

Chapter 18

Facial Filling Combined with Rhytidoplasty



Aristóteles Bersou Júnior



Prof. Yves G. Illouz (France)
1929–2015

A. Bersou Júnior (✉)
Sociedade Brasileira de Cirurgia Plástica, São Paulo, Brazil

18.1 Introduction

18.1.1 Facial Changes

18.1.1.1 Slimming and Aging

The facial structures change with time due to aging and/or weight loss [1], the youthful appearance with shiny and firm skin changes, due to the deflation of the fat compartments, the ligament weakening, muscular and skin atrophy, when this occurs, the facial structures do not return to the previous state, these are the characteristics of aging.

Among the numerous techniques that exist for facial rejuvenation, rhytidoplasty, also referred to as facelift, is recognized as the most effective one [2], on account of the mobilization of the tissues that compose the face, and may be conducted, depending on the indication, in a superficial or profound way, with an endless number of variations, all of them technique and surgeon dependent, in the search for natural results.

With the development of technologies for facial liposuction [3], excess fat located in the neck (double chin) and in the anterior and inferior prominences of the cheeks (jowls) could be modeled, leading to more natural results by reducing the volume and preserving the vascular network that was not sectioned during the dissection conducted for the purposes of the lifting. As a complement, fat grafting stood out by making it possible to selectively increase volume [4] in areas such as the temporal and malar regions, the chin and the lips, with the help of the patient's own fat, generating a tridimensional factor that the old techniques were not able to achieve, a result of the face's liposculpture [5].

18.2 Method

18.2.1 The Importance of SMAS [6]

Among the most employed techniques, the action on the superficial musculoaponeurotic system (SMAS) and the skin predominates; repositioning the SMAS provides firmness to the deep layer structures, and the skin accommodation is made in a natural way and with less tension.

The tension lines that exert traction on the SMAS and the skin act in different directions, but the sum of their resultants projects the direction of the flap upward, which translates into facial rejuvenation, and backward, determining the rejuvenation of the cervical area (Figs. 18.1 and 18.2).

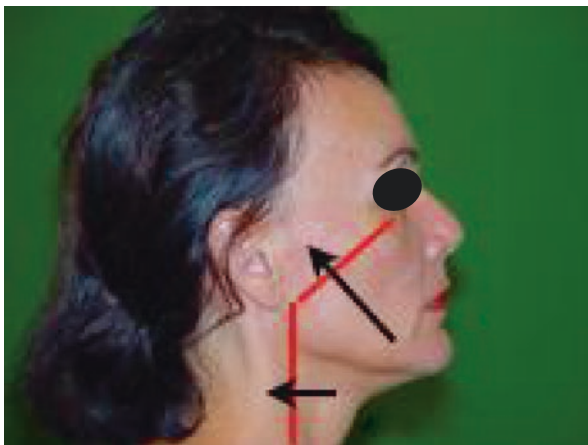


Fig. 18.1 In red the drawing where the incision is made on the SMAS, in black the direction of applied force

Fig. 18.2 The red arrows indicate the direction of the traction on the skin



Of fundamental importance for muscle mobility, the retaining ligaments [7] of the face perform this function by fixing the muscle extremities between the soft spaces.

In facial rejuvenation surgery, the chief point of fixation is the area located in front of the auricular pavilion, which extends to the posterior border of the platysma known as Lore's fascia, an area before and below the tragus, a ligament insertion area described by Furnas as platysma auricular fascia (PAF).

This fixed area allows for suture stitches on the SMAS, which result in anchoring and distribution of tensile strength, leading to the rejuvenation of the lower 2/3 of the face.

18.2.2 *The Importance of Expansive Anesthesia*

Hydric expansion of the areas destined to a facelift or to adipocyte aspiration and grafting is proved to be more effective and less traumatic.

In the facelift, the dissection becomes easier, and there is a better visualization and very little bleeding.

The liquid injected at a temperature of approximately 23 degrees Celcius, cools and distends the fat, constricts the vessels and reduces bleeding.

The same happens in the recipient area: the cooling and the fluid distension of the tissues allow for the placement of new cells at different levels, with less trauma, from the periosteum to superficially close to the dermis, as if the fat cells were bottles of wine in a cave, in different spaces; this way, the bottles do not break and the adipocytes suffer practically no lipolysis [8]. It is the same reasoning.

The injected solution consists of 10 ml of the anesthetic lidocaine 2% without epinephrine, 500 ml of Ringer's lactate diluent, and 0.5 ml of the vasoconstrictor adrenaline.

The fat is easily distensible. It pushes the skin upward and the densest structures are compressed downward, emptying the vessels due to the pressure exerted by the blood on their walls. From these details, we have developed the technique of *expansive anesthesia* in order to perform tissue dissection in facelift and fat grafting.

18.2.3 *Facelift*

The demarcation of the surgery begins in the scalp: a vertical line, ranging between 35 and 70 mm long, distant horizontally 40–50 mm from the beginning of the hairline in the temporal region, slightly curved, going toward the insertion of the helix in the glabrous area of the scalp, continuing down the front through the sinuosities of the auricular pavilion, and around the earlobe up to the projection of the posterior auricular muscle (Figs. 18.3 and 18.4). Depending on the degree of cervical aging, this line may end at this muscle, or continue horizontally toward the hair, or even, in more severe cases of aging, go down close to the border of the hairline in the cervical area (Figs. 18.4 and 18.5).

The expansion begins over the drawing in the scalp, using 10 ml syringes and 21Gx11/4" needles, and increasing as the needle slides close to the skin, following the traced contour in its entirety, distending the whole skin and the preauricular and retroauricular subcutaneous cellular tissue of the temporal region (Fig. 18.6). With the 22Gx31/2" spinal needle, the areas of interest in the face are expanded up to the limit of the nasolabial fold. In the neck, the projection of the cricoid cartilage is the reference between this point and the posterior cervical area as the inferior limit of the infiltration. The average volume injected in each hemiface is 150 ml.

Fig. 18.3 Wing, broken lines result in better scars

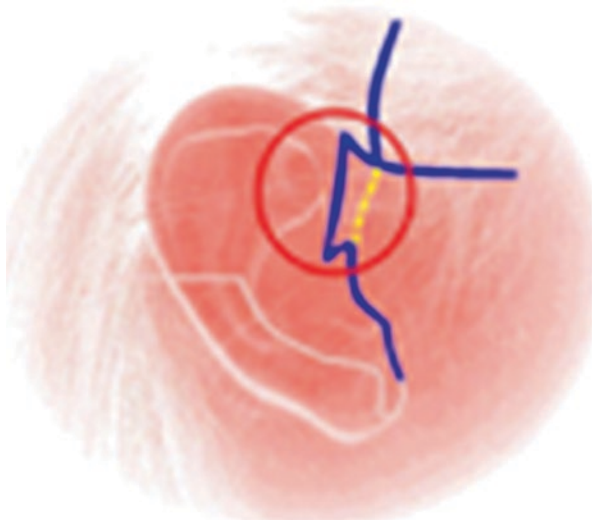


Fig. 18.4 Retroauricular region, convex-concave incision



General anesthesia with a technique determined by the anesthesiologist intends to keep the patient's blood pressure stable and at the same level at the beginning of surgery, which reduces the risk of bleeding in the immediate postoperative period.

Round scalpel handle #3 with surgical blade #15 incises the skin and the subcutaneous layer superficially, beginning in the scalp and following the predetermined drawing. In the earlobe, its movement during the demarcation enables to determine its exact implantation, preventing deformations due to excessive and poorly planned removal. The blade, placed at a 90-degree angle in relation to the lobe, prevents

Fig. 18.5 Incision close to the hair

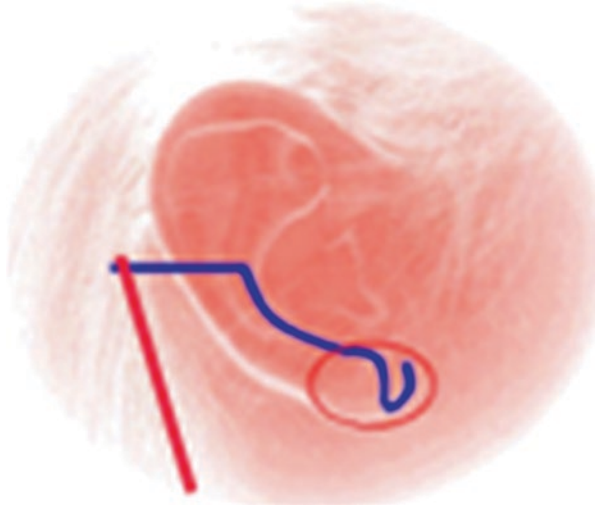


Fig. 18.6 Tissue distension



beveling, going around the lobe and toward the retroauricular area, in which the posterior contour forms a concavo-convex line, concave in the lobe and convex in the concha. This characteristic makes it possible to distribute the tension forces, leading to an optimal cicatricial outcome when the flap is perfectly accommodated in the fold.

Dissection is made with the same blade, starting in the retroauricular area, widely distended by the anesthetic. Hydric distension causes the most firm structures – muscles, vessels, and nerves – to separate from the fat of the subcutaneous cellular tissue [5], which is softer, with minimum risk of damaging important structures and with little bleeding.

The second area to be prepared is the scalp, hydrically distended, which allows for a perfect dissection through the temporal access, preserving the hair bulbs and separating the temporoparietal fascia from the superficial layer of the deep temporal

fascia. Attention should be given to the preservation of the temporal artery branches and to the superficial temporal vein, whose ligation is not necessary (Fig. 18.7).

Hydric distension preserves and makes it easy to mobilize the flap, without compromising the vitality of the hair bulbs.

The dissection of the preauricular area is made easier by the expansive anesthesia. The maneuver of entering the helix by forming a broken line as if it were a short wing, *wing* (Fig. 18.3), results in a superior cicatricial outcome, making it virtually invisible after a few postoperative months. The post-tragal incision makes it possible to better conceal the scar. In men it is mandatory to meticulously remove the hair bulbs in the flap made to cover the tragal cartilage.

The dissection with the blade in the preauricular area is performed on average up to 25 mm away from the ear, in preparation for liposuction. In the dissected area near the earlobe, a 2 mm wide and 150 mm long liposuction cannula, connected to a 10 ml syringe, is inserted into the subcutaneous tissue close to the skin up to the excess fat in the anterior region and lower prominences of the cheeks, duly expanded by the anesthetic (Fig. 18.8).

Fig. 18.7 Preservation of hair bulbs, vessels, and nerves

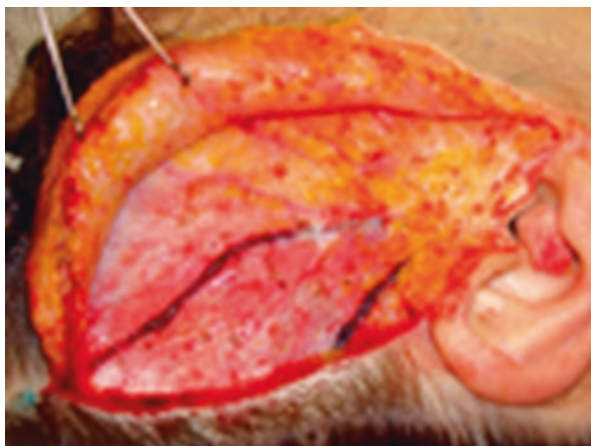


Fig. 18.8 Preauricular dissection at 25 mm of tragus, jowls, and cheek liposuction, tunnels formation



With smooth back-and-forth movements, several tunnels are formed. Each pass must be performed next to the other so that there is no formation of ripples. Through a small incision made with a needle in the skin of the nasolabial fold, at half the distance between the wing of the nose and the corner of the lip, is inserted a 1.5 mm wide and 8 mm long cannula, connected to a 10 ml syringe, and moved vertically in a fan-shaped motion, forming a crossed pattern and thus avoiding ripples. The fat of these regions is aspirated and measured after decantation. The right side should be similar to the left side, unless there are visible differences that determine a larger removal on one side.

After aspiration of the fat, several parallel horizontal tunnels are made with the 2 mm cannula, from the inferior projection of the zygomatic arch to the mandibular arch, close to the deep dermis, in order to facilitate the dissection made by Metzenbaum scissors, at the average distance of 55 to 60 mm from the tragus (Fig. 18.9).

The area of dissection should be completely uniform, avoiding obstacles that can mark the skin externally when the traction is applied.

Two lines are drawn on the SMAS that will determine future incisions and dissections. One going from the projection of the malar bone to the Lore's fascia, with an average length of 40 to 50 mm, will determine the upward force that will pull the SMAS towards the helix. The second line has a vertical direction, going from the Lore's fascia projection to the anterior margin of the sternocleidomastoid muscle 40 to 55 mm in length, which after dissection will pull the SMAS / platysma horizontally towards the cervical region.

Expansive anesthesia makes it possible to safely separate the SMAS from the deeper structures. The dissection is done with scalpel #3 and blade 15, starting at the apex near the Lore's fascia [10] toward the neck at the posterior border of the sternocleidomastoid muscle. Muscle fibers and the fascia of the platysma muscle [9] become attached to the SMAS, forming a thicker and stronger structure when pulled (Fig. 18.10).

Fig. 18.9 Ear distance 60 mm, without bleeding

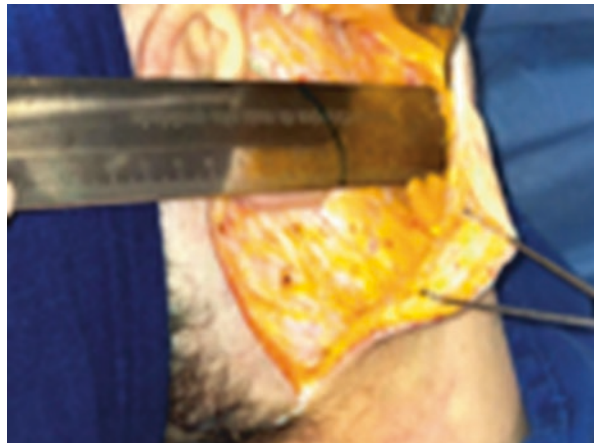
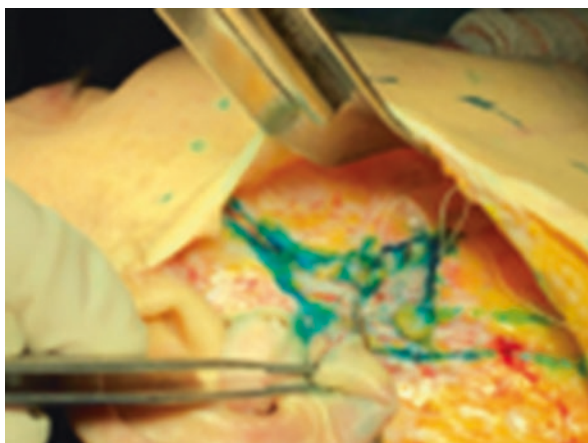


Fig. 18.10 Muscle fibers and the fascia of the platysma muscle become attached to the SMAS, forming a thicker and stronger structure when pulled



Fig. 18.11 The flap is sectioned in the middle at the apex measuring 20 mm in length, and the suture needle is inserted at 30 mm in the thickness of the flap to be firm



After this dissection [11], the SMAS is separated from the parotid gland fascia [6], forming a triangular flap of 20 mm in average at its vertex, which will be divided into two flaps (Fig. 18.11): one in the posterior cervical direction and the other in the cephalic direction. SMAS-ectomy is routinely done in the excesses of the flaps, so that they fit perfectly into the initial incisions, avoiding placing the SMAS cervical flap in an area that does not exist in the human anatomy in the retroauricular region, as well as the flap that goes from the Lore's fascia toward the outer corner of the eyelid (Fig. 18.12).

The suture starts in the cervical flap. The yarn used is Vicryl 4-0 E-15, which is absorbable, disappearing after a few months without becoming a foreign body.

At the vertex of the flap, the needle should be inserted at 10 mm from the edge and keeping the same thickness of the flap to avoid damage to deep structures. This distance will be reduced as the suture is made toward the extremities. The average distance between each point is 3 mm, which makes the suture resistant to the traction exerted by the movements of the face and the neck (Fig. 18.13).

Fig. 18.12 Product of SMAS-ectomy

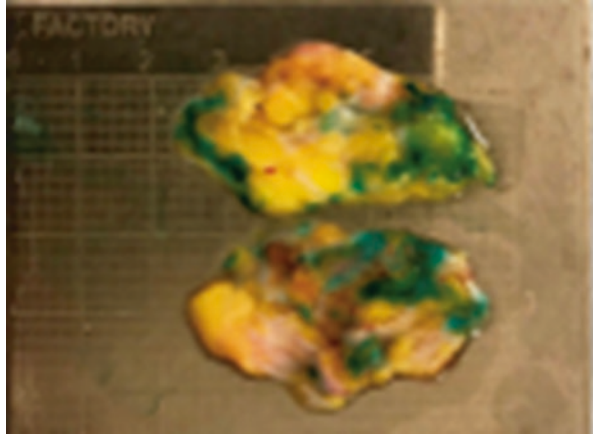
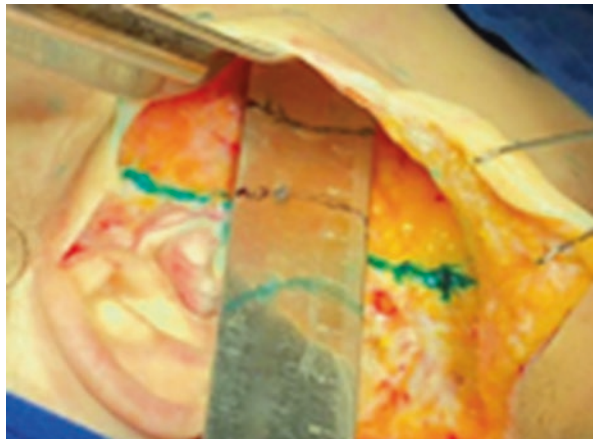


Fig. 18.13 The traction exerted on SMAS promotes an oblique elevation of 20 mm toward the glabrous area



After the end of the SMAS suture, a middle-sized dry compress is placed in the area that has been dissected, and the head is turned to the other side. The same procedures are performed on the other side. At the end of the procedure, the head is returned to its initial position, the compress is removed, the bloody spots are checked, and the skin closure begins.

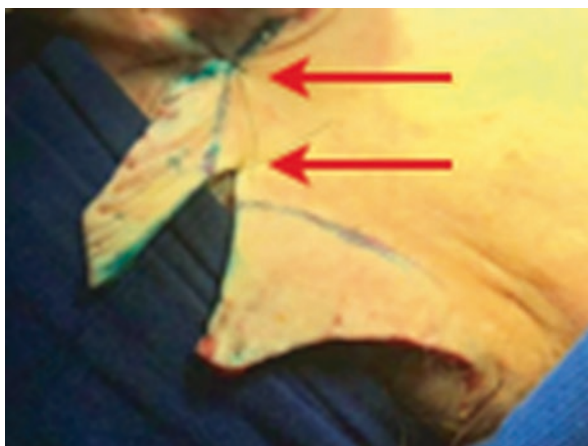
Two points are fundamental for skin accommodation: The first point is in the insertion of the helix in the glabrous area. Kelly-type tweezers are attached to the protuberance of the tragus skin and pulled up to the glabrous area. A marker draws between the tweezers the measure of the excess skin, around 25 to 30 mm, and in this mark the flap is incised with Metzenbaum scissors, fixed at the insertion level of the helix with a 3-0 Nylon suture (Fig. 18.14).

The second point will be fixed with a 4-0 Nylon stitch at the retroauricular muscle level. With a Kelly, the dermo-greasy flap is turned up and back so that the skin naturally fits around the earlobe and the retroauricular convexity (Fig. 18.15). At this point, the Porto-Vac drains are inserted, needle 3.2.

Fig. 18.14 A marker draws between the tweezers the measure of the excess skin, around 25 to 30 mm, and in this mark the flap is incised with Metzenbaum scissors



Fig. 18.15 The red arrow indicates the fixation points of the retroauricular flap



The flap accommodation is initiated by the scalp. To prevent narrowing of the hair area, the flap should rise through the vertical traction, slightly oblique. This movement will determine the elevation of the chops, necessitating the removal of a trim triangle to lower the flap, resulting in a horizontal scar on the hair strand line of the chop.

A narrow vertical triangle is removed to accommodate the flap. The 3-0 Nylon suture is continuous and performed at 2 mm from the edge of the wound, just approaching without squeezing, to avoid alopecia. The flap of the preauricular area should be divided into two stages, one for the tragus and the helix and the other for the earlobe. It is important to draw on the flap to match the previously made incision. The Metzenbaum scissors cut the skin from the bottom up, and the subcutaneous fat from this area of the flap is removed from the edge, so that it has the same thickness of the subcutaneous that recovers the tragus and the original helix (Fig. 18.16).

Fig. 18.16 It is important to draw on the flap to match the previously made incision. The Metzenbaum scissors cut the skin from the bottom up



The 5-0 Nylon suture is initiated at the border of the transition between the lobe and the tragus toward the glabrous area. In the helix, intradermal stitches are made to avoid marks on the skin. Points with Monocryl 5-0 are used for horizontal accommodation at the base of the chops, and their presence at the subdermal level allows for continuous suturing.

In the retroauricular region, two reference points are drawn in the flap, one at the level of the retroauricular fold and the other toward the hairline, which will be incised and fixed with Nylon 4-0 after traction on the flap to accommodate over the incision initially made. The skin is incised with a 15-knife scalpel, hemostasis, and suture on two levels in the deep dermis with Monocryl 5-0, and the skin suture can be made with continuous 4-0 Nylon or with VICRYL RAPIDE 4-0 intradermally.

The accommodation of the flap in the retroauricular fold and the earlobe is the last stage to be completed. The repositioning should begin with the lobe. In the preauricular region, a small triangle of the skin of the flap should be removed just below the tragus, with the size of half lobe length, and rounded base to fit the shape of the lobe as the flap is pulled up and back toward the shell. Once the height has been determined, a concave-convex drawing similar to the one in the groove should be made in the flap, and the skin is incised by Metzenbaum scissors and perfectly accommodated inside the fold.

The fat must be removed 5 mm from the flap edge so that it fits neatly into the retroauricular groove. The suture should start at the distal lobe projection, with 4-0 Nylon, which should pierce the skin of the flap, the Lore's fascia, and the lobe, setting in its anatomical position. The suture can be made with 4-0 Nylon or with Vicryl* rapid 4-0. The needle must pass through the skin of the auricle, the groove, and the skin of the flap continuously, with sufficient traction to join the tissues. Excessive traction, in addition to causing pain, may devitalize the edge of the flap. The anterior side of the earlobe is sutured with Monocryl 5-0, in simple stitches

with the knot inside. Simple Nylon stitches should be avoided on this skin since the suture marks may remain visible.

18.2.4 Fat Grafting [8]

After the facelift, volumetric replacement is performed using fat grafting in the regions, malar, temporal, mentum, nasolabial and nasojugal groove [5]. In the nose the fat is grafted into the columella and under the wings.

The malar and the temporal fat pads submitted to a fat grafting promote the balance of the upper third of the face. Due to its deep positioning, expansive anesthesia is essential to allow access to them, without the risk of damage caused by fat grafting cannulae of 1.3 and 1.5 mm.

The posterior face of the arm is the area of choice as the donor area for the face, since the fat is soft and passes easily through needles and cannulae.

Expansive anesthesia causes distension and temperature decline. Liposuction is performed with a 2-mm-wide, 150-mm-long cannula connected to 10 ml syringes. The extracted product is decanted in the syringe itself. In the face, the water distension is conducted in the areas of interest and necessity, with volumes determined by the aging condition of the patient (Figs. 18.17, 18.18, 18.19, 18.20, and 18.21).

18.3 Complications

Expansive anesthesia significantly reduces complications. The distension of the tissues makes it possible to see the vessels mostly by transparency, the fluid protects the nerves [12], and there is no fulguration nor excessive heating over cauterized areas. The maneuver of making tunnels preserves blood and lymphatic circulation, significantly reducing the risk of vascular complications in the flaps. Blood pressure control, keeping it within a pattern close to that of the beginning of the surgery, is a common practice. It is necessary to use compresses to absorb excessive infiltration. During suture, the flap still presents distension, which reduces traction tension and ischemia in the edges of the flap resulting from the suture. Liposuction and fat grafting are efficient and safe under the expansive technology.



Figs. 18.17, 18.18, 18.19, 18.20, and 18.21 The result of the described technical care, naturalness, well-vascularized flaps, improvement of skin quality by fat grafting, *wing* preauricular scar with excellent result

18.4 Discussion

Hydric expansion has an easily assimilated learning curve. But those who are still not familiar with it or not skilled enough to use it must take great care. Theoretically, those who use only general anesthesia to dissect the face increased risk of damaging nerves [12] and provoking hematomas. The same happens with those who perform liposuction and fat grafting without distension.

18.5 Conclusions

Hydric distension of tissues is a factor of safety and quality of results, with lower risk in dissection and higher quality and engraftment in fat grafting.

Bibliography

1. Gonzalez-Ulloa M, Flores ES. Senility of the face: basic study to understand its causes and effects. *Plast Reconstr Surg.* 1965;36:239–46.
2. La Trenta GS. Facial contouring. In: Rees T, La Trenta GS, editors. *Aesthetic plastic surgery.* 2nd ed. Philadelphia: WB Saunders; 1994. p. 784–889.
3. Avelar JM. Lipoaspiração das Regiões Submentonianase Submandibular: Lipoaspiração. *RJ Hipócrates;* 1986. p. 139–147.
4. Carpaneda CA. Percentage of graft viability versus injected volume in adipose auto-transplants. *Aesth Plast Surg.* 1994;18:17–9.
5. Coleman SR. Facial fat grafting. *Clin Plast Surg.* 1997;24:347–67.
6. Mitz V, Peyronie M. The superficial músculo-aponeurotic system (SMAS) in parotid and cheek área. *Plast Reconstr Surg.* 1976;58:80.
7. Furnas DW. The retaining ligaments of the cheek. *Plast Reconstr Surg.* 1980;83:11–6.
8. Bersou AJ. Fat grafting by expansive technique. *Rev Bras Cir Plást.* 2008;23(2):89–97.
9. De Castro C. The anatomy of platysma muscle. *Plast Reconstr Surg.* 1980;66:680.
10. O'Brien JX, Rozen WM, Whitaker IS, Ashton MW. Lore's fascia and platysma-auricular ligament are distinct structures. *J Plast Reconstr Aesth Surg.* 2012;65(9):e241–5. <https://doi.org/10.1016/j.bjps.2012.03.007>. Epub 2012 Mar 23.
11. LA Trenta GS. *Atlas de Cirurgia estética da face e pescoço/La Trenta, G; tradução de Paulo Roberto Leal – RJ. Elsevier; 2004.*
12. Pitanguy I, Ceravolo MP, Dégand M. Nerve injuries during rhytidectomy: considerations after 3.203 cases. *Aesth Plast Surg.* 1980;4:257–63.