Hair Loss in Lichen Planopilaris and Frontal Fibrosing Alopecia: Not Always Irreversible

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Established Facts

- Lichen planopilaris (LPP) and frontal fibrosing alopecia (FFA) are usually considered irreversible and a trichologic emergency.

Novel Insights

- LPP and FFA may be reversible with appropriate therapy.

Keywords

Alopecia · Biopsy · Frontal fibrosing alopecia · Lichen planopilaris · Reversible hair loss · Trichoscopy

Abstract

Introduction: We present 2 cases in which typically irreversible lichen planopilaris (LPP) and frontal fibrosing alopecia (FFA) showed signs of reversal. **Case Presentation:** A 27-year-old Caucasian man presented with hair loss and intense pruritus on the vertex scalp for 4 years with biopsy-proven LPP and having failed multiple pharmacologic modalities. Six months after adding oral tofacitinib and later dapsone, he demonstrated reduced scalp visibility, evidence of crown and vertex hair regrowth, and elimination of itch. A 45-year-

old premenopausal Hispanic woman presented with eyebrow loss for 3.75 years and hair loss for 9 months with biopsy-proven FFA. After beginning oral finasteride and hydroxychloroquine, triamcinolone injections, and topical minoxidil, she initially worsened over 11 months but subsequently improved over 6 months, demonstrating hair and eyebrow regrowth, reduction in glabella-hairline distance, and new absence of frontal hair line hyperkeratosis and inflammation. **Discussion/Conclusion:** Cicatricial alopecia involves inflammation with JAK-STAT upregulation. We report a positive clinical response in LPP to tofacitinib, a JAK1/3 inhibitor, and dapsone, an anti-neutrophilic agent. FFA is believed to involve autoimmune and/or hormonal processes. Here we report a positive clinical response to androgenic and immune modulators.

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Introduction

Lichen planopilaris (LPP) and frontal fibrosing alopecia (FFA) are usually considered irreversible conditions and trichologic emergencies [1]. However, there are recently reported reversible cases of FFA and LPP with oral JAK inhibitors [2]. Here we present 2 cases in which these conditions showed signs of reversal: one with a systemic JAK inhibitor in combination with dapsone and another involving polytherapy with topical, oral, and intralesional agents without a JAK inhibitor or dapsone.

Case Presentation

Case 1

A 27-year-old Caucasian man presented with scalp hair loss and intense vertex pruritus occurring over the previous 4 years (Fig. 1). The itch was not associated with any particular time of the day nor specific activities. The patient had not changed his usual hair practices at the onset of the alopecia. Aside from his grandfather with adult-onset male pattern hair loss, no other family members showed hair thinning. The patient did not report mucosal lesions.

A previous parietal scalp biopsy revealed scarring alopecia consistent with LPP. Previous management included monthly injections of triamcinolone acetonide (10 mg/mL) as well as courses of oral hydroxychloroquine, mycophenolate mofetil, and acitretin

that did not yield any perceived benefit. A course of naltrexone (4.5 mg/day) improved his scalp pruritus but not hair loss. At the time of presentation, the patient used minoxidil 5% solution and clobetasol 0.05% solution twice daily on the scalp. Owing to the inflammatory and refractory nature of the alopecia, the patient was started on a trial of oral tofacitinib 5 mg twice a day. Two months later, dapsone was added to his treatment regimen. The patient was followed with serial photography of the scalp as well as dynamic trichoscopy (FotoFinder, Columbia, MD) [3]. Within 4 months, the patient demonstrated reduced visibility of the scalp and evidence of regrowth of hair on the crown and vertex (Fig. 1). He also endorsed elimination of all itch.

Physical Examination

The patient was a well-developed Caucasian gentleman with straight red hair. On initial examination, the vertex scalp and crown showed multiple foci of follicular hair loss. Pull test was negative, while card test showed regrowing hairs [4]. Eyebrows, eyelashes, and body hair were unaffected. Oral mucosa was normal. Trichoscopy revealed a milky red “strawberry ice cream” background color with perifollicular and interfollicular scaling with small casts around the base of hair shafts (Fig. 1). Some miniaturized terminal hairs (<30 μ m caliber) were noted but overall terminal-to-vellus hair ratio was preserved.

Laboratory Data

A basic metabolic panel, liver function tests, and complete blood count were within normal limits. Tests for viral hepatitis A/B/C, human immunodeficiency virus, and tuberculosis were negative.

Fig. 1. Gross and trichoscopic images showing hair regrowth in a patient with lichen planopilaris after treatment with tofacitinib and dapsone. Note almost no hyperkeratosis with treatment.

Histopathology

A 4-mm punch biopsy from the left parietal scalp revealed loss of follicular units and perifollicular fibrosis. There were decreased numbers of terminal anagen hair follicles in addition to a perifollicular lymphocytic infiltrate focally obscuring the interface between the follicular epithelium and dermis of several hair follicles. Perifollicular fibrosis and polytrichia were also present (Fig. 2).

Case 2

A 45-year-old premenopausal Hispanic woman presented to clinic with loss of her eyebrows for the past 3.75 years that had spread to loss of hair at the top of her head 9 months prior (Fig. 3). Previous biopsies done in Colombia showed that she had frontal fibrosing alopecia. Prior surgeries included eye and nasal septum surgery. The patient had not undergone prior treatment as she had considered getting pregnant and all medical treatments were clas-

Fig. 2. Histopathologic images of 4-mm punch biopsy from left parietal scalp revealing loss of follicular units and perifollicular fibrosis.

Fig. 3. Gross images showing hair regrowth in a patient with frontal fibrosing alopecia after treatment with finasteride, hydroxychloroquine, and triamcinolone injections.

sified as C, D, or X. She was using avobenzone sunscreen but switched to a mineral sunscreen after her first office visit. On examination there was scarring and absence of ostia. Measurements showed an outer canthi-hairline distance of 8 cm, glabella-hairline distance of 7 cm, and outer canthi-sideburn distance of 6 cm. Trichoscopy showed scarring and slight scaling and inflammation. She was started on oral finasteride 5 mg daily, oral hydroxychloroquine 200 mg twice daily following consultation with an eye specialist, triamcinolone acetonide injections of 2.5 mg/mL placed 1 cm behind the hairline once per month, and one drop of minoxidil 5% solution applied twice daily to the eyebrows. She declined topical application of minoxidil, tacrolimus, and clobetasol to the scalp.

The patient initially worsened over the next 11 months, with the outer canthi-hairline distance increasing by 1 cm and glabella-hairline distance increasing by 1.5 cm as one might expect from FFA. However, after continuing the same treatment for 6 additional months, she demonstrated hair regrowth in these areas that was appreciable on photography (Fig. 3) and a reduction in glabella-hairline distance to the original 7 cm. Trichoscopy showed elimination of hyperkeratosis and evidence of inflammation on the frontal hair line. Her eyebrows also regrew (Fig. 3).

Discussion/Conclusion

Case 1

Inflammation is a defining feature of cicatricial alopecia [5]. The JAK-STAT pathway is upregulated in the keratinocytes and lymphocytes of several inflammatory dermatoses including psoriasis, atopic dermatitis, and lichen planus [6–8]. Tofacitinib, a JAK1/3 inhibitor, is used in rheumatologic conditions and more recently showed promising results in alopecia areata and psoriasis [8–10]. We report a positive clinical response in LPP to tofacitinib and dapsone.

The anti-inflammatory mechanism of dapsone is presumed to be through inhibition of neutrophil myeloperoxidase to prevent radical oxygen species formation. LPP is not typically a neutrophilic dermatosis, but we speculate that this agent may have aided in reducing the pro-inflammatory environment within the patient. Additional trials with patients using either tofacitinib or dapsone alone or in conjunction for LPP are needed.

Case 2

One factor for the patient's improvement may involve the fact that she was premenopausal, which may have improved the odds of reversibility at a younger age of disease onset. This appeared to be associated with a less severe disease course [11]. Another factor may involve the triamcinolone injections, which are not commonly used to treat FFA, as well as 0.3% topical tacrolimus, which ap-

pears to be associated with increased likelihood and shorter time for disease stabilization [11]. A third contributor may be the patient's change of sunscreen, as improvement in some FFA cases has been reported after cessation of sunscreens [12]. The presence of hair regrowth following treatment with triamcinolone and hydroxychloroquine is consistent with an autoimmune process. Triamcinolone has been previously reported in a case of FFA eyebrow regrowth [13]. The use of finasteride may imply a hormonal/androgen-related cause. Antiandrogenic drugs have been previously reported in cases of FFA improvement [14, 15]. Both merit further investigation for possible control of FFA with potential for reversibility if caught early on.

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Statement of Ethics

All published data and images have been de-identified. All subjects have given their consent to publish details and photos of the case.

Disclosure Statement

Author K.S. has an ownership interest in Pilaris Inc. Author J.S. has the following financial relationships with commercial interests: Aclaris Therapeutics Inc, Advisory Board, Honoraria; Applied Biology, Consultant, Honoraria; Bioniz Therapeutics, Advisory Board, Fees; Johnson & Johnson Consumer Products Company, Consultant, Honoraria; L'Oreal France, Consultant, Honoraria; RepliCel Life Sciences Founder, Stock; Samumed, LLC, Advisory Board, Honoraria; Allergan, Inc, Advisory Board, Honoraria; Cassiopea Spa, Advisory Board, Honoraria; Incyte Corporation, Consultant; RegenLab, Investigator, Grants/Research Funding; keeps.com, Advisory Board, Stock; Pfizer, Consultant; Honoraria; and Abbvie, Consultant; Honoraria.

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Author Contributions

J.S. and K.S. saw the patients in clinic. P.B., K.S., and J.S. contributed to writing and revising the manuscript.

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