

Treating REM Syndrome With the Pulsed Dye Laser

Baerbel Greve, MD, and Christian Raulin, MD*

Background and Objective: REM syndrome (reticular erythematous mucinosis) is a benign but bothersome skin disease that commonly occurs in middle age and among women. Local and systemic treatment measures are often associated with a high rate of side effects and relapses are common. We evaluated the pulsed dye laser as an alternative method because of its good efficacy in vascular skin diseases.

Study Design/Materials and Methods: We treated two female patients with REM syndrome using the pulsed dye laser.

Results: In both patients the erythematous skin changes were almost completely removed after five and three laser sessions, respectively. Other than transient hypopigmentation, no side effects occurred. In one case there is still no evidence of recurrence 6 years after a trial treatment was conducted. In the same patient, clinical success was histologically confirmed.

Conclusion: This is the first report on the successful treatment of REM syndrome of two female patients with the pulsed dye laser. *Lasers Surg. Med.* 29:248–251, 2001. © 2001 Wiley-Liss, Inc.

Key words: REM syndrome; pulsed dye laser

INTRODUCTION

REM syndrome is a dermatosis commonly occurring in middle age and among women; it is accompanied by reticular erythema as well as a histological profile that features perivascular round cell infiltrates and alcian blue positive mucoid substances between fine collagen fibers. This syndrome was interpreted as a new entity in 1971 for the first time and published in 1974 by Steigleder et al. [1]. The most frequent localizations are on the chest and back and are mostly symmetrical.

Treatment attempts range from locally or systemically applied glucocorticoids, sometimes combined with UVB irradiation, to systemic dosage of chloroquine, hydroxychloroquine or cyclosporine. [1–12]. Due to the high rate of possible side effects and recurrence, the above treatment measures are often unsatisfactory.

The pulsed dye laser with a wavelength of 585 nm is primarily used in the treatment of vascular skin changes [13,14]. It works according to the principle of selective photothermolysis, damaging dermal vessels to a depth of 1.2–1.5 mm [15,16].

Due to our experience, especially in the treatment of lupus erythematosus [17], and to a lack of alternatives, we

decided to try treatment with the flashlamp-pumped pulsed dye laser.

CASE REPORT OF PATIENT 1

In 1994, a female patient who was 37 years old at the time presented at our clinic with erythematous skin changes on the central part of her chest and upper abdomen. They had existed for approximately 5 years and clearly worsened when exposed to light; ultimately they remained constant. Pre- as well as post-treatment (3 months after the 4th treatment) biopsies were performed to support the diagnosis of REM syndrome and the success of the treatment. The patient's case history and that of her family showed nothing exceptional. A systemic treatment was rejected by the patient.

The flashlamp-pumped pulsed dye laser (Photo Genica V, Cynosure Inc.) was used at a wavelength of 585 nm and a pulse duration of 0.3–0.45 ms. The applied energy density was between 5.4 and 6.9 J/cm² with a beam diameter of 7 mm. An initial test treatment of 2 cm² was carried out in 1994. Despite the impressive success, the patient consulted us again over 4 years later, due to personal reasons. Upon the patient's request, the pulses did not overlap; anesthesia was not necessary.

After 5 laser sessions of the entire area (10/1998, 12/1998, 3/1999, 5/1999, 12/1999), there were only minimal residues visible from a clinical perspective. There was neither crusting and scarring, but transient hypopigmentation occurred (lasting up to 6 months). The patient was very satisfied with the result and thus decided to discontinue treatment. Both the test area and the entire area that was treated showed no detectable clinical signs of REM syndrome after a follow-up time of almost 6 years and 14 months, respectively (as of 2/2001).

Histological Findings Before Treatment (April 1994, Sample Area: Center of Chest)

Perivascular lymphocytic infiltrate, superficial and deep. Subtle interstitial mucin deposits.

Diagnosis. The findings correspond well with a reticular erythematous mucinosis (REM syndrome).

*Correspondence to: Christian Raulin, MD, Laserklinik Karlsruhe, Kaiserstraße 104, 76133 Karlsruhe, Germany.
E-mail: info@laserklinik.de

Accepted 19 March 2001



Fig. 1A. Patient 2 before treatment (7/2000).

Histological Findings 3 Months After the Fourth Laser Session (August 1999, Sample Area: Left Supramammary From a Treated Area)

Wedge-shaped skin biopsy with regularly structured skin (epidermis and cutis). Dense collagen fibers. No significant inflammatory infiltrate or mucin deposits.

Diagnosis. Regularly structured skin without any indication of acute inflammation. No significant lymphocytic infiltrates or mucin deposits, no indication of REM syndrome.

CASE REPORT OF PATIENT 2

The 40-year-old female patient presented in July 2000 with asymptomatic, erythematous, gradually increasing changes to the inframammary skin on both sides and lateral to the left breast. This had existed for approximately 8 years; the patient inquired about possible laser treatment (Fig. 1A). A biopsy performed in June 2000 confirmed the suspicion of REM syndrome. Both the personal and the family medical history were normal. The patient had not undergone any systemic or local treatment and rejected systemic medication.

After a successful treatment of a trial patch in July, we treated the entire area with the pulsed dye laser in a total of 3 sessions (8/2000, 9/2000, 12/2000). The impulses were set to overlap slightly at a fluence of 6.0 J/cm² and a diameter of 7 mm. As was the case with Patient 1, anesthesia was not necessary here.

When she presented again in February 2001, the skin had almost completely healed (Fig. 1B). Slight hypopigmentations were observed, although the patient reported that they were already clearly in regression. This patient was also highly satisfied and did not request any further treatment.

DISCUSSION

The etiology of the REM syndrome is unknown. Various theories are discussed such as increased photosensitivity, viral causes, or an immune disorder [9,18]. The REM syndrome is occasionally accompanied by itching. Cosmetically disturbing, netlike erythema that may be extensive are found on the central chest, abdomen and back. From a histological standpoint, expanded dermal vessels with perivascular roundcell infiltration and deposits of alcian blue positive substances are predominant [1].

Locally or systemically applied glucocorticoids, partly combined with UVB irradiation, to systemic dosage of chloroquine, hydroxychloroquine or cyclosporine [1–12] proved to be unsuccessful or difficult in many ways (side effects, interdisciplinary ophthalmological and medical controls). Relapses often occur.

The pulsed dye laser functions according to the principle of selective photothermolysis [15]. Its wavelength of 585 nm is close to the absorption spectrum of oxygenated hemoglobin, which is the reason it is mainly used in the treatment of port-wine stains, hemangiomas and telangiectases [13,14]. As the pulse duration of 0.3–0.45 msec is

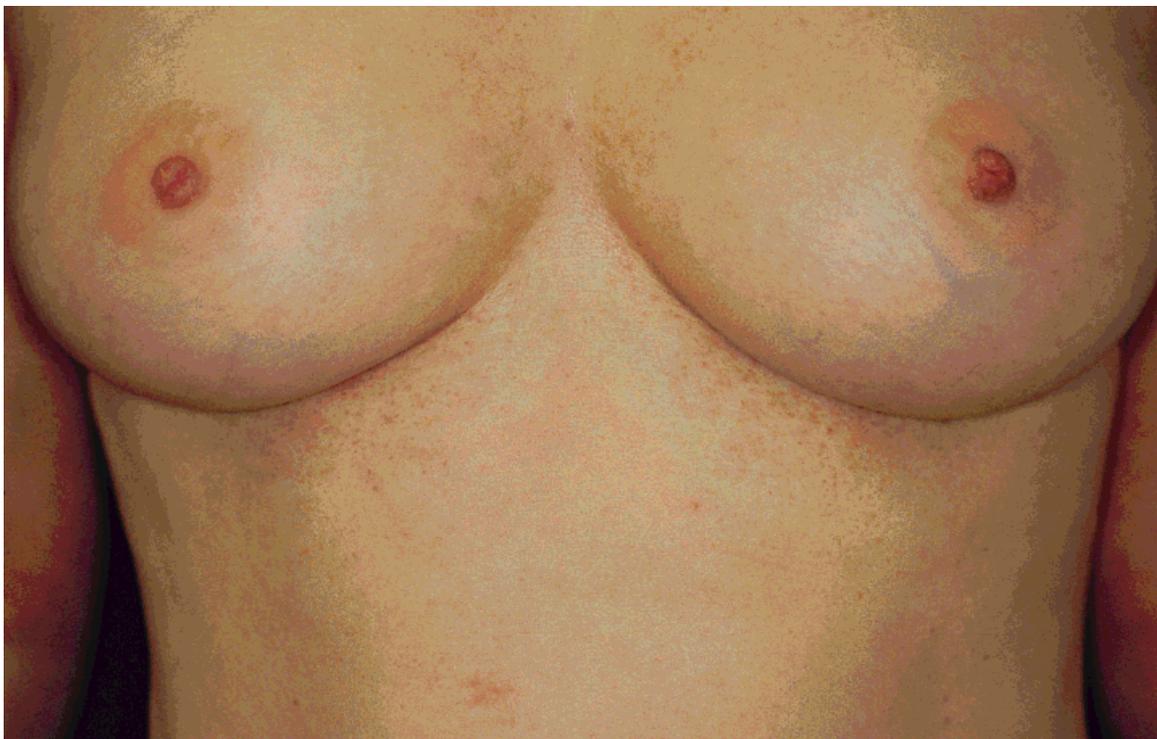


Fig. 1B. Patient 2 after three sessions with the pulsed dye laser and 2-month follow-up (02/2001).

under the thermal relaxation time of the small blood vessels of the skin, damage to surrounding skin structures can be largely avoided. The pulsed dye laser is safe and has few side effects [13,14]. Successful treatment attempts with inflammatory skin diseases such as extragenital lichen sclerosus et atrophicus [19,20] and lupus erythematosus [17] are also described

For the first time, we introduce the treatment of REM syndrome using lasers (the pulsed dye laser in particular). Patient 1 showed no evidence of recurrence, both in the 6 years since the initial trial treatment and the 15 months after the entire area was treated. Patient 1 required 2 treatment sessions more than Patient 2, since the impulses used did not overlap. The intervals of 2–3 months between the laser applications corresponded to those for the recommended treatment of port-wine stains. In both cases, treatment with a laser almost completely resolved the problem. In patient 1, the macroscopic success could also be histologically confirmed; patient 2 did not consent to a biopsy post-treatment.

The mucin and lymphocytic infiltrate, that occur with REM syndrome, are histologically proven to be reduced by the function of the mechanisms of the laser's effects. This is also true in the case of lupus erythematoses, and in both instances the mechanisms in question remain unknown, apart from the laser's precision in damaging small blood vessels. It is highly likely that the laser treatment leads to healing of the skin by activating immunologic processes. Alster et al. [21–23] reached a similar conclusion in the cases of hypertrophic scarring, keloids and stretch marks. Studies on histology, immunohistology, and immunochem-

istry are currently being carried out by our work group to resolve these questions.

The pulsed dye laser is an effective treatment alternative with few side effects and is suitable for the rare, cosmetically bothersome clinical disorder. As opposed to systemic treatments, treatment with the pulsed dye laser can be conducted without problems for the patient and be repeated as many times as necessary, even when any relapses occur. The slight percentage of lasting effects and time consuming, costly follow-up examinations, in comparison to those necessitated by systemic treatment, serves to increase the patients' compliance.

REFERENCES

1. Steigleder GK, Gartmann H, Linker U. REM syndrome: reticular erythematous mucinosis (round-cell erythematosis), a new entity? *Br J Dermatol* 1974;91:191–199.
2. Cohen PR, Rabinowitz AD, Ruszkowski AM, DeLeo V. Reticular erythematous mucinosis syndrome: review of the world literature and report of the syndrome in a prepubertal child. *Pediatr Dermatol* 1990;7:1–10.
3. Dodd HJ, Sarkany I, Sadrudin A. Reticular erythematous mucinosis syndrome. *Clin Exp Dermatol* 1987;12:36–39.
4. Funai T, Aoki T. Reticular erythematous mucinosis syndrome: a case report. *J Dermatol* 1986;13:213–216.
5. Morison WL, Shea CR, Parrish JA. Reticular erythematous mucinosis syndrome. *Arch Dermatol* 1979;115:1340–1342.
6. Braddock SW, Davis CS, Davis RB. Reticular erythematous mucinosis and thrombocytopenic purpura. *J Am Acad Dermatol* 1988;19:859–868.
7. Yamazaki S, Katayama I, Kurumaji Y, Yokozeki H, Nishioka K. Treatment of reticular erythematous mucinosis with a large dose of ultraviolet B radiation and steroid impregnated tape. *J Dermatol* 1999;26:115–118.

8. Bleehen SS, Slater DN, Mahood J, Church RE. Reticular erythematous mucinosis: light and electron microscopy, immunofluorescence and histochemical findings. *Br J Dermatol* 1982;106:9–18.
9. Ingber A, Sandbank M. Retikuläre erythematöse Mucinose (REM). *Z Hautkr* 1988;63:986–998
10. Steigleder GK. Plaque-artige Form der cutanen Mucinose (PCM) und retikuläre erythematöse Mucinosis (REM-Syndrom). *Z Hautkr* 1975;50:25–32.
11. Dal BL, Larsen TE. Reticular erythematous mucinosis syndrome: report of a case. *Acta Derm Venereol* 1977;57:465–467.
12. Bulengo-Ransby S, Ellis CN, Griffiths EM, Cantu-Gonzales G, Dubin HV, Voorhees JJ. Failure of reticular erythematous mucinosis to respond to cyclosporine. *J Am Acad Dermatol* 1992;27:825–828.
13. Levine VJ, Geronemus RG. Adverse effects associated with the 577- and 585-nanometer pulsed dye laser in the treatment of cutaneous vascular lesions: a study of 500 patients. *J Am Acad Dermatol* 1995;32:613–617.
14. Ashinoff R, Geronemus RG. Capillary hemangiomas and treatment with the flash lamp-pumped pulsed dye laser. *Arch Dermatol* 1991;127:202–205.
15. Anderson RR, Parish RR. Selective photothermolysis: precise microsurgery by selective absorption of pulsed radiation. *Science* 1983;220:524–527
16. Raulin C, Kimmig W, Werner S. Laser therapy in dermatology and aesthetic medicine—side effects, complications, and treatment faults. *Hautarzt* 2000;51:463–473.
17. Raulin C, Schmidt C, Hellwig S. Cutaneous Lupus erythematosus—treatment with pulsed dye laser. *Br J Dermatol* 1999;141:1046–1050.
18. Braddock SW, Kay D, Maennle D, McDonald TL, Pirruccello SJ, Masih A, Klassen LW, Sawka AR. Clinical and immunologic studies in reticular erythematous mucinosis and Jessner's lymphocytic infiltrate of skin. *J Am Acad Dermatol* 1993;28:691–695.
19. Greve B, Hartschuh W, Raulin C. Extragenital lichen sclerosus et atrophicus—treatment with pulsed dye laser. *Hautarzt* 1999;50:805–808.
20. Rabinowitz LG. Lichen sclerosus et atrophicus treatment with the 585-nm flashlamp-pumped pulsed dye laser. *Arch Dermatol* 1993;129:381–382.
21. Alster T. Improvement of erythematous and hypertrophic scars by the 585 nm flashlamp-pumped pulsed dye laser. *Ann Plast Surg* 1994;32:186–190.
22. Alster TS, McMeekin TO. Improvement of facial acne scars by the 585 nm flashlamp-pumped pulsed dye laser. *J Am Acad Dermatol* 1996;35:79–81.
23. Alster TS, Williams CM. Treatment of keloid sternotomy scars with the 585 nm flashlamp-pumped pulsed dye laser. *Lancet* 1995;345:1198–1200.