
Facial Lipofilling

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1 Introduction

The face is considered the peculiar feature of each individual, permitting his or her recognition, and is the first element in distinguishing people. It starts at the anterior part of the head beginning from the forehead to the chin, including hairs, forehead, eyebrow, eyes, eyelids, nose, mouth, lips, teeth, skin, chin and the rest of the mandibular outline.

The face is one of the most important and complex means of expression, which everyone can use to communicate and transmit sensations and emotions, and is what characterises ourselves. Nevertheless, time, excessive weight loss, medical therapies or other things can cause some zones of our face to lose some volume, changing their original shape and impacting dramatically on our face's harmony.

Individual morphology is dictated by a set of unique features depending on the underlying bone skeleton, in combination with muscular, cartilaginous, adipose and cutaneous structures. With the current state-of-the-art plastic surgery, if an individual is not satisfied with his or her own appearance, he or she can undergo treatments and surgeries to modify that appearance. The face is composed of multiple structures that, in the ageing face, display changes in mass and skeletal proportion and an atrophy with redistribution of subcutaneous fat tissue [18], a general loss of suspension by supporting structures, an excess and a folding of the skin. The work by Schaverien et al [20], describes the fat tissue compartments in the face, explaining that fat tissue is localised in well-defined compartments, separated by fibrous bands that prevent their movement to another compartment. This new description of the ligaments of the face and the fatty anatomy of the face allows a better understanding of the ageing pro-

cess, in which we see opposing phenomena of lipoatrophy and lipohypertrophy in adjacent zones. Osseous and cartilaginous systems serve as supports; the musculoaponeurotic superficial system, by means of the interlobular fibrous septa in the adipose tissue, connects directly to the skin to ensure its stability. The support system relaxes with ageing, as we see with the lower eyelid ectropion, a consequence of the elongation of the lateral canthal tendon or with the nose ptosis due to changes in cartilaginous and fibrous support. The support for the skin cover, assured by superficial aponeurotic system, lessens, creating a number of well-known folds and grooves connected to the ageing process [28].

We must keep in mind that beauty is expressed by facial harmony, which in turn is the consequence of a perfect balance between its components: eyes, nose, zygoma, mouth, teeth and chin. The central portion of the face, particularly, is the feature that immediately meets the eyes of the persons that speak with us or look at us and is therefore our visiting card. A well-proportionate face can transmit pleasance and harmony to the people who look at it; on the contrary, the zygoma not defined or emptied, a look particularly marked by eye bags, transmits an impression of tiredness and carelessness.

Autologous fat graft restitutes volume to altered features, using the fat tissue of the patient and thus eliminating the possibility of allergic reactions, which can on the contrary occur when using other fillers.

Facial lipofilling or lipostructure consist of infiltrating, in well-defined zones of the face, some fat tissue usually harvested in places like the abdomen, thighs, buttocks or knees; in doing so, we reconstitute a juvenile appearance to features rendered heavy and fatigued by stress and relaxed or altered by defects that are present since birth [2].

2 Facial Embryology

The face represents for every person the most prominent feature. It is constituted, starting from below, by the chin, the lips surrounding the mouth, the philtrum of the upper lip, the

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external nose, the cheeks, the zygoma, the eyes with eyelids and eyebrows and the front. On the sides we find the auricles.

The face begins its development in the fourth week. In this phase, neural crest cells give rise to skeletal and connective tissues, forming the main part of the skull's and face's skeleton.

It develops at the level of the contour of stomodeum (primitive mouth's roof) [25]. In fact, this region is furrowed by this depression, called the stomodeum, which is limited above by the frontonasal process, below by the first pharyngeal arch and laterally by the two maxillary processes [22].

From these processes, the embryo's face develops, through complex morphogenetic movements that will modify its form, size and relationships with various parts, determining fusions in specific regions.

At the end of the fourth week, the two mandibular processes fuse on the median line, constituting the chin and the outline of the lower lip.

At the end of the sixth week, the two nasal median processes give, after fusing, the median massif of the face, formed by nasal septum, vomer, incisive bones and upper lip. Lateral nasal processes, on the contrary, will form the nasal wings and the nasolacrimal duct [24].

The two maxillary processes will give rise to three different fusions: they fuse with intermaxillary process, forming the maxillary arch and the upper lip. At their periphery they fuse with the underlying mandibular processes reducing the

mouth opening. The upper margins will instead fuse with the nasal lateral processes, forming the lateral masses which will give origin to the cheeks.

During those fusion processes, the eye germs will move to their definitive place, from their original situation outside and on the sides of the head.

3 Anatomy

The skull is divided in two portions: neurocranium and splanchnocranium.

The cranium (neurocranium) is formed by frontal, ethmoidal, sphenoidal, occipital, temporal and parietal bones.

The face massif (splanchnocranium) is formed by maxillary, nasal, lacrimal, palatine, inferior turbinate, zygomatic, vomer and mandibular bones.

The skull gives insertion to various muscle groups (Fig. 1), which can be divided in extrinsic and intrinsic muscles:

- Extrinsic muscles originate outside the skull (neck, trunk) and insert on it.
- Intrinsic muscles are entirely located in the skull, where they have both their origins and their insertion. They are constituted by skeletal or masticatory muscles and mimic the expression of muscles.

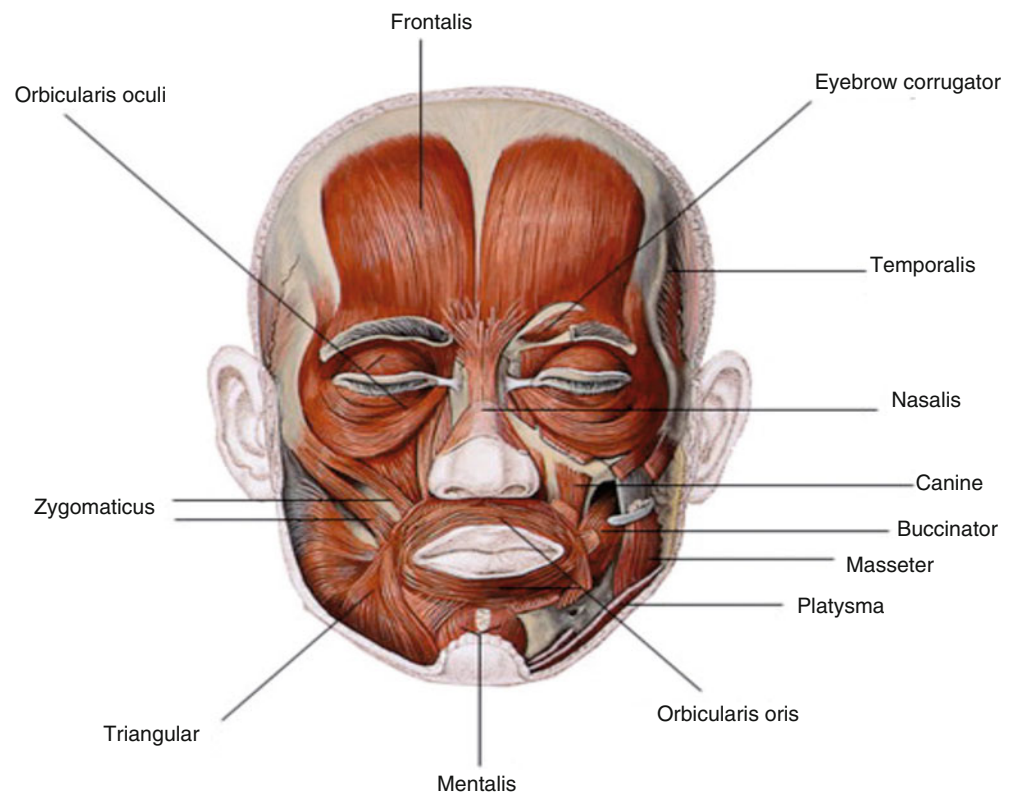


Fig. 1 The muscles of the face

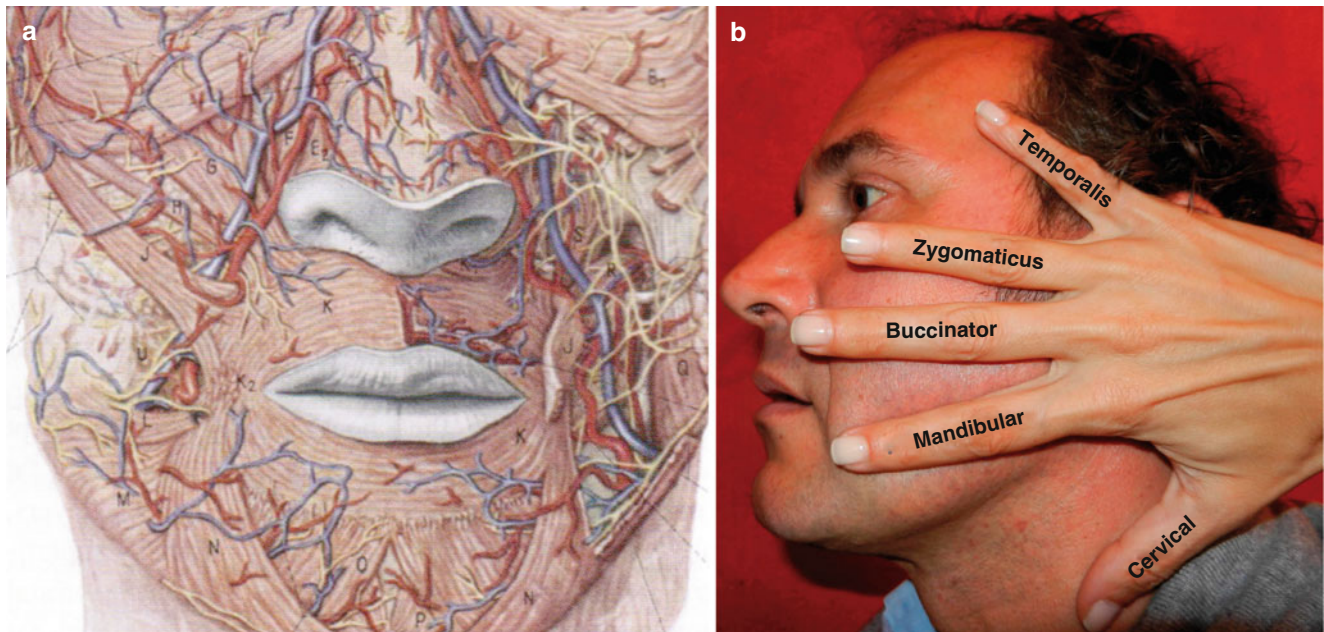


Fig. 2 (a) Face vascularisation. (b) Face innervation

Apart from those in the skull, we find other muscles: those of the ear pavilion, the eyeball, the middle ear and the tongue.

The skin covers all the muscles, fat tissue, vessels and nerves. The vessels are quite numerous, since the face is much vascularised, and the nerves are partly motor and partly sensitive (Fig. 2).

In the face there are zones, of little dimensions, which present a specificity, due to the anatomical and physical features of the composing structures: the skin, the subcutaneous tissue, the underlying muscles and the deep bony planes' setting; moreover, there is the presence of folds and expression grooves.

These zones, so peculiar, are termed "facial aesthetic units" and include the frontal, palpebral and malar zone; the naso-labial grooves' zone; the nasal, labial, mental, submental, supraorbital and orbital zone; and the cheek zone, in turn divided into the infraorbital, zygomatic, buccal and parotid zones. When we operate on the face, it's a must to know the differences between these zones and to respect their relationships, in order to avoid completely transforming one's face harmony [12].

4 Techniques in Use

Lipofilling permits to transfer autologous fat from one site of the body to the other.

The idea of enlarging some bodily parts using adipose tissue is not a new one: in 1919 appeared the first paper on the behaviour of autologous fat tissue injected to correct the

body contour. Since then, the technique of lipofilling has gained widespread diffusion, still keeping some shortcomings and contraindications.

The injection of fat tissue taken from the patient is nothing less than an autologous tissue graft.

A graft is defined as the transfer of one or more tissues without maintaining the vascular continuity with the original site: this is what happens in lipofilling, where the fat tissue aspirated in excess zones is reinjected in distant sites, in the body area to treat. Since there is no vascular connection, the tissue transferred can survive only if it comes in contact with well-vascularised tissues that initially will feed it by imbibition and later forming new vascular connections. Large amounts of fat injected do not allow all the adipocytes to come in contact with the receiving tissue, and they will necessarily develop necrosis. Facial lipofilling is a technique that allows us to obtain more definition in given facial zones, which for various reasons may have lost their original volume.

Nevertheless, this surgical procedure has for a long time produced deceiving results, because the injected fat underwent an unavoidable resorption. With time, results became better, but only in 1997, with Sidney Coleman, that the pivotal turn occurred [4].

Coleman's technique consists in harvesting the fat from a body part where it is in excess, after local infiltration, through a specific needle, with an anaesthetic solution compounded with a vasoconstricting drug. For the face, the fat tissue is harvested after infiltration with Klein solution, through a 3-mm tube, which has a point particularly designed to avoid damaging the adipocytes. The tube is connected to a 10-ml

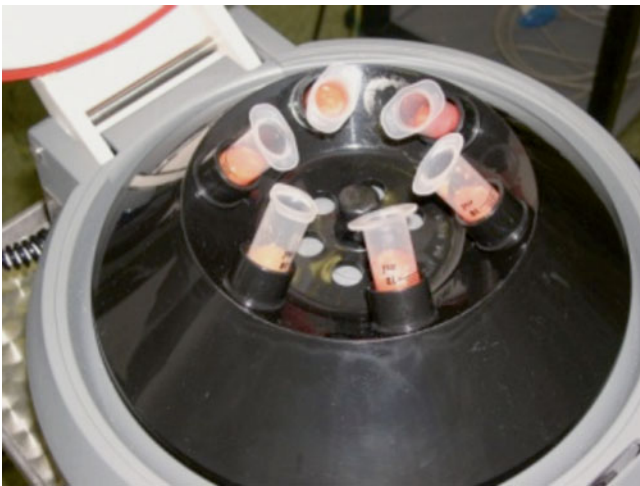


Fig. 3 Coleman's centrifuge



Fig. 4 Pattern of the adipose graft in the malar zone

syringe, which the operator uses in a way that does not damage the fat tissue, regulating the suction pressure.

The fat tissue harvested is subsequently centrifuged for about 3 min at 3,000 rpm (Fig. 3), to obtain only pure fat, excluding the nonviable cellular component and excess fluids like anaesthetics, saline and blood.

The tissue is then implanted in facial zones to treat, by means of 1-ml syringes connected to a very thin (1.5 mm) cannula, which allows the accurate placing of small volumes of fat tissue, using small subcutaneous tunnels. To facilitate maximal healing of the graft, the fat tissue is injected at various depths and criss-crossing the injection tunnels is done (Fig. 4) [3].

Coleman could thus obviate two great constraints of traditional lipofilling:

- The first related to the damage that fat cells sustained during the suction: an adipocyte so altered has lost the healing capability. Using adequately pointed cannulae, cells

are not damaged but remain intact and can thus survive in their new location [26].

- The second question referred to the need to implant the fat cells in contact with well-vascularised tissues, so as to ensure their survival, hence the idea of infiltrating fat in multiple small tunnels, with a small amount of fat tissue in each. This dense tunnel net creates a veritable "structure" in multiple layers, hence the term "liposstructure" [5–13].

The main indication of this technique is facial rejuvenation and defect correction, which are fulfilled modifying facial contour and increasing the volume of some parts [6].

This technique has many advantages: it is a less invasive procedure, thanks to the Coleman cannulae; a more natural result is obtained and the absence of rejection because it can be performed with local anaesthesia on an outpatient basis. Another peculiarity of this procedure is that it can be repeated any time it is desired to increase the volume, when the results of the first session are suboptimal [7].

Another technique is the one developed by Carraway, which differs from the previous way the harvested tissue is processed. It is more practical and quick, since the tissue is simply washed with Lactated Ringer's or saline in a specific net strainer, before being transferred in the syringes for grafting (Fig. 5). This system allows preparation of bigger quantities in lesser time compared to the Coleman's technique [2].

A disadvantage of these techniques, on the other hand, is that the grafted fat tissue unavoidably undergoes a certain resorption. The author's experience, gained in many years in many anatomical regions of the body [8], allows us to affirm that in normal conditions the percentage of healing is indeed very high, around 80 % of the injected volume. A completely different situation is that of the lips, where the initial resorption is much more than in other facial districts.

The common goal of all the different harvesting techniques is to obtain small particles of fat tissue, or groups of fatty cells, without impairing their viability, and thus, the studies are aimed to define the best technique, in order to assure the best possible [21]. Even if a small number of studies notes differences in viability and quality of the graft, related to the different harvesting sites, others, more numerous, affirm that the sites commonly used, like abdomen, flanks, thighs and knees, provide the same proportion of viable cells [19].

A study showed that liposuction performed with a liposuctor or using 60-cc Luer-Lock syringes causes a very small cellular damage and shows 98–100 % of viable cells with both techniques; another animal study also supports these results, finding equal numbers of viable adipocytes regardless of the used technique [17].

The harvesting is done after infiltrating the areas to treat with a lidocaine 0.5 % solution with adrenaline 1:200,000,



Fig. 5 Carraway's technique: rinsing in the strainer

obtained by mixing 20 ml of lidocaine 5 % and 0.5 ml of adrenaline 1:1,000 in 80 ml saline.

The amount of infiltrated solution depends on the fat tissue volume we want to remove and usually is in a 1:1 ratio with the aspirated volume. The infiltration is performed with a 14-gauge needle, and before beginning the liposuction, we wait 10 min for its effect. The cannula we prefer is the blunt-pointed Mercedes type, because it minimises tissue disruption and trauma to fibrous septa, neurovascular bundles and derma. The multiple holes help to harvest a bigger volume of fat tissue in each passage. The most important variable in this harvesting is the maximal negative pressure that we apply. Usually, 300–350 mmHg are the maximum negative pressure we can use for liposuction in the preparation of a lipofilling. If 60-cc Luer-Lock syringes are used, these are put under suction by means of a stop in the piston, creating the negative pressure and making the aspiration easier. The ideal treatment for fat tissue should separate healthy adipocytes and regenerative cells (ADRCs) from cellular components to discard, with minimal air exposition and minimal manipulation. It is necessary to discard as well the blood content, the oily remnants and other exfoliating elements, since they promote an inflammatory response that impairs the graft's healing.

Lipostructure with fat tissue enriched with regenerative and stem cells derived from autologous fat tissue (ADRCs) is used by the author since 2009. This technique involves the use of lipofilling enriched with regenerative cells and stem cells derived from fat tissue in one surgical time [27].

To optimize the best healing of the grafted fat tissue, the fat taken from the patient is “enriched” with regenerative cells harvested from the same patient's adipose tissue (ADRCs) [16].

Using the Celution System (Cytori Therapeutics, Inc.) (Fig. 6), it is possible to separate regenerative cells and stem

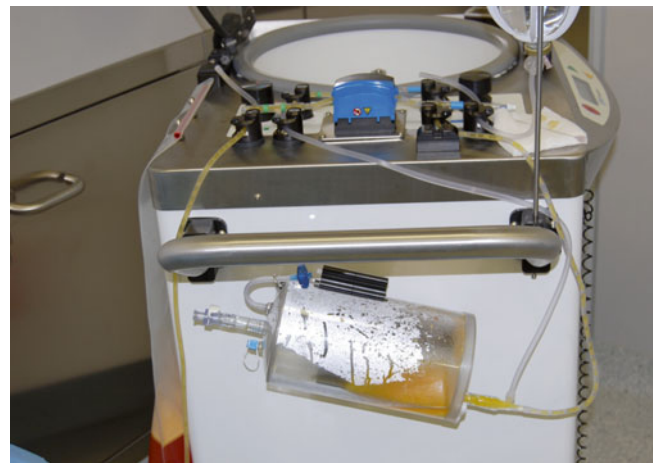


Fig. 6 Celution system

cells in the patient's fat tissue through a fat enzyme digestion procedure with subsequent enrichment of the same patient's fat tissue with the cell fraction previously separated during the surgery.

This mixture of fat tissue, regenerative stem cells and growth factors is then used for facial lipofilling. This method allows better angiogenesis, reduced cell apoptosis and modulation of the local inflammatory response.

A crucial need for this technique is thus the presence of localised fat masses, from which it is possible to harvest the needed amount of tissue.

The technique introduces the first 100 cc of lipoaspirates in the “Celution” device, to be processed and draw preoperatively regenerative stem cells and growth factors derived from adipose tissue (ADRCs), through digestion of the fat tissue by means of the proteolytic enzyme “celase”. At the end of the procedure, which lasts 60 min, 5 cc of regenerative cells of adipose origin (ADRCs) is obtained. The

remaining harvested tissue is collected in a closed system sterile bag (Puregraft), in which a lipodialysis is performed by means of a bilaminar membrane system. The first membrane performs selective filtration, which allows the passage of exfoliating cells, red blood cells and fluids, including the infiltration substances, which are collected in a bag. The second membrane, sort of a “U-flux” filter, allows the elimination of the elements to discard and keeps the purified fat tissue. The system reduces the liquid content of the tissue to implant, which is proportional to the drainage time to which it undergoes, to obtain a graft that is more or less dense, depending on the surgical needs. It does not need centrifugation, and it is possible to process 100 cc in about 10 min.

The adipose tissue prepared with the Puregraft bag is then enriched with ADRCs, before the implant.

5 Author's Preferred Technique

In facial lipofilling, the author's preferred technique is the one described by Sidney Coleman, although it's possible to use Carraway's technique and the technique with Puregraft with excellent results. Concerning the lipofilling enriched with regenerative and stem cells, this is a technique that nowadays finds an ideal use in breast and buttocks lipofilling.

The following facial regions are usually treated and remodelled with lipofilling:

- *Frontal area:* the glabella is a generally convex zone, which loses this appearance with ageing and becomes concave. The skin of the glabella, moreover, often shows wrinkles sustained by corrugator and procerus muscles. Lipofilling with 1–2 cc of fat tissue allows usually to correct this depression and the vertical grooves, if visible; it is performed with a Coleman style I cannula, inoculating from various directions. In correcting the glabella, it is best to associate also repeated injections of botulinic toxin, which allow the reduction of the wrinkles. The temporal region undergoes lipoatrophy and forms a depressed area that underlines the temporal ridge and sometimes the border of the zygomatic arch. Sometimes it underlines also the supraorbital border, which becomes protruding and is a feature of ageing. This region inferiorly is in contact with the lower eyelid, creating a single anatomic unit which is corrected in the same time. The implanted fat tissue volume ranges between 2 and 6 cc, by means of a Coleman style I cannula, starting the injection from the deepest bony plan to the most superficial subcutaneous plan.



Fig. 7 Zygoma lipofilling



Fig. 8 Harvesting cannula

- *Zygomatic-malar area:* with this technique it's possible to enlarge the zygoma without resorting to prostheses, and the result will be more natural, with a less sharp and more rounded zygomatic contour. In less evident cases, the lipofilling is performed through a medial approach (Fig. 7), lateral to the nasal wing and latero-inferior to the external canthus, as always in the face creating the approach with an 18-G needle and then with a curved or straight Coleman style II cannula, implanting 4–8 cc of adipose tissue in many interlaced layers.
- The fat tissue pattern depends as well on the surgeon's aesthetic sense, since he must ideally remodel the zygomatic area. In cases of more advanced ageing, lipofilling is associated to face lifting [13]. Personally, the author prefers performing the lipofilling at the end of the

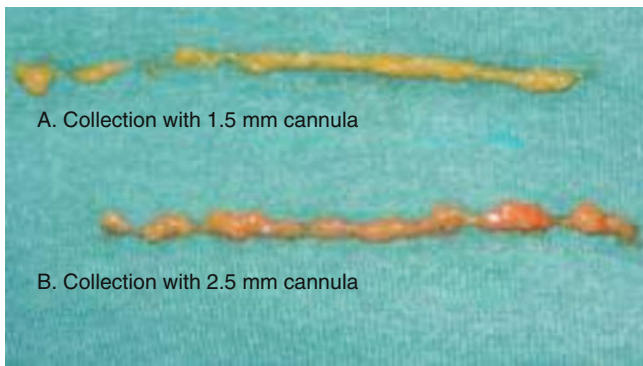


Fig. 9 Harvested fat

lifting procedure, placing 4–10 cc in each zygoma, injecting the fat tissue deep in a plan not subjected to detachment, which has maintained a good vascularity.

- *Palpebral/periorbital zone*: the harvesting of the adipose tissue for eyelid lipofilling involves using the infiltration 1.5-mm needle multiperforated (Fig. 8), to aspirate the fat obtaining a tissue without irregularities and very thin (Fig. 9). The upper eyelid may have a skin and fat excess in its medial portion, but often in the ageing process, lipoatrophy occurs which causes a hollowed eye, due to the presence of shadows. Lipostructure is performed either after a blepharoplasty to remove the skin excess or in cases of atrophy without skin excess to recreate convexity and fullness in the upper eyelid. The area treated with preseptal implant and always under orbicular muscle extends from the superior palpebral groove to the superior orbital border, with a lateral, medial and superior access. With Coleman style III micro-cannula 19 G or 18 G, 1.5–5 cc is injected.
- The lower eyelids are mostly characterised by the presence of the tear trough, a deformity that marks the so-called eye bags (excessive depression of orbital furrow) and the presence of apparent fat bags (Fig. 10) [11], with a marked or light scleral show due to a tendency of having senile ectropion. Lower eyelid lipofilling must, starting from the malar zone, sustain and push up the inferior palpebral vector (Fig. 11a). With Coleman style II micro-cannula 18-G or 19-G, entering medially from the cheek and inferior to internal canthus, the entire inferior palpebral area is corrected with 2–5 cc of adipose tissue. The placing is deep over the bony structure and under the orbicular muscle, performing various to and fro movements with the syringe, to avoid creating elevated masses and protrusions (eyelid skin is very thin and separated from the underlying fibrous tarsal articles by the orbicularis palpebrarum muscle). It is



Fig. 10 Lower eyelids lipofilling, before and after

possible to correct the jugal-palpebral furrow, often too deep, and to correct upper eyelids which have an excessively wide pretarsal space.

- *Naso-labial and marionette furrow*: in this area, with time there is a reduction of soft tissue, forming furrows that will be filled by lipostructure. To achieve a good correction and reduce the depth of naso-labial and “marionette” furrows, it is necessary to act at the same time on the skin retraction caused by muscle-cutaneous adhesions. A subdermal dissection of fibrous attachments between skin and underlying structures should be performed avoiding any skin incision. The dissection is carried with an 18-G needle, which allows to detach the cutaneous tissue, freeing it from adhesions and thus creating a perfect pouch for the adipose graft (Fig. 12).
- Combining subcutaneous dissection and lipofilling, it will be possible to fill the furrow’s depression, preventing recurring adhesions. The upper part of the naso-labial and “marionette” furrow is treated injecting along the furrow’s axis, as well as perpendicularly to it (Fig. 13). The entrance is usually double, lateral to the nasal wing and at the labial commissure externally. The injected adipose tissue varies between 2 and 6 cc for each furrow, and 1–3 cc for the marionette’s, with a Coleman style I cannula.
- *The lips*: a careful preoperative lip analysis requires evaluating the patient while he or she laughs and is at rest. The distance between the columella and the vermillion of the upper lip margin should be determined. When this distance is too big, ideally an upper lip lifting is needed. Ideally the distance between the columella and Cupid’s arc in the woman is 14 mm. Moreover, generally the upper lip has 25 % more volume than the lower lip. The shape of the upper lip is fuller in Cupid’s arc, and the normal vertical distance of the upper lip is 10 mm, while that of lower lip is 12 mm (Fig. 14).
- Lipofilling is performed with a Coleman style II cannula, entering 2 mm above the external commissure, between



Fig. 11 Phases of lower eyelids lipofilling. (a, b) Injection; (c) right lower eyelid not corrected, left eyelid corrected. (d) Both lower eyelids corrected



Fig. 12 Nasogenian furrow lipofilling



Fig. 13 Lipofilling of the "marionette" furrows



Fig. 14 The ideal lip shape



Fig. 15 Lipofilling of the lips



Fig. 16 Chin lipofilling, before and after

buccal mucosa and orbicular muscle. When needed, it's possible to increase as well the philtrum's volume; the injected volume ranges from 3 to 5 cc.

- The lower lip gets the same volume of adipose tissue if we want it more protruding; the graft is performed in every plan from mucosa to skin (Fig. 15).
- *Chin*: The chin can be smaller, due to lipoatrophy or bone resorption of the mandible, and thus is augmented in facial rejuvenation procedures. With accesses at the anterior third of mandibular margin and medially submental,

with a Coleman style III cannula, 5–10 cc of fat tissue is injected, starting from the bony plan and becoming more superficial under the skin (Fig. 16)

- *Mandibular margin*: The mandibular margin is often corrected to recreate a youthful appearance of the face, rendering the mandibular contour more regular. It is frequently necessary to associate a liposuction in the submandibular zone to the injection of adipose tissue at the mandibular margin and the lipostructure at the junction between the mandibular margin and the anterior cervical region (Fig. 17).



Fig. 17 Mandibular margin lipofilling, before and after

- *Nose*: the nose contour correction finds an indication in the congenital or iatrogenic “saddle” nose. With Coleman style III cannula, it’s possible to correct the dorsum, approaching it from the glabella, with 1–2 cc in the subcutaneous space. In secondary cases, with adherent and scarred skin, the greatest care must be taken during the dissection; to avoid lesions to the skin, it’s most important to perform infiltration with local anaesthetics, which eases this dissection. Also very important is the improved skin quality produced by the lipofilling. Due to very fibrous scarred zones, this site quite often necessitates more than a procedure (Fig. 18).
- *Facial atrophy*: This is caused by disorders (Romberg’s disease) or is occurring in HIV-positive patients who use certain agents (protease inhibitors). These disorders can involve some isolated zones, or a whole hemiface, with lipoatrophy in varying degrees. The techniques discussed

for the different anatomic districts are used in a combined way, to achieve an ideal correction of the defect (Fig. 19) [1–23].

6 Local Anaesthesia with Sedation

In most cases, patients undergo local anaesthesia with sedation; only in some cases, and in association with face liftings, we use general anaesthesia.

The harvesting zones are infiltrated with a lidocaine 0.5 % solution with adrenaline 1:200,000, which we obtain by mixing 20 ml of lidocaine 5 % and 0.5 ml of adrenaline 1:1,000 in 80 ml saline [15].

In OR, the patient is monitored with electrocardiography, its blood pressure and oxygen saturation; sedation is achieved



Fig. 18 Lipofilling of dorsum and apex of the nose, before and after

with midazolam (0.5 µg/kg) and propofol in continuous infusion 4–2 mg/kg/h, evaluating the sedation level.

Using lidocaine 5 % (1.5–2 ml for each block) and a 25-G needle, we block the infraorbital nerves for the inferior orbito-palpebral malar region and nasal, upper lip and nasolabial furrows; the mental nerves for lower lip, chin and mandibular contour; and the supratrochlear and supraorbital nerves for the region of the superior palpebral orbital margin and the forehead. Upper and lower eyelids are always infiltrated with a local anaesthetic and vasoconstrictor solution, with a 30-G needle, while we try not to infiltrate the other areas, whenever possible, to avoid losing the landmarks and altering the volumes to treat (Figs. 20, 21, and 22).

7 Complications

Postoperative hematoma usually is neither a relevant nor a frequent complication, even with less infections. In the

same way, asymmetry is not typical of lipofilling; usually it is preoperative and it's necessary to clarify with the patient if and how it's possible to correct that asymmetry.

On the contrary, oedema is always present and in the early 2–3 weeks is quite apparent, as well as the ecchymoses. In the eyelids, oedema can persist longer, and lymph drainage is often prescribed to speed up the recovery.

Nervous lesions are quite uncommon, because in the dangerous areas the blunt cannula prevents problems, and any palsy normally resolves in 60 days.

In eyelids and lips it is necessary to avoid sequelae with adipose tissue that can be felt and seen, due to a spaghetti-like or “cocoon” injection. This is now avoided with the use of much smaller and blunt cannulae.

Uncommon cases of fat embolism are reported and are recommended to inject the fat tissue mainly in dangerous zones while retracting the cannula, during the typical to and fro movement of lipofilling.



Fig. 19 Lipofilling in facial atrophy, before and after



Fig. 20 Infraorbital nerve block



Fig. 21 Mental nerve block



Fig. 22 Supratrochlear and supraorbital nerve blocks

Informed Consent Form for Lipofilling Surgical Procedure

Name: Surname.....

INFORMATION

Volume loss in some areas of the face, like zygoma and cheeks, may traduce ageing or result from an excessive weight loss; other bodily zones as well can be filled to achieve a more harmonious contour, during a liposculpture procedure. These depressions can be corrected in the most natural and safe way by using the transfer of own fat tissue.

Fat transfer, also called autologous fat graft or lipofilling, restores the volume of face and body features with the patient's own fat and represents an alternative to other treatments for filling.

- **What is lipofilling?**
- Face and body lipofilling is a natural, safe and not allergenic method to redraw your face and your body and can increase the definition of zygoma, cheeks, chin and other bodily zones like flanks and buttocks.
- Since this method uses your own cells, you will never have an allergic reaction. With lipofilling, it's possible to extract the fat tissue aspirating it from zones like thighs or abdomen, to transfer it in any region of the body. The grafted fat stays in the treated areas. Lipofilling can also correct posttraumatic or postsurgical defects.
- **How is lipofilling done?**
- Lipofilling is usually done ambulatory, since both donor and receiving areas receive a local anaesthesia. Using a small needle connected to a syringe, the fat is harvested from the donor site, where the fat is more compact, like the abdomen, buttocks or the internal face of the thighs. Once aspirated, the fat is processed to remove fluids in excess and then reinjected using a thin cannula. This procedure can be repeated as needed, to obtain the desired correction. The fat harvesting for lipofilling is usually performed combined with other procedures, including liposculpture or face rejuvenation surgery.
- **Which advantages does lipofilling offer?**
 - The transferred fat stays lifelong.
 - There is no risk of allergy.
 - The result is extremely natural.

- **What happens after the lipofilling?**

After the procedure, the patients are immediately able to perform daily activities. Some discomfort following the procedure can be controlled with drugs. Oedema, which can be marked particularly in the eyelids and lips for 7–10 days, and ecchymoses, which usually resolve in 7–10 days, are easily corrected with fard beginning at first postoperative day, since there is no scarring. Results are stable after the first month and are permanent.

- **Possible complications**

Oedema, hematoma, rare asymmetries, exceptional cases of fat embolism and very rare nervous lesions

Informed Consent

After reading and understanding the above information, I authorise Dr.....to perform the **lipofilling** procedure on my person.

I authorise moreover further procedures which are deemed necessary, in his judgement, to the success of the surgery or for my health during the surgery and during the postoperative care.

The surgical risks and the potential complications have been thoroughly explained to me.

I am aware that any surgical procedure, as many other acts of daily life, like driving a car or travelling by plane, involves certain risks, even deadly.

There are specific risks for a specific procedure and other generic risks correlated to any surgical procedure, including hematomas, infections, abnormal scarring, delayed healing and sensitivity changes. All the surgical procedures involve a scar. I understand that, while good results are expected, these cannot be assured nor it's possible to guarantee against any complication or unfavourable result.

To obtain the best possible result, some further procedures can be necessary. If this would happen, it's customary that the operatory room expenses will be charged to the patient, while the surgeon will not produce another bill.

I give my consent to taking photograph before and after the procedure, for scientific or teaching purposes. It's obvious that my name will not be given in any case.

Patient's signature..... Surgeon's signature.....
Date.....

Pearls and Pitfalls

The advantages of this technique are:

- There is no risk of allergy.
- The results are extremely natural.
- The transferred fat is permanent. The advantages of these techniques are many: the lesser invasivity thanks to the Coleman micro-cannulae, the absence of rejection due to the fact that the used fat tissue comes from the patient himself or herself and the possibility to perform these procedures under local anaesthesia in day surgery;
- Another great potential in this procedure is the opportunity to repeat it every time it is desired to increase the volume, when the results obtained with the first session are not sufficient.
- Immediately after the procedure, the patients are able to perform their daily activities.
- In eyelid lipofilling, it is recommended to use tissue harvested with ultra-fine technique.

The disadvantages are:

- Possible swelling and redness in the treated zone
- The need sometimes to repeat the procedure two or three times, to stabilise the results.

The disadvantage of this technique is on the contrary due to the unavoidable resorption that in the first 3 months the 20–30 % of the grafted fat tissue undergoes. In this respect, in the face it is recommended never to overcorrect: grafting new adipose tissue is much easier than removing an excess of it in these zones.

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