Surgical/Interventional Approach to Hair Restoration in Black Women

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HAIR LOSS CLINIC NEW YORK CITY
Hair Transplantation

- Based on the theory of donor dominance
- Outpatient, local anesthesia dermatologic surgery procedure
- High physician and patient satisfaction
- Low rate of medical and surgical complications
HT Approach in AA Women

- Most Commonly Performed for
  - Traction Alopecia
  - Central Centrifugal Cicatricial Alopecia
Traction Alopecia

- Most common type of hair loss in African American women
- African-American girls
  - Traction alopecia in 18% age 5-14 yrs
FFA mimicking traction alopecia
Hair Transplant for Traction Alopecia
Hair Transplant for Traction Alopecia

Before

After
Technical Considerations for HT with Scarring Alopecia
Traumatic Hairstyles with CCCA
Wig/Weave Adhesives/Attachments

**Tape**

1. [Image of applying tape]
2. [Image of folding tape]
3. [Image of securing tape]
4. [Image of final result]

**Wig Cap**

- One size fits all
- Thin stocking fabric
- Ultra stretch

**Wig/Weave Adhesive Glue**

- 2 pcs.
- 30 sec. Anti-Fungal
- Super Hair Bond Glue

- Professional grade
- For all hair types

** Clips**

- [Images of hair clips]
Satin-Lined Protective wear

Protective Bands
Scarring Alopecia

- Androgenetic alopecia considered normal variant of aging
- Scarring alopecia can be more cosmetically disfiguring
- Separate technical considerations
CCCA mimicking FPHL
How I treat CCCA

- Aggressively
- Education
- Intralesional kenalog
- Oracea
- Spironolactone (if e/o hyperandrogenism)
- Minoxidil
General Guidelines for HT in Scarring Alopecia

- **Same general principles**
  - Anesthesia
  - Graft Creation
  - Graft Placement
  - Postop care

- **Differences**
  - Candidate selection
  - Managing patient expectations
  - Donor harvesting
  - Recipient site creation
  - Number of surgeries performed
<table>
<thead>
<tr>
<th></th>
<th>Scarring alopecia</th>
<th>Non scarring alopecia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of sessions</strong></td>
<td>Consider test area, then 2-4 sessions</td>
<td>1-2 sessions</td>
</tr>
<tr>
<td><strong>Donor area</strong></td>
<td>More unpredictable</td>
<td>More predictable safe donor area</td>
</tr>
<tr>
<td><strong>Recipient area</strong></td>
<td>Disease must be inactive for at least 1-2 years</td>
<td>May have ongoing disease activity</td>
</tr>
<tr>
<td></td>
<td>Transplant with lower densities due to altered vascular supply and fibrotic tissue</td>
<td>Can transplant at higher densities</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td>Decreased graft survival</td>
<td>Most grafts survive and grow</td>
</tr>
<tr>
<td></td>
<td>Less coverage can be achieved with each surgery</td>
<td>More coverage can be achieved with greater cosmetic satisfaction</td>
</tr>
</tbody>
</table>
A. African American female with diffuse scarring alopecia due to CCCA. Example of extension of scarring alopecia into occipital donor area. B. Diminished density in donor area due to involvement of scarring alopecia.
Strip Excision with Curly Hair
Recipient Area

- **Vascular Supply**
  - Decreased
  - Can lead to decreased graft survival
  - Dense packing NOT advised
  - Test spots
  - 2-5% minoxidil topically one week preop or pentoxyphylline 400 mg 2 weeks preop

- **Scalp Thickness and Fibrosis**
  - Hypertrophic scars deeper
    - Need deeper incisions
  - Atrophic scars
    - Incisions at more acute angle, less subcutaneous fat
Hair Transplant for CCCA

- Transplant into scarring alopecia take special technical considerations
- Recipient area with decreased blood supply and fibrotic scar tissue
- Recommend perform test site
- Perform smaller, lower density surgeries once a year
- Until desired coverage is achieved
What happens when CCCA is transplanted without work up
Hair Transplant in CCCA

Before

After
Summary

- If caused by inflammatory alopecia, disease should be inactive without progression and inactive on biopsy for 1-2 years.
- Consider starting with a test area with decreased density.
- Perform smaller, less dense sessions every 9-12 months.
- Consider minoxidil to improve blood flow.
- Consider making incisions at acute angle.
Platelet Rich Plasma
Platelet Rich Plasma

- Various growth factors (VEGF, EGF, IGF, FGF) play a fundamental role in the life-long cyclic transformation of the hair follicle.
- Platelets play active role in wound healing and release PDGF, TGF-beta, and VEGF when activated.
- PRP has been used in the past to prevent infection and speed up the wound healing process by reducing bleeding/swelling after surgery by the plastic-, dental-, general-, neuro-, and orthopedic surgeons.
- Autologous concentrated (4-7x) platelets in small volume of plasma
- Taken from patient’s own blood and processed in automated centrifuge
- Injected subcutaneously in alopecic area
PLATELET RICH PLASMA THERAPY

1. Blood Sampling
2. Separating Platelets
3. Plasma Concentration
4. PRP Injection

Final Result
Proposed Mechanism for PRP use in Hair Loss

- **Upregulates B-catenin**
  - Stimulates follicular bulge stem cells

- **Activates kinase signaling pathways**
  - Prolonged Dermal Papillar cell survival

- **Upregulates Fibroblast growth factor 7**
  - Extends Anagen hair cycle

- **Increases surrounding vascularity**
  - Release of platelet-derived growth factor
Evidence for Hair Growth with PRP

- **Ubel et al 2005**
  - 23 hair transplant patients.
  - 2.5 sq cm areas were planted with 20 grafts/sq cm with PRP enriched grafts vs without.
  - 1 yr postop PRP enriched grafts yielded 18.7 FU/sq cm vs 16.4 FU/sq cm
  - 15.7% increase in follicular density


- **Li et al, in vivo mice study.**
  - Mice received subcutaneous injections of PRP compared with control mice.
  - Activated PRP increased dermal papilla cell proliferation and induced faster transition to anagen phase than in control after 3 weeks.
  - Upregulated beta catenin and FGF7, potent upregulators of hair growth

Pilot studies with PRP

- Pilot study for androgenetic alopecia
  - 64 patients receiving PRP at initial visit and 3 months later and followed for 6 months.
  - Some improvement was seen in all patients by one evaluator and in 62 by the other.
  - Proportion of patients reaching a clinically important difference was 40.6% and 54.7%, according to the two evaluators, respectively.

- Pilot study in alopecia areata.
  - 45 patients randomized to 3 monthly treatments of intralesional PRP, triamcinolone or placebo on half the head and followed for a year.
  - PRP had significant increase in regrowth and burning or itching sensation compared to triamcinolone or placebo. No side effects.

Schiavone et al PLATELET RICH PLASMA FOR ALOPECIA ANDROGENETICA: A PILOT STUDY, accepted Derm Surgery 2014
Trink A, A randomized, double-blind, placebo- and active-controlled, half-head study to evaluate the effects of platelet-rich plasma on alopecia areata. BJD 2013 Sep;169(3):690-4.
• 3 treatments qmonthly (mean 1,484,555 platelets/microliter.
• Showed increased epidermal thickness, follicle number, increased hair count and density
• Cervelli et al, Biomed Res Int. 2014
TRACTION ALOPECIA TREATED WITH HAIR TRANSPLANTATION THEN PLATELET RICH PLASMA AT 6 MONTHS POST TRANSPLANT TO ENHANCE THE HAIR RESTORATION
Trink A, A randomized, double-blind, placebo- and active-controlled, half-head study to evaluate the effects of platelet-rich plasma on alopecia areata. BJD 2013 Sep;169(3):690-4.
Before: Alopecia Totalis failed intralesional steroids x 1 year

6 weeks After treatment with PRP with Fibrin-Rich Matrix

18 weeks After 3 treatments with PRP with Fibrin-Rich Matrix
Before/6 months s/p last PRP tx
Luxiq and minoxidil x 1 month

2 months s/p PRP with Fibrin Rich Matrix

4 months s/p PRP with Fibrin Rich Matrix x 2

2 month fup
PRP + Extracellular Matrices

- Adjuvant to enhance efficacy in human and equine studies (Hair Transplantation 2015)
- Microparticles dalteparin and protamine
- A-cell MatriStem (Acell, Inc, Columbia, MD)
- Selphyl Fibrin Rich Matrix (Aesthetics Factor, Bethlehem, PA)
- Cellular Matrix PRP plus Hyaluronic Acid (RegenLab SA)

A) Baseline B) 22 weeks after PRP with ACell

Wesley. Aesthetic Series. Hair Transplantation 2015
Platelet and growth factor concentrations in activated platelet-rich plasma: a comparison of seven commercial separation systems

Satoshi Kushida · Natsuko Kakudo · Naoki Morimoto · Tomoya Hara · Takeshi Ogawa · Toshihito Mitsui · Kenji Kusumoto
**Table 1** Protocols for the platelet-rich plasma separation systems tested

<table>
<thead>
<tr>
<th>System</th>
<th>Number of centrifuge times</th>
<th>Centrifuge force and time</th>
<th>Features</th>
<th>Preparation process</th>
<th>Whole blood volume (mL)</th>
<th>Final volume of PRP (mL)</th>
<th>Cost/kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP200</td>
<td>2</td>
<td>1,000×g 6 min 800×g 8 min</td>
<td>Tube centrifugation</td>
<td>Open system</td>
<td>20</td>
<td>1</td>
<td>$50</td>
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<tr>
<td>GLO PRP</td>
<td>2</td>
<td>1,800×g 3 min 1,800×g 6 min</td>
<td>Tube centrifugation</td>
<td>Semi-closed system</td>
<td>8.5</td>
<td>0.6</td>
<td>$95</td>
</tr>
<tr>
<td>MAGELLAN</td>
<td>2</td>
<td>610×g 4 min 1,240×g 6 min</td>
<td>Fully automated centrifugation</td>
<td>Closed system</td>
<td>60</td>
<td>3</td>
<td>$500</td>
</tr>
<tr>
<td>KYOCERA</td>
<td>2</td>
<td>600×g 7 min 2,000×g 5 min</td>
<td>Tube centrifugation</td>
<td>Semi-closed system</td>
<td>20</td>
<td>2</td>
<td>$100</td>
</tr>
<tr>
<td>Selphyl</td>
<td>1</td>
<td>525×g 15 min</td>
<td>Gel separation</td>
<td>Semi-closed system</td>
<td>8</td>
<td>2</td>
<td>$215</td>
</tr>
<tr>
<td>MyCells</td>
<td>1</td>
<td>2,054×g 7 min</td>
<td>Gel separation</td>
<td>Closed system</td>
<td>10</td>
<td>1</td>
<td>$120</td>
</tr>
<tr>
<td>Dr. Shin’s System</td>
<td>1</td>
<td>1,720×g 8 min</td>
<td>Tube centrifugation</td>
<td>Semi-closed system</td>
<td>8.5</td>
<td>1</td>
<td>$190</td>
</tr>
</tbody>
</table>

**Fig. 1**

A. Platelet concentrations, B. red blood cell concentrations, C. white blood cell concentrations of PRP with JP200, GLO PRP, Magellan Autologous Platelet Separator System, KYOCERA Medical PRP Kit, SELPHYL, MyCells, and Dr. Shin’s System THROMBO KIT. Data are presented as mean ± SD (**p < 0.01; *p < 0.05**).
Considerations

- Currently, there is no consensus regarding the use of PRP.
- Does adding a form of scaffolding (ie Fibrin Rich Matrix vs Acell) increase efficacy?
- Similar to minoxidil and finasteride, is PRP an indefinite treatment that requires continuous follow-up treatments?
  - Greco et al found terminal hairs lasted up to 8 months
- What is the ideal preparation and concentration of PRP?
  - Leukocyte and Fibrin content Inclusion
  - Pure PRP vs Leukocyte-containing PRP vs Platelet Rich Fibrin
  - Giusti et al, optimal concentration for angiogenic potential is 1,500,000 platelets/micro litre
- What is the ideal frequency of injections and how many should the patient undergo?
- Given the cost of the therapy, how does this treatment compare to more well-documented therapies such as minoxidil, finasteride or even low-level light stimulation?
- Larger randomized-control human trials will help to clarify these issues.
Scalp Micropigmentation

- “Medical Hairline Tattoo”
- Natural pigments are applied at the epidermal level
- Replicates natural appearance of follicles
- Can take up to 3 sessions ~3-4 hrs each
- More gradual and subtle improvement.
- Adjunct with HT to incr perceived density
Thank You!