

## DETAILS | By Garry R. Lee, MD, and Gordon H. Sasaki, MD, FACS



# PRP for Hair Loss

Using PRP nonsurgically to stimulate hair growth in early androgenetic alopecia.

Your patients who are losing their hair may be enticed by the Platelet-Rich Plasma (PRP) concept. After all, it seems so simple: They have their blood drawn; it is centrifuged to concentrate growth hormones and platelets; then a hair restoration physician injects it right back into their own scalp to stimulate hair growth.

Though the premise seems too good to be true—and there remains a paucity of published data on using PRP to treat baldness—we have treated patients with early androgenetic alopecia (AGA) in our practices and seen good results. Following is some background on PRP and hair loss and the protocols we use to treat our patients.

### PRP BASICS

"PRP is blood plasma containing a concentration of platelets many times greater than normally found in blood," as defined by the International Society of Hair Restoration Surgery. Concentrated growth factors are stored in the platelets' alpha granules, including platelet-derived growth factor, transforming growth factor beta, vascular endothelial growth factor, epidermal growth factor, insulin-like growth factor and fibroblast growth factor 2.

Upon being activated with thrombin or calcium chloride, platelets degranulate, releasing growth factors that bind to transmembrane receptors for adult mesenchymal stem cells, fibroblasts, endothelial cells and epidermal cells. This triggers a pathway leading to cellular proliferation, matrix

formation and collagen synthesis—thus stimulating growth and healing.

### PREPARING PRP

While the U.S. Food and Drug Administration (FDA) has accepted a few automated devices for the "safe and rapid preparation of platelet poor (and rich) plasma and platelet concentrate from a small sample of blood," there is not yet any FDA-approved indication for PRP. Therefore, the use of PRP for hair growth is strictly off-label. Physicians may use PRP on patients, so long as it is not specifically marketed or promoted to patients for this indication.

### TREATING AGA WITH PRP

We focus on using PRP to treat early AGA, the most common cause of hair loss, which afflicts 70% of men and 40% of women. AGA in men begins at the temples and at the vertex of the scalp. In women, AGA presents with diffuse thinning without hairline recession. In theory, PRP helps patients with early AGA by stimulating the proliferation and differentiation of stem cells in the hair follicle bulge area. Surgical hair transplantation, minoxidil and finasteride are currently the treatments of choice.

Published data on PRP for hair growth is limited. Among the research, in 2006, Uebel et al.<sup>1</sup>, kept follicular grafts in a PRP solution for 15 minutes before implantation. Seven months after follicular unit transplantation (FUT), the



Dr. Sasaki's patient underwent microneedling with PRP to reverse hair loss.

researchers noted a 3% to 52% increase in follicular density. In 2011, Rinaldi et al.<sup>2</sup> found that PRP reduced diffuse hair loss and stimulated hair growth. In 2012, Kang et al.<sup>3</sup> suggested the CD34+ hematopoietic stem cells concentrated using Smart PReP PRP (Harvest Technologies, harvesttech.com) could assist angiogenesis.

Despite a lack of compelling literature, physicians are using PRP with positive results.

In Sarasota, Florida, Joe Greco, MD, of the Greco Medical Group is injecting Emcyte Pure PRP with Cytokine-Rich Plasma and extracellular matrix to prolong exposure to growth factors. His company, OroGen Bioscience, developed a method patent for processing blood to produce Cytokine-Rich Plasma. His treatment technique involves the use of an anti-inflammatory diet, medications, depot injections, and Dermapen microneedling or rollers. He estimates 70% of patients return for additional hair treatments.

In Beverly Hills, California, Baubac Hayatdavoudi, MD, reports success using PRP with follicular unit extraction for hair transplantation surgery in the scalp, as well as PRP monotherapy to increase follicular density and induce anagen in telogen (resting) follicles.

Gordon Sasaki, MD, FACS, co-author of this article, is combining PRP depot injections with Dermapen microneedling to enhance the topical absorption of PRP in the scalp. Microneedling creates thousands of microchannels in the epidermis to stimulate growth and healing.

Each microchannel serves as an express conduit for PRP absorption through the epidermis and a center of the cascade of wound healing in an enhanced cauldron of human growth factors. Dr. Sasaki believes that microneedling itself has a positive effect on the early stages of AGA.

Garry Lee, MD, co-author of this article, uses PRP depot injections alone and in conjunction with microneedling, and is in the process of adding medications and LED laser treatments to treat hair loss.

## TREATMENT PROTOCOLS

Patient selection is critical for success. Drs. Lee and Sasaki exclude patients with advanced AGA (Norwood V-VII or Ludwig III). This includes patients with traumatic alopecia and autoimmune alopecia, as they may have insufficient adnexal normal tissue to mount an adequate response. The concern with autoimmune alopecia is that even if the healing cascade is stimulated and anagen prolonged, the baseline autoimmune etiology may counter treatment efforts.

Contraindications for treatment with PRP include: significant platelet dysfunctions; hypofibrinogenemia; local infection or septicemia; pregnancy; poor blood clotting; keloid-prone patients; sensitivity to bovine thrombin—if used; and hemodynamic instability.

Prior to treatment, Dr. Sasaki obtains labs including CBC with platelets; serum iron; and estrogen, testosterone, thyroid, pituitary and antibody panels. He follows with

photography and computerized microphotography hair count at tattooed alopecic sites.

He prepares the scalp with an iodine-povidone preparation. Next, 60cc of whole blood are drawn, utilizing the Smart PRP system (Harvest Technologies, harvesttech.com) to yield 7cc to 10cc of inactivated PRP. He then uses the Dermapen microneedling device in a stamp technique over the entire marked scalp with three passes, respectively at 0.5mm depth, 1.0mm depth and 1.5mm depth, so that the microinjuries reach all relevant dermal levels to elicit the maximal response.

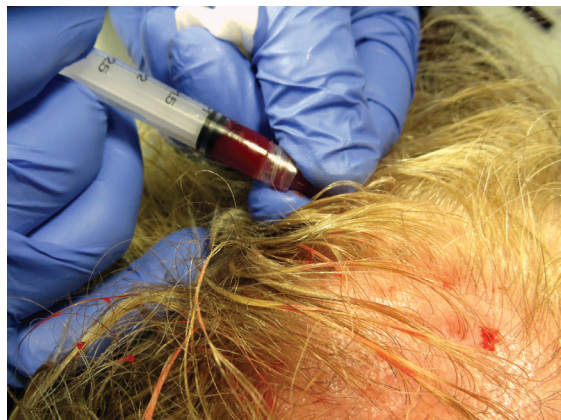
For pain reduction, he injects 0.1cc of 0.25% lidocaine without epinephrine into 60 to 70 sites on the scalp, spaced about 1cm apart. He then injects 0.1ml of the PRP into each of the sites in depot fashion by withdrawing a 23-gauge needle from the deep dermis to the superficial dermis—where most hair follicles are located—with slow injection using a tuberculin syringe.

He follows the injections with LED light (660nm-950nm) exposure for 5 to 10 minutes. This is repeated at weekly intervals for up to six months. Patients are counseled to use a gentle, daily hair shampoo and conditioner. A three-day course of antibiotic and pain medications may be given, and minoxidil or finasteride use may be resumed three weeks after treatment with follow-up exams at three-month intervals for at least a year.

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Dr. Sasaki expects to see new hair growth about six months after the procedure, and patients have reported satisfactory to good results over the past two years. Although the optimal number of PRP treatments and intervals has yet to be determined, Dr. Sasaki recommends repeating the procedure on an annual basis.

Dr. Lee also uses the Smart PRP system (Harvest Technologies, harvesttech.com) with 60cc of whole blood to derive PRP. The process is similar to Dr. Sasaki's in many respects, though the anesthesia protocol differs in that benzocaine 20%/lidocaine 6%/tetracaine 6% (BLT) is applied only to clearly balding areas. The scalp is then covered for 30 minutes with plastic hair color protective caps. There have been no issues with lidocaine toxicity with such a limited surface area, quantity and duration of exposure, despite improved absorption with plastic occlusion.



**Garry R. Lee, MD, performing depot injections of PRP to the scalp.**

Dr. Lee injects the PRP retrograde using a 30-gauge needle. He typically injects three or four 3cc syringes into clearly bald or balding areas. (Injections may traumatize healthy follicles, so Dr. Lee restricts injections to patently bald or balding areas.) The injections are spaced at 1cm intervals, totaling 30 to 50 treatment areas.

As with any injection, risks include bleeding, bruising, tenderness and infection. Potential complications include cutaneous eruptions, post-traumatic hyperpigmentation, inflammation, itching, hypertrophic scars and allergic reactions.

With such a compelling premise, the application of PRP is becoming more and more prevalent—despite little evidence-based medicine—in widely diverse fields where the promotion of healing and tissue growth are beneficial. These include dentistry, surgery, dermatology, aesthetics and hair growth. We believe that the use of PRP today is in its infancy and will grow exponentially in the coming years. **ME**

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