Lichen planus pigmentosus successfully treated with conventional CO₂ laser resurfacing

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Lichen planus pigmentosus (LPP) develops as an asymptomatic and dusky pigmentation of the facial skin with no effective treatment. Herein we report a 54-year-old lady with clinical and histopathologic confirmation of LPP who was scheduled to be treated with CO₂ laser resurfacing. After tumescent anesthesia, the whole facial skin was treated with three passes of Ultrapulse conventional CO₂ ablation. The energy used in the first, second, and third passes were 6.6, 5.4, and 4.8 mJ, respectively. The mandibular area was treated with two passes (4.2 and 3.6 mJ). The eye contours were treated with two passes (3.9 and 3.3 mJ). The patient's face remained edematous for a week, with the facial skin oozing within the first three days before it became crusted. The crust shed out from day three to six. After a week, smooth and erythematous skin appeared. The erythema persisted for up to four months, after which uniform skin with considerable bleaching and rejuvenation developed. No recurrence occurred within 18 months of follow-up. We conclude that LPP can be treated with CO₂ laser resurfacing without any complications.

Keywords: lichen planus, CO₂ laser, treatment

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INTRODUCTION

Lichen planus pigmentosus (LPP) is believed to be a variant of lichen planus disease. This condition develops as asymptomatic dark brown or gray-blue macules or patches over the facial skin and other sun-exposed areas. Unfortunately, LPP can persist for many years with or without treatment. Patients are highly concerned about their disease and appearance, and seek relief from this embarrassing condition. None of the recommended medical therapies are able to remove the dense pigment incontinence in the dermis. The pigment incontinence is the main cause of the pigmentary abnormality in LPP. We attempted to treat LPP by CO₂ laser resurfacing in order to remove the upper dermis with its dense pigment incontinence and other degenerated tissues as well as the damaged epidermis.

CASE PRESENTATION

A 54-year-old lady with Fitzpatrick type 3 skin presented with uneven dusky pigmentation of the facial skin that had lasted for more than a decade (Figures 1-3). Histopathologic studies had previously been conducted twice in two referral centers. Both pathology reports were in favor of LPP with thinning of the epidermis, basal layer degeneration, and sparse band-like infiltration of lymphocytes and monocytes accompanied by some solar elastotic changes in the upper dermis. The blood profiles and liver enzymes (aspartate aminotransferase, alanine aminotransferase, and alkaline phosphatase) were within normal limits and the serology for the hepatitis C virus antibody was negative. The patient had received all available medical therapies in other centers including hydroquinone and other bleaching agents with



Figure 1. Before treatment (front view)



Figure 2. Before treatment (right view)



Figure 3. Before treatment (left view)

variable concentrations and brand names, topical steroids and tacrolimus each considerable durations, and 200 mg daily hydroxychloroquine for six months without any effect. After preparation of the face, the maxillary, mandibular, temple, paranasal, and infraorbital areas were anesthetized by tumescent anesthesia. The nerve block was done for the forehead and the nasalis nerves. Some complementary local lidocaine injections were performed for the eyelids and the tip and sides of the nose to complete the anesthesia. The entire facial skin was treated with three passes of Ultrapulse conventional CO₂ ablation. The CO₂ used was provided by the MiXO₂ Lasering Company, Italy. The parameters used were: 6.6 mJ for the first pass; 5.4 mJ for the second pass; and 4.8 mJ for the third pass. The submandibular area and the border of the mandibular bone were treated with two passes (4.2 and 3.6 mJ) to avoid scar formation. The eye contours were also treated with two passes (3.9 and 3.3 mJ). Immediately after three passes of laser therapy, the face was quite edematous as a result of the tumescent anesthesia. The skin had a yellowish tint with no bleeding or

oozing occurred initially. Silver sulfadiazine was applied to the entire face and covered by sterile gauze fixed with non-allergenic adhesive tape. The mouth and eyes were left open. After such treatment, facial edema may persist for a week as a result of the inflammatory reaction of laser therapy and the slow absorption of the tumescent fluid; the edema may be more severe in the first two days. The facial skin was oozing within the first three days, and the patient was instructed to change the dressing twice a day or more with frequent bathing and gentle washing of the face. As of the third day, the face became crusted. The crust shed out from day three to six. After the complete shedding of the crusts, smooth, even, and erythematous skin appeared. The erythema was remarkable for the first two months with gradual fading thereafter. Four months later, the patient had uniform and pleasant skin with considerable bleaching and rejuvenation. No recurrence occurred within 18 months of follow-up The photographs shown in Figures 4-6 were taken eight months after the procedure.



Figure 5. After treatment (right view)



Figure 4. After treatment (front view)



Figure 6. After treatment (left view)

DISCUSSION

Lichen planus pigmentosus presents as an abnormal gray-blue or dark brown pigmentation of the facial skin and other sun-exposed areas. It is considered a variant of classic lichen planus. The only similarity that LPP has with lichen planus is some common histopathologic features such as pigment incontinence and basal layer degeneration. These pathologic features can also be seen in a variety of disorders such as ashy dermatosis, erythema dyschromicum perstans, and even dermal melasma 1-5. Unlike lichen planus, LPP is asymptomatic and is not preceded by inflammatory and papular reactions; it also is not associated with cutaneous and mucosal involvement in other areas. The abnormal pigmentation seen in LPP is the result of the presence of pigment incontinence in the upper dermis. Any therapeutic modality should be based on the removal of the pigment incontinence, which cannot be achieved by medications applied topically. Bleaching agents are usually inhibitors of tyrosinase, the enzyme that is involved in melanin synthesis within the melanocytes. These compounds cannot affect the dermal components in this condition and in other pigmentary disorders such as melasma. The chemical peeling and retinoid compounds commonly used for such pigmentary disorders ⁶ can remove superficial epidermal segments like the corneal layers, which are loaded with melanin. Though they may have temporary bleaching properties, the main pathology of LPP located in the dermis remains intact, meaning that such agents are unable to treat LPP. Based on all these explanations, we tried to use CO₂ laser resurfacing to remove the papillary dermis in which the pigment incontinence is located. Such technology can remove the pigment incontinence as well as photo-damaged collagen and elastic fibers, which are replaced by newly synthesized matrix and fibers. Hence, considerable rejuvenation is achieved by CO₂ laser resurfacing. By removing the epidermis, the new epithelial cells migrate from the deeper parts of hair follicles and sweat glands and cover the epidermis. Whenever there is pigment incontinence, there would be some vacuolar degeneration of the basal layer and or basement membrane disruptions as in the case of dermal melasma 1-5, so both the epidermis and dermis are involved in the pathogenesis and both should be treated.

Lichen planus is a Koebner-positive disease. It is supposed that any trauma including laser therapy may aggravate or extend the disease. In the case of LLP, however, laser therapy is reported to improve the disease with no complications ⁷⁻⁹. Correspondingly, we used invasive CO₂ laser therapy and achieved remarkable improvements including facial lightening and rejuvenation, with no complications occurring even after 18 months of follow-up.

CONCLUSION

We conclude that LPP can be treated with CO₂ laser resurfacing without any complications.

Conflict of interest: None declared.

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