Adjuvant Scalp Rolling for Patients With Refractory Alopecia Areata

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PRACTICE **POINTS**

- Alopecia areata (AA) is an autoimmune hair loss disorder with few effective treatments and no cure.
- Scalp rolling is a promising new treatment option that may stimulate hair regrowth by both direct collagen induction and indirect synergy with the use of topical medications.
- Dermatologists should be aware of scalp rolling as a safe, affordable, and potentially effective adjuvant to conventional therapy for AA.

To the Editor:

Alopecia areata (AA) is an autoimmune nonscarring hair loss disorder that can present at any age. Patients with AA have a disproportionately high comorbidity burden and low quality of life, often grappling with anxiety, depression, and psychosocial sequelae involving identity, such as reduced self-esteem.[1,2] Although conventional therapies aim to reduce hair loss, none are curative.[3] Response to treatment is highly unpredictable, with current data suggesting that up to 50% of patients recover within 1 year while 14% to 25% progress to either alopecia totalis (total scalp hair loss) or alopecia universalis (total body hair loss).[4] Options for therapeutic intervention remain limited and vary in safety and effectiveness, warranting further research to identify optimal modalities and minimize side effects. Interestingly, scalp rolling has been used as an adjuvant to topical triamcinolone acetonide.[3,5] However, the extent of its effect in combination with other therapies remains unclear. We report 3 pediatric patients with confirmed AA refractory to conventional topical treatment who experienced remarkable scalp hair regrowth after adding biweekly scalp rolling as an adjuvant therapy.

A 7-year-old boy with AA presented with 95% scalp hair loss of 7 months' duration (Figure 1A)(patient 1). Prior treatments included mometasone solution and clobetasol solution 0.05%. After 3 months of conventional topical therapy, twice-weekly scalp rolling with a 0.25-mm scalp roller of their choosing was added to the regimen, with clobetasol solution 0.05% and minoxidil foam 5% applied immediately after each scalp rolling session. The patient experienced 95% scalp hair regrowth after 13 months of treatment (Figure 1B). No pain, bleeding, or other side effects were reported.

An 11-year-old girl with AA presented with 100% hair loss of 7 months' duration (Figure 2A)(patient 2). Prior treatments included fluocinonide solution and intralesional Kenalog injections. After 4 months of conventional topical therapy, twice-weekly scalp rolling with a 0.25-mm scalp roller of their choosing was added to the regimen, with clobetasol solution 0.05% and minoxidil foam 5% applied immediately after each scalp rolling session. The patient experienced 95% scalp hair regrowth after 13 months of treatment (Figure 2B). No pain, bleeding, or other side effects were reported.

A 16-year-old boy with AA presented with 30% hair loss of 4 years' duration (Figure 3A)(patient 3).

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The authors report no conflict of interest.

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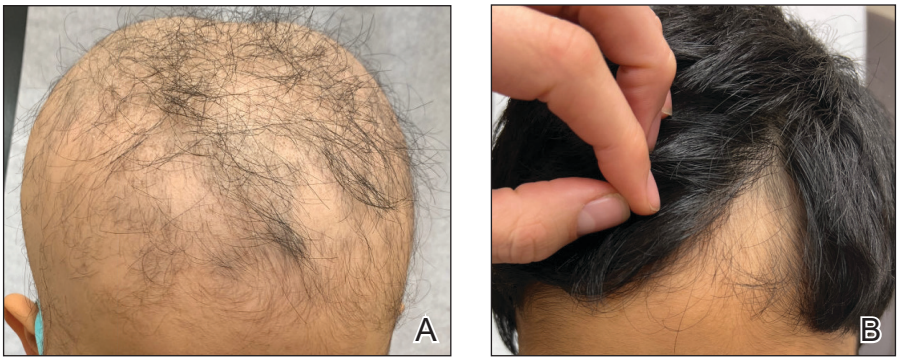

FIGURE 1. Alopecia areata in a 7-year-old boy. A, At baseline, 95% scalp hair loss was noted. B, Hair regrowth of 95% was observed 13 months later after the addition of scalp rolling to conventional therapy.

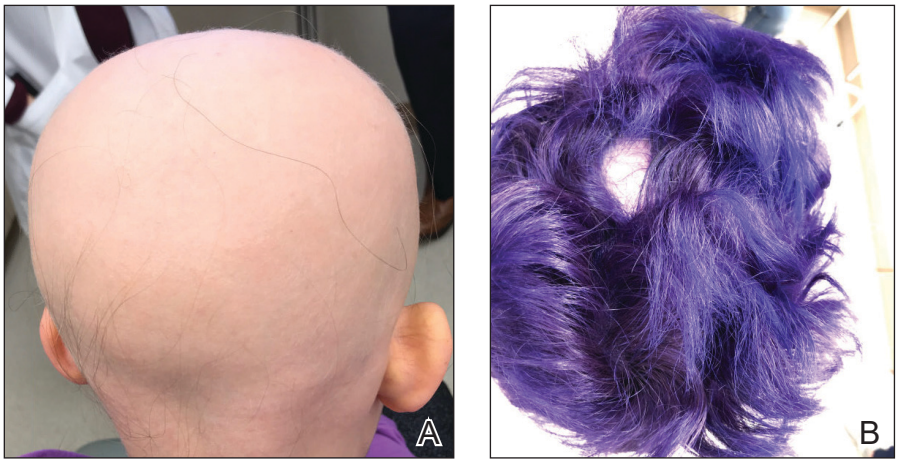

FIGURE 2. Alopecia areata in an 11-year-old girl. A, At baseline, scalp hair loss of 100% was noted. B, Hair regrowth of 95% was observed 13 months later after the addition of scalp rolling to conventional therapy.

Prior treatments included squaric acid and intralesional Kenalog injections. After 2 years of conventional topical therapy, twice-weekly scalp rolling with a 0.25-mm scalp roller of their choosing was added to the regimen, with clobetasol solution 0.05% and minoxidil foam 5% applied immediately after each scalp rolling session. The patient experienced 95% scalp hair regrowth at 17 months (Figure 3B). No pain, bleeding, or other side effects were reported.

Scalp rolling—also known as microneedling—provides a multifactorial approach to hair regrowth in patients with AA. The mechanism of action involves both the hair cycle and wound repair pathways by stimulation of the dermal papillae and stem cells.[6] Scalp rolling has been observed to induce the expression of several hair growth pathway mediators, such as *WNT3A*, β-catenin, vascular endothelial growth factor, and *WNT10B*.[7] Wnt/β-catenin pathway signaling is integral to multiple aspects of the hair regrowth process, including hair morphogenesis, follicle regeneration, and growth of the shaft itself.[8,9] Scalp rolling causes microinjuries to the skin, thereby diverting blood supply to the follicles and stimulating wound regeneration, a process suggested to induce follicle regeneration. This effect is due to increased expression of vascular endothelial growth factor after cutaneous injury, a mediator of both hair growth and cycling as well as wound repair.[7] Adjuvant scalp rolling creates a synergistic effect by facilitating absorption of topical and intralesional therapies. The physical breakdown of dermal capillary barriers creates microchannels that traverse the stratum corneum, improving the permeability of small-molecule substances and allowing for relatively painless and uniform delivery of combination therapies. A secondary benefit is hypertrophy, which counteracts the atrophy caused by topical steroids via collagen induction.[7]

Additionally, scalp rolling confers minimal risk to the patient, making it safer than conventional pharmacologic therapies such as corticosteroids or Janus kinase (JAK) inhibitors. Although intralesional steroid injections are first-line treatments for limited disease, they can cause pain and skin atrophy.[10] In one cohort of 54 patients, topical steroids were inferior to both oral and intralesional treatment, and oral steroids carried a systemic side-effect profile and worsening of comorbidities including hyperglycemia and hypertension as well as negative effects on bone density.[11] Baricitinib, a JAK inhibitor, was the first systemic treatment to gain US Food and Drug Administration approval for severe AA.[12] However, this novel therapeutic confers adverse effects including infection, acne, and hypercholesterolemia, as reported in the BRAVE-AA trials.[13] More broadly, the US Food and Drug Administration warns of serious long-term risks such as cardiovascular events and malignancy.[14] Given the tremendous potential of JAK inhibitors, further research is warranted to understand

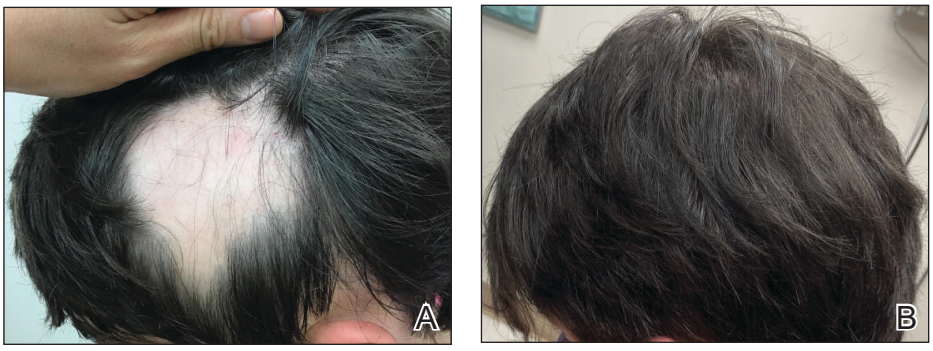

FIGURE 3. Alopecia areata in a 16-year-old boy. A, Scalp hair loss of 30% was noted at baseline. B, Hair regrowth of 95% was observed 17 months later after the addition of scalp rolling to conventional therapy.

both the efficacy of topical formulations as well as the possible role of scalp rolling as its adjuvant.

Finally, scalp rolling is easily accessible and affordable to patients. Scalp rolling devices are readily available and affordable online, and they can be used autonomously at home. This pragmatic option allows patients to take control of their own treatment course and offers a financially feasible alternative to navigating insurance coverage as well as the need for extra office visits for medication refills and monitoring.

We report 3 cases of the use of scalp rolling as an adjuvant to conventional therapy for refractory AA in young patients. Although prospective research is required to establish causality and characterize age-related trends in treatment response, consideration of scalp rolling as an adjuvant to conventional therapy may help to optimize treatment regimens. Given its low risk for side effects and potential benefits, we recommend scalp rolling for patients with refractory AA.

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