

# Treatment of folliculitis decalvans with Nd:YAG laser

*Tratamento da foliculite decalvante com laser Nd:YAG*

## Authors:

Márcia Raquel Horowitz<sup>1</sup>  
Emmanuel Rodrigues de França<sup>2</sup>  
Silvana Maria de Morais Cavalcanti<sup>3</sup>  
Ângela Cristina Rapela Medeiros<sup>4</sup>  
Marcela de Lima Vidal<sup>1</sup>  
Manuela Oliveira Resende<sup>1</sup>

<sup>1</sup> Second-year Dermatology Resident Physician, Hospital Universitário Oswaldo Cruz (Houp) of the Universidade de Pernambuco (UPE)—Recife (PE), Brazil.

<sup>2</sup> PhD and Full Professor in Dermatology, Assistant Professor and Head of the Dermatology Department of the Hospital Universitário Oswaldo Cruz (Houp) of the Universidade de Pernambuco (UPE)—Recife (PE), Brazil.

<sup>3</sup> PhD in Tropical Medicine; Assistant Professor of Dermatology at the Universidade de Pernambuco (UPE).

<sup>4</sup> PhD in Clinical Medicine; Assistant Professor of Dermatology at the Universidade de Pernambuco (UPE).

## Correspondence:

Dra. Marcia Raquel Horowitz  
Rua dos navegantes 741/1202 - Boa Viagem  
51021-010 - Recife - PE  
Brazil  
E-mail: marciawitz@gmail.com

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## ABSTRACT

*Treatment of folliculitis decalvans is a major challenge, with a great number of recurrences and required maintenance of disease activity over a long period. Laser-based hair removal has been used in the management of scarring follicular disorders. The present case report aims to illustrate the case of a patient bearing folliculitis decalvans in the lower limb who underwent five therapeutic sessions of neodymium:YAG laser (Nd:YAG), achieving complete remission of the inflammatory lesions with the treatment.*

**Keywords:** folliculitis; laser therapy; dermatology; alopecia.

## RESUMO

O tratamento da foliculite decalvante representa grande desafio, com inúmeras recidivas e manutenção da atividade da doença por longo período. A remoção de pelo com laser vem sendo utilizada no manejo de distúrbios foliculares cicatríciais. Este relato tem por objetivo ilustrar o caso de paciente portador de foliculite decalvante em membro inferior que realizou cinco sessões terapêuticas com laser neodímio:YAG (Nd:YAG) e assim obteve remissão completa das lesões inflamatórias.

**Palavras-chave:** foliculite; terapia a laser; dermatologia; alopecia.

## INTRODUCTION

Treatment of folliculitis decalvans is challenging, with numerous recurrences and disease activity persisting for long periods. Many treatment options have been recommended: systemic and topical antibiotics; topical, systemic, and intralesional corticosteroids; isotretinoin and dapsone.<sup>1</sup> However, there is no consensus on the treatment of this dermatosis. Other therapeutic alternatives, such as topical calcineurin inhibitors<sup>2</sup>, biological drugs<sup>3</sup>, and laser-based epilation<sup>4</sup>, have been described.

Laser-based hair removal is a fairly commonplace procedure in dermatologic practice, and some inflammatory and scarring follicular disorders have shown satisfactory response to this therapy.<sup>4-7</sup>

The present report is aimed at illustrating the case of a patient bearing folliculitis decalvans who underwent treatment with neodymium:YAG laser (Nd:YAG), achieving complete remission of inflammatory lesions.

## CASE REPORT

An 18-year-old male patient experienced the emergence of follicular lesions in the right lower limb about five years before the present report was prepared. The examination evidenced follicular papules and pustules with peripheral desquamation (Figure 1), a clinical picture compatible with that of folliculitis decalvans.

The patient underwent treatment with Nd:YAG laser in a test area with the following parameters: 40J/cm<sup>2</sup> fluence, 30msec pulse duration and 10mm spot size. The patient recovered uneventfully, and subsequent sessions were carried out with an adjustment of the fluence to 45J/cm<sup>2</sup>, totaling five sessions to completely remove the hair of the affected area. After the treatment there was complete regression of the lesions and absence of inflammatory signs suggestive of folliculitis (Figure 2), a clinical picture that was sustained for at least ten months without the necessity for adjuvant treatments.

## DISCUSSION

Folliculitis decalvans represents approximately 11% of cases of primary cicatricial alopecia.<sup>8</sup> It prevails in adolescents and young adults, especially in dark-skinned male patients.<sup>8</sup> It manifests clinically as erythematous follicular papules that develop into pustules, resulting in centrifugal cicatricial alopecia. The appearance of “tufts” is usually observed, in which numerous strands of hair emerge from a single dilated follicular ostium.

The etiology of this primary neutrophilic cicatricial alopecia is not fully understood.<sup>1</sup> *Staphylococcus aureus* seems to have an important role in the pathogenesis of folliculitis decalvans and can be isolated in almost all patients without treatment.<sup>9</sup>



**FIGURA 1:** Pústulas e pápulas foliculares com descamação periférica em membro inferior direito (antes do tratamento)



**Figura 2:** Após cinco sessões terapêuticas com laser Nd:YAG nota-se resolução completa das lesões

It has been suggested that superantigens or cytokines binding to the major histocompatibility complex type II, play some role in the pathogenesis.<sup>9,10</sup> The possibility of genetic predisposition has also been suggested.<sup>10</sup>

Treatment of folliculitis decalvans is challenging, with the presence of prolonged disease activity even after several therapeutic attempts. Since *S. aureus* has been suggested to have an important role in the pathogenesis of decalvans folliculitis, treatment options are aimed at eradicating that agent. Many oral antibiotics (and their combinations) have proven effective in the treatment. Nevertheless, 300mg rifampicin twice a day during a 10- to 12-week period was reported as the best anti-staphylococcal agent, offering a more enduring remission period.<sup>9,10</sup> Association with a 300mg dose of clindamycin twice a day is recommended in order to prevent bacterial resistance.<sup>9</sup> Topical antibiotic therapy, such as mupirocin, clindamycin, fusidic acid, or erythromycin, can be associated with the oral antibiotic or, in mild cases, be carried out as a monotherapy.<sup>1</sup> Use of shampoo with antiseptic, such as triclosan, also contributes to the treatment.<sup>1</sup>

The use of topical or intralesional corticosteroids may be helpful in reducing inflammation and symptoms such as pruritus, burning sensation, and pain. Oral prednisone should only be considered in cases of rapid progression and for short treatment courses.<sup>1</sup>

Dapsone, combined with antibiotics or as monotherapy, may also be considered as a therapeutic option due to its antibacterial and anti-inflammatory activity, which is directed to neutrophils.<sup>1</sup>

Laser-based hair removal has been used in the management of follicular scarring disorders. A long period of remission was achieved with the use of a 810nm diode laser in African-American patients bearing dissecting cellulitis of the scalp.<sup>5</sup> The long pulsed ruby laser has also proved effective in treating dissecting cellulitis of the scalp, keratosis follicularis spinulosa decalvans and pseudofolliculitis barbae.<sup>6</sup>

The 1,064nm Nd:YAG laser was used for reducing hair and the formation of papulae in pseudofolliculitis barbae, in Fitzpatrick's skin phototypes IV, V, and VI.<sup>7</sup>

The target of laser-based hair removal is the hair bulb's melanin, which is located in the dermis. The melanin absorbs the light emitted by the laser, and the energy is then converted into heat, resulting in the destruction of the bulb.

In dark-skinned patients—as in the case described—there is a challenge in carrying out the laser-based epilation, given that the epidermal melanin competes as a chromophore, thereby absorbing the light and causing the epidermis to heat, which can lead to the formation of blisters, pigmentation alterations, and scarring, in addition to reducing the procedure's effectiveness.

The absorption of light by melanin in the 800nm range is three times greater than in the 1,064nm range. Regardless of the wavelength, the selective heating can be achieved in individuals with darker pigmentation because the epidermis is usually

fairer than the hair. Nonetheless, due to the dispersion of light at shorter wavelengths, longer wavelengths (1,064nm) penetrate deeper and therefore provide a wider security window in dark-skinned patients.<sup>4</sup> The epidermal damage can also be reduced with the use of longer pulses and cooling systems.

Based on the optical properties of light on skin, the best combination of hair removal and epidermis preservation is achieved with a long pulsed laser. Thus, the Nd:YAG laser is a good option to treat follicular disorders in individuals with dark skin,<sup>4</sup> as is the case in the present case report, where the patient had an excellent response to the treatment, with no side effects reported.

## CONCLUSION

The treatment of folliculitis decalvans represents a major challenge, with frequent recurrences of lesions. Laser-based hair removal seems to be a good therapeutic option for this condition, as demonstrated in the present case report. The choice of the laser is of paramount importance, for it must be aimed at decreasing the possibility of adverse effects of the procedure without compromising its effectiveness. Given that most patients with folliculitis decalvans are of a high Fitzpatrick phototype, it is appropriate to employ a long pulsed laser, such as the Nd:YAG laser. The good clinical response obtained in the present case expands the therapeutic options for this difficult to control condition. ●

## REFERENCES

1. Otberg N, Kang H, Alzolibani AA, Shapiro J. Folliculitis decalvans. *Dermatol Ther.* 2008;21(4):238-44.
2. Bastida J; Valerón-Almazán P; Santana-Molina N, Medina-Gil C; Carretero-Hernández G. Treatment of folliculitis decalvans with tacrolimus ointment. *Int J Dermatol.* 2012;51(2):216-20.
3. Mihaljevic N; von den Driesch P. Successful use of infliximab in a patient with recalcitrant folliculitis decalvans. *J Dtsch Dermatol Ges.* 2012;10(8):589-92.
4. Parlette EC, Kroeger N, Ross EV. Nd:YAG laser treatment of recalcitrant folliculitis decalvans. *Dermatol Surg.* 2004;30(8):1152-4.
5. Boyd AS, Binhlam JQ. Use of an 800-nm pulsed-diode laser in the treatment of recalcitrant dissecting cellulitis of the scalp. *Arch Dermatol.* 2002;138(10):1291-3.
6. Chui CT, Berger TG, Price VH, Zachary CB. Recalcitrant scarring follicular disorders treated by laser-assisted hair removal: a preliminary report. *Dermatol Surg.* 1999;25(1):34-7.
7. Ross EV, Cooke LM, Timko AL, Overstreet KA, Graham BS, Barnette DJ. Treatment of pseudofolliculitis barbae in skin types IV, V, and VI with a long-pulsed neodymium: yttrium aluminum garnet laser. *J Am Acad Dermatol.* 2002;47(2):263-70.
8. Tan E, Martinka M, Ball N, Shapiro J. Primary cicatricial alopecias: clinicopathology of 112 cases. *J Am Acad Dermatol.* 2004;50(1):25-32.
9. Powell JJ, Dawber RP, Gatter K. Folliculitis decalvans including tufted folliculitis: clinical, histological and therapeutic findings. *Br J Dermatol.* 1999;140(2):328-33.
10. Powell J, Dawber RPR. Successful treatment regime for folliculitis decalvans despite uncertainty of all aetiological factors. *Br J Dermatol.* 2001;144(2):428-429.