International Journal of Women's Dermatology 7 (2021) 355–356

Contents lists available at ScienceDirect

International Journal of Women's Dermatology

Case Letter

Frontal fibrosing alopecia treatment with Nd:YAG (1064 nm) nonablative laser

Jacob Subash MD, MBA *, Ariana Eginli MD, Leonora Bomar MD, Amy McMichael MD

Department of Dermatology, Wake Forest School of Medicine, Winston-Salem, NC, United States

Dear Editors,

Frontal fibrosing alopecia (FFA) is characterized by scarring alopecia of the frontal hairline. Average age of onset is 56 years. FFA generally affects postmenopausal Caucasian women. There is no approved treatment for FFA. Topical or intralesional corticosteroids are first-line treatment. Second-line treatment includes systemic corticosteroids, hydroxychloroquine, 5-alpha-reductase inhibitors, topical minoxidil, and anti-inflammatory systemic medications (Vañó-Galván et al., 2014).

Because nonablative lasers have traditionally been used to treat scarring disorders (Gold, 2010), we evaluated laser therapy to treat the scarring process in FFA. In this proof-of-concept study, a 1064 nm wavelength neodymium-doped yttrium aluminum garnet (Nd:YAG) nonablative laser that is approved for treatment of superficial fine lines and scars (different than the settings used for hair removal) targeting the superfical dermis was used to treat FFA.

After informed consent was obtained, five patients participated in this study. They were given three laser treatments (once monthly) at 14 J/cm^2, spot size 5 mm, pulse duration 3 ms at 7 Hz for 7000 to 8000 pulses (30 minutes each), 2 cm distance using a nonablative, noncontact 1064 nm laser. The face and frontotemporal scalp (1 cm into the hairline) were treated. The investigator performed a clinical assessment prior to each procedure and $\geq$3 months after the final treatment. Dermatoscope and global scalp photographs were obtained. Patients were age $\geq$18 years and on stable treatment for >6 months. Patients were excluded if they had other active forms of alopecia or prior facial laser therapy.

Patients' average age was 54.0 years (standard deviation ± 8.28). Two were premenopausal and three were postmenopausal. All patients were on topical steroids; three were on hydroxychloroquine and three were on topical minoxidil at the time of the study. All were on stable treatment for >6 months.

After treatment with the Nd:YAG laser, four patients reported improvement in at least 1 symptom. Four patients reported improvement in itching and two reported improvements in pain or burning. Only one patient had worsening of pain. Four patients had improvement in at least 3 of 8 clinician-evaluated signs; decreased perifollicular scale and erythema was observed in four patients (Table 1). Follicular papules and hair loss spreading stabilized in three patients. Two patients had lichen planus pigmentosus of the face that improved with treatment. No major side effects were reported.

Because the Nd:YAG 1064 nm nonablative laser has been used for skin resurfacing, collagen remodeling, and acne scars, we hoped to use it to treat the effects of FFA (Alshami, 2013; Badawi et al., 2011). In this study, we showed that treatment with a noncontact Nd:YAG (1064 nm) laser for FFA can reduce morbidity. The mechanism of laser-induced heating of the dermal layer of the skin associated with rapid vaporization and thermal expansion may lead to skin mechanical damage, followed by remodeling (Alshami, 2013). Laser wounds could potentially increase blood flow, cytokines, and growth factors to induce hair growth. Side effects are mild and occur at low rates (Alshami, 2013). Compared with ablative CO2 and Erbium-YAG lasers, the treatment time and cost were lower with no recovery time for the laser used in this study (Alshami, 2013). A weakness of this study is the lack of standardization in the photographs and that patients were not on the same or standardized therapy (Fig. 1).

Table 1
Pre- and poststudy clinical evaluation for change in signs.

Signs	Improvement (n = 5)	Worsening (n = 5)
Pain/pruritus/burning	2	1
Erythema	2	0
Perifollicular erythema	4	0
Perifollicular scale	4	0
Interfollicular erythema	2	0
Papules	3	0
Hypopigmentation	0	1
Hyperpigmentation	1	0
Hair loss spreading	3	0

* Corresponding author.
E-mail address: jsubash@wakehealth.edu (J. Subash).

https://doi.org/10.1016/j.ijwd.2020.10.007

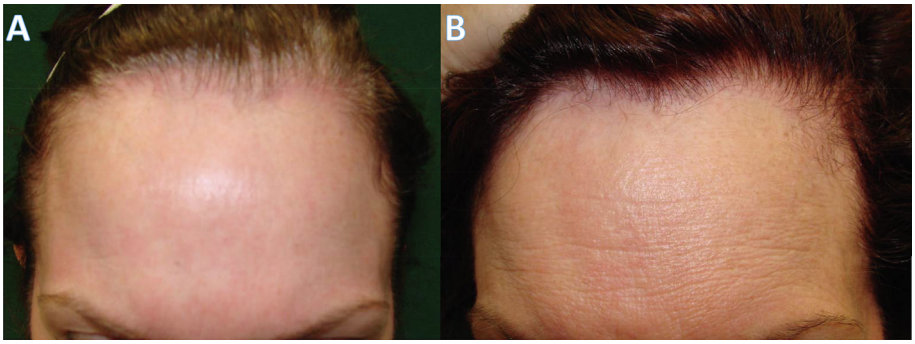

Fig. 1. Clinical Photos**:** Subject 4 Pre-Study (A). Subject 4 Post-Study with improved perifollicular erythema, perifollicular scale, interfollicular erythema and slowed hair loss spread (B).

Conflicts of Interest

Amy McMichael, MD, has received consultant fees from Aclaris, Allergan, Almirall, Bioniz, Cassiopea, Covenance, eResearch Technology, Inc., Galderma, Incyte, Johnson & Johnson, Keranetics, Merck & Co., Inc., Pfizer, Proctor & Gamble, and Samumed, as well as research fees from Aclaris, Cassiopea, Concert Pharmaceuticals, Incyte, Proctor & Gamble, and Samumed. She has also received grants from Allergan, Concert Pharamceuticals, and Proctor & Gamble, as well as royalties from Informa Healthcare and UpToDate. All other authors have no conflicts of interest to declare.

Funding

None.

Study Approval

The author(s) confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies.

References

Alshami MA. New application of the long-pulsed Nd-YAG laser as an ablative resurfacing tool for skin rejuvenation: A 7-year study. J Cosmet Dermatol 2013;12(3):170–8.

Badawi A, Tome MA, Atteya A, Sami N, Morsy IA. Retrospective analysis of non-ablative scar treatment in dark skin types using the sub-millisecond Nd:YAG 1,064 nm laser. Lasers Surg Med 2011;43(2):130–6.

Gold MH. Update on fractional laser technology. J Clin Aesthet Dermatol 2010;3(1):42–50.

Vañó-Galván S, Molina-Ruiz AM, Serrano-Falcón C, Arias-Santiago S, Rodrigues-Barata AR, Garnacho-Saucedo G, et al. Frontal fibrosing alopecia: a multicenter review of 355 patients. J Am Acad Dermatol 2014;70(4):670–8.