

Filling the Facial Compartments during a Face Lift

Ronnie A. Pezeshk, M.D.
Kevin H. Small, M.D.
Rod J. Rohrich, M.D.
Dallas, Texas



Summary: Volume restoration with autologous fat during a rhytidectomy has proved to be a powerful tool in obtaining a youthful appearance while achieving facial harmony. Utilizing a detailed understanding of the fat compartments in conjunction with contour-directed superficial musculoaponeurotic system modifications provides a measure to combat deflation and better optimize outcomes. This article and accompanying video provide an outline for the basic principles that have provided consistently superior results and set the standard for the modern face lift. (*Plast. Reconstr. Surg.* 136: 704, 2015.)

Deflation is a major component of the complex facial aging phenomenon and cannot be corrected by rhytidectomy alone. Our group has advocated volume restoration with autologous fat during rhytidectomy as a crucial component in attaining facial harmony. The “lift-and-fill” technique has modernized facial rejuvenation, with precise volume augmentation as a compulsory component of optimal lifting.¹ Anatomical studies conducted by Rohrich have revealed a topographic map of the facial fat compartments. Deep compartments include nasolabial, deep malar, middle malar, and superior cheek; superficial compartments include temporal, perioral, submental, and ear lobule. This map acts as a “global positioning system,” guiding the surgeon to target specific areas based on an individual facial analysis. We are able to accurately and precisely augment areas that have undergone the “deflation” process while the superficial musculoaponeurotic system (SMAS) and its involved structures are selectively repositioned. Indication for specific fat compartment augmentation is grounded on preoperative analysis of deep and superficial compartments. Deepened nasolabial fold and malar flattening correspond to deflation of the deep compartments, and temporal hollowing, ear lobe elongation, perioral thinning, and jowling indicate atrophy of the superficial compartments. Rhytidectomy addresses facial descent, but filling is needed for these deflated compartments, enhancing facial rejuvenation.

Various fat harvest and preparation techniques have been discussed in the literature^{2,3}; our practice carefully harvests, centrifuges, and prepares the aspirated substance in a precise, reproducible manner to

decrease trauma, improve graft take, and ultimately, augment aesthetic outcomes. The harvesting process is accomplished with manual low-pressure lipoaspiration of the inner thigh using a blunt 3-mm cannula with multiple small holes. Of note, the inner thigh and abdomen have been shown to contain the highest concentration of stromal vascular cells; their fat is morphologically similar to facial fat because of the relative small cell size.⁴ Our group prefers harvesting from the inner thigh because of less postoperative pain. No epinephrine or local anesthetic is used in the lipoaspiration process to ensure cell viability. In addition, the lipoaspirate should fill approximately half of a 10-cc syringe and be placed in a centrifuge for no longer than 1 minute (2250 rpm) at low pressure to remove cellular debris.⁵ The supernatant and infranatant are wasted; the isolated middle fat should be transferred to a 1-cc syringe and injected without delay, minimizing air exposure.

We prefer to transfer autologous fat at the beginning of the procedure; this protocol ensures meticulous injections, accurate tailoring of the SMAS over the augmented fat compartments, and minimal fat environmental contamination. A 16-gauge needle can

Disclosure: *The authors have no financial interests in this research project or in any of the techniques or equipment used in this study. Dr. Rohrich receives instrument royalties from Eriem Surgical, Inc., and book royalties from Quality Medical Publishing and Taylor and Francis Publishing. No funding was received for this article.*

Video Plus content is available for this article. A direct URL citation appears in the printed text; simply type the URL address into any Web browser to access this content. Clickable links to the material are provided in the HTML text of this article on the *Journal's* Web site (www.PRSJournal.com).

From the Department of Plastic Surgery, University of Texas Southwestern Medical Center.

Received for publication February 23, 2015; accepted March 23, 2015.

Copyright © 2015 by the American Society of Plastic Surgeons

DOI: 10.1097/PRS.0000000000001640



Video Available Online

Video. Supplemental Digital Content 1 demonstrates the proper technique for the preparation and filling of the facial compartments during a face lift. This video is available in the “Related Videos” section of the Full-Text article on www.PRSJournal.com or, for Ovid users, at <http://links.lww.com/PRS/B422>.

introduce a blunt-tip Coleman cannula for injection in the deep compartments. Each injection should be with a 1-cc cannula for precise, low-pressure distribution. Approximately 1 to 2 cc can be injected directly into the compartments, followed by a gentle massage to improve take. The superficial compartments can be addressed similarly; however, a 21-gauge needle attached to a 1-cc syringe can be used superficially to minimize vascular trauma and account for the thicker subdermal tissue. Augmentation of the deep and superficial compartments is demonstrated in the video. (See Video, Supplemental Digital Content 1, which demonstrates the proper technique for the preparation and filling of the facial compartments during a face lift. This video is available in the “Related Videos” section of the Full-Text article on www.PRSJournal.com or, for Ovid users, at <http://links.lww.com/PRS/B422>.) Because the deep fat is compartmentalized in a fashion similar to that of the overlying subcutaneous fat, filling of specific deep fat compartments leads to predictable changes in the topography of the face. When fat is injected deep and medial to the zygomaticus major muscle, this technique improves midface projection and recreates a youthful cheek. In addition, the V deformity of the lower lid is improved and the prominence of the nasolabial fold is diminished. Injection of the superficial fat compartments complements the deep compartments’ augmentation for global facial rejuvenation. Of note, the deep malar compartment has smaller fat lobule size and deflates at an accelerated rate, and should be the first deep compartment that is augmented.⁶

After filling the compartments, the SMAS can be manipulated to complement facial contour. The SMAS is the investing fascia of the mimetic muscles

of the face and is continuous with the platysma inferiorly and temporoparietal or superficial temporal fascia superiorly.⁷ Varying how the SMAS is shaped according to preoperative evaluation can improve the predictability in face-lift results. Techniques that center on SMASectomy and SMAS plication/imbrication with wide skin undermining obviate the need for extended sub-SMAS dissection and can still provide excellent aesthetic outcomes. It is important to augment the weaker, less full midface with fat (along with SMAS stacking) to further enhance the contour that is achieved through differential SMAS shaping. The advantage of one particular method of tissue (SMAS) manipulation over another has not been established, yet the current focus has shifted to augmentation and redistribution of volume throughout the face.⁷

Volumization with autologous fat of deflated facial fat compartments is an essential supplement to rhytidectomy. An acute visual analysis of facial shape preoperatively, intraoperatively, and postoperatively is mandatory for successful outcomes. Historical and perpetual changes in lift methodology clearly indicate a shortcoming when focusing solely on extent of undermining, vectors, and tension. Using our understanding of fat compartments with contour-directed SMAS modifications will bring us closer to optimizing outcomes.

Rod J. Rohrich, M.D.

Department of Plastic Surgery
University of Texas Southwestern Medical Center
1801 Inwood Road
Dallas, Texas 75390
rod.rohrich@utsouthwestern.edu

REFERENCES

1. Rohrich RJ, Ghavami A, Constantine FC, Unger J, Mojallal A. Lift-and-fill face lift: Integrating the fat compartments. *Plast Reconstr Surg*. 2014;133:756e–767e.
2. Bucky LP, Percec I. The science of autologous fat grafting: Views on current and future approaches to neoadipogenesis. *Aesthet Surg J*. 2008;28:313–321; quiz 322.
3. Hsu VM, Stransky CA, Bucky LP, Percec I. Fat grafting’s past, present, and future: Why adipose tissue is emerging as a critical link to the advancement of regenerative medicine. *Aesthet Surg J*. 2012;32:892–899.
4. Geissler PJ, Davis K, Roostaeian J, Unger J, Huang J, Rohrich RJ. Improving fat transfer viability: The role of aging, body mass index, and harvest site. *Plast Reconstr Surg*. 2014;134:227–232.
5. Rohrich RJ, Sorokin ES, Brown SA. In search of improved fat transfer viability: A quantitative analysis of the role of centrifugation and harvest site. *Plast Reconstr Surg*. 2004;113:391–395; discussion 396.
6. Wan D, Amirak B, Geissler P, et al. The differing adipocyte morphologies of deep versus superficial midfacial fat compartments: A cadaveric study. *Plast Reconstr Surg*. 2014;133:615e–622e.
7. Rohrich RJ, Ghavami A, Lemmon JA, Brown SA. The individualized component face lift: Developing a systematic approach to facial rejuvenation. *Plast Reconstr Surg*. 2009;123:1050–1063.