FRONTAL FIBROSI NG ALOPECIA

JERRY SHAPIRO, MD, FAAD
PROFESSOR
DIRECTOR
DISORDERS OF HAIR
AND SCALP

South Eastern Consortium
Durham, North Carolina
Disclosures

• Consultant/Investigator for:
  • Aclaris
  • Samumed
  • Incyte
  • Applied Biology
  • Biologics MD
  • Replicel Life Sciences Inc.
  • RegenLab
  • Bioniz
  • Cassiopea
  • Non approved uses of Naltrexone and Pioglitazone
MY MEDICAL PRACTICE

• Unique in that my practice is restricted to only disorders of the scalp and hair

• 1 hour per patient

• Patient ends the consultation, not I

• 35% alopecia areata

• 30% cicatricial alopecia

• 35% pattern hair loss and telogen effluvium
# My clinic epidemiology on alopecia types

<table>
<thead>
<tr>
<th>Alopecia Type</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Androgenetic alopecia</td>
<td>33% (66)</td>
</tr>
<tr>
<td>Frontal fibrosing alopecia</td>
<td>23% (46)</td>
</tr>
<tr>
<td>Alopecia areata</td>
<td>16.5% (33)</td>
</tr>
<tr>
<td>Acute telogen effluvium</td>
<td>9.5% (19)</td>
</tr>
<tr>
<td>Lichen planopilaris</td>
<td>10% (20)</td>
</tr>
<tr>
<td>Central centrifugal cicatricial alopecia</td>
<td>4.5% (9)</td>
</tr>
<tr>
<td>Lichen simplex chronicus</td>
<td>1.5% (3)</td>
</tr>
<tr>
<td>Chronic telogen effluvium</td>
<td>1.5% (3)</td>
</tr>
<tr>
<td>Folliculitis decalvans</td>
<td>0.5% (1)</td>
</tr>
</tbody>
</table>
Bolduc C. Sperling, L. Shapiro J
Clinical Indications for treatment

Activity

• Hyperkeratosis
• Erythema
• Pull test positive
• Symptomatic (itch, burn and pain)
Fotofinder: quantification and quality assessment
Fotofinder: quantification and quality assessment
Frontal Fibrosing Alopecia (FFA): overview

- Typically occurs on the frontotemporal region of the scalp, but upper periauricular and occipital localization are not uncommon.
- The band of alopecia is often readily distinguishable from the sun damaged skin of the forehead.
- Most common in postmenopausal women, but 15% of cases occur in younger; may occur in men.
- Usually presents in patients who are between 55 and 65 years of age.
Frontal Fibrosing Alopecia (FFA): clinical manifestations

- Loss of the eyebrows
- Facial papules reflect vellus hair involvement
- Frontal recession can be measured by the distance between the glabella and frontal hairline
FACIAL PAPULES OF FFA
Scarring Alopecias

• Lichen Planopilaris and FFA

Fig 9. Trichoscopy of lichen planopilaris reveals perifollicular scaling. Scales migrate along the hair shafts and form tubular structures that cover the proximal portion of the emerging hair shaft (tubular perifollicular scaling). (Original magnification: ×20.)

Fibrotic white dots in lichen planopilaris.
Medical Therapy for Frontal Fibrosing Alopecia: A Review and Clinical Approach

Anthony Ho, BA, Jerry Shapiro, MD

PII: S0190-9622(19)30524-9
DOI: https://doi.org/10.1016/j.jaad.2019.03.079
Reference: YMJD 13330

To appear in: Journal of the American Academy of Dermatology

Received Date: 22 August 2018
Revised Date: 24 March 2019
Accepted Date: 27 March 2019
Frontal fibrosing alopecia: a retrospective clinical review of 62 patients with treatment outcome and long-term follow-up

Nusrat Banka1, MD, Thamer Mubki1,2, MD, Mary Jo Kristine Bunagan1, MD, Kevin McElwee1, PhD, and Jerry Shapiro1, MD, FRCPC

Department of Dermatology and Skin Sciences, University of British Columbia, Vancouver, BC, Canada; and Department of Dermatology, Al Ain Mohamed bin Saud Islamic University (MBSI), Riyadh, Saudi Arabia

Correspondence
Jerry Shapiro, MD, MSc, Department of Dermatology and Skin Sciences University of British Columbia, Rob W. 10.4, Vancouver, BC, V6Z 1Z8, Canada
E-mail: jerry.shapiro@ubc.ca

Background

Frontal fibrosing alopecia (FFA) is a distinctive form of scarring alopecia presenting with frontal and temporal recession of the hairline. Its etiology remains unknown and there are no universal treatment guidelines. We conducted a retrospective cohort study to delineate the clinical findings and treatment outcomes of 62 patients with frontal fibrosing alopecia, one of largest cohorts to date.

Methods

Data analysis from case notes was performed on 62 patients with diagnosis of frontal fibrosing alopecia seen from January 2004 to March 2017. Except for one male, all patients in this cohort were females (80% postmenopausal) and mostly Caucasians (81%). Age at onset was between 18 and 61 years. While 33% reported no symptoms, the majority (85%) had itching, pain, or burning sensations. All patients had frontal hairline recession and 81% had complete or partial loss of eyebrows. Perifollicular erythema and perifollicular hyperkeratosis occurred in 73% and 31%, respectively. Associated autoimmune connective tissue diseases were observed in 14% of patients. Reduction in symptoms and hairline stabilization were achieved in 77% of treated patients with intralesional corticosteroids. Thirty-one percent of patients were able to stop treatments and remained in remission for 6 months to 8 years.

Conclusions

Frontal fibrosing alopecia is increasingly seen in postmenopausal women and rarely in men. Despite the limitations of a retrospective study, we conclude early intervention and treatment with intralesional triamcinolone acetonide may halt the progression of the disease; however, further controlled prospective studies are needed to establish treatment guidelines for frontal fibrosing alopecia.

Abstract

Background

Frontal fibrosing alopecia (FFA) is a distinctive form of scarring alopecia presenting with frontal and temporal recession of the hairline. Its etiology remains unknown and there are no universal treatment guidelines. We conducted a retrospective cohort study to delineate the clinical findings and treatment outcomes of 62 patients with frontal fibrosing alopecia, one of largest cohorts to date.

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Frontal fibrosing alopecia is increasingly seen in postmenopausal women and rarely in men. Despite the limitations of a retrospective study, we conclude early intervention and treatment with intralesional triamcinolone acetonide may halt the progression of the disease; however, further controlled prospective studies are needed to establish treatment guidelines for frontal fibrosing alopecia.
Prognosis, treatment, and disease outcomes in frontal fibrosing alopecia: A retrospective review of 92 cases

J Am Acad Dermatol
January 2018

Lauren C. Strazzulla, BA,
Lorena Avila, MD,
Xiaoxue Li, PhD,∗,∗∗
Kristen Lo Sicco, MD,∗∗ and
Jerry Shapiro, MD
Patient Demographics

Total: 92
Women: 90
Men: 2

Eyebrow involvement: 96%
Symptoms: 14%
Autoimmune disease: 11%
<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease stabilization, % (n)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>70.7 (65)</td>
</tr>
<tr>
<td>No</td>
<td>29.3 (27)</td>
</tr>
<tr>
<td>Time to stabilization, months</td>
<td></td>
</tr>
<tr>
<td>Average (range)</td>
<td>10.4 (1-72)</td>
</tr>
<tr>
<td>Intralesional treatment, % (n)</td>
<td></td>
</tr>
<tr>
<td>Triamcinolone acetonide</td>
<td>71.7 (66)</td>
</tr>
<tr>
<td>Systemic treatments, % (n)</td>
<td></td>
</tr>
<tr>
<td>Hydroxychloroquine</td>
<td>34.8 (32)</td>
</tr>
<tr>
<td>Antibiotics: doxycycline, tetracycline, or minocycline</td>
<td>70.7 (65)</td>
</tr>
<tr>
<td>Methotrexate</td>
<td>4.3 (4)</td>
</tr>
<tr>
<td>Spironolactone</td>
<td>2.2 (2)</td>
</tr>
<tr>
<td>Finasteride / dutasteride</td>
<td>26.1 (24)</td>
</tr>
<tr>
<td>Mycophenolate mofetil</td>
<td>3.2 (3)</td>
</tr>
<tr>
<td>Pioglitazone</td>
<td>6.5 (6)</td>
</tr>
<tr>
<td>Systemic prednisone</td>
<td>2.2 (2)</td>
</tr>
<tr>
<td>Topical treatments, % (n)</td>
<td></td>
</tr>
<tr>
<td>Tacrolimus, 0.3% (in Cetaphil cleanser)</td>
<td>41.3 (38)</td>
</tr>
<tr>
<td>Clobetasol propionate, 0.05% lotion or foam and betamethasone dipropionate, 0.05% lotion</td>
<td>23.9 (22)</td>
</tr>
<tr>
<td>Hydrocortisone butyrate, 0.1% solution</td>
<td>54.3 (50)</td>
</tr>
<tr>
<td>Minoxidil, 5% solution or foam</td>
<td>67.4 (62)</td>
</tr>
<tr>
<td>Adverse effects, n (event type)</td>
<td></td>
</tr>
<tr>
<td>Pioglitazone</td>
<td>2 (muscle pain, nausea)</td>
</tr>
<tr>
<td>Mycophenolate mofetil</td>
<td>1 (elevated liver enzymes)</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>5 (nausea, candida infection, esophagitis)</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>9 (nausea, lightheadedness, gastroesophageal reflux, candida infection, palpitations, photosensitivity, skin eruption)</td>
</tr>
<tr>
<td>Hydroxychloroquine</td>
<td>4 (hyperpigmentation, allergic reaction)</td>
</tr>
<tr>
<td>Intralesional triamcinolone acetonide</td>
<td>1 (skin atrophy)</td>
</tr>
<tr>
<td>Tacrolimus, 0.3% (in Cetaphil cleanser)</td>
<td>1 (skin irritation)</td>
</tr>
<tr>
<td>Methotrexate</td>
<td>1 (leukopenia)</td>
</tr>
</tbody>
</table>
Photos for FFA
How do I measure?

FFA

Glabella to hair line

Right and left outer canthi to hair line

Sides to hair line
Right outer canthus to hairline

Giabella to hairline

Left outer canthus to hairline

Sideburns

Sideburns
Figure 1. Frontal Fibrosing Alopecia. Treatment algorithm

- FFA
  - Rapidly progressive: Oral prednisone 40 mg/d x 1 wk, taper by 5 mg/wk for 8 wks
  - Slowly progressive: Initiate maintenance therapy
  - Hairline recession < 1 cm: TCM* bid + IL-TAC 2.5 mg/ml/m
    - No improvement: Initiate HCQ 200 mg bid
    - Stable on current treatment regimen for 6-12 months: Consider tapering to lowest effective dose
  - Hairline recession ≥ 1 cm: TCM* bid + IL-TAC 2.5 mg/ml/m + 5α-R1**
    - No improvement: Initiate doxycycline 100 mg bid
      - No improvement: Initiate pioglitazone 15 mg/d
        - No improvement: Initiate naltrexone 3 mg/d
        - Other options: MMF, MTX, Cyclosporine, Oral retinoid, Low level laser

* TCM: tacrolimus 0.3% in cetaphil cleanser + clobetasol solution + minoxidil 5% solution
** Finasteride 5 mg/d (premenopausal) or Dutasteride 0.5 mg/d (postmenopausal)
Frontal Fibrosing Alopecia (FFA)

- **TOPICAL/INTRALESIONAL Treatment:**
  - Corticosteroids: reduce pruritus
  - Calcineurin inhibitors:
  - Minoxidil
  - Intralesional Corticosteroid: Kenalog 2.5mg/cc, 3cc
Frontal Fibrosing Alopecia
Intralesional triamcinolone acetonide
2.5 mgs/cc X 3cc ear to ear
Lichen Planopilaris (LPP)

- New treatments:
  - Pioglitazone (PPAR gamma agonist): 15-30mg/day;
  - Naltrexone (anti-opioid): 3mg daily, reduction of the symptoms
  - Excimer laser (308 nm ultraviolet B light)

PPAR gamma is essential for healthy pilosebaceous units and it is significantly decreased in LPP patients.
Figure 1. Frontal Fibrosing Alopecia. Treatment algorithm

FLOWCHART:

- **FFA**
  - Rapidly progressive
    - Oral prednisone 40 mg/d x 1 wk, taper by 5 mg/wk for 8 wks
  - Slowly progressive
    - Initiate maintenance therapy

- **Hairline recession < 1 cm**
  - TCM* bid + IL-TAC 2.5 mg/ml/m
  - No improvement

- **Hairline recession ≥ 1 cm**
  - TCM* bid + IL-TAC 2.5 mg/ml/m + 5α-R1**
  - No improvement
    - Initiate HCQ 200 mg bid

- Stable on current treatment regimen for 6-12 months
  - Consider tapering to lowest effective dose

- Other options:
  - MMF
  - MTX
  - Cyclosporine
  - Oral retinoid
  - Low level laser
Twice as many women in the FFA group regularly used a sunscreen compared with controls, a difference that was highly significant.
What is new?

- The time course of sunscreen use by the population does seem to parallel the apparent increase in the incidence of FFA.
- To some extent the predominant distribution of FFA corresponds with the usual sites of moisturiser and sunscreen application.
FFA and Sunscreens

• Studies with men and women support the conclusion that there is an association between FFA and the use of facial moisturisers and sunscreens.

• Ingredients possibly to avoid: Oxybenzone and Avobenzone introduced by FDA in 1988. First cases of FFA reported in 1994

• Better sunscreens: mineral types
  • Zinc oxide
  • Titanium dioxide
Ultraviolet filters in hair-care products: a possible link with frontal fibrosing alopecia and lichen planopilaris

J. Callander, J. Frost, N. Stone

First published: 10 October 2017 | https://doi.org/10.1111/ced.13273

https://library.nyu.edu/getit.gif

Conflict of interest: the authors declare that they have no conflicts of interest.
Frontal fibrosing alopecia: there is no statistically significant association with leave-on facial skin care products and sunscreens

S.D. Seegobin, C. Tziotzios, C.M. Stefanato, K. Bhargava, D.A. Fenton, J.A. McGrath

First published: 10 September 2016 | https://doi.org/10.1111/bjd.15054 | Cited by: 7

https://library.nyu.edu/getit.gif
Letter to the Editor

Response to ‘Frontal fibrosing alopecia in men: an association with facial moisturizers and sunscreens’

DOI: 10.1111/bjd.15464
FFA and Sunscreens

• Studies with men and women support the conclusion that there is an association between FFA and the use of facial moisturisers and sunscreens.

• Ingredients possibly to avoid: Oxybenzone and Avobenzone introduced by FDA in 1988. First cases of FFA reported in 1994.

• Better sunscreens: mineral types
  • Zinc oxide
  • Titanium dioxide
ARTICLE

https://doi.org/10.1038/s41467-019-09117-w

Genome-wide association study in frontal fibrosing alopecia identifies four susceptibility loci including HLA-B*07:02

Christos Tziotzios & et al.
FRONTAL FIBROSING ALOPECIA
PROCEDURAL DERMATOLOGY

Hair transplantation for the treatment of lichen planopilaris and frontal fibrosing alopecia: A report of two cases

You-Chen Serena Liu,1,2 Shiou-Hwa Jee2 and Jung-Yi Lisa Chan2,3

1Department of Dermatology, Hsinchu Cathay General Hospital, Hsinchu, 2Department of Dermatology, Cathay General Hospital, and 3Ferrari Skin and Hair Clinic, Taipei, Taiwan
<table>
<thead>
<tr>
<th>Authors</th>
<th>Age (years)/sex</th>
<th>Age at onset</th>
<th>Diagnosis/involved area</th>
<th>Duration of clinical remission before HT</th>
<th>Medical treatment</th>
<th>N of transplanted FU or hairs</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cevacou et al.</td>
<td>Unknown</td>
<td>Unknown</td>
<td>LPP/unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Stable disease with no response to treatment</td>
</tr>
<tr>
<td>Nusbaum and Nusbaum</td>
<td>44/M</td>
<td>Unknown</td>
<td>FFA/Temporal hairline</td>
<td>10 months</td>
<td>Topical halifenomide 0.1% solution, Intraderal triamcinolone acetonide 2.5 mg/L, Oral finasteride 1 mg/day from 10 months before HT to 15 months after HT, Oral hydroxycholrourine 400 mg/day for 6 months before HT</td>
<td>62 FU (D, T) on frontal hairline, FU transplantation</td>
<td>Hair growth after 5 months, excellent after 15 months; 6 single hairs after 4 years, posterior advancement of alopecia</td>
</tr>
<tr>
<td>Gurfinkel et al.</td>
<td>62/F</td>
<td>50</td>
<td>FFA/female pattern hair loss</td>
<td>Unknown</td>
<td>Unknown</td>
<td>2600 hairs (S, D, T) in two sessions on frontal and frontoparietal hairline</td>
<td>Hair growth after 5 months, 85% after 6 years</td>
</tr>
<tr>
<td>Jiménez and Pohllo</td>
<td>82/F</td>
<td>60</td>
<td>FFA/frontal hairline, sideburns, eyebrows, axillary and occipital areas</td>
<td>Unknown</td>
<td>Topical steroids, topical tacrolimus before HT</td>
<td>50 FU on nonactive frontal hairline</td>
<td>Hair growth after 5 months, 90% after 14 months, 20 FU after 2.5 years, 10 FU after 6 years with disease activation</td>
</tr>
<tr>
<td>70/F</td>
<td>FFA/frontal hairline, sideburns, eyebrows</td>
<td>Unknown</td>
<td>Intraderal and topical steroids, Oral finasteride 2.5 mg/day, and topical minoxidil before HT</td>
<td>80 FU on nonactive frontal hairline</td>
<td>100% after 10 months; 68 FU after 16 months with disease activation, 21 FU after 3 years, 6 FU after 7 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56/F</td>
<td>FFA/frontal hairline, sideburns</td>
<td>Unknown</td>
<td>Topical minoxidil, topical Intraderal steroids, and Oral finasteride 2.5 mg/day before HT</td>
<td>50 FU/55 hairs on left sideburn</td>
<td>100% after 1 year, 5 FU/11 hairs after 4 years without disease activation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our cases</td>
<td>40/F</td>
<td>57</td>
<td>FFA/frontal and temporal hairline, eyebrows</td>
<td>2 years</td>
<td>Oral hydroxycholorourine 400 mg/day, topical tacrolimus 0.1% ointment, Intraderal triamcinolone acetonide 2.5 mg/mL, topical flutinomide 0.05% solution before HT</td>
<td>560 FU (S, D, T)/ 950 hairs on frontal and temporal hairline, FU extraction</td>
<td>Hair growth after 5 months, favourable result after 14 months, stable after 4 years without disease activation</td>
</tr>
<tr>
<td>57/F</td>
<td>LPP (with FFA)/ frontal hairline and vertex</td>
<td>5 years</td>
<td>Intraderal triamcinolone acetonide 5 mg/mL, topical flutinomide 0.05% solution before HT</td>
<td>551 FU (S, D, T)/ 950 hairs on frontal hairline and vertex, FU extraction</td>
<td>5FU after 6 months, 80% after 10 months, stable after 5 years and 4 months</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D: double; FFA, frontal fibrousing alopecia; FU, follicular unit; HT, hair transplant; LPP, lichen planopilaris; S, single; T, triple.
Scarring Alopecias

- Trichologic emergency
- Early intervention can potentially avert scarring and secondary complications
- Ensure diagnosis with biopsy
- Trichoscopy helps in following up progress
- Disease-directed medical therapy is only indicated in those with active disease
- Adjunctive agents that can improve cosmeticis
- Topical minoxidil
- Hair transplantation

Take home message
PRP and micro-needling

JERRY SHAPIRO, MD, FAAD
PROFESSOR

South Eastern Consortium
Durham, North Carolina
Platelet Rich Plasma (PRP)

Cell-based therapy

Concentrated suspension of autologous platelets

1980’s: Orthopedic use for bone

2000’s: Skin rejuvenation

• “Vampire Facial”: PRP with microneedling

2010’s: Hair restoration
PLATELET-RICH PLASMA (PRP) TREATMENT PROTOCOL

Month 0
Assessment
PRP Treatment

Month 1
Assessment
PRP Treatment

Month 2
Assessment

No Response
+10 hairs/cm²

No further PRP
Continue other treatments

3/4/5/6 Month
Repeat assessment
PRP Treatment

PRP responses in androgenetic alopecia
NYU retrospective study on PRP

Trichologic response of platelet-rich plasma in androgenetic alopecia is maintained during combination therapy.

Ho A¹, Sukhdeo K¹, Lo Sicco K¹, Shapiro J².

Author information
1 Ronald O. Perelman Department of Dermatology, New York University, New York, New York.
2 Ronald O. Perelman Department of Dermatology, New York University, New York, New York. Electronic address: jerry.shapiro@nyumc.org.
**PATIENT COHORT DEMOGRAPHICS**

**Caucasian**: 71%

**Hispanic**: 12%

**Asian**: 17%

**Total**: 24

**Women**: 19

**Men**: 5

**Concurrent Therapies**

- Minoxidil: 24
- Finasteride: 17
- Spironolactone: 6
- Laser Therapy: 1
QUANTITATIVE INCREASES IN HAIR DENSITY

All patients
(N=24)

Start count: 155 hair/cm²
End count: 179 hairs/cm²
Mean Δ: +24 hairs/cm²
(P=0.022)
Trichologic Responses are Time-Dependent

- Segregation of responders vs non-responders after 2 months
- Most benefit achieved within 2 to 4 months
- No shock loss
PRP: Take Home Points

Can I use PRP with other treatments?

• No apparent downside to use PRP as combination therapy

What are the chances of it working?

• Nearly 3 out of 4 recipients of combination therapy show increased hair density

How much benefit can I expect?

• Average increase: +35 hairs/cm². No change in hair diameter.

Which people do worse with therapy?

• Patients with earlier-onset disease and lower baseline hair counts don’t respond as well

When will I see benefit?

• Usual response at 2-4 months, but may increase or decrease
Our PRP Protocol:

2 PRP sessions at 1 month intervals

Assessment with hair count and diameter

Successful response (hair density increase greater than 10 hairs/cm²)

Continue monthly PRP for more 4 months and reevaluate

YES

NO

Stop PRP
PRP clinical trial NYU

Clinicaltrials.gov

- Randomized, double blinded, placebo controlled study
- 50 men and women screened between 18-65 years old with androgenetic hair loss
- Blood tests to rule out diseases related to hair loss
  - Platelets > 150 000/ul
- Split scalp: PRP injection vs Saline injection
- Injected area is tattooed
- Funded by Regenlab
Dynamic Quantitative Trichoscopy Tracks Response

Baseline

6 months

Standard Photography

Handheld Dynamic Quantitative Trichoscopy
Summary:

For a better understanding, we need:

- large-scale double-blind, randomized controlled studies
- men and women included
- standardized PRP preparation methods and administration protocol
- repeated treatments
- standardized objective data documentation and evaluation
- physician and subject assessment
- analysis of effects of PRP in different grades of AGA
- long-term follow-up
When NOT to use PRP: presence of skin cancer on the head

Nodular BCC on the scalp
Microneedling Clinical Trial at NYU

• Split scalp; one side MN
• Both sides receive Minoxidil 5% foam bid
• Single blinded study
• Hair counts and diameters
• Treatment q 2 weeks for 20 weeks
MICRONEEDLING (MN)

Intra-dermabrasion

Length: 25 to 3000 microns

Transient epidermal and/or papillary dermal pores with disruption of dermal microcirculation

Mechanisms of action:

- Neo-angiogenesis
- Growth factor production

Breach of stratum corneum allows for more effective drug delivery

Bellus Medical SkinPen®

1.5–2 mm needle depth to reach deep dermis (scars)

0.25–1 mm needle depth to reach epidermis/papillary dermis (fine lines, pores, etc.)

Epidermis:
- Keratinocytes
- Melanocytes (pigment cells)

Dermis:
- Fibroblasts
- Collagen/elastin fibers

Breach of stratum corneum allows for more effective drug delivery
Microneedling (MN)

Mechanisms of action:

• Neo-angiogenesis, growth factor production

• Breach of stratum corneum allows for more effective drug delivery
Skin Pen II

Automated vibrating cartridge, stamp-like and fractionated

Variable length needles, set for 1.5 mm in our study

FDA registered as medical device

Bellus Medical SkinPen®
Our Study:

Evaluating the efficacy of dermal microneedling in the treatment of androgenetic alopecia: a dual-center, randomized, controlled, single-blinded pilot trial
Microneedling half head study
Microneedling

• Subjects were randomly allocated into 3 groups
  • Topical 5% minoxidil (group 1, n = 20),
  • Electrodynammic microneedle treatment (group 2, n = 20),
  • Electrodynammic microneedle treatment with topical 5% minoxidil (group 3, n = 20).
• Patients received microneedle treatments every 2 weeks, for a total of 12 times.
• The best therapeutic effect was observed in group 3: non-vellus and the total hair counts, the hair thickness, investigator assessment, and patient self-assessment
  • 80% of these patients showed greater than 50% improvement of hair growth
An Overview of the Biology of Platelet-Rich Plasma and Microneedling as Potential Treatments for Alopecia Areata

Lauren C. Strazzulla\textsuperscript{1}, Lorena Avila\textsuperscript{1}, Kristen Lo Sicco\textsuperscript{1} and Jerry Shapiro\textsuperscript{1}
• PRP may have the ability to induce a longer disease remission.

• Patients treated with PRP appeared to regrow pigmented hairs from the beginning of hair regrowth compared with 25% of those treated with TAC

• Non-standardized treatment protocols and methods for assessing response make it challenging to adequately assess the potential benefit of the treatments.
ACKNOWLEDGEMENTS

NYU Hair Research Group

Dr. Jerry Shapiro          Anthony Ho, MS3
Dr. Kristen Lo Sicco       Dr. Maura Bourroul (Brazil)
Dr. Loren Krueger         Dr. Lorena Avila (Brazil)
Dr. Nooshin Brinster      Lauren Strazzulla
Paul Curtiss              Katerina Svigos
Sarah Leventhal           Catherine Motosko
Garrett Yoon              Prag Batra
Thank you from NYU School of Medicine