CASE REPORT

Complete regrowth of hair following scalp tattooing in a patient with alopecia universalis

Amanda Ramnot, DO, Sydney Resnik, MD, and Barry Resnik, MD

Key words: alopecia; alopecia areata; autoimmune; hair loss; scalp micropigmentation; tattoo.

INTRODUCTION

Alopecia areata (AA) is an autoimmune disease characterized by non-scarring hair loss with a variable clinical course and response to treatment. Hair loss can progress to subtypes of AA including alopecia totalis (total hair loss on the scalp), and alopecia universalis (AU, complete loss of hair on the entire body). The extent of hair loss dictates treatment options. For extensive cases of AA, and cases of alopecia totalis and AU, oral corticosteroids, topical immunotherapy, and oral immunomodulators are used with varying degrees of success. Most recently, baricitinib (Olumiant), an oral JAK inhibitor, was approved for the treatment of AA. We present a patient with AU who ultimately had no lasting regrowth of hair with any medical therapy, despite high compliance. The patient ultimately chose to camouflage her scalp with a full-scalp tattoo. To her surprise, shortly after the completion of her tattoo, she experienced complete regrowth of her scalp hair. While clear correlation between the scalp tattooing and the regrowth cannot be proven yet, it is likely. However, it remains possible that hair growth could have occurred without any intervention.

CASE PRESENTATION

A 56-year-old female with a medical history of arteriovascular malformation that was surgically corrected and AU experienced spontaneous hair regrowth following ink tattooing of the scalp. The hair loss began as a single patch on the scalp treated with intralesional and oral corticosteroids, and other topical agents. Despite some regrowth, the patient’s hair loss continued to expand, eventually developing into alopecia totalis and finally AU (Figs 1 and 2). The continued progression of the patient’s hair loss caused increased stress and depression in the patient, and she was started on escitalopram (Lexapro) by another physician.

The patient underwent sensitization and challenge with squaric acid dibutyl ester (SADBE) immunotherapy and began applications of 0.2% 3 times a week in addition to monthly intramuscular Kenalog injections for 3 months. On this regimen, the patient had new vellus hairs on the scalp, axillae, and genitalia, and new terminal eyebrow and eyelash hair. From the positive response, the patient increased SADBE immunotherapy 0.2%, ultimately performing daily applications. She continued to have vellus hairs over the entire scalp, vellus eyebrow hairs, and terminal eyelash hairs. Unfortunately, the patient’s hair growth came to a halt and the hairs present had fallen at which point the patient decided to stop SADBE immunotherapy.

The patient returned 1 year later with complete hair growth on her scalp. She reported that she decided to get a complete scalp tattoo and noticed hair growth 1 month after the tattoo had been completed.

Abbreviations used:
AA: alopecia areata
AU: alopecia universalis
SADBE: Squaric acid dibutyl ester

From the University of Miami/Jackson Health Systems, Miami, Florida; and Resnik Skin Institute, Aventura, Florida.

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Correspondence to: Barry Resnik, MD, Resnik Skin Institute, 21097 NE 27TH CT Suite 580, Aventura, FL 33180. E-mail: bir@drresnik.com.

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completed. Of note, she was not taking any medications at the time of regrowth. At the most recent follow-up visit, she had new full hair growth on the scalp (Figs 3 and 4), a few strands in the axillae, and her eyelashes and eyebrows were filling in. In addition to hair growth on the scalp, the patient also grew some facial hair which she removed through waxing.

DISCUSSION

This is a single case of spontaneous hair growth in a patient with AU following cosmetic tattooing. Hair loss can create a psychological burden for patients, necessitating mental health therapies to cope, especially after failed trials of therapies for hair loss. The pathophysiology of AU is not completely understood and while treatments can result in hair regrowth, there is a high propensity for relapse. As such, it is important to counsel patients on expectations and the importance of compliance while creating a treatment regimen.1,3

Scalp micropigmentation is a procedure that creates the illusion of scalp hair using specialized ink and conventional tattoo instruments to place microdroplets of pigment into the upper dermis of the scalp.4 The process of conventional tattooing is similar in that insoluble ink is injected into the dermal layer of the skin. The ink utilized for this patient’s tattoo was a custom-made ink by the tattoo artist that consisted of glycerin, pigment imported from Japan, pure water, and alcohol. Immune cells in the dermis mount a response to the ink used in tattooing. Once injected, the ink particles can passively be transported through the blood and lymphatic fluid or be engulfed by immune cells to be deposited in lymph nodes. At the end of the skin’s healing process, ink remains in macrophages in the dermal layer and the

Fig 1. The patient with complete baldness of the scalp (frontal view). Of note, the patient had complete loss of hair on entire body. The cranial scar seen on the scalp is from a past surgery for arteriovascular malformation.

Fig 2. The patient with complete baldness of the scalp (posterior view). Of note, the patient had complete loss of hair on entire body. The cranial scar seen on the scalp is from a past surgery for arteriovascular malformation.
sinusoids of draining lymph nodes. Dermal macrophages engulf ink particles and sequester the ink inside vacuoles, which are not capable of degrading the ink. A study completed found that upon macrophage death, trapped pigment is released. However, as new macrophages circulate, the ink is engulfed again. This process occurs indefinitely, explaining the permanence of tattoos.5,6

The mechanism by which the hair growth occurred in this patient is undetermined and it is unknown if the tattoo ink or tattooing process contributed to the growth. A literature search was performed to look for similar cases, but none were identified aside from a case of henna tattoo inducing hypertrichosis in a patient.7 There is no evidence of tattooing stimulating the hair follicle to induce growth. However, the course of this patient’s alopecia represents a unique and unexpected one as the only dependent variable between AU status and terminal hairs on her scalp was the tattooing.

Conflicts of interest
None disclosed.

REFERENCES
1. Lepe K, Zito PM. Alopecia Areata. StatPearls; 2022.
2. FDA. FDA approves first systemic treatment for alopecia areata. 2022. Accessed August 1, 2022. https://www.fda.gov/news-events/press-announcements/fda-approves-first-systemic-treatment-alopecia-areata
3. Titeca G, Goudetsidis L, Francq R, et al. The psychosocial burden of alopecia areata and androgenetica: a cross-sectional multicentre study among dermatological out-patients in 13 European countries. J Eur Acad Dermatol Venereol. 2020;34(2):406-411. https://doi.org/10.1111/jdv.15927
4. Rassman WR, Pak JP, Kim J, Estrin NF. Scalp micropigmentation: a concealer for hair and scalp deformities. J Clin Aesthet Dermatol. 2015;8(3):35-42.
5. Baranska A, Shawket A, Jouve M, et al. Unveiling skin macrophage dynamics explains both tattoo persistence and strenuous removal. J Exp Med. 2018;215(4):1115-1133. https://doi.org/10.1084/jem.20171608
6. Schreiber I, Hesse B, Seim C, et al. Synchrotron-based nu-XRF mapping and mu-FTIR microscopy enable to look into the fate and effects of tattoo pigments in human skin. Sci Rep. 2017;7(1):11395. https://doi.org/10.1038/s41598-017-11721-z
7. El Habr C, Megarbane H. Temporary henna tattoos and hypertrichosis: a case report and review of the literature. J Dermatol Case Rep. 2015;9(2):36-38. https://doi.org/10.3315/jdcr.2015.1204