

CASE REPORTS AND SHORT REPORTS

Inflammatory linear verrucous epidermal nevus: why a combined laser therapy

ROSSANA CONTI, NICOLA BRUSCINO, PIERO CAMPOLMI, PAOLO BONAN,
GIOVANNI CANNAROZZO & SILVIA MORETTI

Department of Dermatology II, University of Florence, Florence, Italy

Abstract

Inflammatory linear verrucous epidermal nevus (ILVEN) is a benign cutaneous hamartoma, and more precisely an uncommon variant of the verrucous epidermal nevus. In our case report we describe an ILVEN female patient, resistant to previous treatments but responsive to a combined laser therapy, 10,600-nm CO₂ laser and Fractional CO₂ laser, with good and longstanding results. A complete resolution of the lesion was observed at the 9-month follow-up. The application of lasers has been reported in literature over recent years for resolving ILVEN lesions. Based on our clinical experience, 10,600-nm CO₂ pulsed laser therapy seems to be the best treatment and Fractional CO₂ laser treatment can be regarded as a very promising technique to combine with CO₂ laser for reducing pigment modifications and endowing a more youthful appearance to the treated areas.

Key Words: *fractional CO₂ laser therapy, inflammatory linear verrucous epidermal nevus, 10,600-nm CO₂ laser therapy*

Introduction

Inflammatory linear verrucous epidermal nevus (ILVEN) is a benign cutaneous hamartoma, and more precisely, it represents an uncommon variant of the verrucous epidermal nevus (1–2). This rare disease, found most frequently in females, ratio 4:1, has early onset, usually within the first years of life and rarely in adulthood, and it rarely remits or improves over time. It is clinically characterized by erythematous, hyperkeratotic, warty papules, and at times by psoriasiform or lichenoid patches with a typical linear arrangement, following Blaschko's lines (3–5). In our case report we describe an ILVEN female patient, resistant to previous treatments but responsive to a combined laser therapy, 10,600-nm CO₂ laser and Fractional CO₂ laser, with good and longstanding results.

Material and methods

A 36-year-old Italian woman came to our dermatological clinic presenting a particular lesion located on

the trunk, which occupied the skin from under the mammary gland around to the lumbar region, with a linear arrangement following Blaschko's lines (Figure 1A–C). The lesion started during childhood with dark-brown warty papules on the left side of the trunk, rough to the touch and surrounded by a pink halo. Over time the papules gradually extended to involve other skin areas, coalescing into a continuous linear hyperkeratotic plaque. There were no pathological antecedents or previous family history of the disease. The diagnosis of clinically suspected ILVEN was confirmed by an incisional biopsy. Routine tests showed that there was no involvement of any other body regions, and none of the other occasionally associated cutaneous, musculoskeletal, neurological abnormalities. With hamartomatous skin lesions, it is always advisable to exclude involvement of other body areas with the fundus examination and skeletal X-rays, and, if necessary with more specific exams such as ultrasounds and abdominal CT. The disease partially impaired her quality of life, due to its chronic, unremitting symptomatology, and issues regarding its cosmetic appearance. She

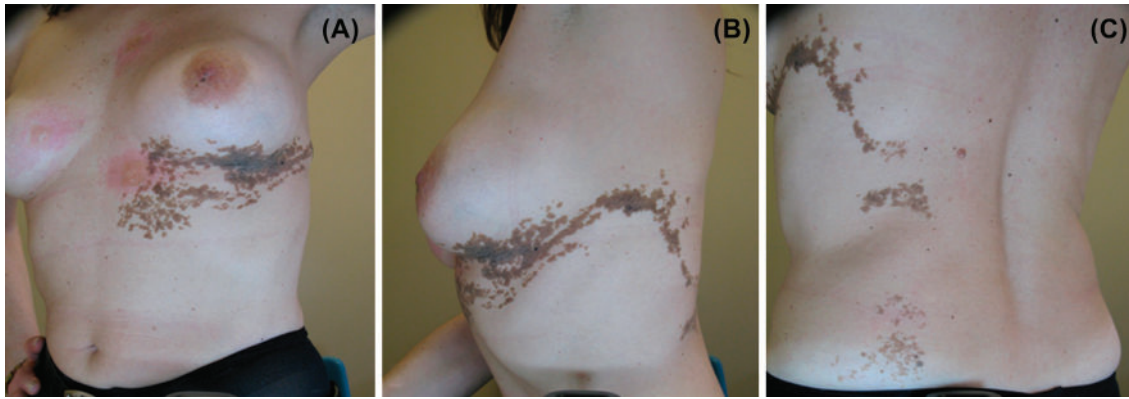


Figure 1. A-B-C: ILVEN lesion located on the trunk, which linearly occupied the skin from under the mammal up to the lumbar region, typically following the lines of Blaschko. (A) An initial explorative laser test is carried out on a small area of the lesion on the right.

had previously received long-term treatments with topical drugs but without any beneficial effects. The initial treatment involved occlusive topical steroids (clobetasol propionate), administered once a day for one and a half months. Several months later, 0.005% calcipotriol was administered once a day for 2 months and another attempt was made using topical 0.1% tretinoin cream and 5% 5-fluorouracil cream but without any long-lasting results. Due to the extensiveness of the lesions, and considering the proven ineffectiveness and invasiveness of previous medical treatment as well as the aesthetic and functional complications of surgery, we decided to treat the lesion with laser therapy. The patient signed an informed consent form for treatment and we began the session by applying a topical iodine antiseptic solution to the lesion and drying it with a sterile gauze. Surface anesthesia was not necessary, because the laser application was rapid and generally well tolerated by all patients according to our experience. Initial explorative laser therapy (Figure 1A) was carried out on a small area to test whether this kind of laser was effective in removing the lesion and to gauge the patient's skin reaction. As the test was successful on a small part of the lesion, we extended the treatment to the remaining skin areas during the same session. We treated our patient using a 10,600-nm CO₂ pulsed laser (SL 250 CO₂ laser DEKA-M.E.L.A., Calenzano, Italy), with a spot size of 0.7 mm, 0.5–0.7 J/Cm² and 10–15 H. Three sessions were held at regular intervals approximately 3 weeks apart. Three months after the last CO₂ pulsed laser session, the patient received another treatment with the SmartXide DOT Fractional CO₂ laser device (DEKA-M.E.L.A., Calenzano, Italy) (Figure 2) to remove a moderate dyschromia. This last laser session involved only one pass per area. The settings included: 8 W power, 500 DOT spacing, 1000 s dwell time, stack 1. An antibiotic cream and sunscreen were applied regularly by the patient for 15 days after each therapeutical session to prevent infections and post-inflammatory hyperpigmentations.

Results

Three applications were sufficient for treating the entire ILVEN lesion and we achieved excellent and immediate results which remained stable over time. The laser treatment was well tolerated by the patient without any side effects except for mild local pain; for this reason she was satisfied with the clinical outcome and pleased to have avoided the discomfort that other therapies would probably have caused. Three months after the last CO₂ pulsed laser treatment we noticed the appearance of a moderate dyschromia where the lesion had been, so we decided to remove this and improve the skin texture with a Fractional CO₂ laser session. At 9-month follow-up, there had been no lesion recurrence or any discomforting symptom such as pruritus (Figure 3A–C).

Discussion

One of ILVEN's most frequent and appropriate criteria is its resistance to various types of treatment. Because of its chronic and unremitting symptoms,



Figure 2. The typical erythema, immediately after the treatment session with the SmartXide DOT (DEKA-M.E.L.A., Calenzano, Italy) Fractional CO₂ laser device.

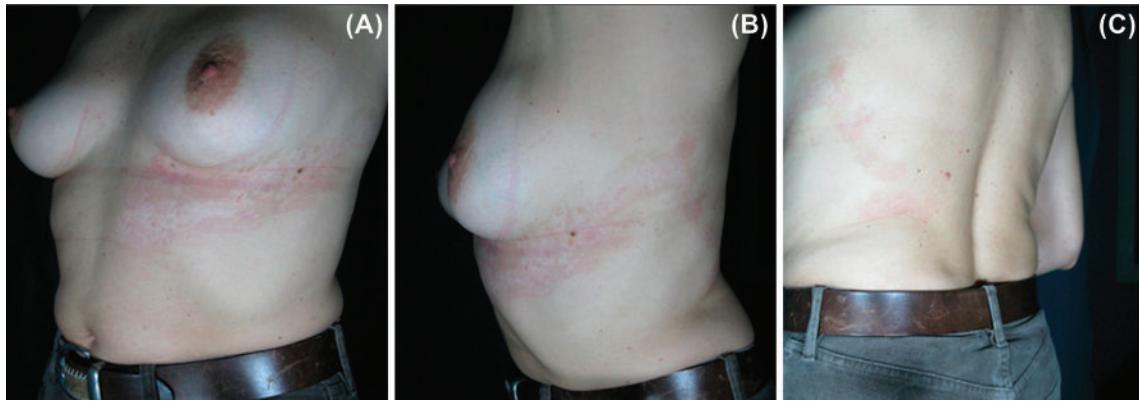


Figure 3. A-B-C: At 9-month follow-up: disappearance of ILVEN lesion, with no recurrences, reduced dischromyas, and improved skin texture.

patients seek treatments capable of improving their condition, even if often unsatisfactory as only temporary or partially effective. Dermatologists can choose from a wide range of options: topical or intralesional corticosteroids, a combination of 0.1% tretinoin and 5% Fluorouracil, topical calcipotriol, topical tacrolimus and pimecrolimus, trichloroacetic acid peeling, Anthralin, tar, Etanercept, cryotherapy, dermabrasion, electrodesiccation, surgical excision, photodynamic therapy (PDT), and laser therapy (6–13). Since ILVEN is a rare disease, there are very few anecdotal studies on its treatment, no controlled clinical trials have been conducted, and the most effective procedure has not yet been established. While the medical approach is not able to relieve the discomfort and improve the cosmetic appearance, surgical methods are often more efficacious, especially in the case of small lesions, but they involve a high risk of relevant side effects such as marked scarring. Recently, phototherapy, in particular the PDT technique, has proved to be an interesting and useful tool for treating ILVEN, although it provokes severe pain for patients who often require local anesthesia (6). The application of lasers such as argon laser, carbon dioxide laser, pulsed ruby laser, and 585-nm flash lamp-pumped pulsed dye laser has been reported in literature over recent years for resolving ILVEN lesions (7–13). Based on our clinical experience, CO₂ laser therapy seems to be the best treatment; in fact, compared to other treatments, laser therapy has no contraindications and requires no special patient preparation such as anesthesia. The laser action is faster, less invasive, and less destructive than surgery thanks to precise ablation and minimal damage to the surrounding tissues. Side effects are practically absent and, even more importantly, there are no relevant related complications. The laser lesions showed rapid epithelialization and the aesthetic and functional results were excellent. Fractional CO₂ laser treatment can be regarded as a very promising technique to combine with a

10,600-nm CO₂ pulsed laser for reducing pigment modifications and endowing a more youthful appearance to the treated areas. This depigmenting action can also be guaranteed by Intense Pulsed Light, however this technique requires at least three sessions at regular intervals, 3 weeks apart, and for this reason we preferred to use Fractional CO₂ laser, which improves the texture and removes the dyschromias after only one session. Our patient was very satisfied not only with the effectiveness of the operation, but also with the speed of each treatment, its tolerability, and the absence of any special pre- or post-operative precautions except for short-term local antibiotic therapy.

Declaration of interest: The authors report no declarations of interest. The authors alone are responsible for the content and writing of the paper.

References

- Altman J, Mehregan AH. Inflammatory linear verrucous epidermal nevus. *Arch Dermatol*. 1971;104:385–389.
- Lee SH, Rogers M. Inflammatory linear verrucous epidermal naevi: a review of 23 cases. *Australas J Dermatol*. 2001;42: 252–256.
- Simonart T, Heenen M. Inflammatory verrucous epidermal naevus presenting as a psoriasiform plaque. *Dermatology*. 2007;215:167–168.
- Hofer T. Does inflammatory linear verrucous epidermal nevus represent a segmental type 1/type 2 mosaic of psoriasis? *Dermatology*. 2006;212:103–107.
- Morag G, Metzker A. Inflammatory linear verrucous epidermal nevus. Report of seven new cases and review of the literature. *Pediatr Dermatol*. 1985;3:15–18.
- Parera E, Gallardo F, Toll A, Gil I, Sánchez-Schmidt J, Pujol R. Inflammatory linear verrucous epidermal nevus successfully treated with Methyl-Aminolevulinate Photodynamic Therapy. *Dermatol Surg*. 2010;36:253–256.
- Hohenleutner U, Landthaler M. Laser therapy of verrucous epidermal naevi. *Clin Exp Dermatol*. 1993;18:124.
- Hohenleutner U, Wlotzke U, Konz B, Landthaler M. Carbon dioxide laser therapy of a widespread epidermal nevus. *Lasers Surg Med*. 1995;16:288.

9. Molin L, Sarhammar G. Perivulvar inflammatory linear verrucous epidermal nevus (ILVEN) treated with CO₂ laser. *J Cutan Laser Ther.* 1999;1:53–56.
10. Paradela S, Del Pozo J, Fernandez-Jorge B, Lozano J, Martínez-González C, Fonseca E. Epidermal nevi treated by carbon dioxide laser vaporization: a series of 25 patients. *J Dermatolog Treat.* 2007;18:169–174.
11. Ulkur E, Celikoz B, Yuksel F, Karagoz H. Carbon dioxide laser therapy for an inflammatory linear verrucous epidermal nevus: a case report. *Aesth Plast Surg.* 2004;28:428–430.
12. Baba T, Narumi H, Hanada K, Hashimoto I. Successful treatment of dark-colored epidermal nevus with ruby laser. *J Dermatol.* 1995;22:567–570.
13. Alster TS. Inflammatory linear verrucous epidermal nevus: succesful treatment with the 585 nm flashlamp-pumped dye laser. *J Am Acad Dermatol.* 1994;31:513–514.