari Z. Lip augmentation. Dent Clin North Am 2022;66(3):431–442. DOI: 10.1016/j.cden.2022.02.005.
4. Mutaf M. V-Y in V-Y procedure: New technique for augmentation and protrusion of the upper lip. Ann Plast Surg 2006;56(6):605–608. DOI: 10.1097/01.sap.0000205774.40210.58.
5. Guo J, W Fang, F Wang. Injectable fillers: Current status, physicochemical properties, function mechanism, and perspectives. RSC Adv 2023;13(34):23841–23858. DOI: 10.1039/d3ra04321e
6. DeJoseph LM, A Agarwal, TM Greco. Lip augmentation. Facial Plast Surg Clin North Am 2018;26(2):193–203. DOI: 10.1016/j.fsc.2017.12.005.
7. Fagien S. Facial soft-tissue augmentation with injectable autologous and allogeneic human tissue collagen matrix (autologen and dermalogen). Plast Reconstr Surg 2000;105(1):362–373; discussion 374–375. DOI: 10.1097/00006534-200001000-00057.
8. Coleman SR, EB Katzel. Fat grafting for facial filling and regeneration. Clin Plast Surg 2015;42(3):289–300, vii. DOI: 10.1016/j.cps.2015.04.001.
9. Aksam E, ME Demirseren. Correction of a misjudgment of reference in Grabb and Smith's plastic surgery seventh edition. Arch Plast Surg 2014;41(6):773–774. DOI: 10.5999/aps.2014.41.6.773B.
10. Fischer TC, G Sattler, GG Gauglitz. Hyaluron filler containing lidocaine on a CPM basis for lip augmentation: Reports from practical experience. Facial Plast Surg 2016;32(3):283–288. DOI: 10.1055/s-0036-1583534.
11. Bloom J, Kaplan J, Verma A, et al. Development and validation of a photonumeric scale for evaluation of lip fullness. J Drugs Dermatol 2023;22(3):274–281. DOI: 10.36849/JDD.7309.
12. Strong AL, Cederna PS, Rubin JP, et al. The current state of fat grafting: A review of harvesting, processing, and injection techniques. Plast Reconstr Surg 2015;136(4):897–912. DOI: 10.1097/PRS.0000000000001590.
13. Lam SM, RA Glasgold, MJ Glasgold. Fat harvesting techniques for facial fat transfer. Facial Plast Surg 2010;26(5):356–361. DOI: 10.1055/s-0030-1265016.
14. Alarbeed S, MH Jaafo. Analysis of upper lip appearance after surgical lip augmentation procedure "VY in VY": Progress of results. J Stomatol Oral Maxillofac Surg 2022;123(2):248–256. DOI: 10.1016/j.jormas.2021.03.007.
15. Zielins ER, EA Brett MT Longaker, et al. Autologous fat grafting: The science behind the surgery. Aesthet Surg J 2016;36(4):488–496. DOI: 10.1093/asj/sjw004.
16. Coleman SR, S Lam, SR Chen, et al. Fat grafting: Challenges and debates. Atlas Oral Maxillofac Surg Clin North Am 2018;26(1):81–84. DOI: 10.1016/j.cxom.2017.10.006.
17. Chan CW, SJ McCulley, RD Macmillan. Autologous fat transfer–a review of the literature with a focus on breast cancer surgery. J Plast Reconstr Aesthet Surg 2008;61(12):1438–1448. DOI: 10.1016/j.bjps.2008.08.006.
18. Cohen SR, Wesson J, Willens S, et al. Standardized anatomic and regenerative facial fat grafting: Objective photometric evaluation 1 to 19 months after injectable tissue replacement and regeneration. Aesthet Surg J 2022;42(4):327–339. DOI: 10.1093/asj/sjab379.
19. Schiraldi L, Sapino G, Meuli J, et al. Facial fat grafting (FFG): Worth the risk? A systematic review of complications and critical appraisal. J Clin Med 2022;11(16):4708. DOI: 10.3390/jcm11164708.
20. Buhsem O. Comparing the effects of different injection techniques used in lip augmentation on filler migration and patient satisfaction. Cureus 2024;16(7):e64716. DOI: 10.7759/cureus.64716.
21. Müller DS, Grablowitz DA. Krames-Juerss, et al. Lip augmentation with saypha LIPS lidocaine: A postmarket, prospective, open-label, randomized clinical study to evaluate its efficacy and short- and long-term safety. Aesthet Surg J 2024:sjae149. DOI: 10.1093/asj/sjae149.