Fat Grafting as an Adjunct to Facial Rejuvenation Procedures

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KEYWORDS

• Fat grafting • Facial aging • Rejuvenation • Restoration

KEY POINTS

- Volume restoration is the backbone of current facial rejuvenation concepts.
- Fat grafting is a simple and effective technique that may be added to most esthetic surgical procedures.
- Small volumes of fat grafting may lead to optimal rejuvenation results while avoiding many of the possible complications.
- In addition to adding volume and contour, fat grafting may improve the quality of skin, enhancing skin rejuvenation methods.

Introduction

Fat grafting is commonly combined with other facial rejuvenation procedures to improve and optimize esthetic results.[1–4] Additionally, it is becoming more popular, particularly as an adjunct to optimize lifting techniques. In a study by Sino and colleagues, the authors showed that nearly 85% of 308 surgeons surveyed add fat grafting to some of their face lifting procedures. About 70% of participating surgeons began to use fat grafting in addition to face-lifting surgeries within the last 10 years of practice, and 45% added it within only the last 5 years. To illustrate this increasing trend, Rohrich and colleagues[3] described their effective rejuvenation as "lift-and-fill face lifting." They perform lifting and repositioning by surgical techniques, and they improve volume and contour loss by fat grafting.[3]

Mechanisms of facial aging

The exact mechanism of facial aging is not well understood, but it is widely accepted that facial aging is a complex process that involves all anatomic compartments in all levels of the face.[5,6]

Historically, gravity was assumed to be a dominant factor in the process of aging. In the gravity model, it is hypothesized that frequent contractions of the muscles of facial expression cause expansion of the overlying soft tissues. Subsequently, gravity gradually displaces this expanded tissue, thus leading to the changes that occur over time such as deepening of the nasolabial folds, creation tear troughs, and changing of the jawline borders.[5–7]

Now it is widely believed that aging is not as simple as the sagging and descent of soft tissues caused by gravity. Many recent studies have shown that in addition to gravity, there are considerable volumetric changes that occur at the time of aging.[5–7] These changes start in the maxillary and mandibular bones, which recede gradually. The maxilla becomes smaller in all dimensions and moves posteriorly, and the mandible moves upwards and backwards as well[8,9](Fig. 1).

In this theory, facial fat compartments play a determinant role. After hard tissue volumetric regression, retaining ligaments lose their supports. Subsequently, facial fat compartments begin to descend, leading to the changes commonly associated with aging[7,10](Fig. 2). Malar prominences recede, while periorbital fat compartments herniate out of the septum. These events in concert cause flattening of the malar eminence, hollowing of the suborbital zone, lengthening of the lower lids, and deepening of nasolabial grooves.[7,10]

Rationale for adding fat grafts to rejuvenation operations

Face lifting techniques have evolved during the past few decades, and now most known mechanisms of aging are compensated for and reversed by these practices. Meanwhile, there are reasons that may convince an aesthetic surgeon to consider fat grafting for addition to any rejuvenation procedure.

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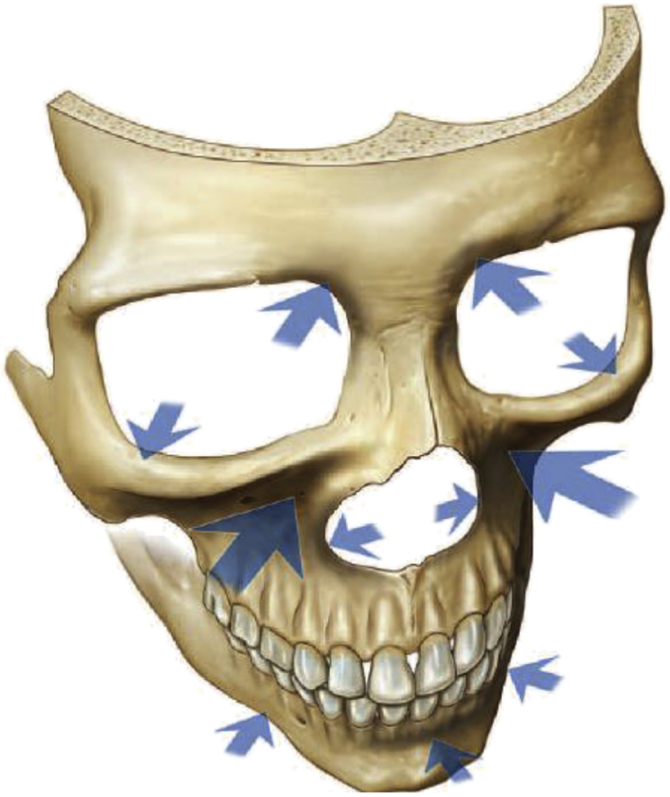

Fig. 1 The areas of facial skeletons and remodeling with aging. (*From* Mendelson B, Wong C-H. Changes in the facial skeleton with aging: implications and clinical applications in facial rejuvenation. Aesthetic Plast Surg 2012;36:753—60; with permission.)

Volume restoration

It is frequently shown that in most standard face-lifting approaches, hollowing, or volume loss, of facial compartments is improved. Jacono and colleagues[11] showed that deep plane face lifting resulted in long-term midface volume augmentation, on average 3.2 mL in each hemi-face. Although beneficial, it is clear that this amount of volume gain might be inadequate in some cases. Fat graft can easily be used to optimize volume augmentation (Fig. 3A—D).

Contour restoration

The superficial musculoaponeurotic system (SMAS) modification techniques (pursing, imbrication, composite lifts, and SMAS flaps) have been repeatedly shown to help to reposition sagging tissues and to recontour prolapsed tissues. In a Jacono and colleagues[11] study, deep SMAS flaps increased, about 1 mm, in malar contour. The authors believe that this contour change is equal to 3 cartridges of hyaluronic acid. It is clear that this amount of malar augmentation by SMAS modification techniques alone would not add enough increased volumetric dimension in most aging faces, and that fat grafting may serve as a powerful tool to ideally design and create facial contours in conjunction with these procedures (Fig. 4A—D).

Planning a more conservative approach

There are some resistant anatomic compartments in which reversing and restoring the effects of aging are difficult. To do so, often wider and more complicated techniques and approaches are needed. These challenging regions include deep nasolabial folds, tear troughs, and deep marionette lines. Fat grafting can both optimize traditional techniques, or can augment conservative lifting techniques in order to restore recalcitrant areas needing further augmentation.

Skin quality

There are many effective modalities such as LASER resurfacing, chemical peeling, and dermabrasion that may be combined with lifting surgeries to enhance the quality of aging skin. In

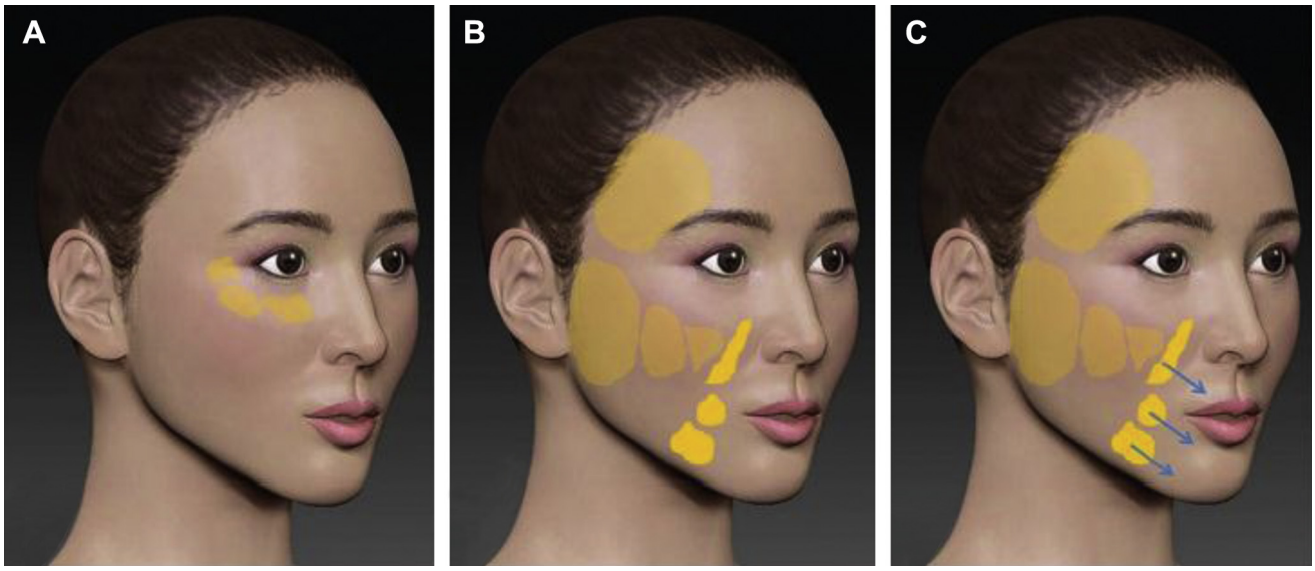

Fig. 2 (*A*) Deep fat compartments of the face. (*B*) Superficial fat compartments of the face (*C*) Sliding of fat compartments due to aging process. (*From* Salti G, Rauso R. Facial rejuvenation with fillers: the dual plane technique. J Cutan Aesthet Surg 2015;8:127—33; with permission.)