# Platelet Rich Plasma for Skin and Hair Concerns, an Evidence-Based Approach.

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## INTRODUCTION:

Platelet rich plasma (PRP) has long been used in orthopedics, oral maxillofacial surgery, and cardiac surgery, and more recently has been introduced to the field of dermatology. PRP applications in dermatology are mainly rejuvenating but it has also been used for inflammatory disorders given the abundance of growth factors and anti-inflammatory components (Leo et al., 2015; Nicoli et al., 2015). Furthermore, PRP can be combined with other cosmetic procedures to have a synergistic effect (Makki et al., 2019).

PRP is an autologous blood product with an abundant platelet concentration. Growth factors are stored in alpha and dense granules of platelets. The growth factors relevant to dermatology include platelet-derived growth factor (PDGF), vascular endothelial growth factor (VEGF), epithelial growth factor (EGF), and transforming growth factor beta (TGF-β) (Lubkowska et al., 2012; Marx, 2004). These growth factors play a role in cellular proliferation, differentiation, angiogenesis, and neocollagenesis (Lubkowska et al., 2012; Marx, 2004).

There are 4 different types of PRP depending on platelet concentration: pure platelet-rich plasma (P-PRP), leukocyte platelet-rich plasma (L-PRP), pure platelet-rich fibrin matrix (P-PRFM), and leukocyte and platelet-rich fibrin matrix (L-PRFM) (Alves and Grimalt, 2018). A minimum of 1 million/ml platelet count usually has a therapeutic effect in dermatologic applications; this is equivalent to 2-8 times the amount of platelets in whole blood (Emer, 2019).

Although PRP is considered as a relatively safe treatment, a few contraindications exist (Table 1 and Hesseler and Shyam, 2020). PRP growth factor release has been associated with platelet aggregation, hence anti-platelet therapy, such as non-steroidal anti-inflammatory drugs (NSAIDs), has been proposed to decrease the efficacy of PRP (Jayaram et al., 2019; Schippinger et al., 2015). However, some authors have demonstrated that NSAIDs may not affect PRP at all (Ludwig et al., 2017). Indeed, stopping NSAIDs prior to PRP may increase the risk for thromboembolic events (Maulaz et al., 2005).

## HARVESTING TECHNIQUE:

There are various commercially available PRP kits and protocols. On the day of treatment, the production of PRP traditionally involves the venipuncture collection of 10-60 mL of whole blood (Hesseler and Shyam, 2019). Anticoagulants such as acid citrate dextrose or sodium citrate are added to prevent ex vivo coagulation and premature secretion of the alpha granules (Hesseler and Shyam, 2019). Centrifugation then separates the whole blood sample into four layers based upon specific gravity: red blood cell bottom layer, the buffy coat layer, the of-interest PRP layer, and the upper platelet-poor plasma (PPP) upper layer. Isolation and a second centrifugation of the plasma and superficial buffy coat can be done to increase platelet concentration (Hesseler and Shyam, 2019). Calcium or thrombin can be added before patient administration to create activated autologous PRP, whereas nonactivated autologous PRP uses host dermal collagen and thrombin as endogenous activators (Hesseler and Shyam, 2019). Most dermatology applications do not require activation with calcium or thrombin as the more viscous substance produced once activated exogenously is better suited for wound healing and orthopedic uses (Emer, 2019).

*Table 1. Contraindications to PRP:*

| Absolute contraindications: | Relative contraindications: |
|---|---|
| Platelet dysfunction syndrome | Consistent use of NSAIDs within 48 hours of procedure |
| Critical thrombocytopenia | Corticosteroid injection at treatment site or systemic use of corticosteroids in last 3 months |
| Hemodynamic instability | Recent fever or illness |
| Pregnancy | History of malignancy |
| Use of anticoagulation | HGB < 10 g/dl |
| Chronic liver disease | Platelet count < $10^5$/ul |
| Acute and chronic infections | |
| Hypofibrinogenemia | |

## APPLICATIONS:

### *Aging and skin rejuvenation:*

The normal aging process is due to loss of collagen and elastin in the dermis, which are the main components of the dermis, and provide functional and structural support. The use of PRP to increase the density of collagen and elastic fibers and enhanced wound healing has been shown in multiple studies, some of which have utilized PRP with other treatment modalities, such as microneedling, fractional lasers, and hyaluronic acid (HA) fillers to augment the aesthetic effect (Na et al., 2011; Shin et al., 2012). Improvement is usually noted 1-3 months after treatment and lasts up to 6 months (Cameli et al., 2017; Redaelli et al., 2010; Scarano et al., 2016). The majority of patients require multiple treatments, on average 3-4 treatments at 3-4-week intervals (Redaelli et al., 2010; Scarano et al., 2016). Multiple studies have shown varying degrees of improvement (Cameli et al., 2017; Gawdat et al., 2017; Redaelli et al., 2010; Scarano et al., 2016).

The effect of PRP in rejuvenation is thought to be due to neocollagenesis and angiogenesis mediated by the multiple growth factors in PRP, mainly PDGF and VEGF. This will lead to improved wrinkles, skin elasticity, texture, micropigmentation, and hydration (Sand et al., 2017).

### *Volume loss and soft tissue augmentation:*

PRP has recently gained popularity for its volume-augmenting and lifting effects of the face and other areas in the body. It is most commonly combined with other treatment modalities such as HA fillers or autologous fat transfer rather than used as a monotherapy (Sand et al., 2017; Sclafani, 2011). It is thought that HA serves as a scaffolding for PRP to enhance and prolong its effect (Sand et al., 2017). Similarly, when PRP is injected with autologous fat, the multiple growth factors are thought to improve the survivability of the fat and prolong its effect (Sclafani, 2011).

The evidence of PRP playing a solo role in volume augmentation is mainly anecdotal and lacks well-structured randomized clinical trials (Sand et al., 2017; Sclafani, 2011).

### *Scar management:*

There are several studies that have demonstrated improvement in scarring parameters when PRP is used as an adjunct treatment with other minimally invasive treatments, such as carbon dioxide ($CO_2$) ablative laser and microneedling (Chawla, 2014; Faghihi et al., 2016; Nita et al., 2013; Zhu et al., 2013). Such treatments allow for trans-epidermal drug delivery of PRP when used topically (Chawla, 2014; Faghihi et al., 2016; Nita et al., 2013; Zhu et al., 2013). While there is no strong evidence in the literature evaluating PRP as a monotherapy for scarring, the effect on scar improvement is thought to be due to the destruction of the epidermis and superficial dermis using other minimally invasive treatments, and then with the addition of PRP, neocollagenesis and enhanced re-epithelization ensue (Alsousou et al., 2013). Furthermore, PRP-treated scars were found to have reduced levels of TGF-β and increased levels of metalloproteinase leading to reduced fibrosis and increased scar remodeling, respectively (Alsousou et al., 2013; Pierce et al., 1991; Pierce et al., 1989). This will ultimately lead to improved scar texture and contour.

### *Hair loss and restoration:*

One of the most popular and heavily studied applications of PRP in dermatology is hair loss. It is mainly used in androgenetic alopecia (AGA) but has also been described in other causes of hair loss. AGA is characterized by miniaturization of anagen hair follicles, most commonly in the vertex and bitemporal scalp (Kaufman, 2002). The wide array of growth factors in PRP promote angiogenesis and follicular cellular growth and prevent apoptosis, thereby prolonging the anagen phase (Gonzalez et al., 2017; Lin et al., 2015; Yano et al., 2001). PRP can be used in conjunction with other hair restoring treatments such as topical minoxidil, finasteride, spironolactone or as a monotherapy.

While there is a good evidence supporting the efficacy of PRP in hair restoration, some studies showed no improvement, this is thought to be due to an insufficient PRP treatment (Gentile et al., 2015; Gupta et al., 2017; Khatu et al., 2014; Sand et al., 2017; Shapiro et al., 2020).

See Figure 1 for summary of evidence on PRP applications for skin and hair.

## LIMITATIONS:

Although PRP has numerous different applications, it is not yet fully understood. For example, there has been speculation about the pro- and anti-inflammatory properties of PRP and their role in tissue regeneration. Hudgens et al. (2016) found that PRP increases the levels TNF-alpha and NFkB pathways thereby inducing a transient inflammatory response that triggers a tissue regeneration response In contrast, El-Sharkawy et al. (2007) have concluded that PRP may suppress cytokine release and limit inflammation, thereby promoting tissue regeneration.

In addition, most studies in the literature on PRP are of small scale, therefore larger randomized clinical trials are needed to accurately evaluate its role in dermatology.

## CONCLUSION:

PRP is a well-tolerated treatment with several dermatologic applications given the abundance of diverse growth factors. It can be used as a monotherapy or in conjunction with multiple other treatments to have a synergetic effect. Figure 1 summarizes the evidence-based applications of PRP in dermatology.

Multiple commercially available kits have made PRP an easy, office-based procedure using the patient's own blood. Adverse effects include erythema, pain, and bruising. No serious adverse events have been reported in the literature. Further clinical studies are warranted to standardize treatment with PRP

Dr Anthony M. Rossi is currently leading a clinical study titled: "A Pilot Study of the Clinical Effectiveness of Platelet-Rich Plasma (PRP) for the Treatment of Endocrine Therapy-Induced Alopecia (EIA) and Permanent Chemotherapy-Induced Alopecia (pCIA) in Breast Cancer Patients".


*Figure 1: Male patient with pronounced androgenetic alopecia of the vertex area of the scalp. A. at baseline and B. 12 months after beginning RegenPRP treatment*

The second case is of a 65-year-old female patient with AGA who underwent 4 PRP sessions every two months. In this case we also observed both a quantitative and qualitative increase in hair (Fig. 2).

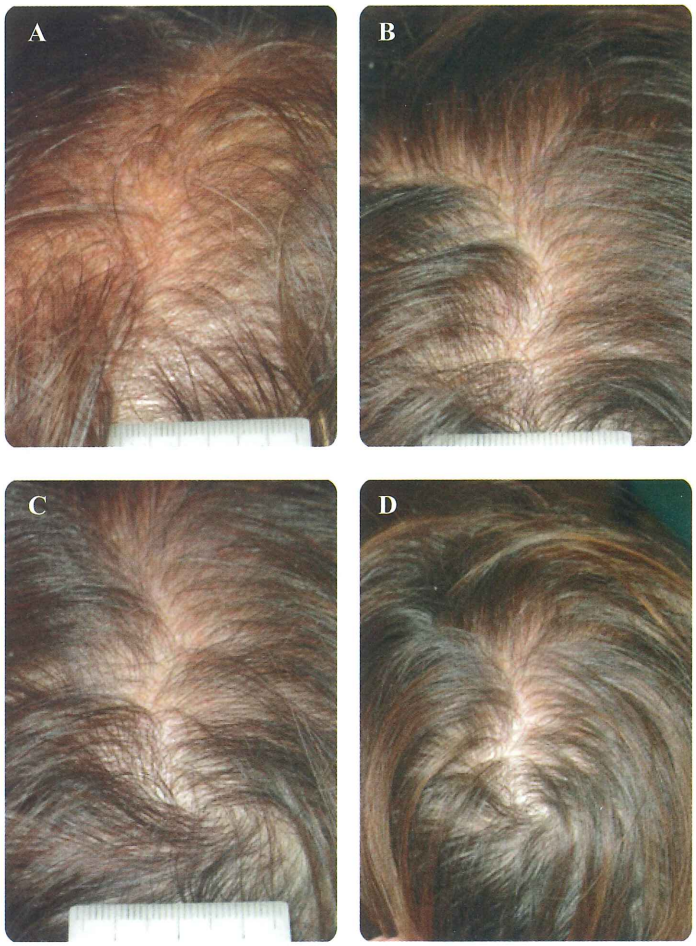


*Figure 2: Female patient with androgenetic alopecia. Images were taken of the vertex area. Note the changes in hair density over time A. at 4 months; B. 6 months;C. 10 months;D. 14 months after beginning RegenPRP treatment*

The results obtained with the application of the bimonthly RegenPRP protocol to a 70-year-old patient were excellent. Despite his age, the follow-up results showed surprising outcomes in term of hair density (Fig. 3). We also used the same protocol in an even older patient, which also gave satisfactory results in this 74-year-old patient (Fig. 4).

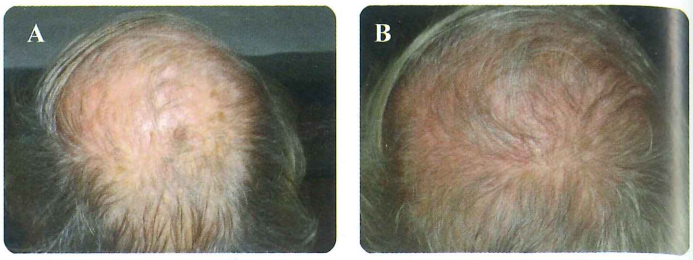


*Figure 3: Elderly male patient with androgenetic alopecia. Images show the vertex area of the scalp. A. at baseline and B. 12 months after beginning RegenPRP treatment*


*Figure 4: Elderly patient with androgenetic alopecia. Images were taken of the vertex area. Note the changes in hair density at A. baseline; B. 6 months and C. 12 months after beginning RegenPRP treatment.*

Another indication that I am experienced using PRP in is alopecia areata (AA). The first case I want to illustrate is that of a 26-year-old man, with a normal thyroid profile, who underwent 3 PRP injection sessions every two months., The alopecia completely disappeared within four months (Fig. 5).

The second case of AA concerns an 18-year-old male with a normal thyroid profile, previously treated with oral cortisone therapy without success. We carried out 4 PRP sessions every two months, obtaining complete hair regrowth. The patient still has no relapse 5 years after treatment (Fig. 6). We also performed PRP injections in the brow area where alopecic patches were present. Successful results were also obtained here (Fig. 7).

Finally, I illustrate the results from a 47-year-old patient suffering from AA in the frontal area of the scalp for about 10 years who was treated with PRP. The thyroid haematochemical profile was found to be normal. In this case, we also performed our protocol with 4 PRP sessions every two months. The images speak for themselves (Fig 8).

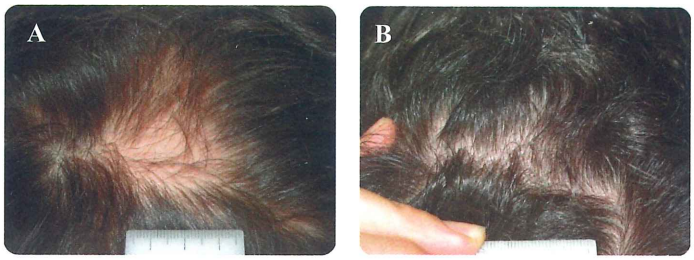


*Figure 5: Young male patient with alopecia aretata. Images were taken at A. baseline and B. 4 months after beginning RegenPRP treatment.*


*Figure 6: Young male patient with alopecia aretata. Images were taken at A. baseline and B. 9 months after beginning RegenPRP treatment*


*Figure 7: Young male patient with alopecia areata of the brow area. Images were taken at A. baseline and B. 12 months after beginning RegenPRP treatment.*


*Figure 8: Male patient with alopecia areata at the frontal area of the scalp. Images were taken at A. baseline, B. two months and C. 12 months after beginning RegenPRP treatment.*

# Testimonial

## Dr Bruce Reith MD, PhD

I'm a medical doctor working mostly in the field of hair loss, hair restoration, and minimal invasive treatments. I also have a PhD in Public Health where I continue to do research and give lectures.
When you deal with patients with hair loss every day, like I do, you find that their treatment options are limited. Apart from Finasteride and Minoxidil, nothing else can be recommended to the patient with a clear conscience. Opinions differ on the use of Platelet-Rich Plasma (PRP) due to a lack of concrete evidence on its efficacy. This is due to the heterogeneity of the studies because there is no standard procedure for PRP preparation and administration; consequently, the studies are not comparable. However, new meta-analyzes show that PRP treatments, especially when used as a combination therapy with microneedling, low laser therapy, oral finasteride therapy or local minoxidil application, have greater effectiveness and patient satisfaction.

I can only confirm these findings. My co-workers dealing with hair loss also use Regenlab's autologous PRP as the treatment of choice for androgenetic hair loss. My experience showed that PRP in combination with microneedling (Dermapen) gave the best results in androgenetic alopecia (AGA) for women and men.
(Protocol: 4 treatments at 1, 4, 12 and 24 weeks).

When PRP was used for hair transplants, the downtime was lower, the hair grew earlier, and the growth rate was better. PRP was used both as a holding solution and in the transplant area.

In minimally invasive treatments, mesotherapy with low molecular weight natural hyaluronic acid with PRP showed better results and higher patient satisfaction than without. Similar results were obtained with PRP as an adjuvant in combination therapies.

In my opinion, autologous PRP when used as a combination therapy or as an additional adjuvant for hair loss and hair transplants has become indispensable.

## Dr Thomas Zimmermann, MD, PhD

My requirements for a highly effective PRP system are a high degree of safety and reliable quality! This is completely fulfilled by Regen Lab.
The system can be used in all areas of dermatological and aesthetic practice. The main focus for the use of RegenPRP in my practice is on patients with hair loss or poor hair structure. Here we have already achieved amazing success with the PRP system from Regen Lab.
We have also achieved reliable results in the field of aesthetics with the Regen Lab kits, which is very satisfying, both for me and for my patients. I am absolutely convinced by the Regen Lab PRP System, from the usability to the results!

# The role of platelet-rich plasma in the treatment of male and female pattern hair loss

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## INTRODUCTION

Androgenetic alopecia (AGA) is a common, genetically determined disorder, affecting both men and women.

Signs of androgenic alopecia include gradual onset, increased hair shedding, transition in the areas involved from large, thick, pigmented terminal hairs to thinner, shorter, indeterminate hairs and finally to short, wispy, nonpigmented vellus hairs.

Patients with this disorder usually display a typical patterned distribution of hair loss, with inter individual differences.

Males suffering from AGA are characterized by a gradual recession of the frontal/temporal areas, while in females hair is generally lost diffusely over the crown; this produces a gradual thinning of the hair rather than an area of marked baldness and the frontal hairline is often preserved.

Bitemporal recession can also occur in women, however to a lesser degree compared with men.

History and physical examination are the most important aspects of diagnosis in patients with AGA.

Approved drugs include Minoxidil and Finasteride (5-Alpha reductase type 2 inhibitor) together with micrograft hair transplant.

Platelet-rich plasma (PRP) is an autologous concentration of platelet-rich plasma and its action depends on the variety of growth factors released from platelets.

These growth factors may act on stem cells in the bulge area of the follicles, stimulating the development of new follicles and promoting neovascularization, processes normally occurring during healthy hair growth.

Therefore, the aim of the present study was to assess the possible clinical effects and the safety of injecting PRP into the scalp of male and female patients with pattern hair loss.

## METHODS

25 patients (6 males and 19 females) suffering from AGA.

- Males (aged between 25-42) AGA: Hamilton-Norwood scale grades I-V.
- Females (aged between 28-45) AGA: Ludwig scale grades I-II.
- Lab tests were done to exclude any associated diseases.
- Some patients were taking other hair loss treatments (topical treatment, oral treatment).
- 6 sessions were performed, 2 to 3 weeks apart.
- Clinical assessment performed at session 3 and after session 6 by a standard camera and physical exam (hair loss, density, regrowth and adverse effects).
- PRP at 0.1 ml/cm$^2$ was injected

## RESULTS :

The following images show hair growth before and after the sixth PRP session.

## CONCLUSION

A significant reduction in hair loss was observed. Pictures also showed an improvement in hair thickness and hair follicle density after six sessions.

No adverse effects were observed.

The present study may provide evidence that PRP injections represent a safe and effective adjuvant treatment for androgenetic alopecia.

# Platelet Rich Plasma (PRP): my treatment of choice for Alopecia Areata

Dr. Julieta Peralta-Arambulo, MD, FPDS, DABHRS, FISHRS
Dr. Maria Julieta P. Arambulo, MD, DPDS

*Asian Hair Restoration Center*
*The Medical City, Ortigas, Manila, Philippines*

Platelet-rich plasma (PRP) has emerged as a new treatment modality in dermatology where it is used for acne scars and for skin rejuvenation, and preliminary evidence has suggested that it might even have a beneficial role for hair growth. Uebel et al. (2006) have shown that storing hair grafts in the presence of PRP can enhance graft survival, improve hair density and stimulate the growth of transplanted follicular units. Thus, from my extensive and vast experience in performing hair transplant surgery in the Philippines, I advocate the use of PRP during surgery as the best storage solution for enhancing follicular graft survival as well as PRP injection into the recipient areas prior to the creation of slits, and topical application of PRP on the slits and donor harvested areas. In my experience, the use of PRP has given positive results in my patients, with growth of transplanted follicular units as early as 2-3 months after surgery. In addition to this, I have incorporated PRP in treating different types of hair loss such as alopecia areata (AA). The role of PRP in promoting hair growth was demonstrated by Trink et al. (2013) who reported that administration of PRP led to a major improvement in chronic relapsing AA.

Alopecia areata is a chronic, relapsing T-lymphocyte-mediated autoimmune disorder affecting anagen hair follicles resulting in nonscarring patches of hair loss. The estimated prevalence of AA is approximately 1 in 1000 people, with a lifetime risk of approximately 2%, most commonly starting before the age of 30. Although up to 34%-50% of patients who present with patchy AA experience spontaneous hair regrowth within one year, most will relapse. This unpredictable course causes major psychological distress to most patients, especially the young.

Current treatment modalities addressing the unpredictable course of AA lack efficacy and present with numerous side effects which poses a huge therapeutic challenge. Presently, intralesional steroid injection (ILSI) is the first line of treatment for patch type AA. However, it is effective only on patients with limited involvement and is associated with various side effects.

In view of this, I started treatment of AA with different presentations: a rapidly progressing diffuse AA (Fig. 1), alopecia universalis (Fig. 2), and a chronic condition, ophiasis AA (Fig. 3). Though all these patients received a combination treatment of Triamcinolone Acetonide (TrA) and PRP, the regrowth of terminal hair in such a short period of time was most likely due to the addition of PRP to the treatment. As a dermatologist of 24 years, I have not observed such results when treating different types of AA with intralesional TrA alone.

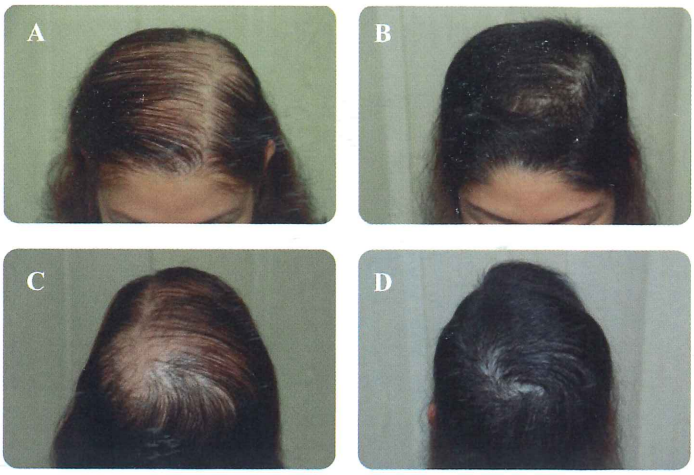


*Fig 1: (A and C) Acute diffuse alopecia areata of two weeks duration. (B) Results two months after the first PRP treatment. (D) Seven months after the second PRP treatment with no relapse.*


*Fig 2: (A) A 34-year-old female with alopecia totalis of 18 months duration who initially underwent two ILSI-treatments without improvement (at another clinic). The patient then had two PRP treatment sessions in our clinic. (B) This is the initial regrowth of terminal pigmented hair 4 months after the first PRP session. (C and D) The patient received the second PRP treatment 4 months after the first session. The images show hair regrowth 13 months later, with only a solitary small patch on the nape area remaining.*

*Fig 3: Ophiasis form of AA of 1-year duration. The patient had one session of ILSI 5 mg/ml without improvement. A. Image shows hair growth at baseline Following 2 weeks of PRP treatment, the patient claimed fine grey hair developed 1 month later and terminal hair growth was noted 2 months later. B. The result after 1 year follow-up without recurrence.*

I would like to share with you a preliminary report from our clinical study with my daughter, Dr. Maria Julieta P. Arambulo, also a dermatologist, entitled, "Platelet Rich Plasma versus Triamcinolone Acetonide as treatment strategy for alopecia areata: A randomized half head double-blind, controlled study".

In this preliminary clinical study report, 8 AA patients were recruited with 7 who completed the 3 PRP/ILSI treatments and 1 patient for the third follow up. For preparation of PRP, we use a BCT PRP (RegenLab) separating gel technology to prepare between 4.5-6 ml of autologous PRP from 10 ml of peripheral blood. After blood extraction, the tube is centrifuged at 1500 x g for 5 mins. This technology is simple and needs no activation to prepare PRP with a slightly supra physiological platelet concentration (1.6x). The recovery of platelets is described as 80%, with a low contamination of WBC and RBC. This quality is important for PRP to give its optimum effect. Afterwards, 0.05 ml of PRP is injected with a 30G needle 1cm apart at 2 mm depth in the central alopecia areas and 4 mm deep at the edges of the lesions. On the other side of the head, intralesional Triamcinolone Acetone 10 mg/ml is used and injected at a depth of 2 mm using a 30G needle. All treatments were done at monthly intervals for a total of 3 sessions and were well tolerated.

We used a half head study to compare the two treatment modalities. To evaluate the results, we utilized the following: Dermatology life quality index (DLQI), the SALT score, global photos and dermoscopy evaluation (dystrophic hair scale). The preliminary results show that the satisfaction rate is higher with the PRP-treated sides after 3 months of treatment due to improvement in a larger treatment area, no recurrence, less expansion of alopecia patches, thicker anagen hair growth, increase in hair pigmentation from a lighter to darker shade, and a greater decrease in dystrophic hair (Fig. 4 and 5). The Triamcinolone Acetonide (ILSI) treated side was associated with higher relapse rates, atrophy, and other side effects such as itching and folliculitis.


*Fig 4. Comparison of treatment with PRP and ILSI (A) Global photo of PRP side. SALT score on the left side at the first treatment session showed 80% involvement with a decrease to 14.4% involvement at the third treatment session. Note the dramatic decrease of SALT score with increase in hair thickness and pigmentation. (B) Global photo of ILSI side. SALT score on the left side at the first treatment session showed 35% involvement with a decrease to 14.4% involvement at the third treatment. Note the temporary improvement at the second treatment session and increase in the alopecic patch at the third treatment session.*

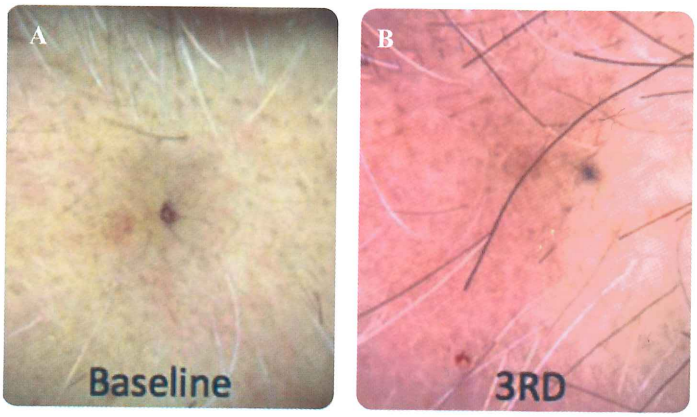


Fig 5. (A) Dermoscopy of the PRP-treated area. From the first month to the last treatment. The dystrophic scale decreased from 3 (>50% dystrophic hair) to 1 (<29% dystrophic hair). (B) Dermoscopy of ILSI-treated area. From the first month to the last treatment. The dystrophic scale remained at 3 from baseline to the last treatment (>50% dystrophic hair).

Presently, in my clinical practice, PRP is included as the first line of treatment. I always advise my patient that the best treatment for AA patients from my experience is usually monthly monotherapy of PRP initially for 3 sessions with complete remission thereafter with severe cases, and in mild cases, usually 1 session is enough. For persistent AA cases, additional monthly treatment is suggested until regrowth is observed.

In conclusion, PRP induces hair growth by releasing growth factors from platelets that act on stem cells in the bulge area of the follicles, stimulating the development of hair follicle regeneration and promoting neovascularization. It suppresses cytokine release and limits local tissue inflammation which makes PRP potentially beneficial in treating inflammatory hair conditions like alopecia areata.

In addition, PRP preparation involves many variables including the centrifugation process, if and how the platelets are activated, and the exact method of exposing the tissue to the PRP. Whether and how these factors affect the clinical outcomes when PRP is used as a treatment for AA needs further controlled and clinical trials.

Lastly, preliminary evidence and reports favor PRP as a safe and effective treatment in AA. In my opinion, PRP should be included in the first line of treatment and probably offers the best chance of success in all types of alopecia compared to other therapies, has the best safety profile and can be used as a stand-alone treatment, bringing hope to patients with acute and longstanding severe AA who are already psychologically affected from its relapsing and chronic course.

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# Benefits of PRP in plastic surgery

Dr Paul Audi, MD

*American Board Certified Plastic Surgeon*

I began offering Platelet-Rich Plasma (PRP) treatment in 2010. This demand was initiated by patients; they were asking for PRP injections for the face and for the hair. Patients were coming back later stating that they, noticed remarkable improvements month after month in their skin texture and in hair density. I am now seeing more and more patients asking for PRP treatments. PRP injections are used in many indications.

**FACIAL REJUVENATION:**

We are using PRP in the face, alone or in combination with other surgical procedures such as blepharoplasty, facelift or laser skin resurfacing.

- ***PRP alone:***

PRP is used, especially around the eyes, to treat dark circles, fine eyelid wrinkles and to enhance the skin glow of the cheeks. This treatment is done in the office. One blue top tube from Regenlab is filled with 10cc of blood and processed. PRP is mixed with glutathione and a vitamin cocktail and injected intradermally over the eyelids and cheeks.

Patient returns home with an icepack.
Swelling in the periocular areas is expected for 3 to 5 days. An intramuscular injection of 1 ml of Diprophos (Betamethasone) is given prior to the PRP treatment to decrease the amount and duration of swelling.

- ***PRP in combination:***

Surgical procedures like blepharoplasty, will improve hollow eyes and will remove fat pockets and excess skin but have no effect on dark circles or fine eyelid wrinkles. PRP injection enhances the aesthetic surgical results. It is done in the same setting as the surgical procedure (Fig. 1)

*Fig. 1: Patient treated for lower blepharoplasty. At the same setting the patient underwent temporal, cheeks and eyelid lipofilling using a mix with PRP. Photos illustrate before and after treatment.*

If the patient presents with dark circles and fine wrinkles, or sun damaged facial skin, sometimes nanofat is used together with PRP as well (Fig. 2)

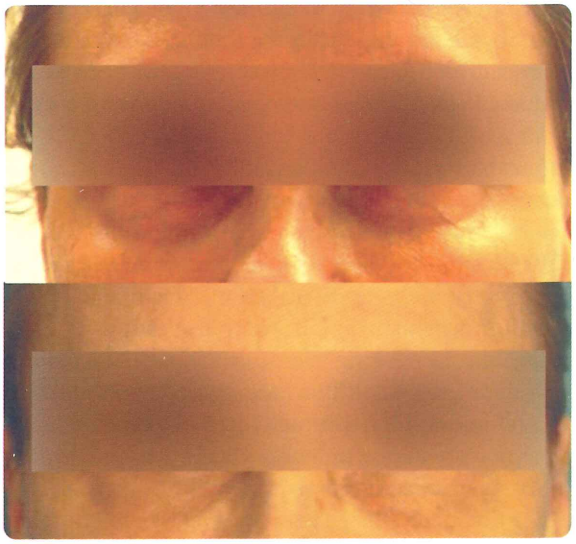

*Fig. 2: Combination of nanofat and PRP treatment on a patient to correct tear trough, dark circles and deformity in temporal area lipofilling. Photos illustrate before and two months after treatment.*

For dark circles, we mix PRP with glutathione and a polyvitamin cocktail.
A deep subdermal injection is done in areas where there is deflation of the eyelids. In other areas, the injection is done by creating a papule in the superficial dermis.
The session is repeated each month for three months in a row. The final result is seen at 6 months.

A facelift will get rid of jowling and face and neck skin laxity, but skin texture and fine wrinkles, especially around the perioral areas, are not improved. We combine a PRP treatment with the surgical procedure.

We use a blue top tube from Regen lab and we mix it with a polyvitamin cocktail. The injection is done deeply in the mandibular, lateral ocular and perioral areas, and superficial injections as well, especially for the treatment of smoker lines.

Patients notice an improvement with the PRP facial treatment. It reverses aging by thickening and firming the skin. This gives a glow and radiance to the face and perioral area. It is of particular benefit for smoker lines or barcode lips which are not improved by a facelift.
Patient satisfaction has been very high.

**TREATMENT OF ALOPECIA:**
PRP is also used for alopecia in men and women. Patients take one gram of paracetamol orally one hour before the treatment, and anesthetic cream is applied to the scalp areas 30 minutes prior to treatment.

One blue tube from Regenlab is filled with 10 ml of blood. After centrifugation the PRP is aspirated from the tube and mixed with a hair vitamin cocktail. The PRP/vitamin solution is injected intradermally using a 27-gauge needle all along the scalp, concentrating on the alopecia areas. Ice rollers are of great help during the procedure to decrease pain. After completion, the patient is asked not to shampoo the hair for 24 hours. The session is repeated monthly for a total of 4 months.

Results have been encouraging and the satisfaction rate is about 80 percent among the patients. An increase in hair density is observed. Patients report the cessation of hair shedding after 2 to 3 weeks. They start to see new hair after the second session. One case of traumatic scalp alopecia with scalp scarring has been treated with two injection sessions and shows ongoing improvement (Fig. 3)

Even after hair transplantation, PRP is used to strengthen transplant uptake (Fig. 4)

**NEW TRENDS**
We are currently studying the effects of PRP mixed with nanofat to treat cellulitis in mature skin. After harvesting fat under local anesthesia, and processing the aspirated fat into nanofat, one blue top tube of Regenlab PRP is prepared and mixed with the nanofat, and injected intradermally in the area of cellulitis.
The preliminary results in tightening of the skin and improvement in cellulitis seem encouraging.

In wound healing, we are starting to inject PRP around an open wound to accelerate healing. More follow up is needed with these new trends.

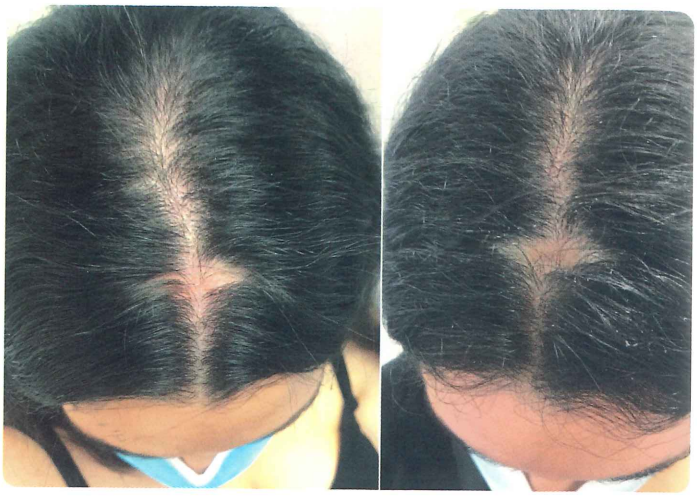

*Fig. 3: Patient with traumatic alopecia from a hair piece. Before and is one month after her first PRP session. We start seeing narrowing of the alopecia area and new hairs coming up through the scar*

*Fig. 4: 27 years old patient treated for hair transplant, 3 weeks following PRP treatment and one year later*

# Brazilian Experience

## Dr. Alessandro Alarcão, MD

Regenerative therapy is an extremely promising modality in Dermatology. Autologous platelet-rich plasma (PRP) and growth factors promote cell regeneration and tissue remodeling rapidly.

Since PRP induces neocollagenesis, it is a good option before facial restructuring with hyaluronic acid fillers. One month after the procedure, we noticed the skin is firmer with less cracking. This is when we schedule the MD codes, which usually require less volume and last longer.
For acne scars, the association with fractional Erbium laser allows a significant and more sustained improvement. The number of sessions will vary depending on the number of scars. Another successful combination is the use of the 1927 nm Tulio Laser with PRP as a drug delivery. The result is a noticeable increase in lushness of the skin, less pores and fewer fine wrinkles.
We also achieved promising results with the combined treatment for androgenetic alopecia. We usually see an increase in the number of new follicles after the first session. In addition,

we know that there is an extension of the anagen phase and stimulation of perifollicular angiogenesis, which provides longer lasting results. Our current protocol consists of 3 monthly sessions, followed by maintenance every 3 months.

## Dr. Daniela P. N. Ribeiro, MD

When I started working with platelet-rich plasma (PRP) in 2008, I found the process very artisanal and I confess I was somewhat apprehensive. But I've always believed in the results of this treatment.

I discovered Regen Lab during the American Academy of Dermatology (AAD) meeting 4 years ago, I was enchanted by their products and I realized this was how I could begin to offer this treatment to my patients. As soon as I went back to Brazil I began using this new technology on my patients and I am passionate about the results.
I use Regen Lab PRP for the face, neck, décolleté and the intimate region, which is my treatment of choice, generally in combination with other technologies.
I have incredible results for various indications in the intimate area, both aesthetic and functional.
Besides the use of RegenPRP (BCT) as a post laser drug delivery and for introitus treatment, I also use CellularMatrix and ATS for a filling effect, which brings excellent regenerative results for the patient and this positive response is very satsifying.
The aesthetic result in the vulva, especially on the labia majora is also extremely interesting.

## Dr. Ilner de Souza e Souza, MD

Regenerative therapy has been established among Dermatologists as one of the main techniques for rejuvenation, tissue remodeling and hair therapies.

It consists of a procedure that requires low investment for the physician, since it simply requires the acquisition of the appropriate centrifuge and different kits. Using a closed-circuit system is safer and has the approval of ANVISA (Brazilian National Health Surveillance Agency).
We have been offering Platelet-Rich Plasma (PRP) for over three years and introduced Regen Lab products about one year ago. The results we obtained confirmed the efficacy of this technique, mainly in facial rejuvenation, stretch marks, atrophic scars and androgenetic alopecia.

In rejuvenation we obtained improvement in texture, hydration and firmness of the skin. In patients with atrophic lesions we observed a recovery of thickness and relief. Finally, in patients suffering from alopecia, the recovery of anagen follicles is evident and rapid.
PRP can be used either by injecting the processed material directly into the treated area or in combination with procedures that allow its delivery such as lasers, especially fractionated ones.

Despite the lack of consistent international protocols and controlled studies, clinical evidence leaves no doubt that regenerative therapies are promising and safe.

## Dr. Luciana M. Lourenço, MD, PhD

I have been using Regen Lab products for over two years and they have surprised me positively in every aspect.

Today I train colleagues throughout Brazil. There have been more than 15 courses in the last 2 years in addition to several participations in national and international congresses where I shared my experience using Regen Lab products.

I have always believed in regenerative therapy, and I have been following its evolution for a few years, but my experience with Regen Lab products has only come to prove that it represents the medicine of the future. The safety of procedures has been increasingly confirmed in the medical literature due to the absence of complications and their efficacy through their beautiful results in the studies presented in recent years.

My experience with Regen Lab for the treatment of alopecia is amazing. I have more than 100 patients treated, with almost 90% androgenetic alopecia with excellent results with an average of 3 sessions per year. I always try to maintain the clinical treatments already recommended (finasteride, minoxidil, vitamins and minerals). I have even gained a very interesting experience with telogen effluvium, the incidence of which has greatly increased in this time of Covid epidemic we are currently living. Telogen effluvium is a self-limiting disease, but it makes the patient very tense and treatment helps prevent hair loss, accelerates growth and improves hair quality.

With regards to skin quality, my experience has also been very rewarding in particular with CellularMatrix. I realize that the worse the skin quality is, the better the visualization of the results. This is especially true for smokers where the results are surprising.
I have also had a small but very interesting experience in the treatment of melasma with RegenPRP using a superficial subdermal application technique.

For the facial contour, RegenPRP in association with ATS has helped me a lot in patients where I cannot use hyaluronic acid. I have preferred the use of cannulas for treating the facial contour. Recently I have also started to use Regen Lab kits for lip augmentation. Although I have only used it in a few cases, I believe it will be a promising treatment due to the naturalness of the results. The filling effect is obtained without the risk of hypercorrection or complications (ETIP, granulomas), which are increasingly observed when using traditional fillers, and this has attracted most of my patients. The absence of complications in the medical literature of regenerative therapy has enchanted physicians and their patients.

In Brazil we still face some regulatory issues with our medical council and so Brazilian clinical studies supporting such results are necessary so that use of the PRP technology can become more widespread amongst medical doctors in this country.
I believe that regenerative therapy is the future, not only for dermatological treatments but also for all of medicine.

Finally, my experience with Regen Lab products has been extremely rewarding, both for myself and my patients.