

Scar Sarcoidosis—Treatment With the Q-Switched Ruby Laser

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Background and Objective: Scar sarcoidosis is a circumscribed form of cutaneous sarcoidosis, which is often very difficult to treat. To date, therapeutic approaches have yielded little success and often been accompanied by adverse effects, some of which are severe. Laser treatment is one alternative, which has proven to be effective in a dramatically increasing number of cases over the past years.

Study Design/Patients and Methods: We report about a 50-year-old female patient who presented with histologically confirmed scar sarcoidosis on the right elbow and both knees; the sarcoidosis had spontaneously developed on three sites which had traumatic tattoos from abrasions. Because of the reddish-brown livid discolorations, we treated the granulomas with the pulsed dye laser for three sessions, although without success. Treatment with the Q-switched ruby laser was commenced to remove the traumatic tattoos.

Results: Not only had the areas lightened fully after four sessions, the sarcoidosis foci had resolved completely, and the patient has been recurrence-free for over 3 years.

Conclusion: The Q-switched ruby laser appears to be a rapid and effective means of treating scar sarcoidosis with traumatic tattoos without incurring adverse effects. The definitive mode of action is still not fully known, however. *Lasers Surg. Med.* 30:398–400, 2002.

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Key words: cutaneous sarcoidosis; laser; lupus pernio; sarcoidosis; traumatic tattoos

INTRODUCTION

Cutaneous sarcoidosis was first described by Besnier [1] in 1889. He referred to this disease as *lupus pernio* because it was both reminiscent of perniosis and manifested a lupoid histological infiltrate [2].

Scar sarcoidosis is a circumscribed form of cutaneous sarcoidosis. It is localized in scars and marked by inflammatory infiltrations and livid discolorations [2]. Its occurrence is described after such conditions as herpes zoster infections [3,4], pseudofolliculitis barbae [5], hyposensitivities [6], operations, trauma [7,8], cosmetic tattoos, and traumatic tattoos [7]. In every instance, there is the spontaneous development of livid or reddish-brown plaques on scars that were previously atrophic for the most part; this phenomenon occurs at varying intervals.

To date, therapeutic strategies have ranged from topical, intralesional, and systemic application of corticosteroids all the way to balneophototherapy (PUVA) and surgical excision [1].

Only three works have been published about the use of lasers in scar sarcoidosis.

CASE REPORT

A 50-year-old woman presented for the first time in September 1996. She had fallen on her right elbow and both knees 40 years previously and then again in the spring of 1996, causing deep abrasions. Scars had formed with traumatic tattoos. Since early August 1996, the patient had noticed that both the old and the new scars had glassy foci that were becoming erythematous; they appeared to be growing and were strongly pruritic. There were no similar efflorescences on other body parts.

On the elbow and both knees there was scarred tissue of clinical relevance as well as blackish-grey traumatic tattoos and reddish-brown livid nodal skin changes with irregular margins (Fig. 1). The remaining dermatological findings were normal and standard for a patient of that age. A histological examination of the elbow (September 26, 1996, dermatopathological joint office of Drs. Hügel, Kutzner, Rütten) yielded epithelioid cell granulomas in the dermis that had intracellular polarizing fragments (hematoxylin/eosin stain). Due to the disseminated and simultaneous occurrence of the skin changes in both the old (40 years post trauma) and the new scars, it was assumed that a spontaneous sarcoidal reaction had taken place, resulting in noncaseous granuloma. Taking the medical history as well as the unambiguous clinical and histological findings into account, the diagnosis of a subclinical form of sarcoidosis with cutaneous manifestation was confirmed. The differential diagnosis of foreign-body granuloma was thus ruled out. The resulting general internistic examination yielded no evidence of the systemic presence of sarcoidosis.

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Fig. 1. Scar sarcoidosis and traumatic tattoos 40 years after abrasion (4/97).

We performed treatment on the patient with the pulsed dye laser (Photo Genica V, Cynosure Inc., Bedford, MA, wavelength 585 nm, pulse duration 0.5 millisecond, fluence 5.5–5.6 J/cm², impulse spot size 7 mm) from January to June 1997; three sessions were held at intervals of 4–6 weeks each. The areas in question showed no response during treatment or the follow-up observation of 7 months; the pruritus remained unaffected.

Due to the concomitant traumatic tattoos, we used the Q-switched ruby laser (Laseaway, Lambda Photometrics Ltd., Harpenden, England, wavelength 694 nm, pulse duration 25 nanosecond, fluence 10 J/cm², impulse spot size 6 mm) between February and July 1998.

COURSE OF THERAPY

No trial session was performed because of the relatively small size of the skin affected. The scar sarcoidosis was treated with the Q-switched ruby laser (at a fluence of 10 J/cm²) a total of four times at intervals of 4–6 weeks between February and July 1998. The patient tolerated

the treatment well and did not require local anesthetics or analgesics. Parts of the treated areas developed punctate bleeding and crusting. The wounds were treated with anti-inflammatory ointment bandages (Flammazine[®], Silver Sulfadiazine) for 7–10 days until the crusting healed. Photodocumentation was performed at the beginning and end of the treatment (camera: Canon EOS 100, Film: Agfa CTX 100).

RESULTS

The first treatment session of the scar sarcoidosis using a Q-switched ruby laser took place in February 1998, and the last session was held in July. In the course of treatment, a clear regression of the granulomas could be observed; within a mere four sessions, this led to a complete resolution of the sarcoidosis foci, which remain recurrence-free to date. The traumatic tattoos were also completely resolved (Fig. 2). Hypopigmentations or hyperpigmenta-



Fig. 2. Complete resolution after four sessions with the Q-switched ruby laser (2/00) following a previous unsuccessful treatment with the pulsed dye laser. The patient has been recurrence-free for 3 years.

tion were not observed. A histological follow-up examination was not performed due to the possibility of iatrogenic reactivation of the scar sarcoidosis.

DISCUSSION

Scar sarcoidosis is an inflammatory skin disease of unknown etiology which occurs due to a dysfunction of the immune system [2,9,10]. The diagnosis is well established when clinical and radiological findings are supported by histological evidence of widespread noncaseous granulomas. Several studies reported that the presence of polarizable foreign body material in granulomatous cutaneous lesions is common in patients with systemic sarcoidosis [11–14]. In addition, it has also been hypothesized that sarcoidosis is a disease in which the immune system's capacity to handle particulate foreign matter is altered; the presence of foreign bodies might also provide the stimulus necessary for granuloma formation [11,14,15].

Treating this disease is a difficult matter. Therapeutic approaches range from topical, intralesional, and systemic application of corticosteroids to systemic administration of cytostatic drugs, chloroquine, vitamin D, allopurinol (Zyloric[®]) [2,8], and thalidomide (Contergan[®]) [16]. The considerable adverse effects of these substances and the often poor prognosis of success with these medications only justify their use, let alone permit it, in carefully considered select individual cases. Alternatives include balneophototherapy (PUVA), surgical excision [2], and laser treatment.

There are reports of initial experiences with the excision and vaporization of foci of cutaneous sarcoidosis involving the nose [17] or nasal mucosa [18] using a CO₂ laser. Goodmann et al. also described a clear improvement of the skin findings of lupus pernio of the nose using a pulsed dye laser [19]. In this instance, the remission was largely attributed to the immunomodulatory effect of the dye laser, which corresponded to the theory postulated by Alster et al. in 1997 [20]. In our case, however, the anticipated therapeutic success did not occur with this type of laser. It was only when the existing traumatic tattoos were treated with the Q-switched ruby laser that the desired results occurred. Both the traumatic tattoos and the sarcoidosis foci were removed or resolved. The patient has been recurrence-free for over 3 years. The resolution of sarcoidosis foci could be induced by an activation of immunological processes. The definitive mode of efficacy remains unclear.

To summarize, in our case report the Q-switched ruby laser has proven itself to be a quick, patient-friendly and non-invasive method of treating scar sarcoidosis when foreign bodies are present. It can be repeated as needed, and local anesthetics are not necessary. In comparison to

the therapeutic options described to date, this technique is an elegant alternative with few adverse effects.

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