

## Successful Treatment of Discoid Lupus erythematosus with Argon Laser

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### Key Words

Argon laser · Discoid lupus erythematosus · Treatment of cutaneous lupus erythematosus

### Abstract

Vascular lesions with telangiectasias on visible areas, such as the face, are common in discoid lupus erythematosus (DLE); however, an efficient management of these skin lesions can sometimes be difficult. Since argon laser light is able to specifically coagulate vascular structures, it has been used in the treatment of various vascular skin malformations. Therefore, we addressed the issue whether argon laser treatment could be a therapeutic alternative for this disease. Here, we report on a patient with DLE, who suffered from long-standing erythematous, telangiectatic plaques on the face refractory to standard regimens of therapy. After 2 laser applications, a significant improvement was observed and after 5 sessions of argon laser therapy the treated skin lesions had completely resolved with an excellent cosmetic result. The patient tolerated the laser treatment well without any short-term side effects. These data indicate that argon laser therapy might be a powerful alternative approach in the treatment of vascular skin lesions of DLE.

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Discoid lupus erythematosus (DLE), the most common form of chronic cutaneous lupus erythematosus, is characterized by

persistent erythema, adherent scaling, follicular plugging and, in the later stages, scarring and atrophy. Telangiectasia and hyper- or hypopigmentation can replace active inflammation, and the patches may develop a poikilodermatous appearance [1, 2]. Topical corticosteroids as well as antimalarials, such as hydroxychloroquine or chloroquine, are employed in the treatment of this disease [3, 4]. Patients who continue to develop new lesions or whose lesions remain active require second-line therapies including retinoids, azathioprine, methotrexate, dapsone, clofazimine or thalidomide [5, 6]. The choice of an alternative treatment is individual and discussions of the risks and benefits should be carefully documented [4, 7, 8]. However, a successful management of patients with DLE is desirable as skin lesions mostly occur on visible areas and therefore often affect patients psychologically.

In spite of the recent advent of lasers, only one group demonstrated in 1988 the effective use of argon laser for the treatment of cutaneous vascular lesions in connective tissue diseases [9]. Here, we report on a patient with a long-standing history of DLE, who was successfully treated with the argon laser leading to a complete resolution of the facial skin lesions.

### Case Report

A 59-year-old white female had a 15-year history of skin lesions of variable extent over the extensor aspects of the arms and the V area of the neck. The clinical diagno-

sis of DLE was supported by histological examination which demonstrated focally thinned epidermis associated with orthokeratosis and smudged appearance of the dermoepidermal junction as well as superficial and deep perivascular lymphocytic infiltration. When referred to our clinic she presented with erythematous, hyperkeratotic, confluent, disfiguring plaques and telangiectasia on her cheeks (fig. 1a) and the diagnosis of DLE was confirmed by experimental reproduction of skin lesions by UVA and UVB photoprovocation as previously described [10]. Serological investigations such as antinuclear antibodies (HEp-2 cells) were negative and rheumatoid factor, immunoglobulins (IgG, IgM, IgA) as well as complement components (C3, C4) were within normal limits. Furthermore, the patient showed no signs of underlying systemic manifestations. The patient had been treated with standard therapies including local corticosteroids and antimalarials (chloroquine 250 mg/day) for several months; however, the skin lesions on the face continued to develop and remained active.

We used an argon laser (DLS 5-Laser, Aesculap-Meditec GmbH, Jena, Germany) at a wavelength of 514 nm, a power level of 2 W, a pulse duration of 0.1 s and a spot size of 1 mm. The pulses were applied not overlapping ('polka dot technique'). Before treatment, a defined area on the face was test treated, and clinical assessments and photographs were obtained before and 4 weeks following each laser session. After application of a topical anesthetic cream (Emla®), the patient tolerated the laser therapy without



**Fig. 1. a** Erythematous, hyperkeratotic, telangiectatic plaques on the cheeks of a patient with DLE before argon laser treatment. **b** Complete resolution of the vascular DLE skin lesions on the cheeks after 5 sessions of argon laser treatment.

**Table 1.** Treatment of lupus erythematosus with laser: review of the literature

Year	Authors	Indication	Type of laser	Response	Side effects
1986	Henderson and Odom [11]	DLE (1)	carbon dioxide laser	dramatical clinical and cosmetic improvement	splotchy hypopigmentation
1988	Zachariae et al. [9]	DLE (5)	argon laser	cosmetically satisfactory result	60–70% permanent bleaching
1995	Nunez et al. [12]	LE telangiectoides (1)	FPDL	excellent improvement	none
1996	Nunez et al. [13]	SLE (4)	FPDL	clearance in more than 75%	slightly transient hyperpigmentation
1996	Nürnberg et al. [14]	DLE (1)	argon laser	clinical and histological improvement	hypopigmentation
1999	Raulin et al. [15]	DLE (8), CLE (1) SCLE (1), SLE (2)	FPDL	clearance rate of 70%	transient hyperpigmentation

Figures in parentheses indicate numbers of patients. LE telangiectoides = Lupus erythematosus telangiectoides; CLE = cutaneous lupus erythematosus; SCLE = subacute cutaneous lupus erythematosus; SLE = systemic lupus erythematosus; FPDL = flashlamp pulsed dye laser.

pain. After 2 laser applications, the result of the argon laser therapy was already highly satisfactory with a significant improvement of the treated skin lesions, and after 3 further consecutive monthly sessions the erythematous, hyperkeratotic plaques and telangiectasias on the cheeks had completely resolved with an excellent cosmetic result (fig. 1b). After an observation period of 6 months neither pigmentary changes nor scarring was observed in the treated areas.

### Discussion

Single observations in the literature revealed successful treatment of cutaneous vascular lesions of lupus erythematosus with the carbon dioxide and the pulsed dye laser (table 1). In 1986, Henderson and Odom [11] treated characteristic plaques of 1 DLE patient with the carbon dioxide laser and observed a dramatic clinical and cosmetic improvement of the cutaneous lesions. Hy-

popigmentation in the tested areas and reactivation of DLE in the periphery were described as side effects. Nunez et al. [12, 13] reported on 4 patients with telangiectatic chronic erythema of cutaneous lesions in patients with systemic lupus erythematosus (SLE) who had been successfully treated with the flashlamp pulsed dye laser operating at 585 nm. Recently, Raulin et al. [15] published a group of 12 patients with different forms of lupus erythematosus who were

treated with the pulsed dye laser. A clearance rate was attained in 70% of the patients and, even in the 2 patients with SLE, a significant improvement was achieved. None of these patients showed any prolonged laser-induced scarring.

In 1988, Zachariae et al. [9] reported for the first time the treatment of cutaneous vascular lesions in connective tissue diseases with the argon laser, and noticed significant blanching of the patches, although scarring and hyperpigmentation remained. Since then, only one further report in the German literature [14] documented successful treatment with the argon laser of skin lesions on the extensor aspects of the arms in 1 patient with chronic DLE. However, in contrast, Wolfe et al. [16] suggested that overtreatment with an argon laser has the potential to induce DLE since thermal injury appears to have caused a Koebner's phenomenon in a patient without any previous history of autoimmune disease. The induction of such isomorphic skin changes after cutaneous in-

jury in previously uninvolved skin has been associated with DLE [17].

We treated the DLE patient with 5 applications of argon laser and the result was highly satisfactory with complete clearing of the facial skin lesions. Since the patient had a long-standing history of DLE and local corticosteroids as well as systemic therapy with antimalarials for several months had shown no improvement of the telangiectatic skin lesions on the face, argon laser therapy was tried as an alternative method. The argon laser emits a visible, blue-green, continuous-wave beam of 488–514 nm with a skin penetration of 1–2 mm and operates at only a few watts of power [18, 19]. This light is preferentially absorbed by the red color of hemoglobin and is converted to heat, which leads to red cell destruction and thrombosis of small blood vessels. Thus, the photodermic effect of the argon laser reduces the reddish color of a vascular lesion by reducing the hemoglobin content of the skin [20]. The argon laser is

suitable for treating superficial vascular lesions as well as cosmetically troublesome telangiectasia which are common in DLE [21]. Nevertheless, there is some debate as to whether argon-laser-induced scarring reflects the skill of the physician and postoperative wound care rather than an intrinsic problem with the laser-tissue interaction [18].

This presentation suggests that the argon laser appears to be a promising alternative for the treatment of vascular DLE skin lesions with an excellent cosmetic result. However, the indication must be carefully evaluated and the risks and benefits should be precisely documented, as skin texture changes and scarring might occur.

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