

## Facial Re-Contouring Using Autologous Fat Transfer

AMGAD HENDY, M.D.

*The Department of Plastic & Reconstructive Surgery, Faculty of Medicine, Tanta University.*

### ABSTRACT

*Propose:* This article introduces the concept of soft tissue augmentation of the face. With aging, diminished volume of the soft tissue of face leads to an excess skin envelope and the illusion of a more prominent nasolabial fold. The use of autologous fat grafts for facial soft tissue augmentation has solved this problem.

*Methods:* Twenty patients were injected with autologous fat into their faces bilaterally for soft tissue augmentation. The fat tissue was harvested from the lower abdomen and the trochanteric area under local anesthesia using lidocaine and saline-adrenaline 1-100,000. A syringe and a 2mm cannula was used for suction of fat, then the aspirated fat was centrifuged to eliminate blood and fluids. Small amounts of fat grafts were injected into the face using a 2mm cannula.

*Results:* Our study showed that harvesting of the autologous fat should be done using a non traumatic blunt cannula. The caliber of the cannula is not more than 2mm in diameter, as the small caliber allows for only small size fat grafts to be harvested. Also, small fat graft survival rate is higher than the bigger ones. Good preparation by means of centrifugation without washing or any additions. It is better to inject fat immediately and inject small amounts by means of multiple passes. There is a quantitative evidence of clinical fat survivability and predictability of volume restoration. There was usually a need for revisionary procedures to optimize results.

*Conclusions:* Loss of volume of cheek fat leads to pseudoptosis and is an additional determinant of the nasolabial fold. Cheek augmentation has four effects: 1- It increases anterior projection, 2- It diminishes the nasolabial fold, 3- The v-deformity of the cheek is corrected, 4- A youthful cheek with natural boundaries is achieved.

### INTRODUCTION

There have been many techniques and concepts described to address the aging midface, an excellent review being given by Little [1]. Lambros has proposed the concept of deflation as an important factor in causing facial aging [2]. Both of these authors have discussed a volumetric approach to mid-facial restoration. Other surgeons have discussed midface rejuvenation by deep augmentation of the face to improve mid-facial projection, aging highlighting the concept of volume loss as an important mechanism of facial aging. The transfer

of autologous fat has been performed as whole grafts since the 1890s [3] and as injectable grafts since the 1920s [4]. However, it is only within the past 20 years that the popularity of autologous fat transfer for facial re-contouring has increased within the plastic surgery community. The rising interest in this procedure has paralleled the development and popularity of liposuction for body contouring. Plastic surgeons most experienced with fat filling procedures have reported clinical results suggesting short and long-term persistence of transferred grafts and promote autologous fat as the ideal filler [5-8].

Modification of fat transfer techniques have been reported by Coleman, who promotes a traumatic method of fat harvesting, centrifugation and re-injection aimed at maximizing nutrition and structural integrity at the recipient site [9].

### PATIENTS AND METHODS

Autologous fat was used for facial augmentation in twenty patients bilaterally, all of them were females. The procedure was done under local anesthesia; a mixture of 20cc of Lidocaine 0.5% together with 0.25mg of epinephrine and 20cc of ringer solution were used in the recipient site. In sixteen patients, the donor site was the lower abdomen and in four patients, the donor site was the trochanteric area. Infusion of the local solution aims to create vasoconstriction of vessels to decrease post-operative ecchymosis. The recipient site was anaesthetized using 5cc of 0.5% lidocaine on each side. Fatty tissue was harvested using a syringe and a 2mm cannula, then centrifuged for 5 minutes. The extra cellular lipids and blood were discarded. Nothing was added to the isolated fat that is now ready for injection. A ten cc of fat was injected into each side of the face in small amounts into different layers using a 2mm cannula (Fig. 1). 50% overcorrection was performed to insure patient satisfaction after resolution.

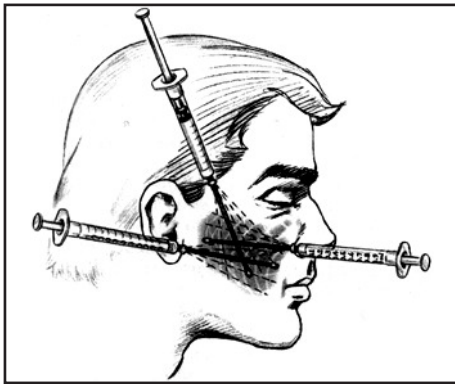


Fig. (1): Technique of fat injection.

## RESULTS

Between January 2008 and October 2009, twenty patients underwent facial re-contouring using autologous fat transfer. All patients were females. The average age was 35 years (range 26 to 49 years). The average time of the harvesting and injection of fat into the face was 40 minutes (range between 32 and 48 minutes). A total of 20cc of fat was injected in the two sides of the face (10cc for each side) (Figs. 2-5). Repeated injection after three months was performed for 11 patients (Fig. 6) and a third time injection was done for 3 patients after 6 months (Fig. 7). Five cc of stored fat (at 4 degree centigrade) was used on each side of face in each repeated injection. Follow-up ranged from 1 to 18 month (mean 9 month). The outcome was satisfactory in the majority of patients, with the planned shape achieved in all patients after one to three injections. A visible clinical improvement was obtained in all of the patients, with a moderate improvement in 6 patients (30 percent) and a good improvement in 14 patients (70 percent).

None of the patients showed minimal or no clinical improvement. Asymmetries were observed in 8 patients after the first injection (40 percent), but these were corrected with a second injection. No infection was seen in any of the cases. Soft tissue augmentation of the face resulted in: 1- It increases the anterior projection, 2- It diminishes the nasolabial fold, 3- It correct the V- deformity of the cheek, 4- A youthful cheek with natural boundaries is achieved.

## DISCUSSION

The recurring themes throughout this work have been the concept of deflation as the mechanism responsible for changes of the surface topography of the aging face. Many other concept of mid-facial aging exists, and it is likely that there are many contributing factors [10]. Volume loss of the facial fat may determine much of what is

observed in the aging midface. In the aging midface, there is loss of malar projection with prominent nasolabial fold. These findings suggest the concept that the formation a prominent nasolabial fold with aging is, in part, a form of pseudo-ptosis. Loss of projection of the midface soft tissue creates an illusion that the nasolabial fold has become more prominent. Skin laxity is secondary to volume deflation and an excess skin envelope.

This concept is supported by clinical experience. Skin re-draping of the face lift, as advocated by Stuzin, is performed by some surgeons. When a volume to the deep cheek fat is added, anterior projection of the midface is achieved. Some surgeons described direct injection of this area with autogenous fat. It is interesting that a recent article on fillers by Nicolau shows similar improvement of the mid-facial hollowing with the use of fillers [11]. Over the past 15 years, more widespread clinical use of autologous fat grafts for facial soft tissue augmentation suggests that this procedure is the best presently available. In many ways, fat is the closest we have to ideal filler: It is readily available and inexpensive: It is autologous and therefore lacks a host immune response; it is easily acquired with a minimally invasive procedure [12].

Drawbacks to the procedure seem limited but include the need for a surgical procedure (as opposed to office off-the-shelf injectable filler). Also, it needs specific techniques of a harvest, preparation and application for improving overall fat graft outcomes. Our experience demonstrates that fat injection is very effective, easy to perform, long lasting and associated with a short post-operative recovery time. The outcome was satisfactory in the entire patient, with moderate improvement in 6 patents (30 percent) and a good improvement in 14 patents (70 percent). The only disadvantage of fat injection is the requirement for repeated injections or touch-ups. Medial cheek fat diminishes the nasolabial fold and improves cheek projection without lifting is testimony of Lambros [2] genius in visualizing these process decades before the anatomical work. Lambros vision has provided the conceptual framework that has enabled multiple anatomical observations to be formulated into a cohesive model. The heightened interest in autologous fat transfer by patients and physicians should inspire objective investigative. Advances in three dimensional surface mapping with laser scanners and photography now allow for inexpensive methods for documentation of fat grafting techniques. We suspect that the future tissue engineering techniques with adult-derived stem cells will allow for long-lasting results and more predictable outcomes.



Fig. (2): Pre-fat injection and one month post-injection result.



Fig. (3): Pre-injection and three months post-injection results.



Fig. (4): Pre-injection and 6 months post-injection results.





Fig. (5): Pre-injection and 12 months post-injection results.



Fig. (6): Pre-injection and post one re-injection results.



Fig. (7): Pre-injection and post two re-injections results.



*Conclusion:*

Facial soft tissue augmentation using autologous fat injection was performed in 20 patients with no complications during 18 months follow-up. This technique offers many advantages, including the use of auto-grafts; a small, unnoticeable scar; no late complications; the opportunity to perform touch-up injections and satisfactory long-lasting results.

**REFERENCES**

- 1- Little J.W.: Three-dimensional rejuvenation of the midface: Volumetric re-sculpture by malar imbrications. *Plast. Reconst. Surg.*, 105: 267, 2000.
- 2- Lambros V.: Fat augmentation and facial aging. Presented at the American society for Aesth. Plast. Surg. April, 2007.
- 3- Nevber F.: Fat transplantation. *Zentrabl. Chir.*, 22: 66, 1893.
- 4- Miller C.G.: *Cannula Implants and Review of Implantation Techniques in Esthetic Surgery*. Chicago: Oak Press, 1926.
- 5- Ellenbogen R.: Free autogenous pearl fat grafts in the face: A preliminary report of a re-discovered techniques. *Ann. Plast. Surg.*, 16: 179, 1986.
- 6- Carraway J.H. and Mellow G.G.: Syringe aspiration and fat concentration: A simple technique of autologous fat injection. *Ann. Plast. Surg.*, 24: 293, 1990.
- 7- Calabria R.: Fat grafting: Fact or fiction?. *Aesthetic Surg.*, 25: 55, 2005.
- 8- Gverrerosantos J.: Long-term outcome of autologous fat transplantation in esthetic facial recontouring. *Clin. Plast. Surg.*, 27: 515, 2000.
- 9- Coleman S.R.: Structural fat grafts: The ideal filler. *Clin. Plast. Surg.*, 28: 111, 2001.
- 10- Raskin E. and La Trenta G.: Why do we age in our face?. *Aesth. Plast. Surg.*, 1: 19, 2007.
- 11- Nicoliar P.J.: Long-lasting and Permanent fillers: Biomaterial influence over host tissue response. *Plast. Reconst. Surg.*, 119: 2271, 2007.
- 12- Kaminer M.S. and Omura N.E.: Autologous fat transplantation. *Arch. Dermatol.*, 137: 812, 2001.