

## Alopecia areata: Impressive results using low-level laser therapy

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### Abstract

Alopecia areata (AA) is a genetic and autoimmune-mediated disease which specifically targets anagen hair follicles. The disease affects children and adults, men, as well as women, and is characterized by round or oval patches of hair loss. We are presenting here a spectacular case, extremely rare, of AA localized at the level of the scalp, which was successfully treated by Sunetics Laser (Sunetics International, Las Vegas, NV, USA) therapy. Post laser therapy, hair regrowth in the areas that presented hair loss previously, as well as repigmentation, was noted.

**Keywords:** Alopecia Areata; Laser Therapy; Hair Growth; Red Light; Diode Lasers; Repigmentation

### 1. Introduction

Alopecia areata (AA) is a genetic and autoimmune-mediated disease which specifically targets anagen hair follicles [1].

Genetic predisposition, autoimmunity, and environmental factors play a major role in the etiopathogenesis of AA, but the exact pathobiology of AA has still remained elusive, while the common theory is the collapse of the immune privilege of the hair follicle caused by immunological mechanism [2, 3].

Several genetic susceptibility loci were identified to be associated with signalling pathways that are important to hair follicle cycling and development [1].

AA, a common nonscarring alopecia, affects 1.7-2% of the population at some point in their lives [3-5].

The disease affects children and adults, men, as well as women, and is characterized by round or oval patches of hair loss [6]. The scalp is the most commonly affected area (90%) but any hair-bearing area can be involved [4, 7].

### 2. Material and methods

Caucasian patient, aged 62 years old, without pathological personal antecedents, reports to the Dermatology Department of the Bioderm Medical Center, from Bucharest, Romania, with the diagnosis of AA.

There was no history of similar disease in family members and also no history of chemical substances and trauma.

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According to the internal procedure of the clinic, the patient signed the informed consent of the patient and gave her approval for the additional dermatological investigations and specific therapy.

After complete and detailed investigations, and all the data corroboration, the recommended treatment was Low-Level Laser (light) Therapy (LLLT) in order to stimulate the hair follicles and restore normal hair growth using the Sunetics Laser (Sunetics International, Las Vegas, NV, USA).

This device has been clinically proven to have a healing effect on hair follicles, using a number of 107 separate laser diodes that use the power of red laser light at an optimized wavelength of 650 nm.

The laser therapy was conducted for a period of seven months out of the 12 months recommended by the laser protocol, which consisted of three 20 minute sessions every week in the first month, two 30 minute sessions weekly the next two months, and one 30 minute session every week for the next four months.

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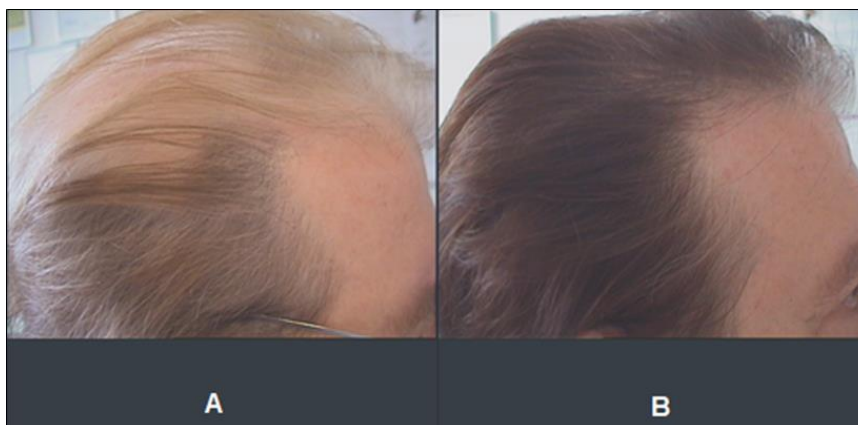
### 3. Results

After the seven month laser procedure, the patient reported hair regrowth in the areas that presented hair loss previously (Fig. 1-5), as well as repigmentation (Fig. 1-5).

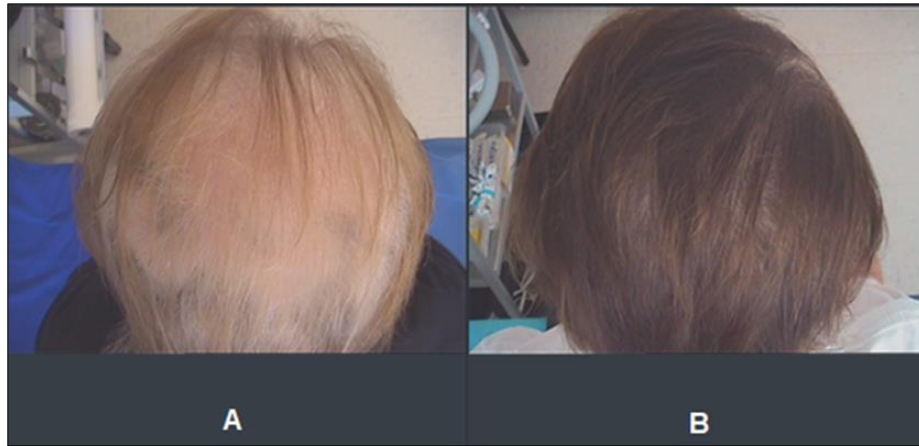
During this time, no adjuvant treatment was recommended or used.



**Figure 1** A. Loss of hair due to AA localized to the retroauricular and occipital areas; B. Hair regrowth in the areas that presented hair loss previously, as well as repigmentation



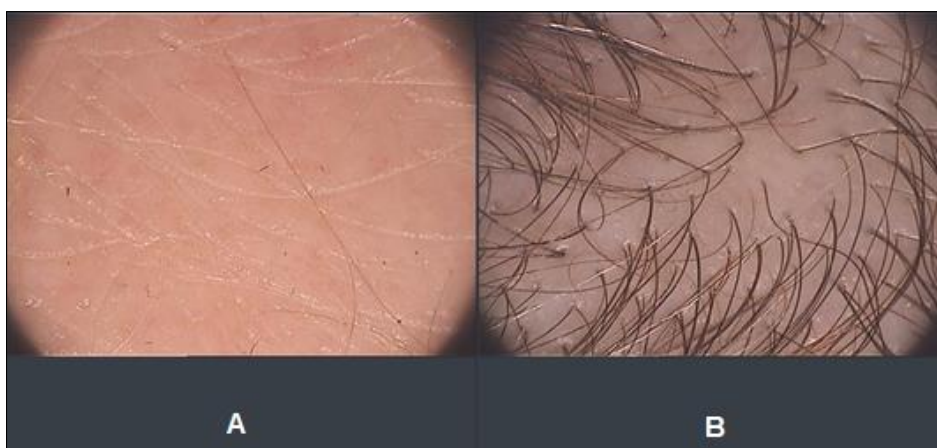
**Figure 2** A. Loss of hair localized to the frontal and parietal areas; B. Hair regrowth in the areas that presented hair loss previously, as well as repigmentation



**Figure 3** A. Large circular confluent patch of alopecia on the parietal scalp; B. Hair regrowth in the areas that presented hair loss previously, as well as repigmentation



**Figure 4** A. Large round patches of hair loss due to AA localized to the parietal areas of the scalp; B. Hair regrowth in the areas that presented hair loss previously, as well as repigmentation



**Figure 5** Digital dermoscopy of the scalp and trichoscopy: A. Area of hair loss due to AA; B. Hair regrowth in the area that presented hair loss previously, as well as repigmentation

#### **4. Discussion**

AA, a form of alopecia that impacts hair follicles, nails, and rarely, the retinal pigment epithelium, typically presents with round patches and is a type of non-scarring hair loss [5].

AA is an immune-mediated disorder, occurring with the highest observed frequency in the rare recessive autoimmune polyendocrinopathy-candidiasis-ectodermal dystrophy (APECED) syndrome caused by mutations of the autoimmune regulator (AIRE) gene on chromosome 21q22.3 [8].

AA is the third most common cause of dermatology consultations in children [9]. AA seems to have a genetic basis because a 55% concordance rate between identical twins has been observed [5].

The frequency of AA and observed patterns of heritability are in keeping with a polygenic inheritance model but the genetics of AA is still poorly understood [10].

Also, the association of AA and infectious foci of dental origin is relatively common, and may be explained by the autoimmune nature of the disorder [11]. According to researchers from the Department of Stomatology at the University of Granada, Spain, there is a close relationship between dental disease and hair loss [12]. So, Professors Montoya and Soriano point out the importance of regular dental check-ups when patients notice the presence of AA lesions, given the autoimmune nature of the disease [12].

The management of AA varies from common therapy involving topical or intralesional corticosteroids, Minoxidil, immunotherapy, and even psychotherapy, to the use of LLLT, as another novel, efficient, and non-invasive alternative treatment option [7, 13-16].

Other modalities, such as topical calcineurin inhibitors and biologic agents, have been used with limited success [17-19].

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#### **5. Conclusion**

In conclusion, our research highlight a spectacular case of AA localized at the level of the scalp, which was successfully treated using the Sunetics Laser therapy. Post laser therapy, hair regrowth in the areas that presented hair loss previously, as well as repigmentation, was noted.

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#### **Compliance with ethical standards**

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##### *Authors' contributions*

All authors contributed equally to preparing, review, and editing of the article. All authors read and approved the final version of the manuscript.

##### *Disclosure of conflict of interest*

The authors declare no conflict of interest.

##### *Statement of informed consent*

Informed consent was obtained from the patient included in the study.

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