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SPECIAL TOPIC
Reconstructive

AI-enhanced "Two-thirds Guidelines" for Lipolifting: Addressing Multiple Hallmarks of Facial Aging

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Background: Facial aging involves complex changes such as volume loss, ligament weakening, and skin quality alterations. The "two-thirds guidelines" emerge as a novel strategy to combat these aging signs, drawing from an extensive analysis of 2800 facial fat grafting procedures conducted over two decades.

Methods: Guided by facial lipolifting data, including patient age, fat type (microfat and nanofat), and injection depth, this study devises a systematic framework for multilayer fat rejuvenation and ligament restoration. The two-thirds guidelines advocate injecting two-thirds of the patient's age for microfat and one-third for nanofat, with specific injection codes for lower, middle, and upper facial regions.

Results: A prospective study involving 400 patients confirms the efficacy of the two-thirds guidelines. However, applicability may vary for patients outside SD ranges, particularly concerning facial proportions and body mass index. Patients within the golden ratio range (1.4–1.9) report high satisfaction rates and a 50% fat graft uptake, with minimal complications. For patients outside this range, an artificial intelligence (AI) program was implemented.

Conclusions: The two-thirds guidelines offer a comprehensive approach to facial rejuvenation, addressing volume loss, ligament weakening, and skin quality. They are applicable in early aging stages, promising enduring and natural outcomes while mitigating effects of weight fluctuations. These guidelines provide a safe, replicable, and adaptable approach to facial fat grafting, either standalone or in combination with facelift techniques, with minimized overfilling risks. A dataset obtained from 2800 patients serves as the foundation for developing an AI program tailored to aid doctors in diagnosing and treating similar cases. *(Plast Reconstr Surg Glob Open 2024; 12:e6060; doi: 10.1097/GOX.0000000000006060; Published online 21 August 2024.)*

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INTRODUCTION

Facial aging is a complex process and involves multiple factors, first and foremost a multilayer loss of volume in the facial skeleton and soft tissues, such as deep and superficial fat compartments and the superficial musculoaponeurotic system (SMAS).[1,2] Changes in the bony framework led to reduced surface area and projection over time, primarily due to resorption. This process affects frontotemporal, zygomatic, and mandibular arches, altering the natural V-shape and contributes to the attenuation of facial ligaments,[3,4] which in turn results in a secondary tissue ptosis or facial drooping. Additionally, aging leads to intrinsic and extrinsic skin changes such as wrinkles, hyperpigmentation, rough texture, dryness (xerosis), and visible blood vessels (telangiectasias). Successful techniques to address facial aging must target three primary

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hallmarks of facial aging: the loss of bone and soft-tissue volume, ligament laxity due to multilayer volume loss, and changes in skin quality.[3,5–7]

To combat facial aging, various strategies have been devised, like facelifts to address ligament attenuation, whereas epidermal/dermal treatments such as chemical peels, lasers, or radiofrequency target superficial signs. Facial volume replacement options include synthetic fillers and autologous materials (typically fat). Although synthetic fillers have limitations such as infection risk, granuloma formation, and cost increase over time, fat offers versatility, regenerative potential, long-lasting results, and cost-effectiveness.[8] Due to its unique advantages, fat grafting has been essential for plastic surgeons since the 1990s.[5,9,10] The discovery of adipose-derived mesenchymal stem cells within lipoaspirate has allowed for a regenerative approach to fat transfer with improved overall survival and increased adipose stem cell proliferation, particularly beneficial for challenging recipient areas and tissue trophicity.[3,7,8,11–14] Combining fat transfer with incisional facelift procedures[15–19] has also proven very successful.[20,21]

Recent progress focuses on improving the quality and survival of fat grafting,[15,16] as well as techniques harnessing microfat and nanofat[22,23] parcels, which have demonstrated their usefulness in enhancing contouring and treating fine wrinkles.[17] Nanofat offers clinical benefits, including pigmentation control, collagen and elastin stimulation, and correction of fine wrinkles.[1,2,18,20,21] Concepts like injectable tissue replacement and regeneration have expanded the use of structural fat grafting,[4,5,17] showing evidence of volumetric improvements.[24,25] Furthermore, the utilization of intraligamental microfat injection results in a limited yet sustainable ligamental expansion and secondary lifting of superficial SMAS-skin layers.

However, concerns such as excessive fat graft resorption and overfilling persist, usually due to variations in grafting techniques and a lack of understanding of facial anatomy and the aging process.[23,25–27] In light of the need for safety, predictability, simplicity, and reproducibility, development of straightforward and standardized guidelines for fat injection becomes imperative. To identify recurring patterns and establish guidelines for injection location, fat graft type, depth, and volume, the authors conducted a comprehensive retrospective analysis of 2800 fat grafting operations. Utilizing these patterns and insights, a novel approach known as the “two-thirds guidelines” has been introduced to offer a standardized methodology for patients whose facial golden ratio falls within the range of 1.4–1.9.[28–30] In instances where patients fall outside this specified facial golden ratio range, an artificial intelligence (AI) program has been initiated, drawing from data sourced from the same dataset. This comprehensive concept, addressing all the major hallmarks of facial aging, including multilayer volume resorption, ligament attenuation, and skin surface issues, according to the two-thirds guidelines has been described as “lipolifting” to achieve more predictable and desirable outcomes while minimizing complications.[24,25]

Takeaways

Question: Traditional fat injection methods have historically faced challenges such as unpredictable results and inconsistent techniques.

Findings: The "two-thirds guidelines" for facial rejuvenation innovate with a data-driven approach, analyzing 2800 cases to fat grafting strategies. These guidelines recommend using a mix of microfat and nanofat, proportionate to the patient's age and facial area, for volume restoration and skin quality enhancement. Validated by a study of 400 patients, they show more than 80% satisfaction and a 50% fat graft uptake, with minimal complications.

Meaning: This method provides personalized, lasting results, suitable for standalone use. It represents a safe, replicable, and adaptable advancement in facial aesthetics.

MATERIALS AND METHODS

Data Collection and Analysis

This study aimed to optimize fat injection techniques and protocols through a set of guidelines and AI assistance. Data from 2800 patients who underwent fat injection procedures between 2000 and January 2020 were analyzed to identify patterns. Data collected included patient age, quantities of microfat and nanofat injected into different facial regions, and injection depth. Of the patients, 95% were White, with less than 5% having East Asian and Indian backgrounds. Pre- and postprocedure 3D measurements were conducted, accompanied by patient satisfaction assessments. Descriptive statistical analysis and decision-making patterns were derived from the mean and SDs of fat grafts to assess the significance of the findings from 2800 patients. Based on this analysis of mean values and SDs, a correlation analysis was conducted. Inclusion criteria for the clinical study involved healthy adults 25–75 years of age with visible facial aging indicators, such as wrinkles and volume loss. Adequate fat tissue yields up to 200 mL were required from the donor site. Informed consents were obtained from all participants. Exclusion criteria included insufficient fat supply and ages outside the 25–75 range, ensuring research quality and ethical considerations. Institutional review board approval was not required. The Declaration of Helsinki was used as a guiding principle for this study, and patients were provided written consent for all surgical procedures and anesthesia.

Fat Harvesting and Processing

Fat tissue was harvested from areas such as the flanks, abdomen, and thighs. Before tissue collection, a standard tumescent solution was applied under sterile conditions. Fat was extracted using a 3-mm cannula with hole sizes of 1×2 mm through separate stab incisions. The harvested fat was rinsed with saline at a 1:1 ratio, and then decanted fat tissue was collected into 10-mL syringes. During the study, various techniques were used to process the collected fat into microfat and nanofat. Apart from Lipocube Nano,

other methods were utilized for obtaining micro- and nanofat, such as emulsification, mechanical disruption, and centrifugation. However, after 2018, all microfat and nanofat applications have been performed with Lipocube Nano, covering approximately 30% of the total cases. Before injection, preinfiltration of the recipient site was conducted using the same tumescent solution, and a 7 cm long, 1.6 mm diameter blunt Luer lock spoon-type cannula was utilized for deep and medium depth microfat injection, whereas a 27G needle was used for superficial and dermal nanofat injection.

Fat Injection Analysis

A prospective study was conducted on 400 consecutive patients after the implementation of the two-thirds guidelines from February 2020 to May 2023. These guidelines were strictly followed. The study assessed outcomes using Canfield 3D image comparisons before and after the procedures. Patient satisfaction was also evaluated at various postoperative time points, notably at 12 months, using standardized criteria.

Patients were asked to rate their satisfaction on a 1–5 scale in feedback forms provided before and after surgery. Each rating was assigned a corresponding point value between 1 and 5. The sum of these values was divided by the total number of questions and converted to a score of 100. (**See figure, Supplemental Digital Content 1**, which displays an example of the survey to all patients after two-thirds guidelines. Patients rated scores on deformity, volume retention scarring, skin pigmentation, skin regeneration, and overall satisfaction with treatment results. **http://links.lww.com/PRSGO/D429**.) This scoring system comprehensively assessed the general patient satisfaction, and by using a standardized scale and evaluation criteria, we aimed to provide an objective measure of patient satisfaction and treatment outcomes.

RESULTS

Correlation Assessment: Two-thirds Guidelines for Injection Amount, Location, Technique, and Depth

The data obtained from 2800 patients were analyzed, and the following correlations were calculated by considering the SDs while averaging the amounts of fat injected into the patients. Correlations involving patient age, fat graft amount, type, and injection depth were examined and summarized in the two-thirds guidelines. Subsequently, these guidelines were utilized to guide the allocation of fat graft volume, depth, and placement during procedures.

Specifically, the amount of microfat for volume restoration correlated with two-thirds of the patient's age, whereas nano fat for surface quality improvement was determined as one-third of the patient's age in addition to the microfat.

Age Implications

The procedure involved following the rule of age, which provided guidance on the appropriate amount of fat to be injected. The quantity of microfat administered for volume restoration and ligamental expansion was calculated as two-thirds of the patient's age, whereas the amount of nanofat injected for surface quality improvement equated to one-third of the patient's age (Fig. 1).

Location and Depth Implications

The injection process followed the structure of the rule of location implications, which divided the face into three main sections: the lower arch of the jaw (J), the middle arch of the maxilla and zygoma (M), and the upper arch of the temples and frontal bone (T), as illustrated in Supplemental Digital Content 2. (**See figure, Supplemental Digital Content 2**, which displays variability of injection compartments with respect to facial compartments and injection depth. **http://links.lww.com/PRSGO/D430**.) Based on these regions, specific injection codes were designated for the midface, temple, and chin regions, each corresponding to particular areas.

Guidelines for Lower Two Arches for Microfat

Two-thirds of the total microfat is dedicated to the lower two facial arches. The first one-third was administered into the J, targeting the following codes as shown in Figure 1. The second one-third of the microfat was intended for injection into the M, focusing on the following codes as shown in Figure 2.

Guidelines for the Upper Arch for Microfat

Two-thirds of the remaining microfat was designated for the upper arch of the T as shown in Figure 2, whereas the remainder of the fat was allocated for use on the nose, lips, or other necessary areas, as outlined in Figure 1.

Guidelines for Nanofat

Two-thirds of the total nanofat was injected to the lower two facial arches either by 27G needles intradermally, or using a cannula to the tear-through, whereas the remaining one-third was distributed to the whole facial surface using a dermaroller for epidermal application.

Depth Implications. The guideline for depth governed the injection depth for both microfat and nanofat grafts. For the two-thirds allocation of microfat, the technique involved bone-onlay grafting, targeting all designated injection points. Nanofat injection was described as earlier. [**See figure, Supplemental Digital Content 3**, which displays (A) preoperative AP photograph of a 46-year-old woman who was bothered by volume loss. (B) Postoperative AP photograph of 12 months after fat grafting using the two-thirds rule. A total of 34 mL of microfat and 8 mL of nanofat were used, along with microneedling of the nanofat. **http://links.lww.com/PRSGO/D431**.] [**See figure, Supplemental Digital Content 4**, which displays (A) preoperative AP photograph of a 66-year-old woman who was bothered by volume loss. (B) Postoperative AP photograph of 12 months after fat grafting using the two-thirds rule. A total of 46 mL of microfat and 22 mL of nanofat were used, along with microneedling of the nanofat. **http://links.lww.com/PRSGO/D432**.]

It is important to note that the amount of adipose tissue to be injected into the face is determined not for each

Amount of Fat Required for Half Face

Type of fat → / Injection Depth →		Micro Fat (Age*2:3/mL) Bone Only Injection	Nano Fat (Age*1:3) Superficial Injection
Age			
20 ± 5	Total Fat Required	10 ± 2	5 ± 1
	Mid-Face	3 ± 1	2
	Jaw	3 ± 1	2
	Temple	2	1
	Alternative Point (Nose)	0,6	0,3
	Alternative Point (Lips)	0,6	0,3
30 ± 5	Total Fat Required	13 ± 1	7 ± 1
	Mid-Face	4 ± 1	2
	Jaw	4 ± 1	2
	Temple	3	1
	Alternative Point (Nose)	0,7	0,4
	Alternative Point (Lips)	0,7	0,4
40 ± 5	Total Fat Required	17 ± 1	8 ± 1
	Mid-Face	6 ± 1	3
	Jaw	6 ± 1	3
	Temple	4	2
	Alternative Point (Nose)	0,9	0,6
	Alternative Point (Lips)	0,9	0,6
50 ± 5	Total Fat Required	20 ± 2	10 ± 1
	Mid-Face	7 ± 1	3
	Jaw	7 ± 1	3
	Temple	4	2
	Alternative Point (Nose)	1,1	0,6
	Alternative Point (Lips)	1,1	0,6
60 ± 5	Total Fat Required	23 ± 2	12 ± 1
	Mid-Face	8 ± 1	4
	Jaw	8 ± 1	4
	Temple	5	3
	Alternative Point (Nose)	1,3	0,6
	Alternative Point (Lips)	1,3	0,6

Fig. 1. Age and location-based guidelines for microfat and nanofat application in volumetric and subdermal facial injections by two-thirds standards. The table shows the minimum and maximum recommended fat quantities for application, determined based on age.

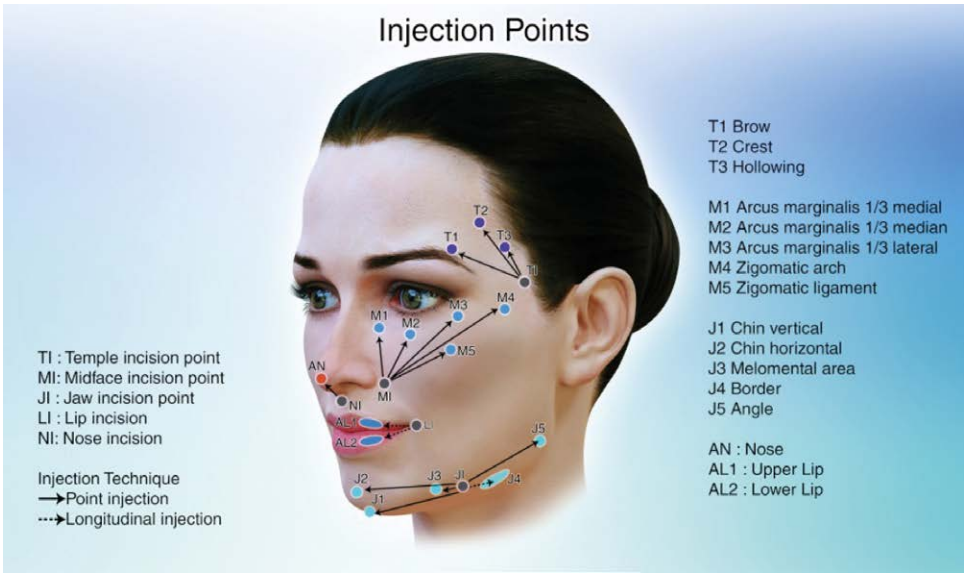

Fig. 2. Injection and incision points used in two-thirds fat grafting. Regular injections are administered at points indicated by straight arrows, while injections marked by dashed arrows involve a longitudinal scan of the area.

point within the regions but rather for each region as a whole. The quantity of fat to be injected at specific points is determined based on the patient's anatomical structure.

Considering the above guidelines, the following equations were prepared. The quantity of microfat administered:

$$\mathrm{MF} = \left(\frac{2}{3}\right) \times A \tag{1}$$

$$\mathrm{MFJ} = \left(\frac{1}{3}\right) \times \mathrm{MF} \tag{2}$$

$$\mathrm{MFM} = \left(\frac{1}{3}\right) \times \mathrm{MF} \tag{3}$$

$$\mathrm{MFT} = \left(\frac{2}{3}\right) \times (\mathrm{MFM}) \tag{4}$$

The quantity of nanofat administered:

$$\mathrm{NF} = \left(\frac{1}{3}\right) \times A \tag{5}$$

$$\mathrm{NFD} = \left(\frac{2}{3}\right) \times \mathrm{NF} \tag{6}$$

$$\mathrm{NFE} = \left(\frac{1}{3}\right) \times \mathrm{NF}. \tag{7}$$

where:
A: patient's age.
MF: Total quantity of microfat to be injected.
MFJ: Total amount of microfat for the lower arch of the jaw (J).
MFM: Total amount of microfat for the middle arch of the maxilla and zygoma (M).
MFT: Total amount of microfat for the upper arch of the temples and frontal bone (T).
NF: Total quantity of nanofat to be injected.
NFD: Total amount of nanofat injected deep to the dermis to the lower and midface by needles or cannulae.
NFE: Total amount of Nano fat allocated to the epidermis of the entire face using a dermaroller.

Fat Injection Analysis Validation

To validate fat injection guidelines, 400 patients who underwent fat injections between February 2020 and May 2023 were evaluated following the updated guidelines. The patients' ages ranged from 17 to 75 years, with a mean age of 46 years. Within the patient group, 95% were women, and the average body mass index was 21 kg/m², with weights ranging from 46 to 78 kg.

Patients were categorized into five age groups: 25–35, 35–45, 45–55, 55–65, and 65–75 years. The distribution across these groups was as follows: 13%, 18%, 25%, 23%, and 21%, respectively.

Patients were assessed at an average of 12 months post-surgery. Photographs were taken before the fat injection, and the amount of microfat and nanofat required was calculated based on the patient's age. Injection intervals were determined accordingly, following designated guidelines (Fig. 1). After 12 months, patients returned for follow-up appointments. Measurements using the Canfield device assessed fat retention rates, whereas a questionnaire evaluated patient satisfaction.

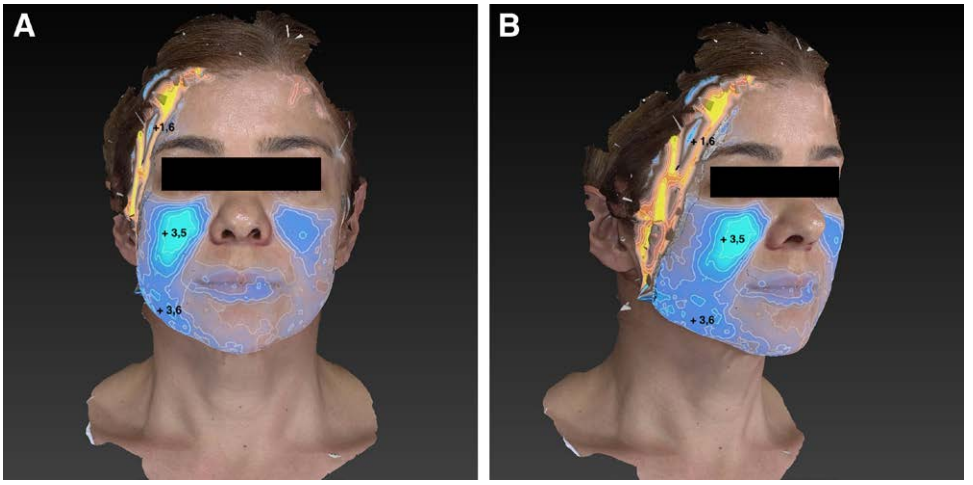

Fig. 3. A 42-year-old patient with fat loss in facial fat compartments, sun damage, and skin laxity underwent fat injection following the two-thirds rule. Fat retention after 12 months was measured using the Canfield device. A, Frontal view. B, three-fourths view.

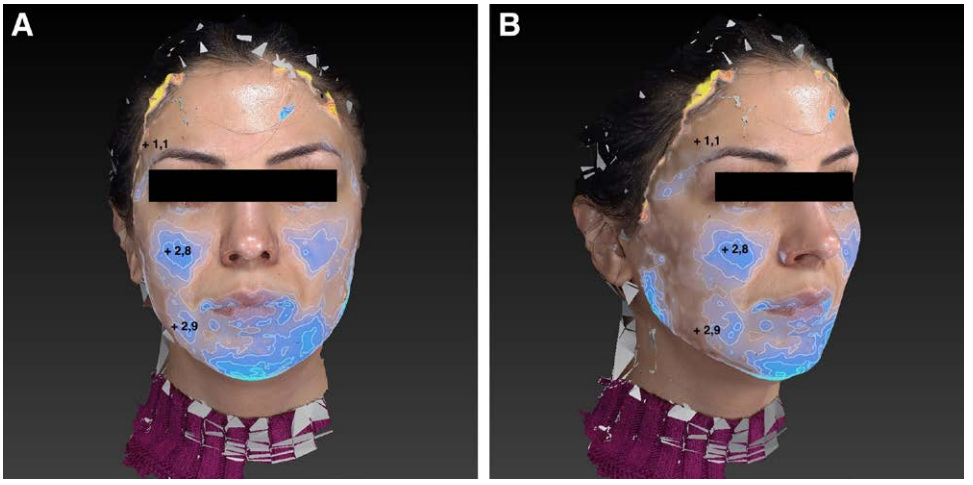

Fig. 4. A 28-year-old patient with fat loss in facial fat compartments, sun damage, and skin laxity had fat retention measured after 12 months after fat injection according to the two-thirds rule, using the Canfield device. A, Frontal view. B, three-fourths view.

Patient satisfaction consistently exceeded 80% across all age groups. Before-and-after images were analyzed using the Canfield device to examine fat uptake rates, which were approximately 70% for both the M and J zones and around 50% for the T zone. Examples of outcomes and uptakes according to the two-thirds guidelines can be seen in Figures 3 and 4.

The technique helped restore the aesthetic V-shape to the face (Fig. 5), allowing for lifting based on anatomical knowledge and volume replacement (Fig. 6). It also addressed cutaneous changes through the regenerative properties of nanofat and was applicable to all Fitzpatrick skin types (Fig. 6).

No major complications, such as vascular compromise, were encountered, whereas four infection cases were resolved with IV antibiotics. Minor complications primarily related to insufficient fat graft uptake were reported and addressed through touch-up procedures (touch-up procedure with ratio of 15% ± 5%), typically performed under local anesthesia. Feedback indicated that patients with high variation of facial proportions from the golden ratio (facial golden ratio falls between 1.4 and 1.9), patients whose skin age exceeded their chronological age, or patients with high body mass index did not achieve the same results. Consequently, an AI program was developed to optimize treatment for such patients. For individuals whose golden ratio fell within the 1.4–1.9 range, patient satisfaction exceeded 80% across all age groups, and fat graft uptake rates were approximately 50%, with no major complications reported. Overall, patients across various age cohorts expressed satisfaction levels exceeding 80% concerning their fat injection surgery performed 12 months earlier.

Fig. 5. Preoperative and 12-month postoperative results following fat grafting in a 66-year-old woman. A, Preoperative photograph of a 66-year-old woman who was bothered by volume loss. B, Postoperative result 12 months after fat grafting using the two-thirds rule. A total of 46 mL of microfat and 22 mL of nanofat were used, along with microneedling of the nanofat.

Fig. 6. Preoperative and 12-month postoperative results following fat grafting in a 46-year-old woman. A, Preoperative photograph of a 46-year-old woman who was bothered by volume loss. B, Postoperative result 12 months after fat grafting using the two-thirds rule. A total of 34 mL of microfat and 8 mL of nanofat were used, along with microneedling of the nanofat.

DISCUSSION

Recent advancements in understanding facial aging and improvements in the safety and efficacy of fat grafting have emphasized the role of fat transfer in addressing aging and regeneration, particularly as the associated risks of using synthetic fillers underscore its importance. This study aimed to establish clear, safe, and replicable guidelines to optimize facial fat grafting outcomes, demonstrating the effectiveness of lipolifting using the two-thirds guidelines to achieve excellent results and patient

satisfaction. These guidelines are adaptable to diverse patient profiles, aiding physicians in selecting suitable methods and volumes for facial fat transfer, especially for patients with facial proportions close to the golden ratio, thereby mitigating concerns about overfilling and uneven fat distribution. The two-thirds guidelines refer to age-associated recommendations, likely indicating proportions or volumes pertinent to age-related facial structure changes, while facial proportion pertains to the balance of fat distribution within facial thirds, aiming for harmony.

The guidelines provide a comprehensive solution for the hallmarks of facial aging. In the preperiosteal microfat grafting technique, microfat is carefully injected into the periosteum. By targeting this specific layer, the graft aims to address the bone resorption–related volume loss, expand attenuating facial ligaments, restore the facial V-shape and stimulate localized osseous regeneration. Contour deficiencies related to fat atrophy are also rectified through targeted microfat injection. Skin changes and fine wrinkles are addressed using nanofat or stromal vascular fraction, known for their regenerative properties. This approach can be initiated relatively early in the aging process, addressing mild to moderate age-related changes typically seen in individuals in their late 30s to late 40s.[31–34] In cases of significant ptosis occurring at a later stage, lipolifting according to the two-thirds guidelines can be combined with various facelift techniques without the necessity of any change in the correlations, offering significant improvements over traditional facelift approaches that often result in under-correction and poor longevity.

The "lift and fill" concept by Rohrich,[35] which focuses on volume loss in accordance with compartmental anatomy, overlooks issues related to bone resorption and ligament laxity. Adding weight to facial compartments may lead to earlier tissue ptosis. In contrast, lipolifting based on these guidelines represents an advancement over previous facial fat transfer methods and addresses ligament attenuation and bone loss with deep bone-onlay and intraligamental expansive fat injections. This results in a sustainable ligamental lifting of the superficial SMAS-skin layer, complemented by superficial injections to correct contour deficiencies and skin changes, building on the concepts of injectable tissue replacement and regeneration.[36]

In this study, data from 2800 entries were rigorously analyzed, and both mean and SD were calculated for the entire dataset. Subsequently, a decision support mechanism was constructed based on observed patterns, leading to the creation of rules governing two-thirds of the exchange rates within the dataset. A prospective study involving 400 patients treated between 2020 and 2023 validated the effectiveness of the two-thirds guidelines. However, these guidelines proved less effective for patients with skeletal deviations such as micrognathia and maxillary hypoplasia, whose attributes fell outside the SD range. Consequently, an AI program was developed to optimize treatment for such patients. Patient satisfaction exceeded 80% across all age groups, and fat graft uptake rates were approximately 50% for patients within the golden ratio range. To ensure the rules' reliability, a thorough validation process involving 400 individuals was conducted, with no issues observed for patients within the SD range. However, the rules were less effective for patients outside this range, prompting an expansion of the dataset to 3200 patient records and subsequent analysis using an artificial intelligence program. Within this AI framework, we crafted a robust regression model, leveraging the capabilities of the ML.NET (Microsoft Learning) library. ML.NET stands out as a versatile machine learning tool thoughtfully designed for the .NET platform, offering a wide array of powerful features for data manipulation and model development. Our model was expertly trained using the Stochastic Dual Coordinate Ascent regression algorithm, renowned for its proficiency in handling large datasets. Notably, Stochastic Dual Coordinate Ascent offers a versatile range of parameters that enhance the model's ability to generalize effectively across various scenarios. Following the training phase, we transformed the model into a prediction engine object, empowering it with real-time prediction capabilities. This transformation greatly facilitates the seamless integration of our model into diverse application scenarios, enhancing its practical usability.

Although our study demonstrates the reliability and effectiveness of the two-thirds guidelines for lipolifting in achieving facial rejuvenation with minimal morbidity, we acknowledge the limitations of our retrospective study and the narrow scope of assessed outcomes. Future research should encompass both objective measures and patient-reported outcomes for a comprehensive evaluation.[8,37] It is important to emphasize that the two-thirds guidelines serve as standards for surgeons aiming to enhance results in facial fat transfer. However, they should be adapted on a case-by-case basis to accommodate individual patient anatomy and facial asymmetry.[10,38,39]

CONCLUSIONS

Facial aging is characterized by volume loss, ligament weakening, and declining skin quality. Multilayer fat grafting addresses these issues effectively, offering lasting results such as volume restoration, ligament support, and skin enhancement. The study demonstrates significant progress in facial rejuvenation through lipolifting, showcasing the reliability of the two-thirds guidelines, especially for patients with proportions close to the golden ratio. These guidelines provide a safe and adaptable approach to fat grafting, alone or with facelift techniques, reducing the risk of overfilling. Moreover, integrating artificial intelligence can improve precision and patient outcomes in personalized medical procedures. Despite acknowledging limitations like retrospective analysis, the study emphasizes the potential for AI-driven advancements and underscores the importance of tailored treatments for individual patient needs and facial asymmetry.

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DISCLOSURES

Dr. Cohen discloses financial affiliations with several companies and organizations. Dr Cohen holds a shareholder position

in MAGE GROUP, UK, and RECURE. Additionally, Dr. Cohen has invested in the London Regenerative Institute. Dr Cohen serves as a Key Opinion Leader for Lipocube Ltd and has multifaceted roles with Apyx Medical, including consultancy, investigation, and training. Furthermore, Dr. Cohen is an investigator for Cytrellis and Sientra. Merz has granted me educational support. Dr. Cohen is also a shareholder in Millennium Medical and plays consulting and investigative roles for MTF. Dr. Cohen acknowledges these financial interests, and committed to transparently disclosing them as appropriate in his professional activities to maintain ethical standards and ensure the integrity of his engagements. Dr. Tiryaki is an investigator for Mentor, receives book royalties from Springer, and is on the advisory board and holds equity in Mage Group and Lipocube Ltd. Mrs. Canikyan is a Chief of R&D officer at Lipocube Ltd. Ms Kul R&D Engineer in Lipocube Ltd. Ms. Duyan R&D Engineer in Lipocube Ltd. Dr. Schlaudraff holds a shareholder position in Mage Group, UK, and Recure. Additionally, he has invested in the London Regenerative Institute. As a Key Opinion Leader for Lipocube Ltd, Bausch & Lomb, G&G Biotechnology, Bioscience, and Vivacy, he shares his expertise and insights. Dr. Schlaudraff is serving as a Board Director of the International Society of Aesthetic Plastic Surgery ISAPS and the Swiss Society of Aesthetic Surgery. Dr. Siolo holds active memberships in esteemed organizations such as the American Society of Plastic Surgeons, the American Society for Aesthetic Plastic Surgery, the International Federation for Adipose Therapeutics and Science, the Association of Plastic, Reconstructive, and Aesthetic Surgeons of South Africa, and the Society of Rhinoplasty Surgeons of South Africa. The other authors have no financial interest to declare in relation to the content of this article.

PATIENT CONSENT

Patients provided written consent for the use of their images.

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