Fat Grafting in Facial Aesthetic Units

Husain Ali Khan, MD, DMD [a], Seied Omid Keyhan, DDS [b,c,*]

KEYWORDS

• Fat grafting • Facial aesthetic units • Technique • Surgery • Plastic • Cosmetic • Augmentation

KEY POINTS

- Fat grafting to the nose is an effective method for complementing rhinoplasty procedures or for reshaping congenital or acquired deficiencies.
- In the authors' experience, lip augmentation with fat is rarely permanent.
- The most common problems in the cheek area are tissue bunching and undercorrection.
- The key to fatty placement in the nasolabial fold and marionette line is infiltration with the different angle of placement multidirectional approach.
- To achieve a consistently excellent result, it must be noticed that the inferior orbital rim is considered as the most technically difficult area.

Introduction and history

For the first time, Hollander[1] presented a technique for fat injection using a cannula in 1909. Fat grafts have always had the difficulties of inducing the necessary neoangiogenesis, which subsequently cause significant resorption.[2] Today there are a lot of clinical methods that can change the results. Unfortunately, controversies still exists about the longevity of the results and also the best technique but, yet the recipient-site re-vascularization and neoangiogenesis for exaggerated fat survival is the basic of fat reimplantation.[3] By simple skin incision and its size according to the diameter of the cannula, the fat graft is injected to the surface of the specific anatomic area. It seems that cannulas with a small gauge could decrease damaging trauma to the recipient site and also decrease the risks of hematoma formation, poor graft oxygen bleeding, and diffusion.[3] Because revascularization starts at the periphery, ischemic time is longer in the center of the graft.[4] Therefore fat injection in multiple small-volume sessions is preferred over on single injection.[4] Commonly, multiple tunnels are created on insertion through multiple access sites; but fat is injected only during withdrawal of the cannula in a fanning-out pattern.[3] Fat grafts are distributed in small amounts and located in different areas in the soft tissue to not create overcrowding of the transplanted adipocytes and excessive interstitial pressure at the recipient area.[3] Maintenance fat graft studies revealed that the lips and glabella, which are mobile areas, have less ability for modification than the malar and buccal areas, which are less-mobile areas.[3]

About the cannula size in fat injection, many studies use various caliber cannulas, and the only factor that determines the choice of cannula refers to the nature of the recipient site. Reports demonstrated that the vitality of adipose tissue is increased when infiltration with cannulas reach at least 2.5 mm in diameter. Nevertheless, cell viability had no significant changes with a different needle gauge.[4]

The Coleman facial lipostructure technique[5,6] is the backbone of this article.

Facial lipostructure has advantages, such as being natural, long lasting results which supports and fills the face in layered fashion. This method facilitates the formation of tissues in 3 dimensions, which is augmented facial complex.[7]

Numerous techniques have been introduced to increase longevity and improve results.[2,5,8–11]

Facial aesthetic units

One consideration in any type of facial surgery is the appearance of the final scar.[12] Gonzales-Ulloa[13] first described the regional aesthetic units of the face in an effort to emphasize the need for restoring facial skin units in complete regions as opposed to patch work (Fig. 1). The final results led to the development of 40 regions of the body and 14 regions of the face based on skin thickness and histology.[12]

These facial regions were further classified by observing what Gonzales-Ulloa[13] termed "relief lines, folds, and evident changes in cutaneous texture." The original 14 aesthetic units as classified by Gonzales-Ulloa[13] included the forehead, right and left cheeks, nose, right and left upper lids, right and left lower lids, lower lip, upper lip, right and left ears, mental region, and the neck.[12]

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[a] Aesthetics International USA, 11975 Morris Road, Suite 220, Alpharetta, GA 30005, USA

[b] Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Birjand University of Medical Science, #3, Pasdaran Street, Birjand, South Khorasan Province, Iran

[c] Department of Oral and Maxillofacial Surgery, Cranio Maxillofacial Research Center, Tehran Dental Branch, Islamic Azad University, Tehran, Iran

* Corresponding author. Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Birjand University of Medical Science, #3, Pasdaran Street, Birjand, South Khorasan Province, Iran.

E-mail address: keyhanomid@ymail.com

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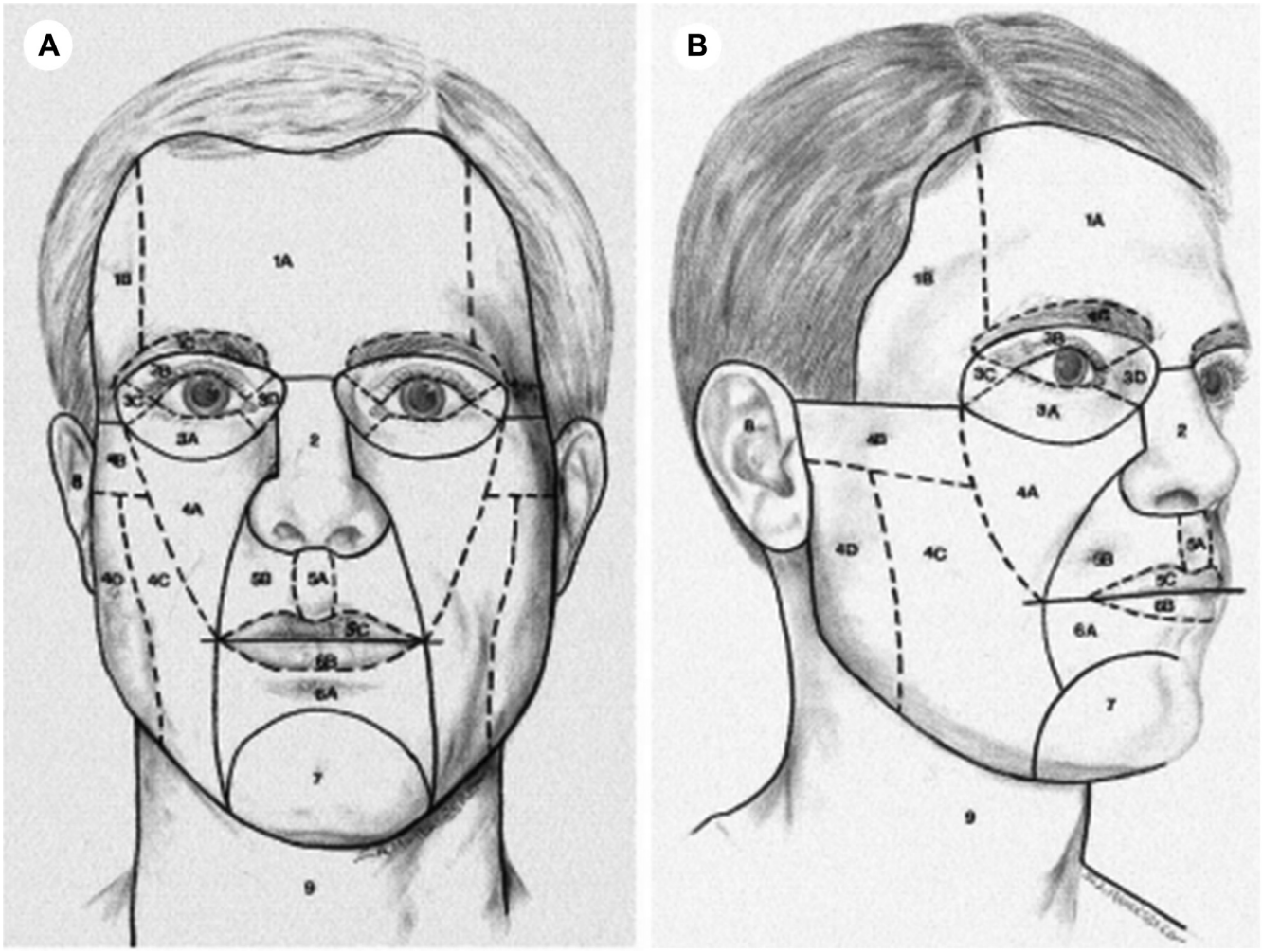

Fig. 1 Facial aesthetic units. (*From* Fattahi TT. An overview of facial aesthetic units. J Oral Maxillofac Surg 2003;61:1208; with permission.)

Goals and outcomes

First of all, the complaints and goals of patients in facial rejuvenation must be identified. Then next step includes analysis of the face, donor sites, and general patient selection criteria.[14]

One of the areas of facial rejuvenation that is so progressed is fat grafting. Because of the extreme loose skin of the face, this procedure may face some problems and, if used solely, could not satisfy patients. The face should be analyzed in a systematic manner to assess the needs of each potential patient. In the youthful face, the forehead's skin is tight with no rhytids and the glabella and brow are not furrowed. The upper eyelids and orbits are full. The cheeks are full and hide the zygomatic arch with the buccal fat pad (BFP).

The nasolabial folds are soft; the lips are pouted, full, and averted, with the lower lip slightly larger than the upper lip. The line of the jaw is sharp with a well-defined chin. With aging, folds and lines become visible on the glabella and forehead. The temples start to concave, as do the orbits. The upper eyelid lacks fullness, and the upper-lid skin gets hollow. This process can lead to weakness of the excess skin, and the skin can come back into the orbit giving a concave appearance.[15] The lid-cheek junction elongates because the inferior orbital rim becomes more prominent again because of volume loss.

The tear trough deepens, as marionette and the nasolabial folds. When the malar fat pads empty out and the mandible's border becomes weak and less defined with atrophy, the zygomatic arch becomes visible and the jawline coordinately with the descent of the jowl, often with the vision of excess jowls.[16]

Preoperative evaluation

Like any procedure in oral and maxillofacial surgery, all candidates should undergo a thorough preoperative history and physical examination. Attention should be paid in the preoperative assessment to the family history or patients' history of clotting disorders, previous miscarriage, even bleeding, and/or deep vein thrombosis or pulmonary embolism. The past medical history of the use of anticoagulants, such as warfarin, enoxaparin sodium (Lovenox), aspirin, nonsteroidal antiinflammatory drugs, and supplements and certain vitamins which can change the duration of blood clotting, should be considered in all patients. The rate of smoking should be documented.[11] Patients should be questioned about a history of methicillin-resistant *Staphylococcus aureus* infections and postsurgical infections.[11] Patients must be asked specifically about previous cosmetic surgeries and noninvasive procedures.[11]