

Research Article

Derma roller: simple and effective acne scar treatment

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ABSTRACT

Background: Scarring is particularly a distressing phenomenon. The micro-needling is a minimally invasive procedure which has recently attained popularity because of the fact that it can be used safely with minimal training.

Methods: The present study was performed on 30 patients suffering from facial scarring of acne vulgaris. The patients were photographed and assessed clinically at the time of enrolment to grade the severity of scarring as per the grading system proposed by Goodman and Baron.

Results: A total of 30 patients were included in the study of which females were 18 and males 12. The age of the patients ranged from 18 to 30 years with the mean age of 24 years. Overall, 20 out of the total of 28 patients (71.4%) showed an excellent response to derma roller treatment while 7 others achieved a good response (25%). Only 1 patient (3.6%) out of the total of 28 failed to show a significant response to treatment.

Conclusions: Derma roller is a safe and effective treatment option for grade 2 and grade 3 acne scars.

Keywords: Derma roller, Acne scars

INTRODUCTION

Scarring is particularly a distressing phenomenon. Post-acne facial scarring is a psychologically devastating condition and the affected patient invariably suffers from low self-esteem and many other psychological ill-effects because of this condition.¹

The micro-needling is a minimally invasive procedure which can be used for a plethora of conditions ranging from acne scars to alopecia areata. Treatment with these hand-held devices is known by many names like microneedling therapy, collagen induction therapy or derma roller therapy. Derma roller has recently attained popularity because of the fact that it can be used safely with minimal training.

Post-acne facial scars have been classified into many morphological types and the ideal treatment option depends upon the type of scarring. a clinical grading system has been devised to grade the severity of post-

acne facial scars. This grading system, proposed by Goodman and Baron as presented in Table 1.²

Table 1: Grades of atrophic scar.

Grades of atrophic scars	Clinical picture
Grade 1	Macular erythematous, hypo or hyperpigmented scars
Grade2	Mild atrophy not obvious at social distances of >50 cm or easily covered by facial makeup or beard line
Grade3	Moderate atrophy obvious at social distances of >50 cm ;not easily covered by facial makeup or beard line, but able to be flattened by manual stretching
Grade4	Severe atrophy not flattened by manual stretching of the skin.

METHODS

The present study was performed on 30 patients suffering from facial scarring of acne vulgaris. The patients were photographed and assessed clinically at the time of enrolment to grade the severity of scarring as per the grading system proposed by Goodman and Baron.

Patients with post acne facial scarring were included in the study and patients with presence of active acne on the face, keloidal tendency, presence of herpes labialis or facial warts and patients who are using topical or systemic retinoids were excluded from the study.

Informed written consent was obtained from all the patients who were enrolled for the study.

Microneedling or dermaroller treatment was performed at every 4 weeks interval for a maximum of 4 sittings. The area to be treated is anesthetized with topical emla preparation for 45 minutes to one hour. After preparation of the area, dermarollers with 1.5 mm long needles were used. Rolling was done 10-15 times in horizontal, vertical, and oblique directions and the endpoint for any treatment session was the presence of uniform bleeding points over the scarred area.

The patients were followed up monthly repeat photographs were taken for a period of 4 months. The appearance and grading of scars was then compared with that in the pre-treatment period and any change in the grading of scars was noted. On objective lines, an improvement of scarring by two grades or more was labeled as ‘excellent’ response while a ‘good’ response meant an improvement by a single grade only. In those patients where the scar grading remained the same after the completion of treatment irrespective of any visible change in the facial scarring the response was labelled as ‘poor’ as given in Table 2.

Table 2: Improvement of grading.

Improvement of grading	Response
≥2	Excellent
≥1	Good
Nil	Poor

RESULTS

A total of 30 patients were included in the study of which females were 18 and males 12. The age of the patients ranged from 18 to 30 years with the mean age of 24 years.

All patients tolerated the procedure well except for a temporary erythema. No adverse effects were noted in any patient. No patient reported any interference in his/her daily activities in the immediate post-treatment except for mild crusting that persisted for a day or two.

Out of 30 patients 2 patients dropped out of the study as they could not complete the sittings required for final assessment.

In 2 patients with grade 4 scarring 1 patient showed good and 1 patient showed poor response. In 14 patients with grade 3 scarring, an excellent response was noted in 10 patients, 4 patients showed good response while poor response was noted in none. In 12 patients with grade 2 scars 10 patients showed an excellent response while 2 patients had good response to treatment while poor response was noted in none as presented in Table 3.

Table 3: Response to derma roller treatment.

Grade of acne	No.of patients	Excellent response	Good response	Poor response
Grade 4	02	-	1(50%)	1(50%)
Grade 3	14	10(71.4%)	4(28.6%)	-
Grade 2	12	10(83.3%)	2(16.7%)	-
Total	28	20(71.4%)	7(25%)	1(3.6%)

Thus, overall, 20 out of the total of 28 patients (71.4%) showed an excellent response to dermaroller treatment while 7 others achieved a good response (25%). Only 1 patient (3.6%) out of the total of 28 failed to show a significant response to treatment.

Correlating the response with the morphological type of scarring present, we found a good to excellent response in rolling and boxcar scars while pitted scars showed only moderate improvement. Deep tunnels and other complicated scars showed a poor response.



Figure 1: Before and after derma roller treatment.



Figure 2: Acne –grade 4.

DISCUSSION

The medical dermaroller needles are 0.5-1.5 mm in length. During treatment, the needles pierce the stratum corneum and create microconduits (holes) without damaging the epidermis. It has been shown that rolling with a dermaroller (192 needles, 200 µm length and 70 µm diameter) over an area for 15 times will result in approximately 250 holes/cm². Microneedling leads to the release of growth factors which stimulate the formation of new collagen (natural collagen) and elastin in the papillary dermis. In addition, new capillaries are formed- this neovascularisation and neocollagenesis following treatment leads to reduction of scars.³⁻⁵ The procedure was therefore aptly called "percutaneous collagen induction therapy" and has also been used in the treatment of photoageing.

Dermaroller

The standard dermaroller used for acne scars is a drum-shaped roller studded with 192 fine microneedles in eight rows, 0.5-1.5 mm in length and 0.1 mm in diameter. The microneedles are synthesized by silicon or medical-grade stainless steel. The instrument is presterilized by gamma irradiation. Medical dermarollers are for single use only.

Procedure

Microneedling is an office-based procedure. The area to be treated is anesthetized with topical emla preparation for 45 minutes to one hour. After preparation of the area, rolling is done 10-15 times in horizontal, vertical, and oblique directions; petechiae or pin-point bleeding which occurs is easily controlled. After treatment, the area is wetted with saline pads. The entire procedure lasts for 15 to 20 minutes, depending on the extent of the area to be treated. Three to four treatments may be needed for moderate acne scars. The idea is to create a controlled injury, thereby inducing the body to respond by producing more collagen in the treated area. It stimulates massive growth of elastin and collagen fibres and neovascularisation.

Side effects

Microneedling is well tolerated by patients but erythema may be seen after treatment, lasting for 2-3 days. Skin may also feel warm, tight and itchy for a short while, this normally resolves in 12 - 48 hours.

Post procedure care

Photoprotection using broad spectrum sunscreen is advised as a routine and local antibiotic creams may be prescribed.

Advantages

The procedure is well tolerated and well accepted by the patients, is cost-effective, can be done on all skin types and on areas not suitable for peeling or laser resurfacing, such as near eye and can be combined with other acne scar treatments like subcision, chemical peels, microdermabrasion, fractional resurfacing thus maximizing the benefits to the patients.

Disadvantages

It is not suitable for persons with active acne, eczema, rosacea, psoriasis or warts. Choice of treatment of post-acne scars depends both on the morphological type as well as the severity of each scar present on the face.⁶

We have analysed the efficacy of dermaroller in different grades of scars. Excellent response was seen in rolling or boxcar scars, while moderate response was seen in pitted scars.

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Ethical approval: The study was approved by the institutional ethics committee

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