

WHITE PAPER

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SMARTXIDE² DOT RF

Laser and Skin Rejuvenation

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Laser and Skin Rejuvenation

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Introduction

Everyone is interested in skin rejuvenation. The development of laser systems exploiting different wavelengths in the medical field has made it possible to safely and effectively treat numerous skin imperfections. In our experience, resurfacing with fractional CO_2 laser integrated with bipolar radiofrequency is efficacious in improving the treatment of patients with various degrees of photo damagewhile reducing healing times.

This method has proved effective in attenuating wrinkles and sunspots with the formation of neocollagenogenesis, thus offering enhanced skin elasticity and smoothness. The method is considered a valid technological answer to the increasing demand for satisfactory results and reduced healing times.

SmartXide²

The level and speed of development of laser systems in the medical field over the last decade has made it possible to treat many pathological or purely aesthetic skin and mucosa lesions more safely and effectively. This development derives from a better understanding of laser-tissue interactions and more advanced technology in creating laser systems that consequently offer a wider range of applications in dermatology. New technologies have been developed for treating wrinkles, post-acne scars and pigment alterations, and in general everything connected with enhancing skin texture and tone.

In our experience, ablative resurfacing with CO_2 laser is considered the gold-standard for treating wrinkles, skin damage from photoaging and post-acne scars. However, this method is also associated with long post-op recovery times, possible infective complications (bacterial and viral) and bothersome side effects (persistent erythema, post-inflammatory pigmentation alterations and possible atrophic scarring). The excellent results obtained with this technique have therefore stimulated research into methods and technologies capable of achieving similar results while reducing healing times and side effects. Based on these requirements, "fractional" resurfacing with CO_2 laser, which combines laser energy with bipolar radiofrequency, has been developed. The CO_2 fractional laser makes it possible to obtain vertical micro-zones of damage surrounded by areas of healthy tissue; the system simultaneously delivers bipolar radiofrequency that amplifies the stimulating effect on the treated tissue.

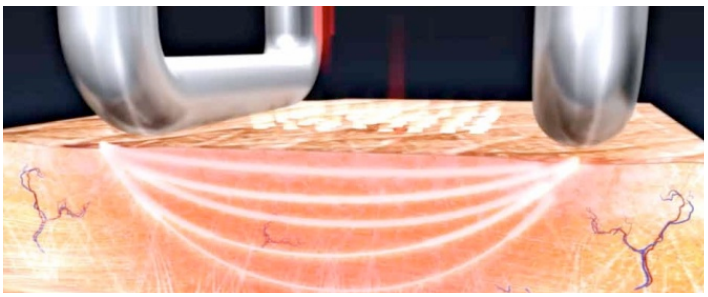


Figure 1. Synergy between CO_2 and bipolar RF current

The simultaneous emission of CO_2 fractional laser and radiofrequency currents yields several significant beneficial effects.
In particular, there is a transfer of energy from the surface to the deeper layers with a more uniform lateral diffusion of the biostimulation. A reduction in superficial hyperaemia (redness) can also be observed.

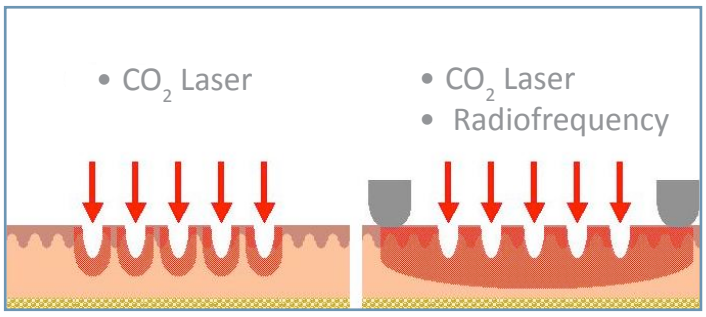


Figure 2. Localised effect (fractional laser only) and diffused effect (with RF)

Our Experience

Minimally invasive fractional laser stems from the idea of combining the non-ablative fractional action (sources in the near-medium infrared) with ablation of the epidermis "in toto" (sources in the far infrared).

These fractional systems are equipped with a new scanning system (HiScan DOT/RF) that makes it

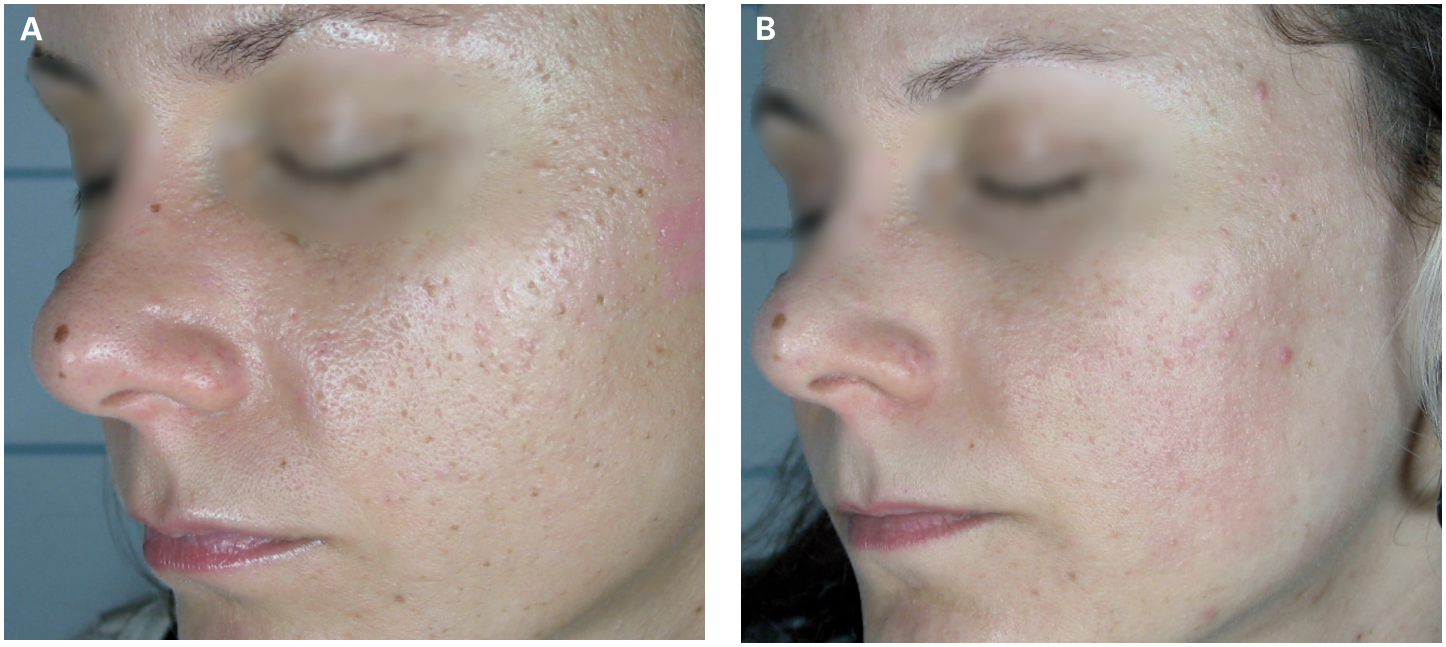


Figure 3. Acne scars: **(A)** before **(B)** after 3 treatments (HiScan DOT/RF: use of S-Pulse and Radiofrequency)

possible to create micro-columns of heat damage surrounded by healthy tissue.

These columns of light are capable of producing vertical ablation of the epidermis and variable ablation of the dermis. The controlled release of heat in the treated micro-areas, depending on the pulse used (normally the S-Pulse for acne scars and the D-Pulse for sagging skin), has an immediate tissue-shrinking effect and generates stimulation (of growth factors and wound repair) and the reorganisation of new collagen.scheduled with the fractional laser. The areas of healthy tissue that separate the penetration micro-columns at different distances, enable faster tissue repair and enhanced stimulation of the skin components.

The skin features of patients enrolled for this laser technique included: yellowish/grey skin colour, superficial hyperpigmentation, fine wrinkles, medium wrinkles, rough skin, dilated pores, and alterations in skin texture.

The inclusion criteria for this technique were: no topical exfoliant treatments for at least two months previously, no administration of photosensitising or oral retinoid drugs for at least eight months previously, no surgical treatments or local injection therapies for eight months previously, no photorejuvenation treatments with other sources or photodynamic therapy with ALA for at least a year. Patients with a positive anamnesis for the formation of keloids or collagenopathies were excluded.

An appropriate anti-herpetic therapy was administered to patients two days before and seven days after treatment, even when there was a negative anamnesis for this infection.

To achieve better patient compliance, an anaesthetic cream can be applied 15-20 minutes before treatment or a dynamic cooling system can be used before treatment (with a jet of cool air).

At the end of the treatment, compression was maintained for approximately 20 minutes with gauze soaked in saline solution followed by the application of a moisturising cream.

It may helpful to apply an antibiotic cream or administer oral NSAIDs in case of intense erythema and/or oedema (in the area around the eyes). The patient must repeat this procedure at home for the following 5-6 days. Immediately after the operation, the patient will have signs of erythema and oedema (evident in the area around the eyes). On the second or third day, there may a colour change (tanned appearance) followed by mild peeling. Once the skin has stopped peeling there will be varying degrees of erythema that require photoprotection.

The reason for developing a minimally invasive fractional laser was to combine the excellent clinical results obtained with an ablative laser such as the CO_2 with reduced risk of side effects and shorter post-op recovery times.

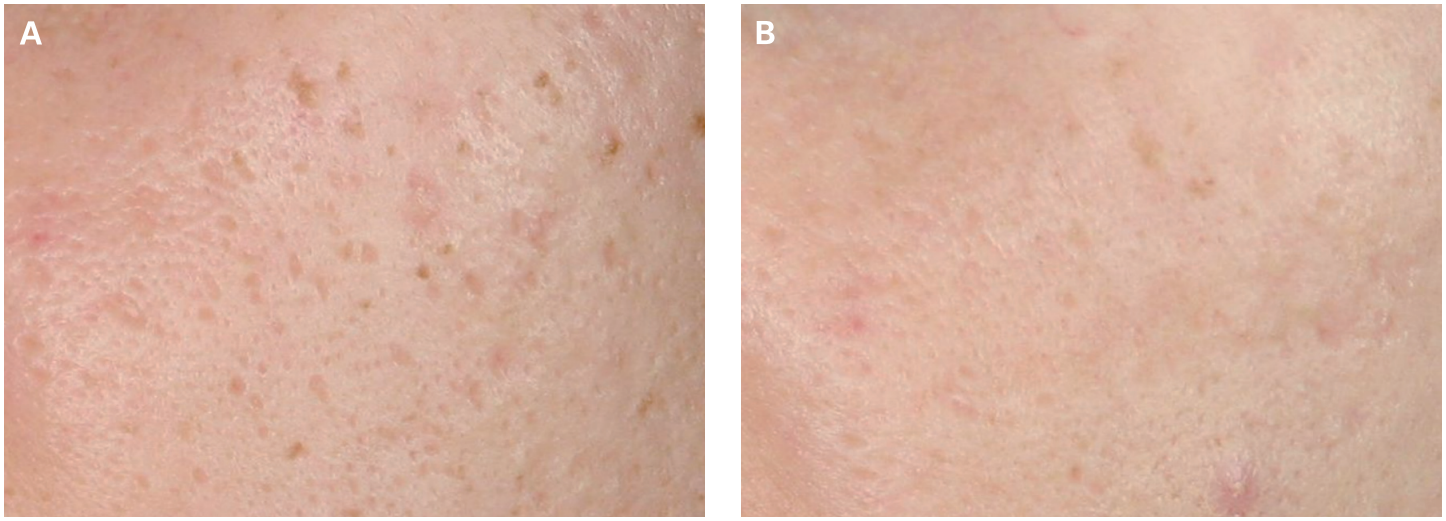


Figure 4 (A) and **(B)** Detail of scars, in polarised light

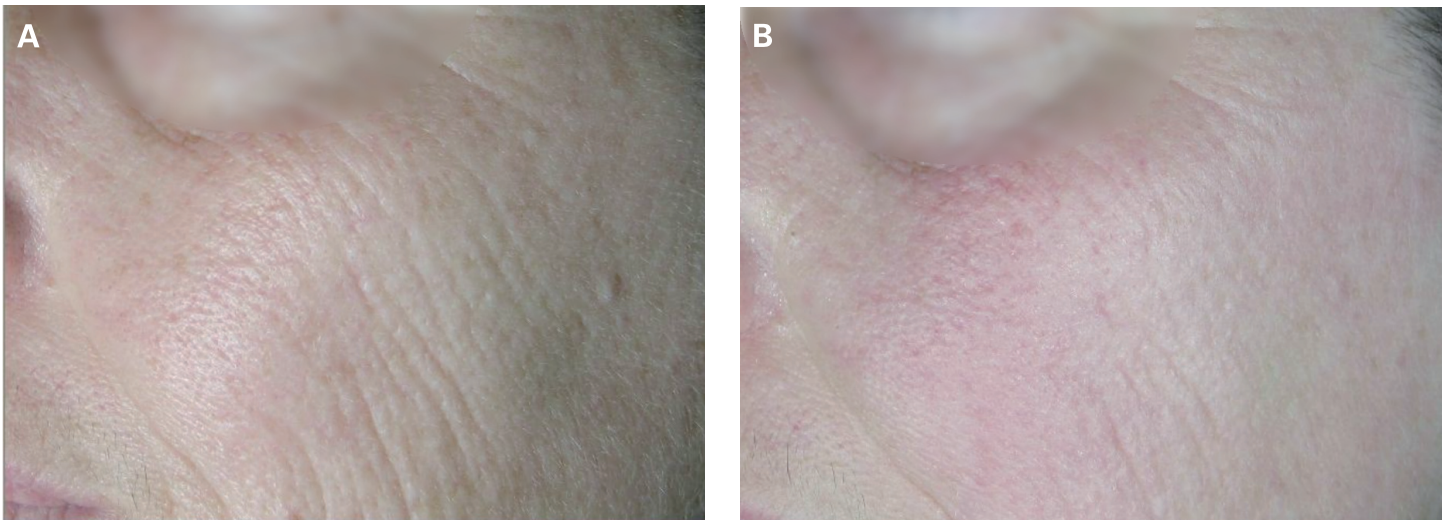


Figure 5. Face wrinkles: **(A)** Before **(B)** after 3 treatments (HiScan DOT/RF: use of D-Pulse and Radiofrequency)

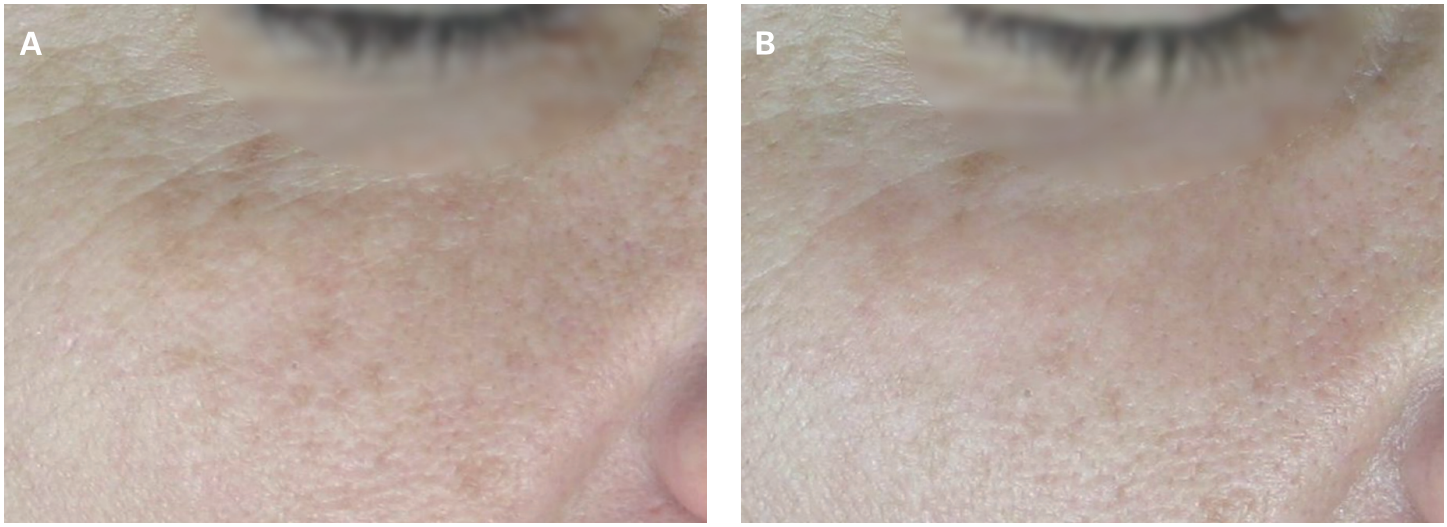


Figure 6 (A) and **(B)** Face wrinkles: Before Wrinkles around eyes: Before and 15 days after one treatment Reduction of superficial hyperpigmentation, fine wrinkles and general improvement of skin texture. (HiScan DOT/RF: use of D-Pulse)

The fractional technique today satisfies the demands of the majority of people seeking face and neck photorejuvenation .

A significant reduction in the signs of photodamage was observed in all patients. The minimally invasive fractional skin resurfacing method proved to be effective in attenuating wrinkles and sunspots. The treated skin gradually improved and became more elastic due to the fibroblastic activation and neocollagenogenesis, finally achieving enhanced skin tone and smoothness. The recovery times were between 3 and 7 days in nearly all patients, and the erythema normally never lasted longer than 15 days.

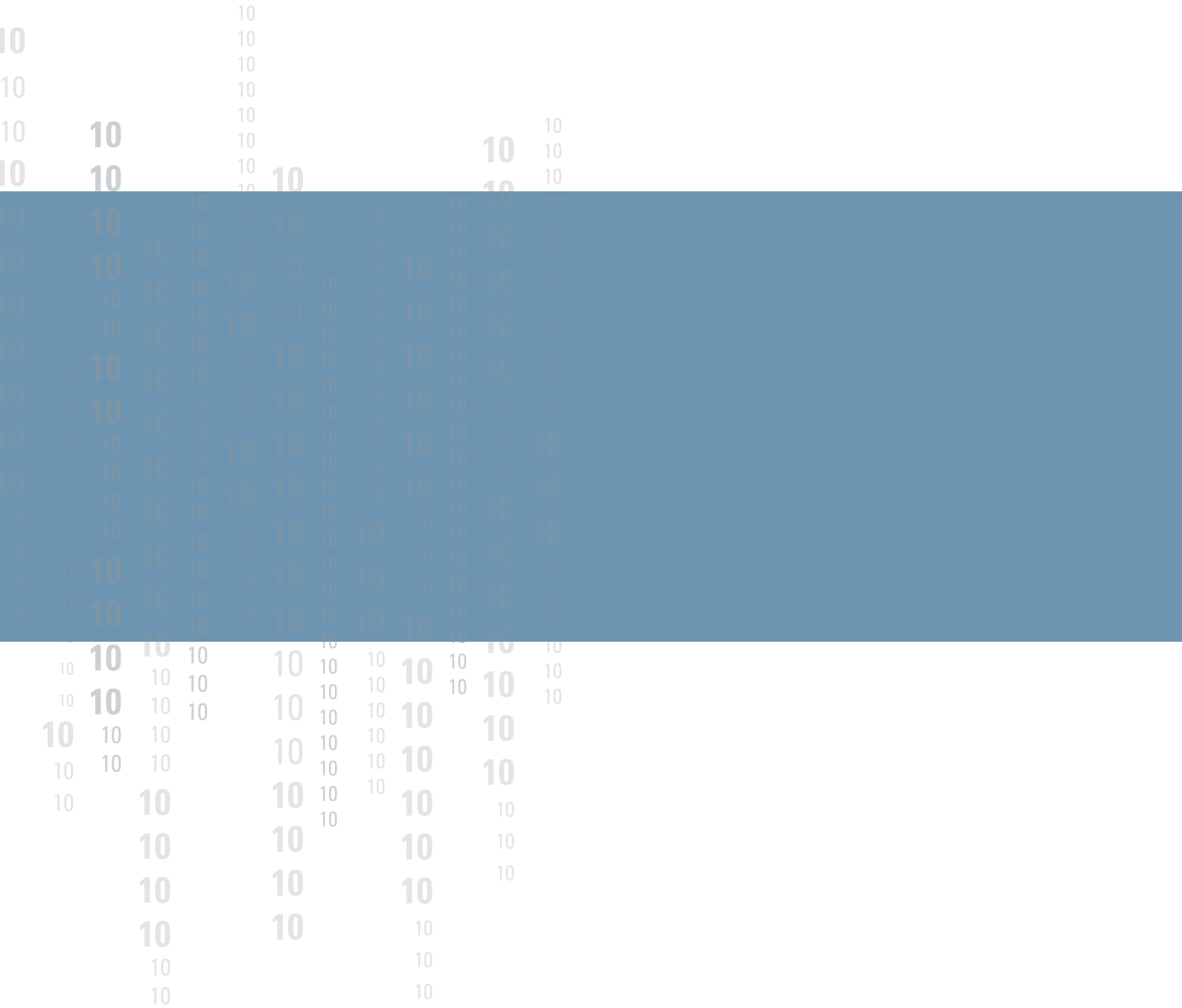
There was a very low incidence of complications (bacterial infections, atrophic scarring, post-inflammatory hypopigmentation and hyperpigmentation) compared to the ablative treatment.

It should be noted however that herpetic complications are possible in the absence of appropriate pre- and post-treatment. Positive reports were received from patients regarding pain during treatment, recovery times and the smoothness and compactness of their skin after treatment.

Conclusions

In our experience, CO_2 fractional laser has proved to be an effective and safe method for achieving positive results in one or two sessions (spaced 40-60 days apart), with recovery times never longer than 8 days.

The method can therefore be considered a valid answer to the growing demand for satisfactory results combined with reduced healing times.



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