

Original article:

Assess The Effectiveness of Microneedling in Post Acne Scars

Shekhar Pradhan¹, Umesh Bhoi²

¹MD, Associate Professor, Department of Dermatology, Government Medical College, Miraj, Maharashtra, India.

²MD, Assistant Professor, Department of Dermatology, Government Medical College, Miraj, Maharashtra, India.

Corresponding author: Dr. Umesh Bhoi,

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E-mail: drumeshbhoi@gmail.com

Abstract

Background: Microneedling is simple and novel technique used for the treatment of atrophic scars and skin rejuvenation. It involves use of a hand held rolling instrument with tiny needles which create multiple microinjuries in the skin, breakdown old collagen strands and induce new collagen synthesis. Post acne scars are difficult to treat causes psychosocial effect like depression, anxiety in patients and are the need to treat with less invasive and cheaper technique so tried Microneedling (dermaroller) in patient on rolling scar or box scar due to acne.

Aims: To assess the efficacy of Microneedling or dermaroller in rolling and box type of post acne scars.

Materials and Methods: 18 patients were selected in the study that had post acne scars maximum of rolling or box scar. Patients were evaluated clinically after six week interval and were recorded. Patients underwent a total of four sittings. Patients with severity from grade 2 to grade 4 post acne scars were selected. Patients with history of herpes labialis, presence of active infection, keloidal tendency were excluded. Improvement of scarring by two grades or more was labelled as 'excellent' while a 'good' response meant an improvement by a single grade only. Patients with no response were labeled as poor response.

Results: Out of total 18 patients 16 patients completed the treatment protocol. Among total 18 patients 15 patients were in the age group of 21-30 years. Out of 2 patients with grade 4 scarring one patient had good response while one patient had poor response. Amongst the 4 patients with grade 3 scarring 2 patients showed excellent response while 2 patients showed good response. In grade 2 scarring patients out of total 10 patients 4 had excellent, 5 had good response and 1 had poor response. No major side effects were encountered post procedure.

Key words: Microneedling, Acne, Rolling Scar, Box Scars, Therapeutic Effectiveness.

INTRODUCTION

Acne is a multifactorial inflammatory dermatosis of the pilosebaceous unit, affecting up to 80 percent of teenagers and approximately 20 percent of adults. Scarring can occur early in acne development and may affect up to 95% of patients with this disease. 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 In a survey of acne patients, 49% reported having scars.² In another study, it was documented that 95% of the acne scars occurred on face, and there was no gender difference.³ Genetic factors have an impact on predisposition to scarring, and type of scarring.⁴ Remodeling of collagen, the last step in tissue repair, is modulated by MMPs, which cause the damage, and tissue inhibitors of metalloproteases (TIMPs), which contain the damage. When the ratio of MMPs/TIMPs is low, atrophic scars occur and, conversely, when the ratio is high, hypertrophic scars occur.⁵ Broadly, acne

scars are classified as atrophic and hypertrophic. Atrophic acne scars have been further classified as ice-pick, rolling, and boxcar.⁶ The European acne group (ECCA) has renamed the atrophic acne scars as V-shaped (ice-pick), U-shaped (boxcar), and W-shaped (rolling).⁷

Treatment of Acne Scars: Various resurfacing techniques include TCA peeling, phenol peeling, microdermabrasion, laser abrasion, selective thermolysis with Fraxel laser, and resurfacing by radiofrequency and electrosurgery. A clinical grading system has been devised to grade the severity of post-acne facial scars. This grading system, proposed by Goodman and Baron, encompasses all the morphological types of post-acne scars and uses a simple clinical examination as the tool to grade the scars on objective lines.⁸ Microneedling therapy, also known as collagen induction therapy, is a recent addition to the treatment armamentarium for managing post-acne scars. Microneedling is a relatively new minimally invasive procedure involving superficial and controlled puncturing of the skin by rolling with miniature fine needles.

Basic Instrument: The standard medical dermaroller has a 12 cm long handle with a 2 × 2 cm wide drum-shaped cylinder at one end studded with 8 rows and 24 circular arrays of 192 fine microneedles usually 0.5–3 mm in length and 0.1–0.25 mm in diameter. The instrument is presterilized by gamma irradiation. Rolling with a standard dermaroller containing 192 needles of 2 mm length and 0.07 mm diameter over an area of skin for 15 times results in approximately 250 holes per square cm upto the papillary dermis depending on the pressure applied.⁹

Principle and Mechanism of Action:

Micropunctures are created using microneedles which produce a controlled skin injury without actually damaging the epidermis. These microinjuries lead to minimal superficial bleeding and set up a wound healing cascade with release of various growth factors such as platelet derived growth factor (PGF), transforming growth factor alpha and beta (TGF- α and TGF- β), connective tissue activating protein, connective tissue growth factor, and fibroblast growth factor (FGF).¹⁰ The needles also breakdown the old hardened scar strands and allow it to revascularise. Neovascularisation and neocollagenesis is initiated by migration and proliferation of fibroblasts and laying down of intercellular matrix.¹¹

Limitations and Adverse Effects: It is less efficacious in some types of scars such as pitted scars, linear scars, and deep boxcar scars. However, combining other surgical procedures to microneedling can improve its results. Certain adverse events are also known with the procedure, the common ones being potential erythema and irritation which usually subside within a few hours. Other events noted are post-inflammatory hyperpigmentation, aggravation of acne and reactivation of herpes.¹²

Microneedling can be combined with other treatment modalities such as chemical peels, subcision, nonablative lasers to enhance cosmetic outcomes in case of acne scars and rejuvenation.¹³

Contraindications:⁹

1. Active acne
2. Herpes labialis or any other local infection such as warts
3. Patients on anticoagulant therapy
4. Extreme keloidal tendency.

AIMS AND OBJECTIVES

The present study was conducted to assess the efficacy of Microneedling or dermaroller in rolling and box type of post acne scars.

MATERIALS AND METHODS

The present study was performed on 18 patients with variable degree of involvement of facial post

acne atrophic scars. These were the patients attending the outpatient department of Dermatology. The thorough clinical examination of the patients was done and assessed to grade the severity of post acne atrophic scars per the grading system proposed by Goodman and Baron.⁸(Table 1)

Table 1: Post acne atrophic scars per the grading system proposed by Goodman and Baron⁸

Atrophic Scars	Observability	Grade
None	NA	1
Mild	easily covered; not obvious at 50+ meters	2
Moderate	not easily covered but flattened by stretching the skin	3
Marked	not easily covered and cannot be flattened by stretching the skin	4

Patients with severity from grade 2 to grade 4 post acne scars were selected. Informed written consent was taken from enrolled patients. Dermaroller with 1.5 mm therapy was performed at intervals of 6 weeks for 4 sittings and then the clinical evaluation was taken into consideration.

Exclusion criteria:

1. History of herpes labialis.
2. Presence of active infection.
3. Keloidal tendency.
4. Use of systemic retinoids in last 3 months.

Topical anaesthesia with application of anaesthetics cream mixture of prilocaine and lignocaine was used 45 min to 1 hour before procedure. Presence of pinpoint uniform bleeding points on the scarred area was considered as endpoint. Improvement of scarring by two grades or more was labelled as ‘excellent’ while a ‘good’ response meant an improvement by a single grade only. In those patients where the scar grading remained the same were labelled as ‘poor’. Post treatment patients were advised topical antibiotics, photo protection and regular use of sunscreens.

RESULTS

Out of total 18 patients of post acne scars enrolled 11 were male patients and 7 were females. Out of total 18 patients 15 patients were in the age group of 21-30 years. 2 patients were below 20 years of age and one male patient was 32 years old. Two patients discontinued the treatment after one sitting. Hence total of 16 patients completed the treatment protocol. Among the 16 patients 10 patients were from grade 2 type of rolling and box scars, while 4 patients were having grade 3 severity type of post acne scars. Two patients were having grade 4 scarring severity. Two patients who discontinued the treatment one was from grade 4 and other had grade 3 type of severity.

Among the two patients with grade 4 scarring who completed the study protocol of all 4 sittings one patient showed good response while the other had poor response.

Amongst the 4 patients with grade 3 scarring 2 patient showed excellent response. While 2 patients showed good response.

In grade 2 scarring patients out of total 10 patients 4 had excellent, 5 had good response and 1 had poor response.

No major side effects were encountered post procedure. Transient erythema and oedema were noticed post procedure. Patients were advised topical antibiotics and photoprotection.

DISCUSSION

Microneedling is performed as an office procedure by means of an instrument known as a dermaroller. Microneedling causes small pinpoint injuries on the treated skin, which apparently heal within two to three days with no post-treatment sequel.¹⁴ Microneedling or dermaroller treatment is becoming popular all over the world in the management of post-acne scars.

We have analyzed the efficacy of dermaroller in different grades of scars. The severity of scars

improved by two or more grades in 6 (37%) of our patients and in a further 8 (50%) patients we could achieve a reduction in scars by a single grade. Thus, on an overall basis a good to excellent response was achieved in 14 out of 16 patients (87%). Response in excellent grade was much lower in our study 37% as compared to the similar study done by Majid¹⁴ where they had 72% response. But over all outcome of microneedling treatment in both studies were comparable. Limitations of dermaroller are it could not show fair response in few cases. Considering the economical cost, easy availability, office procedure and minimal downtime it can be considered as a good alternative to the laser therapy.

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