

## CORRECTION OF SCARS BY AUTOLOGOUS FAT GRAFT AND PLATELET RICH PLASMA (PRP)

UGO MAJANI, ALDO MAJANI  
Ambulatorio Chirurgico MIAS, Catania

*[Trattamento degli esiti cicatriziali mediante lipofilling e plasma ricco di piastrine (PRP)]*

### ABSTRACT

**Objective.** Lipografting is a surgical technique widely used in various clinical settings for reconstructive and aesthetic purposes<sup>(1-8)</sup>. Recent studies have shown that the infiltration of growth factors derived from platelet-rich plasma (PRP) results in a significant stimulation of angiogenesis<sup>(9-10)</sup>.

The objective of this study is to determine whether PRP-induced angiogenesis could result in an improved engraftment of the injected fat in scar areas, which are areas suffering from severe skin retraction and without annexes.

**Methods.** We evaluated 28 patients aged between 27 and 62 years: 6 patients had cicatricial results from burns; 12 patients had scars from previous plastic surgery; 2 patients required correction of scars from childbirth cesarean section; 4 patients complained of scarring from operations of general surgery; 4 patients turned to us for the correction of traumatic scars.

We treated all patients with lipografting: 11 patients (group 1) without PRP preparation; 11 patients (group 2) had been treated with PRP 7-10 days before; 6 patients (group 3), who had symmetrical scars, were treated on the left side only with lipografting and on the right side with PRP and lipografting.

**Results.** 30 days after lipografting all patients showed better scar elasticity, an attenuation of dyschromias and an evident aesthetic improvement of the treated areas. 90 days after surgery, in three patients from group 1 and one patient from group 2 there was an absorption of the injected fat. In patients from group 3 the increase was most evident on the right side. 180 days after lipografting, it was necessary to proceed to another partial or total lipografting in five patients from group 1 and in two patients from group 2.

**Conclusions.** The analysis of our results shows that a suitable preparation of the treated areas with PRP allows to obtain, in association with lipografting, more durable corrections, particularly in situations where vascularization is more impaired and there is a more evident loss of substance.

**Key words:** Lipografting, regenerative medicine, PRP.

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### Introduction

Growth factors are small protein molecules belonging to the cytokine family. The platelet growth factors (PDGF) are contained in the alpha-granules of platelets. PDGF induces the expression of a number of nuclear localized proto-oncogenes, such as FOS, MYC and JUN.

Recent studies by Garcia and Gonzalez<sup>(10)</sup> have shown that after injection of PRP via mesotherapy, a significant stimulation of angiogenesis was determined with neof ormation of microvessels. After 30-60 days they reached the maximum concentration of activated fibroblasts, ready to determine optimum regeneration of the tissue.

Most interestingly, after two months the formation of reticular collagen (type III) took place.

The aim of our study is to assess whether we can use the neovascularization evidenced experimentally from the seventh day after the infiltration of growth factors to obtain a better result in a subsequent lipografting.

### Materials and methods

7-10 days before lipografting, blood samples were taken from patients from Group 2 and Group 3. The blood was transferred with the use of a sterile kit in 10cc tubes, equipped with a suitable filter separator, which were placed in a centrifuge for 8 minutes at 1800 rpm. Only the lower fraction, in contact with the filter separator, which consists of PRP, was taken and infiltrated in the receiving areas with 1 cc syringes. and 32-gauge needles.

The amount of PRP varied from patient to patient: from a minimum of 1cc. to a maximum of 8 cc.

7-10 days after, lipofgrafting was performed under local anesthesia.

Fat was removed, after infiltration of the Klein solution, from the abdomen or from the hips except in seven patients, who had been aspirated in other locations for aesthetical purposes. Normally 2-2.5 mm diameter cannulas were used (12 cm long); if the donation area had to be aspired for aesthetic purposes, cannulas from 15 to 20 cm were used. Syringes were then placed in a centrifuge at 3000 rpm for 3 minutes. After centrifugation, the upper layer was removed with small pad dressings, while the lower liquid portion was drained by gravity by unscrewing the cap from the syringe. The purified fat was thus injected in the receiving areas with 1 or 2cc syringes with a retrograde injection technique. Depending on the case, 18 gauge needles were used, or 1 to 1.55mm diameter micro cannulas (blunt-tipped or bevelled) when the debridement of adhesions was necessary. The amount of fat injected ranged from 8 to 37 cc.

All patients were monitored and photographed at 30, 90 and 180 days after surgery.

## Results

In all patients, the treated skin showed greater elasticity, linear scars had a good attenuation of dyschromias, were thinner and were overall better accepted by patients. The pearly appearance of scars from burns had subsided and the skin appeared generally more similar to healthy skin.

90 days after lipofgrafting, the retracted cicatricial areas had a better degree of fullness. However, three patients who had not been subjected to the preparation with platelet growth factors (Group 1) and one patient from group 2 previously treated with platelet growth factors had evident absorption.

Patients from group 3 had overall better aesthetic and functional results (four out of six) in the side that had been previously prepared with the PRP and the greater the amount of fat that had been implanted, the more pronounced the differences were. At 180 days after the interventions, it was necessary to proceed to a new lipofgrafting (partial or total) in five patients from group 1 and in two patients from group 2.

## Conclusions

From the analysis of our results it is clear that a preparation with platelet growth factors before lipofgrafting performed in a context scar is able to determine, with the significant induced angiogenesis, higher aesthetic and functional results than lipofgrafting performed without preparation. However it is important to remember that the treatment must be performed between 4 and 10 days after the infiltration of PRP, period in which neovascularization is maximal. Simultaneous infiltration of fat and PRP, as reported by other authors, did not provide in our experience satisfactory results<sup>(11)</sup>.

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Dott. ALDO MAJANI  
Piazza Trento, 2  
95126 Catania  
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