



Title: A Comparative Study of Dermapen and Fractional Laser for Skin Rejuvenation: Efficacy and Side Effect Analysis

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Abstract

Objective: This study aimed to evaluate the effectiveness and potential side effects of Dermapen versus Fractional Laser for skin rejuvenation in patients between the ages of 39 and 50.

Methods: 24 patients in the 39–50 age range in total. Which involved interventions; two Dermapen sessions were completed by each of the twelve patients. And 12 individuals received skin rejuvenation with fractional laser therapy. The gap in sessions was a one-month interval between the two sessions. Patients with diabetes, a history of herpes, or other serious condition were not eligible to participate in the case studies.

Result: The outcome revealed five patients (41.67%) in the fractional laser group had post-inflammatory hyperpigmentation. Patients with severe photosensitivity: 5 (41.67%), Downtime increase: 5 patients (41.67%) whereas in the Dermapen Group, 0 individuals (0%) had post-inflammatory hyperpigmentation. Patients with photosensitivity: 0%, Downtime: 0% of patients

Conclusion: Dermapen had fewer side effects than fractional laser treatment in terms of skin rejuvenation. Due to its little downtime and lack of photosensitivity or post-inflammatory hyperpigmentation, Dermapen is a safer option. Since of the way it works, Dermapen can be used on more skin types since it reduces some of the side effects associated with fractional lasers. The study claims that since Dermapen doesn't result in adverse effects like post-inflammatory hyperpigmentation, which is typically connected to light-based therapies, it is a safer choice. Those with darker complexion tones should especially be aware of this.

Key words: techniques, laser, derma pen, infection, inflammation

Introduction:

All living things eventually experience ageing, which is characterized by a loss of anatomical and physiological integrity at the cellular and individual levels as a direct result of their longer biological lifespans. Reference Since skin is the largest and most visible organ; changes resulting from ageing immediately affect an individual's quality of life since skin is a cosmetic reflection of self-confidence. Wrinkles, elasticity loss, a rough texture, thinning, and dryness are the hallmarks of ageing skin that arise from phenotypic changes in the cellular and extracellular matrix brought on by both internal and external stimuli¹⁻⁴. The advantages of products have been seen as viable candidates for ageing therapy,

have been discovered by researchers thanks to recent technological breakthroughs. Topical formulations containing extracellular matrix proteins, chemokines, cytokines, and growth factors. Their promise for skin rejuvenation has been scientifically disclosed by previous study, which shows that they can increase collagen synthesis and reduce fibroblast mortality in reaction to UV exposure⁵⁻⁷. Because of their easier handling and comparatively reduced immunogenicity, micro-needling with topical products is a better option for therapeutic applications than cell lines. In addition to the kind of product, administration methods are thought to influence the results. Microneedle therapy has been demonstrated to enhance the amount of dermal collagen and elastic fibers, skin capacitance, epidermal thickness, and macroscopic skin profile prior to topical administration⁸⁻¹⁰.

Methodology:

The effectiveness and adverse effects of Dermapen were compared to Fractional Laser in this study using a prospective approach for skin rejuvenation. In all, 24 patients between the ages of 39 and 50 were included in the research. The subjects were split into two groups: the first group had two Dermapen sessions, while the second group had fractional laser skin rejuvenation. Patients with a history of diabetes, herpes, or other serious sickness were not allowed to participate in the case studies in order to guarantee the validity of the findings. A thorough evaluation of treatment outcomes was made possible by the one-month interval between the intervention sessions. Patients were extensively observed for adverse effects, such as photosensitivity, downtime, and post-inflammatory hyperpigmentation, following treatment. After that, an analysis was conducted on the data collected from both groups to compare the safety and effectiveness profiles of Dermapen and Fractional Laser. The methodology of the study was to evaluate the two skin rejuvenation techniques in a strict and controlled setting. This study attempted to provide important insights into the relative efficacy and safety concerns related to Dermapen and Fractional Laser skin treatments by incorporating a wide variety of patients and carefully recording the interventions and results.

Results:

Table 1: Fractional Laser Treatment Results

Treatment Outcome	Number of Patients	Percentage
Post Inflammatory Hyperpigmentation	5	41.67%
Severe Photosensitivity	5	41.67%
Increased Downtime	5	41.67%

Table 2: Dermapen Treatment Results

Treatment Outcome	Number of Patients	Percentage
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Treatment Outcome	Number of Patients	Percentage
Post Inflammatory Hyperpigmentation	0	0%
Photosensitivity	0	0%
Downtime	0	0%

Pic 1



pic 2



Pic 3



pic 4



Discussion:

The study's findings demonstrated significant variations in the adverse effect profiles of skin-rejuvenating Fractional Laser and Dermapen treatments. In aesthetic and cosmetic dermatology, MN and FL procedures are used for many things, including treating skin ageing. Both techniques produce regulated vertical micro-tunnels into the dermis, facilitating efficient transdermal topical substance distribution¹¹. Five out of the twelve patients who received fractional laser treatment reported increased downtime, significant photosensitivity, and post-inflammatory hyperpigmentation. The group that had Dermapen treatment, however, had a remarkably different result; none of the patients experienced photosensitivity or post-inflammatory hyperpigmentation, and the downtime was essentially undetectable. When MN and FL treatments caused mechanical and thermal damage, fibrovascular tissue grew, leading to the creation of telangiectasia in individuals with a hereditary susceptibility¹². These results imply that Dermapen might be a more acceptable and safe alternative for skin rejuvenation, especially when weighed against the reported negative effects of fractional laser therapy. The documented side effects of fractional lasers, which include discomfort (particularly in individuals with darker skin), prolonged erythema, infections, post-inflammatory hyperpigmentation, and hypopigmentation, must be carefully taken into account. It is well known that retinoic acid inhibits sebocyte differentiation and proliferation as well as sebum production. This further prevents *Cutibacterium acnes*, a commensal flora that produces porphyrins and is present in human skin, from growing¹³⁻¹⁴. The Dermapen, which uses a microneedling technique, seemed to lessen these side effects. The outcomes demonstrate the potential benefits of Dermapen over fractional lasers, both in terms of

effectiveness and lowering the possibility of negative side effects. According to Pooja et al., there may be brief erythema and edoema following FL treatment, and pain and discomfort may linger for a few hours after receiving MN treatment¹⁵. Moreover, Dermapen's colorblindness, which makes it suitable for almost all skin tones, is a major benefit over fractional lasers, which could have restrictions depending on skin tone. The study's findings offer insightful information about the relative safety and effectiveness of these two skin rejuvenation techniques, assisting medical professionals in making better decisions when choosing the best courses of action for their patients.

Conclusion:

When it came to skin rejuvenation, Dermapen showed less adverse effects than fractional laser treatment. Dermapen is a safer choice because it doesn't cause photosensitivity or post-inflammatory hyperpigmentation and has very little downtime. Due to its mechanism of action, Dermapen can be used on a wider variety of skin types by limiting certain negative effects linked to fractional lasers. According to the study, Dermapen is a safer option because it doesn't cause side effects like post-inflammatory hyperpigmentation, which is frequently associated with light-based therapies. This is especially true for people with darker skin tones.

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