



# Hyperpigmentated Scars of the Face Following a Toxic Epidermal Necrolysis (TEN): A Case Report

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## Abstract

Toxic Epidermal Necrolysis (TEN) is a rare and often fatal muco-cutaneous disease usually related to severe adverse drug reaction. The standard treatment of TEN remains controversial and to our knowledge, all reports in literature are mostly concentrated on systemic therapy. On the contrary, no report deals with deep skin scars that may occur. We therefore present an original case of a severe scarring of the face following TEN, treated by fractional CO<sub>2</sub> laser resurfacing.

**Keywords:** Hyperpigmentated scars; Toxic epidermal necrolysis; Fractional laser

## Introduction

Toxic epidermal necrolysis (TEN), also known as Lyell's syndrome, is an acute T-cell mediated immune disorder, caused by idiosyncratic adverse drug reaction to sulfonamides, anticonvulsants, antiretroviral drugs, allopurinol, and non-steroidal anti-inflammatories (NSAIDs) [1]. An extensive cleavage of the epidermis from the dermis occurs due to keratinocyte apoptosis, resulting in large exposed areas, from 10 % up to more than 30% of skin detachment. General conditions are severe, and the mortality rate ranges from 5% to 35%. Primary treatment aims at the survival of the patient, rarely considering the aesthetic appearance of cutaneous sequela [2]. The healing process of the skin is similar to a partial thickness burn injury, with secondary wound infection or self-induced picking trauma that may alter the recovery, resulting in atrophic deep scars. The management consists of different approaches: physical approach (laser, pulsed light, and cryotherapy), surgical approach (dermabrasion, punch excision etc.), fillers and chemical peels. Shallow lesions can improve with chemical peels, while non-ablative radiofrequency, subcision techniques, or subcutaneous infiltration give better results in case of deep scars. To our knowledge, few reports deal with treatments of facial scars following a TEN.

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## Case Presentation

A 35 years-old woman presented 3 years ago with facial scarring due to a severe TEN, following nonsteroidal anti-inflammatory drug assumption. The patient referred no response to medical or chemical treatment. The partial thickness damage of the dermis caused on both cheeks depressed, rolling and boxcar scars with hyperpigmentation that enhanced the unsightly appearance of the patient's face (Figure 1).

To improve skin texture and lighten hyperpigmentation three fractional CO<sub>2</sub> resurfacings were planned. The treatment was performed with a fractional CO<sub>2</sub> Laser (SmartXide<sup>2</sup>, DEKA M.E.L.A., Calenzano, Italy) using these parameters: 500 micron spacing, 1000 Hz frequency and 45 mJ/cm<sup>2</sup> of energy. Time interval between treatments was three months. No post-operative pain or bleeding was registered. Face oedema and erythema resolved completely within 10 days after each treatment.

A satisfactory cosmetic appearance of the skin, with almost complete resolution of the hyperpigmentation, was achieved (Figure 2). Follow up at 18 months showed just a mild recurrence of skin irregularities but no hyperpigmentation and substantially confirmed a good stability of the result (Figure 3). Patient's satisfaction assessed by a visual analog scale (VAS) evaluation (score: 1 to 5) confirmed a high satisfaction rate (score 4) at the end of the treatment and still a good rate (score 3.5) after 18 months.

## Discussion

TEN often begins as a morbilliform rash that quickly converges in bigger spots with purpura aspects, which rapidly turn into flaccid bulla, Nikolsky-positive. Large cutaneous areas are often involved as well as mucous membrane that are interested in the 90% of the patients, with implication



**Figure 1:** Preoperative view of facial hyperpigmented scars.



**Figure 2:** Early postoperative result after three fractional CO<sub>2</sub> resurfacing.

of conjunctiva as a poor prognostic sign. In positive prognosis cases, a complete healing is possible in 10-20 days [3].

Treatment usually implies intensive care unit or big burns center, and early symptomatic therapy with huge quantity of water, electrolytes, macrolides, and antibiotics to prevent infection [4-7].

Scarring is initially underestimated whereas aesthetic and psychological effects may be significant, especially if the face is involved. Obviously effective procedures for scars are well known and numerous, all aiming to disrupt or remove scar tissue and to allow its replacement with functional, healthy tissue. However, sub typing scars is of paramount importance to define the correct clinical presentation in order to choose the appropriate treatment. In our case, the clinical presentation was more similar to a severe post acne inflammatory reaction than to a burn, and the hyperpigmentation, following the damage enhanced the visibility of the scars.

The laser resurfacing approach was preferred to renew the superficial layers, removing darkened and damaged cells and to improve deep levels, inducing formation of new collagen. Traditional resurfacing is associated with potential side effects, such as long lasting erythema, scarring, infection, and hyperpigmentation especially following inflammatory reactions; whereas fractional laser is claimed to be capable of producing only minor improvements.

Our experience confirmed that the fractional Smart Xide CO<sub>2</sub> laser, thanks to a bipolar radiofrequency source, generates perfectly controlled pulses (DOTs) by managing the “energy per pulse” parameter, the “DOT spacing” between two microscopic wounds, and the pulse duration (known as “dwell time”). Many articles already reported its effectiveness to improve skin texture in acne scars also combining the emission of a bipolar radiofrequency to increase the release of heat deeper down in the dermis [8-10]. As a matter of facts, this report supports its application also in case of refractory scars and



**Figure 3:** Postoperative result after 18 months.

for the treatment of hyperpigmentation. Combined procedures with chemical peels as well as Intense Pulsed Light can be eventually added.

## Conclusion

Toxic Epidermal Necrolysis (TEN) is a severe and threatening disease in which the first goal is patient survival, however, scarring, following this syndrome, could be highly disfiguring. Fractional CO<sub>2</sub> laser resurfacing proved to be a good option to improve both skin texture and hyperpigmentation, and it should be considered in these cases.

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