Received: 19 February 2024 | Revised: 9 March 2024 | Accepted: 28 March 2024

DOI: 10.1111/jocd.16318

JCD Journal of Cosmetic Dermatology WILEY

ORIGINAL ARTICLE

New autologous fat implantation technique for face lifting: A pilot study

Elaheh Lotfi MD[1] | Najmeh Ahramiyanpour MD[2] | Somayeh Khosravi MD[3]

[1]Yousef Abad Skin and Hair Center, Tehran, Iran

[2]Department of Dermatology, Afzalipour Faculty of Medicine, Afzalipour Hospital, Kerman University of Medical Sciences, Kerman, Iran

[3]Imam Khomeini Hospital Complex, Advanced Medical Technologies & Equipment Institute, Tehran, Iran

Correspondence
Elaheh Lotfi, Yoosef Abad Skin and Hair Center, Tehran, Iran.
Email: elahehlotfiii@gmail.com

Abstract

Background: Autologous fat injection techniques are specially performed to restore the lack of face volume.

Aim: However, no reports have focused on the effect of sides of injection on the sagging appearance improvements and facial lifting. This study aimed to evaluate face lifting using the autologous fat injection in to sides of the face as a new technique.

Methods: Ten patients with aging face were involved in this study. The procedure was done in an anaerobic method. To improve the method, to make patients more satisfied and gain better cosmetic outcomes autologous fat was injected on the sides of the face. To give a lifting effect to the face, the fat was injected on the hairline in the temple area, next to the ear, the angel of the jaw and the angel of the mandible leaning behind the ear to cause face lift. The patients were appraised clinically and photographically.

Results: The results showed that this autologous fat injection technique has significant improvement in face lifting.

Conclusion: This new fat injection technique in sides of the face can create superior results on face lifting without any adverse side effects.

KEYWORDS
autologous fat, face lift, facial rejuvenation, fat injection

1 | INTRODUCTION

Beauty is an important issue for everyone. We all want to look beautiful and want to stay younger as we age. During aging, one of the most important parts is the face. Facial aging is a dynamic and multifactorial process. Various factors such as environmental factors and internal factors of the body cause facial skin aging.[1] However, the reduction of the subcutaneous tissue volume and the skin elasticity, as well as the loss of bones, have a key role on the aging process.[2] Collagen plays a major role in skin elasticity. With aging, collagen is destroyed and its synthesis rate decreases.[3] At the age of 40 to 50 years, elastin starts to decrease drastically. Loss of elastin leads to loss of skin elasticity. Also, the loss of fat under the skin plays a major role in causing facial aging.[4] However, aging does not occur uniformly in the face. According to the superficial fascia system, facial fat is divided into superficial fat and deep fat.[5] Superficial and deep fat tissues are each separated into smaller parts.[6] With aging, the interval position of fat changed and its cause the alteration in the adipose tissue contour.[7] In general, aging caused the shallow fat tissue hypertrophy and the deep fat tissue atrophy.[5,7,8] Plastic surgery is a method that has been performed for more than 100 years and can improve the appearance of the face and correct its function. Recently, nonsurgical and minimally invasive methods have received more attention for facial beauty. Nonsurgical techniques provide more natural results with fewer side effects and less recovery time in compared to traditional cosmetic surgery, so that are utilized by persons.[9] Autologous fat injection has become very popular technique because it is a perfect method with complete biocompatibility. Autologous fat can replace fillers because it has many properties of fillers, including biocompatibility, easily available, cheap, abundant and in addition, it can be harvested. Simply and frequently, by minimal complications.[10,11] Fat grafting, counting fat rebalancing,[12] structural fat grafting,[13] complement fat grafting,[14] fat autologous muscular injection,[15] and autologous fat injection,[16] are commonly done as a conventional facial procedure. Previously, the face lift was a difficult and complicated operation, but recently, with the discovery of numerous fat compartments in the face, it has become possible to restore the volume of the face more accurately, while rejuvenating it. The selective inclusion of fat in the face allows tissue regeneration to be performed with better control. At the same time, this method solves the reduction of facial volume, which is one of the most important problems in facial aging. In this study, the effect of autologous fat injection in lifting the face at the same time as filling the face was evaluated in the patients with skin laxity and sagging face.

1.1 | Patients and methods

The harvesting and implantation of fat have been performed with several methods with that same basic way. In this study the area of autologous fat injection is different. We focused on the sides of the face. With the aim of improving the method, increasing patient's satisfaction and gain better cosmetic outcomes autologous fat was injected on the sides of the face. To give a lifting effect to the face, the fat was injected on the hairline in the temple area, next to the ear, the angel of the jaw and the angel of the mandible leaning behind the ear to cause face lift. Ten patients with aging face were involved in this study. The study patients were appraised photographically (digital camera: Nikon, 42 megapixels, Tokyo, Japan) and clinically. The procedure (harvesting, and implantation) were done in an anaerobic method.

1.2 | Anesthesia

Minimal anesthetic with 1% lidocaine was used for our purposes. Lidocaine adequate and sodium bicarbonate and epinephrine HCl 1:100000 were then added. The donor site was anesthetized by subcutaneously infiltration of the anesthetic solution via a 2-mm cannula attached to a syringe. The anesthetic effect is basically instantaneous. The high dilution of lidocaine and epinephrine reduces these drugs toxic effects on the adipocytes, central nervous systems and cardiovascular.

1.3 | The donor site

Generally, the sites with sufficient fat reserves may be suitable for fat donation. Before choosing the donation site, it is better to talk with the person and then choose a site of body that has sufficient fat reserves. Areas with deposit fat that no change is created in that area with weight loss can be a desirable focus. The abdomen, buttocks, hips and lateral thighs are excellent donor sites in women, while lateral flanks and the abdomen are commonly used in men. In the present study the lateral thighs were used as donor site because it has longer lasting fat and more stem cells.

1.4 | The procedure

Fat injection is a safe process, that is simply done without severe side effects. The procedure is generally done by the assistance of one or two nurses and takes about 60 min. Before the procedure, the patient is photographed. After marking the donor site, the patient is located on the operating place. The donor site is cleaned by a sterile solution. An anesthetic solution is superficially injected into the marked points. After that anesthetic infiltration is sited subcutaneously.

1.5 | Fat harvesting

Autologous fat grafts are typically harvested from thigh site using a 20-cc syringe. A 2–3 mm cannula connected to a syringe (20-mL) is inserted subcutaneously by negative pressure generated with pulling back the syringe plunger. The cannula is moved (in and out parallel to the surface of the skin) within the fat layer. The syringe is filled with the yellow fat after 1 min. The same procedure is repeated to enough fat is harvested. After filling the syringes containing the harvested fat with normal saline, they capped and located vertically in a container with the tips facing down. After about 5 min the fat tissue is separated from the fat free liquid. Then with pressing the plunger, fat free liquid is removed from the syringe. Then the harvested fat and preexisting normal saline are mixed and added to the aspirating syringe. In order to completely separate the fat from fat free solution this process can repeat two or three times. The fat sample is bloodless, and yellow. The washed fat is centrifuged and then the residual serum is removed.

1.6 | Fat implantation

The harvested fat tissue is moved in small syringes (1-mL). The small syringes were utilized, because the thick fat could not block the needle by passing through it. The syringes comprising the harvested fat are counted and the require amount is separated. 18 G cannula was used for fat injection in the subcutaneous layer of the skin. Use of cryo-gel packs before the injections is effective to reduce the pain. To give a lifting effect to the face, more than half amount of harvested autologous fat was injected on the sides of the face. The fat was injected on the hairline in the temple area, next to the ear, the angel of the jaw and the angel of the mandible leaning behind the ear to cause face lift. It is very important to inject the autologous fat in these point of the face (sides of the face), to give a lifting effect to the face. The rest of fat was injected under the eyebrow for eyebrow lift, nano fat was also injected under the eyes. The nasolabial fold, chin and jaw angel was modified according to the patient's needs.

2 | RESULTS

Ten patients underwent autologous fat implantation (2 men and 8 women, the mean age was 42 years). The patient's follow-up was 9 months. At the end of the 9 months, the patient (Patient satisfaction questionnaires) did clinical evaluation of the face lifting results. The level of under-studied cases satisfaction after the intervention was excellent and good and medium in eight (80%), one (10%) and one (10%) of cases, respectively (Table 1). Most patients reported that they were satisfied with their face without make up. All patients said their fine wrinkles were improved, along with a lifting and rejuvenation effect. Moreover, more than 80% of cases displayed a great improvement in facial lifting. Clinical improvement (face lifting) in most patients was evaluated by two independent physicians, with no improvement and minimal improvement in zero patients (0%), moderate improvement in two patients (20%), and good improvement in eight patients (80%) (Table 2). An analysis of pre- and post-operative photographs showed that the procedure has a significant effect on face lifting (Figure 1). No severe side effects were reported in this research. Minor problems, such as edema and redness, some pain at the donor sites, were reported in all under study patients.

TABLE 1 Patients' outcomes including satisfaction level, 9 months after treatment.

Current status	*N* (%)
Unsatisfied	0 (0)
Medium	1 (10)
Good	1 (10)
Excellent	8 (80)

TABLE 2 Clinical improvement (face lifting) in patients after autologous fat implantation according to the physician assessment.

	Clinical Improvement	
Score	Patients, *n*	Percentage of total
0 (no improvement)	0	0
1 (minimal improvement)	0	0
2 (moderate improvement)	2	20
3 (good improvement)	8	80

3 | DISCUSSION

Facial aging has various reasons and it is mainly related to the breakdown of collagen and elastin, as well as the loss of fat volume and displacement of fat in different places. Also, changes in the tension and length of the muscle and the shape of bones can affect facial aging. The levels of aging in different part of the faces is not the same. As a result of aging, wrinkles appear on the face,

FIGURE 1 Pre- and post-operative photographs of the study patients.

the volume of tissues decreases and tissue sagging is appeared. Rejuvenation methods are used to solve these problems that caused by aging to return the patient to a younger state. Wrinkles seem to be the main cause of aging, while the loss of volume and sagging of tissues is the main cause. Wrinkles begin to appear in places with the thinnest skin, such as around the eyes, in the late 20s, and as people age, tissue begins to lose volume and droop. In all tissues volume loss and drooping occur with aging such as muscles, skin tissue, bones and fats. Also, due to the reduction of sex hormones and growth hormones, various changes occur in the body. Growth hormone causes bone and muscle growth in young people, and it helps maintain muscle mass and proper distribution of fat in the body in adults. With aging, as a result of the decrease in growth hormone secreted from the pituitary gland, muscle mass and basal metabolic rate decrease, and fat is not evenly distributed in the body. Due to the reduction of fat tissue, volume reduction and drooping occur in the facial tissue, which is the most obvious phenomenon, and fat injection is recommended.[17,18] These problems can be addressed with a fat injection that help to rejuvenate. The role of fat injection on volume restoration in facial aging is not new. The key treatment goal of this study was the evaluation of the facial lifting effect of the autologous fat injection technique. To give a lifting effect to the face, the anatomic regions that used for injection including on the sides of the face. The fat was injected on the hairline in the temple area, next to the ear, the angel of the jaw and the angel of the mandible leaning behind the ear to cause face lift. Drooping is typically produced by gravity, and the lifting of the face is the most effective technique to pull the tissues back up. Face lifts can be categorized as "traditional," "short-scar," or "mini." Patient safety is depend on proper knowledge of facial anatomy and danger zones.[19] Several techniques and approaches are used in facelift like surgery, but all need tissue dissection.[19] Hollander first performed the facelift by removing tissues along the hair line, and this technique has been advanced by many surgeons.[20] However, the most procedures were restricted to the skin manipulation and the subcutaneous layer, until Skoog presented the superficial muscular aponeurotic system (SMAS) lift in 1973.[21] After that, the SMAS lift has gained a lot of attention. The subperiosteal facelift was introduced by Psillakis et al. in 1988.[22] In 1990, Hamra[23,24] presented the "deep plane facelift", that was replaced by the "composite facelift" in 1992. Stuzin et al. developed the extended SMAS technique by dissecting tissues beyond the supporting ligaments that can effectively lift the nasolabial fold.[25,26] In recent times, a numerous new methods have been introduced to rejuvenate the aging face, like methods by several threads. These methods have simply done on busy office workers as they are relatively simple with shorter recovery periods.[27–30] However, conventional facelifts carries more risks and side effects with a long recovery period.[31,32] The patients prefer noninvasive or minimally invasive facelifts surgical methods because have less side effects and have a shorter recovery period. Fat injection technique can create superior results without any adverse side effects. Our results showed that this autologous fat injection technique has significant improvement in face lifting.

4 | CONCLUSION

Autologous fat injection techniques are specially performed to restore the lack of face volume. However, no reports have focused on the effect of side of injection on the sagging appearance improvements and facial lifting. This study showed that this new Fat injection technique in sides of the face can create superior results on face lifting without any adverse side effects.

Study limitation

The sample size of the study is small.

AUTHOR CONTRIBUTIONS

All authors contributed to the preparation of data and the finalization of this article. All the figures have been produced by the authors of this article and are personal data. EL made the idea. EL, NA and SKH performed the techniques.

ACKNOWLEDGMENTS

The authors would like to thank the colleagues and staff in Yousef Abad Skin and Hair Center, Tehran, Iran.

FUNDING INFORMATION

The authors received no funding for this project.

CONFLICT OF INTEREST STATEMENT

The authors declare there is no conflict of interests.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

Informed consent was obtained from all the patients. Standard demographic information of the patients was acquired and recorded in special questionnaires. All patients were provided with a complete description of the study design, purpose, and probable outcomes.

ORCID

Elaheh Lotfi https://orcid.org/0000-0002-5262-0231

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How to cite this article: Lotfi E, Ahramiyanpour N, Khosravi S. New autologous fat implantation technique for face lifting: A pilot study. *J Cosmet Dermatol*. 2024;23:2681-2685. doi:10.1111/jocd.16318