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Treatment of Nasolabial Fold with Lipofilling

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Abstract

Objectives: Demonstration of Anasolabial folds Lipo filling technique with micro fat.

Design: Interventional, longitudinal, non-controlled prospective and trial study.

Setting: The study was performed at an outpatient level in a Clinic of Criciúma [SC], Brazil.

Participants: In this study 47 NLF fillings were made using micro fat from April 2014 to April 2016. 42 female and 5 male patients were tested, in which 12 cases facial lift was done simultaneously with Lipografting.

Intervention: The harvest was made with Cannula's of 2 mm in diameter with multiple sharpen holes of 1mm. The fat was prepared by washing with saline solution in a nylon sterile fine mesh for the removal of clots, debris and oil. The application of Lipo grafting was done with Micro cannula's of 0.7 and 0.9 mm holes in the edge [Tulip medical], as illustrated in [Figure 1]. The deep filling was carried out with the 9 mm cannula in the medial portion of the NLF; followed by a Subcision right below the dermis in all NLF extension, associated with micro fat grafting using a Micro cannula of 0.7 mm.

Results: The results were registered at 1, 3 and 6 months. In all cases Ecchymosis and edema had spontaneous resolution in the first 10 to 14 days, respectively. In a patient there was the occurrence of hardened elevation in the filling area of the subcision, resolved after 45 days with the corticoid Infiltration.

All 47 cases, the NLF had improvement with consistent results along the follow-up period. All the patients reported satisfaction with the result.

Conclusions: The NLF Lipo-filling with Micro fat, can be carried out in an ambulatory fashion with local anesthetic, has a fast recovery and consistent results. Therefore, micro fat proved to be clinically adequate for Skin rejuvenation procedures.

Trial registration: The study was conducted in accordance with the principles of the Helsinki Declaration.

Keywords: *Nasolabial Fold; Facial Rejuvenation; Plastic Surgery*

Introduction

Nasolabial fold [NLF] deepening is considered an aging sign and that's why making it smoother is one of the main goals of Facial rejuvenation. Thus, a procedure that has been growing in the past few years is the use of fat [Lipo-filling] in the Facial fillings. The main advantage of the autologous fat transplant is its low risk of Hypersensitiveness or of foreign-body reaction. According to ASAPS, it is the 9th most popular surgical procedure of the face, with more than 48,000 fillings carried out in 2015.

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The first reports of Autologous fat transplant go back to the beginning of the twentieth century, for correction of soft-tissue defects [1, 2]. Since the standardization of the Lipo-grafting techniques by Coleman, Lipo-filling has become a powerful tool in the plastic surgeon tool box [2]. Coleman's technique involved a sample of fat from the body areas where it is widely present [Abdomen, Trochanter area, groin, knee], followed by Centrifugation and the purified-fat-cell grafting [3].

The interest in Lipo-grafting has a parallel with the development and popularity of the Liposuction for body contour [3]. The increased number of Autologous fat transplant may be due to the opportunity of having a material which is already present in hand, to raise or restore face areas with volume loss or Contour deformity [2, 4].

The initial objective of the fat grafting was to treat the volume losses caused by disease, Trauma or aging [4, 8]. The arise of new techniques

for harvesting and processing the fat and the presence of stem cells derived from Adipose tissue, may get to an improved feasibility with regard to the Lipo-grafting longevity [9]. The fat was injected with piercing Cannula's relatively large [± 2 mm in diameter]. In 2012, Tonnard reported Lipo filling with Cannula's of up to 0.7 mm, also called Micro fat grafting [2, 10]. The Micro fat shows the Grafting's that have greater longevity and less need for future Lipo grafting [2]. The fat is harvested with small-hole Cannula's to get small fat particles, making the Lipo-grafting application more precise [10].

Methods

It was an interventional, longitudinal, non-controlled prospective and trial study. The study was performed at an outpatient level and all patients were operated in a hospital setting with Local anesthesia and Sedation. In this study 47 NLS fillings were made using Micro fat from April 2014 to April 2016. 42 female and 5 male, in 12 cases facial lift was done simultaneously with Lipo-grafting. None of the patients were diabetics, hypertensive or smokers. This study followed the Helsinki principles.

NLF severity can be classified in two types: (1) Nasolabial creases and (2) Nasolabial folds. Nasolabial creases are skin defects rather than Contour deformities, appear to be epidermal and dermal, not created by overhanging skin. This type of NLF is more common in younger patients and in patients with thin skin. The second group of patients has an actual fold of skin in the nasolabial area. Both deformities were treated with the Lipofilling technique proposed.

Technique

The harvest was made with Cannula's of 2 mm in diameter with multiple sharpen holes of 1mm. The fat was washed with saline solution in a nylon sterile fine mesh for the removal of clots, debris and oil. The application of Lipo-grafting was done with Micro cannula's of 0.7 and 0.9 mm of diameters with one hole [Tulip medical], as illustrated in [Figure 1]. The 0.9 mm cannula was used for deep filling in the medial portion of the NLS; followed by a Subcision right below the dermis in all NLF extension and associated with micro fat grafting using a 0.7 mm Micro cannula [Figure 2].

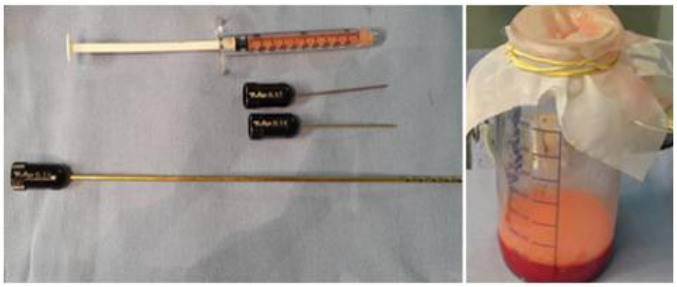


Figure 1: Materials used for harvesting, preparation and grafting of micro fat.

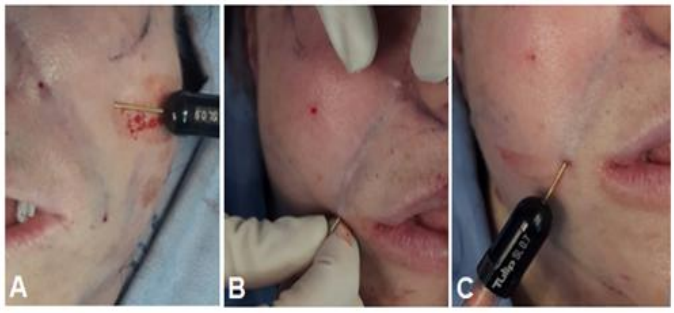


Figure 2: (A) Deep Filling; (B) Subcision; (C) Superficial Filling.

The clinical efficacy evaluation was conducted using the patient's and investigator's opinions and pictures obtained 30, 90 and 180 days after. The pictures were analyzed using the Global Aesthetic Improvement Scale (GAIS) [11] described below. Safety was evaluated by the observation and report of adverse events Such as edema, ecchymose, visible nodules or palpable and other unexpected symptoms.

Global Aesthetic Imprvement Scale (GAIS)

3. Very much improved: Highly satisfactory cosmetic result after injection.

2. Much improved: Accentuated improvement in the appearance as compared to the initial condition, but not completely satisfactory for the patient. A complementary application would improve the result slightly.

1. Improved: Obvious improvement in the apperance as compared to the intial condition . complementary implant or retreatment would be suitable.

0. No change: The appearance essentially resembles the original condition.

-1. Worse: The appearance is worse than that of the original condition.

Results

The results were registered in 1, 3 and 6 months by photos. In all cases Ecchymosis and edema had spontaneous resolution in the first 10 days. In one patient a hardened elevation in the filling area of the Subcision was observed. It resolved after 45 days with Corticoid Infiltration [Figure 3].

Figure 3: Ecchymosis on the first day after operation.

All cases had consistent improvement of the NLF along the follow-up period[Figure 4]. One patient did not return after 30 days, and was excluded. The very much improved and much improved results remained in 95% and 89% after three and six months, respectively [Table 1; Graph 1].

Discussion

Fat injection was first reported in 1910, by Hollander, in order to correct a Facial fat Atrophy. Since then, many authors like Coleman [12] and Tonnard [2] have improved this popular technique [12].

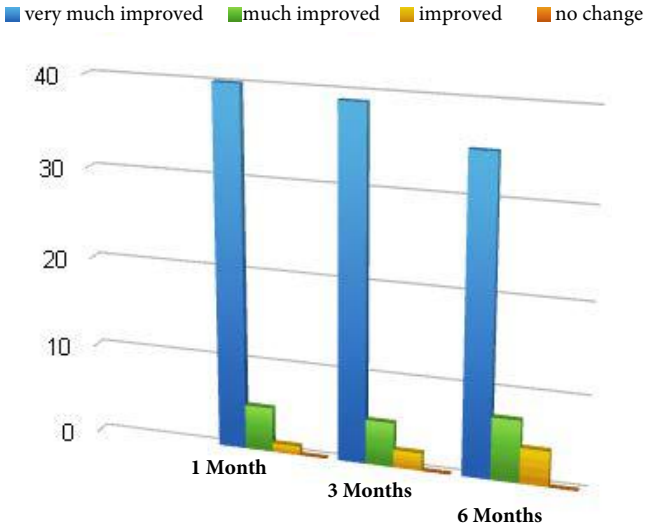
The key to successful structural Fat grafting to the face is to understand how to place fat in different levels and to use the graded densities in fat to accomplish maximal predictability [12].

The aging process thins out the subcutaneous fat layer, altering the facial contour, so that it is necessary to have the application in the atrophic areas and usually in the superior two t hirds of the face to

Figure 4: (A) pre and post-operative of 2 years; (B) of 6 months; (C) of 3 months.

Table 1: Efficacy of lipofilling in nasolabial folds, according to the Global Aesthetic Improvement Scale

DAY	30	90	180
0 = no change	0	0	0
1= improved	1	2	4
2= much improved	5	5	7
3= very much improved	40	39	35



Graph 1 - Efficacy of lipofilling in nasolabial fold, according to the Global Aesthetic Improvement Scale

to restore youth without skin removal [5]. The repetitive facial movements are the main mechanical factors that contribute to wrinkle formation [2]. Moreover, the muscle in the Facial expression produces folds on the skin surface which, initially, are only seen during the facial muscle contraction [Dynamic Wrinkles], However the repetitive muscle movements make the folds permanent along the time [Static Wrinkles] [2]. The Wrinkles may be treated by filling the Subdermal or Intradermal planes. The subdermal plane filling is used to treat deep folds or wrinkles which result from the depletion of underlying volume. On the other hand, the fine wrinkles are treated with Intradermal Injections, since they result from disorders in the skin itself [2].

The filling materials may be from autologous or heterologous origin. The autologous materials are those extracted from the patient's own body [Fat and Dermal grafting]. The heterologous fillings are not derived from the patient's body they may be derived from normal substances found in the human body, such as the collagen and the Hyaluronic acid. The autologous fat's main advantage comparing to other soft tissue loads is that it doesn't have the risk of Hypersensitiveness or foreign body reactions. Besides, the autologous material does not bio-degrade with time and the effect is more permanent [2].

The autologous fat is injected in small quantities in order to trigger revascularization in the applied area. The histological exams reveal a mixed inflammatory infiltrate that appears around the grafting on the first days after application. Small vessels surround and then penetrate the periphery 4 days after the procedure [5]. However, the fat will be partly reabsorbed, in most cases, at least part of the fat will continue to be conceivable [5, 13-15]. The main disadvantage was the partial loss of the injected volume, which was pretty variable [5]. Only 30% of the injected fat can survive for 1 year [14] and repeated applications usually necessary to obtain the desired results [5]. The survival mechanism and adipose tissue absorption are not outright clear. The adipose tissue is believed to be able to survive by the nutrient spread from the IV fluid in the first 48 hours [15]. A range of factors, including the harvesting technique, type of fat implanted, area of application, injection technique and the professional's experience may influence in the treatment efficacy [9].

Besides partial reabsorption of the injected fat in the first 6 months, there were few complications and negative results, and the local morbidity is low [2]. The procedure's complications are normally of a slight intensity and at a short term, and the most common are: Edema, Contour deformities and Ecchymosis in the injected areas, expected for 3-5 days [5, 6]. In our study, there were ecchymosis and local edema in the 47 cases with spontaneous resolution in 10 days and 14 days, respectively. A great concern with the acute injection of soft tissue loads in the face is the rare occurrence of intravascular injection, causing embolization in vascular areas and, consequently, resulting in skin necrosis, Cerebrovascular accident and blindness [Injections in the glabellar area or in the Nasolabial fold may cause retinal artery occlusion] [2, 16-19]. Other complications that may occur are: redness, chronic edema, infections, Lymphadenopathy, scarring, calcification of the injected fat, discoloration, skin ulcer [2, 20].

The use of small diameter needles for fat implant decreased the post-operative and the idle time, making the procedure easily acceptable [5]. It's fundamental for the patient to get a satisfactory aesthetic result right after the procedure, since a bad experience after

after the first session would discourage the patient from continuing to the next appointment which would be necessary to replace the reabsorbed fat and improve the aesthetic result [5].

The use of Micro fat in our study showed good results in the 47 cases as well as minor side effects, corroborating with other literatures that the best method for fat grafting to be successful is by using Micro grafting [2]. Because, the fat particle radius is inversely proportional to its contact surface, which means that, for the same volume of injected fat, reducing the diameter to a half will double the contact surface. Thus, a wider surface means a better contact with the capillaries in the recipient area and a raise in the grafting survival rate with less need for future applications, reducing the morbidity.

Conclusion

NLF Lipo filling, with the described technique is done in an ambulatory fashion with local anesthetic; it has a fast recovery and consistent results. Therefore, Micro fat proved to be clinically adequate for Skin rejuvenation procedures.

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