

The Current Art Combination of Platelet-Rich Plasma and Poly-D, L-Lactic Acid for Improvement of Deep Nasolabial Folds: A Case Report

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ABSTRACT

Background: Platelet-rich plasma (PRP) is blood plasma containing an above baseline level of platelets and growth factors. Recently, Platelet-rich plasma (PRP) has come to the attention of aesthetic surgeons, with burgeoning new applications ranging from hair restoration to soft tissue augmentation. Injectable Poly-D,L-Lactic Acid (PDLLA) is a biostimulator rather than a traditional filler, which provides immediate volumetric improvement. Injectable PLA can produce a result comparable with Hyaluronic Acid fillers for the correction of wrinkles such as nasolabial folds, and can be a good choice for such a treatment.

Methods: A Female 45 years Old with deep smile lines and fine wrinkles on cheeks. The patient was treated with injected of Poly(D,L Lactic Acid) and Platelet Rich Plasma. Poly-D,L-Lactic Acid was injected subdermal with retrograde linear thread technique and used 24-G cannula needle. After 3 weeks PDLLA Injection, PRP was injected intradermal into the whole face especially along the smile lines using a 32-G Needle at a dose of 0.05 ml at each injection site with a distance of about 0.5-1.0 cm. PRP was injected every 2 weeks for 3 months.

Results: Wrinkle Severity Rating Scale was downgrading and skin quality like skin tone looks more brightening and fading hyperpigmentation.

Conclusion: The combination of Poly-D,L-Lactic Acid and Platelet-Rich Plasma is effective for facial rejuvenation.

KEYWORDS: Platelet-rich plasma (PRP), Poly-D,L-Lactic Acid, Nasolabial Folds, Wrinkle Severity Rating Scale

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INTRODUCTION

At recent days, people have tried to delay the aging of the skin and keep it healthy in various ways. The usual methods are using skincare, exercise, diet, etc. However, in most cases, these methods failed to efficiently repair the skin or eliminate wrinkles. Therefore, in order to achieve the purpose of facial rejuvenation, modern plastic and aesthetic surgery have been applied to restore tissue defects or change the overall appearance¹.

Currently there are a variety of injectable treatments available to restore the youthful appearance of the face by replacing lost tissue volume, as well as filling and effacing rhytides and deep folds. Due to complementary modes of action, biodegradable volume augmentation products such as hyaluronic acid (HA), calcium hydroxylapatite (CaHA), and

poly-D,L-lactic acid (PDLLA). Specially for Injectable PDLLA is a volume restoration product that contains biocompatible, biodegradable microparticles of PDLLA, which stimulate the production of type 1 collagen, providing gradual volume¹.

Platelet-rich plasma (PRP) has long been known as an effective treatment in various surgical and medical fields. Facial rejuvenation utilizing autologous platelet growth factors, such as platelet-derived growth factor, transforming-growth factor, vascular endothelial growth factor, insulin-like growth factor, and epidermal growth factor, is a natural approach to restore dermal degeneration. Autologous PRP offers regarding facial rejuvenation: quantifiable improvement of skin complexion was observed with visible changes noticeable in 3–4 weeks and it is a biological cell

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therapy with patient's own cells and a popular, relatively painless injectable treatment for the aging face in aesthetic practices².

CASE PRESENTATION

A 45-year-old woman with smile lines and fine wrinkles on the cheeks that make the patient look very old. Previously, the patient had done facial Hifu treatment by the previous doctor but the patient was not satisfied with the results (Figure 1). From us, The patient was treated with injected of Poly-D,L-Lactic Acid and Platelet Rich Plasma. Poly-D,L-Lactic Acid was injected subdermal with retrograde linear thread technique and used 24-G cannula needle. After 3 weeks PDLLA Injection (Figure 2) , PRP was injected intradermal into the whole face especially along the smile lines using a 32-G Needle at a dose of 0.05 ml at each injection site with a distance of about 0.5-1.0 cm. PRP was injected every 2 weeks for 3 months. Wrinkle Severity Rating Scale was used to asses nasolabial folds treatment progress.



Figure 1. Patient's Nasolabial Fold before PDLLA Injection

Result and Follow Up

During the treatment period, the patient showed improvement her smile line and the condition of fine wrinkles began to decrease. The patient's face also looks brighter and there is an improvement in the quality of the patient's skin. No adverse effects like nodule formation were found. The patient was satisfied with the result (Figure 3) . The score from the patient's Wrinkle Severity Rating Scale also showed a decrease in the score from 3 to 1 within 3 months.

Table 1. Wrinkle Severity Rating Scale⁹

Score	Category	Description
1	Absent	No visible nasolabial fold; continuous skin line
2	Mild	Shallow but visible nasolabial fold with a slight indentation; minor facial feature; implant is expected to produce a slight improvement in appearance
3	Moderate	Moderately deep nasolabial fold; clear facial feature visible at normal appearance but not when stretched; excellent correction is expected from injectable implant



Figure 2. Patient's Nasolabial Fold After 3 Weeks PDLLA Injection



Figure 3. Patient's Nasolabial Fold After 5th PRP Injection

The WSRS is a valid and reliable instrument for quantitative assessment of facial skin folds, with good inter- and intra-observer consistency. According to the WSRS instrument, scoring of the nasolabial fold severity is based on visual assessment of the length and apparent depth of the nasolabial fold; the five scores encompassed by this scale represent visibly distinct (and hence clinically significant) gradations in fold severity (Table 1). The WSRS should prove a useful clinical tool for assessing the effectiveness of soft-tissue augmentation and other facial contouring procedures⁹.

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4	Severe	Very long and deep nasolabial fold; prominent facial feature; <2 mm visible fold when stretched; significant improvement is expected from injectable implant
5	Extreme	Extremely deep and long nasolabial fold detrimental to facial appearance; 2–4mm visible V-shaped fold when stretched; unlikely to have satisfactory correction with injectable implant alone

DISCUSSION

Many medical devices for antiaging treatment have been introduced into current medical practice. Although hyaluronic acid is the most commonly applied injection device because of its excellent safety and longevity, physicians also prefer to use other fillers such as calcium hydroxyapatite, collagen, and poly-D,L-lactic acid¹.

Injectable PDLA is a new subdermal stimulatory filler and it has identical features as injectable PLLA. Injectable PDLA is biocompatible, biodegradable, biostimulatory and long lasting. But the difference is the microparticles of injectable PDLA are spongiform microspheres with multiple micropores. There are some studies were to test the in vivo efficacy and safety of the injectable PDLA as a subdermal tissue filler^{3,4}.

The main ingredient of injectable PDLA is composed of PLA microparticles, are biocompatible and biodegradable polymers, and are biostimulators. The observed volume effect of injectable PDLA has a dual mechanism of action. Initially, it is caused by the hydrogel volume injected. However, the immediate fill effect diminishes within 1 week as the water is absorbed and swelling subsides, leaving only PDLA microparticles in place. The secondary delayed mechanism of action involves collagen synthesis. A capsule of macrophages, lymphocytes, mast cells, and fibroblasts surrounds these particles 1-month post injection. Subsequently, the thickness and cell density of this capsule decrease gradually, and at 6 months, the surrounding areas are composed entirely of collagen fibers^{3,5}.

There a randomized, evaluator-blinded, comparative study on the efficacy and safety of injectable PDLA compared with HA for the correction of nasolabial folds was conducted at Chung-Ang University Hospital and Seoul Asan Medical Center, Korea. In total, 58 subjects (30 in the PDLA group and 28 in the HA group) completed the follow-up at 24 weeks. The results showed that both PDLA and HA injections were well tolerated and that adverse effects were mild and transient in most cases. Further, injectable PDLA provided noninferior efficacy compared with HA after being used for treating moderate-to-severe nasolabial folds. The maximum improvement in the nasolabial fold Wrinkle Severity Rating Scale (WSRS) scores was observed at the 6th month's follow-up. Despite the WSRS scores were gradually normalized, they were still better at the 24th month's follow-up than at the preoperative status².

PRP is an autologous modification of fibrin glue, which has been described and used in various applications with apparent clinical success. PRP obtained from autologous blood is used to deliver growth factors in high concentrations

to a

region requiring augmentation. There are some studies described promising results with PRP for facial rejuvenation⁶.

PRP contains a mixture of growth factors and fibrin that stimulate collagen synthesis, cell proliferation and epidermal thickening which improves skin appearance, elasticity, texture and homogeneity. Furthermore, there a reported that PRP contains varying amounts of VEGF, PDGF, TGF, FGF, IGF-1 and EGF. These growth factors are well known for their influence on different stages of healing processes, acceleration of tissue regeneration and neocollagenesis with subsequent tightening and strengthening of the skin⁷. In addition, the secreted growth factor after PRP injection, support regeneration by activating fibroblast and attracting un-differentiated cells to the dermis leading to enhancing collagen production. These changes accompanied by epidermal and dermal regeneration resulting in reduction of wrinkles depth^{7,8}.

CONCLUSION

The combination of Poly-D,L-Lactic Acid and Platelet-Rich Plasma is effective for facial rejuvenation.

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Conflicts of interest

There are no conflicts of interest.

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