Special Topic

Facial Reshaping Using Minimally Invasive Methods

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There has been no ideal option for patients who are unhappy with their facial shape but do not want to undergo complex surgeries or pay the high price of temporary injectable treatments. In this article, we describe the treatment of facial complaints such as the gaunt face, long face, bottom-heavy face, chubby face, midface retrusion, and asymmetric face, as well as the modification of racial and ethnic characteristics, through the use of minimally invasive methods.

Fat grafting was used to accentuate the cheekbones in most patients complaining about their facial shape. For the long face, this technique increased the horizontal facial diameter. Lipoplasty combined with buccal lipectomy effectively decreased the fullness of the lower face and improved facial contour in the bottom-heavy face and chubby face. A skin-tightening face lift may also be necessary in patients with neck laxity. Fat grafting was used to fill in depressions or defects in the gaunt face and to treat midface retrusion and facial asymmetry. Added facial projection was obtained with nasal and chin implants. Photographs of representative patients treated for facial reshaping using the described techniques are presented. By using the minimally invasive techniques described, plastic surgeons can reshape a patient's face without the prolonged downtime or morbidities associated with more invasive procedures. (*Aesthetic Surg J* 2005;25:.)

Throughout the evolution of plastic surgery, facial reshaping has traditionally been accomplished with procedures that are complicated to perform and associated with long recovery periods and morbidity. In some cases, complaints regarding facial shape were regarded as frivolous concerns.

Facial shapes such as midface retrusion and a long face have traditionally been treated with maxillofacial osteotomies.[1-4] Patients with asymmetric faces have undergone treatment involving various flaps and maxillofacial rearrangement.[5,6] Although the recent popularity of injectables, such as Restylane, may encourage some surgeons to use these products to reshape the face, such corrections are temporary, and often several syringes are needed to fill in larger depressions.

This paper deals with the use of minimally invasive techniques, such as fat grafting, silicone facial implants, lipoplasty, and buccal lipectomy, to reshape a patient's face. By using these and other techniques, patients now have options for facial reshaping that minimize downtime and morbidity. Treatment of the following facial shapes is described: the gaunt face, the long face, the bottom-heavy face, the chubby face, midface retrusion, and the asymmetric face.

The Gaunt Face

The face can loose fat in the cheeks, malar regions, and infraorbital areas due to heredity, weight loss, disease, or aging. Volume can be added to the gaunt face by fat grafting to appropriate areas, as depicted in Figure 1. Depending on the individual, fat may also be grafted to other areas, such as the nasolabial folds and supraorbital regions, to improve the volume-deficient face.

Fat was harvested for facial fat grafting using a blunt cannula from a suitable subcutaneous fat donor site. Preferred donor sites included the abdomen and lateral thighs. The harvested fat was then spun using a centrifuge for 3 minutes and blood, lidocaine, and impurities were removed. The fat was injected with a blunt

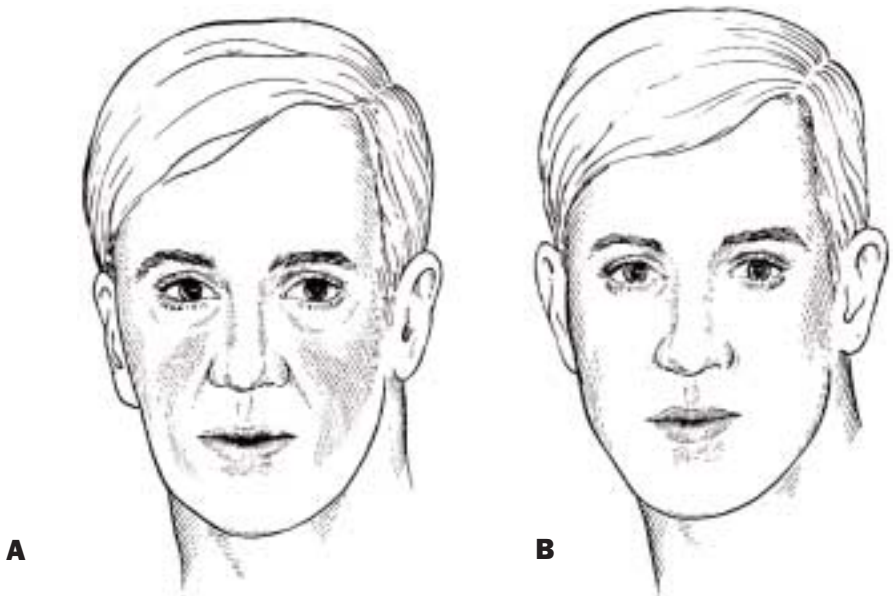
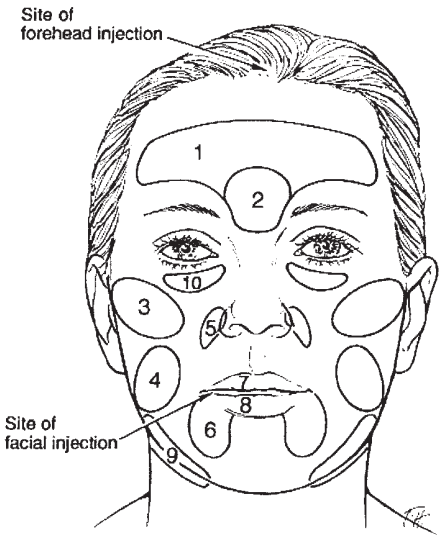


Figure 1. *Treatment of the gaunt face.* **A,** *Preoperative drawing of a gaunt male face. Note the prominent nasojugal folds and lack of fullness in the submalar region and lower face.* **B**, *Expected postoperative result after fat grafting to the infraorbital regions, malar and submalar regions, and lower face.*



Area	Amount of fat
1	Rarely fat grafted
2	Rarely fat grafted
3	5-9 cc
4	2-9 cc
5	2-5 cc
6	2-5 cc
7	1-4 cc
8	1-4 cc
9	4-8 cc
10	1-2 cc

Figure 2. *Diagram depicting average amounts of fat grafting per region. Areas 3, 5, 6, 7, 8, and 10 are the most frequently grafted.*

cannula into the desired areas through one of 3 common injection sites: the lateral commissures, a lateral orbital wrinkle, or through a face lift incision site. Figure 2 illustrates typical areas for fat grafting and average amounts grafted.[7] The fat was placed in stacked and cross-stacked "toothpick"-shaped layers with limited passes in order to minimize trauma. Local anesthetic with epinephrine was not infiltrated into these areas in order to preserve maximum adipocyte viability. Because catecholamines may result in vasoconstriction and decrease fat survival, epinephrine-free graft sites were desired.

The amount of grafted fat that remained was variable among patients. Anecdotally, based on clinical observation, retention was greater in the malar region and less in the lips and chin (Figure 3). If neck and jawline laxity were present, then a skin-tightening face lift was also performed to redrape the neck skin. AQ2

The Long Face

Patients presenting with a "long face" typically exhibit a narrowed transverse facial diameter compared to a lengthened vertical diameter. In addition, there may be hollowing in the temporal region, lack of cheekbone prominence, and an inferiorly positioned labiomental crease (Figure 4). These areas were improved by fat grafting to the malar areas, which increased the width of the face and matched the lengthened vertical dimension.

Figure 3. A, *Preoperative view of a 56-year-old woman with a gaunt face.* **B,** *Postoperative view 6 months after fat grafting to the malar, submalar, and infraorbital regions. A total of 24 mL of fat was grafted.*

In addition, chin augmentation with an alloplastic implant or via fat grafting could help to elevate the labiomental crease and increase the horizontal dimensions of the chin and jawline. In certain cases where the nose was thin, such as the patient in Figure 5, this thinness could create an optical illusion that the face was longer than it actually was. A concurrent rhinoplasty helped to decrease this effect by slightly widening the nose. Fat was sometimes grafted to other areas, such as the cheek hollow, to increase the horizontal dimension of the face.

The Bottom-Heavy Face

Patients presenting with the "bottom-heavy face" have excessive prominence of the lower face, often with jowling and submandibular fat rolls (Figure 6). Treatment was based on removing fat from the submandibular region and lower midface, while simultaneously enhancing the volume of the upper midface to develop a more aesthetic "ogee" appearance, as described by Little.[8] A skin-tightening face lift was performed, with aggressive defatting of the submental and submandibular region to contour the neck and jawline. A buccal lipectomy was performed to decrease the volume of the lower midface. These procedures, combined with fat grafting to the malar region, effectively created the desired "ogee" appearance (Figure 7).

The Chubby Face

The "chubby face" differs from the "bottom-heavy face" in that all of the areas of the face appear full, instead of only the lower face. Patients with a chubby face often complain that their face makes them appear to be heavier than they really are.

Similar principles applied in the treatment of the chubby face and bottom-heavy face because an aesthetic "ogee" shape to the face was desired in both cases. This was accomplished by increasing the volume of the upper midface by fat grafting while decreasing the volume of the lower midface and jowls by buccal lipectomies (Figure 8). Patients with the "chubby face" are usually young with elastic skin; therefore, submental lipoplasty was usually sufficient to create a sharper contour to the neck (Figure 9).

A rhinoplasty with dorsal augmentation (such as with an implant) can also thin the face by optical illusion. As described previously in the "long face," thinning of the nose created the illusion of a thinner face. This optical illusion can be seen in the patient in Figure 10, who appeared to have a thinner face after only rhinoplasty was performed.

Midface Retrusion

Alternatives exist to Le Fort osteotomies for patients with midface retrusion. These patients were treated by fat

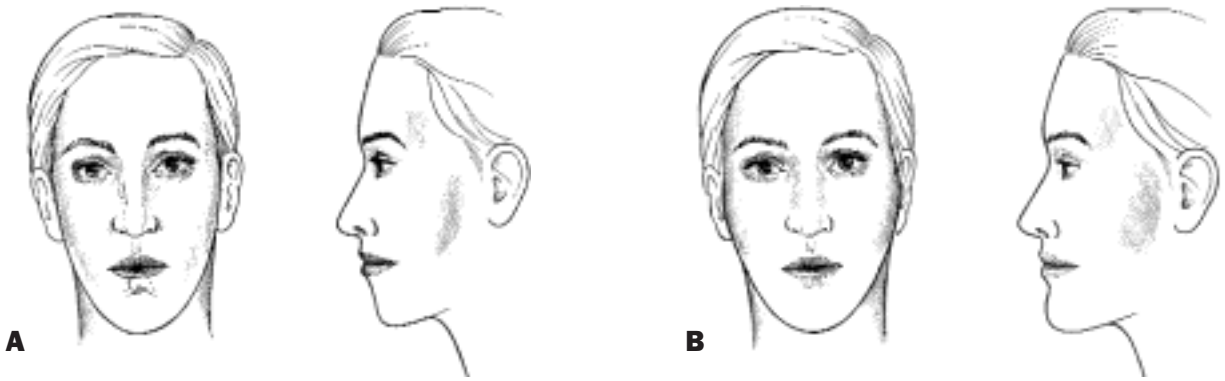


Figure 4. *Treatment of the long face.* **A,** *Preoperative drawing of a long face.* **B,** *Expected postoperative result after fat grafting to the malar and submalar regions to increase the horizontal dimension of the face. A chin implant or fat grafting can be used to increase the width of the chin.*

Figure 5. A, C, *Preoperative view of a 48-year-old woman with a long face.* **B, D,** *Postoperative view 9 months after fat grafting to the malar and infraorbital areas and chin augmentation. A total of 26 mL of fat was grafted.*

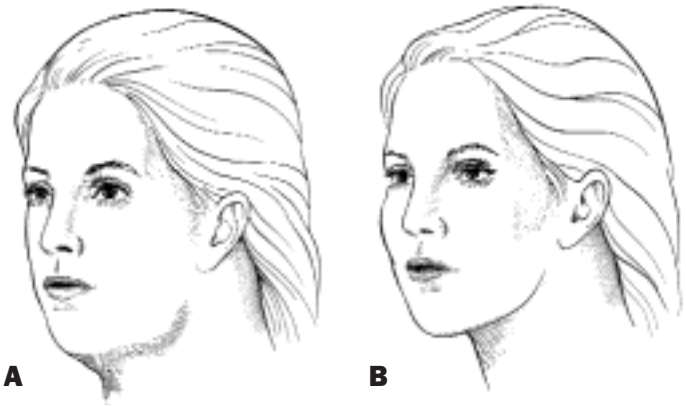


Figure 6. *Treatment of the bottom-heavy face.* **A**, *Preoperative drawing of the bottom-heavy face. Note lack of jawline definition, with jowling and fullness in the lower face.* **B,** *Expected postoperative result after a skin-tightening facelift with defatting of the submental region, bilateral buccal lipectomies, and fat grafting to the malar areas.*

Figure 7. A, C, *Preoperative view of a 33-year-old woman with a bottom-heavy face.* **B, D,** *Postoperative view 7 months after submental neck lift, bilateral buccal lipectomies, and fat grafting to the malar areas and infraorbital regions. Note the lack of fullness in the lower face, with a sharp jawline. A total of 12 mL of fat was grafted.*

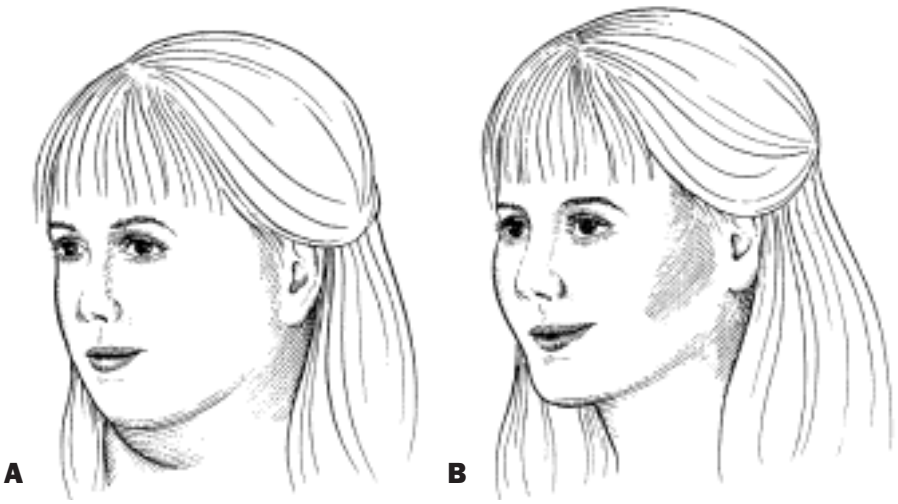


Figure 8. *Treatment of the chubby face.* **A,** *Preoperative drawing of the chubby face.* **B,** *Expected postoperative result after submental lipoplasty, bilateral buccal lipectomies, and fat grafting to the malar regions. A chin implant can be placed to further define the chin and jawline. A nasal implant can be used in certain cases to decrease the width of the nose and add projection.*

Figure 9. A, C, *Preoperative view of a 32-year-old woman with a chubby face.* **B, D,** *Postoperative view 7 months after a skin-tightening face lift, bilateral buccal lipectomies, and fat grafting to the malar areas and infraorbital regions. Note the lack of fullness in the lower face, with a sharp jawline and "ogee" appearance to the midface. A total of 16 mL of fat was grafted.*

Figure 10. A, *Preoperative view of a 36-year-old man with a chubby face.* **B,** *Postoperative view 3 years and 8 months after rhinoplasty with use of a dorsal silicone implant. Note how the thinning of the nose creates the illusion that the face is thinner.*

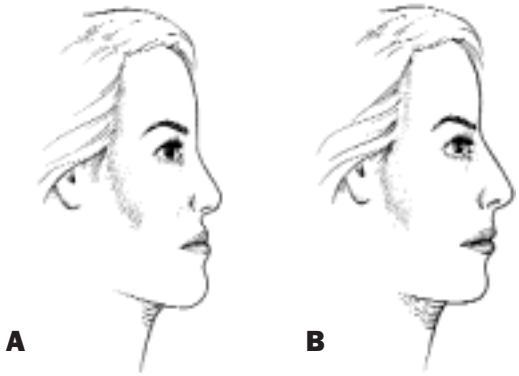


Figure 11. *Treatment of midface retrusion.* **A,** *Preoperative drawing of midface retrusion.* **B,** *Expected postoperative result after fat grafting to the midface and augmentation of the nasal dorsum with cartilage or a silicone implant.*

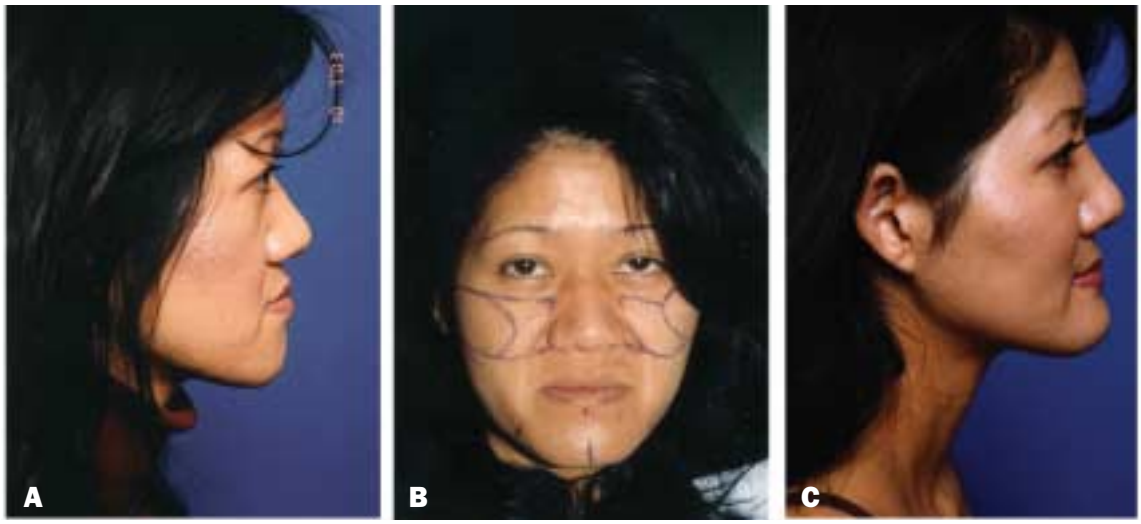


Figure 12. A, *Preoperative view of a 30-year-old woman with midface retrusion.* **B,** *Preoperative markings exhibiting proposed fat grafting areas.* **C,** *Postoperative view 7 months after fat grafting to the marked areas, rhinoplasty with dorsum and maxillary spine silicone implant, and chin implant placement to reshape the chin and pogonion. A total of 25 mL of fat was grafted.*

Figure 13. *Treatment of the asymmetric face.* **A,** *Preoperative drawing of an asymmetric face. Note the lack of fullness on the patient's left side, as well as the descended left brow.* **B,** *Expected postoperative result after fat grafting to the affected, volume-deficient side. A brow lift is performed to elevate the depressed left brow.*

Figure 14. A, *Preoperative view of a 33-year-old woman with an asymmetric face. Note the lack of volume in the right malar, submalar, and infraorbital areas. The right brow was descended as well.* **B,** *Postoperative view 18 months after grafting to the bilateral malar, submalar, and infraorbital regions. The patient also underwent a forehead lift, bilateral lower blepharoplasty, submental lipoplasty, rhinoplasty, and perioral dermabrasion. A total of 27 mL of fat was grafted, with more fat grafted to the right side of the face.*

grafting to the midface (both malar areas and infraorbital areas), as well as dorsal augmentation of the nose with an implant or graft (Figures 11 and 12).

The Asymmetric Face

The asymmetric face can be a result of heredity, trauma, and certain disorders such as Romberg's disease. Fat grafting to the affected side was performed as an alternative to traditional treatments, such as free flaps (Figure 13). Asymmetric brows were treated by a brow lift with greater pull on the ptotic side. Because patients often desired a more youthful appearance as well as correction of the asymmetry, fat grafting was performed bilaterally, with more grafting to the affected side for symmetry (Figure 14).

Changing Racial and Ethnic Characteristics

Occasionally, patients present with the desire to have their facial shape altered to more closely match features more prevalent in their racial or ethnic community. Fat grafting was performed to create a more desirable facial shape. Figure 15 shows a 23-year-old Korean woman who had previously undergone maxillofacial surgery, resulting in a face which she thought lacked the fullness

Figure 15. *Modifying racial and ethnic characteristics.* **A,** *Preoperative view of a 23-year-old woman who complained that her face was too thin for her Korean heritage.* **B,** *Preoperative markings for planned fat grafting sites.* **C,** *Postoperative view 6 months after fat grafting to the marked areas. A total of 36 mL of fat was grafted.*

more prevalent in the Korean community. Facial fat grafting was performed to create an appearance she felt was more characteristic of her heritage.

Conclusion

Alternatives to extensive maxillofacial surgery, muscle flaps, or temporary injectable fillers exist for patients who present for facial reshaping. By using minimally invasive techniques such as facial fat grafting, lipoplasty, and buccal lipectomy, plastic surgeons can reshape a patient's face without the extensive downtime or morbidities associated with more invasive procedures. ■

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AQ1: "Less" was changed to "Minimally" in title because "less" implies a comparison that is not given: one automatically asks "less than what?" However, we are not sure whether it is appropriate to label a face lift, even if skin only, as minimally invasive, or whether the term is appropriate for rhinoplasty, which is also discussed. If the term is not appropriate, please suggest an alternative.
AQ2: Figure 4 was deleted by editors.